**Treffliste fra PubMed og Cochrane Library, referanse, sammendrag og url.**

269 treff.

1. Priori SG, Blomström-Lundqvist C, Mazzanti A, Blom N, Borggrefe M, Camm J, et al. 2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: The Task Force for the Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death of the European Society of Cardiology (ESC). Endorsed by: Association for European Paediatric and Congenital Cardiology (AEPC). Eur Heart J. 2015;36(41):2793-867.

2. Rihal CS, Naidu SS, Givertz MM, Szeto WY, Burke JA, Kapur NK, et al. 2015 SCAI/ACC/HFSA/STS Clinical Expert Consensus Statement on the Use of Percutaneous Mechanical Circulatory Support Devices in Cardiovascular Care (Endorsed by the American Heart Association, the Cardiological Society of India, and Sociedad Latino Americana de Cardiologia Intervencion; Affirmation of Value by the Canadian Association of Interventional Cardiology-Association Canadienne de Cardiologie D'intervention). Catheter Cardiovasc Interv. 2015;85(7):E175-96.

Although historically the intra-aortic balloon pump has been the only mechanical circulatory support device available to clinicians, a number of new devices have become commercially available and have entered clinical practice. These include axial flow pumps, such as Impella®; left atrial to femoral artery bypass pumps, specifically the TandemHeart; and new devices for institution of extracorporeal membrane oxygenation. These devices differ significantly in their hemodynamic effects, insertion, monitoring, and clinical applicability. This document reviews the physiologic impact on the circulation of these devices and their use in specific clinical situations. These situations include patients undergoing high-risk percutaneous coronary intervention, those presenting with cardiogenic shock, and acute decompensated heart failure. Specialized uses for right-sided support and in pediatric populations are discussed and the clinical utility of mechanical circulatory support devices is reviewed, as are the American College of Cardiology/American Heart Association clinical practice guidelines.

3. Rihal CS, Naidu SS, Givertz MM, Szeto WY, Burke JA, Kapur NK, et al. 2015 SCAI/ACC/HFSA/STS Clinical Expert Consensus Statement on the Use of Percutaneous Mechanical Circulatory Support Devices in Cardiovascular Care (Endorsed by the American Heart Association, the Cardiological Society of India, and Sociedad Latino Americana de Cardiología Intervencionista; Affirmation of Value by the Canadian Association of Interventional Cardiology-Association Canadienne de Cardiologie d'intervention). Catheter Cardiovasc Interv. 2015;85(7):1112-4.

This article provides a brief summary of the relevant recommendations and references related to percutaneous mechanical circulatory support. The goal was to provide the clinician with concise, evidence-based contemporary recommendations, and the supporting documentation to encourage their application. The full text includes disclosure of all relevant relationships with industry for each writing committee member. A fundamental aspect of all expert consensus statements is that these carefully developed, evidence-based documents can neither encompass all clinical circumstances, nor replace the judgment of individual physicians in management of each patient. The science of medicine is rooted in evidence, and the art of medicine is based on the application of this evidence to the individual patient. This expert consensus statement has adhered to these principles for optimal management of patients requiring percutaneous mechanical circulatory support.

4. Levine GN, Bates ER, Bittl JA, Brindis RG, Fihn SD, Fleisher LA, et al. 2016 ACC/AHA Guideline Focused Update on Duration of Dual Antiplatelet Therapy in Patients With Coronary Artery Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines: An Update of the 2011 ACCF/AHA/SCAI Guideline for Percutaneous Coronary Intervention, 2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery, 2012 ACC/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease, 2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction, 2014 AHA/ACC Guideline for the Management of Patients With Non-ST-Elevation Acute Coronary Syndromes, and 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery. Circulation. 2016;134(10):e123-55.

5. Anderson TJ, Grégoire J, Pearson GJ, Barry AR, Couture P, Dawes M, et al. 2016 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult. Can J Cardiol. 2016;32(11):1263-82.

Since the publication of the 2012 guidelines new literature has emerged to inform decision-making. The 2016 guidelines primary panel selected a number of clinically relevant questions and has produced updated recommendations, on the basis of important new findings. In subjects with clinical atherosclerosis, abdominal aortic aneurysm, most subjects with diabetes or chronic kidney disease, and those with low-density lipoprotein cholesterol ≥ 5 mmol/L, statin therapy is recommended. For all others, there is an emphasis on risk assessment linked to lipid determination to optimize decision-making. We have recommended nonfasting lipid determination as a suitable alternative to fasting levels. Risk assessment and lipid determination should be considered in individuals older than 40 years of age or in those at increased risk regardless of age. Pharmacotherapy is generally not indicated for those at low Framingham Risk Score (FRS; <10%). A wider range of patients are now eligible for statin therapy in the FRS intermediate risk category (10%-19%) and in those with a high FRS (> 20%). Despite the controversy, we continue to advocate for low-density lipoprotein cholesterol targets for subjects who start therapy. Detailed recommendations are also presented for health behaviour modification that is indicated in all subjects. Finally, recommendation for the use of nonstatin medications is provided. Shared decision-making is vital because there are many areas in which clinical trials do not fully inform practice. The guidelines are meant to be a platform for meaningful conversation between patient and care provider so that individual decisions can be made for risk screening, assessment, and treatment.

6. Klein LW, Harjai KJ, Resnic F, Weintraub WS, Vernon Anderson H, Yeh RW, et al. 2016 Revision of the SCAI position statement on public reporting. Catheter Cardiovasc Interv. 2017;89(2):269-79.

7. Hecht HS, Cronin P, Blaha MJ, Budoff MJ, Kazerooni EA, Narula J, et al. 2016 SCCT/STR guidelines for coronary artery calcium scoring of noncontrast noncardiac chest CT scans: A report of the Society of Cardiovascular Computed Tomography and Society of Thoracic Radiology. J Cardiovasc Comput Tomogr. 2017;11(1):74-84.

The Society of Cardiovascular Computed Tomography (SCCT) and the Society of Thoracic Radiology (STR) have jointly produced this document. Experts in this subject have been selected from both organizations to examine subject-specific data and write this guideline in partnership. A formal literature review, weighing the strength of evidence has been performed. When available, information from studies on cost was considered. Computed tomography (CT) acquisition, CAC scoring methodologies and clinical outcomes are the primary basis for the recommendations in this guideline. This guideline is intended to assist healthcare providers in clinical decision making. The recommendations reflect a consensus after a thorough review of the best available current scientific evidence and practice patterns of experts in the field and are intended to improve patient care while acknowledging that situations arise where additional information may be needed to better inform patient care.

8. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS Guideline for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. J Am Coll Cardiol. 2018;72(14):e91-e220.

9. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS Guideline for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Circulation. 2018;138(13):e272-e391.

10. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Heart Rhythm. 2018;15(10):e73-e189.

11. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS Guideline for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Circulation. 2018;138(13):e210-e71.

12. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS Guideline for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. J Am Coll Cardiol. 2018;72(14):1677-749.

13. Lloyd-Jones DM, Morris PB, Ballantyne CM, Birtcher KK, Daly DD, Jr., DePalma SM, et al. 2017 Focused Update of the 2016 ACC Expert Consensus Decision Pathway on the Role of Non-Statin Therapies for LDL-Cholesterol Lowering in the Management of Atherosclerotic Cardiovascular Disease Risk: A Report of the American College of Cardiology Task Force on Expert Consensus Decision Pathways. J Am Coll Cardiol. 2017;70(14):1785-822.

In 2016, the American College of Cardiology published the first expert consensus decision pathway (ECDP) on the role of non-statin therapies for low-density lipoprotein (LDL)-cholesterol lowering in the management of atherosclerotic cardiovascular disease (ASCVD) risk. Since the publication of that document, additional evidence and perspectives have emerged from randomized clinical trials and other sources, particularly considering the longer-term efficacy and safety of proprotein convertase subtilisin/kexin 9 (PCSK9) inhibitors in secondary prevention of ASCVD. Most notably, the FOURIER (Further Cardiovascular Outcomes Research with PCSK9 Inhibition in Subjects with Elevated Risk) trial and SPIRE-1 and -2 (Studies of PCSK9 Inhibition and the Reduction of Vascular Events), assessing evolocumab and bococizumab, respectively, have published final results of cardiovascular outcomes trials in patients with clinical ASCVD and in a smaller number of high-risk primary prevention patients. In addition, further evidence on the types of patients most likely to benefit from the use of ezetimibe in addition to statin therapy after acute coronary syndrome has been published. Based on results from these important analyses, the ECDP writing committee judged that it would be desirable to provide a focused update to help guide clinicians more clearly on decision making regarding the use of ezetimibe and PCSK9 inhibitors in patients with clinical ASCVD with or without comorbidities. In the following summary table, changes from the 2016 ECDP to the 2017 ECDP Focused Update are highlighted, and a brief rationale is provided. The content of the full document has been changed accordingly, with more extensive and detailed guidance regarding decision making provided both in the text and in the updated algorithms. Revised recommendations are provided for patients with clinical ASCVD with or without comorbidities on statin therapy for secondary prevention. The ECDP writing committee judged that these new data did not warrant changes to the decision pathways and algorithms regarding the use of ezetimibe or PCSK9 inhibitors in primary prevention patients with LDL-C <190 mg/dL with or without diabetes mellitus or patients without ASCVD and LDL-C ≥190 mg/dL not due to secondary causes. Based on feedback and further deliberation, the ECDP writing committee down-graded recommendations regarding bile acid sequestrant use, recommending bile acid sequestrants only as optional secondary agents for consideration in patients intolerant to ezetimibe. For clarification, the writing committee has also included new information on diagnostic categories of heterozygous and homozygous familial hypercholesterolemia, based on clinical criteria with and without genetic testing. Other changes to the original document were kept to a minimum to provide consistent guidance to clinicians, unless there was a compelling reason or new evidence, in which case justification is provided.

14. Hannan EL, Samadashvili Z, Cozzens K, Berger PB, Chikwe J, Jacobs AK, et al. 2017 Versus 2012 Appropriate Use Criteria for Percutaneous Coronary Interventions: Impact on Appropriateness Ratings. JACC Cardiovasc Interv. 2018;11(5):473-8.

OBJECTIVES: The purpose of this study is to revisit cases rated as "inappropriate" in the 2012 appropriate use criteria (AUC) using the 2017 AUC. BACKGROUND: AUC for coronary revascularization in patients with stable ischemic heart disease (SIHD) were released in January 2017. Earlier 2012 AUC identified a relatively high percentage of New York State patients for whom percutaneous coronary intervention (PCI) was rated as "inappropriate" versus optimal medical therapy alone. METHODS: New York State's PCI registry was used to rate inappropriateness of patients undergoing PCI in 2014 using the 2012 and 2017 AUC, and to examine patient characteristics for patients rated differently. RESULTS: A total of 911 of 9,261 (9.8%) patients who underwent PCI in New York State in 2014 with SIHD without prior coronary artery bypass grafting were rated as "inappropriate" using the 2012 AUC, but only 171 (1.8%) patients were rated as "rarely appropriate" ("inappropriate" in 2012 AUC terminology) using the 2017 AUC. A total of 26% of all 8,407 patients undergoing PCI in New York State with 1- to 2-vessel SIHD were without high-risk findings on noninvasive testing and were either asymptomatic or without antianginal therapy. No current or past randomized controlled trials have focused on these patients. CONCLUSIONS: The percentage of 2014 New York State PCI patients with SIHD who are rated "rarely appropriate" has decreased substantially using 2017 AUC in comparison with the older 2012 AUC. However, for many low-risk patients undergoing the procedure, the relative benefits of optimal medical therapy with and without PCI are unknown. Randomized controlled trials are needed to study these groups.

15. Grundy SM, Stone NJ. 2018 Cholesterol Clinical Practice Guidelines: Synopsis of the 2018 American Heart Association/American College of Cardiology/Multisociety Cholesterol Guideline. Ann Intern Med. 2019;170(11):779-83.

DESCRIPTION: In November 2018, the American Heart Association and American College of Cardiology (AHA/ACC) released a new clinical practice guideline on cholesterol management. It was accompanied by a risk assessment report on primary prevention of atherosclerotic cardiovascular disease (ASCVD). METHODS: A panel of experts free of recent and relevant industry-related conflicts was chosen to carry out systematic reviews and meta-analyses of randomized controlled trials (RCTs) that examined cardiovascular outcomes. High-quality observational studies were used for estimation of ASCVD risk. An independent panel systematically reviewed RCT evidence about the benefits and risks of adding nonstatin medications to statin therapy compared with receiving statin therapy alone in persons who have or are at high risk for ASCVD. RECOMMENDATION: The guideline endorses a heart-healthy lifestyle beginning in childhood to reduce lifetime risk for ASCVD. It contains several new features compared with the 2013 guideline. For secondary prevention, patients at very high risk may be candidates for adding nonstatin medications (ezetimibe or proprotein convertase subtilisin/kexin type 9 [PCSK9] inhibitors) to statin therapy. In primary prevention, a clinician-patient risk discussion is still strongly recommended before a decision is made about statin treatment. The AHA/ACC risk calculator first triages patients into 4 risk categories. Those at intermediate risk deserve a focused clinician-patient discussion before initiation of statin therapy. Among intermediate-risk patients, identification of risk-enhancing factors and coronary artery calcium testing can assist in the decision to use a statin. Compared with the 2013 guideline, the new guideline gives more attention to percentage reduction in low-density lipoprotein cholesterol as a treatment goal and to long-term monitoring of therapeutic efficacy. To simplify monitoring, nonfasting lipid measurements are allowed.

16. Steffel J, Verhamme P, Potpara TS, Albaladejo P, Antz M, Desteghe L, et al. The 2018 European Heart Rhythm Association Practical Guide on the use of non-vitamin K antagonist oral anticoagulants in patients with atrial fibrillation: executive summary. Europace. 2018;20(8):1231-42.

The current manuscript is the Executive Summary of the second update to the original Practical Guide, published in 2013. Non-vitamin K antagonist oral anticoagulants (NOACs) are an alternative for vitamin K antagonists (VKAs) to prevent stroke in patients with atrial fibrillation (AF), and have emerged as the preferred choice, particularly in patients newly started on anticoagulation. Both physicians and patients are becoming more accustomed to the use of these drugs in clinical practice. However, many unresolved questions on how to optimally use these agents in specific clinical situations remain. The European Heart Rhythm Association (EHRA) set out to co-ordinate a unified way of informing physicians on the use of the different NOACs. A writing group identified 20 topics of concrete clinical scenarios for which practical answers were formulated, based on available evidence. The 20 topics are (i) eligibility for NOACs; (ii) practical start-up and follow-up scheme for patients on NOACs; (iii) ensuring adherence to prescribed oral anticoagulant intake; (iv) switching between anticoagulant regimens; (v) pharmacokinetics and drug-drug interactions of NOACs; (vi) NOACs in patients with chronic kidney or advanced liver disease; (vii) how to measure the anticoagulant effect of NOACs; (viii) NOAC plasma level measurement: rare indications, precautions, and potential pitfalls; (ix) how to deal with dosing errors; (x) what to do if there is a (suspected) overdose without bleeding, or a clotting test is indicating a potential risk of bleeding; (xi) management of bleeding under NOAC therapy; (xii) patients undergoing a planned invasive procedure, surgery or ablation; (xiii) patients requiring an urgent surgical intervention; (xiv) patients with AF and coronary artery disease; (xv) avoiding confusion with NOAC dosing across indications; (xvi) cardioversion in a NOAC-treated patient; (xvii) AF patients presenting with acute stroke while on NOACs; (xviii) NOACs in special situations; (xix) anticoagulation in AF patients with a malignancy; and (xx) optimizing dose adjustments of VKA. Additional information and downloads of the text and anticoagulation cards in different languages can be found on an EHRA web site (www.NOACforAF.eu).

17. January CT, Wann LS, Calkins H, Chen LY, Cigarroa JE, Cleveland JC, Jr., et al. 2019 AHA/ACC/HRS Focused Update of the 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society in Collaboration With the Society of Thoracic Surgeons. Circulation. 2019;140(2):e125-e51.

18. Wong GC, Welsford M, Ainsworth C, Abuzeid W, Fordyce CB, Greene J, et al. 2019 Canadian Cardiovascular Society/Canadian Association of Interventional Cardiology Guidelines on the Acute Management of ST-Elevation Myocardial Infarction: Focused Update on Regionalization and Reperfusion. Can J Cardiol. 2019;35(2):107-32.

Rapid reperfusion of the infarct-related artery is the cornerstone of therapy for the management of acute ST-elevation myocardial infarction (STEMI). Canada's geography presents unique challenges for timely delivery of reperfusion therapy for STEMI patients. The Canadian Cardiovascular Society/Canadian Association of Interventional Cardiology STEMI guideline was developed to provide advice regarding the optimal acute management of STEMI patients irrespective of where they are initially identified: in the field, at a non-percutaneous coronary intervention-capable centre or at a percutaneous coronary intervention-capable centre. We had also planned to evaluate and incorporate sex and gender considerations in the development of our recommendations. Unfortunately, inadequate enrollment of women in randomized trials, lack of publication of main outcomes stratified according to sex, and lack of inclusion of gender as a study variable in the available literature limited the feasibility of such an approach. The Grading Recommendations, Assessment, Development, and Evaluation system was used to develop specific evidence-based recommendations for the early identification of STEMI patients, practical aspects of patient transport, regional reperfusion decision-making, adjunctive prehospital interventions (oxygen, opioids, antiplatelet therapy), and procedural aspects of mechanical reperfusion (access site, thrombectomy, antithrombotic therapy, extent of revascularization). Emphasis is placed on integrating these recommendations as part of an organized regional network of STEMI care and the development of appropriate reperfusion and transportation pathways for any given region. It is anticipated that these guidelines will serve as a practical template to develop systems of care capable of providing optimal treatment for a wide range of STEMI patients.

19. Patel MR, Calhoon JH, Dehmer GJ, Grantham JA, Maddox TM, Maron DJ, et al. ACC/AATS/AHA/ASE/ASNC/SCAI/SCCT/STS 2016 Appropriate Use Criteria for Coronary Revascularization in Patients With Acute Coronary Syndromes: A Report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and the Society of Thoracic Surgeons. J Am Coll Cardiol. 2017;69(5):570-91.

The American College of Cardiology, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, and American Association for Thoracic Surgery, along with key specialty and subspecialty societies, have completed a 2-part revision of the appropriate use criteria (AUC) for coronary revascularization. In prior coronary revascularization AUC documents, indications for revascularization in acute coronary syndromes (ACS) and stable ischemic heart disease were combined into 1 document. To address the expanding clinical indications for coronary revascularization, and in an effort to align the subject matter with the most current American College of Cardiology/American Heart Association guidelines, the new AUC for coronary artery revascularization were separated into 2 documents addressing ACS and stable ischemic heart disease individually. This document presents the AUC for ACS. Clinical scenarios were developed to mimic patient presentations encountered in everyday practice and included information on symptom status, presence of clinical instability or ongoing ischemic symptoms, prior reperfusion therapy, risk level as assessed by noninvasive testing, fractional flow reserve testing, and coronary anatomy. This update provides a reassessment of clinical scenarios that the writing group felt to be affected by significant changes in the medical literature or gaps from prior criteria. The methodology used in this update is similar to the initial document but employs the recent modifications in the methods for developing AUC, most notably, alterations in the nomenclature for appropriate use categorization. A separate, independent rating panel scored the clinical scenarios on a scale of 1 to 9. Scores of 7 to 9 indicate that revascularization is considered appropriate for the clinical scenario presented. Scores of 1 to 3 indicate that revascularization is considered rarely appropriate for the clinical scenario, whereas scores in the mid-range (4 to 6) indicate that coronary revascularization may be appropriate for the clinical scenario. Seventeen clinical scenarios were developed by a writing committee and scored by the rating panel: 10 were identified as appropriate, 6 as may be appropriate, and 1 as rarely appropriate. As seen with the prior coronary revascularization AUC, revascularization in clinical scenarios with ST-segment elevation myocardial infarction and non–ST-segment elevation myocardial infarction were considered appropriate. Likewise, clinical scenarios with unstable angina and intermediate- or high-risk features were deemed appropriate. Additionally, the management of nonculprit artery disease and the timing of revascularization are now also rated. The primary objective of the AUC is to provide a framework for the assessment of practice patterns that will hopefully improve physician decision making.

20. Proietti M, Nobili A, Raparelli V, Napoleone L, Mannucci PM, Lip GY. Adherence to antithrombotic therapy guidelines improves mortality among elderly patients with atrial fibrillation: insights from the REPOSI study. Clin Res Cardiol. 2016;105(11):912-20.

BACKGROUND: Atrial fibrillation (AF) is associated with a substantial risk of thromboembolism and mortality, significantly reduced by oral anticoagulation. Adherence to guidelines may lower the risks for both all cause and cardiovascular (CV) deaths. METHODS: Our objective was to evaluate if antithrombotic prophylaxis according to the 2012 European Society of Cardiology (ESC) guidelines is associated to a lower rate of adverse outcomes. Data were obtained from REPOSI; a prospective observational study enrolling inpatients aged ≥65 years. Patients enrolled in 2012 and 2014 discharged with an AF diagnosis were analysed. RESULTS: Among 2535 patients, 558 (22.0 %) were discharged with a diagnosis of AF. Based on ESC guidelines, 40.9 % of patients were on guideline-adherent thromboprophylaxis, 6.8 % were overtreated, and 52.3 % were undertreated. Logistic analysis showed that increasing age (p = 0.01), heart failure (p = 0.04), coronary artery disease (p = 0.013), peripheral arterial disease (p = 0.03) and concomitant cancer (p = 0.003) were associated with non-adherence to guidelines. Specifically, undertreatment was significantly associated with increasing age (p = 0.001) and cancer (p < 0.001), and inversely associated with HF (p = 0.023). AF patients who were guideline adherent had a lower rate of both all-cause death (p = 0.007) and CV death (p = 0.024) compared to those non-adherent. Kaplan-Meier analysis showed that guideline-adherent patients had a lower cumulative risk for both all-cause (p = 0.002) and CV deaths (p = 0.011). On Cox regression analysis, guideline adherence was independently associated with a lower risk of all-cause and CV deaths (p = 0.019 and p = 0.006). CONCLUSIONS: Non-adherence to guidelines is highly prevalent among elderly AF patients, despite guideline-adherent treatment being independently associated with lower risk of all-cause and CV deaths. Efforts to improve guideline adherence would lead to better outcomes for elderly AF patients.

21. O'Donnell TFX, Deery SE, Darling JD, Shean KE, Mittleman MA, Yee GN, et al. Adherence to lipid management guidelines is associated with lower mortality and major adverse limb events in patients undergoing revascularization for chronic limb-threatening ischemia. J Vasc Surg. 2017;66(2):572-8.

OBJECTIVE: The 2013 American College of Cardiology/American Heart Association lipid management guidelines recommend high-intensity statins for all patients ≤75 years old with chronic limb-threatening ischemia (CLTI) and moderate-intensity statins for CLTI patients >75 years old without contraindications or on dialysis, but these recommendations are based primarily on coronary and stroke data. We aimed to validate these guidelines in patients with CLTI and to assess current adherence to these recommendations. METHODS: We identified all patients with CLTI who underwent first-time revascularization (endovascular or surgical) at Beth Israel Deaconess Medical Center from 2005 to 2014. Patients were classified as taking high-intensity, moderate-intensity, low-intensity, or no statin postoperatively. Outcomes included death and major adverse limb event (MALE). Propensity scores were calculated for the probability of receiving guideline-recommended intensity of statin therapy to account for nonrandom assignment of treatments. Cox regression models were constructed and adjusted for the propensity scores and further adjusted for strong potential confounders. RESULTS: After excluding patients on hemodialysis (n = 252), we identified 1019 limbs from 931 patients with a median follow-up of 380 days. Patients discharged on the recommended statin intensity had higher rates of preoperative statin use, coronary artery disease, chronic kidney disease, stroke, atrial fibrillation, congestive heart failure, and coronary artery bypass grafting; they had lower smoking rates and were less likely to be ambulatory preoperatively. Overall, only 35% were taking the recommended statin dosage: 55% of those >75 years old and 20% of those ≤75 years old. In multivariable analysis including propensity scores where appropriate, discharge on any statin was associated with lower mortality (hazard ratio [HR], 0.71; 95% confidence interval [CI], 0.60-0.90; P < .01). Discharge on the recommended intensity of statin therapy was associated with lower mortality (HR, 0.73; 95% CI, 0.60-0.99; P < .05) and lower MALE rate (HR, 0.71; 95% CI, 0.51-0.97; P < .05). Patients >75 years old and ≤75 years old accrued similar benefit. In patients >75 years old, moderate-intensity statin therapy was associated with lower rates of death and MALE compared with high-intensity therapy but did not reach statistical significance. CONCLUSIONS: Use of the recommended intensity of statin therapy in compliance with 2013 American College of Cardiology/American Heart Association lipid management guidelines is associated with significantly improved survival and lower MALE rate in patients undergoing revascularization for CLTI. Adherence to current guidelines is an appealing target for quality improvement.

22. Raeisi-Giglou P, Volgman AS, Patel H, Campbell S, Villablanca A, Hsich E. Advances in Cardiovascular Health in Women over the Past Decade: Guideline Recommendations for Practice. J Womens Health (Larchmt). 2018;27(2):128-39.

Cardiovascular disease (CVD) remains the number one cause of death in women. It is estimated that 44 million women in the United States are either living with or at risk for heart disease. This article highlights the recent significant progress made in improving care, clinical decision-making, and policy implications for women with CVD. We provide our perspective supported by evidence-based advances in cardiovascular research and clinical care guidelines in seven areas: (1) primary CVD prevention and community heart care, (2) secondary prevention of CVD, (3) stroke, (4) heart failure and cardiomyopathies, (5) ischemia with nonobstructive coronary artery disease, (6) spontaneous coronary artery dissection, and (7) arrhythmias and device therapies. Advances in these fields have improved the lives of women living with and at risk for heart disease. With increase awareness, partnership with national organizations, sex-specific research, and changes in policy, the morbidity and mortality of CVD in women can be further reduced.

23. Karimianpour A, Maran A. Advances in Coronary No-Reflow Phenomenon-a Contemporary Review. Curr Atheroscler Rep. 2018;20(9):44.

PURPOSE OF REVIEW: Coronary artery no-reflow phenomenon is an incidental outcome of percutaneous coronary intervention in patients presenting with acute myocardial infarction. Despite advances in pharmacologic and non-pharmacologic therapies, coronary no-reflow phenomenon occurs more commonly than desired. It often results in poor clinical outcomes and remains as a relevant consideration in the cardiac catheterization laboratory. In this systematic review, we have sought to discuss the topic in detail, and to relay the most recent discoveries and data on management of this condition. RECENT FINDINGS: We discuss several pharmacologic and non-pharmacologic treatments used in the prevention and management of coronary no-reflow and microvascular obstruction. Covered topics include the understanding of pharmacologic mechanisms of current and future agents, and recent discoveries that may result in the development of future treatment options. We conclude that the pathophysiology of coronary no-reflow phenomenon and microvascular obstruction still remains incompletely understood, although several plausible theories have led to the current standard of care for its management. We also conclude that coronary no-reflow phenomenon and microvascular obstruction must be recognized as a multifactorial condition that has certain predispositions and characteristics, therefore its prevention and treatment must begin pre-procedurally and be multi-faceted including certain medications and operator techniques in the cardiac catheterization laboratory.

24. Garvey WT, Mechanick JI, Brett EM, Garber AJ, Hurley DL, Jastreboff AM, et al. AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY COMPREHENSIVE CLINICAL PRACTICE GUIDELINES FOR MEDICAL CARE OF PATIENTS WITH OBESITY. Endocr Pract. 2016;22 Suppl 3:1-203.

OBJECTIVE: Development of these guidelines is mandated by the American Association of Clinical Endocrinologists (AACE) Board of Directors and the American College of Endocrinology (ACE) Board of Trustees and adheres to published AACE protocols for the standardized production of clinical practice guidelines (CPGs). METHODS: Recommendations are based on diligent review of clinical evidence with transparent incorporation of subjective factors. RESULTS: There are 9 broad clinical questions with 123 recommendation numbers that include 160 specific statements (85 [53.1%] strong [Grade A]; 48 [30.0%] intermediate [Grade B], and 11 [6.9%] weak [Grade C], with 16 [10.0%] based on expert opinion [Grade D]) that build a comprehensive medical care plan for obesity. There were 133 (83.1%) statements based on strong (best evidence level [BEL] 1 = 79 [49.4%]) or intermediate (BEL 2 = 54 [33.7%]) levels of scientific substantiation. There were 34 (23.6%) evidence-based recommendation grades (Grades A-C = 144) that were adjusted based on subjective factors. Among the 1,790 reference citations used in this CPG, 524 (29.3%) were based on strong (evidence level [EL] 1), 605 (33.8%) were based on intermediate (EL 2), and 308 (17.2%) were based on weak (EL 3) scientific studies, with 353 (19.7%) based on reviews and opinions (EL 4). CONCLUSION: The final recommendations recognize that obesity is a complex, adiposity-based chronic disease, where management targets both weight-related complications and adiposity to improve overall health and quality of life. The detailed evidence-based recommendations allow for nuanced clinical decision-making that addresses real-world medical care of patients with obesity, including screening, diagnosis, evaluation, selection of therapy, treatment goals, and individualization of care. The goal is to facilitate high-quality care of patients with obesity and provide a rational, scientific approach to management that optimizes health outcomes and safety. ABBREVIATIONS: A1C = hemoglobin A1c AACE = American Association of Clinical Endocrinologists ACE = American College of Endocrinology ACSM = American College of Sports Medicine ADA = American Diabetes Association ADAPT = Arthritis, Diet, and Activity Promotion Trial ADHD = attention-deficit hyperactivity disorder AHA = American Heart Association AHEAD = Action for Health in Diabetes AHI = apnea-hypopnea index ALT = alanine aminotransferase AMA = American Medical Association ARB = angiotensin receptor blocker ART = assisted reproductive technology AUC = area under the curve BDI = Beck Depression Inventory BED = binge eating disorder BEL = best evidence level BLOOM = Behavioral Modification and Lorcaserin for Overweight and Obesity Management BLOSSOM = Behavioral Modification and Lorcaserin Second Study for Obesity Management BMI = body mass index BP = blood pressure C-SSRS = Columbia Suicidality Severity Rating Scale CAD = coronary artery disease CARDIA = Coronary Artery Risk Development in Young Adults CBT = cognitive behavioral therapy CCO = Consensus Conference on Obesity CHF = congestive heart failure CHO = carbohydrate CI = confidence interval COR-I = Contrave Obesity Research I CPG = clinical practice guideline CV = cardiovascular CVD = cardiovascular disease DASH = Dietary Approaches to Stop Hypertension DBP = diastolic blood pressure DEXA = dual-energy X-ray absorptiometry DPP = Diabetes Prevention Program DSE = diabetes support and education EL = evidence level ED = erectile dysfunction ER = extended release EWL = excess weight loss FDA = Food and Drug Administration FDG = 18F-fluorodeoxyglucose GABA = gamma-aminobutyric acid GERD = gastroesophageal reflux disease GI = gastrointestinal GLP-1 = glucagon-like peptide 1 HADS = Hospital Anxiety and Depression Scale HDL-c = high-density lipoprotein cholesterol HR = hazard ratio HTN = hypertension HUNT = Nord-Trøndelag Health Study ICSI = intracytoplasmic sperm injection IFG = impaired fasting glucose IGT = impaired glucose tolerance ILI = intensive lifestyle intervention IVF = in vitro fertilization LAGB = laparoscopic adjustable gastric banding LDL-c = low-density lipoprotein cholesterol LES = lower esophageal sphincter LSG = laparoscopic sleeve gastrectomy LV = left ventricle LVH = left ventricular hypertrophy LVBG = laparoscopic vertical banded gastroplasty MACE = major adverse cardiovascular events MAOI = monoamine oxidase inhibitor MI = myocardial infarction MNRCT = meta-analysis of non-randomized prospective or case-controlled trials MRI = magnetic resonance imaging MUFA = monounsaturated fatty acid NAFLD = nonalcoholic fatty liver disease NASH = nonalcoholic steatohepatitis NES = night eating syndrome NHANES = National Health and Nutrition Examination Surveys NHLBI = National Heart, Lung, and Blood Institute NHS = Nurses' Health Study NICE = National Institute for Health and Care Excellence OA = osteoarthritis OGTT = oral glucose tolerance test OR = odds ratio OSA = obstructive sleep apnea PHQ-9 = Patient Health Questionnaire PCOS = polycystic ovary syndrome PCP = primary care physician POMC = pro-opiomelanocortin POWER = Practice-Based Opportunities for Weight Reduction PPI = proton pump inhibitor PRIDE = Program to Reduce Incontinence by Diet and Exercise PSA = prostate specific antigen QOL = quality of life RA = receptor agonist RCT = randomized controlled trial ROC = receiver operator characteristic RR = relative risk RYGB = Roux-en-Y gastric bypass SAD = sagittal abdominal diameter SBP = systolic blood pressure SCOUT = Sibutramine Cardiovascular Outcome Trial SG = sleeve gastrectomy SHBG = sex hormonebinding globulin SIEDY = Structured Interview on Erectile Dysfunction SNRI = serotonin-norepinephrine reuptake inhibitors SOS = Swedish Obese Subjects SS = surveillance study SSRI = selective serotonin reuptake inhibitors STORM = Sibutramine Trial on Obesity Reduction and Maintenance TCA = tricyclic antidepressant TONE = Trial of Nonpharmacologic Intervention in the Elderly TOS = The Obesity Society T2DM = type 2 diabetes mellitus UKPDS = United Kingdom Prospective Diabetes Study U.S = United States VAT = visceral adipose tissue VLDL = very low-density lipoprotein WC = waist circumference WHO = World Health Organization WHR = waist-hip ratio WHtR = waist-to-height ratio WMD = weighted mean difference WOMAC = Western Ontario and McMaster Universities osteoarthritis index XENDOS = XEnical in the Prevention of Diabetes in Obese Subjects.

25. Cobin RH, Goodman NF. AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY POSITION STATEMENT ON MENOPAUSE-2017 UPDATE. Endocr Pract. 2017;23(7):869-80.

EXECUTIVE SUMMARY This American Association of Clinical Endocrinologists (AACE)/American College of Endocrinology (ACE) Position Statement is designed to update the previous menopause clinical practice guidelines published in 2011 but does not replace them. The current document reviews new clinical trials published since then as well as new information regarding possible risks and benefits of therapies available for the treatment of menopausal symptoms. AACE reinforces the recommendations made in its previous guidelines and provides additional recommendations on the basis of new data. A summary regarding this position statement is listed below: New information available from randomized clinical trials and epidemiologic studies reported after 2011 was critically reviewed. No previous recommendations from the 2011 menopause clinical practice guidelines have been reversed or changed. Newer information enhances AACE's guidance for the use of hormone therapy in different subsets of women. Newer information helps to support the use of various types of estrogens, selective estrogen-receptor modulators (SERMs), and progesterone, as well as the route of delivery. Newer information supports the previous recommendation against the use of bioidentical hormones. The use of nonhormonal therapies for the symptomatic relief of menopausal symptoms is supported. Newer information enhances AACE's guidance for the use of hormone therapy in different subsets of women. Newer information helps to support the use of various types of estrogens, SERMs, and progesterone, as well as the route of delivery. Newer information supports the previous recommendation against the use of bioidentical hormones. The use of nonhormonal therapies for the symptomatic relief of menopausal symptoms is supported. New recommendations in this position statement include: 1. RECOMMENDATION: the use of menopausal hormone therapy in symptomatic postmenopausal women should be based on consideration of all risk factors for cardiovascular disease, age, and time from menopause. 2. RECOMMENDATION: the use of transdermal as compared with oral estrogen preparations may be considered less likely to produce thrombotic risk and perhaps the risk of stroke and coronary artery disease. 3. RECOMMENDATION: when the use of progesterone is necessary, micronized progesterone is considered the safer alternative. 4. RECOMMENDATION: in symptomatic menopausal women who are at significant risk from the use of hormone replacement therapy, the use of selective serotonin re-uptake inhibitors and possibly other nonhormonal agents may offer significant symptom relief. 5. RECOMMENDATION: AACE does not recommend use of bioidentical hormone therapy. 6. RECOMMENDATION: AACE fully supports the recommendations of the Comité de l'Évolution des Pratiques en Oncologie regarding the management of menopause in women with breast cancer. 7. RECOMMENDATION: HRT is not recommended for the prevention of diabetes. 8. RECOMMENDATION: In women with previously diagnosed diabetes, the use of HRT should be individualized, taking in to account age, metabolic, and cardiovascular risk factors. ABBREVIATIONS: AACE = American Association of Clinical Endocrinologists; ACE = American College of Endocrinology; BMI = body mass index; CAC = coronary artery calcification; CEE = conjugated equine estrogen; CEPO = Comité de l'Évolution des Pratiques en Oncologie; CAD = coronary artery disease; CIMT = carotid intima media thickness; CVD = cardiovascular disease; FDA = Food and Drug Administration; HDL = high-density lipoprotein; HRT = hormone replacement therapy; HT = hypertension; KEEPS = Kronos Early Estrogen Prevention Study; LDL = low-density lipoprotein; MBS = metabolic syndrome; MPA = medroxyprogesterone acetate; RR = relative risk; SERM = selective estrogen-receptor modulator; SSRI = selective serotonin re-uptake inhibitor; VTE = venous thrombo-embolism; WHI = Women's Health Initiative.

26. Hsu CCT, Kwan GNC, Singh D, Rophael JA, Anthony C, van Driel ML. Angioplasty versus stenting for infrapopliteal arterial lesions in chronic limb‐threatening ischaemia. Cochrane Database Syst Rev. 2018(12).

http://dx.doi.org/10.1002/14651858.CD009195.pub2

- Background Chronic limbâ€threatening ischaemia (CLTI) is a manifestation of peripheral arterial disease (PAD) that includes chronic ischaemic rest pain or ischaemic skin lesions, ulcers, or gangrene for longer than two weeks. The severity of the disease depends on the extent of arterial stenosis and the availability of collateral circulation. Treatment for CLTI aims to relieve ischaemic pain, heal ischaemic ulcers, prevent limb loss, improve quality of life, and prolong survival. CLTI due to occlusive disease in the infrapopliteal arterial circulation (belowâ€knee circulation) can be treated via an endovascular technique by a balloon opening the narrowed vessel, so called angioplasty, with or without the additional deployment of a scaffold made of metal alloy or other material, so called stenting. Endovascular interventions in the infrapopliteal vasculature may improve symptoms in patients with CLTI by reâ€establishing inâ€line blood flow to the foot. Controversy remains as to whether a balloon should be used alone to open the vessel, or whether a stent should also be deployed. Objectives To determine the efficacy and safety of percutaneous transluminal angioplasty (PTA) alone versus PTA with stenting of infrapopliteal arterial lesions (anterior tibial artery, posterior tibial artery, fibular artery (formerly known as peroneal artery), and common tibioperoneal trunk) for patients with chronic limbâ€threatening ischaemia (CLTI). Search methods The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, Embase, CINAHL, and AMED databases, as well as World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov trials registers to 25 June 2018. We applied no language restrictions. Selection criteria We planned to include randomised or quasiâ€randomised controlled trials comparing PTA versus PTA with a stent and including patients aged 18 years or over with CLTI. We defined CLTI as Fontaine stage III (ischaemic rest pain) and IV (ischaemic ulcers or gangrene) or consistent with Rutherford category 4 (ischaemic rest pain), 5 (minor tissue loss), and 6 (major tissue loss), with stenotic (> 50% luminal loss) or occluded infrapopliteal artery, including tibiofibular trunk, anterior tibial artery, posterior tibial artery, and fibular artery. We included all types of stents irrespective of design (e.g. bareâ€metal, drugâ€eluting, bioâ€absorbable). Data collection and analysis Two review authors (CCâ€TH and GNCK) independently selected suitable trials, assessed trial quality, and extracted data. An additional third review author (MLvD) assessed trial quality and, when necessary, acted as arbiter for study selection and data extraction. Outcomes included technical success of the procedure, procedural complications, patency, major amputation, and mortality. We assessed the quality of evidence using the GRADE approach. Main results We included in the review seven trials with 542 participants. One trial randomised limbs to undergo PTA alone or PTA with stent placement, and the remaining studies randomised participants. Five trials with 476 participants show that the technical success rate was greater in the stent group than in the angioplasty group (odds ratio (OR) 3.00, 95% confidence interval (CI) 1.14 to 7.93; 476 lesions; 5 studies; IÂ² = 23%). Metaâ€analysis of three eligible trials with 456 participants did not show a clear difference in shortâ€term (within six months) patency between infrapopliteal arterial lesions treated with PTA and those treated with PTA and stenting (OR 0.88, 95% CI 0.37 to 2.11; 456 lesions; 3 studies; IÂ² = 77%). Results also did not show clear differences between treatment groups in procedure complication rate (OR 0.87, 95% CI 0.01 to 53.60; 360 participants; 5 studies; IÂ² = 85%), rate of major amputations at 12 months (OR 1.34, 95% CI 0.56 to 3.22; 306 participants; 4 studies; IÂ² = 0%), and rate of mortality at 12 months (OR 0.71, 95% CI 0.43 to 1.17; 497 participants; 6 studies; IÂ = 0%). Heterogeneity between studies was high for the outcomes procedure complications and primary patency. The overall methodological quality of the trials included in this review was moderate due to selection and performance bias. Studies used different regimens for pretreatment and postâ€treatment antiplatelet/anticoagulant medication. We downgraded the certainty of the overall evidence for all outcomes by one level to moderate due to inconsistency of results across studies and large confidence intervals (small numbers of trials and participants). Authors' conclusions Trials show that the immediate technical success rate of restoring luminal patency is higher in the stent group but reveal no clear differences in shortâ€term patency at six months between infrapopliteal arterial lesions treated with PTA with stenting versus those treated with PTA without stenting. We ascertained no clear differences between groups in periprocedural complications, major amputation, and mortality. However, use of different regimens for pretreatment and postâ€treatment antiplatelet/anticoagulant medication and the duration of its use within and between trials may have influenced the outcomes. Limited currently available data suggest that highâ€quality evidence is insufficient to show that PTA with stent insertion is superior to use of standard PTA alone without stenting for treatment of infrapopliteal arterial lesions. Further studies should standardise the use of antiplatelets/anticoagulants before and after the intervention to improve the comparability of the two treatments. Plain language summary Angioplasty versus stenting for belowâ€knee arterial disease in people with chronic limbâ€threatening ischaemia Background Chronic limbâ€threatening ischaemia (CLTI) is a manifestation of peripheral arterial disease that occurs as chronic ischaemic rest pain or ischaemic skin lesions, ulcers, or gangrene with symptoms present for longer than two weeks. The symptoms are a result of impaired blood flow to the leg and the foot due to narrowing of the arteries by atherosclerosis. Atherosclerosis is a disease of the arteries caused by a buildup of plaque composed of fat, cholesterol, calcium, and other substances in the blood; over time, the plaque narrows the artery. Patients can have narrowing of the artery in the thigh or below the knee. This review focusses on a subgroup of patients with belowâ€knee arterial disease (infrapopliteal arterial disease) who might benefit from an intervention that reâ€establishes blood flow by inserting and inflating a balloon to reâ€open the narrowed artery (percutaneous transluminal angioplasty). This can be performed with or without additional placement of a stent (a scaffold made of metal alloy or other material). The types of stents used in this procedure vary from a simple bareâ€metal stent to a stent coated with medication. However, it is not clear whether deploying stents after ballooning in narrowed belowâ€knee arteries (infrapopliteal arteries) provides any additional benefit for the patient. Study characteristics and key results We identified seven trials with a combined total of 542 participants comparing percutaneous transluminal angioplasty (PTA) alone versus PTA with stent placement (current until June 2018). One trial randomised limbs to PTA alone or PTA with stent placement, and the remaining studies randomised participants. Full analysis of five trials shows that the technical success rate of reâ€opening the narrowed artery was higher in the stent group than in the PTA group. However, we noted no clear differences in patency (opened vessel remaining open) of the treated vessel at six months. The complication rate of the procedure, the number of major amputations at 12 months, and the number of deaths at 12 months also did not differ greatly between treatment groups. Certainty of the evidence The overall certainty of evidence provided by the trials included in this review was moderate. Trials differed in their methods. Two studies reported poorly on the methods used to generate random n mbers and to allocate participants to different groups. All studies were unblinded. All included studies were rated as direct in their relevance to the review question. Overall, we downgraded the certainty of evidence for all outcomes by one level to moderate due to inconsistency of results across studies and the small numbers of studies and participants. Conclusion PTA with stent placement is better than PTA alone for restoring vessel patency immediately; however we found no clear difference in shortâ€term patency at six months between the two groups. Trials show no clear differences between groups in complications at or around the time of the procedure, major amputation, and death. Currently available data suggest that highâ€certainty evidence is insufficient to show that PTA with stent placement is superior to PTA alone for treatment of infrapopliteal arterial lesions. Further studies should standardise the use of bloodâ€thinning drugs (antiplatelets/anticoagulants) before and after both interventions to improve the comparability of the two treatments.

27. Zeitouni M, Kerneis M, Nafee T, Collet JP, Silvain J, Montalescot G. Anticoagulation in Acute Coronary Syndrome-State of the Art. Prog Cardiovasc Dis. 2018;60(4-5):508-13.

Early intravenous anticoagulation is the corner stone treatment of patients admitted with an acute coronary syndrome: it antagonizes the ongoing coronary thrombosis and facilitates the percutaneous coronary intervention, hence a reduction of mortality and acute stent thrombosis. Unfractionated heparin, enoxaparin, bivalirudin and fondaparinux have been extensively studied in large randomized control trials and meta-analyses with the same objective: reducing the ischemic burden without hiking hemorrhagic events. This conundrum is evolving along the generalization of the radial-artery access, the use of potent P2Y12 and the trend towards a tailored approach regarding the ischemic and bleeding balance. In this systematic review, we aimed at presenting the evidence based data and strategies for each anticoagulant in the setting of acute coronary syndrome with and without ST-segment elevation.

28. Gupta S, Belley-Cote EP, Panchal P, Pandey A, Basha A, Pallo L, et al. Antiplatelet therapy and coronary artery bypass grafting: a systematic review and network meta-analysis. Interact Cardiovasc Thorac Surg. 2020.

OBJECTIVES: Acetylsalicylic acid (ASA) monotherapy is the standard of care after coronary artery bypass grafting (CABG), but the benefits of more intense antiplatelet therapy, specifically dual antiplatelet therapy (DAPT), require further exploration in CABG patients. We performed a network meta-analysis to compare the effects of various antiplatelet regimens on saphenous vein graft patency, mortality, major adverse cardiovascular events and bleeding among CABG patients. METHODS: We searched Cochrane Central Register of Controlled Trials, Medical Literature Analysis and Retrieval Systems Online, Excerpta Medica Database, Cumulative Index to Nursing and Allied Health Literature, American College of Physicians Journal Club and conference proceedings for randomized controlled trials. Screening, data extraction, risk of bias assessment and Grading of Recommendations Assessment, Development and Evaluation were performed in duplicate. We conducted a random effect Bayesian network meta-analysis including both direct and indirect comparisons. RESULTS: We included 43 randomized controlled trials studying 15 511 patients. DAPT with low-dose ASA and ticagrelor [odds ratio (OR) 2.53, 95% credible interval (CrI) 1.35-4.72; I2 = 55; low certainty] or clopidogrel (OR 1.56, 95% CrI 1.02-2.39; I2 = 55; very low certainty) improved saphenous vein graft patency when compared to low-dose ASA monotherapy. DAPT with low-dose ASA and ticagrelor was associated with lower mortality (OR 0.52, 95% CrI 0.30-0.87; I2 = 14; high certainty) and lower major adverse cardiovascular events (OR 0.63, 95% CrI 0.44-0.91; I2 = 0; high certainty) when compared to low-dose ASA monotherapy. Based on moderate certainty evidence, DAPT was associated with an increase in major bleeding. CONCLUSIONS: Our results suggest that DAPT improves saphenous vein graft patency, mortality and major adverse cardiovascular event. As such, surgeons and physicians should consider re-initiating DAPT for acute coronary syndrome patients after their CABG, at the expense of an increased risk for major bleeding. CLINICAL TRIAL REGISTRATION: International Prospective Register of Systematic Reviews ID Number CRD42019127695.

29. Deif B, Kang S, Ismail A, Vanniyasingam T, Guzman JC, Morillo CA. Application of Syncope Guidelines in the Emergency Department Do Not Reduce Admission Rates: A Retrospective Cohort Study. Can J Cardiol. 2018;34(9):1158-64.

BACKGROUND: Low-risk syncope accounts for a large proportion of hospital admissions; however, inpatient investigations are often not necessary and are rarely diagnostic. Reducing the number of low-risk syncope admissions can likely lower health care resource consumption and overall expenditure. Application of syncope guidelines by physicians in the emergency department provides a standardized approach that may potentially reduce admissions and lead to health care resource utilization savings. METHODS: A retrospective chart review of 1229 syncope presentations was conducted at 2 major academic centres spanning 1 year. Three major society guidelines and position statements were applied to determine the effect on admission rates. RESULTS: A total of 1031 true syncope charts were included in the analysis; 407 (39%) were admitted and 624 (61%) were discharged by the treating physician (MD). There was a significant difference in the mean [standard deviation] age (75 [14] vs 55 [22]) and baseline cardiovascular disease, including congestive heart failure 51/407 (13%) vs 28/624 (5%), coronary artery disease 125/407 (31%) vs 91/624 (15%), and structural heart disease 36/407 (9%) vs 26/624 (4%), between admitted and not admitted patients, respectively (P < 0.01). All guidelines warranted more low-risk admissions when compared with 19% by the MD: Canadian Cardiovascular Society 34% (P < 0.01), American College of Emergency Physicians 22% (P = 0.03), and European Society of Cardiology 26% (P < 0.01). CONCLUSION: In conclusion, application of the current syncope guidelines to an emergency department population is unlikely to reduce low-risk hospital admissions.

30. Nishi FA, de Motta Maia FO, de Lopes Monteiro da Cruz DA. Assessing sensitivity and specificity of the Manchester Triage System in the evaluation of acute coronary syndrome in adult patients in emergency care: a systematic review protocol. JBI Database System Rev Implement Rep. 2015;13(11):64-73.

REVIEW QUESTION/OBJECTIVE: The objective of this review is to assess the sensitivity and specificity of the Manchester Triage System in the evaluation of adult patients with acute coronary syndrome in emergency departments. BACKGROUND: Acute coronary syndrome (ACS) is a group of clinical conditions that include myocardial infarction with or without elevation of the ST segment and unstable angina. The term acute myocardial infarction (AMI) can be applied when there is evidence of myocardium necrosis with a clinical sign compatible with myocardial ischaemia. Acute myocardial infarction can be identified using clinical methods including electrocardiography (ECG), elevation in myocardium necrosis biomarkers, and imaging. Acute myocardial infarction is one of the leading causes of death and disability worldwide, and may be the first manifestation of coronary artery disease.Estimating the prevalence of coronary diseases in the general population is quite a complex task. In 2010, the prevalence of coronary diseases was reported as 6.4% among the general population in the United States.One of the main manifestations of ACS is chest pain. However, even in the presence of this typical symptom, early diagnosis of ACS is a challenge for health care professionals who initially attend to these patients. Several authors have indicated the importance and difficulty of recognizing chest pain of cardiac origin, where immediate medical attention is required.Triage, or risk classification, is a clinical management tool used in emergency services to guide patient flow when the need for medical attention exceeds that available. The Manchester Triage Group was developed in 1994 in the United Kingdom. The aim was to establish a consensus among physicians and nurses in the emergency room by creating a triage pattern focused on the development of the following:Thus, the Manchester Triage System (MTS) was created. The MTS simplifies the clinical management of each patient, and consequently, the whole service, by utilizing a system that defines the clinical priority for adults and children. The assessment of clinical priority needs to be fast; therefore, it is separated from the process of medical diagnosis. Restricting the time allocated for patient classification prevents an attempt to make a medical diagnosis at the time of classification.The main goal of the MTS is to set a time limit for each patient to be attended to safely, that is, with no risk to the patient's health. One of the main principles of the system is the higher the perceived risk to the patient's health, the shorter the waiting time for medical attendance. The MTS comprises a scale of five priority levels ().(Table is included in full-text article.)The MTS is composed of 52 distinct flowcharts that "guide" the triage decision-making process. Based on the main presenting symptom of the patient seeking emergency care, the health care professional must choose one of the 52 flowcharts in order to proceed with evaluation. Classification into one of the five clinical priority levels is set for each patient using the selected flowchart.The lack of a risk classification system within an emergency room implies attendance on a first-come, first-served basis, which in many cases may jeopardize a patient's safety, as patients whose health status is more unstable or severe are not prioritized.The MTS is a tool that aims to define the degree of severity and associated safe waiting time for patients in the emergency department, establishing an order of priority for medical care. It determines the clinical priority of every patient who comes to the emergency department. It is possible to evaluate the sensitivity and specificity of the MTS by calculating the frequency of appropriately assigned clinical priority levels to patients presenting at the emergency department.A "diagnostic test" can be understood as a laboratory or imaging test: however, the concepts related to "test" also apply to clinical information from other findings, such as physical examination and patient history. The sensitivity of a test is understood as the capacity of the test to detect individuals who present with a particular condition, or the proportion of individuals with a particular condition who have been tested positive for this condition (true positive). Highly sensitive tests can be used at the beginning of the diagnostic process, when a great number of possibilities are being considered, with the intention of excluding as many options as possible. The specificity of a test is defined as the capacity of the test to identify individuals who do not have a particular medical condition, or the proportion of individuals without the condition who have a negative test (true negative). A triage system that presents a good sensitivity can minimize the occurrence of undertriage, the same way, systems with suitable specificity can avoid the occurrence of overtriage.The assessment of patients with ACS suspected using the MTS, can occur through different flow charts, since the patient does not always have typical symptoms and concerns such as chest pain as the main complaint. For this reason, in addition to the flowchart "chest pain", other flowcharts, including "shortness of breath in adults", "unwell adult", "collapsed adult", and "palpitations", enable distinguishing chest pain and other urgent conditions from non-urgent conditions, and can assist the appraiser to establish the highest priority level to treat patients with these urgent conditions.According to the algorithm from the American Heart Association, every patient who presents symptoms of chest discomfort suggestive of ischaemia must receive medical attention within 10 minutes. Therefore, in order to recognize patients in those conditions, the health care professional applying MTS must establish priority levels of "red" or "orange", thereby setting a safe waiting time for these patients.Although there are well-established criteria for the prioritization of patients with suspected ACS, several studies have reported the difficulties of evaluating patients with these conditions. Various factors can interfere with the outcome of this process, such as atypical presentation of symptoms, AMI classification, patient age, and professional skill.Primary studies have addressed the issue from different perspectives. Studies have been conducted to evaluate the ability of nurses using MTS to detect high-risk patients with chest pain, the impact of MTS on short-term mortality in AMI, and the sensitivity and specificity of MTS for patients with ACS, and to assess whether the MTS was used effectively in patients admitted to the hospital with a diagnosis of acute coronary syndrome.These studies concluded that use of the MTS by nurses is a sensitive method for identifying high risk cardiac chest pain, but further studies are required to assess whether additional training can improve the sensitivity of MTS. The MTS safeguards patients with typical AMI presentation and ST elevation during myocardial infarction, and who are under 70 years of age. The MTS has a high sensitivity in prioritization (immediate/very urgent) of patients with ACS. Additionally, most patients admitted for ACS are initially triaged as "orange" or "yellow", an indication for prompt assessment in the emergency department. This has a positive effect on time to first medical assessment, but has no effect on time to hospital admission.A systematic review addressing a similar theme was published. The review evaluated the efficacy of MTS for all groups of patients and included studies that evaluated the MTS in relation to different outcomes. This proposed review is different as it will include primary studies with a specific sub-population (patients with ACS). Another important difference lies in the fact that the published review did not include critical appraisal of the primary studies included in review. A systematic review that synthesizes the available evidence on the sensitivity of MTS to evaluate patients with an ACS medical diagnosis is necessary to guide decisions related to the use or adoption of the instrument, as well as providing data that can contribute to improvements to the system.

31. Farahzadi M, Shafiee A, Bozorgi A, Mahmoudian M, Sadeghian S. Assessment of adherence to ACC/AHA guidelines in primary management of patients with NSTEMI in a referral cardiology hospital. Crit Pathw Cardiol. 2015;14(1):36-8.

Acute coronary syndromes are considered as a global major health-care problem, and Iran as a developing country is of no exception. We aimed to investigate the degree of adherence to American College of Cardiology and American Heart Association (ACC/AHA) guideline for the management of non-ST-segment elevation myocardial infarction (NSTEMI) in patients who presented to the emergency department at Tehran Heart Center. Data of the patients who presented with acute chest pain to the emergency department of Tehran Heart Center within 1 year and were diagnosed as NSTEMI by the cardiologist in charge were included. The details of the initial managements based on the ACC/AHA guideline for NSTEMI of the patients were recorded from the patients' files in the emergency department for this study. Then, the frequency of guideline-related management in the study population was calculated and reported. A total of 684 patients [mean age = 62.95 ± 12.19 years; male gender = 460 (67.3%)] were diagnosed as NSTEMI at the emergency department of our center. Initial management based on the current guideline including administration of aspirin and clopidogrel was performed in 98.4% and 95.0%, respectively. Intravenous heparin was administered in 67.0% of the patients, whereas 30.8% of patients received enoxaparin. Following the initial management, coronary angiography was performed in 563 (82.3%) patients within 48 hours from the admission. Adherence to ACC/AHA guideline for the management of NSTEMI in patients who presented to a tertiary health-care center was in a high degree.

32. Lambert-Kerzner A, Maynard C, McCreight M, Ladebue A, Williams KM, Fehling KB, et al. Assessment of barriers and facilitators in the implementation of appropriate use criteria for elective percutaneous coronary interventions: a qualitative study. BMC Cardiovasc Disord. 2018;18(1):164.

BACKGROUND: The use of inappropriate elective Percutaneous Coronary Intervention (PCI) has decreased over time, but hospital-level variation in the use of inappropriate PCI persists. Understanding the barriers and facilitators to the implementation of Appropriate Use Criteria (AUC) guidelines may inform efforts to improve elective PCI appropriateness. METHODS: All hospitals performing PCI in Washington State were categorized by their use of inappropriate elective PCI in 2010 to 2013. Semi-structured, qualitative telephone interviews were then conducted with 17 individual interviews at 13 sites in Washington State to identify barriers and facilitators to the implementation of the AUC guidelines. An inductive and deductive, team-based analytical approach, drawing primarily on Matrix analysis was performed to identify factors affecting implementation of the AUC. RESULTS: Specific facilitators were identified that supported successful implementation of the AUC. These included collaborative catheterization laboratory environments that allow all staff to participate with questions and opinions; ongoing AUC education with catheterization laboratory teams and referring providers; internal AUC peer review processes; interventional cardiologist be directly involved with the pre-procedural review process; checklist-based algorithms for pre-procedural documentation; systems redesign to include insurance companies; and AUC educational information with patients. Barriers to implementation of the AUC included external pressures, such as competition for patients, and the lack of shared medical records with sites that referred patients for coronary angiography. CONCLUSIONS: The identified facilitators enabled sites to successfully implement the AUC. Catheterization laboratories struggling to successfully implement the AUC may consider utilizing these strategies to improve their processes to improve patient selection for elective PCI.

33. Jones RN, Cizginer S, Pavlech L, Albuquerque A, Daiello LA, Dharmarajan K, et al. Assessment of Instruments for Measurement of Delirium Severity: A Systematic Review. JAMA Intern Med. 2019;179(2):231-9.

IMPORTANCE: Measurement of delirium severity has been recognized as highly important for tracking prognosis, monitoring response to treatment, and estimating burden of care for patients both during and after hospitalization. Rather than simply rating delirium as present or absent, the ability to quantify its severity would enable development and monitoring of more effective treatment approaches for the condition. OBJECTIVES: To present a comprehensive review of delirium severity instruments, conduct a methodologic quality rating of the original validation study of the most commonly used instruments, and select a group of top-rated instruments. EVIDENCE REVIEW: This systematic review was conducted using literature from Embase, PsycINFO, PubMed, Web of Science, and Cumulative Index to Nursing and Allied Health Literature, from January 1, 1974, through March 31, 2017, with the key words delirium, severity, tests, measures, and intensity. Inclusion criteria were original articles assessing delirium severity and using a delirium-specific severity instrument. Final listings of articles were supplemented with hand searches of reference listings to ensure completeness. At least 2 reviewers independently completed each step of the review process: article selection, data extraction, and methodologic quality assessment of relevant articles using a validated rating scale. All discrepancies between raters were resolved by consensus. FINDINGS: Of 9409 articles identified, 228 underwent full text review, and we identified 42 different instruments of delirium severity. Eleven of the 42 tools were multidomain, delirium-specific instruments providing a quantitative rating of delirium severity; these instruments underwent a methodologic quality review. Applying prespecified criteria related to frequency of use, methodologic quality, construct or predictive validity, and broad domain coverage, an expert panel used an iterative modified Delphi process to select 6 final high-quality instruments meeting these criteria: the Confusion Assessment Method-Severity Score, Confusional State Examination, Delirium-O-Meter, Delirium Observation Scale, Delirium Rating Scale, and Memorial Delirium Assessment Scale. CONCLUSIONS AND RELEVANCE: The 6 instruments identified may enable accurate measurement of delirium severity to improve clinical care for patients with this condition. This work may stimulate increased usage and head-to-head comparison of these instruments.

34. Xu S, Huang Y, Xiao J, Zhu W, Wang L, Tang H, et al. The association between job strain and coronary heart disease: a meta-analysis of prospective cohort studies. Ann Med. 2015;47(6):512-8.

BACKGROUND: Studies about work stress and the risk of coronary heart disease (CHD) have yielded inconsistent results. This meta-analysis aimed to investigate the association between job strain and the risk of CHD. METHODS: We searched PubMed and Embase databases for studies reporting data on job strain and the risk of CHD. Studies were included if they reported multiple-adjusted relative risk (RR) with 95% confidence interval (CI) with respect to CHD from job strain. RESULTS: Fourteen prospective cohort studies comprising 232,767 participants were included. The risk of CHD was increased in high-strain (RR 1.26; 95% CI 1.12-1.41) and passive jobs (RR 1.14; 95% CI 1.02-1.29) but not in active jobs (RR 1.09; 95% CI 0.97-1.22), when compared with low-strain group. The increased risk of CHD in high-strain and passive jobs was mainly driven by studies with a follow-up duration of ≥ 10 years. Neither the low-control (RR 1.06; 95% CI 0.93-1.19) nor high-demand (RR 1.13; 95% CI 0.97-1.32) dimension was independently associated with the risk of CHD. CONCLUSIONS: Individuals with high-strain and passive jobs were more likely to experience a CHD event. Intervention programs incorporating individual and organizational levels are crucial for reducing job strain and the risk of CHD.

35. Chen Z, Li N, Wang J, Li C, He S, Zhou X, et al. Association between mean platelet volume and major adverse cardiac events in percutaneous coronary interventions: a systematic review and meta-analysis. Coron Artery Dis. 2020.

Platelets with high hemostatic activity play a key role during percutaneous coronary interventions (PCI), and in recent years, mean platelet volume (MPV) has been looked upon as a crucial indicator of platelet reactivity. Thus, MPV may emerge as a potential gauge for the measurement of major adverse cardiac event (MACE) risks in PCI patients. This study aimed to conduct a meta-analysis illustrating the association between MPV and long-term MACE in PCI. The Cochrane Library, Pubmed, EMBASE, Ovid MEDLINE, and BIOSIS databases were used to search for relevant studies from their inception to 30 June 2019. All studies reporting incidences of MACE and MPV in PCI patients were retained. Data extraction was performed by three independent reviewers. A total of 33 studies were included in this meta-analysis. The results indicated that patients with MACE had a significantly larger MPV than those without, with an unstandardized mean difference (USMD) of 0.29 fL (95% CI, 0.04-0.54). The USMD of MPV in deceased patients was 0.39 fL (95% CI, 0.09-0.68). The results also indicated that patients with larger MPV were at greater risks of having MACE and higher incidence of mortality than those with smaller MPV, with a pooled risk ratio of 1.81 (95% CI, 1.29-2.55) and 2.34 (95% CI, 1.52-3.60), respectively. These findings indicate a significant association between larger MPV and MACE in PCI patients. Consequently, MPV, an easily accessible indicator, might be helpful in PCI patients' risk assessment and strati&filig;cation.

36. Qureshi R, Jadotte Y, Zha P, Porter SA, Holly C, Salmond S, et al. The association between prenatal exposure to environmental tobacco smoke and childhood obesity: a systematic review. JBI Database System Rev Implement Rep. 2018;16(8):1643-62.

OBJECTIVE: The objective of the review was to determine if prenatal exposure to environmental tobacco smoke (ETS) increases the risk of obesity and overweight in children. INTRODUCTION: Childhood obesity has reached epidemic proportions in many developed countries. This is of great concern as childhood obesity is associated with early onset of chronic diseases such as coronary artery disease, type II diabetes and hypertension in adulthood. Extensive research suggests a multifactorial etiology. These factors include genetic markers, individual lifestyle, social and environmental factors, particularly the interaction between these factors. Among environmental factors, prenatal exposure to ETS has been linked to increased rates of obesity and overweight in childhood. INCLUSION CRITERIA: This review considered studies on children of women who were non-smokers and who reported exposure to ETS during pregnancy. The exposure of interest was exposure to ETS or second hand smoke during pregnancy, determined by either: i) self-reported maternal exposure; and/or ii) serum cotinine levels. Observational studies such as cohort studies, case control studies, retrospective studies and analytical cross-sectional studies were included. Outcomes of interest were weight, height and body mass index of children from birth up to 18 years. METHODS: A three-step search strategy was used to search for published and unpublished studies in the English language. No search range (years) was set. Two reviewers assessed the studies for inclusion and methodological quality using the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI SUMARI) standardized appraisal instruments. Data was extracted by two people independently and entered into the JBI extraction tool. Extracted data was pooled in a statistical meta-analysis based on a random effects model. RESULTS: Nineteen studies were included in the review. Eight of the studies were included in the final meta-analysis. Findings suggest that there was an association between prenatal exposure to ETS and childhood obesity (odds ratio [OR]: 1.905, CI: 1.23-2.94), and no association between ETS exposure and overweight (OR: 1.51, CI: 0.49-4.59). The high rates of heterogeneity between studies in both of the meta-analyses determined by the I statistic (97% and 99%, respectively) sanction caution in the interpretation and use of these findings. CONCLUSIONS: Based on the evidence, childhood obesity is associated with exposure to prenatal ETS, however overweight does not appear to be associated with this type of exposure.

37. Stenman M, Holzmann MJ, Sartipy U. Association between preoperative depression and long-term survival following coronary artery bypass surgery - A systematic review and meta-analysis. Int J Cardiol. 2016;222:462-6.

BACKGROUND: Depression is common in patients with cardiovascular disease. The importance of preoperative depression for long-term survival following coronary artery bypass grafting (CABG) is not well known. The aim was to provide a summary estimate of the association between preoperative depression and long-term survival in adults who underwent CABG. METHODS: We did a systematic search of MEDLINE, EMBASE, Cochrane Library, PsycINFO, Web of Science, and PubMed from inception to November, 2015, including cohort studies with at least one month of follow-up that reported hazard ratios (HR) and 95% confidence intervals (CI) for long-term all-cause mortality following CABG in patients with preoperative depression compared to non-depressed patients. Two reviewers independently extracted data on populations, exposure, outcome, risk of bias, and quality of evidence. We calculated HR and 95% CIs for all-cause mortality using random-effects meta-analyses and performed subgroup and sensitivity analyses. RESULTS: Seven studies were included with a combined study population of 89,490 patients (4002 depressed/85,488 non-depressed). All studies observed a positive association between preoperative depression and all-cause mortality, and in 4 studies the association was statistically significant. Patients with depression had a pooled hazard ratio of 1.46 (95% CI: 1.23-1.73, p<0.0001) for all-cause mortality with moderate heterogeneity (I(2)=50.1%, p=0.061). CONCLUSIONS: This systematic review and meta-analysis indicates that patients with preoperative depression are at increased risk for long-term, all-cause mortality following CABG compared with those without depression. Systematic screening for depression prior to cardiac surgery could identify those at higher risk.

38. Li Y, Wang S, Zhang D, Xu X, Yu B, Zhang Y. The association of functional polymorphisms in genes expressed in endothelial cells and smooth muscle cells with the myocardial infarction. Hum Genomics. 2019;13(1):5.

BACKGROUND: The association of platelet endothelial cell adhesion molecule 1 (PECAM1), hypoxia-inducible factor 1 subunit alpha (HIF1A), and KIAA1462 in myocardial infarction (MI) was investigated. The study included 401 Han Chinese MI patients and 409 controls. Three tag single-nucleotide polymorphisms (SNPs)-PECAM1 rs1867624, HIF1A rs2057482, and KIAA1462 rs3739998-were selected. SNP genotyping was performed by an improved multiplex ligation detection reaction assay. A systematic review and meta-analysis of studies including 3314 cases and 2687 controls on the association of 5 HIF1A SNPs and the overall risk of MI or coronary artery disease (CAD) was performed. RESULTS: The rs1867624 variants were associated with high TG concentrations (p = 0.040) and the rs2057482 variants were associated with decreased HDL-C in MI patients compared with the control group (p = 0.003). Rs2057482 SNP interacted with age to influence TC levels. The SNP of rs3739998 interacted with sex and hypertension to modulate CRE and TG levels, respectively (p < 3.04E-5-0.002). No association between the three SNPs and susceptibility to MI was found (p > 0.05 for all). In the meta-analysis of HIF1A, the rs11549465 C > T and rs10873142 T > C polymorphisms, but not rs2057482, rs11549467, and rs41508050, were correlated with overall MI or CAD risk. CONCLUSIONS: Taken together, this study provides additional evidence that genetic variation of the PECAM1 rs1867624 and HIF1A rs2057482 can mediate lipid levels in MI patients.

39. Amare AT, Schubert KO, Tekola-Ayele F, Hsu YH, Sangkuhl K, Jenkins G, et al. The association of obesity and coronary artery disease genes with response to SSRIs treatment in major depression. J Neural Transm (Vienna). 2019;126(1):35-45.

Selective serotonin reuptake inhibitors (SSRIs) are first-line antidepressants for the treatment of major depressive disorder (MDD). However, treatment response during an initial therapeutic trial is often poor and is difficult to predict. Heterogeneity of response to SSRIs in depressed patients is partly driven by co-occurring somatic disorders such as coronary artery disease (CAD) and obesity. CAD and obesity may also be associated with metabolic side effects of SSRIs. In this study, we assessed the association of CAD and obesity with treatment response to SSRIs in patients with MDD using a polygenic score (PGS) approach. Additionally, we performed cross-trait meta-analyses to pinpoint genetic variants underpinnings the relationship of CAD and obesity with SSRIs treatment response. First, PGSs were calculated at different p value thresholds (P(T)) for obesity and CAD. Next, binary logistic regression was applied to evaluate the association of the PGSs to SSRIs treatment response in a discovery sample (ISPC, N = 865), and in a replication cohort (STAR\*D, N = 1,878). Finally, a cross-trait GWAS meta-analysis was performed by combining summary statistics. We show that the PGSs for CAD and obesity were inversely associated with SSRIs treatment response. At the most significant thresholds, the PGS for CAD and body mass index accounted 1.3%, and 0.8% of the observed variability in treatment response to SSRIs, respectively. In the cross-trait meta-analyses, we identified (1) 14 genetic loci (including NEGR1, CADM2, PMAIP1, PARK2) that are associated with both obesity and SSRIs treatment response; (2) five genetic loci (LINC01412, PHACTR1, CDKN2B, ATXN2, KCNE2) with effects on CAD and SSRIs treatment response. Our findings implicate that the genetic variants of CAD and obesity are linked to SSRIs treatment response in MDD. A better SSRIs treatment response might be achieved through a stratified allocation of treatment for MDD patients with a genetic risk for obesity or CAD.

40. Descamps OS, Van Caenegem O, Hermans MP, Balligand JL, Beauloye C, Bondue A, et al. A Belgian consensus strategy to identify familial hypercholesterolaemia in the coronary care unit and its subsequent cascade screening and treatment: BEL-FaHST (The BELgium Familial Hypercholesterolaemia STrategy). Atherosclerosis. 2018;277:369-76.

BACKGROUND AND AIMS: Familial hypercholesterolaemia (FH) is an autosomal dominant lipoprotein disorder characterized by significant elevation of low-density lipoprotein cholesterol (LDL-C) and markedly increased risk of premature cardiovascular disease (CVD). Because of the very high coronary artery disease risk associated with this condition, the prevalence of FH among patients admitted for CVD outmatches many times the prevalence in the general population. Awareness of this disease is crucial for recognizing FH in the aftermath of a hospitalization of a patient with CVD, and also represents a unique opportunity to identify relatives of the index patient, who are unaware they have FH. This article aims to describe a feasible strategy to facilitate the detection and management of FH among patients hospitalized for CVD. METHODS: A multidisciplinary national panel of lipidologists, cardiologists, endocrinologists and cardio-geneticists developed a three-step diagnostic algorithm, each step including three key aspects of diagnosis, treatment and family care. RESULTS: A sequence of tasks was generated, starting with the process of suspecting FH amongst affected patients admitted for CVD, treating them to LDL-C target, finally culminating in extensive cascade-screening for FH in their family. Conceptually, the pathway is broken down into 3 phases to provide the treating physicians with a time-efficient chain of priorities. CONCLUSIONS: We emphasize the need for optimal collaboration between the various actors, starting with a "vigilant doctor" who actively develops the capability or framework to recognize potential FH patients, continuing with an "FH specialist", and finally involving the patient himself as "FH ambassador" to approach his/her family and facilitate cascade screening and subsequent treatment of relatives.

41. Safi S, Sethi NJ, Nielsen EE, Feinberg J, Jakobsen JC, Gluud C. Beta-blockers for suspected or diagnosed acute myocardial infarction. Cochrane Database Syst Rev. 2019;12(12):Cd012484.

BACKGROUND: Cardiovascular disease is the number one cause of death globally. According to the World Health Organization, 7.4 million people died from ischaemic heart diseases in 2012, constituting 15% of all deaths. Acute myocardial infarction is caused by blockage of the blood supplied to the heart muscle. Beta-blockers are often used in patients with acute myocardial infarction. Previous meta-analyses on the topic have shown conflicting results ranging from harms, neutral effects, to benefits. No previous systematic review using Cochrane methodology has assessed the effects of beta-blockers for acute myocardial infarction. OBJECTIVES: To assess the benefits and harms of beta-blockers compared with placebo or no intervention in people with suspected or diagnosed acute myocardial infarction. SEARCH METHODS: We searched CENTRAL, MEDLINE, Embase, LILACS, Science Citation Index Expanded and BIOSIS Citation Index in June 2019. We also searched the WHO International Clinical Trials Registry Platform, ClinicalTrials.gov, Turning Research into Practice, Google Scholar, SciSearch, and the reference lists of included trials and previous reviews in August 2019. SELECTION CRITERIA: We included all randomised clinical trials assessing the effects of beta-blockers versus placebo or no intervention in people with suspected or diagnosed acute myocardial infarction. Trials were included irrespective of trial design, setting, blinding, publication status, publication year, language, and reporting of our outcomes. DATA COLLECTION AND ANALYSIS: We followed the Cochrane methodological recommendations. Four review authors independently extracted data. Our primary outcomes were all-cause mortality, serious adverse events according to the International Conference on Harmonization - Good Clinical Practice (ICH-GCP), and major adverse cardiovascular events (composite of cardiovascular mortality and non-fatal myocardial infarction during follow-up). Our secondary outcomes were quality of life, angina, cardiovascular mortality, and myocardial infarction during follow-up. Our primary time point of interest was less than three months after randomisation. We also assessed the outcomes at maximum follow-up beyond three months. Due to risk of multiplicity, we calculated a 97.5% confidence interval (CI) for the primary outcomes and a 98% CI for the secondary outcomes. We assessed the risks of systematic errors through seven bias domains in accordance to the instructions given in the Cochrane Handbook. The quality of the body of evidence was assessed by GRADE. MAIN RESULTS: We included 63 trials randomising a total of 85,550 participants (mean age 57.4 years). Only one trial was at low risk of bias. The remaining trials were at high risk of bias. The quality of the evidence according to GRADE ranged from very low to high. Fifty-six trials commenced beta-blockers during the acute phase of acute myocardial infarction and seven trials during the subacute phase. At our primary time point 'less than three months follow-up', meta-analysis showed that beta-blockers versus placebo or no intervention probably reduce the risk of a reinfarction during follow-up (risk ratio (RR) 0.82, 98% confidence interval (CI) 0.73 to 0.91; 67,562 participants; 18 trials; moderate-quality evidence) with an absolute risk reduction of 0.5% and a number needed to treat for an additional beneficial outcome (NNTB) of 196 participants. However, we found little or no effect of beta-blockers when assessing all-cause mortality (RR 0.94, 97.5% CI 0.90 to 1.00; 80,452 participants; 46 trials/47 comparisons; high-quality evidence) with an absolute risk reduction of 0.4% and cardiovascular mortality (RR 0.99, 95% CI 0.91 to 1.08; 45,852 participants; 1 trial; moderate-quality evidence) with an absolute risk reduction of 0.4%. Regarding angina, it is uncertain whether beta-blockers have a beneficial or harmful effect (RR 0.70, 98% CI 0.25 to 1.84; 98 participants; 3 trials; very low-quality evidence) with an absolute risk reduction of 7.1%. None of the trials specifically assessed nor reported serious adverse events according to ICH-GCP. Only two trials specifically assessed major adverse cardiovascular events, however, no major adverse cardiovascular events occurred in either trial. At maximum follow-up beyond three months, meta-analyses showed that beta-blockers versus placebo or no intervention probably reduce the risk of all-cause mortality (RR 0.93, 97.5% CI 0.86 to 0.99; 25,210 participants; 21 trials/22 comparisons; moderate-quality evidence) with an absolute risk reduction of 1.1% and a NNTB of 91 participants, and cardiovascular mortality (RR 0.90, 98% CI 0.83 to 0.98; 22,457 participants; 14 trials/15 comparisons; moderate-quality evidence) with an absolute risk reduction of 1.2% and a NNTB of 83 participants. However, it is uncertain whether beta-blockers have a beneficial or harmful effect when assessing major adverse cardiovascular events (RR 0.81, 97.5% CI 0.40 to 1.66; 475 participants; 4 trials; very low-quality evidence) with an absolute risk reduction of 1.7%; reinfarction (RR 0.89, 98% CI 0.75 to 1.08; 6825 participants; 14 trials; low-quality evidence) with an absolute risk reduction of 0.9%; and angina (RR 0.64, 98% CI 0.18 to 2.0; 844 participants; 2 trials; very low-quality evidence). None of the trials specifically assessed nor reported serious adverse events according to ICH-GCP. None of the trials assessed quality of life. We identified two ongoing randomised clinical trials investigating the effect of early administration of beta-blockers after percutaneous coronary intervention or thrombolysis to patients with an acute myocardial infarction and one ongoing trial investigating the effect of long-term beta-blocker therapy. AUTHORS' CONCLUSIONS: Our present review indicates that beta-blockers for suspected or diagnosed acute myocardial infarction probably reduce the short-term risk of a reinfarction and the long-term risk of all-cause mortality and cardiovascular mortality. Nevertheless, it is most likely that beta-blockers have little or no effect on the short-term risk of all-cause mortality and cardiovascular mortality. Regarding all remaining outcomes (serious adverse events according to ICH-GCP, major adverse cardiovascular events (composite of cardiovascular mortality and non-fatal myocardial infarction during follow-up), the long-term risk of a reinfarction during follow-up, quality of life, and angina), further information is needed to confirm or reject the clinical effects of beta-blockers on these outcomes for people with or suspected of acute myocardial infarction.

42. Hecht HS, Blaha MJ, Kazerooni EA, Cury RC, Budoff M, Leipsic J, et al. CAC-DRS: Coronary Artery Calcium Data and Reporting System. An expert consensus document of the Society of Cardiovascular Computed Tomography (SCCT). J Cardiovasc Comput Tomogr. 2018;12(3):185-91.

The goal of CAC-DRS: Coronary Artery Calcium Data and Reporting System is to create a standardized method to communicate findings of CAC scanning on all noncontrast CT scans, irrespective of the indication, in order to facilitate clinical decision-making, with recommendations for subsequent patient management. The CAC-DRS classification is applied on a per-patient basis and represents the total calcium score and the number of involved arteries. General recommendations are provided for further management of patients with different degrees of calcified plaque burden based on CAC-DRS classification. In addition, CAC-DRS will provide a framework of standardization that may benefit quality assurance and tracking patient outcomes with the potential to ultimately result in improved quality of care.

43. Cury RC, Abbara S, Achenbach S, Agatston A, Berman DS, Budoff MJ, et al. CAD-RADS(TM) Coronary Artery Disease - Reporting and Data System. An expert consensus document of the Society of Cardiovascular Computed Tomography (SCCT), the American College of Radiology (ACR) and the North American Society for Cardiovascular Imaging (NASCI). Endorsed by the American College of Cardiology. J Cardiovasc Comput Tomogr. 2016;10(4):269-81.

The intent of CAD-RADS - Coronary Artery Disease Reporting and Data System is to create a standardized method to communicate findings of coronary CT angiography (coronary CTA) in order to facilitate decision-making regarding further patient management. The suggested CAD-RADS classification is applied on a per-patient basis and represents the highest-grade coronary artery lesion documented by coronary CTA. It ranges from CAD-RADS 0 (Zero) for the complete absence of stenosis and plaque to CAD-RADS 5 for the presence of at least one totally occluded coronary artery and should always be interpreted in conjunction with the impression found in the report. Specific recommendations are provided for further management of patients with stable or acute chest pain based on the CAD-RADS classification. The main goal of CAD-RADS is to standardize reporting of coronary CTA results and to facilitate communication of test results to referring physicians along with suggestions for subsequent patient management. In addition, CAD-RADS will provide a framework of standardization that may benefit education, research, peer-review and quality assurance with the potential to ultimately result in improved quality of care.

44. Brunham LR, Ruel I, Aljenedil S, Rivière JB, Baass A, Tu JV, et al. Canadian Cardiovascular Society Position Statement on Familial Hypercholesterolemia: Update 2018. Can J Cardiol. 2018;34(12):1553-63.

Familial hypercholesterolemia (FH) is the most common monogenic disorder causing premature atherosclerotic cardiovascular disease. It affects 1 in 250 individuals worldwide, and of the approximately 145,000 Canadians estimated to have FH, most are undiagnosed. Herein, we provide an update of the 2014 Canadian Cardiovascular Society position statement on FH addressing the need for case identification, prompt recognition, and treatment with statins and ezetimibe, and cascade family screening. We provide a new Canadian definition for FH and tools for clinicians to make a diagnosis. The risk of atherosclerotic cardiovascular disease in patients with "definite" FH is 10- to 20-fold that of a normolipidemic individual and initiating treatment in youth or young adulthood can normalize life expectancy. Target levels for low-density lipoprotein cholesterol are proposed and are aligned with the Canadian Cardiovascular Society guidelines on dyslipidemia. Recommendation for the use of inhibitors of proprotein convertase kexin/subtilisin type 9 are made in patients who cannot achieve therapeutic low-density lipoprotein cholesterol targets on maximally tolerated statins and ezetimibe. The writing committee used the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) methodology in the preparation of the present document, which offers guidance for practical evaluation and management of patients with FH. This position statement also aims to raise awareness of FH nationally, and to mobilize patient support, promote knowledge translation, and availability of treatment and health care resources for this under-recognized, but important medical condition.

45. Dibben GO, Dalal HM, Taylor RS, Doherty P, Tang LH, Hillsdon M. Cardiac rehabilitation and physical activity: systematic review and meta-analysis. Heart. 2018;104(17):1394-402.

OBJECTIVE: To undertake a systematic review and meta-analysis to assess the impact of cardiac rehabilitation (CR) on physical activity (PA) levels of patients with heart disease and the methodological quality of these studies. METHODS: Databases (MEDLINE, EMBASE, CENTRAL, CINAHL, PsychINFO and SportDiscus) were searched without language restriction from inception to January 2017 for randomised controlled trials (RCTs) comparing CR to usual care control in adults with heart failure (HF) or coronary heart disease (CHD) and measuring PA subjectively or objectively. The direction of PA difference between CR and control was summarised using vote counting (ie, counting the positive, negative and non-significant results) and meta-analysis. RESULTS: Forty RCTs, (6480 patients: 5825 CHD, 655 HF) were included with 26% (38/145) PA results showing a statistically significant improvement in PA levels with CR compared with control. This pattern of results appeared consistent regardless of type of CR intervention (comprehensive vs exercise-only) or PA measurement (objective vs subjective). Meta-analysis showed PA increases in the metrics of steps/day (1423, 95% CI 757.07 to 2089.43, p<0.0001) and proportion of patients categorised as physically active (relative risk 1.55, 95% CI 1.19 to 2.02, p=0.001). The included trials were at high risk of bias, and the quality of the PA assessment and reporting was relatively poor. CONCLUSION: Overall, there is moderate evidence of an increase in PA with CR participation compared with control. High-quality trials are required, with robust PA measurement and data analysis methods, to assess if CR definitely leads to important improvements in PA.

46. Sliwa K, Zühlke L, Kleinloog R, Doubell A, Ebrahim I, Essop M, et al. Cardiology-cardiothoracic subspeciality training in South Africa: a position paper of the South Africa Heart Association. Cardiovasc J Afr. 2016;27(3):188-93.

Over the past decades, South Africa has undergone rapid demographic changes, which have led to marked increases in specific cardiac disease categories, such as rheumatic heart disease (now predominantly presenting in young adults with advanced and symptomatic disease) and coronary artery disease (with rapidly increasing prevalence in middle age). The lack of screening facilities, delayed diagnosis and inadequate care at primary, secondary and tertiary levels have led to a large burden of patients with heart failure. This leads to suffering of the patients and substantial costs to society and the healthcare system. In this position paper, the South African Heart Association (SA Heart) National Council members have summarised the current state of cardiology, cardiothoracic surgery and paediatric cardiology reigning in South Africa. Our report demonstrates that there has been minimal change in the number of successfully qualified specialists over the last decade and, therefore, a de facto decline per capita. We summarise the major gaps in training and possible interventions to transform the healthcare system, dealing with the colliding epidemic of communicable disease and the rapidly expanding epidemic of non-communicable disease, including cardiac disease.

47. Gomes BR. Care of the Patient Undergoing Radial Approach Heart Catheterization: Implications for Medical-Surgical Nurses. Medsurg Nurs. 2015;24(3):173-6.

Primary treatment for coronary vascular disease focuses on therapeutic lifestyle changes. However, additional medical management or even coronary intervention may be required. Access sites for catheterization include the brachial, radial, and femoral arteries. As an increasing number of providers implement transradial cardiac catheterization, education for nurses is a priority.

48. Liu JZ, Erlich Y, Pickrell JK. Case-control association mapping by proxy using family history of disease. Nat Genet. 2017;49(3):325-31.

Collecting cases for case-control genetic association studies can be time-consuming and expensive. In some situations (such as studies of late-onset or rapidly lethal diseases), it may be more practical to identify family members of cases. In randomly ascertained cohorts, replacing cases with their first-degree relatives enables studies of diseases that are absent (or nearly absent) in the cohort. We refer to this approach as genome-wide association study by proxy (GWAX) and apply it to 12 common diseases in 116,196 individuals from the UK Biobank. Meta-analysis with published genome-wide association study summary statistics replicated established risk loci and yielded four newly associated loci for Alzheimer's disease, eight for coronary artery disease and five for type 2 diabetes. In addition to informing disease biology, our results demonstrate the utility of association mapping without directly observing cases. We anticipate that GWAX will prove useful in future genetic studies of complex traits in large population cohorts.

49. Villarruz-Sulit MV, Forster R, Dans AL, Tan FN, Sulit DV. Chelation therapy for atherosclerotic cardiovascular disease. Cochrane Database Syst Rev. 2020;5(5):Cd002785.

BACKGROUND: Chelation therapy is promoted and practiced around the world as a form of alternative medicine in the treatment of atherosclerotic cardiovascular disease. It has been suggested as a safe, relatively inexpensive, non-surgical method of restoring blood flow in atherosclerotic vessels. However, there is currently limited high-quality, adequately-powered research informing evidence-based medicine on the topic, specifically regarding clinical outcomes. Due to this limited evidence, the benefit of chelation therapy remains controversial at present. This is an update of a review first published in 2002. OBJECTIVES: To assess the effects of ethylene diamine tetra-acetic acid (EDTA) chelation therapy versus placebo or no treatment on clinical outcomes among people with atherosclerotic cardiovascular disease. SEARCH METHODS: For this update, the Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases, the World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov trials register to 6 August 2019. We searched the bibliographies of the studies retrieved by the literature searches for further trials. SELECTION CRITERIA: We included studies if they were randomised controlled trials of EDTA chelation therapy versus placebo or no treatment in participants with atherosclerotic cardiovascular disease. The main outcome measures we considered include all-cause or cause-specific mortality, non-fatal cardiovascular events, direct or indirect measurement of disease severity, and subjective measures of improvement or adverse events. DATA COLLECTION AND ANALYSIS: Two review authors independently extracted data and assessed trial quality using standard Cochrane procedures. A third author considered any unresolved issues, and we discussed any discrepancies until a consensus was reached. We contacted study authors for additional information. MAIN RESULTS: We included five studies with a total of 1993 randomised participants. Three studies enrolled participants with peripheral vascular disease and two studies included participants with coronary artery disease, one of which specifically recruited people who had had a myocardial infarction. The number of participants in each study varied widely (from 10 to 1708 participants), but all studies compared EDTA chelation to a placebo. Risk of bias for the included studies was generally moderate to low, but one study had high risk of bias because the study investigators broke their randomisation code halfway through the study and rolled the placebo participants over to active treatment. Certainty of the evidence, as assessed by GRADE, was generally low to very low, which was mostly due to a paucity of data in each outcome's meta-analysis. This limited our ability to draw any strong conclusions. We also had concerns about one study's risk of bias regarding blinding and outcome assessment that may have biased the results. Two studies with coronary artery disease participants reported no evidence of a difference in all-cause mortality between chelation therapy and placebo (risk ratio (RR) 0.97, 95% CI 0.73 to 1.28; 1792 participants; low-certainty). One study with coronary artery disease participants reported no evidence of a difference in coronary heart disease deaths between chelation therapy and placebo (RR 1.02, 95% CI 0.70 to 1.48; 1708 participants; very low-certainty). Two studies with coronary artery disease participants reported no evidence of a difference in myocardial infarction (RR 0.81, 95% CI 0.57 to 1.14; 1792 participants; moderate-certainty), angina (RR 0.95, 95% CI 0.55 to 1.67; 1792 participants; very low-certainty), and coronary revascularisation (RR 0.46, 95% CI 0.07 to 3.25; 1792 participants). Two studies (one with coronary artery disease participants and one with peripheral vascular disease participants) reported no evidence of a difference in stroke (RR 0.88, 95% CI 0.40 to 1.92; 1867 participants; low-certainty). Ankle-brachial pressure index (ABPI; also known as ankle brachial index) was measured in three studies, all including participants with peripheral vascular disease; two studies found no evidence of a difference in the treatment groups after three months after treatment (mean difference (MD) 0.02, 95% CI -0.03 to 0.06; 181 participants; low-certainty). A third study reported an improvement in ABPI in the EDTA chelation group, but this study was at high risk of bias. Meta-analysis of maximum and pain-free walking distances three months after treatment included participants with peripheral vascular disease and showed no evidence of a difference between the treatment groups (MD -31.46, 95% CI -87.63 to 24.71; 165 participants; 2 studies; low-certainty). Quality of life outcomes were reported by two studies that included participants with coronary artery disease, but we were unable to pool the data due to different methods of reporting and varied criteria. However, there did not appear to be any major differences between the treatment groups. None of the included studies reported on vascular deaths. Overall, there was no evidence of major or minor adverse events associated with EDTA chelation treatment. AUTHORS' CONCLUSIONS: There is currently insufficient evidence to determine the effectiveness or ineffectiveness of chelation therapy in improving clinical outcomes of people with atherosclerotic cardiovascular disease. More high-quality, randomised controlled trials are needed that assess the effects of chelation therapy on longevity and quality of life among people with atherosclerotic cardiovascular disease.

50. Ayerbe L, González E, Gallo V, Coleman CL, Wragg A, Robson J. Clinical assessment of patients with chest pain; a systematic review of predictive tools. BMC Cardiovasc Disord. 2016;16:18.

BACKGROUND: The clinical assessment of patients with chest pain of recent onset remains difficult. This study presents a critical review of clinical predictive tools for the assessment of patients with chest pain. METHODS: Systematic review of observational studies and estimation of probabilities of coronary artery disease (CAD) in patients with chest pain. Searches were conducted in PubMed, Embase, Scopus, and Web of Science to identify studies reporting tools, with at least three variables from clinical history, physical examination or ECG, produced with multivariate analysis, to estimate probabilities of CAD in patients with chest pain of recent onset, published from inception of the database to the 31st July 2015. The references of previous relevant reviews were hand searched. The methodological quality was assessed with standard criteria. Since the incidence of CAD has changed in the past few decades, the date of publication was acknowledged to be relevant in order to use the tool in clinical practice, and more recent papers were considered more relevant. Probabilities of CAD according to the studies of highest quality were estimated and the evidence provided was graded. RESULTS: Twelve papers were included out of the 19126 references initially identified. The methodological quality of all of them was high. The clinical characteristics of the chest pain, age, past medical history of cardiovascular disease, gender, and abnormalities in the ECG were the predictors of CAD most commonly reported across the studies. The most recent papers, with highest methodological quality, and most practical for use in clinical settings, reported prediction or exclusion of CAD with area under the curve 0.90 in Primary Care, 0.91 in Emergency department, and 0.79 in Cardiology. These papers provide evidence of high level (1B) and the recommendation to use their results in the management of patients with chest pain is strong (A). CONCLUSIONS: The risk of CAD can be estimated on clinical grounds in patients with chest pain in different clinical settings with high accuracy. The estimation of probabilities of CAD presented in these studies could be used for a better management of patients with chest pain and also in the development of future predictive tools.

51. Di Gioia G, Pellicano M, Toth GG, Casselman F, Adjedj J, Van Praet F, et al. Clinical Outcome of Patients with Aortic Stenosis and Coronary Artery Disease Not Treated According to Current Recommendations. J Cardiovasc Transl Res. 2016;9(2):145-52.

We evaluated the clinical outcome of patients with moderate/severe aortic stenosis and significant coronary disease not treated according to guidelines, recommending combined aortic valve replacement (AVR) and coronary artery bypass grafting (CABG). From 2002 to 2010, we assessed death up to 5 years in 650 patients with moderate/severe aortic stenosis and at least one coronary lesion (>50 %): 23 % were treated conservatively (MT), 17 % with percutaneous coronary intervention (PCI), 11 % with AVR, and 49 % with combined CABG and AVR. At a median follow-up of 58 months, overall death decreased over the groups (MT, 68 % vs. PCI, 44 % vs. AVR, 34 % vs. CABG and AVR, 23 %, p < 0.01). Compared to the MT group, Cox regression analysis adjusted for potential confounders showed significantly reduced mortality in the PCI, AVR, and CABG and AVR groups. When combined CABG and AVR is not feasible, PCI or AVR alone still improves significantly long-term survival as compared with MT alone.

52. Kansara P, Weiss S, Weintraub WS, Hann MC, Tcheng J, Rab ST, et al. Clinical Trials Versus Clinical Practice: When Evidence and Practice Diverge--Should Nondiabetic Patients With 3-Vessel Disease and Stable Ischemic Heart Disease Be Preferentially Treated With CABG? JACC Cardiovasc Interv. 2015;8(13):1647-56.

53. Webster J, Osborne S, Rickard CM, Marsh N. Clinically‐indicated replacement versus routine replacement of peripheral venous catheters. Cochrane Database Syst Rev. 2019(1).

http://dx.doi.org/10.1002/14651858.CD007798.pub5

- Background US Centers for Disease Control guidelines recommend replacement of peripheral intravenous catheters (PIVC) no more frequently than every 72 to 96 hours. Routine replacement is thought to reduce the risk of phlebitis and bloodstream infection. Catheter insertion is an unpleasant experience for patients and replacement may be unnecessary if the catheter remains functional and there are no signs of inflammation or infection. Costs associated with routine replacement may be considerable. This is the third update of a review first published in 2010. Objectives To assess the effects of removing peripheral intravenous catheters when clinically indicated compared with removing and re‐siting the catheter routinely. Search methods The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, Embase and CINAHL and World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov trials registers to 18 April 2018. We also undertook reference checking, and contacted researchers and manufacturers to identify additional studies. Selection criteria We included randomised controlled trials that compared routine removal of PIVC with removal only when clinically indicated, in hospitalised or community‐dwelling patients receiving continuous or intermittent infusions. Data collection and analysis Three review authors independently reviewed trials for inclusion, extracted data, and assessed risk of bias using Cochrane methods. We used GRADE to assess the overall evidence certainty. Main results This update contains two new trials, taking the total to nine included studies with 7412 participants. Eight trials were conducted in acute hospitals and one in a community setting. We rated the overall certainty of evidence as moderate for most outcomes, due to serious risk of bias for unblinded outcome assessment or imprecision, or both. Because outcome assessment was unblinded in all of the trials, none met our criteria for high methodological quality. Primary outcomes Seven trials (7323 participants), assessed catheter‐related bloodstream infection (CRBSI). There is no clear difference in the incidence of CRBSI between the clinically indicated (1/3590) and routine change (2/3733) groups (risk ratio (RR) 0.61, 95% confidence interval (CI) 0.08 to 4.68), low‐certainty evidence (downgraded twice for serious imprecision). All trials reported incidence of thrombophlebitis and we combined the results from seven of these in the analysis (7323 participants). We excluded two studies in the meta‐analysis because they contributed to high heterogeneity. There is no clear difference in the incidence of thrombophlebitis whether catheters were changed according to clinical indication or routinely (RR 1.07, 95% CI 0.93 to 1.25; clinically indicated 317/3590; 3‐day change 307/3733, moderate‐certainty evidence, downgraded once for serious risk of bias). The result was unaffected by whether the infusion was continuous or intermittent. Six trials provided thrombophlebitis rates by number of device days (32,709 device days). There is no clear difference between groups (RR 0.90, 95% CI 0.76 to 1.08; clinically indicated 248/17,251; 3‐day change 236/15,458; moderate‐certainty evidence, downgraded once for serious risk of bias). One trial (3283 participants), assessed all‐cause blood stream infection (BSI). We found no clear difference in the all‐cause BSI rate between the two groups (RR 0.47, 95% CI 0.15 to 1.53; clinically indicated: 4/1593 (0.02%); routine change 9/1690 (0.05%); moderate‐certainty evidence, downgraded one level for serious imprecision). Three trials (4244 participants), investigated costs; clinically indicated removal probably reduces device‐related costs by approximately AUD 7.00 compared with routine removal (MD −6.96, 95% CI −9.05 to −4.86; moderate‐certainty evidence, downgraded once for serious risk of bias). Secondary outcomes Six trials assessed infiltration (7123 participants). Routine replacement p obably reduces infiltration of fluid into surrounding tissues compared with a clinically indicated change (RR 1.16 (95% CI 1.06 to 1.26; routine replacement 747/3638 (20.5%); clinically indicated 834/3485 (23.9%); moderate‐certainty evidence, downgraded once for serious risk of bias). Meta‐analysis of seven trials (7323 participants), found that rates of catheter failure due to blockage were probably lower in the routine‐replacement group compared to the clinically indicated group (RR 1.14, 95% CI 1.01 to 1.29; routine‐replacement 519/3733 (13.9%); clinically indicated 560/3590 (15.6%); moderate‐certainty evidence, downgraded once for serious risk of bias). Four studies (4606 participants), reported local infection rates. It is uncertain if there are differences between groups (RR 4.96, 95% CI 0.24 to 102.98; clinically indicated 2/2260 (0.09%); routine replacement 0/2346 (0.0%); very low‐certainty evidence, downgraded one level for serious risk of bias and two levels for very serious imprecision). One trial (3283 participants), found no clear difference in the incidence of mortality when clinically indicated removal was compared with routine removal (RR 1.06, 95% CI 0.27 to 4.23; low‐certainty evidence, downgraded two levels for very serious imprecision). One small trial (198 participants) reported no clear difference in device‐related pain between clinically indicated and routine removal groups (MD −0.60, 95% CI −1.44 to 0.24; low‐certainty evidence, downgraded one level for serious risk of bias and one level for serious imprecision). The pre‐planned outcomes 'number of catheter re‐sites per patient', and 'satisfaction' were not reported by any studies included in this review. Authors' conclusions There is moderate‐certainty evidence of no clear difference in rates of CRBSI, thrombophlebitis, all‐cause BSI, mortality and pain between clinically indicated or routine replacement of PIVC. We are uncertain if local infection is reduced or increased when catheters are changed when clinically indicated. There is moderate‐certainty evidence that infiltration and catheter blockage is probably lower when PIVC are changed routinely; and moderate‐certainty evidence that clinically indicated removal probably reduces device‐related costs. The addition of two new trials for this update found no further evidence to support changing catheters every 72 to 96 hours. Healthcare organisations may consider changing to a policy whereby catheters are changed only if there is a clinical indication to do so, for example, if there were signs of infection, blockage or infiltration. This would provide significant cost savings, spare patients the unnecessary pain of routine re‐sites in the absence of clinical indications and would reduce time spent by busy clinicians on this intervention. To minimise PIVC‐related complications, staff should inspect the insertion site at each shift change and remove the catheter if signs of inflammation, infiltration, occlusion, infection or blockage are present, or if the catheter is no longer needed for therapy. Plain language summary Replacing a peripheral venous catheter when clinically indicated versus routine replacement Review question We reviewed the evidence about the effects of changing a catheter routinely (every three to four days) or changing the catheter only if there were signs or symptoms of a problem with the catheter remaining in place. Background Most hospital patients receive fluids or medications via a peripheral intravenous catheter at some time during their hospital stay. An intravenous catheter (also called an IV drip, an IV line or intravenous cannula) is a short, hollow tube placed in the vein to allow administration of medications, fluids or nutrients directly into the bloodstream. These catheters are often replaced every three to four days to try to prevent irritation of the vein or infection of the blood. However, replacing the catheter may cause discomfort to patients and is quite costly. This is the third update of a review first published in 20 0. Study characteristics In April 2018 we searched for randomised controlled trials (RCTs) that compared changing catheters every 72 to 96 hours (routine change) with changing the catheter only if there were complications or therapy was complete. We measured catheter‐related blood stream infection, phlebitis and other problems associated with peripheral catheters, such as local infection and catheter blockage. We included two new studies for this update, bringing the total to nine studies with 7412 participants. Key results We found no clear difference in rates of catheter‐related blood stream infection, phlebitis (inflammation of the vein), blood stream infection from any cause, local infection, mortality or pain. We are uncertain if local infection is reduced or increased when catheters are changed when clinically indicated. Infiltration (fluid seeping into the tissue around the catheter) and catheter blockage (an inability to infuse fluids or medication through the catheter), are probably reduced when catheters are changed routinely. Cost is reduced when catheters are replaced when there was a clinical indication to do so. The pre‐planned outcomes 'number of catheter re‐sites per patient', and 'satisfaction' were not reported by any studies included in the review. Quality of the evidence The overall quality of the evidence was judged to be moderate for most outcomes, which leaves us uncertain of our findings. The uncertainty is largely due to outcomes, such as phlebitis, being assessed by people who were aware of the group allocation, which may or may not affect their decision about whether a problem is present or absent.

54. Cannon JA, Moffitt P, Perez-Moreno AC, Walters MR, Broomfield NM, McMurray JJV, et al. Cognitive Impairment and Heart Failure: Systematic Review and Meta-Analysis. J Card Fail. 2017;23(6):464-75.

BACKGROUND: Cognitive impairment and dementia are associated with a range of cardiovascular conditions, including hypertension, coronary artery disease, and atrial fibrillation. We aimed to describe the association with heart failure, summarizing published data to give estimates of prevalence, incidence, and relative risk of cognitive impairment/dementia in heart failure. METHODS: We searched multidisciplinary databases including MEDLINE (OVID), EMBASE (OVID), CINAHL (EBSCO), PsychINFO (EBSCO), Web of Science (Thomson Reuters), and CENTRAL (Cochrane Library) from inception until May 31, 2015. All relevant studies looking at cognitive impairment/dementia in heart failure were included. Studies were selected by 2 independent reviewers using prespecified inclusion/exclusion criteria. Where data allowed, we performed meta-analysis and pooled results using random effects models. RESULTS: From 18,000 titles, 37 studies were eligible (n = 8411 participants). Data from 4 prospective cohorts (n = 2513 participants) suggest greater cognitive decline in heart failure compared with non-heart failure over the longer term. These data were not suitable for meta-analysis. In case control studies describing those with and without heart failure (n = 4 papers, 1414 participants) the odds ratio for cognitive impairment in the heart failure population was 1.67 (95% confidence interval 1.15-2.42). Prevalence of cognitive impairment in heart failure cohorts (n = 26 studies, 4176 participants) was 43% (95% confidence interval 30-55). CONCLUSIONS: This review suggests a substantial proportion of patients with heart failure have concomitant cognitive problems. This has implications for planning treatment and services. These data do not allow us to comment on causation, and further work is needed to describe the underlying pathophysiology.

55. Tully PJ, Baumeister H. Collaborative care for comorbid depression and coronary heart disease: a systematic review and meta-analysis of randomised controlled trials. BMJ Open. 2015;5(12):e009128.

OBJECTIVES: To systematically review the efficacy of collaborative care (CC) for depression in adults with coronary heart disease (CHD) and depression. DESIGN: Systematic review and meta-analysis. DATA SOURCES: Electronic databases (Cochrane Central Register of Controlled Trials MEDLINE, EMBASE, PsycINFO and CINAHL) were searched until April 2014. INCLUSION CRITERIA: Population, depression comorbid with CHD; intervention, randomised controlled trial (RCT) of CC; comparison, either usual care, wait-list control group or no further treatment; and outcome, (primary) major adverse cardiac events (MACE), (secondary) standardised measure of depression, anxiety, quality of life (QOL) and cost-effectiveness. DATA EXTRACTION AND ANALYSIS: RevMan V.5.3 was used to synthesise the data as risk ratios (RRs), ORs and standardised mean differences (SMD) with 95% CIs in random effect models. RESULTS: Six RCTs met the inclusion criteria and comprised 655 participants randomised to CC and 629 participants randomised to the control group (total 1284). Collaborative depression care led to a significant reduction in MACE in the short term (three trials, RR 0.54; 95% CI 0.31 to 0.95, p=0.03) that was not sustained in the longer term. Small reductions in depressive symptoms were evident in the short term (6 trials, pooled SMD -0.31; 95% CI -0.43 to -0.19, p<0.00001) and depression remission was more likely to be achieved with CC (5 trials, OR 1.77; 95% CI 1.28 to 2.44, p=0.0005). Likewise, a significant effect was observed for anxiety symptoms (SMD -0.36) and mental QOL (SMD 0.24). The timing of the intervention was a source of between-group heterogeneity for depression symptoms (between groups p=0.04, I(2)=76.5%). CONCLUSIONS: Collaborative depression care did not lead to a sustained reduction in the primary MACE end point. Small effects were observed for depression, depression remission, anxiety and mental QOL. TRIALS REGISTRATION NUMBER: PROSPERO CRD42014013653.

56. Piccolo R, Pilgrim T, Heg D, Franzone A, Rat-Wirtzler J, Räber L, et al. Comparative Effectiveness and Safety of New-Generation Versus Early-Generation Drug-Eluting Stents According to Complexity of Coronary Artery Disease: A Patient-Level Pooled Analysis of 6,081 Patients. JACC Cardiovasc Interv. 2015;8(13):1657-66.

OBJECTIVES: The purpose of this study was to compare the 2-year safety and effectiveness of new- versus early-generation drug-eluting stents (DES) according to the severity of coronary artery disease (CAD) as assessed by the SYNTAX (Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery) score. BACKGROUND: New-generation DES are considered the standard-of-care in patients with CAD undergoing percutaneous coronary intervention. However, there are few data investigating the effects of new- over early-generation DES according to the anatomic complexity of CAD. METHODS: Patient-level data from 4 contemporary, all-comers trials were pooled. The primary device-oriented clinical endpoint was the composite of cardiac death, myocardial infarction, or ischemia-driven target-lesion revascularization (TLR). The principal effectiveness and safety endpoints were TLR and definite stent thrombosis (ST), respectively. Adjusted hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated at 2 years for overall comparisons, as well as stratified for patients with lower (SYNTAX score ≤11) and higher complexity (SYNTAX score >11). RESULTS: A total of 6,081 patients were included in the study. New-generation DES (n = 4,554) compared with early-generation DES (n = 1,527) reduced the primary endpoint (HR: 0.75 [95% CI: 0.63 to 0.89]; p = 0.001) without interaction (p = 0.219) between patients with lower (HR: 0.86 [95% CI: 0.64 to 1.16]; p = 0.322) versus higher CAD complexity (HR: 0.68 [95% CI: 0.54 to 0.85]; p = 0.001). In patients with SYNTAX score >11, new-generation DES significantly reduced TLR (HR: 0.36 [95% CI: 0.26 to 0.51]; p < 0.001) and definite ST (HR: 0.28 [95% CI: 0.15 to 0.55]; p < 0.001) to a greater extent than in the low-complexity group (TLR pint = 0.059; ST pint = 0.013). New-generation DES decreased the risk of cardiac mortality in patients with SYNTAX score >11 (HR: 0.45 [95% CI: 0.27 to 0.76]; p = 0.003) but not in patients with SYNTAX score ≤11 (pint = 0.042). CONCLUSIONS: New-generation DES improve clinical outcomes compared with early-generation DES, with a greater safety and effectiveness in patients with SYNTAX score >11.

57. Case BC, Geiser KM, Torguson R, Pichard AD, Satler LF, Waksman R, et al. Comparison of coronary revascularization appropriateness for non-acute coronary syndrome cases under the 2017 update vs the 2012 appropriate use criteria. Catheter Cardiovasc Interv. 2019;93(4):620-5.

OBJECTIVES: To compare coronary revascularization appropriateness for non-acute coronary syndrome cases under the 2017 update vs the 2012 appropriate use criteria (AUC). BACKGROUND: In 2017, the 2012 AUC for coronary revascularization were updated. We examined how applying these new 2017 updates to our previous inappropriate cases would change their appropriateness. METHODS: We identified 50 cases of patients who underwent coronary revascularization for stable ischemic heart disease who were deemed inappropriate under the 2012 AUC. Two separate physicians reviewed the cases and applied a new AUC based on the 2017 AUC. Next, if there was a change, the reason was identified. RESULTS: Average age was 64, majority being male (29; 58%). Forty-two (84%) were asymptomatic upon presentation. Most cases (27, 54%) dealt with percutaneous coronary intervention (PCI) of the right coronary artery. After applying the 2017 AUC, 34 of the 50 inappropriate failures (68%) would be changed from "inappropriate" to "may be appropriate care." Of the 34 cases, 25 (73.5%) were changed due to the new AUC no longer expecting the patient to be on ≥2 anti-angina medications prior to PCI. Of the 34 cases, eight (23.5%) were changed due to the new AUC expanding the use of non-invasive modalities. CONCLUSIONS: Applying the 2017 AUC led to a statistically higher number of cases being deemed "may be appropriate." The most common cause for the change included the change in requirement for anti-angina regimen and the expanded role of non-invasive modalities.

58. Adamson PD, Newby DE, Hill CL, Coles A, Douglas PS, Fordyce CB. Comparison of International Guidelines for Assessment of Suspected Stable Angina: Insights From the PROMISE and SCOT-HEART. JACC Cardiovasc Imaging. 2018;11(9):1301-10.

OBJECTIVES: This study sought to compare the performance of major guidelines for the assessment of stable chest pain including risk-based (American College of Cardiology/American Heart Association and European Society of Cardiology) and symptom-focused (National Institute for Health and Care Excellence) strategies. BACKGROUND: Although noninvasive testing is not recommended in low-risk individuals with stable chest pain, guidelines recommend differing approaches to defining low-risk patients. METHODS: Patient-level data were obtained from the PROMISE (Prospective Multicenter Imaging Study for Evaluation of Chest Pain) and SCOT-HEART (Scottish Computed Tomography of the Heart) trials. Pre-test probability was determined and patients dichotomized into low-risk and intermediate-high-risk groups according to each guideline's definitions. The primary endpoint was obstructive coronary artery disease on coronary computed tomography angiography. Secondary endpoints were coronary revascularization at 90 days and cardiovascular death or nonfatal myocardial infarction up to 3 years. RESULTS: In total, 13,773 patients were included of whom 6,160 had coronary computed tomography angiography. The proportions of patients identified as low risk by the American College of Cardiology/American Heart Association, European Society of Cardiology, and National Institute for Health and Care Excellence guidelines, respectively, were 2.5%, 2.5%, and 10.0% within PROMISE, and 14.0%, 19.8%, and 38.4% within SCOT-HEART. All guidelines identified lower rates of obstructive coronary artery disease in low- versus intermediate-high-risk patients with a negative predictive value of ≥0.90. Compared with low-risk groups, all intermediate-high-risk groups had greater risks of coronary revascularization (odds ratio [OR]: 2.2 to 24.1) and clinical outcomes (OR: 1.84 to 5.8). CONCLUSIONS: Compared with risk-based guidelines, symptom-focused assessment identifies a larger group of low-risk chest pain patients potentially deriving limited benefit from noninvasive testing. (Scottish Computed Tomography of the Heart Trial [SCOT-HEART]; NCT01149590; Prospective Multicenter Imaging Study for Evaluation of Chest Pain [PROMISE]; NCT01174550).

59. Fanari Z, Weiss SA, Zhang W, Sonnad SS, Weintraub WS. Comparison of percutaneous coronary intervention with drug eluting stents versus coronary artery bypass grafting in patients with multivessel coronary artery disease: Meta-analysis of six randomized controlled trials. Cardiovasc Revasc Med. 2015;16(2):70-7.

OBJECTIVE: To compare outcomes of percutaneous coronary intervention (PCI) with drug eluting stent (DES) and Coronary Artery Bypass Grafting (CABG) in patients with multivessel Coronary Artery Disease (CAD) using data from randomized controlled trials (RCT). BACKGROUND: PCI and CABG are established strategies for coronary revascularization in the setting of ischemic heart disease. Multiple RCTs have compared outcomes of the two modalities in patients with multivessel CAD. METHODS: We did a meta-analysis from six RCTs in the contemporary era comparing the effectiveness of PCI with DES to at 1 year, 2 years and 5 years respectively. RESULTS: Compared to CABG, at one year PCI was associated with a significantly higher incidence of TVR (RR=2.31; 95% CI: [1.80-2.96]; P=<0.0001), lower incidence of stroke (RR=0.35; 95% CI: [0.19-0.62]; P=0.0003), and no difference in death (RR=1.02; 95% CI: [0.77-1.36]; P=0.88) or MI (RR=1.16; 95% CI: [0.72-1.88]; P=0.53). At 5 years, PCI was associated with a higher incidence of death (RR=1.3; 95% CI: [1.10-1.54]; P=0.0026) and MI (RR=2.21; 95% CI: [1.75-2.79]; P=<0.0001). While the higher incidence of MI with PCI was noticed in both diabetic and non-diabetics, death was increased mainly in diabetic patients. CONCLUSION: In patients with multi-vessel CAD, PCI with DES is associated with no significant difference in death or MI at 1 or 2 years. However at 5 years, PCI is associated with higher incidence of death and MI.

60. Nikolakopoulou A, Mavridis D, Egger M, Salanti G. Continuously updated network meta-analysis and statistical monitoring for timely decision-making. Stat Methods Med Res. 2018;27(5):1312-30.

Pairwise and network meta-analysis (NMA) are traditionally used retrospectively to assess existing evidence. However, the current evidence often undergoes several updates as new studies become available. In each update recommendations about the conclusiveness of the evidence and the need of future studies need to be made. In the context of prospective meta-analysis future studies are planned as part of the accumulation of the evidence. In this setting, multiple testing issues need to be taken into account when the meta-analysis results are interpreted. We extend ideas of sequential monitoring of meta-analysis to provide a methodological framework for updating NMAs. Based on the z-score for each network estimate (the ratio of effect size to its standard error) and the respective information gained after each study enters NMA we construct efficacy and futility stopping boundaries. A NMA treatment effect is considered conclusive when it crosses an appended stopping boundary. The methods are illustrated using a recently published NMA where we show that evidence about a particular comparison can become conclusive via indirect evidence even if no further trials address this comparison.

61. Dzaye O, Dudum R, Reiter-Brennan C, Kianoush S, Tota-Maharaj R, Cainzos-Achirica M, et al. Coronary artery calcium scoring for individualized cardiovascular risk estimation in important patient subpopulations after the 2019 AHA/ACC primary prevention guidelines. Prog Cardiovasc Dis. 2019;62(5):423-30.

The 2018 and 2019 American Heart Association and American College of Cardiology (AHA/ACC) guidelines for primary prevention of atherosclerotic cardiovascular disease (ASCVD) recommend consideration of so-called "risk-enhancing factors" in borderline to intermediate risk individuals. These include high-risk race/ethnicity (e.g. South Asian origin), chronic kidney disease, a family history of premature ASCVD, the metabolic syndrome, chronic inflammatory disorders (e.g. rheumatoid arthritis [RA], psoriasis, or chronic human immunodeficiency virus [HIV]), and conditions specific to women, among others. Studies suggest, however, that risk may be highly heterogeneous within these subgroups. The AHA/ACC guidelines also recommend consideration of coronary artery calcium (CAC) scoring for further risk assessment in borderline to intermediate risk individuals in whom management is uncertain. Although the combination of risk enhancing factors and CAC burden (together with Pooled Cohort estimates) may lead to more accurate ASCVD risk assessment, few publications have closely examined the interplay between risk enhancing factors and CAC scoring for personalized risk estimation. Our aim is to review the relevant literature in this area. Although further research is clearly needed, CAC assessment seems a highly valuable option to inform individualized ASCVD risk management in these important, often highly heterogeneous patient subgroups.

62. Cury RC, Abbara S, Achenbach S, Agatston A, Berman DS, Budoff MJ, et al. Coronary Artery Disease - Reporting and Data System (CAD-RADS): An Expert Consensus Document of SCCT, ACR and NASCI: Endorsed by the ACC. JACC Cardiovasc Imaging. 2016;9(9):1099-113.

The intent of CAD-RADS - Coronary Artery Disease Reporting and Data System is to create a standardized method to communicate findings of coronary CT angiography (coronary CTA) in order to facilitate decision-making regarding further patient management. The suggested CAD-RADS classification is applied on a per-patient basis and represents the highest-grade coronary artery lesion documented by coronary CTA. It ranges from CAD-RADS 0 (Zero) for the complete absence of stenosis and plaque to CAD-RADS 5 for the presence of at least one totally occluded coronary artery and should always be interpreted in conjunction with the impression found in the report. Specific recommendations are provided for further management of patients with stable or acute chest pain based on the CAD-RADS classification. The main goal of CAD-RADS is to standardize reporting of coronary CTA results and to facilitate communication of test results to referring physicians along with suggestions for subsequent patient management. In addition, CAD-RADS will provide a framework of standardization that may benefit education, research, peer-review and quality assurance with the potential to ultimately result in improved quality of care.

63. Gholami SS, Azar FEF, Rezapour A, Tajdini M. Cost-effectiveness of coronary artery bypass graft and percutaneous coronary intervention compared to medical therapy in patients with coronary artery disease: a systematic review. Heart Fail Rev. 2019;24(6):967-75.

Coronary artery disease (CAD) has significant social and economic implications. It is necessary to create tools to identify the most cost-effectiveness treatments, which can assist clinicians in their therapeutic decisions so that the maximum possible benefit is reached with the lowest possible cost. Effectiveness must be measured by final treatment goals in which the most effective interventions are those with the lowest costs. This study is aimed to systematically review and compare the studies conducted on the cost-effectiveness of the three coronary artery disease treatment strategies (medical treatment, percutaneous coronary intervention, and coronary artery bypass graft). In this systematic review, the databases NHS Economic Evaluation Database, Embase, MEDLINE, Science Direct, and Scopus were searched for studies on the cost-effectiveness of coronary artery bypass graft (CABG) and percutaneous coronary intervention (PCI) compared to medical therapy (MT) in patients with coronary artery disease between 1 January 2004 to 30 September 2018. The quality appraisal of the included studies was examined using the Consolidated Health Economics Evaluation Reporting Standards (CHEERS) statement. Out of 186 unique retrievals, 8 studies were included. The results showed that the all studies clearly stated the time horizon of the study and included direct medical costs in their analysis. In addition, in most of the studies, quality-adjusted life years (QALY) were the main outcome used for measuring the effectiveness. The studies reported various ranges of the incremental cost-effectiveness ratio (ICER); accordingly, the highest ratio was observed in the USA ($212,800) for PCI v MT and the lowest ratio was observed in Brazil ($4403) for CABG v MT. Although the results of the studies were different in terms of a number of aspects, such as the viewpoint of the study, the study horizons, and the costs of expenditure items, they reached similar results. Based on the result of the present study, it seems that each three treatment strategies for CAD yielded improvements in QALY.

64. Turchetti G, Kroes MA, Lorenzoni V, Trieste L, Chapman AM, Sweet AC, et al. The cost-effectiveness of diagnostic cardiac imaging for stable coronary artery disease. Expert Rev Pharmacoecon Outcomes Res. 2015;15(4):625-33.

Early and accurate diagnosis of stable coronary artery disease (CAD) is crucial to reduce morbidity, mortality and healthcare costs. This critical appraisal of health-economic literature concerning non-invasive diagnostic cardiac imaging aims to summarize current approaches to economic evaluation of diagnostic cardiac imaging and associated procedural risks, inform cardiologists how to use economic analyses for decision-making, highlight areas where new information could strengthen the economic evaluation and shed light on cost-effective approaches to diagnose stable CAD. Economic analysis can support cardiologists' decision-making. Current economic evidence in the field does not provide sufficient information to guide the choice among different imaging modalities or strategies for each patient. Available economic analyses suggest that computed tomography coronary angiography (CTCA) is a cost-effective approach to rule out CAD prior to invasive coronary angiography in patients with low to intermediate pre-test probability of disease and that stress imaging modalities may be cost-effective at variable pre-test probabilities.

65. Ozaki Y, Katagiri Y, Onuma Y, Amano T, Muramatsu T, Kozuma K, et al. CVIT expert consensus document on primary percutaneous coronary intervention (PCI) for acute myocardial infarction (AMI) in 2018. Cardiovasc Interv Ther. 2018;33(2):178-203.

While primary percutaneous coronary intervention (PCI) has significantly contributed to improve the mortality in patients with ST segment elevation myocardial infarction even in cardiogenic shock, primary PCI is a standard of care in most of Japanese institutions. Whereas there are high numbers of available facilities providing primary PCI in Japan, there are no clear guidelines focusing on procedural aspect of the standardized care. Whilst updated guidelines for the management of acute myocardial infarction were recently published by European Society of Cardiology, the following major changes are indicated; (1) radial access and drug-eluting stent over bare metal stent were recommended as Class I indication, and (2) complete revascularization before hospital discharge (either immediate or staged) is now considered as Class IIa recommendation. Although the primary PCI is consistently recommended in recent and previous guidelines, the device lag from Europe, the frequent usage of coronary imaging modalities in Japan, and the difference in available medical therapy or mechanical support may prevent direct application of European guidelines to Japanese population. The Task Force on Primary Percutaneous Coronary Intervention of the Japanese Association of Cardiovascular Intervention and Therapeutics (CVIT) has now proposed the expert consensus document for the management of acute myocardial infarction focusing on procedural aspect of primary PCI.

66. Spitzer E, McFadden E, Vranckx P, de Vries T, Ren B, Collet C, et al. Defining Staged Procedures for Percutaneous Coronary Intervention Trials: A Guidance Document. JACC Cardiovasc Interv. 2018;11(9):823-32.

Patients in coronary intervention trials may require more than 1 procedure to complete the intended revascularization strategy. However, these staged interventions are not consistently defined. Standardized definitions are needed to allow meaningful comparisons of this outcome among trials. This document provides guidance on relevant parameters involving staged procedures, including minimum data collection and consistent classification of coronary procedures initially identified as staged; the aim is to achieve consistency among clinical trialists, sponsors, health authorities, and regulators. Definitions were developed jointly among representatives of academic institutions and clinical research organizations based on clinical trial experience and published literature. Reasons for staged procedures were identified and include baseline kidney function, contrast load and radiation exposure, lesion complexity, and patient or operator fatigue. Moreover, nonclinical reasons include procedure scheduling and reimbursement. Management of staged procedures should be a standalone section in clinical trial protocols and clinical events committee charters. These documents should clearly define a time window for staged procedures that allows latitude for local policies, while respecting accepted clinical guidelines, and consistency with study objectives. Investigators should document in the case report form the intent to stage a procedure, the lesions to be treated, and the reasons for staging, preferably before randomization. Ideally, all reinterventions, or at least all procedures performed after the recommended time window, those in which data suggest an anticipated procedure due to a worsening condition and those where a revascularization is attempted in the target vessel, should be reviewed by an independent clinical events committee.

67. Brostow DP, Petrik ML, Starosta AJ, Waldo SW. Depression in patients with peripheral arterial disease: A systematic review. Eur J Cardiovasc Nurs. 2017;16(3):181-93.

OBJECTIVES: The association between cardiovascular disease and depression is well-established. Peripheral arterial disease arises from atherosclerosis like other cardiovascular disease, but unlike other cardiovascular disease, it impairs ambulation and lower extremity function. Given peripheral arterial disease's unique characteristics and underrepresentation in mental health research, we aimed to: (a) assess the prevalence of depression or depressive symptoms among peripheral arterial disease patients compared to coronary artery disease rates, (b) assess whether an independent association between peripheral arterial disease and depression exists, and (c) identify associated factors that may be targeted for intervention. DESIGN: This study was based on a systematic review. MATERIALS AND METHODS: Electronic databases were searched to identify studies that examined peripheral arterial disease and depression or depressive symptoms. Methodological quality was assessed using the Newcastle-Ottawa Scale. RESULTS: We identified 28 studies. Prevalence of depression or depressive symptoms ranged from 11-48% in 12 cross-sectional studies, and from 3-36% in 16 longitudinal studies, which is comparable to reported coronary artery disease rates. Depressed peripheral arterial disease patients were more likely to be female, African American, and have more severe peripheral arterial disease symptoms and more compromised physical function compared to non-depressed patients. There is evidence to suggest that depression exerts a negative influence on walking ability and physical function independently of peripheral arterial disease. CONCLUSIONS: There is a critical need to address depression in peripheral arterial disease patients, particularly those with characteristics that place them at increased risk. Vascular care providers appear to be the primary contact for assessing depressive symptoms, and once identified, integrated mental health providers may intervene to prevent the worsening of both depression and peripheral arterial disease.

68. Desborough MJ, Oakland K, Brierley C, Bennett S, Doree C, Trivella M, et al. Desmopressin use for minimising perioperative blood transfusion. Cochrane Database Syst Rev. 2017(7).

http://dx.doi.org/10.1002/14651858.CD001884.pub3

- Background Blood transfusion is administered during many types of surgery, but its efficacy and safety are increasingly questioned. Evaluation of the efficacy of agents, such as desmopressin (DDAVP; 1‐deamino‐8‐D‐arginine‐vasopressin), that may reduce perioperative blood loss is needed. Objectives To examine the evidence for the efficacy of DDAVP in reducing perioperative blood loss and the need for red cell transfusion in people who do not have inherited bleeding disorders. Search methods We searched for randomised controlled trials (RCTs) in the Cochrane Central Register of Controlled Trials (2017, issue 3) in the Cochrane Library, MEDLINE (from 1946), Embase (from 1974), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (from 1937), the Transfusion Evidence Library (from 1980), and ongoing trial databases (all searches to 3 April 2017). Selection criteria We included randomised controlled trials comparing DDAVP to placebo or an active comparator (e.g. tranexamic acid, aprotinin) before, during, or immediately after surgery or after invasive procedures in adults or children. Data collection and analysis We used the standard methodological procedures expected by Cochrane. Main results We identified 65 completed trials (3874 participants) and four ongoing trials. Of the 65 completed trials, 39 focused on adult cardiac surgery, three on paediatric cardiac surgery, 12 on orthopaedic surgery, two on plastic surgery, and two on vascular surgery; seven studies were conducted in surgery for other conditions. These trials were conducted between 1986 and 2016, and 11 were funded by pharmaceutical companies or by a party with a commercial interest in the outcome of the trial. The GRADE quality of evidence was very low to moderate across all outcomes. No trial reported quality of life. DDAVP versus placebo or no treatment Trial results showed considerable heterogeneity between surgical settings for total volume of red cells transfused ( low‐quality evidence ) and for total blood loss ( very low‐quality evidence ) due to large differences in baseline blood loss. Consequently, these outcomes were not pooled and were reported in subgroups. Compared with placebo, DDAVP may slightly decrease the total volume of red cells transfused in adult cardiac surgery (mean difference (MD) ‐0.52 units, 95% confidence interval (CI) ‐0.96 to ‐0.08 units; 14 trials, 957 participants), but may lead to little or no difference in orthopaedic surgery (MD ‐0.02, 95% CI ‐0.67 to 0.64 units; 6 trials, 303 participants), vascular surgery (MD 0.06, 95% CI ‐0.60 to 0.73 units; 2 trials, 135 participants), or hepatic surgery (MD ‐0.47, 95% CI ‐1.27 to 0.33 units; 1 trial, 59 participants). DDAVP probably leads to little or no difference in the total number of participants transfused with blood (risk ratio (RR) 0.96, 95% CI 0.86 to 1.06; 25 trials; 1806 participants) ( moderate‐quality evidence ). Whether DDAVP decreases total blood loss in adult cardiac surgery (MD ‐135.24 mL, 95% CI ‐210.80 mL to ‐59.68 mL; 22 trials, 1358 participants), orthopaedic surgery (MD ‐285.76 mL, 95% CI ‐514.99 mL to ‐56.53 mL; 5 trials, 241 participants), or vascular surgery (MD ‐582.00 mL, 95% CI ‐1264.07 mL to 100.07 mL; 1 trial, 44 participants) is uncertain because the quality of evidence is very low. DDAVP probably leads to little or no difference in all‐cause mortality (Peto odds ratio (pOR) 1.09, 95% CI 0.51 to 2.34; 22 trials, 1631 participants) or in thrombotic events (pOR 1.36, 95% CI, 0.85 to 2.16; 29 trials, 1984 participants) ( both low‐quality evidence ). DDAVP versus placebo or no treatment for people with platelet dysfunction Compared with placebo, DDAVP may lead to a reduction in the total volume of red cells transfused (MD ‐0.65 units, 95% CI ‐1.16 to ‐0.13 units; 6 trials, 388 participants) ( low‐quality evidence ) and in total blood loss (MD ‐253.93 mL, 95% CI ‐408.01 mL to ‐99.85 mL; 7 trials, 422 participants) ( low‐quality evidence ). DDAVP probably leads o little or no difference in the total number of participants receiving a red cell transfusion (RR 0.83, 95% CI 0.66 to 1.04; 5 trials, 258 participants) ( moderate‐quality evidence ). Whether DDAVP leads to a difference in all‐cause mortality (pOR 0.72, 95% CI 0.12 to 4.22; 7 trials; 422 participants) or in thrombotic events (pOR 1.58, 95% CI 0.60 to 4.17; 7 trials, 422 participants) is uncertain because the quality of evidence is very low . DDAVP versus tranexamic acid Compared with tranexamic acid, DDAVP may increase the volume of blood transfused (MD 0.6 units, 95% CI 0.09 to 1.11 units; 1 trial, 40 participants) and total blood loss (MD 142.81 mL, 95% CI 79.78 mL to 205.84 mL; 2 trials, 115 participants) ( both low‐quality evidence ). Whether DDAVP increases or decreases the total number of participants transfused with blood is uncertain because the quality of evidence is very low (RR 2.42, 95% CI 1.04 to 5.64; 3 trials, 135 participants). No trial reported all‐cause mortality. Whether DDAVP leads to a difference in thrombotic events is uncertain because the quality of evidence is very low (pOR 2.92, 95% CI 0.32 to 26.83; 2 trials, 115 participants). DDAVP versus aprotinin Compared with aprotinin, DDAVP probably increases the total number of participants transfused with blood (RR 2.41, 95% CI 1.45 to 4.02; 1 trial, 99 participants) ( moderate‐quality evidence ). No trials reported volume of blood transfused or total blood loss and the single trial that included mortality as an outcome reported no deaths. Whether DDAVP leads to a difference in thrombotic events is uncertain because the quality of evidence is very low (pOR 0.98, 95% CI 0.06 to 15.89; 2 trials, 152 participants). Authors' conclusions Most of the evidence derived by comparing DDAVP versus placebo was obtained in cardiac surgery, where DDAVP was administered after cardiopulmonary bypass. In adults undergoing cardiac surgery, the reduction in volume of red cells transfused and total blood loss was small and was unlikely to be clinically important. It is less clear whether DDAVP may be of benefit for children and for those undergoing non‐cardiac surgery. A key area for researchers is examining the effects of DDAVP for people with platelet dysfunction. Few trials have compared DDAVP versus tranexamic acid or aprotinin; consequently, we are uncertain of the relative efficacy of these interventions. Plain language summary Desmopressin use for reducing the need for blood transfusion for people having an operation Review question Could desmopressin (a medicine that can be used to prevent bleeding) reduce the need for blood transfusion when people have surgery? Background Blood loss is common during major surgery. Blood transfusions can replace blood that has been lost. Risks associated with blood transfusion include reactions against the blood, and – particularly in low‐ and middle‐income countries – infection. Desmopressin is a medicine commonly known as DDAVP (an abbreviation of its chemical name: 1‐deamino‐8‐D‐arginine vasopressin). It is used for people born with problems that put them at risk of bleeding, and may help people who do not have bleeding disorders. DDAVP may have side effects; for instance, it might increase risk of heart attack or stroke, or cause low blood pressure when it is given. Study characteristics We investigated whether giving DDAVP reduced the need for blood transfusion in people having surgery. We searched the medical literature to 3 April 2017. We identified 65 relevant trials with 3874 participants (adults and children). All trials assessed the effects of giving DDAVP before, during, or immediately after surgery or more minor procedures like biopsies. Most trials focused on adult heart surgery, or bone and joint surgery. Fewer trials focused on heart surgery for children, plastic surgery, surgery on blood vessels, or liver surgery. The trials were conducted between 1986 and 2016. Eleven were funded by pharmaceutical companies or by a party with a commercial interest in the trial’s outcome. Key results Compared with placebo (an inactive substance that looks the same as the substance being tested, i.e. DDAVP) or no treatment, DDAVP may slightly reduce the amount of blood transfused in adult heart surgery. DDAVP may lead to little or no difference in the amount of blood transfused in heart surgery for children, bone and joint surgery, surgery on major blood vessels, or liver surgery. DDAVP probably leads to little or no difference in the total number of people who receive a blood transfusion. Whether DDAVP increases or reduces total blood loss is uncertain because the quality of evidence is very low. DDAVP may lead to little or no difference in the risk of death, heart attack, or stroke. For people who are more vulnerable to bleeding because they are taking an antiplatelet medicine that stops their blood from clotting normally, DDAVP may lead to a reduction in the total volume of red cells transfused and in total blood loss. It probably leads to little or no difference in the number of people receiving a red cell transfusion. Whether DDAVP increases or reduces the risk of death, heart attack, or stroke is uncertain because the quality of evidence is very low. Compared with tranexamic acid (a medication used to treat or prevent excessive blood loss) DDAVP may be less effective in reducing the volume of blood transfused and total blood loss. Whether DDAVP increases or reduces the number of people who receive a blood transfusion, or risk of death, heart attack, or stroke is uncertain because the quality of evidence is very low. Compared with aprotinin (another medication used to reduce bleeding) DDAVP probably increases the number of people who receive a blood transfusion. Whether it increases or decreases the risk of a heart attack or stroke is uncertain because the quality of evidence is very low. No trials comparing DDAVP against aprotinin reported the volume of blood transfused, total blood loss, or risk of death. None of the 65 trials assessed quality of life. Quality of the evidence We rated the quality of evidence as very low to moderate for the outcomes above. We considered many of the trials to be at high risk of bias and noted inconsistency and imprecision in their results. Conclusion Overall, differences in transfusion and blood loss when people were treated with DDAVP or placebo were small and unlikely to be clinically important. It is possible that people who are more vulnerable to bleeding, such as those taking antiplatelet agents, may gain more benefit from DDAVP. Few trials compared DDAVP against tranexamic acid or aprotinin; consequently, we are uncertain whether DDAVP is better or worse than these agents.

69. Marsh N, Webster J, Mihala G, Rickard CM. Devices and dressings to secure peripheral venous catheters to prevent complications. Cochrane Database Syst Rev. 2015(6).

http://dx.doi.org/10.1002/14651858.CD011070.pub2

- Background A peripheral venous catheter (PVC) is typically used for short‐term delivery of intravascular fluids and medications. It is an essential element of modern medicine and the most frequent invasive procedure performed in hospitals. However, PVCs often fail before intravenous treatment is completed: this can occur because the device is not adequately attached to the skin, allowing the PVC to fall out, leading to complications such as phlebitis (irritation or inflammation to the vein wall), infiltration (fluid leaking into surrounding tissues) or occlusion (blockage). An inadequately secured PVC also increases the risk of catheter‐related bloodstream infection (CRBSI), as the pistoning action (moving back and forth in the vein) of the catheter can allow migration of organisms along the catheter and into the bloodstream. Despite the many dressings and securement devices available, the impact of different securement techniques for increasing PVC dwell time is still unclear; there is a need to provide guidance for clinicians by reviewing current studies systematically. Objectives To assess the effects of PVC dressings and securement devices on the incidence of PVC failure. Search methods We searched the following electronic databases to identify reports of relevant randomised controlled trials (RCTs): the Cochrane Wounds Group Register (searched 08 April 2015): The Cochrane Central Register of Controlled Trials (CENTRAL; 2015, Issue 3), Ovid MEDLINE (1946 to March 7 2015); Ovid MEDLINE (In‐Process & Other Non‐Indexed Citations, March 7 2015); Ovid EMBASE (1974 to March 7 2015); and EBSCO CINAHL (1982 to March 8 2015). Selection criteria RCTs or cluster RCTs comparing different dressings or securement devices for the stabilisation of PVCs. Cross‐over trials were ineligible for inclusion, unless data for the first treatment period could be obtained. Data collection and analysis Two review authors independently selected studies, assessed trial quality and extracted data. We contacted study authors for missing information. We used standard methodological procedures expected by Cochrane. Main results We included six RCTs (1539 participants) in this review. Trial sizes ranged from 50 to 703 participants. These six trials made four comparisons, namely: transparent dressings versus gauze; bordered transparent dressings versus a securement device; bordered transparent dressings versus tape; and transparent dressing versus sticking plaster. There is very low quality evidence of fewer catheter dislodgements or accidental removals with transparent dressings compared with gauze (two studies, 278 participants, RR 0.40; 95% CI 0.17 to 0.92, P = 0.03%). The relative effects of transparent dressings and gauze on phlebitis (RR 0.89; 95% CI 0.47 to 1.68) and infiltration (RR 0.80; 95% CI 0.48 to 1.33) are unclear. The relative effects on PVC failure of a bordered transparent dressing and a securement device have been assessed in only one small study and these were unclear. There was very low quality evidence from the same single study of less frequent dislodgement or accidental catheter removal with bordered transparent dressings than securement devices (RR 0.14, 95% CI 0.03 to 0.63) but more phlebitis with bordered dressings (RR 8.11, 95% CI 1.03 to 64.02) ( very low quality evidence ). A small single study compared bordered transparent dressings with tape and found very low quality evidence of more PVC failure with the bordered dressing (RR 1.84, 95% CI 1.08 to 3.11) but the relative effects on dislodgement were not clear ( very low quality evidence ). The relative effects of transparent dressings and a sticking plaster have only been compared in one small study and are unclear. More high quality RCTs are required to determine the relative effects of alternative PVC dressings and securement devices. Authors' conclusions It is not clear if any one dressing or securement device is better than any other in securing peripheral venous catheters. There is a need for further, independent high quality trials o evaluate the many traditional as well as the newer, high use products. Given the large cost differences between some different dressings and securement devices, future trials should include a robust cost‐effectiveness analysis. Plain language summary Effectiveness of dressings and other devices that are used to keep a peripheral venous catheter in place Background Most people admitted to an acute/emergency hospital ward require the insertion of a peripheral venous catheter/cannula (PVC), often known as a 'drip' or 'IV'. A PVC is a flexible, hollow, plastic tube that is inserted in a peripheral vein, most commonly in the hand, or lower arm. Up to half of all PVCs stop working before treatment has finished and a new one has to be inserted. This is uncomfortable for the patient and costly for the healthcare system. One of the reasons PVCs fail, is that the products used to hold them in place are not fully effective, and allow the PVC to move around. This movement causes redness, inflammation and even blood infections. The PVC can become blocked, or leak into the surrounding tissues, or even fall out as a consequence of the movement. The function of PVC dressings and/or securement devices is to keep the PVC in the vein, and to cover the insertion site so that it is kept dry and clean and protected from infection. Review question We reviewed the evidence about the effect that different PVC dressings and securement devices have on PVC failure rates. Study characteristics We searched the medical literature for studies that compared different types of products that are used to keep PVCs in place. We found six studies (involving 1539 participants) that compared four different ways of securing PVCs. These included: 1. a plain transparent film dressing compared with a gauze (woven fabric) dressing;  2. a bordered transparent dressing (clear transparent window with a reinforced fabric edge) compared with a securement device (that has anchor points or clips that hold the PVC in place over a strong adhesive base pad on the skin) that is used in conjunction with a transparent film dressing;  3. a bordered transparent dressing compared with non‐sterile medical tape;  4. a plain transparent film dressing compared with sticking plaster. The participants in the studies were both adults and children on medical and surgical wards. There were no studies based in emergency departments. Key results Two studies provided very low quality evidence that PVCs were less likely to fail when a transparent dressing was used rather than gauze. Other positive outcomes favouring one dressing over another were based on the results of very low quality, single studies. Overall there is a lack of high quality evidence and continued uncertainty regarding the best methods of securing a peripheral venous catheter remains. More high quality research is needed in this area. Quality of the evidence We assessed a number of quality indicators regarding the methods used in each study and graded the overall quality of studies as very low. Each study had a high or unclear risk of bias for some of the quality indicators. For example, it is likely that clinical staff responsible for assessing participants' outcomes knew the treatment group to which each person belonged, as the securement methods for PVCs looked different. There were only a limited number of studies available for consideration in this review, and they did not investigate some securement products that are in common use.

70. Koblizek V, Novotna B, Zbozinkova Z, Hejduk K. Diagnosing COPD: advances in training and practice - a systematic review. Adv Med Educ Pract. 2016;7:219-31.

Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung syndrome, caused by long-term inhalation of noxious gases and particles, which leads to gradual airflow limitation. All health care professionals who care for COPD patients should have full access to high-quality spirometry testing, as postbronchodilator spirometry constitutes the principal method of COPD diagnosis. One out of four smokers 45 years or older presenting respiratory symptoms in primary care, have non-fully reversible airflow limitation compatible with COPD and are mostly without a known diagnosis. Approximately 50.0%-98.3% of patients are undiagnosed worldwide. The majority of undiagnosed COPD patients are isolated at home, are in nursing or senior-assisted living facilities, or are present in oncology and cardiology clinics as patients with lung cancers and coronary artery disease. At this time, the prevalence and mortality of COPD subjects is increasing, rapidly among women who are more susceptible to risk factors. Since effective management strategies are currently available for all phenotypes of COPD, correctly performed and well-interpreted postbronchodilator spirometry is still an essential component of all approaches used. Simple educational training can substantially improve physicians' knowledge relating to COPD diagnosis. Similarly, a physician inhaler education program can improve attitudes toward inhaler teaching and facilitate its implementation in routine clinical practices. Spirometry combined with inhaled technique education improves the ability of predominantly nonrespiratory physicians to correctly diagnose COPD, to adequately assess its severity, and to increase the percentage of correct COPD treatment used in a real-life setting.

71. Albus C, Barkhausen J, Fleck E, Haasenritter J, Lindner O, Silber S. The Diagnosis of Chronic Coronary Heart Disease. Dtsch Arztebl Int. 2017;114(42):712-9.

BACKGROUND: Chronic coronary heart disease (CHD) and acute myocardial infarction are endemic conditions. In Germany, an estimated 900 000 cardiac catheterizations were performed in the year 2014, and a percutaneous intervention was carried out in 40% of these procedures. It would be desirable to lessen the number of invasive diagnostic procedures while preserving the reliability of diagnosis. In this article, we present the updated recommendations of the German National Care Guideline for Chronic CHD with regard to diagnostic evaluation. METHODS: Updated recommendations for the diagnostic evaluation of chronic CHD were developed on the basis of existing guidelines and a systematic literature review and approved by a formal consensus process. RESULTS: 8-11% of patients with chest pain who present to a general practitioner and 20-25% of those who present to a cardiologist have chronic CHD. General practitioners should estimate the probability of CHD with the Marburg Heart Score. Specialists can use detailed tables for determining the pre-test probability of CHD; if this lies in the range of 15% to 85%, then non-invasive tests should be primarily used for evaluation and treatment planning. If the pretest probability is less than 15%, other potential causes should be ruled out first. If it is over 85%, the presence of CHD should be presumed and treatment planning should be initiated. Coronary angiography is needed only if therapeutic implications are expected (revascularization). Psychosocial risk factors for the development and course of CHD and the patient's quality of life should be regularly assessed as well. CONCLUSION: Non-invasive testing and invasive coronary angiography should be used only if their findings are expected to have therapeutic implications. Psychosocial risk factors, the quality of life, and adherence to treatment are important components of these patients' diagnostic evaluation and long-term care.

72. Webner C. Discharging a Patient After a Percutaneous Coronary Intervention. Crit Care Nurse. 2018;38(3):80-1.

73. Luo ZC, Zhai L, Dai X. Does a Nurse-Led Program of Support and Lifestyle Management for patients with coronary artery disease significantly improve psychological outcomes among the patients?: A meta-analysis. Medicine (Baltimore). 2018;97(35):e12171.

BACKGROUND: Nowadays, secondary prevention of coronary heart disease (CHD) is commonly provided by nurse-coordinated prevention programs (NCPPs). NCPPs were recommended to be incorporated into the healthcare systems by the European Society of Cardiology (ESC) as stated in their 2012 European Guideline. Even if Nurse-Led Programs of Support and Lifestyle Management are beneficial to the patients with CHD, it is not clear whether these programs significantly improve psychological outcomes among the patients. Therefore, in this analysis, we aimed to systematically compare anxiety and depression reported among CHD patients who were assigned to a Nurse-Led Programs of Support and Lifestyle Management versus patients who were assigned to a normal usual care setting. METHODS: Online databases were searched for English publications assessing anxiety and depression in CHD patients who were assigned to a Nurse Interventional program versus patients who were assigned to a normal usual care setting. This analysis was carried out by RevMan software (version 5.3). For dichotomous data, odds ratios (ORs) and 95% confidence intervals (CIs) were generated whereas for continuous data, weight mean difference (WMDs) and 95% CIs were calculated. RESULTS: A total number of 3110 patients were analyzed (1526 participants were assigned to the Nurse Interventional group whereas 1584 participants were assigned to the normal usual care group). Patients' enrollment time period varied from the year 2008 to the year 2015. Results of this analysis showed that depression among participants who were assigned to a Nurse-Led Program of Support and Lifestyle Management was not significantly different (OR: 0.90, 95% CI: 0.68-1.20; P = .47) compared to participants who were assigned to the normal usual care setting. When continuous data were used, still no significant difference was observed (WMD: -0.83, 95% CI: -1.68-0.02; P = .06). A similar result was obtained even when anxiety was assessed (WMD: -1.38, 95% CI: -3.21-0.45; P = .14). CONCLUSIONS: The current analysis did not show any significant improvement in reduction of depression and anxiety among CHD patients who were assigned to a Nurse-Led Program of Support and Lifestyle Management versus those patients who were assigned to a normal usual care setting. Therefore, according to this analysis, even if a Nurse-Led Program of Support and Lifestyle Management might be clinically effective, it does not improve mental well-being in these patients with CHD.

74. Gyberg V, Kotseva K, Dallongeville J, Backer GD, Mellbin L, Rydén L, et al. Does pharmacologic treatment in patients with established coronary artery disease and diabetes fulfil guideline recommended targets? A report from the EUROASPIRE III cross-sectional study. Eur J Prev Cardiol. 2015;22(6):753-61.

PURPOSE: The aim was to investigate the use of cardioprotective drug therapies (aspirin or other antiplatelet agents, β-blockade, renin-angiotensin-aldosterone-system-blockade (RAAS-blockade) and statins) and treatment targets achieved in a large cohort of patients with established coronary artery disease and diabetes across Europe. METHODS AND RESULTS: EUROASPIRE III is an observational cross-sectional study of stable coronary artery disease patients aged 18-80 years from 76 centres in 22 European countries conducted in 2006-2007. The glycaemic status (prevalent, incident or no diabetes), the guideline treatment targets achieved and the use of pharmacotherapies were assessed at one visit 6-36 months after the index event. Of all 6588 patients investigated (women 25%), 4295 (65%) had no diabetes, 752 (11%) had incident diabetes and 1541 (23%) had prevalent diabetes. All four drugs were used in 44% of the patients with no diabetes, 51% with incident diabetes and 50% with prevalent diabetes respectively. Individual prescriptions for patients with no, incident and prevalent diabetes were respectively: aspirin or other antiplatelet agents 91, 93, and 91%; β-blockers: 81, 84, and 79%; RAAS-blockers: 77, 76, and 68%; statins: 80, 80, and 79%. The proportion of patients with coronary artery disease and prevalent diabetes reaching the treatment targets were 20% for blood pressure, 53% for low density lipoprotein cholesterol (LDL-cholesterol) and 22% for haemoglobin A1c (HbA1c). CONCLUSION: This European study demonstrates a low use of cardioprotective drug therapies among patients with a combination of coronary artery disease and diabetes, which will be contributing to the poor achievement of risk factor treatment targets for cardiovascular prevention.

75. McGraw S, Mirza O, Bauml MA, Rangarajan VS, Farzaneh-Far A. Downstream clinical consequences of stress cardiovascular magnetic resonance based on appropriate use criteria. J Cardiovasc Magn Reson. 2015;17(1):35.

BACKGROUND: Appropriate use criteria (AUC) have been developed by professional organizations as a response to the rising costs of imaging, with the goal of optimizing test-patient selection. Consequently, the AUC are now increasingly used by third-party-payers to assess reimbursement. However, these criteria were created by expert consensus and have not been systematically assessed for CMR. The aim of this study was to determine the rates of abnormal stress-CMR and subsequent downstream utilization of angiography and revascularization procedures based on the most recent AUC. METHODS: 300 consecutive patients referred for CMR-stress testing were prospectively enrolled. Two cardiologists reviewed all clinical information before the CMR-stress test and classified the test as "appropriate', "maybe appropriate" or "rarely appropriate" according to the 2013 AUC. Patients were followed for 2 months for the primary outcomes of coronary angiography and/or revascularization. RESULTS: 49.7% of stress CMRs were appropriate, 36.7% maybe appropriate, and 13.6% rarely appropriate. Ischemia was significantly more likely to be seen in the appropriate (18.8%) or maybe appropriate groups (21.8%) than the rarely appropriate group (4.8%) (p = 0.030 and p = 0.014 respectively). Referral for cardiac catheterization was not significantly different in the appropriate (10.1%) and maybe appropriate groups (10.0%) compared to the rarely appropriate group (2.4%) (p = 0.119 and p = 0.127 respectively). No patients undergoing catheterization in the rarely appropriate group went on to require revascularization, in contrast to 53.3% of the appropriate vs 36.4% of the maybe appropriate patients (p = 0.391). Presence of ischemia led to referral for cardiac catheterization in 50.0% of the appropriate group vs 33.3% of the maybe appropriate group (p = 0.225); in contrast to none of the rarely appropriate group. CONCLUSIONS: The great majority of tests were classified as appropriate or maybe appropriate. Downstream cardiac catheterization rates were similar in all 3 groups. However, rarely appropriate studies never required revascularization, suggesting suboptimal resource utilization. Studies classified as maybe appropriate had similar rates of abnormal findings and led to similar rates of downstream catheterization and revascularization as those that were deemed appropriate. This suggests that consideration could be given to upgrading some of the common maybe appropriate indications to the appropriate category.

76. Kayssi A, Al‐Jundi W, Papia G, Kucey DS, Forbes T, Rajan DK, et al. Drug‐eluting balloon angioplasty versus uncoated balloon angioplasty for the treatment of in‐stent restenosis of the femoropopliteal arteries. Cochrane Database Syst Rev. 2019(1).

http://dx.doi.org/10.1002/14651858.CD012510.pub2

- Background Stents are placed in the femoropopliteal arteries for numerous reasons, such as atherosclerotic disease, the need for dissection, and perforation of the arteries, and can become stenosed with the passage of time. When a stent develops a flow‐limiting stenosis, this process is known as "in‐stent stenosis." It is thought that in‐stent restenosis is caused by a process known as "intimal hyperplasia" rather than by the progression of atherosclerotic disease. Management of in‐stent restenosis may include performing balloon angioplasty, deploying another stent within the stenosed stent to force it open, and creating a bypass to deliver blood around the stent. The role of drug‐eluting technologies, such as drug‐eluting balloons (DEBs), in the management of in‐stent restenosis is unclear. Drug‐eluting balloons might function by coating the inside of stenosed stents with cytotoxic chemicals such as paclitaxel and by inhibiting the hyperplastic processes responsible for in‐stent restenosis. It is important to perform this systematic review to evaluate the efficacy of DEB because of the potential for increased expenses associated with DEBs over uncoated balloon angioplasty, also known as plain old balloon angioplasty (POBA). Objectives To assess the safety and efficacy of DEBs compared with uncoated balloon angioplasty in people with in‐stent restenosis of the femoropopliteal arteries as assessed by criteria such as amputation‐free survival, vessel patency, target lesion revascularization, binary restenosis rate, and death. We define "in‐stent restenosis" as 50% or greater narrowing of a previously stented vessel by duplex ultrasound or angiography. Search methods The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, Embase, and CINAHL databases and the World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov trials registers to November 28, 2017. Review authors also undertook reference checking to identify additional studies. Selection criteria We included all randomized controlled trials that compared DEBs versus uncoated balloon angioplasty for treatment of in‐stent restenosis in the femoropopliteal arteries. Data collection and analysis Two review authors (AK, WA) independently selected appropriate trials and performed data extraction, assessment of trial quality, and data analysis. The senior review author (AD) adjudicated any disagreements. Main results Three trials that randomized a combined total of 263 participants met the review inclusion criteria. All three trials examined the treatment of symptomatic in‐stent restenosis within the femoropopliteal arteries. These trials were carried out in Germany and Austria and used paclitaxel as the agent in the drug‐eluting balloons. Two of the three trials were industry sponsored. Two companies manufactured the drug‐eluting balloons (Eurocor, Bonn, Germany; Medtronic, Fridley, Minnesota, USA). The trials examined both anatomical and clinical endpoints. We noted heterogeneity in the frequency of bailout stenting deployment between studies as well as in the dosage of paclitaxel applied by the DEBs. Using GRADE assessment criteria, we determined that the certainty of evidence presented was very low for the outcomes of amputation, target lesion revascularization, binary restenosis, death, and improvement of one or more Rutherford categories. Most participants were followed up to 12 months, but one trial followed participants for up to 24 months. Trial results show no difference in the incidence of amputation between DEBs and uncoated balloon angioplasty. DEBs showed better outcomes for up to 24 months for target lesion revascularization (odds ratio (OR) 0.05, 95% confidence Interval (CI) 0.00 to 0.92 at six months; OR 0.24, 95% CI 0.08 to 0.70 at 24 months) and at six and 12 months for binary restenosis (OR 0.28, 95% CI 0.14 to 0.56 at six months; OR 0.34, 95% CI 0.15 to 0.76 at 12 months). Participants treated with DEBs also howed improvement of one or more Rutherford categories at six and 12 months (OR 1.81, 95% CI 1.02 to 3.21 at six months; OR 2.08, 95% CI 1.13 to 3.83 at 12 months). Data show no clear differences in death between DEBs and uncoated balloon angioplasty. Data were insufficient for subgroup or sensitivity analyses to be conducted. Authors' conclusions Based on a meta‐analysis of three trials with 263 participants, evidence suggests an advantage for DEBs compared with uncoated balloon angioplasty for anatomical endpoints such as target lesion revascularization (TLR) and binary restenosis, and for one clinical endpoint ‐ improvement in Rutherford category post intervention for up to 24 months. However, the certainty of evidence for all these outcomes is very low due to the small number of included studies and participants and the high risk of bias in study design. Adequately powered and carefully constructed randomized controlled trials are needed to adequately investigate the role of drug‐eluting technologies in the management of in‐stent restenosis. Plain language summary Drug‐eluting balloon angioplasty versus uncoated balloon angioplasty for stenosis of stents in lower limb arteries Background   Many people have disease in their leg arteries that may develop into a blockage and lead to loss of circulation and subsequent pain, skin ulcers, and amputation of the leg. In an effort to prevent lack of blood from harming the leg, procedures can be performed to bypass the blocked artery using a vein or an artificial graft, or to cross it with a wire and open it with a balloon, then place a stent to help prevent the blockage from happening again. Although stents are very strong and can last a long time, it is possible that a stent inside an artery might at times become narrower, and eventually can become blocked. This process is known as "in‐stent restenosis." A blocked stent can be treated in several ways, such as sucking out the clot or ballooning it, or placing another stent inside the stent that failed. Although all treatment options offer advantages and disadvantages, there have been advancements in the technologies available to treat this problem. One of these advancements requires covering the balloon used to treat the stent blockage with a cytotoxic drug used in chemotherapy, to slow down the blockage process after the stent is treated. Such specially prepared balloons, known as "drug‐eluting balloons," have shown encouraging results for treating patients with artery disease in the leg. Review question   The goal of this review was to determine how drug‐eluting balloon (DEB) angioplasty compares with traditional uncoated balloon angioplasty, also known as plain old balloon angioplasty (POBA), for the treatment of in‐stent restenosis in stents placed in leg arteries. Study characteristics   Our review included three clinical trials that randomized 263 participants (most recent search ‐ November 28, 2017). Trials included leg arteries at and above the knee and were carried out in Europe; all used DEBs that contained the chemical known as "paclitaxel." Two companies manufactured the DEBs: Eurocor and Medtronic. Most study participants were followed for six or more months; this is called "follow‐up." Key results   Results showed that DEBs were not better for participants than uncoated balloon angioplasty with regard to the need for amputation. At 24 months of follow‐up, DEBs were associated with fewer target lesion revascularizations, which refers to the need to perform a procedure on a stent that had already been treated with a DEB or an uncoated balloon angioplasty for in‐stent restenosis. DEBs were also found to have better binary restenosis rates, which refers to the percentage of treated stents that develop new stenosis after they have been treated with a DEB or an uncoated balloon angioplasty. Finally, more people who were treated with DEBs described improvement in their leg symptoms, as measured by a change in their Rutherford category. DEBs were not found to be better for participants han uncoated balloon angioplasty with regard to patient death. Certainty of the evidence   The certainty of the evidence presented was very low because we identified only three studies with small numbers of participants, and because many participants in those studies were lost to follow‐up. Furthermore, risk of performance and attrition bias was significant, as was risk of other biases, due to lack of accounting for the type of stent treated and the need for bailout stenting.

77. Karmali KN, Lloyd-Jones DM, Berendsen MA, Goff DC, Jr., Sanghavi DM, Brown NC, et al. Drugs for Primary Prevention of Atherosclerotic Cardiovascular Disease: An Overview of Systematic Reviews. JAMA Cardiol. 2016;1(3):341-9.

IMPORTANCE: The Million Hearts initiative emphasizes ABCS (aspirin for high-risk patients, blood pressure [BP] control, cholesterol level management, and smoking cessation). Evidence of the effects of drugs used to achieve ABCS has not been synthesized comprehensively in the prevention of primary atherosclerotic cardiovascular disease (ASCVD). OBJECTIVE: To compare the efficacy and safety of aspirin, BP-lowering therapy, statins, and tobacco cessation drugs for fatal and nonfatal ASCVD outcomes in primary ASCVD prevention. EVIDENCE REVIEW: Structured search of the Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects (DARE), Health Technology Assessment Database (HTA), MEDLINE, EMBASE, and PROSPERO International Prospective Systematic Review Trial Register to identify systematic reviews published from January 1, 2005, to June 17, 2015, that reported the effect of aspirin, BP-lowering therapy, statin, or tobacco cessation drugs on ASCVD events in individuals without prevalent ASCVD. Additional studies were identified by searching the reference lists of included systematic reviews, meta-analyses, and health technology assessment reports. Reviews were selected according to predefined criteria and appraised for methodologic quality using the Assessment of Multiple Systematic Reviews (AMSTAR) tool (range, 0-11). Studies were independently reviewed for key participant and intervention characteristics. Outcomes that were meta-analyzed in each included review were extracted. Qualitative synthesis was performed, and data were analyzed from July 2 to August 13, 2015. FINDINGS: From a total of 1967 reports, 35 systematic reviews of randomized clinical trials were identified, including 15 reviews of aspirin, 4 reviews of BP-lowering therapy, 12 reviews of statins, and 4 reviews of tobacco cessation drugs. Methodologic quality varied, but 30 reviews had AMSTAR ratings of 5 or higher. Compared with placebo, aspirin (relative risk [RR], 0.90; 95% CI, 0.85-0.96) and statins (RR, 0.75; 95% CI, 0.70-0.81) reduced the risk for ASCVD. Compared with placebo, BP-lowering therapy reduced the risk for coronary heart disease (RR, 0.84; 95% CI, 0.79-0.90) and stroke (RR, 0.64; 95% CI, 0.56-0.73). Tobacco cessation drugs increased the odds of continued abstinence at 6 months (odds ratio range, 1.82 [95% CI, 1.60-2.06] to 2.88 [95% CI, 2.40-3.47]), but the direct effects on ASCVD were poorly reported. Aspirin increased the risk for major bleeding (RR, 1.54; 95% CI, 1.30-1.82), and statins did not increase overall risk for adverse effects (RR, 1.00; 95% CI, 0.97-1.03). Adverse effects of BP-lowering therapy and tobacco cessation drugs were poorly reported. CONCLUSIONS AND RELEVANCE: This overview demonstrates high-quality evidence to support aspirin, BP-lowering therapy, and statins for primary ASCVD prevention and tobacco cessation drugs for smoking cessation. Treatment effects of each drug can be used to enrich discussions between health care professionals and patients in primary ASCVD prevention.

78. Abdelnoor M, Andersen JG, Arnesen H, Johansen O. Early discharge compared with ordinary discharge after percutaneous coronary intervention - a systematic review and meta-analysis of safety and cost. Vasc Health Risk Manag. 2017;13:101-9.

AIM: We aimed to summarize the pooled effect of early discharge compared with ordinary discharge after percutaneous coronary intervention (PCI) on the composite endpoint of re-infarction, revascularization, stroke, death, and incidence of rehospitalization. We also aimed to compare costs for the two strategies. METHODS: The study was a systematic review and a meta-analysis of 12 randomized controlled trials including 2962 patients, followed by trial sequential analysis. An estimation of cost was considered. Follow-up time was 30 days. RESULTS: For early discharge, pooled effect for the composite endpoint was relative risk of efficacy (RRe)=0.65, 95% confidence interval (CI) (0.52-0.81). Rehospitalization had a pooled effect of RRe=1.10, 95% CI (0.88-1.38). Early discharge had an increasing risk of rehospitalization with increasing frequency of hypertension for all populations, except those with stable angina, where a decreasing risk was noted. Advancing age gave increased risk of revascularization. Early discharge had a cost reduction of 655 Euros per patient compared with ordinary discharge. CONCLUSION: The pooled effect supports the safe use of early discharge after PCI in the treatment of a heterogeneous population of patients with coronary artery disease. There was an increased risk of rehospitalization for all subpopulations, except patients with stable angina. Clinical trials with homogeneous populations of acute coronary syndrome are needed to be conclusive on this issue.

79. Ma W, Liang Y, Zhu J. Early Invasive Versus Initially Conservative Strategy in Elderly Patients Older Than 75 Years with Non-ST-Elevation Acute Coronary Syndrome: A Meta-Analysis. Heart Lung Circ. 2018;27(5):611-20.

BACKGROUND: Fear of complications related to the procedure and unclear benefits in elderly patients are common reasons for invasive angiography being withheld. METHODS: We searched PubMed and Embase from inception until February 2016 for studies that enrolled individuals older than 75 years with non-ST-elevation acute coronary syndrome (NSTE-ACS) and allocated patients to either an invasive or conservative strategy. RESULTS: Thirteen studies (four randomised controlled trials (RCTs) and nine observational studies) enrolling 832,007 elderly NSTE-ACS patients were analysed. Compared with the conservative treatment, the early invasive approach does significantly reduce the risk of death at follow-up from 6 months to 5 years (risk ratio [RR] 0.65, 95% confidence interval [CI] 0.59-0.73, p<0.001); the definite benefit was mainly observed in observational studies (RR 0.63, 95% CI 0.57-0.70, p<0.001), and the risk of death also showed a strong trend toward reduction with invasive approach (RR 0.82, 95% CI 0.64-1.05, p=0.119) in RCTs. For the outcome of bleeding complications, there was a higher risk of any bleeding occurring in-hospital (RR 2.51, 95% CI 1.53-4.11, p<0.001) in patients treated with invasive strategy than those treated with conservative strategy. However, no difference of in-hospital major bleeding (RR 1.78, 95% CI 0.31-10.13, p=0.514) was observed between the two strategies. CONCLUSION: Elderly patients with NSTE-ACS might benefit from an early invasive strategy but with increasing risk of any bleeding complications. More RCTs are needed to assess early invasive strategies in the elderly.

80. Gordon A, Greenhalgh M, McGuire W. Early planned removal versus expectant management of peripherally inserted central catheters to prevent infection in newborn infants. Cochrane Database Syst Rev. 2018(6).

http://dx.doi.org/10.1002/14651858.CD012141.pub2

- Background Duration of use may be a modifiable risk factor for central venous catheter‐associated bloodstream infection in newborn infants. Early planned removal of peripherally inserted central catheters (PICCs) is recommended as a strategy to reduce the incidence of infection and its associated morbidity and mortality. Objectives To determine the effectiveness of early planned removal of PICCs (up to two weeks after insertion) compared to an expectant approach or a longer fixed duration in preventing bloodstream infection and other complications in newborn infants. Search methods We searched of the Cochrane Central Register of Controlled Trials (CENTRAL; 2018, Issue 4), Ovid MEDLINE, Embase, Maternity & Infant Care Database, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (until April 2018), and conference proceedings and previous reviews. Selection criteria Randomised and quasi‐randomised controlled trials that assessed the effect of early planned removal of peripherally inserted central catheters (PICCs) (up to two weeks after insertion) compared to an expectant management approach or a longer fixed duration in preventing bloodstream infection and other complications in newborn infants. Data collection and analysis Two review authors assessed trial eligibility independently. We planned to analyse any treatment effects in the individual trials and report the risk ratio and risk difference for dichotomous data and mean difference for continuous data, with respective 95% confidence intervals. We planned to use a fixed‐effect model in meta‐analyses and explore potential causes of heterogeneity in sensitivity analyses. We planned to assess the quality of evidence for the main comparison at the outcome level using "Grading of Recommendations Assessment, Development and Evaluation" (GRADE) methods. Main results We did not identify any eligible randomised controlled trials. Authors' conclusions There are no trial data to guide practice regarding early planned removal versus expectant management of PICCs in newborn infants. A simple and pragmatic randomised controlled trial is needed to resolve the uncertainty about optimal management in this common and important clinical dilemma. Plain language summary Early planned removal versus expectant management of peripherally inserted central catheters to prevent infection in newborn infants Review question   In newborn infants with a peripherally inserted central catheter in place, does early removal of the catheter reduce the risk of complications, including infection? Background   Infection in the bloodstream is a frequent and harmful complication for newborn infants who have a peripherally inserted central catheter (a long, narrow, soft and flexible plastic tube inserted through the skin into a vein and advanced several centimetres into the infant's large blood vessels; used as a stable route to deliver drugs and nutrition). Bloodstream infection may cause death and disability. One potential method of reducing the risk of this and other serious complications is to remove the catheter within about two weeks after insertion rather than leaving it for longer until no longer required. Study characteristics/key results   We did not find any randomised controlled trials that assessed whether removing peripherally inserted central catheters within two weeks prevents infection or other complications in newborn infants. Conclusions   There are no trial data available to help clinicians to address this common clinical dilemma. Due to the potential for benefit and harm, such a trial may be warranted.

81. Lu H, Guan W, Zhou Y, Bao H. Early versus late clinical outcomes following same day discharge after elective percutaneous coronary intervention: A systematic review and meta-analysis. Medicine (Baltimore). 2019;98(1):e14025.

BACKGROUND: Nowadays 57% of the cardiologists based in the United Kingdom and 32% of the cardiologists based in Canada utilize same day discharge (SDD) following elective percutaneous coronary intervention (PCI) as a routine practice. In this analysis, we aimed to systematically assess early versus late clinical outcomes following SDD after elective PCI. METHODS: The Medical Literature Analysis and Retrieval System Online, the Cochrane Central, the Resources from the United States National Library of Medicine (www.ClinicalTrials.gov: http://www.clinicaltrials.gov) and EMBASE were carefully searched for relevant English publications which reported early versus late clinical outcomes in patients who were discharged on the same day following revascularization by PCI. Relevant clinical outcomes which were reported in the original studies were considered as the endpoints in this analysis. Odd ratios (OR) and 95% confidence intervals (CI) were used to represent the data, and RevMan 5.3 was used as the statistical software. RESULTS: A total number of 21, 687 participants (enrollment time period from the year 1998 to the year 2015) were assigned to this analysis. When early versus late clinical outcomes were compared in patients who were discharged on the same day following elective PCI, major adverse cardiac events (OR: 0.75, 95% CI: 0.31-1.79; P = .51), mortality (OR: 0.26, 95% CI: 0.06-1.06; P = .06), stroke (OR: 1.46, 95% CI: 0.72-2.94; P = .29), arrhythmia (OR: 1.30, 95% CI: 0.64-2.63; P = .47), hematoma (OR: 1.00, 95% CI: 0.60-1.66; P = 1.00) and major bleeding from access site (OR: 1.68, 95% CI: 0.22-12.85; P = .62) were not significantly different. Post-procedural myocardial infarction (OR: 2.01, 95% CI: 0.71-5.70; P = .19) and minor bleeding from access site (OR: 6.61, 95% CI: 0.86-50.66; P = .07) were also similarly manifested. However, re-hospitalization was significantly higher in those patients with late clinical outcomes (OR: 0.18, 95% CI: 0.07-0.44; P = .0002). CONCLUSIONS: In those patients who were discharged from the hospital on the same day following elective PCI, no significant difference was observed in the assessed early versus late clinical outcomes. However, late clinical outcomes resulted in a significantly higher rate of re-hospitalization. Larger studies should confirm this hypothesis.

82. Francis T, Kabboul N, Rac V, Mitsakakis N, Pechlivanoglou P, Bielecki J, et al. The Effect of Cardiac Rehabilitation on Health-Related Quality of Life in Patients With Coronary Artery Disease: A Meta-analysis. Can J Cardiol. 2019;35(3):352-64.

BACKGROUND: The clinical effectiveness of cardiac rehabilitation (CR) on health-related quality of life (HRQOL) is an area that has not been consistently explored. The objective of this systematic review was to evaluate the effectiveness of providing any core component of CR on HRQOL domains. METHODS: We performed a meta-analysis and meta-regression of randomized controlled trials (RCTs) on the core components of CR. RCTs included adult patients with diagnosed coronary artery disease via angiography, myocardial infarction, angina, or who had undergone coronary revascularization. The Cochrane Library, MEDLINE, EMBASE, CINAHL, SCI-EXPANDED, Psych INFO, and Web of Science were searched from inception to April 27, 2017. Outcomes included overall, physical, emotional, and social HRQOL. Outcomes were reported as standardized mean change (SMC) with 95% confidence intervals (CIs). Effect size changes of 0.2, 0.5, and 0.8 SD units reflect a small, moderate, and large effect, respectively. RESULTS: Forty-nine reports of 41 RCTs with 11,747 patients were included. Summary effect sizes were: overall HRQOL SMC, 0.28 (95% CI, 0.05-0.50), physical HRQOL SMC, 0.47 (95% CI, 0.13-0.81), emotional HRQOL SMC, 0.37 (95% CI, -0.02 to 0.77), and social HRQOL SMC, 0.13 (95% CI, -0.06 to 0.32). Meta-regression revealed type of CR intervention and year of publication as positive statistically significant treatment effect modifiers. CONCLUSIONS: Receiving CR was shown to improve HRQOL, with exercise-, nonexercise-, and psychological-based interventions playing a vital role. Although these improvements in HRQOL were modest they still reflect an incremental benefit compared with receiving usual care.

83. Mengesha HG, Weldearegawi B, Petrucka P, Bekele T, Otieno MG, Hailu A. Effect of ivabradine on cardiovascular outcomes in patients with stable angina: meta-analysis of randomized clinical trials. BMC Cardiovasc Disord. 2017;17(1):105.

BACKGROUND: Although there are established drugs for treatment of cardiovascular diseases, due to adverse effects these drugs may not be clinically applicable to all patients. Recent trends have seen the emergence of drugs which act on funny current channels to induce selective heart rate reduction. Ivabradine is one such drug developed for coronary artery disease and heart failure. There is inconsistent evidence about the effect of this selective inhibitor in reduction of cardiovascular related mortality and morbidity. Such an inconsistency warrants the need for a meta-analysis to consider the effectiveness and efficacy of Ivabradine in the treatment of coronary artery disease and heart failure. METHODS: Randomized controlled trials with a minimum follow-up period of one year were searched in Pub Med/Medline, Embase, Cochrane Central Register of Controlled Trials published between 1980 and 2016.Each eligible study was assessed for risk of bias by using the Cochrane Risk of Bias Assessment tool. The outcomes assessed in this study included: all cause mortality, cardiovascular-related mortality, hospitalization for new or worsening heart failure, and adverse events. Subgroup analysis and publication bias were assessed. We used Mantel-Haenszel method for random-effects. Analysis was done using RevMan5.1™.This study was registered in PROSPERO as [PROSPERO 2016:CRD42016035597]. RESULT: Three trials with a total of 36,577 participants met the meta-analysis criteria. Pooled analysis showed that ivabradine is not effective in reducing cardiovascular deaths (OR: 1.02; CI:0.91-1.15,P = 0.74), all-cause mortality (OR:1.00; CI:0.91-1.10,P = 0.98), coronary revascularization (OR: 0.93, CI: 0.77-1.11, P = 0.41) and hospital admission for worsening of heart failure (OR: 0.94, CI: 0.71-1.25, P = 0.69). However, the drug was found to significantly increase adverse events: phosphenes (OR:7.77, CI: 4.4-14.6,P < 0.00001), blurred vision (OR:3.07,CI:2.18-4.32,P < 0.00001), symptomatic bradycardia (OR: 6.23, CI: 4.2-9.26, P < 0.00001), and atrial fibrillation (OR: 1.35, CI: 1.19-1.53, P < 0.0001). Subgroup analysis by duration of follow up on cardiovascular outcomes found that there is no difference in effect of ivabradine depending on the duration of follow up. There was no publication bias in reporting of included studies. CONCLUSION: This meta-analysis suggests that ivabradine is not effective in reducing cardiovascular-related morbidity and mortality unless used for specific conditions. On the contrary, the use of this drug was strongly associated with the onset of untoward and new adverse events. This finding strongly supports previous findings and further informs the rational and evidence-informed clinical use of ivabradine.

84. Driscoll A, Grant MJ, Carroll D, Dalton S, Deaton C, Jones I, et al. The effect of nurse-to-patient ratios on nurse-sensitive patient outcomes in acute specialist units: a systematic review and meta-analysis. Eur J Cardiovasc Nurs. 2018;17(1):6-22.

BACKGROUND: Nurses are pivotal in the provision of high quality care in acute hospitals. However, the optimal dosing of the number of nurses caring for patients remains elusive. In light of this, an updated review of the evidence on the effect of nurse staffing levels on patient outcomes is required. AIM: To undertake a systematic review and meta-analysis examining the association between nurse staffing levels and nurse-sensitive patient outcomes in acute specialist units. METHODS: Nine electronic databases were searched for English articles published between 2006 and 2017. The primary outcomes were nurse-sensitive patient outcomes. RESULTS: Of 3429 unique articles identified, 35 met the inclusion criteria. All were cross-sectional and the majority utilised large administrative databases. Higher staffing levels were associated with reduced mortality, medication errors, ulcers, restraint use, infections, pneumonia, higher aspirin use and a greater number of patients receiving percutaneous coronary intervention within 90 minutes. A meta-analysis involving 175,755 patients, from six studies, admitted to the intensive care unit and/or cardiac/cardiothoracic units showed that a higher nurse staffing level decreased the risk of inhospital mortality by 14% (0.86, 95% confidence interval 0.79-0.94). However, the meta-analysis also showed high heterogeneity (I(2)=86%). CONCLUSION: Nurse-to-patient ratios influence many patient outcomes, most markedly inhospital mortality. More studies need to be conducted on the association of nurse-to-patient ratios with nurse-sensitive patient outcomes to offset the paucity and weaknesses of research in this area. This would provide further evidence for recommendations of optimal nurse-to-patient ratios in acute specialist units.

85. Qin S, Gu Y, Song T. Effect of peer support on patient anxiety during the coronary angiography or percutaneous coronary intervention perioperative period: a protocol for a systematic review and meta-analysis of randomised controlled trials. BMJ Open. 2020;10(3):e031952.

INTRODUCTION: The purpose of this study is to investigate the effect of peer support on patient anxiety during the perioperative period of coronary angiography or percutaneous coronary intervention (PCI). METHODS AND ANALYSIS: We will search the following databases (PubMed, Web of Science, EMBASE, Cochrane Library, CINAHL, Clinicaltrials.gov, WHO International Clinical Trials Registry Platform, Google Scholar, Chinese National Knowledge Infrastructure, Chinese Science and Technology Periodicals Database, Chinese BioMedical Database and Wanfang Data) from the date of database inception to January 2019. Only randomised controlled trials will be included. For the data analysis, we will use RevMan V.5.3.5 software to evaluate the risk of bias, and the heterogeneity will be investigated using the Q statistic and P index. Additionally, the Grading of Recommendations Assessment, Development and Evaluation system will be used to assess the quality of evidence. ETHICS AND DISSEMINATION: No ethics approval will be required since this is a systematic review of published studies. We aim to report information regarding the effects of peer support on patient anxiety during the perioperative period of coronary angiography or PCI. This systematic review and meta-analysis will be submitted to a peer-reviewed journal for publication. PROSPERO REGISTRATION NUMBER: CRD42019123290.

86. Curtis E, Fernandez R, Lee A. The effect of topical medications on radial artery spasm in patients undergoing transradial coronary procedures: a systematic review. JBI Database System Rev Implement Rep. 2018;16(3):738-51.

OBJECTIVE: The objective of this review was to identify the effectiveness of topical medications on radial artery spasm (RAS) in patients undergoing transradial percutaneous coronary procedures. INTRODUCTION: Percutaneous coronary procedures were traditionally carried out via the femoral artery; however, over the last 20 years there has been a global increase in the number of proceduralists carrying out percutaneous coronary procedures via the transradial approach. Radial artery spasm remains an issue for the transradial approach, potentially leading to procedural failure. Topical medications have been suggested to reduce the occurrence of RAS during transradial percutaneous coronary procedures. INCLUSION CRITERIA: This review considered papers that included participants aged 18 years and over undergoing non-emergency transradial percutaneous coronary procedures. This review considered papers on the utilization of topical medications prior to commencing the transradial approach for percutaneous coronary procedures to reduce RAS. Topical medications were compared to other medications. The primary outcome was the incidence of RAS as assessed by angiography or ultrasound or resistance felt by the operator while manipulating the catheter. Other outcomes of interest included change in radial artery diameter, measured by angiography or ultrasound, change in radial artery patency and side effects of medications administered. Randomized and quasi-randomized controlled trials were considered. METHODS: A three-step search strategy was utilized in this review. A search of various databases was carried out followed by a search for unpublished literature between 1989 to January 2017. Only papers published in English were included in the review. Papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instrument from the Joanna Briggs Institute (JBI). There was no need for a third reviewer. Quantitative data was extracted from papers included in the review using the JBI data extraction instrument and entered in to RevMan5 (Copenhagen: The Nordic Cochrane Centre, Cochrane). All results were subject to double data entry. Effect sizes were expressed as odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals were calculated for analysis. RESULTS: Only three studies involving 697 participants met the inclusion criteria. There was a statistically significant reduction in the incidence of RAS in patients treated with a eutectic mixture of local anesthetics compared to subcutaneous lidocaine (OR 0.26; 95%CI 0.07,0.96). However there were no significant differences in RAS in studies that compared eutectic mixture of local anesthetics and placebo or a combinations of lidocaine with nitroglycerine compared to placebo. CONCLUSIONS: It is difficult to draw a valid conclusion, given the low number of studies, small sample sizes and heterogeneity between the studies.

87. Curtis E, Fernandez R, Lee A. The effect of vasodilatory medications on radial artery spasm in patients undergoing transradial coronary artery procedures: a systematic review. JBI Database System Rev Implement Rep. 2017;15(7):1952-67.

BACKGROUND: The uptake of percutaneous coronary procedures via the radial artery has increased internationally due to the decreased risk of complications and increased patient satisfaction. The increased susceptibility of the radial artery to spasm however presents a potential risk for procedural failure. Although most experts agree on the need for prophylactic medications to reduce radial artery spasm, currently there is inconsistency in literature regarding the most effective vasodilatory medication or combination of medications. REVIEW OBJECTIVE: The objective of this study is to identify the effectiveness of vasodilatory medications on radial artery spasm in patients undergoing transradial coronary artery procedures. INCLUSION CRITERIA TYPES OF PARTICIPANTS: This review considered studies that included participants aged 18 years and over undergoing non-emergent transradial percutaneous coronary artery procedures. TYPES OF INTERVENTION(S): This review considered studies that used vasodilating intravenous and intra-arterial medications or combinations of medications prior to commencing and during transradial coronary approaches to reduce radial artery spasm. OUTCOMES: The outcomes of interest were the incidence of radial artery spasm during percutaneous coronary procedure using objective and/or subjective measures and its effect on the successful completion of the procedure. TYPES OF STUDIES: Randomized controlled trials published in the English language between 1989 to date were considered for inclusion. SEARCH STRATEGY: The search strategy aimed to find both published and unpublished studies. A three-step search strategy was utilized in this review. An initial search of MEDLINE, CINAHL and Scopus was undertaken, followed by a search for unpublished studies. ASSESSMENT OF METHODOLOGICAL QUALITY: Papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments. Any disagreements that arose between the reviewers were resolved through discussion. DATA EXTRACTION: Quantitative data was extracted from papers included in the review using the standardized data extraction tool from RevMan5 (Copenhagen: The Nordic Cochrane Centre, Cochrane). DATA SYNTHESIS: Quantitative data, where possible, was pooled in statistical meta-analysis using RevMan5. All results were subject to double data entry. Effect sizes expressed as risk ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals were calculated for analysis. RESULTS: Nine trials involving 3614 patients were included in the final review. Pooled data involving 992 patients on the effect of calcium channel blockers demonstrated a statistically significant reduction in the incidence of vasospasm in patients who received verapamil 5 mg compared to those who received a placebo (OR 0.33; 95%CI 0.19, 0.58). Similarly patients who received verapamil 2.5 mg or 1.25 mg had significantly fewer incidences of vasospasm when compared to those who received a placebo. Nitroglycerine 100mcg was demonstrated to be associated with a statistically significant reduction in the incidence of vasospasm. CONCLUSION: The evidence demonstrates a benefit in the use of vasodilatory medications for the reduction of vasospasm in patients having radial coronary procedures. Further large-scale multi-center trials are needed to determine the preferred medication.

88. Chen YC, Tsai JC, Liou YM, Chan P. Effectiveness of endurance exercise training in patients with coronary artery disease: A meta-analysis of randomised controlled trials. Eur J Cardiovasc Nurs. 2017;16(5):397-408.

BACKGROUND: Exercise interventions apparently reduce the risks of and prevent coronary artery disease (CAD). Developing an exercise intervention for patients with CAD is a rapidly expanding focus worldwide. The results of previous studies are inconsistent and difficult to interpret across various types of exercise programme. AIM: This study aimed to update prior systemic reviews and meta-analyses in order to determine the overall effects of endurance exercise training on patients with CAD. METHODS: The databases (PubMed, Medline, CINAHL, EMBASE and Cochrane Library) were searched for the interventions published between January 1, 2000, and May 31, 2015. Comprehensive meta-analysis software was used to evaluate the heterogeneity of the selected studies and to calculate mean differences (MDs) while considering effect size. RESULTS: A total of 18 studies with 1286 participants were included. Endurance exercise interventions at a moderate to high training intensity significantly reduced resting systolic blood pressure (MD: -3.8 mmHg, p = 0.01) and low-density lipoprotein cholesterol (MD: -5.5 mg/dL, p = 0.02), and increased high-density lipoprotein cholesterol (MD: 3.8 mg/dL, p < 0.001). There were also significant positive changes in peak oxygen consumption (MD: 3.47 mL/kg/min, p < 0.001) and left ventricular ejection fraction (MD: 2.6%, p = 0.03) after the interventions. Subgroup analysis results revealed that exercise interventions of 60-90 minutes per week with a programme duration of >12 weeks had beneficial effects on functional capacity, cardiac function and a number of cardiovascular risk factors. CONCLUSIONS: Endurance exercise training has a positive effect on major modifiable cardiovascular risk factors and functional capacity. Nurses can develop endurance exercise recommendations for incorporation into care plans of clinically stable CAD patients following an acute cardiac event or revascularisation procedure.

89. Chase JA, Bogener JL, Ruppar TM, Conn VS. The Effectiveness of Medication Adherence Interventions Among Patients With Coronary Artery Disease: A Meta-analysis. J Cardiovasc Nurs. 2016;31(4):357-66.

BACKGROUND: Despite the known benefits of medication therapy for secondary prevention of coronary artery disease (CAD), many patients do not adhere to prescribed medication regimens. Medication nonadherence is associated with poor health outcomes and higher healthcare cost. OBJECTIVE: The purpose of this meta-analysis was to determine the overall effectiveness of interventions designed to improve medication adherence (MA) among adults with CAD. In addition, sample, study design, and intervention characteristics were explored as potential moderators to intervention effectiveness. METHODS: Comprehensive search strategies helped in facilitating the identification of 2-group, treatment-versus-control-design studies testing MA interventions among patients with CAD. Data were independently extracted by 2 trained research specialists. Standardized mean difference effect sizes were calculated for eligible primary studies, adjusted for bias, and then synthesized under a random-effects model. Homogeneity of variance was explored using a conventional heterogeneity statistic. Exploratory moderator analyses were conducted using meta-analytic analogs for analysis of variance and regression for dichotomous and continuous moderators, respectively. RESULTS: Twenty-four primary studies were included in this meta-analysis. The overall effect size of MA interventions, calculated from 18,839 participants, was 0.229 (P < .001). The most effective interventions used nurses as interventionists, initiated interventions in the inpatient setting, and informed providers of patients' MA behaviors. Medication adherence interventions tested among older patients were more effective than those among younger patients. The interventions were equally effective regardless of number of intervention sessions, targeting MA behavior alone or with other behaviors, and the use of written instructions only. CONCLUSIONS: Interventions to increase MA among patients with CAD were modestly effective. Nurses can be instrumental in improving MA among these patients. Future research is needed to investigate nurse-delivered MA interventions across varied clinical settings. In addition, more research testing MA interventions among younger populations and more racially diverse groups is needed.

90. Chandrababu R, Rathinasamy EL, Suresh C, Ramesh J. Effectiveness of reflexology on anxiety of patients undergoing cardiovascular interventional procedures: A systematic review and meta-analysis of randomized controlled trials. J Adv Nurs. 2019;75(1):43-53.

AIM: To appraise the evidence concerning the effect of reflexology on the anxiety in patients undergoing cardiovascular interventional procedures. BACKGROUND: Anxiety, fear, and other unpleasant emotional experiences are common among patients before and after cardiovascular interventional procedures. The higher anxiety may affect prognosis and recovery of patients. DESIGN: A systematic review and meta-analysis. DATA SOURCES: The MEDLINE, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Central Register of Controlled Trials (Cochrane Library), EMBASE, PsycINFO, and Web of Science were searched between 2001-2017. REVIEW METHODS: Randomized controlled trials evaluated the effectiveness of reflexology on anxiety among patients undergoing cardiovascular interventional procedures were included. Meta-analysis was done using Revman 5.3. RESULTS: Ten trials, representing 760 patients with the mean age of 59, fulfilled the inclusion criteria. Reflexology significantly decreased the anxiety of patients undergoing cardiovascular interventional procedures in the treatment group compared with the control group. CONCLUSION: Reflexology has some positive effects on anxiety among patients undergoing cardiovascular procedures. It may be a useful complementary therapy and further research is necessary to create reliable evidence.

91. Turan Kavradim S, Özer Z, Boz İ. Effectiveness of telehealth interventions as a part of secondary prevention in coronary artery disease: a systematic review and meta-analysis. Scand J Caring Sci. 2019.

BACKGROUND: Coronary artery disease is one of the most important health problems among heart diseases in the world, with high morbidity and mortality. Lifestyle changes in particular are recommended in the latest guidelines for implementing secondary prevention. AIM: The aim of this study was to evaluate the effectiveness of telehealth interventions as a part of secondary prevention compared to routine care in those with coronary artery disease. METHOD: The systematic review with meta-analysis was performed in accordance with Cochrane methods. Science Direct, Springer Link, Web of Science, Cochrane Central Register of Controlled Trials, CINAHL, MEDLINE, ProQuest and Network Digital Library databases were searched between 2000 and 2018 up to February 2018. The studies chosen conformed to PICOS inclusion and exclusion criteria. The risk of bias was assessed using the Cochrane risk of bias tool. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guideline was used in reporting the study. RESULTS: Twenty-four studies with a total of 6773 study participants met the inclusion criteria. It was found that telephone call interventions were the most commonly used, text message interventions came second with seven studies, telephone calls in combination with messages were used in four studies and telemonitoring was used in two studies. Compared to routine care, telehealth interventions had moderate significant effects in reducing waist circumference, total cholesterol and triglyceride, improving medication adherence and physical activity, and had small significant effects in reducing blood pressure and smoking cessation. No significant publication bias was found in the main outcomes. CONCLUSION: Results showed that the telehealth interventions yielded positive outcomes in lifestyle changes for coronary artery disease. Therefore, telehealth interventions can be used for effective secondary prevention by health professionals who care for individuals with coronary artery disease. Additionally, this study will provide guidance for studies on the development of telehealth intervention.

92. Curtis E, Fernandez R, Lee A. Effectiveness of vasodilatory medications on radial artery spasm in patients undergoing transradial coronary artery procedures: a systematic review protocol. JBI Database System Rev Implement Rep. 2016;14(8):26-33.

The quantitative objective is to identify the effectiveness of vasodilatory medications on radial artery spasm in patients undergoing transradial coronary artery procedures.

93. Fernandez RS, Lee A. Effects of methods used to achieve hemostasis on radial artery occlusion following percutaneous coronary procedures: a systematic review. JBI Database System Rev Implement Rep. 2017;15(3):738-64.

BACKGROUND: Transradial access to percutaneous coronary procedures is becoming the preferred access route, and it is being increasingly used for emergent and elective procedures. However, radial artery occlusion (RAO) continues to remain an adverse occurrence following sheath removal or in the first 24 hours following sheath removal due to the smaller diameter of the artery. OBJECTIVES: The overall objective of this study was to synthesize the best available research evidence related to the effects of methods used to achieve hemostasis on RAO rates after percutaneous coronary procedures. INCLUSION CRITERIA TYPES OF PARTICIPANTS: The current review considered trials that included adult patients (18 years and over) who have had a coronary angiography or coronary re-vascularization intervention via the radial artery. TYPES OF INTERVENTION(S): The interventions of interest were the use of various hemostatic methods compared to traditional interventions to prevent RAO. TYPES OF STUDIES: All randomized and quasi-randomized controlled trials evaluating the effect of various hemostatic methods on RAO rates after percutaneous coronary procedures were included in the review. OUTCOMES: The primary outcome of interest was the incidence of RAO at the time of discharge and persistent occlusion at the time of follow-up. SEARCH STRATEGY: The search aimed to find published and unpublished trials through electronic databases, reference lists and key reports. An extensive search was undertaken for the following databases - CINAHL, Embase, PubMed and the Cochrane Central Register of Controlled Trials (CENTRAL). Databases were searched up to May 2016. The search for unpublished trials included Dissertation Abstracts International, World Cat, Clinicaltrials.gov, ProQuest Dissertation and Theses and MedNar. METHODOLOGICAL QUALITY: Methodological quality was assessed independently by two reviewers using the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) checklist. Disagreements that arose between the reviewers were resolved through discussion. DATA EXTRACTION: Quantitative data were extracted from papers included in the review by one reviewer using the standardized data extraction tool from JBI-MAStARI. The data extracted were checked by a second reviewer. Disagreements that arose between the reviewers were resolved through discussion. All results were subject to double data entry in Review Manager. DATA SYNTHESIS: Statistical pooling of the data was not possible due to the heterogeneity of the trials; therefore, the findings are presented in narrative form. However, figures have been used to illustrate the results. RESULTS: A total of seven trials were included in the review. One trial demonstrated a significant reduction in RAO rates in patients who had a mean arterial pressure (MAP)-guided TR band to a standard TR band (odds ratio [OR] 0.08; 95% confidence interval [CI] 0.02, 0.37). A statistically significant reduction in the incidence of RAO was observed among patients who received a biopolymer dressing (Chitosen) compared to those who received the TR band (OR 2.20; 95% CI 1.20, 4.02). No statistically significant difference in the incidence of RAO was reported between those who received the TR band and those who received either the elastic bandage (P = 0.08) or T band (P = 0.76). Similarly, no statistically significant difference in rates of RAO among patients was reported among those who had pro-coagulant dressings compared to those who had short or long manual compression. One trial that compared the TR band to a MAP-guided TR band demonstrated no statistically significant difference in the time taken to obtain hemostasis between the two groups (P = 0.61). A statistically significant reduction in the time taken to obtain hemostasis was observed among patients who received the hemostatic biopolymer dressing compared to the TR band. No statistically significant difference in the incidence of hematoma was identified among patients who received pneumatic compression or traditional compression to achieve hemostasis. CONCLUSION: There is limited evidence to support the use of any single hemostatic method to prevent RAO rates after percutaneous coronary procedures. Although used extensively, there is evidence of no effect of the pneumatic compression method using the TR band on the incidence of RAO at discharge or follow-up, the time taken to obtain hemostasis and the incidence of hematoma. The MAP-guided compression method and the Biopolymer dressing (Chitosen) were superior to the TR band compression method, and patent hemostasis was superior to hemoband in the prevention of RAO. However, these results are based on single trials and should be interpreted with caution. The evidence obtained from the review does not provide a concrete base for the development of practice guidelines. Until more robust evidence is available, practices will continue to be dictated by local preferences and available resources.

94. Fernandez RS, Lee A. Effects of methods used to achieve hemostasis on radial artery occlusion following percutaneous coronary procedures: a systematic review protocol. JBI Database System Rev Implement Rep. 2016;14(9):25-31.

The objective of this systematic review is to synthesize the best available research evidence related to the effects of methods used to achieve hemostasis on radial artery occlusion (RAO) rates, following the radial artery approach for percutaneous coronary procedures.The specific review question is as follows: What is the effect of methods used to achieve hemostasis post sheath removal on RAO rates in adult patients, following the radial artery approach for percutaneous coronary procedures?

95. Trenkwalder T, Nelson CP, Musameh MD, Mordi IR, Kessler T, Pellegrini C, et al. Effects of the coronary artery disease associated LPA and 9p21 loci on risk of aortic valve stenosis. Int J Cardiol. 2019;276:212-7.

BACKGROUND: Aortic valve stenosis (AVS) and coronary artery disease (CAD) have a significant genetic contribution and commonly co-exist. To compare and contrast genetic determinants of the two diseases, we investigated associations of the LPA and 9p21 loci, i.e. the two strongest CAD risk loci, with risk of AVS. METHODS: We genotyped the CAD-associated variants at the LPA (rs10455872) and 9p21 loci (rs1333049) in the GeneCAST (Genetics of Calcific Aortic STenosis) Consortium and conducted a meta-analysis for their association with AVS. Cases and controls were stratified by CAD status. External validation of findings was undertaken in five cohorts including 7880 cases and 851,152 controls. RESULTS: In the meta-analysis including 4651 cases and 8231 controls the CAD-associated allele at the LPA locus was associated with increased risk of AVS (OR 1.37; 95%CI 1.24-1.52, p = 6.9 × 10(-10)) with a larger effect size in those without CAD (OR 1.53; 95%CI 1.31-1.79) compared to those with CAD (OR 1.27; 95%CI 1.12-1.45). The CAD-associated allele at 9p21 was associated with a trend towards lower risk of AVS (OR 0.93; 95%CI 0.88-0.99, p = 0.014). External validation confirmed the association of the LPA risk allele with risk of AVS (OR 1.37; 95%CI 1.27-1.47), again with a higher effect size in those without CAD. The small protective effect of the 9p21 CAD risk allele could not be replicated (OR 0.98; 95%CI 0.95-1.02). CONCLUSIONS: Our study confirms the association of the LPA locus with risk of AVS, with a higher effect in those without concomitant CAD. Overall, 9p21 was not associated with AVS.

96. Luo C, Wen J, Sun W, Li T, Yu X, Zhang T, et al. Effects of traditional Chinese exercise on cardiac rehabilitation after percutaneous coronary intervention: study protocol for network meta-analysis of randomised controlled trials. BMJ Open. 2019;9(2):e023096.

INTRODUCTION: Coronary heart disease (CHD) is the most common cause of death worldwide. Percutaneous coronary intervention (PCI) has been shown to reduce mortality in patients with CHD. However, there are still recurrences of cardiovascular events after PCI. Cardiac rehabilitation (CR) in patients with established CHD is associated with reductions in cardiovascular mortality and hospital admissions, as well as improved quality of life. More and more clinical trials suggest that traditional Chinese exercise (TCE) plays a positive role in patients post-PCI. The primary purposes of the current study are to conduct a network meta-analysis of randomised trials to determine the effects of TCE in patients after PCI, and to separately compare the effects of tai chi, baduanjin and yijinjing on CR after PCI. METHODS AND ANALYSIS: Studies will be retrieved from the following databases: PubMed, Embase, Cochrane Library, Chinese National Knowledge Infrastructure, Wanfang Data, Chinese BioMedical Database and Chinese Science and Technology Periodicals Database, from inception to December 2018. We will include randomised controlled trials that are related to the effects of TCE therapies in patients after PCI. The primary outcomes will be all-cause mortality, revascularisations, health-related quality of life and hospitalisations. Two reviewers will independently select eligible articles. For each included article, two reviewers will independently extract the data and assess the risk of bias by using the Cochrane risk of bias tool. Bayesian network meta-analyses will be conducted to pool all treatment effects. The ranking probabilities for the optimal intervention of various treatments (tai chi, baduanjin or yijinjing) will be estimated by the mean ranks and surface under the cumulative ranking curve. The Grading of Recommendations Assessment, Development and Evaluation System will be used to assess the quality of evidence. ETHICS AND DISSEMINATION: The results will be disseminated through peer-reviewed publications. They will provide consolidated evidence to inform clinicians on the potential functions of TCE in CR, and to provide reliable evidence for the application of TCE. TRIAL REGISTRATION NUMBER: CRD42018088415.

97. Bordbar M, Fereidouni Z, Morandini MK, Najafi Kalyani M. Efficacy of complementary interventions for management of anxiety in patients undergoing coronary angiography: A rapid systematic review. J Vasc Nurs. 2020;38(1):9-17.

Coronary angiography (CAG) is an invasive and anxiety-provoking procedure for many patients. Psychological problems, especially anxiety, are the main concern of nurses taking care of these patients before the procedure. This rapid systematic review aimed to assess the efficacy of interventions for management of anxiety in patients undergoing CAG. In this study, all published, peer-reviewed, English-language interventional studies from 2009 to 2018 were identified in a search of Scopus, PubMed, and Google Scholar databases. The relevant studies were assessed using a quality assessment checklist. All included studies were assessed by 2 researchers. Finally, 15 studies with 1,312 participants that evaluated the effects of complementary methods on management of anxiety in patients undergoing CAG were included. The findings of this rapid systematic review suggested that complementary and nonpharmacological methods, such as music therapy, reflexology, Benson's relaxation technique, aromatherapy, guided imagery, and yoga, could be used effectively for management of anxiety in patients undergoing CAG.

98. Fereidouni Z, Kameli Morandini M, Najafi Kalyani M. The efficacy of interventions for back pain in patients after transfemoral coronary angiography: A rapid systematic review. J Vasc Nurs. 2019;37(1):52-7.

Coronary angiography is a gold standard tool for diagnosis of coronary artery disease. After this test, patients are restricted in bed to prevent vascular complications. Immobilization and bed rest can cause back pain in these patients. The objective of this rapid systematic review is to assess the efficacy of interventions for reducing back pain after transfemoral coronary angiography. All published, peer-reviewed, English-language interventional studies from 1990 to 2017 were identified in a search of Scopus, PubMed, and CINAHL databases. Relevant studies were surveyed with experimental and quasiexperimental designs that assessed the interventions for reducing back pain after coronary angiography. Data were extracted from studies and assessed. Totally 9 studies with 1062 participants which evaluated the interventions for reducing back pain after coronary angiography were included. The findings of these studies suggest that early ambulation and modified positioning were effective to reduce back pain in patients undergoing coronary angiography. The use of early ambulation 2-4 hours after angiography and changing the patients' position along with modified positioning cause a reduction in the back pain of the patients.

99. Ferdinand FD, MacDonald JK, Balkhy HH, Bisleri G, Hwang HY, Northrup P, et al. Endoscopic Conduit Harvest in Coronary Artery Bypass Grafting Surgery: An ISMICS Systematic Review and Consensus Conference Statements. Innovations (Phila). 2017;12(5):301-19.

OBJECTIVE: The purpose of this consensus conference was to develop and update evidence-informed consensus statements and recommendations on harvesting saphenous vein and radial artery via an open as compared with endoscopic technique by systematically reviewing and performing a meta-analysis of randomized and nonrandomized clinical trials. METHODS: All randomized controlled trials and nonrandomized controlled trials included in the first the International Society for Minimally Invasive Cardiothoracic Surgery Consensus Conference and Statements, in 2005 up to November 30, 2015, were included in a systematic review and meta-analysis. Based on the resultant, 76 studies (23 randomized controlled trials and 53 nonrandomized controlled trials) on 281,459 patients analyzed, consensus statements, and recommendations were generated comparing the risks and benefits of endoscopic versus open conduit harvesting for patients undergoing coronary artery bypass grafting. RESULTS: Compared with open vein harvest, it is reasonable to perform endoscopic vein harvest of saphenous vein to reduce wound-related complications, postoperative length of stay, and outpatient wound management resources and to increase patient satisfaction (class I, level A). Based on the quality of the conduit and major adverse cardiac events as well as 6-month angiographic patency, endoscopic vein harvest was noninferior to open harvest. It is reasonable to perform endoscopic radial artery harvest to reduce wound-related complication and to increase patient satisfaction (class I, level B-R and B-NR, respectively) with reduction in major adverse cardiac events and noninferior patency rate at 1 and 3 to 5 years (class III, level B-R). CONCLUSIONS: Based on the consensus statements, the consensus panel recommends (class I, level B) that endoscopic saphenous vein and radial artery harvesting should be the standard of care for patients who require these conduits for coronary revascularization.

100. Badger S, Forster R, Blair PH, Ellis P, Kee F, Harkin DW. Endovascular treatment for ruptured abdominal aortic aneurysm. Cochrane Database Syst Rev. 2017(5).

http://dx.doi.org/10.1002/14651858.CD005261.pub4

- Background An abdominal aortic aneurysm (AAA) (pathological enlargement of the aorta) is a condition that can occur as a person ages. It is most commonly seen in men older than 65 years of age. Progressive aneurysm enlargement can lead to rupture and massive internal bleeding, which is fatal unless timely repair can be achieved. Despite improvements in perioperative care, mortality remains high (approximately 50%) after conventional open surgical repair. Endovascular aneurysm repair (EVAR), a minimally invasive technique, has been shown to reduce early morbidity and mortality as compared to conventional open surgery for planned AAA repair. More recently emergency endovascular aneurysm repair (eEVAR) has been used successfully to treat ruptured abdominal aortic aneurysm (RAAA), proving that it is feasible in select patients; however, it is unclear if eEVAR will lead to significant improvements in outcomes for these patients or if indeed it can replace conventional open repair as the preferred treatment for this lethal condition. This is an update of the review first published in 2006. Objectives To assess the advantages and disadvantages of emergency endovascular aneurysm repair (eEVAR) in comparison with conventional open surgical repair for the treatment of ruptured abdominal aortic aneurysm (RAAA). This will be determined by comparing the effects of eEVAR and conventional open surgical repair on short‐term mortality, major complication rates, aneurysm exclusion (specifically endoleaks in the eEVAR treatment group), and late complications. Search methods For this update the Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register (last searched June 2016), CENTRAL (2016, Issue 5), and trials registries. We also checked reference lists of relevant publications. Selection criteria Randomised controlled trials in which participants with a clinically or radiologically diagnosed RAAA were randomly allocated to eEVAR or conventional open surgical repair. Data collection and analysis Two review authors independently assessed studies identified for potential inclusion for eligibility. Two review authors also independently completed data extraction and quality assessment. Disagreements were resolved through discussion. We performed meta‐analysis using fixed‐effect models with odds ratios (ORs) and 95% confidence intervals (CIs) for dichotomous data and mean differences with 95% CIs for continuous data. Main results We included four randomised controlled trials in this review. A total of 868 participants with a clinical or radiological diagnosis of RAAA were randomised to receive either eEVAR or open surgical repair. Overall risk of bias was low, but we considered one study that performed randomisation in blocks by week and performed no allocation concealment and no blinding to be at high risk of selection bias. Another study did not adequately report random sequence generation, putting it at risk of selection bias, and two studies were underpowered. There was no clear evidence to support a difference between the two interventions for 30‐day (or in‐hospital) mortality (OR 0.88, 95% CI 0.66 to 1.16; moderate‐quality evidence). There were a total of 44 endoleak events in 128 participants from three studies (low‐quality evidence). Thirty‐day complication outcomes (myocardial infarction, stroke, composite cardiac complications, renal complications, severe bowel ischaemia, spinal cord ischaemia, reoperation, amputation, and respiratory failure) were reported in between one and three studies, therefore we were unable to draw a robust conclusion. We downgraded the quality of the evidence for myocardial infarction, renal complications, and respiratory failure due to imprecision, inconsistency, and risk of bias. Odds ratios for complications outcomes were OR 2.38 (95% CI 0.34 to 16.53; 139 participants; 2 studies; low‐quality evidence) for myocardial infarction; OR 1.07 (95% CI 0.21 to 5.42; 255 participants; 3 studies; low‐quality evidence) for renal complications; and OR 3.62 (95% CI 0.14 to 95.78; 32 participants; 1 study; low‐quality evidence) for respiratory failure. There was low‐quality evidence of a reduction in bowel ischaemia in the eEVAR treatment group, but very few events were reported (OR 0.37, 95% CI 0.14 to 0.94), and we downgraded the evidence due to imprecision and risk of bias. Six‐month and one‐year outcomes were evaluated in three studies, but only results from a single study could be used for each outcome, which showed no clear evidence of a difference between the interventions. We rated six‐month mortality evidence as of moderate quality due to imprecision (OR 0.89, 95% CI 0.40 to 1.98; 116 participants). Authors' conclusions The conclusions of this review are currently limited by the paucity of data. We found from the data available moderate‐quality evidence suggesting there is no difference in 30‐day mortality between eEVAR and open repair. Not enough information was provided for complications for us to make a well‐informed conclusion, although it is possible that eEVAR is associated with a reduction in bowel ischaemia. Long‐term data were lacking for both survival and late complications. More high‐quality randomised controlled trials comparing eEVAR and open repair for the treatment of RAAA are needed to better understand if one method is superior to the other, or if there is no difference between the methods on relevant outcomes. Plain language summary Endovascular treatment for ruptured abdominal aortic aneurysm Background The abdominal aorta is the main artery supplying blood to the lower part of the body. An abnormal ballooning and weakening of the wall of the aorta (aortic aneurysm) can occur with age, particularly in older men. An aneurysm may progressively enlarge without obvious symptoms, yet it is potentially lethal as it can burst (rupture), causing massive internal bleeding. Death is inevitable unless the bleeding can be stopped and blood flow to the lower body promptly restored. Until recently this required an open operation (laparotomy) to clamp the abdominal aorta and replace the segment of the aorta with a synthetic artery tube‐graft. Many patients do not survive this major operation due to the effects of massive bleeding or failure of vital organs, such as the heart, lungs, and kidneys, despite improvements in the surgical technique and care of the critically ill patient. Endovascular treatment, a minimally invasive technique, allows the surgeon to pass a stent graft through the blood vessels from the groin to the site of rupture, where it is positioned and attached to the healthy artery above and below the aneurysm to stop bleeding and form a new channel for blood flow. This technique is successful in suitable patients for the planned treatment of non‐ruptured aneurysms and can reduce early postoperative complications and deaths. Study characteristics and key results The present review looked at the available evidence for endovascular repair effectiveness compared with open surgery for ruptured aneurysms. We included four studies with a total of 868 participants. Risk of bias was generally low, but one study was at high risk of selection bias due to their use of the block method of randomisation; one study did not adequately report randomisation methods; and two studies may not have included a sufficient number of participants to adequately answer the questions posed by the studies. We found that from the data currently available there appears to be no difference in death within 30 days of the procedure between endovascular repair and open repair. Endoleaks were reported in 44 participants from three studies. The data on complications (myocardial infarction, stroke, combined cardiac complications, renal complications, spinal cord ischaemia, reoperation, amputation, and respiratory failure) are not robust enough at this point to make any strong conclusions on superiority of either repair technique, but emergency endovascular aneurysm repair (eEVAR) may be associated with a lower risk of bowel ischaemia. No robust conc usion can be made on outcomes at six months or one year. More studies are needed to better understand whether or not one of the aneurysm repair techniques, endovascular or open surgical, is superior based on patient outcomes. Quality of the evidence We found from the data available moderate‐quality evidence suggesting there is no difference in 30‐day mortality between eEVAR and open repair. Not enough information was provided for complications for us to make a well‐informed conclusion, although it is possible that eEVAR is associated with a reduction in bowel ischaemia. We downgraded the quality of the evidence as some studies contained too few participants, not all studies reported on all complication outcomes, and the number of complications occurring between studies varied substantially.

101. Woo K, Ulloa J, Allon M, Carsten CG, 3rd, Chemla ES, Henry ML, et al. Establishing patient-specific criteria for selecting the optimal upper extremity vascular access procedure. J Vasc Surg. 2017;65(4):1089-103.e1.

OBJECTIVE: The Kidney Disease Outcome Quality Initiative and Fistula First Breakthrough Initiative call for the indiscriminate creation of arteriovenous fistulas (AVFs) over arteriovenous grafts (AVGs) without providing patient-specific criteria for vascular access selection. Although the U.S. AVF rate has increased dramatically, several reports have found that this singular focus on increasing AVFs has resulted in increased AVF nonmaturation/early failure and a high prevalence of catheter dependence. The objective of this study was to determine the appropriateness of vascular access procedures in clinical scenarios constructed with combinations of relevant factors potentially influencing outcomes. METHODS: The RAND/UCLA Appropriateness Method was used. Accordingly, a comprehensive literature search was performed and a synthesis of results compiled. The RAND/UCLA Appropriateness Method was applied to 2088 AVF and 1728 AVG clinical scenarios with varying patient characteristics. Eleven international vascular access experts rated the appropriateness of each scenario in two rounds. On the basis of the distribution of the panelists' scores, each scenario was determined to be appropriate, inappropriate, or indeterminate. RESULTS: Panelists achieved agreement in 2964 (77.7%) scenarios; 860 (41%) AVF and 588 (34%) AVG scenarios were scored appropriate, 686 (33%) AVF and 480 (28%) AVG scenarios were scored inappropriate, and 542 (26%) AVF and 660 (38%) AVG scenarios were indeterminate. Younger age, larger outflow vein diameter, normal or obese body mass index (vs morbidly obese), larger inflow artery diameter, and higher patient functional status were associated with appropriateness of AVF creation. Older age, dialysis dependence, and smaller vein size were associated with appropriateness of AVG creation. Gender, diabetes, and coronary artery disease were not associated with AVF or AVG appropriateness. Dialysis status was not associated with AVF appropriateness. Body mass index and functional status were not associated with AVG appropriateness. To simulate the surgeon's decision-making, scenarios were combined to create situations with the same patient characteristics and both AVF and AVG options for access. Of these 864 clinical situations, 311 (36%) were rated appropriate for AVG but inappropriate or indeterminate for AVF. CONCLUSIONS: The results of this study indicate that patient-specific situations exist wherein AVG is as appropriate as or more appropriate than AVF. These results provide patient-specific recommendations for clinicians to optimize vascular access selection criteria, to standardize care, and to inform payers and policy. Indeterminate scenarios will guide future research.

102. Badano LP, Miglioranza MH, Edvardsen T, Colafranceschi AS, Muraru D, Bacal F, et al. European Association of Cardiovascular Imaging/Cardiovascular Imaging Department of the Brazilian Society of Cardiology recommendations for the use of cardiac imaging to assess and follow patients after heart transplantation. Eur Heart J Cardiovasc Imaging. 2015;16(9):919-48.

The cohort of long-term survivors of heart transplant is expanding, and the assessment of these patients requires specific knowledge of the surgical techniques employed to implant the donor heart, the physiology of the transplanted heart, complications of invasive tests routinely performed to detect graft rejection (GR), and the specific pathologies that may affect the transplanted heart. A joint EACVI/Brazilian cardiovascular imaging writing group committee has prepared these recommendations to provide a practical guide to echocardiographers involved in the follow-up of heart transplant patients and a framework for standardized and efficient use of cardiovascular imaging after heart transplant. Since the transplanted heart is smaller than the recipient's dilated heart, the former is usually located more medially in the mediastinum and tends to be rotated clockwise. Therefore, standard views with conventional two-dimensional (2D) echocardiography are often difficult to obtain generating a large variability from patient to patient. Therefore, in echocardiography laboratories equipped with three-dimensional echocardiography (3DE) scanners and specific expertise with the technique, 3DE may be a suitable alternative to conventional 2D echocardiography to assess the size and the function of cardiac chambers. 3DE measurement of left (LV) and right ventricular (RV) size and function are more accurate and reproducible than conventional 2D calculations. However, clinicians should be aware that cardiac chamber volumes obtained with 3DE cannot be compared with those obtained with 2D echocardiography. To assess cardiac chamber morphology and function during follow-up studies, it is recommended to obtain a comprehensive echocardiographic study at 6 months from the cardiac transplantation as a baseline and make a careful quantitation of cardiac chamber size, RV systolic function, both systolic and diastolic parameters of LV function, and pulmonary artery pressure. Subsequent echocardiographic studies should be interpreted in comparison with the data obtained from the 6-month study. An echocardiographic study, which shows no change from the baseline study, has a high negative predictive value for GR. There is no single systolic or diastolic parameter that can be reliably used to diagnose GR. However, in case several parameters are abnormal, the likelihood of GR increases. When an abnormality is detected, careful revision of images of the present and baseline study (side-by-side) is highly recommended. Global longitudinal strain (GLS) is a suitable parameter to diagnose subclinical allograft dysfunction, regardless of aetiology, by comparing the changes occurring during serial evaluations. Evaluation of GLS could be used in association with endomyocardial biopsy (EMB) to characterize and monitor an acute GR or global dysfunction episode. RV size and function at baseline should be assessed using several parameters, which do not exclusively evaluate longitudinal function. At follow-up echocardiogram, all these parameters should be compared with the baseline values. 3DE may provide a more accurate and comprehensive assessment of RV size and function. Moreover, due to the unpredictable shape of the atria in transplanted patients, atrial volume should be measured using the discs' summation algorithm (biplane algorithm for the left atrium) or 3DE. Tricuspid regurgitation should be looked for and properly assessed in all echocardiographic studies. In case of significant changes in severity of tricuspid regurgitation during follow-up, a 2D/3D and colour Doppler assessment of its severity and mechanisms should be performed. Aortic and mitral valves should be evaluated according to current recommendations. Pericardial effusion should be serially evaluated regarding extent, location, and haemodynamic impact. In case of newly detected pericardial effusion, GR should be considered taking into account the overall echocardiographic assessment and patient evaluation. Dobutamine stress echocardiography might be a suitable alternative to routine coronary angiography to assess cardiac allograft vasculopathy (CAV) at centres with adequate experience with the methodology. Coronary flow reserve and/or contrast infusion to assess myocardial perfusion might be combined with stress echocardiography to improve the accuracy of the test. In addition to its role in monitoring cardiac chamber function and in diagnosis the occurrence of GR and/or CAV, in experienced centres, echocardiography might be an alternative to fluoroscopy to guide EMB, particularly in children and young women, since echocardiography avoids repeated X-ray exposure, permits visualization of soft tissues and safer performance of biopsies of different RV regions. Finally, in addition to the indications about when and how to use echocardiography, the document also addresses the role of the other cardiovascular imaging modalities during follow-up of heart transplant patients. In patients with inadequate acoustic window and contraindication to contrast agents, pharmacological SPECT is an alternative imaging modality to detect CAV in heart transplant patients. However, in centres with adequate expertise, intravascular ultrasound (IVUS) in conjunction with coronary angiography with a baseline study at 4-6 weeks and at 1 year after heart transplant should be performed to exclude donor coronary artery disease, to detect rapidly progressive CAV, and to provide prognostic information. Despite the fact that coronary angiography is the current gold-standard method for the detection of CAV, the use of IVUS should also be considered when there is a discrepancy between non-invasive imaging tests and coronary angiography concerning the presence of CAV. In experienced centres, computerized tomography coronary angiography is a good alternative to coronary angiography to detect CAV. In patients with a persistently high heart rate, scanners that provide high temporal resolution, such as dual-source systems, provide better image quality. Finally, in patients with insufficient acoustic window, cardiac magnetic resonance is an alternative to echocardiography to assess cardiac chamber volumes and function and to exclude acute GR and CAV in a surveillance protocol.

103. Kwong JL, Ross G, Turner L, Olynyk C, Cheskes S, Thurston A, et al. Evaluation of a primary care paramedic STEMI bypass guideline. Cjem. 2018;20(6):850-6.

OBJECTIVE: Limited evidence supports primary care paramedic (PCP) direct transport of ST-segment elevation myocardial infarction (STEMI) patients for percutaneous coronary intervention (PCI). The goal of this study was to evaluate an urban-based PCP STEMI bypass guideline. METHODS: We reviewed consecutive Toronto Paramedic Services call reports between April 7, 2015, and May 31, 2016, regarding STEMI patients identified by PCPs. The primary outcome was patient assignment (stable versus unstable) according to guideline criteria. Secondary outcomes were the proportion of PCP-transported patients who had an indication for an advanced care intervention (ACI) or who received an ACI when PCPs rendezvoused with an advanced care paramedic (ACP). Lastly, we reviewed prehospital outcomes of cardiac arrest patients and calculated the difference in transport intervals between direct PCP bypass and a PCI-centre and predicted transport interval to the closest emergency department (ED). RESULTS: Of 361 patients, 232 were PCP transports and 129 were ACP-rendezvous transports. There was a significant difference in the distribution of stable and unstable patients between PCPs and ACPs (p<0.001). For PCP patients, 21/232 (9.1%) had indications for an ACI, whereas 34/129 (26.4%) ACP patients received an ACI. Eleven patients experienced cardiac arrest; 10 were successfully resuscitated (5 of these by PCPs). The median difference between direct PCP bypass and a PCI-centre versus transport to the closest ED was 5.53 minutes (IQR=6.71). CONCLUSIONS: We found a significant difference in the distribution of stable and unstable patients and fewer patients with indications for an ACI in PCP patients. This PCP STEMI bypass guideline appears feasible.

104. Lau JK, Anastasius MO, Hyun KK, Dabin B, Coverdale S, Ferry C, et al. Evidence-based care in a population with chronic kidney disease and acute coronary syndrome. Findings from the Australian Cooperative National Registry of Acute Coronary Care, Guideline Adherence and Clinical Events (CONCORDANCE). Am Heart J. 2015;170(3):566-72.e1.

BACKGROUND: Acute coronary syndrome (ACS) guidelines recommend that patients with chronic kidney disease (CKD) be offered the same therapies as other high-risk ACS patients with normal renal function. Our objective was to describe the gaps in evidence-based care offered to patients with ACS and concomitant CKD. METHODS: Patients presenting to 41 Australian hospitals with suspected ACS were stratified by presence of CKD (glomerular filtration rate <60 mL/min). Receipt of evidence-based care including, coronary angiography (CA), evidence-based discharge medications (EBMs), and cardiac rehabilitation (CR) referral, were compared between patients with and without CKD. Hospital and clinical factors that predicted receipt of care were determined using multilevel multivariable stepwise logistic regression models. RESULTS: Of the 4,778 patients admitted with suspected ACS, 1,227 had CKD. On univariate analyses, patients with CKD were less likely to undergo CA (59.1% vs 85.0%, P < .0001) or receive EBM (69.4% vs 78.7%, P < .0001), or were offered CR (49.5% vs 68.0%, P < .0001). After adjusting for patient characteristics and clustering by hospital, CKD remained an independent predictor of not undergoing CA only (odds ratio 0.48, 95% CI 0.37-0.61). Within the CKD cohort, presenting to a hospital with a catheterization laboratory was the strongest predictor of undergoing CA (odds ratio 3.07, 95% CI 1.91-4.93). CONCLUSION: The presence of CKD independently predicts failure to undergo CA but not failure to receive EBM or CR, which is predicted by comorbidities. Among the CKD population, performance of CA is largely determined by admission to a catheterization capable hospital. Targeting these patients through standardization of care across institutions offers opportunities to improve outcomes in this high-risk population.

105. Bhagwat MM, Woods JA, Dronavalli M, Hamilton SJ, Thompson SC. Evidence-based interventions in primary care following acute coronary syndrome in Australia and New Zealand: a systematic scoping review. BMC Cardiovasc Disord. 2016;16(1):214.

BACKGROUND: Coronary artery disease has a significant disease burden, but there are many known barriers to management of acute coronary syndrome (ACS). General practitioners (GPs) bear considerable responsibility for post-discharge management of ACS in Australia and New Zealand (NZ), but knowledge about the extent and efficacy of such management is limited. This systematic review summarises published evidence from Australia and New Zealand regarding management in primary care after discharge following ACS. METHODS: A search of PubMed, Scopus, CINAHL-Plus and PSYCINFO databases in August 2015 was supplemented by citation screening and hand-searching. Literature was selected based on specified criteria, and assessed for quality using the Mixed Methods Appraisal Tool (MMAT). Extracted data was related to evidence-based interventions specified by published guidelines. RESULTS: The search yielded 19 publications, most of which reported on quantitative and observational studies from Australia. The majority of studies scored at least 75 % on the MMAT. Diverse aspects of management by GPs are presented according to categories of evidence-based guidelines. Data suggests that GPs are more likely to prescribe ACS medications than to assist in lifestyle or psychological management. GP referral to cardiac rehabilitation varied, and one study showed an improvement in the number of ACS patients with documented ACS management plans. Few studies described successful interventions to improve GP management, though some quality improvement efforts through education and integration of care with hospitals were beneficial. Limited data was published about interventions effective in rural, minority, and Indigenous populations. CONCLUSIONS: Research reflects room for improvement in GP post-discharge ACS management, but little is known about effective methods for improvement. Additional research, both observational and interventional, would assist GPs in improving the quality of post-discharge ACS care.

106. Masoudi FA, Ponirakis A, de Lemos JA, Jollis JG, Kremers M, Messenger JC, et al. Executive Summary: Trends in U.S. Cardiovascular Care: 2016 Report From 4 ACC National Cardiovascular Data Registries. J Am Coll Cardiol. 2017;69(11):1424-6.

107. Thompson G, Davison GW, Crawford J, Hughes CM. Exercise and inflammation in coronary artery disease: A systematic review and meta-analysis of randomised trials. J Sports Sci. 2020;38(7):814-26.

Current evidence suggests that chronic inflammation contributes to the development of coronary artery disease (CAD). Interestingly, exercise may constitute a method of reducing inflammation in this patient population. As such, this systematic review and meta-analysis examined the evidence generated by randomised studies that investigated the effect of exercise on inflammatory biomarkers in CAD. Literature was sought from various sources. Outcomes were pooled in a random-effects model to calculate standardised mean differences (SMD) with 95% confidence intervals (CI). Twenty-five studies were reviewed; post-intervention C-reactive protein (SMD: -0.55 (95% CI: -0.93, -0.16), P = 0.005), fibrinogen (SMD: -0.52 (95% CI: -0.74, -0.29, P = <0.00001)), and von Willebrand factor (SMD: -1.57 (95% CI: -2.23, -0.92), P = <0.00001) values were significantly lower in exercise groups compared to controls. In addition, qualitative analyses identified evidence that supports a beneficial effect of exercise on these acute-phase reactants. However, the impact of exercise on anti-inflammatory cytokines, adhesion molecules, and chemokines is equivocal, which may be attributed to a paucity of research. Nevertheless, the findings of this review suggest that exercise induces an anti-inflammatory effect in CAD patients. Although, the quality of evidence needs to be improved by further randomised studies with high methodological qualities and large sample sizes.

108. Pengelly J, Pengelly M, Lin KY, Royse C, Karri R, Royse A, et al. Exercise Parameters and Outcome Measures Used in Cardiac Rehabilitation Programs Following Median Sternotomy in the Elderly: A Systematic Review and Meta-Analysis. Heart Lung Circ. 2019;28(10):1560-70.

OBJECTIVE: The aim of this systematic review was to identify exercise parameters and outcome measures used in cardiac rehabilitation programs following median sternotomy, in the elderly cardiac population. DATA SOURCES: Five (5) electronic databases were searched for relevant studies published in English after 1997. STUDY SELECTION: The screening process was completed by two independent researchers, with a third independent reviewer for overall agreement. Studies were selected if they included only cardiac patients aged ≥65 years who had undergone valve surgery and/or coronary artery bypass grafting via median sternotomy, and who had undertaken a postoperative cardiac rehabilitation exercise intervention assessing physical function and/or cognitive recovery as outcomes. DATA EXTRACTION: Two researchers independently completed the data extraction and quality assessment. Quality was assessed using a modified Downs and Black tool. DATA SYNTHESIS: In total, 11 articles were included for appraisal with respect to the quality of the study. Only two randomised controlled trials were suitable for meta-analysis. A higher volume of exercise was shown to have a positive effect on functional recovery, assessed using the 6-minute walk test (6MWT) (mean difference=26.97m; 95% confidence interval [CI], 6.96-46.97; p=0.008; I(2)=0%). No significant improvement was shown between additional exercise compared to standard care in improving VO(2peak), maximal power output or quality of life. No studies evaluated the effect of exercise on cognitive recovery. CONCLUSIONS: Exercise significantly improves functional recovery in the post-surgical elderly cardiac population, however uncertainty still exists with regard to which modes of exercise and their specific parameters are most effective in improving cognitive recovery.

109. Sibilitz KL, Berg SK, Tang LH, Risom SS, Gluud C, Lindschou J, et al. Exercise‐based cardiac rehabilitation for adults after heart valve surgery. Cochrane Database Syst Rev. 2016(3).

http://dx.doi.org/10.1002/14651858.CD010876.pub2

- Background Exercise‐based cardiac rehabilitation may benefit heart valve surgery patients. We conducted a systematic review to assess the evidence for the use of exercise‐based intervention programmes following heart valve surgery. Objectives To assess the benefits and harms of exercise‐based cardiac rehabilitation compared with no exercise training intervention, or treatment as usual, in adults following heart valve surgery. We considered programmes including exercise training with or without another intervention (such as a psycho‐educational component). Search methods We searched: the Cochrane Central Register of Controlled Trials (CENTRAL); the Database of Abstracts of Reviews of Effects (DARE); MEDLINE (Ovid); EMBASE (Ovid); CINAHL (EBSCO); PsycINFO (Ovid); LILACS (Bireme); and Conference Proceedings Citation Index‐S (CPCI‐S) on Web of Science (Thomson Reuters) on 23 March 2015. We handsearched Web of Science, bibliographies of systematic reviews and trial registers (ClinicalTrials.gov, Controlled‐trials.com, and The World Health Organization International Clinical Trials Registry Platform). Selection criteria We included randomised clinical trials that investigated exercise‐based interventions compared with no exercise intervention control. The trial participants comprised adults aged 18 years or older who had undergone heart valve surgery for heart valve disease (from any cause) and received either heart valve replacement, or heart valve repair. Data collection and analysis Two authors independently extracted data. We assessed the risk of systematic errors (‘bias’) by evaluation of bias risk domains. Clinical and statistical heterogeneity were assessed. Meta‐analyses were undertaken using both fixed‐effect and random‐effects models. We used the GRADE approach to assess the quality of evidence. We sought to assess the risk of random errors with trial sequential analysis. Main results We included two trials from 1987 and 2004 with a total 148 participants who have had heart valve surgery. Both trials had a high risk of bias. There was insufficient evidence at 3 to 6 months follow‐up to judge the effect of exercise‐based cardiac rehabilitation compared to no exercise on mortality (RR 4.46 (95% confidence interval (CI) 0.22 to 90.78); participants = 104; studies = 1; quality of evidence: very low) and on serious adverse events (RR 1.15 (95% CI 0.37 to 3.62); participants = 148; studies = 2; quality of evidence: very low). Included trials did not report on health‐related quality of life (HRQoL), and the secondary outcomes of New York Heart Association class, left ventricular ejection fraction and cost. We did find that, compared with control (no exercise), exercise‐based rehabilitation may increase exercise capacity (SMD ‐0.47, 95% CI ‐0.81 to ‐0.13; participants = 140; studies = 2, quality of evidence: moderate). There was insufficient evidence at 12 months follow‐up for the return to work outcome (RR 0.55 (95% CI 0.19 to 1.56); participants = 44; studies = 1; quality of evidence: low). Due to limited information, trial sequential analysis could not be performed as planned. Authors' conclusions Our findings suggest that exercise‐based rehabilitation for adults after heart valve surgery, compared with no exercise, may improve exercise capacity. Due to a lack of evidence, we cannot evaluate the impact on other outcomes. Further high‐quality randomised clinical trials are needed in order to assess the impact of exercise‐based rehabilitation on patient‐relevant outcomes, including mortality and quality of life. Plain language summary Exercise‐based cardiac rehabilitation for adults after heart valve surgery Background Cardiac rehabilitation has been recommended as a treatment after heart valve surgery, but we have been unable to identify a previous systematic review of the evidence. This systematic review assesses the benefits and harms of exercise‐based cardiac rehabilitation in adults who have undergone heart valve surgery. Study characteristics We s arched for randomised clinical trials (experiments in which participants are randomly allocated to an experimental compared with a control intervention) examining the effect of exercise‐based cardiac rehabilitation compared with no exercise after heart valve surgery for heart valve disease (from any cause) in adults (18 years or older). Our literature searches were undertaken up to March 2015. Key results We found two randomised clinical trials published in 1987 and 2004 that included a total of 148 participants. Due to the limited amount of data, we were not able to determine the effect of exercise‐based rehabilitation on mortality, serious adverse events, health‐related quality of life, ability to return to work, New York Heart Association class, left ventricular ejection fraction, or cost. However, exercise‐based rehabilitation did appear to increase exercise capacity at up to 12 months follow‐up, although this should be interpreted with caution as the included trials had a high risk of systematic error (bias). Further randomised clinical trials are needed to definitely understand the effect of physical exercise in adults after heart valve surgery. Quality of the evidence Given that the included studies are relatively old, and included narrowly‐selected trial populations, the evidence is likely to be of limited applicability to clinical practice. Both trials had a high risk of bias (systematic errors) and the quality of the evidence was low. Due to the scarcity of the evidence there is also a high risk that the results may be subject to random errors (play of chance). Therefore, further high‐quality randomised clinical trials are needed to assess the effects of exercise‐based interventions.

110. Anderson L, Thompson DR, Oldridge N, Zwisler AD, Rees K, Martin N, et al. Exercise-based cardiac rehabilitation for coronary heart disease. Cochrane Database Syst Rev. 2016;2016(1):Cd001800.

BACKGROUND: Coronary heart disease (CHD) is the single most common cause of death globally. However, with falling CHD mortality rates, an increasing number of people live with CHD and may need support to manage their symptoms and prognosis. Exercise-based cardiac rehabilitation (CR) aims to improve the health and outcomes of people with CHD. This is an update of a Cochrane systematic review previously published in 2011. OBJECTIVES: To assess the effectiveness and cost-effectiveness of exercise-based CR (exercise training alone or in combination with psychosocial or educational interventions) compared with usual care on mortality, morbidity and HRQL in patients with CHD.To explore the potential study level predictors of the effectiveness of exercise-based CR in patients with CHD. SEARCH METHODS: We updated searches from the previous Cochrane review, by searching Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, Issue 6, 2014) from December 2009 to July 2014. We also searched MEDLINE (Ovid), EMBASE (Ovid), CINAHL (EBSCO) and Science Citation Index Expanded (December 2009 to July 2014). SELECTION CRITERIA: We included randomised controlled trials (RCTs) of exercise-based interventions with at least six months' follow-up, compared with a no exercise control. The study population comprised men and women of all ages who have had a myocardial infarction (MI), coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI), or who have angina pectoris, or coronary artery disease. We included RCTs that reported at least one of the following outcomes: mortality, MI, revascularisations, hospitalisations, health-related quality of life (HRQL), or costs. DATA COLLECTION AND ANALYSIS: Two review authors independently screened all identified references for inclusion based on the above inclusion and exclusion criteria. One author extracted data from the included trials and assessed their risk of bias; a second review author checked data. We stratified meta-analysis by the duration of follow up of trials, i.e. short-term: 6 to 12 months, medium-term: 13 to 36 months, and long-term: > 3 years. MAIN RESULTS: This review included 63 trials which randomised 14,486 people with CHD. This latest update identified 16 new trials (3872 participants). The population included predominantly post-MI and post-revascularisation patients and the mean age of patients within the trials ranged from 47.5 to 71.0 years. Women accounted for fewer than 15% of the patients recruited. Overall trial reporting was poor, although there was evidence of an improvement in quality of reporting in more recent trials.As we found no significant difference in the impact of exercise-based CR on clinical outcomes across follow-up, we focused on reporting findings pooled across all trials at their longest follow-up (median 12 months). Exercise-based CR reduced cardiovascular mortality compared with no exercise control (27 trials; risk ratio (RR) 0.74, 95% CI 0.64 to 0.86). There was no reduction in total mortality with CR (47 trials, RR 0.96, 95% CI 0.88 to 1.04). The overall risk of hospital admissions was reduced with CR (15 trials; RR 0.82, 95% CI 0.70 to 0.96) but there was no significant impact on the risk of MI (36 trials; RR 0.90, 95% CI 0.79 to 1.04), CABG (29 trials; RR 0.96, 95% CI 0.80 to 1.16) or PCI (18 trials; RR 0.85, 95% CI 0.70 to 1.04).There was little evidence of statistical heterogeneity across trials for all event outcomes, and there was evidence of small study bias for MI and hospitalisation, but no other outcome. Predictors of clinical outcomes were examined across the longest follow-up of studies using univariate meta-regression. Results show that benefits in outcomes were independent of participants' CHD case mix (proportion of patients with MI), type of CR (exercise only vs comprehensive rehabilitation) dose of exercise, length of follow-up, trial publication date, setting (centre vs home-based), study location (continent), sample size or risk of bias.Given the heterogeneity in outcome measures and reporting methods, meta-analysis was not undertaken for HRQL. In five out of 20 trials reporting HRQL using validated measures, there was evidence of significant improvement in most or all of the sub-scales with exercise-based CR compared to control at follow-up. Four trial-based economic evaluation studies indicated exercise-based CR to be a potentially cost-effective use of resources in terms of gain in quality-adjusted life years.The quality of the evidence for outcomes reported in the review was rated using the GRADE method. The quality of the evidence varied widely by outcome and ranged from low to moderate. AUTHORS' CONCLUSIONS: This updated Cochrane review supports the conclusions of the previous version of this review that, compared with no exercise control, exercise-based CR reduces the risk of cardiovascular mortality but not total mortality. We saw a significant reduction in the risk of hospitalisation with CR but not in the risk of MI or revascularisation. We identified further evidence supporting improved HRQL with exercise-based CR. More recent trials were more likely to be well reported and include older and female patients. However, the population studied in this review still consists predominantly of lower risk individuals following MI or revascularisation. Further well conducted RCTs are needed to assess the impact of exercise-based CR in higher risk CHD groups and also those presenting with stable angina. These trials should include validated HRQL outcome measures, explicitly report clinical event outcomes including mortality and hospital admissions, and assess costs and cost-effectiveness.

111. Anderson L, Nguyen TT, Dall CH, Burgess L, Bridges C, Taylor RS. Exercise‐based cardiac rehabilitation in heart transplant recipients. Cochrane Database Syst Rev. 2017(4).

http://dx.doi.org/10.1002/14651858.CD012264.pub2

- Background Heart transplantation is considered to be the gold standard treatment for selected patients with end‐stage heart disease when medical therapy has been unable to halt progression of the underlying pathology. Evidence suggests that aerobic exercise training may be effective in reversing the pathophysiological consequences associated with cardiac denervation and prevent immunosuppression‐induced adverse effects in heart transplant recipients. Objectives To determine the effectiveness and safety of exercise‐based rehabilitation on the mortality, hospital admissions, adverse events, exercise capacity, health‐related quality of life, return to work and costs for people after heart transplantation. Search methods We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library, MEDLINE (Ovid), Embase (Ovid), CINAHL (EBSCO) and Web of Science Core Collection (Thomson Reuters) to June 2016. We also searched two clinical trials registers and handsearched the reference lists of included studies. Selection criteria We included randomised controlled trials (RCTs) of parallel group, cross‐over or cluster design, which compared exercise‐based interventions with (i) no exercise control (ii) a different dose of exercise training (e.g. low‐ versus high‐intensity exercise training); or (iii) an active intervention (i.e. education, psychological intervention). The study population comprised adults aged 18 years or over who had received a heart transplant. Data collection and analysis Two review authors independently screened all identified references for inclusion based on pre‐specified inclusion criteria. Disagreements were resolved by consensus or by involving a third person. Two review authors extracted outcome data from the included trials and assessed their risk of bias. One review author extracted study characteristics from included studies and a second author checked them against the trial report for accuracy. Main results We included 10 RCTs that involved a total of 300 participants whose mean age was 54.4 years. Women accounted for fewer than 25% of all study participants. Nine trials which randomised 284 participants to receive exercise‐based rehabilitation (151 participants) or no exercise (133 participants) were included in the main analysis. One cross‐over RCT compared high‐intensity interval training with continued moderate‐intensity training in 16 participants. We reported findings for all trials at their longest follow‐up (median 12 weeks). Exercise‐based cardiac rehabilitation increased exercise capacity (VO 2peak ) compared with no exercise control (MD 2.49 mL/kg/min, 95% CI 1.63 to 3.36; N = 284; studies = 9; moderate quality evidence). There was evidence from one trial that high‐intensity interval exercise training was more effective in improving exercise capacity than continuous moderate‐intensity exercise (MD 2.30 mL/kg/min, 95% CI 0.59 to 4.01; N = 16; 1 study). Four studies reported health‐related quality of life (HRQoL) measured using SF‐36, Profile of Quality of Life in the Chronically Ill (PLC) and the World Health Organization Quality Of Life (WHOQoL) ‐ BREF. Due to the variation in HRQoL outcomes and methods of reporting we were unable to meta‐analyse results across studies, but there was no evidence of a difference between exercise‐based cardiac rehabilitation and control in 18 of 21 HRQoL domains reported, or between high and moderate intensity exercise in any of the 10 HRQoL domains reported. One adverse event was reported by one study. Exercise‐based cardiac rehabilitation improves exercise capacity, but exercise was found to have no impact on health‐related quality of life in the short‐term (median 12 weeks follow‐up), in heart transplant recipients whose health is stable. There was no evidence of statistical heterogeneity across trials for exercise capacity and no evidence of small study bias. The overall risk of bias in included studies was judged as low or unclear; more than 50% of included st dies were assessed at unclear risk of bias with respect to allocation concealment, blinding of outcome assessors and declaration of conflicts of interest. Evidence quality was assessed as moderate according to GRADE criteria. Authors' conclusions We found moderate quality evidence suggesting that exercise‐based cardiac rehabilitation improves exercise capacity, and that exercise has no impact on health‐related quality of life in the short‐term (median 12 weeks follow‐up), in heart transplant recipients. Cardiac rehabilitation appears to be safe in this population, but long‐term follow‐up data are incomplete and further good quality and adequately‐powered trials are needed to demonstrate the longer‐term benefits of exercise on safety and impact on both clinical and patient‐related outcomes, such as health‐related quality of life, and healthcare costs. Plain language summary Exercise‐based cardiac rehabilitation for patients following a heart transplantation Review question We wanted to find out if exercise training versus no exercise training following heart transplant effects numbers of deaths, hospital admissions, harms, exercise capacity, health‐related quality of life, return to work and costs. Background Heart transplantation is considered to be the best treatment for some people with heart disease whose medical therapy cannot stop progression of their illness. Clinical practice guidelines recommend exercise training for people who receive heart transplants, despite limited information on the long‐term benefits or harms. Search date We searched up to June 2016. Study characteristics We searched for randomised controlled trials (experiments that randomly allocate participants to one of two or more treatment groups) looking at the effectiveness of exercise‐based rehabilitation programmes compared with no exercise, or a different type or intensity of exercise, in people aged 18 years or over, who were heart transplant recipients. Key results We included 10 trials that studied 300 people who were heart transplant recipients. Nine studies compared exercise with no exercise; one study compared high‐intensity interval training with continuous moderate‐intensity exercise. We found that exercise‐based cardiac rehabilitation led to an increase in the exercise capacity of heart transplant recipients compared to not undertaking exercise. There was evidence of better exercise capacity following high‐intensity interval training compared to continuous moderate‐intensity exercise. Four studies reported health‐related quality of life, but there was no evidence of differences between exercise training and no exercise training in most (18/21) aspects reported, or between high‐ and moderate‐intensity exercise. One adverse event was reported in one study. Risk of bias in the included studies was assessed as low or unclear; lack of reporting made assessment for more than half of included studies challenging. Study funding sources Six (of 10) trials reported sources of funding. None reported funding from agencies with commercial interests in the results. Quality of the evidence Poor reporting or few participants in the analyses led to evidence quality being judged as moderate for both exercise capacity and health‐related quality of life. Evidence suggested that exercise‐based cardiac rehabilitation improves exercise capacity, and that exercise has no impact on health‐related quality of life in the short‐term (median 12 weeks follow‐up), in heart transplant recipients whose health is stable. Further research is needed to establish long‐term impacts of exercise‐based rehabilitation on important aspects such as risk of death and hospital admission.

112. Wong WT, Lai VKW, Chee YE, Lee A. Fast‐track cardiac care for adult cardiac surgical patients. Cochrane Database Syst Rev. 2016(9).

http://dx.doi.org/10.1002/14651858.CD003587.pub3

- Background Fast‐track cardiac care is a complex intervention involving several components of care during cardiac anaesthesia and in the postoperative period, with the ultimate aim of early extubation after surgery, to reduce length of stay in the intensive care unit and in the hospital. Safe and effective fast‐track cardiac care may reduce hospital costs. This is an update of a Cochrane review first published in 2003, updated in 2012 and updated now in 2016. Objectives To determine the safety and effectiveness of fast‐track cardiac care compared with conventional (not fast‐track) care in adult patients undergoing cardiac surgery. Fast‐track cardiac care intervention includes administration of low‐dose opioid‐based general anaesthesia or use of a time‐directed extubation protocol, or both. Search methods We searched the Cochrane Central Register of Controlled Trials (CENTRAL; 2015, Issue 5), MEDLINE (January 2012 to May 2015), Embase (January 2012 to May 2015), the Cumulative Index to Nursing and Allied Health Literature (CINAHL; January 2012 to May 2015) and the Institute for Scientific Information (ISI) Web of Science (January 2012 to May 2015), along with reference lists of articles, to identify additional trials. We applied no language restrictions. Selection criteria We included all randomized controlled trials of adult cardiac surgical patients (coronary artery bypass grafts, aortic valve replacement, mitral valve replacement) that compared fast‐track cardiac care and conventional (not fast‐track) care groups. We focused on the following fast‐track interventions, which were designed for early extubation after surgery: administration of low‐dose opioid‐based general anaesthesia during cardiac surgery and use of a time‐directed extubation protocol after surgery. The primary outcome was risk of mortality. Secondary outcomes included postoperative complications, reintubation within 24 hours of surgery, time to extubation, length of stay in the intensive care unit and in the hospital, quality of life after surgery and hospital costs. Data collection and analysis Two review authors independently assessed trial quality and extracted study data. We contacted study authors for additional information. We calculated a Peto odds ratio (OR) for risk of mortality and used a random‐effects model to report risk ratio (RR), mean difference (MD) and 95% confidence intervals (95% CIs) for all secondary outcomes. Main results We included 28 trials (4438 participants) in the updated review. We considered most participants to be at low to moderate risk of death after surgery. We assessed two studies as having low risk of bias and 11 studies high risk of bias. Investigators reported no differences in risk of mortality within the first year after surgery between low‐dose versus high‐dose opioid‐based general anaesthesia groups (OR 0.53, 95% CI 0.25 to 1.12; eight trials, 1994 participants, low level of evidence) and between a time‐directed extubation protocol versus usual care (OR 0.80, 95% CI 0.45 to 1.45; 10 trials, 1802 participants, low level of evidence). Researchers noted no significant differences between low‐dose and high‐dose opioid‐based anaesthesia groups in the following postoperative complications: myocardial infarction (RR 0.98, 95% CI 0.48 to 1.99; eight trials, 1683 participants, low level of evidence), stroke (RR 1.17, 95% CI 0.36 to 3.78; five trials, 562 participants, low level of evidence) and tracheal reintubation (RR 1.77, 95% CI 0.38 to 8.27; five trials, 594 participants, low level of evidence). Comparisons with usual care revealed no significant differences in the risk of postoperative complications associated with a time‐directed extubation protocol: myocardial infarction (RR 0.59, 95% CI 0.27 to 1.31; eight trials, 1378 participants, low level of evidence), stroke (RR 0.85, 95% CI 0.33 to 2.16; 11 trials, 1646 participants, low level of evidence) and tracheal reintubation (RR 1.34, 95% CI 0.74 to 2.41; 12 trials, 1261 participants, low level of evide ce). Although levels of heterogeneity were high, low‐dose opioid anaesthesia was associated with reduced time to extubation (reduction of 4.3 to 10.5 hours, 14 trials, 2486 participants, low level of evidence) and length of stay in the intensive care unit (reduction of 0.4 to 7.0 hours, 12 trials, 1394 participants, low level of evidence). Use of a time‐directed extubation protocol was associated with reduced time to extubation (reduction of 3.7 to 8.8 hours, 16 trials, 2024 participants, low level of evidence) and length of stay in the intensive care unit (reduction of 3.9 to 10.5 hours, 13 trials, 1888 participants, low level of evidence). However, these two fast‐track care interventions were not associated with reduced total length of stay in the hospital (low level of evidence). Authors' conclusions Low‐dose opioid‐based general anaesthesia and time‐directed extubation protocols for fast‐track interventions have risks of mortality and major postoperative complications similar to those of conventional (not fast‐track) care, and therefore appear to be safe for use in patients considered to be at low to moderate risk. These fast‐track interventions reduced time to extubation and shortened length of stay in the intensive care unit but did not reduce length of stay in the hospital. Plain language summary Fast‐track interventions of low‐dose opioid‐based general anaesthesia and early tracheal extubation in adults undergoing cardiac surgery Review question Fast‐track cardiac care involves early removal, within eight hours of heart surgery, of the tube that provides mechanical breathing support (called early tracheal extubation) to enable cardiac surgery. This review examined evidence on the effectiveness and safety of fast‐track care compared with conventional (not fast‐track) care. We have updated the published evidence that we identified in 2012. It is now current to March 2016. Background In the past, adults were given high‐dose opioid‐based anaesthesia for cardiac surgery and were provided with mechanical breathing support overnight in an intensive care unit after surgery. Now, many surgical units remove the tube that provides mechanical breathing support when the patient is on the operating table or within hours after cardiac surgery. They use time‐directed protocols for removing breathing support. Some patients recover in an intensive care unit (ICU) or in a dedicated unit outside the ICU. It is important to improve hospital efficiency by using safe fast‐track interventions. Study characteristics We found 28 relevant randomized controlled studies, conducted between 1994 and 2015. Most of the 4438 adults who participated in these studies were undergoing first‐time elective coronary artery graft bypass or valve replacement surgery, or both. They were at low to moderate risk of death after surgery. Eighteen studies examined the use of low‐dose opioid‐based general anaesthesia. Sixteen studies assessed how effective the protocols were in guiding staff to remove the tube that provided breathing support within eight hours after surgery. Key findings and quality of evidence We found no differences in risk of death in the first year after surgery (18 trials, 3796 participants) nor in complications after surgery such as the need to replace the tracheal tube after surgery (17 trials, 1855 participants) and occurrence of myocardial infarction (16 trials, 3061 participants) or stroke (16 trials, 2208 participants), when we examined both types of interventions. Occurrences of acute renal failure, major bleeding, sepsis and wound infection also were not different. We rated the quality of evidence as low for both mortality and postoperative complications. Tracheal tubes were removed from adults in the fast‐track care group up to a half day earlier than for those in the conventional care group. The fast‐track group spent less time in the intensive care unit, but length of time spent in the hospital was similar between groups. The quality of evidence was low because of study limitations nd unexplained variation in study findings. Large trials were few, and only one trial was designed to study postoperative effects of myocardial infarction, stroke or death. Our results did not apply to ‘high‐risk' patients who had multiple concurrent health problems or to settings in which a short‐acting opioid (remifentanil) was used for general anaesthesia. Conclusion Fast‐track cardiac care is safe in patients considered to be at low to moderate risk of death after surgery.

113. Postma S, Kolkman E, Rubinstein SM, Jansma EP, De Luca G, Suryapranata H, et al. Field triage in the ambulance versus referral via non-percutaneous coronary intervention centre in ST-elevation myocardial infarction patients undergoing primary percutaneous coronary intervention: A systematic review. Eur Heart J Acute Cardiovasc Care. 2017;6(5):396-403.

AIMS: The purpose of this study was to determine whether direct ambulance transport of ST-elevation myocardial infarction (STEMI) patients to a percutaneous coronary intervention (PCI) hospital (field triage) leads to a lower 30-day mortality compared to transport via a referral non-PCI hospital (referral via a spoke centre) in STEMI patients. METHODS AND RESULTS: We performed a systematic review of interventions. An experienced librarian searched in PubMed, EMBASE.com and The Cochrane Library (via Wiley) from January 1980-February 2013. Studies that examined field triage and/or referral via a spoke centre in STEMI patients treated with primary or facilitated PCI were included. Two authors independently conducted the study selection and data extraction. Multivariable frequency weighted logistic regression analysis was performed to assess the effect of the type of transfer on the outcome measures. We identified 14 randomised clinical trials (RCTs), including 20 transfer groups and 4474 participants. Thirty-day mortality was lower in patients who underwent field triage (3.0%; 95% confidence interval (CI) 2.2-4.2) compared to patients who were referred via a spoke centre (4.7%; 95% CI 4.0-5.5). In multivariable frequency weighted logistic regression analysis, field triage was independently associated with a lower incidence of 30-day mortality (odds ratio (OR): 0.58; 95% CI 0.37-0.89). CONCLUSION: Field triage compared to referral via a spoke centre leads to a lower 30-day mortality in STEMI patients. Therefore, direct ambulance transport to a PCI hospital should become the transfer type for STEMI patients.

114. Amare AT, Schubert KO, Klingler-Hoffmann M, Cohen-Woods S, Baune BT. The genetic overlap between mood disorders and cardiometabolic diseases: a systematic review of genome wide and candidate gene studies. Transl Psychiatry. 2017;7(1):e1007.

Meta-analyses of genome-wide association studies (meta-GWASs) and candidate gene studies have identified genetic variants associated with cardiovascular diseases, metabolic diseases and mood disorders. Although previous efforts were successful for individual disease conditions (single disease), limited information exists on shared genetic risk between these disorders. This article presents a detailed review and analysis of cardiometabolic diseases risk (CMD-R) genes that are also associated with mood disorders. First, we reviewed meta-GWASs published until January 2016, for the diseases 'type 2 diabetes, coronary artery disease, hypertension' and/or for the risk factors 'blood pressure, obesity, plasma lipid levels, insulin and glucose related traits'. We then searched the literature for published associations of these CMD-R genes with mood disorders. We considered studies that reported a significant association of at least one of the CMD-R genes and 'depression' or 'depressive disorder' or 'depressive symptoms' or 'bipolar disorder' or 'lithium treatment response in bipolar disorder', or 'serotonin reuptake inhibitors treatment response in major depression'. Our review revealed 24 potential pleiotropic genes that are likely to be shared between mood disorders and CMD-Rs. These genes include MTHFR, CACNA1D, CACNB2, GNAS, ADRB1, NCAN, REST, FTO, POMC, BDNF, CREB, ITIH4, LEP, GSK3B, SLC18A1, TLR4, PPP1R1B, APOE, CRY2, HTR1A, ADRA2A, TCF7L2, MTNR1B and IGF1. A pathway analysis of these genes revealed significant pathways: corticotrophin-releasing hormone signaling, AMPK signaling, cAMP-mediated or G-protein coupled receptor signaling, axonal guidance signaling, serotonin or dopamine receptors signaling, dopamine-DARPP32 feedback in cAMP signaling, circadian rhythm signaling and leptin signaling. Our review provides insights into the shared biological mechanisms of mood disorders and cardiometabolic diseases.

115. Nordestgaard LT, Tybjærg-Hansen A, Rasmussen KL, Nordestgaard BG, Frikke-Schmidt R. Genetic variation in clusterin and risk of dementia and ischemic vascular disease in the general population: cohort studies and meta-analyses of 362,338 individuals. BMC Med. 2018;16(1):39.

BACKGROUND: Clusterin, also known as apolipoprotein J (apoJ), is one of the most abundantly expressed apolipoproteins in the brain after apolipoprotein E (apoE). Like the ε4 allele of the apolipoprotein E gene (APOE), the clusterin gene (CLU) is a risk locus for Alzheimer's disease, and may play additional roles in atherosclerosis pathogenesis. We tested whether genetic variation in CLU was associated with either Alzheimer's disease or atherosclerosis-related diseases. METHODS: We studied individual data on 103,987 participants from the Copenhagen General Population Study (CGPS) and the Copenhagen City Heart Study (CCHS). We genotyped a common CLU variant (rs9331896) and two common APOE variants (rs7412 and rs429358), defining the ε2, ε3, and ε4, alleles in CGPS and CCHS. All individuals in the CGPS and CCHS cohorts were followed from study inclusion to occurrence of event, death, emigration, or until 10 November 2014, whichever came first. Summary consortia data on 258,351 individuals from the International Genomics of Alzheimer's Project (IGAP) and the Coronary Artery Disease Genome-wide Replication and Meta-analysis plus the Coronary Artery Disease (C4D) Genetics and 1000-Genomes-based genome-wide association studies (CARDIoGRAMplusC4D) were used in meta-analyses. RESULTS: In CGPS and CCHS, multifactorially adjusted hazard ratios for Alzheimer's disease, all dementia, vascular dementia, ischemic cerebrovascular disease, and ischemic heart disease were 1.18 (1.07-1.30), 1.09 (1.02-1.17), 0.96 (0.80-1.17), 1.02 (0.97-1.07), and 0.97 (0.93-1.01) per T allele, respectively. Multifactorially adjusted hazard ratios for Alzheimer's disease and all dementia were 2.72 (2.45-3.01) and 2.21 (2.05-2.38) for the APOE ɛ4 allele. There was no interaction between rs9331896 in CLU and rs429358 (defining the ɛ4 allele) in APOE in predicting Alzheimer's disease or all dementia (P = 0.39 and P = 0.21). In a meta-analysis including consortium data, the overall fixed- and random-effects odds ratios for Alzheimer's disease per T allele were 1.16 (1.13-1.18) (I (2) = 0.0%; P for heterogeneity = 0.89). CONCLUSIONS: A common variant in CLU was associated with a high risk of Alzheimer's disease and all dementia in the general population but not with vascular dementia or ischemic vascular disease. Important novel aspects compared to previous studies are the incorporation of individual risk factor data, the exact causative ε4 allele, and several subtypes of dementia and atherosclerosis-related endpoints.

116. Ligthart S, Vaez A, Võsa U, Stathopoulou MG, de Vries PS, Prins BP, et al. Genome Analyses of >200,000 Individuals Identify 58 Loci for Chronic Inflammation and Highlight Pathways that Link Inflammation and Complex Disorders. Am J Hum Genet. 2018;103(5):691-706.

C-reactive protein (CRP) is a sensitive biomarker of chronic low-grade inflammation and is associated with multiple complex diseases. The genetic determinants of chronic inflammation remain largely unknown, and the causal role of CRP in several clinical outcomes is debated. We performed two genome-wide association studies (GWASs), on HapMap and 1000 Genomes imputed data, of circulating amounts of CRP by using data from 88 studies comprising 204,402 European individuals. Additionally, we performed in silico functional analyses and Mendelian randomization analyses with several clinical outcomes. The GWAS meta-analyses of CRP revealed 58 distinct genetic loci (p < 5 × 10(-8)). After adjustment for body mass index in the regression analysis, the associations at all except three loci remained. The lead variants at the distinct loci explained up to 7.0% of the variance in circulating amounts of CRP. We identified 66 gene sets that were organized in two substantially correlated clusters, one mainly composed of immune pathways and the other characterized by metabolic pathways in the liver. Mendelian randomization analyses revealed a causal protective effect of CRP on schizophrenia and a risk-increasing effect on bipolar disorder. Our findings provide further insights into the biology of inflammation and could lead to interventions for treating inflammation and its clinical consequences.

117. Joshi PK, Pirastu N, Kentistou KA, Fischer K, Hofer E, Schraut KE, et al. Genome-wide meta-analysis associates HLA-DQA1/DRB1 and LPA and lifestyle factors with human longevity. Nat Commun. 2017;8(1):910.

Genomic analysis of longevity offers the potential to illuminate the biology of human aging. Here, using genome-wide association meta-analysis of 606,059 parents' survival, we discover two regions associated with longevity (HLA-DQA1/DRB1 and LPA). We also validate previous suggestions that APOE, CHRNA3/5, CDKN2A/B, SH2B3 and FOXO3A influence longevity. Next we show that giving up smoking, educational attainment, openness to new experience and high-density lipoprotein (HDL) cholesterol levels are most positively genetically correlated with lifespan while susceptibility to coronary artery disease (CAD), cigarettes smoked per day, lung cancer, insulin resistance and body fat are most negatively correlated. We suggest that the effect of education on lifespan is principally mediated through smoking while the effect of obesity appears to act via CAD. Using instrumental variables, we suggest that an increase of one body mass index unit reduces lifespan by 7 months while 1 year of education adds 11 months to expected lifespan.Variability in human longevity is genetically influenced. Using genetic data of parental lifespan, the authors identify associations at HLA-DQA/DRB1 and LPA and find that genetic variants that increase educational attainment have a positive effect on lifespan whereas increasing BMI negatively affects lifespan.

118. Breuckmann F, Hochadel M, Darius H, Giannitsis E, Münzel T, Maier LS, et al. Guideline-adherence and perspectives in the acute management of unstable angina - Initial results from the German chest pain unit registry. J Cardiol. 2015;66(2):108-13.

BACKGROUND: We investigated the current management of unstable angina pectoris (UAP) in certified chest pain units (CPUs) in Germany and focused on the European Society of Cardiology (ESC) guideline-adherence in the timing of invasive strategies or choice of conservative treatment options. More specifically, we analyzed differences in clinical outcome with respect to guideline-adherence. METHOD: Prospective data from 1400 UAP patients were collected. Analyses of high-risk criteria with indication for invasive management and 3-month clinical outcome data were performed. Guideline-adherence was tested for a primarily conservative strategy as well as for percutaneous coronary intervention (PCI) within <24 and <72h after admission. RESULTS: Overall guideline-conforming management was performed in 38.2%. In UAP patients at risk, undertreatment caused by an insufficient consideration of risk criteria was obvious in 78%. Reciprocally, overtreatment in the absence of adequate risk markers was performed in 27%, whereas a guideline-conforming primarily conservative strategy was chosen in 73% of the low-risk patients. Together, the 3-month major adverse coronary and cerebrovascular events (MACCE) were low (3.6%). Nonetheless, guideline-conforming treatment was even associated with significantly lower MACCE rates (1.6% vs. 4.0%, p<0.05). CONCLUSION: The data suggest an inadequate adherence to ESC guidelines in nearly two thirds of the patients, particularly in those patients at high to intermediate risk with secondary risk factors, emphasizing the need for further attention to consistent risk profiling in the CPU and its certification process.

119. Breuckmann F, Remberg F, Böse D, Lichtenberg M, Kümpers P, Pavenstädt H, et al. Guideline-conforming timing of invasive management in troponin-positive or high-risk ACS without persistent ST-segment elevation in German chest pain units. Urban university maximum care vs. rural regional primary care. Herz. 2016;41(2):151-8.

AIM: This study aimed to analyze guideline adherence in the timing of invasive management for myocardial infarction without persistent ST-segment elevation (NSTEMI) in two exemplary German centers, comparing an urban university maximum care facility and a rural regional primary care facility. METHODS: All patients diagnosed as having NSTEMI during 2013 were retrospectively enrolled in two centers: (1) site I, a maximum care center in an urban university setting, and (b) site II, a primary care center in a rural regional care setting. Data acquisition included time intervals from admission to invasive management, risk criteria, rate of intervention, and medical therapy. RESULTS: The median time from admission to coronary angiography was 12.0 h (site I) or 17.5 h (site II; p = 0.17). Guideline-adherent timing was achieved in 88.1 % (site I) or 82.9 % (site II; p = 0.18) of cases. Intervention rates were high in both sites (site I-75.5 % vs. site II-75.3 %; p = 0.85). Adherence to recommendations of medical therapy was high and comparable between the two sites. CONCLUSION: In NSTEMI or high-risk acute coronary syndromes without persistent ST-segment elevation, guideline-adherent timing of invasive management was achieved in about 85 % of cases, and was comparable between urban maximum and rural primary care settings. Validation by the German Chest Pain Unit Registry including outcome analysis is required.

120. Pokharel Y, Wei J, Hira RS, Kalra A, Shore S, Kerkar PG, et al. Guideline-Directed Medication Use in Patients With Heart Failure With Reduced Ejection Fraction in India: American College of Cardiology's PINNACLE India Quality Improvement Program. Clin Cardiol. 2016;39(3):145-9.

Little is known about the use of guideline-directed medical therapy (GDMT) in outpatients with heart failure with reduced left ventricular ejection fraction (HFrEF; ≤40%) in India. Our objective was to understand the use of GDMT in outpatients with HFrEF in India. The Practice Innovation And Clinical Excellence (PINNACLE) India Quality Improvement Program (PIQIP) is a registry for cardiovascular quality improvement in India supported by the American College of Cardiology Foundation. Between January 2008 and September 2014, we evaluated documentation of use of angiotensin-converting enzyme inhibitors (ACEIs)/angiotensin receptor blockers (ARBs) and β-blockers, or both, among outpatients with HFrEF seeking care in 10 centers enrolled in the PIQIP registry. Among 75 639 patients in the PIQIP registry, 34 995 had EF reported, and 15 870 had an EF ≤40%. The mean age was 56 years; 23% were female. Hypertension, diabetes, coronary artery disease, and myocardial infarction were present in 37%, 23%, 27%, and 17%, respectively. Use of ACEIs/ARBs, β-blockers, and both were documented in 33.5%, 34.9%, and 29.6% of patients, respectively. The documentation of GDMT was higher in men, in patients age ≥65 years, and in those with presence of hypertension, diabetes, or coronary artery disease. Documentation of GDMT gradually increased over the study period. Among patients enrolled in the PIQIP registry, about two-thirds of patients with EF ≤40% did not have documented receipt of GDMT. This study is an initial step toward improving adherence to GDMT in India and highlights the feasibility of examining quality of care in HFrEF in a resource-limited setting.

121. Joseph J, Velasco A, Hage FG, Reyes E. Guidelines in review: Comparison of ESC and ACC/AHA guidelines for the diagnosis and management of patients with stable coronary artery disease. J Nucl Cardiol. 2018;25(2):509-15.

In 2012, the American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) Task Force on Practice Guidelines jointly with the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons produced a set of recommendations intended to assist physicians in the diagnosis and management of patients with stable ischemic heart disease. Two years later, a focused update on the 2012 guidelines was published. A year before this update, The Task Force on the management of stable coronary artery disease (CAD) of the European Society of Cardiology (ESC) issued a guideline on the management of stable CAD. This document brings together European and American recommendations that include the use of stress testing and non-invasive imaging for the diagnosis and management of patients with known or suspected stable CAD.

122. Butland M, Corones-Watkins K, Evanson AD, Cooke M. Health behaviours of rural Australians following percutaneous coronary intervention: a systematic scoping review. Rural Remote Health. 2019;19(2):4854.

INTRODUCTION: Following a percutaneous coronary intervention (PCI), emphasis is placed on healthy lifestyle modification by means of secondary prevention. The literature suggests Australians have difficulty within the period following a PCI, particularly the rural cohort. Despite having a higher incidence of cardiac disease, there is minimal evidence on secondary prevention within the rural Australian population. Therefore, there is a clear need for a comprehensive review to gather literature of the health behaviours of this population post-PCI. METHODS: A scoping review was undertaken to obtain literature within 2007-2017. The following databases were searched in January 2018: Cochrane Library, Cumulative Index to Nursing and Allied Health Literature, PubMed Central, Embase, ProQuest and PsycINFO. Search strings were derived from three topics: 'behaviours', 'rural' and 'PCI'. RESULTS: Ten publications met the inclusion criteria. Over half the studies were of a quantitative design, along with one qualitative study. Overall, there was minimal published literature on the rural Australian population. Three key themes were identified from the literature: referral and attendance to cardiac rehabilitation, isolation and transitioning difficulties. CONCLUSIONS: The systematic scoping review highlights the need for future research to determine strategies to improve healthy behaviours of rural Australians post-PCI.

123. Ghisi GLM, Chaves G, Britto RR, Oh P. Health literacy and coronary artery disease: A systematic review. Patient Educ Couns. 2018;101(2):177-84.

OBJECTIVE: Identify health literacy (HL) screening instruments available to CAD patients; describe the prevalence of low HL; explore the predictors of low HL; and, identify the association between HL, health behaviors, and outcomes among these patients. METHODS: A literature search of electronic databases was conducted for published articles from database inception to February 2017. Eligible articles included the assessment of HL in CAD patients. Health behaviors and outcomes included diet, exercise, smoking, medication use, hospital readmission, knowledge, health-related quality of life (HRQoL), and psychosocial indicators. RESULTS: Overall, ten articles were included, of which two were RCTs, and seven were considered "good" quality. The most used screening instruments were REALM and TOFHLA. The average prevalence of low HL was 30.5%. Low HL participants were more likely to be older, male, from a non-white ethnic group, have many CVD comorbidities, lower educational level, disadvantaged socioeconomic position, and less likely to be employed. Low HL was consistently associated with hospital readmissions, low HRQoL, higher anxiety and lower social support. CONCLUSION: The literature on HL in CAD patients is very limited. PRACTICE IMPLICATIONS: Healthcare providers should start adopting strategies that can potentially mitigate the impact of low HL in the care of CAD patients.

124. Slim AM, Jerome S, Blankstein R, Weigold WG, Patel AR, Kalra DK, et al. Healthcare Policy Statement on the Utility of Coronary Computed Tomography for Evaluation of Cardiovascular Conditions and Preventive Healthcare: From the Health Policy Working Group of the Society of Cardiovascular Computed Tomography. J Cardiovasc Comput Tomogr. 2017;11(5):404-14.

The rising cost of healthcare is prompting numerous policy and advocacy discussions regarding strategies for constraining growth and creating a more efficient and effective healthcare system. Cardiovascular imaging is central to the care of patients at risk of, and living with, heart disease. Estimates are that utilization of cardiovascular imaging exceeds 20 million studies per year. The Society of Cardiovascular CT (SCCT), alongside Rush University Medical Center, and in collaboration with government agencies, regional payers, and industry healthcare experts met in November 2016 in Chicago, IL to evaluate obstacles and hurdles facing the cardiovascular imaging community and how they can contribute to efficacy while maintaining or even improving outcomes and quality. The summit incorporated inputs from payers, providers, and patients' perspectives, providing a platform for all voices to be heard, allowing for a constructive dialogue with potential solutions moving forward. This article outlines the proceedings from the summit, with a detailed review of past hurdles, current status, and potential solutions as we move forward in an ever-changing healthcare landscape.

125. Housholder-Hughes SD, Martin MM, McFarland MR, Creech CJ, Shea MJ. Healthcare provider compliance with the 2013 ACC/AHA Adult Cholesterol Guideline recommendation for high-intensity dose statins for patients with coronary artery disease. Heart Lung. 2017;46(4):328-33.

BACKGROUND: Atherosclerotic cardiovascular disease is the foremost cause of death for U.S. adults. The 2013 ACC/AHA Adult Cholesterol Guidelines recommend high-intensity dose statins for individuals with coronary artery disease (CAD). OBJECTIVE: To determine healthcare provider compliance with the Cholesterol Guideline recommendation specific to high-intensity dose statins for patients with CAD. METHODS: A retrospective chart review was conducted to determine compliance rate. A questionnaire was developed to evaluate healthcare provider beliefs, attitudes, and self-confidence toward this recommendation. RESULTS: Of the 473 patients with CAD, 67% were prescribed a high-intensity dose statin. Patients with non-ST segment myocardial infarction and ST segment myocardial infarction were more likely to be prescribed a high-intensity dose statin versus a moderate or low-intensity dose. Healthcare providers strongly agreed with this guideline recommendation. CONCLUSION: There exists a dichotomy between intention to prescribe and actual prescribing behaviors of high-intensity dose statin for patients with CAD.

126. Morbach C, Wagner M, Güntner S, Malsch C, Oezkur M, Wood D, et al. Heart failure in patients with coronary heart disease: Prevalence, characteristics and guideline implementation - Results from the German EuroAspire IV cohort. BMC Cardiovasc Disord. 2017;17(1):108.

BACKGROUND: Adherence to pharmacotherapeutic treatment guidelines in patients with heart failure (HF) is of major prognostic importance, but thorough implementation of guidelines in routine care remains insufficient. Our aim was to investigate prevalence and characteristics of HF in patients with coronary heart disease (CHD), and to assess the adherence to current HF guidelines in patients with HF stage C, thus identifying potential targets for the optimization of guideline implementation. METHODS: Patients from the German sample of the European Action on Secondary and Primary Prevention by Intervention to Reduce Events (EuroAspire) IV survey with a hospitalization for CHD within the previous six to 36 months providing valid data on echocardiography as well as on signs and symptoms of HF were categorized into stages of HF: A, prevalence of risk factors for developing HF; B, asymptomatic but with structural heart disease; C, symptomatic HF. A Guideline Adherence Indicator (GAI-3) was calculated for patients with reduced (≤40%) left ventricular ejection fraction (HFrEF) as number of drugs taken per number of drugs indicated; beta-blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers, and mineralocorticoid receptor antagonists (MRA) were considered. RESULTS: 509/536 patients entered analysis. HF stage A was prevalent in n = 20 (3.9%), stage B in n = 264 (51.9%), and stage C in n = 225 (44.2%) patients; 94/225 patients were diagnosed with HFrEF (42%). Stage C patients were older, had a longer duration of CHD, and a higher prevalence of arterial hypertension. Awareness of pre-diagnosed HF was low (19%). Overall GAI-3 of HFrEF patients was 96.4% with a trend towards lower GAI-3 in patients with lower LVEF due to less thorough MRA prescription. CONCLUSIONS: In our sample of CHD patients, prevalence of HF stage C was high and a sizable subgroup suffered from HFrEF. Overall, pharmacotherapy was fairly well implemented in HFrEF patients, although somewhat worse in patients with more reduced ejection fraction. Two major targets were identified possibly suited to further improve the implementation of HF guidelines: 1) increase patients´ awareness of diagnosis and importance of HF; and 2) disseminate knowledge about the importance of appropriately implementing the use of mineralocorticoid receptor antagonists. TRIAL REGISTRATION: This is a cross-sectional analysis of a non-interventional study. Therefore, it was not registered as an interventional trial.

127. Pedrazzini GB, Ferrari E, Zellweger M, Genoni M. Heart Team: Joint Position of the Swiss Society of Cardiology and the Swiss Society of Cardiac Surgery. Thorac Cardiovasc Surg. 2017;65(7):519-23.

The Swiss Society of Cardiology (SSC) and the Swiss Society of Cardiac and ThoracicVascular Surgery (SSCTVS) have formulated their mutual intent of a close, patient-oriented, and expertise-based collaboration in the Heart Team Paper. The interdisciplinary dialogue between the SSC and SSCTVS reflects an attitude in decision making, which guarantees the best possible therapy for the individual patient. At the same time, it is a cornerstone of optimized process quality, placing individual interests into the background. Evaluation of the correct indication for a treatment is indeed very challenging and almost impossible to verify retrospectively. Quality in this very important health policy process can therefore only be assured by the use of mutually recognized indications, agreed upon by all involved physicians and medical specialties, whereby the capacity of those involved in the process is not important but rather their competence. These two medical societies recognize their responsibility and have incorporated international guidelines as well as specified regulations for Switzerland. Former competitors now form an integrative consulting team able to deliver a comprehensive evaluation for patients. Naturally, implementation rests with the individual caregiver. The Heart Team Paperof the SGK and SGHC, has defined guide boards within which the involved specialists maintain sufficient room to maneuver, and patients have certainty of receiving the best possible therapy they require.

128. Gomes-Neto M, Durães AR, Reis H, Neves VR, Martinez BP, Carvalho VO. High-intensity interval training versus moderate-intensity continuous training on exercise capacity and quality of life in patients with coronary artery disease: A systematic review and meta-analysis. Eur J Prev Cardiol. 2017;24(16):1696-707.

Background Exercise is an effective strategy for reducing total and cardiovascular mortality in patients with coronary artery disease. However, it is not clear which modality is best. We performed a meta-analysis to investigate the effects of high-intensity interval versus moderate-intensity continuous training of coronary artery disease patients. Methods We searched MEDLINE, PEDro, LILACS, SciELO and the Cochrane Library (from the earliest date available to November 2016) for controlled trials that evaluated the effects of high-intensity interval versus moderate-intensity continuous training for coronary artery disease patients. Weighted mean differences and 95% confidence intervals were calculated, and heterogeneity was assessed using the I(2) test. Results Twelve studies met the study criteria, including 609 patients. High-intensity interval training resulted in improvement in peak oxygen uptake weighted mean difference (1.3 ml/kg/min, 95% confidence interval: 0.6-1.9, n = 594) compared with moderate-intensity continuous training. No significant difference in physical, emotional, and social domain of quality of life was found for participants for participants in the high-intensity interval training group compared with the moderate-intensity continuous training group. Sub-analysis of three studies with isocaloric exercise training showed no significant difference in peak oxygen uptake weighted mean difference (0.4 ml/kg/min, 95% confidence interval: -0.1-0.9, n = 137) for participants in the high-intensity interval training group compared with moderate-intensity continuous training group. Conclusions High-intensity interval training may improve peak oxygen uptake and should be considered as a component of care of coronary artery disease patients. However, this superiority disappeared when isocaloric protocol is compared.

129. Anderson L, Sharp GA, Norton RJ, Dalal H, Dean SG, Jolly K, et al. Home‐based versus centre‐based cardiac rehabilitation. Cochrane Database Syst Rev. 2017(6).

http://dx.doi.org/10.1002/14651858.CD007130.pub4

- Background Cardiovascular disease is the most common cause of death globally. Traditionally, centre‐based cardiac rehabilitation programmes are offered to individuals after cardiac events to aid recovery and prevent further cardiac illness. Home‐based cardiac rehabilitation programmes have been introduced in an attempt to widen access and participation. This is an update of a review previously published in 2009 and 2015. Objectives To compare the effect of home‐based and supervised centre‐based cardiac rehabilitation on mortality and morbidity, exercise‐capacity, health‐related quality of life, and modifiable cardiac risk factors in patients with heart disease. Search methods We updated searches from the previous Cochrane Review by searching the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid), Embase (Ovid), PsycINFO (Ovid) and CINAHL (EBSCO) on 21 September 2016. We also searched two clinical trials registers as well as previous systematic reviews and reference lists of included studies. No language restrictions were applied. Selection criteria We included randomised controlled trials, including parallel group, cross‐over or quasi‐randomised designs) that compared centre‐based cardiac rehabilitation (e.g. hospital, gymnasium, sports centre) with home‐based programmes in adults with myocardial infarction, angina, heart failure or who had undergone revascularisation . Data collection and analysis Two review authors independently screened all identified references for inclusion based on pre‐defined inclusion criteria. Disagreements were resolved through discussion or by involving a third review author. Two authors independently extracted outcome data and study characteristics and assessed risk of bias. Quality of evidence was assessed using GRADE principles and a Summary of findings table was created. Main results We included six new studies (624 participants) for this update, which now includes a total of 23 trials that randomised a total of 2890 participants undergoing cardiac rehabilitation. Participants had an acute myocardial infarction, revascularisation or heart failure. A number of studies provided insufficient detail to enable assessment of potential risk of bias, in particular, details of generation and concealment of random allocation sequencing and blinding of outcome assessment were poorly reported. No evidence of a difference was seen between home‐ and centre‐based cardiac rehabilitation in clinical primary outcomes up to 12 months of follow up: total mortality (relative risk (RR) = 1.19, 95% CI 0.65 to 2.16; participants = 1505; studies = 11/comparisons = 13; very low quality evidence), exercise capacity (standardised mean difference (SMD) = ‐0.13, 95% CI ‐0.28 to 0.02; participants = 2255; studies = 22/comparisons = 26; low quality evidence), or health‐related quality of life up to 24 months (not estimable). Trials were generally of short duration, with only three studies reporting outcomes beyond 12 months (exercise capacity: SMD 0.11, 95% CI ‐0.01 to 0.23; participants = 1074; studies = 3; moderate quality evidence). However, there was evidence of marginally higher levels of programme completion (RR 1.04, 95% CI 1.00 to 1.08; participants = 2615; studies = 22/comparisons = 26; low quality evidence) by home‐based participants. Authors' conclusions This update supports previous conclusions that home‐ and centre‐based forms of cardiac rehabilitation seem to be similarly effective in improving clinical and health‐related quality of life outcomes in patients after myocardial infarction or revascularisation, or with heart failure. This finding supports the continued expansion of evidence‐based, home‐based cardiac rehabilitation programmes. The choice of participating in a more traditional and supervised centre‐based programme or a home‐based programme may reflect local availability and consider the preference of the individual patient. Further data are needed to determine whether the effects of home‐ and centre‐base cardiac rehabilitation reported in the included short‐term trials can be confirmed in the longer term and need to consider adequately powered non‐inferiority or equivalence study designs. Plain language summary Home‐based versus supervised centre‐based cardiac rehabilitation Review question We compared home‐based cardiac rehabilitation programmes with supervised centre‐based cardiac rehabilitation for adults with myocardial infarction (blood flow to the heart has stopped), angina (chest pain), heart failure or who had undergone revascularisation. Background Cardiac rehabilitation aims to restore people with heart disease to health, through a combination of exercise, education and psychological support. Traditionally, centre‐based cardiac rehabilitation programmes (e.g. based at a hospital, gymnasium or in sport centre) are offered to people after cardiac events. Home‐based cardiac rehabilitation programmes have been introduced to increase access and participation. Search date We searched up to September 2016. Study characteristics We searched for randomised controlled trials (trials that randomly allocate participants to one of two or more treatment groups) looking at the effectiveness of home‐based versus supervised centre‐based cardiac rehabilitation programmes, in adults with heart disease. We included 23 trials (2890 participants). Most trials were relatively small (median 104 participants, range: 20 to 525). The average age of trial participants ranged from 51.6 to 69 years. Women accounted for only 19% of recruited participants; four trials did not include women. The mix of people recruited to the trials varied; 10 studies included a mixed population of people with coronary heart disease, five studies included people who had had a heart attack, and four studies each recruited people following revascularisation or who had heart failure. Study funding sources Sixteen studies reported sources of funding; seven did not. No study reported funding from an agency with commercial interest in the results. Key results We found that home‐ and centre‐based cardiac rehabilitation programmes are similar in benefits measured in terms of numbers of deaths, exercise capacity and health‐related quality of life. Further data are needed to confirm if these short‐term effects of home‐ and centre‐based cardiac rehabilitation can be sustained over time. Quality of the evidence Poor reporting made it difficult to assess methodological quality of the included studies and their risk of bias. Evidence quality ranged from very low (total mortality), to moderate (exercise capacity over 12 months and health‐related quality of life). The main reasons for the low assessment of quality was poor reporting in the included studies.

130. Wu C, Li Y, Chen J. Hybrid versus traditional cardiac rehabilitation models: a systematic review and meta-analysis. Kardiol Pol. 2018;76(12):1717-24.

BACKGROUND: The common drawbacks of standard cardiac rehabilitation (CR) models include low participation rate, high cost, and dependence on on-site exercise sessions. Therefore, hybrid CR protocols have been developed. AIM: We aimed to test whether hybrid CR models are superior or equivalent to the traditional CR models in patients after myocardial infarction, heart failure, and cardiac surgery, using a meta-analysis framework. METHODS: Data from relevant original studies indexed in the Medline, Scopus, Cochrane Central, and Web of Science data-bases were extracted and analysed. The standardised mean difference (SMD) was used as a summary effect estimate, along with 95% confidence interval (CI). RESULTS: Based on data from 1195 patients, the summary effect size showed similar improvement in functional capacity in hybrid and standard CR programmes (SMD = -0.04, 95% CI -0.18 to 0.09, p = 0.51). No significant difference was detected between the two models in terms of changes in exercise duration (SMD = -0.14, 95% CI -0.51 to 0.24, p = 0.47), systolic (SMD = -0.01, 95% CI -0.14 to 0.12, p = 0.91), and diastolic (SMD = -0.03, 95% CI -0.16 to 0.11, p = 0.7) blood pres-sure, or health-related quality of life (SMD = -0.08, 95% CI -0.23 to 0.07, p = 0.27). In terms of blood lipids, no significant difference was noted between hybrid and traditional CR models in all assessed lipid profile parameters, except for triglycerides (favouring the traditional CR model). CONCLUSIONS: Hybrid CR protocols showed comparable efficacy to the traditional model. Further well-designed studies are required to validate these findings, especially regarding the long-term outcomes.

131. Bennett MH, Lehm JP, Jepson N. Hyperbaric oxygen therapy for acute coronary syndrome. Cochrane Database Syst Rev. 2015(7).

http://dx.doi.org/10.1002/14651858.CD004818.pub4

- Background Acute coronary syndrome (ACS), includes acute myocardial infarction and unstable angina, is common and may prove fatal. Hyperbaric oxygen therapy (HBOT) will improve oxygen supply to the threatened heart and may reduce the volume of heart muscle that perishes. The addition of HBOT to standard treatment may reduce death rate and other major adverse outcomes. This an update of a review previously published in May 2004 and June 2010. Objectives The aim of this review was to assess the evidence for the effects of adjunctive HBOT in the treatment of ACS. We compared treatment regimens including adjunctive HBOT against similar regimens excluding HBOT. Where regimens differed significantly between studies this is clearly stated and the implications discussed. All comparisons were made using an intention to treat analysis where this was possible. Efficacy was estimated from randomised trial comparisons but no attempt was made to evaluate the likely effectiveness that might be achieved in routine clinical practice. Specifically, we addressed: Does the adjunctive administration of HBOT to people with acute coronary syndrome (unstable angina or infarction) result in a reduction in the risk of death? Does the adjunctive administration of HBOT to people with acute coronary syndrome result in a reduction in the risk of major adverse cardiac events (MACE), that is: cardiac death, myocardial infarction, and target vessel revascularization by operative or percutaneous intervention? Is the administration of HBOT safe in both the short and long term? Search methods We updated the search of the following sources in September 2014, but found no additional relevant citations since the previous search in June 2010 (CENTRAL), MEDLINE, EMBASE, CINAHL and DORCTHIM. Relevant journals were handsearched and researchers in the field contacted. We applied no language restrictions. Selection criteria Randomised studies comparing the effect on ACS of regimens that include HBOT with those that exclude HBOT. Data collection and analysis Three authors independently evaluated the quality of trials using the guidelines of the Cochrane Handbook and extracted data from included trials. Binary outcomes were analysed using risk ratios (RR) and continuous outcomes using the mean difference (MD) and both are presented with 95% confidence intervals. We assessed the quality of the evidence using the GRADE approach. Main results No new trials were located in our most recent search in September 2014. Six trials with 665 participants contributed to this review. These trials were small and subject to potential bias. Only two reported randomisation procedures in detail and in only one trial was allocation concealed. While only modest numbers of participants were lost to follow‐up, in general there is little information on the longer‐term outcome for participants. Patients with acute coronary syndrome allocated to HBOT were associated with a reduction in the risk of death by around 42% (RR: 0.58, (95% CI 0.36 to 0.92), 5 trials, 614 participants; low quality evidence). In general, HBOT was well‐tolerated. No patients were reported as suffering neurological oxygen toxicity and only a single patient was reported to have significant barotrauma to the tympanic membrane. One trial suggested a significant incidence of claustrophobia in single occupancy chambers of 15% (RR of claustrophobia with HBOT 31.6, 95% CI 1.92 to 521). Authors' conclusions For people with ACS, there is some evidence from small trials to suggest that HBOT is associated with a reduction in the risk of death, the volume of damaged muscle, the risk of MACE and time to relief from ischaemic pain. In view of the modest number of patients, methodological shortcomings and poor reporting, this result should be interpreted cautiously, and an appropriately powered trial of high methodological rigour is justified to define those patients (if any) who can be expected to derive most benefit from HBOT. The routine application of HBOT to these patients cannot be justified from this rev ew. Plain language summary Does hyperbaric oxygen therapy improve outcome after heart attack? Background Acute heart attacks and severe angina (heart pain) are usually due to blockages in the arteries supplying the heart (coronary arteries). These problems are collectively referred to as 'acute coronary syndrome' (ACS). ACS is very common and may lead to severe complications including death. Hyperbaric oxygen therapy (HBOT) involves people breathing pure oxygen at high pressures in a specially designed chamber. It is sometimes used as a treatment to increase the supply of oxygen to the damaged heart in an attempt to reduce the area of the heart that is at risk of dying. We searched the medical literature for any studies that reported the outcome of patients with ACS when treated with HBOT. Studies found We first searched the literature in 2004 and most recently in September 2014, finding 6 studies in total. All studies included patients with heart attack and some also included patients with severe angina. The dose of hyperbaric oxygen was similar in most studies. Key results Overall, we found some evidence that people with ACS are less likely to die or to have major adverse events, and to have more rapid relief from their pain if they receive hyperbaric oxygen therapy as part of their treatment. However, our conclusions are based on relatively small randomised trials. Our confidence in these findings is further reduced because in most of these studies both the patients and researchers were aware of who was receiving HBOT and it is possible a 'placebo effect' has biased the result in favour of HBOT. HBOT was generally well‐tolerated. Some patients complained of claustrophobia when treated in small (single person) chambers and there was no evidence of important toxicity from oxygen breathing in any subject. One individual suffered damage to the eardrum from pressurisation. Conclusions While HBOT may reduce the risk of dying, time to pain relief and the chance of adverse heart events in people with heart attack and unstable angina, more work is needed to be sure that HBOT should be recommended.

132. Lip GYH, Coca A, Kahan T, Boriani G, Manolis AS, Olsen MH, et al. Hypertension and cardiac arrhythmias: a consensus document from the European Heart Rhythm Association (EHRA) and ESC Council on Hypertension, endorsed by the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS) and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLEACE). Europace. 2017;19(6):891-911.

Hypertension is a common cardiovascular risk factor leading to heart failure (HF), coronary artery disease, stroke, peripheral artery disease and chronic renal insufficiency. Hypertensive heart disease can manifest as many cardiac arrhythmias, most commonly being atrial fibrillation (AF). Both supraventricular and ventricular arrhythmias may occur in hypertensive patients, especially in those with left ventricular hypertrophy (LVH) or HF. Also, some of the antihypertensive drugs commonly used to reduce blood pressure, such as thiazide diuretics, may result in electrolyte abnormalities (e.g. hypokalaemia, hypomagnesemia), further contributing to arrhythmias, whereas effective control of blood pressure may prevent the development of the arrhythmias such as AF. In recognizing this close relationship between hypertension and arrhythmias, the European Heart Rhythm Association (EHRA) and the European Society of Cardiology (ESC) Council on Hypertension convened a Task Force, with representation from the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLEACE), with the remit to comprehensively review the available evidence to publish a joint consensus document on hypertension and cardiac arrhythmias, and to provide up-to-date consensus recommendations for use in clinical practice. The ultimate judgment regarding care of a particular patient must be made by the healthcare provider and the patient in light of all of the circumstances presented by that patient.

133. Lip GYH, Coca A, Kahan T, Boriani G, Manolis AS, Olsen MH, et al. Hypertension and cardiac arrhythmias: executive summary of a consensus document from the European Heart Rhythm Association (EHRA) and ESC Council on Hypertension, endorsed by the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLEACE). Eur Heart J Cardiovasc Pharmacother. 2017;3(4):235-50.

Hypertension (HTN) is a common cardiovascular risk factor leading to heart failure (HF), coronary artery disease (CAD), stroke, peripheral artery disease and chronic renal failure. Hypertensive heart disease can manifest as many types of cardiac arrhythmias, most commonly being atrial fibrillation (AF). Both supraventricular and ventricular arrhythmias may occur in HTN patients, especially in those with left ventricular hypertrophy (LVH), CAD, or HF. In addition, high doses of thiazide diuretics commonly used to treat HTN, may result in electrolyte abnormalities (e.g. hypokalaemia, hypomagnesaemia), contributing further to arrhythmias, while effective blood pressure control may prevent the development of the arrhythmias such as AF. In recognizing this close relationship between HTN and arrhythmias, the European Heart Rhythm Association (EHRA) and the European Society of Cardiology (ESC) Council on Hypertension convened a Task Force, with representation from the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLEACE), with the remit of comprehensively reviewing the available evidence and publishing a joint consensus document on HTN and cardiac arrhythmias, and providing up-to-date consensus recommendations for use in clinical practice. The ultimate judgment on the care of a specific patient must be made by the healthcare provider and the patient in light of all individual factors presented. This is an executive summary of the full document co-published by EHRA in EP-Europace.

134. Al-Smadi AM, Ashour A, Hweidi I, Gharaibeh B, Fitzsimons D. Illness perception in patients with coronary artery disease: A systematic review. Int J Nurs Pract. 2016;22(6):633-48.

The aim of this study was to conduct a systematic review that investigates the differences in illness perception with age and gender in patients diagnosed with coronary artery disease. Previous studies show some discrepancies regarding the influence of age and gender on the specific dimensions of coronary artery disease patients' illness perception. A systematic review using a narrative synthesis process included preliminary synthesis, exploration of relationships and assessment of the robustness of the synthesis and findings was conducted. Search terms were used to identify research studies published between 1996 and December 2014 across four key databases: CINAHL, Medline, PsycINFO and Web of Science. A total of 14 studies met the inclusion criteria of the review. The review found that men had a stronger perception that their own behaviour had caused their illness than women. In addition, older patients had lower perceptions of the consequences and chronicity of their illness. This analysis concludes that some dimensions of illness perception vary according to age and gender of patients with coronary artery disease. These differences should be taken into consideration, particularly when providing health education and cardiac rehabilitation.

135. Lee CK, Meng SW, Lee MH, Chen HC, Wang CL, Wang HN, et al. The impact of door-to-electrocardiogram time on door-to-balloon time after achieving the guideline-recommended target rate. PLoS One. 2019;14(9):e0222019.

BACKGROUND: Little is known about the components and contributing factors of door-to-balloon time after implementation of Door-to-Balloon Alliance quality-improving (QI) strategies, including the impact of door-to-ECG time on door-to-balloon time. OBJECTIVE: We investigated whether modification of emergency department (ED) triage processes could improve door-to-ECG and door-to-balloon times after implementation of QI strategies. METHODS: This was a retrospective before-and-after study of a prospectively collected database. From June 2014 to October 2014, interventions were implemented in our ED, including a protocol-driven ECG initiation and moving an ECG station and technician to the triage area. The primary outcome was the percentage of patients with ST-elevation myocardial infarction (STEMI) who received ECG within 10 min of arrival; the secondary outcome was the percentage of patients with door-to-balloon times of <90 min from arrival. Patients from the year pre- and post-QI initiative were defined as the control and intervention groups, respectively. RESULTS: Enrollment comprised 214 patients with STEMI: 109 before the intervention and 105 after the intervention. We analyzed the components of the door-to-balloon process and found the door-to-ECG process was the most critical interval of delay (20.8%). Unrecognized symptoms were the most common cause of delay in the door-to-ECG process resulting in a significant impact on the door-to-balloon time. The intervention group had a higher percentage of patients with door-to-ECG times <10 min than did the control group (93.3% vs. 79.8%, p = 0.005), with a corresponding improvement in door-to-balloon times <90 min (91.1% vs. 76.2%, p = 0.007). In subgroup analysis, the intervention benefits occurred only in non-transferred or walk-in patients. After adjustment for possible co-variates, the QI interventions remained a significant contributing factor for achieving the door-to-ECG and door-to-balloon targets. CONCLUSIONS: The modification of ED triage processes through implementation of QI strategies are effective in achieving better door-to-ECG times and thus, achieving door-to-balloon times <90 min. In patients presenting with ambiguous symptoms, improved door-to ECG target achievement rates, through a protocol-driven and multidisciplinary approach allows for earlier identification of STEMI.

136. Wang A, Pollack T, Kadziel LA, Ross SM, McHugh M, Jordan N, et al. Impact of Practice Facilitation in Primary Care on Chronic Disease Care Processes and Outcomes: a Systematic Review. J Gen Intern Med. 2018;33(11):1968-77.

BACKGROUND: More than 100 million individuals in the USA have been diagnosed with a chronic disease, yet chronic disease care has remained fragmented and of inconsistent quality. Improving chronic disease management has been challenging for primary care and internal medicine practitioners. Practice facilitation provides a comprehensive approach to chronic disease care. The objective is to evaluate the impact of practice facilitation on chronic disease outcomes in the primary care setting. METHODS: This systematic review examined North American studies from PubMed, EMBASE, and Web of Science (database inception to August 2017). Investigators independently extracted and assessed the quality of the data on chronic disease process and clinical outcome measures. Studies implemented practice facilitation and reported quantifiable care processes and patient outcomes for chronic disease. Each study and their evidence were assessed for risk of bias and quality according to the Cochrane Collaboration and the Grade Collaboration tool. RESULTS: This systematic review included 25 studies: 12 randomized control trials and 13 prospective cohort studies. Across all studies, practices and their clinicians were aware of the implementation of practice facilitation. Improvements were observed in most studies for chronic diseases including asthma, cancer (breast, cervical, and colorectal), cardiovascular disease (cerebrovascular disease, coronary artery disease, dyslipidemia, hypertension, myocardial infarction, and peripheral vascular disease), and type 2 diabetes. Mixed results were observed for chronic kidney disease and chronic illness care. DISCUSSION: Overall, the results suggest that practice facilitation may improve chronic disease care measures. Across all studies, practices were aware of practice facilitation. These findings lend support for the potential expansion of practice facilitation in primary care. Future work will need to investigate potential opportunities for practice facilitation to improve chronic disease outcomes in other health care settings (e.g., specialty and multi-specialty practices) with standardized measures.

137. Gurgle HE, Schauerhamer MB, Rodriguez SA, McAdam-Marx C. Impact of statin guidelines on statin utilization and costs in an employer-based primary care clinic. Am J Manag Care. 2017;23(12):e387-e93.

OBJECTIVES: The purpose of this study was to describe statin utilization and costs in an employer-based patient cohort by comparing actual practice and assumed adoption of the 2013 American College of Cardiology/American Heart Association (ACC/AHA) or 2016 US Preventive Services Task Force (USPSTF) statin recommendations versus the guidelines described in 2001 (and supplemented in 2004) in the Third Report of the National Cholesterol Education Program's Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (ATPIII). STUDY DESIGN: Descriptive cohort analysis included patients treated in an employer-based primary care clinic between January 2012 and April 2014. METHODS: ATPIII, ACC/AHA, and USPSTF recommendations were retrospectively applied at the patient level based on lipid levels and statin prescribing data collected from a health risk assessment and electronic health record. Actual statin prescribing was compared with prescribing predicted by guideline recommendations. Costs for each strategy were estimated using employer pharmacy claims data. RESULTS: The study included 555 patients, of whom 112 (20.2%) were treated with a statin at baseline. ATPIII and ACC/AHA recommended statin use in 284 (51.2%) and 279 (50.3%) patients, respectively. Within the subgroup of 479 primary prevention patients, ACC/AHA recommended statin use in 203 (42.4%) versus USPSTF, which recommended statin use in 91 (19.0%). The 90-day cost per patient was similar to baseline with implementation of ATPIII or ACC/AHA recommendations, excluding use of brand name-only high-intensity statins, and costs could be reduced slightly with implementation of USPSTF guidelines. CONCLUSIONS: Despite differences in ATPIII, ACC/AHA, and USPSTF guidelines, application of any of these statin recommendations would result in optimized statin utilization and fairly neutral effects on cost in this real-world employer-based population.

138. Storm C, Leithner C, Krannich A, Suarez JI, Stevens RD. Impact of Structured Pathways for Postcardiac Arrest Care: A Systematic Review and Meta-Analysis. Crit Care Med. 2019;47(8):e710-e6.

OBJECTIVES: Recent research has demonstrated value in selected therapeutic and prognostic interventions delivered to patients following cardiac arrest. The aim of this work was to determine if the implementation of a structured care pathway, which combines different interventions, could improve outcomes in survivors of cardiac arrest. DATA SOURCES: PubMed and review of citations in retrieved articles. STUDY SELECTION: Randomized trials and prospective observational studies conducted in adult cardiac arrest patients, which evaluated the impact on outcome of a structured care pathway, defined as an organized set of interventions designed specifically for postcardiac arrest patients. DATA EXTRACTION: Data collected included study characteristics and methodologic quality, populations enrolled, interventions that were part of the cardiac arrest structured care pathway, and outcomes. The principal outcome was favorable functional status defined as a Cerebral Performance Category score of 1-2 at or after hospital discharge. DATA SYNTHESIS: The systematic search retrieved 481 articles of which nine (total, 1,994 patients) were selected for systematic review, and six (1,422 patients) met criteria for meta-analysis. Interventions in the care pathways included early coronary angiography with or without percutaneous coronary intervention (eight studies), targeted temperature management (nine studies), and protocolized management in the ICU (seven studies). Neurologic prognostication was not a part of any of the structured pathways. Meta-analysis found significantly higher odds of achieving a favorable functional outcome in patients who were treated in a structured care pathway, when compared with standard care (odds ratio, 2.35; 95% CI, 1.46-3.81). CONCLUSIONS: Following cardiac arrest, patients treated in a structured care pathway may have a substantially higher likelihood of favorable functional outcome than those who receive standard care. These findings suggest benefit of a highly organized approach to postcardiac arrest care, in which a cluster of evidence-based interventions are delivered by a specialized interdisciplinary team. Given the overall low certainty of evidence, definitive recommendations will need confirmation in additional high-quality studies.

139. Hong JC, Blankstein R, Shaw LJ, Padula WV, Arrieta A, Fialkow JA, et al. Implications of Coronary Artery Calcium Testing for Treatment Decisions Among Statin Candidates According to the ACC/AHA Cholesterol Management Guidelines: A Cost-Effectiveness Analysis. JACC Cardiovasc Imaging. 2017;10(8):938-52.

This review evaluates the cost-effectiveness of using coronary artery calcium (CAC) to guide long-term statin therapy compared with treating all patients eligible for statins according to 2013 American College of Cardiology/American Heart Association cholesterol management guidelines for atherosclerotic cardiovascular disease. The authors used a microsimulation model to compare costs and effectiveness from a societal perspective over a lifetime horizon. Both strategies resulted in similar costs and quality-adjusted life years (QALYs). CAC resulted in increased costs (+$81) and near-equal QALY (+0.01) for an incremental cost-effectiveness ratio of $8,100/QALY compared with the treat-all strategy. For 10,000 patients, the treat-all strategy would theoretically avert 21 atherosclerotic cardiovascular disease events, but would add 47,294 person-years of statins. With CAC costs <$100, and higher cost and/or disutility associated with statin therapy, CAC strategy was favored. These findings suggest the economic value of both approaches were similar. Clinicians should account for individual preferences in context of shared decision making when choosing the most appropriate strategy to guide statin decisions.

140. Eccleston D, Horrigan M, Rafter T, Holt G, Worthley SG, Sage P, et al. Improving Guideline Compliance in Australia With a National Percutaneous Coronary Intervention Outcomes Registry. Heart Lung Circ. 2017;26(12):1303-9.

BACKGROUND: Secondary prevention strategies after percutaneous coronary intervention (PCI) include statins and dual anti-platelet therapy, however there are significant gaps between guidelines and practice. Contemporary PCI practice requires comprehensive data collection to allow dynamic auditing and benchmarking of key performance and safety indices. Genesis HeartCare is Australia's largest collaborative venture of cardiologists, practising at over 40 public and private hospitals. We hypothesised that measurement and local reporting of data would improve patient outcomes through improving compliance with guideline therapies. METHODS: Real-time benchmarking via a national clinical quality and outcomes register, the Genesis Cardiovascular Outcomes Registry (GCOR-PCI). GCOR-PCI prospectively collected clinical, procedural, medication and outcomes data for 6720 consecutive patients undergoing PCI from 10 private hospitals across Australia. Key performance outcomes benchmarked against the aggregated study cohort and international standards were reported to individual sites. The main outcome measure was compliance with guideline medications (statins, anti-platelet agents). RESULTS: Early data identified specific practice patterns associated with lower rates of statin therapy post-PCI, which led to changes in practice. Between the first and latest year of data collection there was significant improvement in the rates of statin therapy at discharge (92.1 vs. 94.4% p<0.03) and 12 months post-PCI (87.0 vs. 92.2% p<0.001) and of antiplatelet therapy at 12 months (90.7 vs. 94.3% p<0.001). CONCLUSIONS: This large-scale collaboration provides a platform for the development of quality improvement initiatives. Establishment of this clinical quality registry improved patient care by identifying and monitoring gaps in delivery of appropriate therapies, driving key practice change.

141. Fuller RH, Perel P, Navarro-Ruan T, Nieuwlaat R, Haynes RB, Huffman MD. Improving medication adherence in patients with cardiovascular disease: a systematic review. Heart. 2018;104(15):1238-43.

OBJECTIVE: To evaluate and compare the effect of interventions for improving adherence to medications for atherosclerotic cardiovascular disease (ASCVD) secondary prevention. METHODS: We extracted eligible trials from a 2014 Cochrane systematic review on adherence for any condition. We updated the search from CENTRAL, Medline, Embase, PsycINFO, CINAHL, Sociological Abstracts and trial registers through November 2016. Study reports needed to be from a randomised controlled trial, incorporate participants identified as having ASCVD and interventions aimed at improving adherence to medicines for secondary prevention of ASCVD and measure both adherence and a clinical outcome. Two reviewers independently determined the eligibility of studies, extracted data and conducted a narrative synthesis. RESULTS: We identified 17 trials (n=17 448 participants). Most trials had high risk of bias in at least one domain. The intervention group adherence rates ranged from 44%to99% and the comparator group adherence rates ranged from 13% to 96%. Three distinct interventions reported improvements in both adherence and clinical outcomes: short message service (65% vs 13% of participants with high adherence in the intervention vs control group), a fixed-dose combination pill (86% vs 65% adherence, risk ratio of being adherent, 1.33; 95% CI 1.26 to 1.41) and a community health worker-based intervention (97% in the intervention group compared with 92% in the control group; OR=2.62, 95% CI 1.32 to 5.19). CONCLUSIONS: We identified three interventions that demonstrated improvements in adherence and clinical outcomes. Ongoing, longer-term trials will help determine whether short-term changes in adherence can be maintained and lead to differences in clinical events.

142. Higgs M, Sim J, Traynor V. Incidence and risk factors for new-onset atrial fibrillation following coronary artery bypass grafting: A systematic review and meta-analysis. Intensive Crit Care Nurs. 2020:102897.

OBJECTIVES: To estimate the incidence of new-onset post-operative atrial fibrillation after isolated coronary artery bypass surgery and summarise the evidence on risk factors that predispose people to developing the complication. STUDY DESIGN/METHODS: A systematic review was conducted to identify studies from the CINAHL, MEDLINE and Cochrane databases. A title and abstract review was conducted by one reviewer. Full text review and quality assessment processes were conducted by two reviewers. Incidence data was combined in meta-analysis using the 'metaprop' routine in Stata and risk factor data were synthesised in narrative and table format. RESULTS: Ten studies, including 6173 participants, were included in the review. The estimated pooled incidence of post-operative atrial fibrillation was 25% (CI 0.19-0.30). In a secondary meta-analysis including studies that only included first time bypass surgery recipients the estimated pooled incidence was 26% (CI 0.14-0.41). Due to high levels of heterogeneity these results should be interpreted with caution. Risk factors with the strongest associations to post-operative atrial fibrillation were chronic obstructive pulmonary disease, decreased partial pressure of oxygen on air, congestive heart failure, right coronary artery disease, male gender, prolonged cross clamp time and port-operative inotropic exposure. CONCLUSION: Further prospective studies are needed to strengthen the current evidence base.

143. Huded CP, Kumar A, Johnson M, Abdallah M, Ballout JA, Kravitz K, et al. Incremental Prognostic Value of Guideline-Directed Medical Therapy, Transradial Access, and Door-to-Balloon Time on Outcomes in ST-Segment-Elevation Myocardial Infarction. Circ Cardiovasc Interv. 2019;12(3):e007101.

BACKGROUND: Systems to improve ST-segment-elevation myocardial infarction (STEMI) care have traditionally focused on improving door-to-balloon time. However, prompt guideline-directed medical therapy and transradial primary percutaneous coronary intervention (PCI) are also associated with reduced STEMI mortality. The incremental prognostic value of each facet of STEMI care on clinical outcomes within a STEMI system of care is unknown. METHODS AND RESULTS: We implemented systems-based strategies at our hospital to improve 3 STEMI care metrics: (1) prompt guideline-directed medical therapy before sheath insertion for PCI, (2) use of transradial primary PCI, and (3) door-to-balloon time. We assessed the incremental association of metrics achieved with in-hospital adverse events and 30-day mortality. Of 1272 consecutive patients with STEMI treated with PCI at our hospital (January 1, 2011, to December 31, 2016), the percentage with achievement of zero, 1, 2, or 3 STEMI care metrics was 7.1%, 24.1%, 43.8%, and 25.1%; and 30-day mortality was 15.6%, 8.6%, 3.6%, and 3.2%, respectively (log-rank P<0.001). After adjusting for known clinical predictors of STEMI in-hospital mortality, achievement of at least 2 STEMI care metrics was associated with significantly reduced in-hospital mortality (odds ratio, 0.39; 95% CI, 0.16-0.96; P=0.041). Each metric provided incremental prognostic value when modeled in stepwise order of their occurrence in clinical practice (final model C statistic, 0.677; P<0.001). CONCLUSIONS: Prompt guideline-directed medical therapy before sheath insertion for PCI, transradial primary PCI, and door-to-balloon time add incremental prognostic value in STEMI care. Expanding STEMI systems of care from a singular focus on door-to-balloon time to a comprehensive focus on multifaceted STEMI care offers an opportunity to further improve STEMI outcomes.

144. Devi R, Singh SJ, Powell J, Fulton EA, Igbinedion E, Rees K. Internet-based interventions for the secondary prevention of coronary heart disease. Cochrane Database Syst Rev. 2015(12):Cd009386.

BACKGROUND: The Internet could provide a means of delivering secondary prevention programmes to people with coronary heart disease (CHD). OBJECTIVES: To determine the effectiveness of Internet-based interventions targeting lifestyle changes and medicines management for the secondary prevention of CHD. SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, in December 2014. We also searched six other databases in October 2014, and three trials registers in January 2015 together with reference checking and handsearching to identify additional studies. SELECTION CRITERIA: Randomised controlled trials (RCTs) evaluating Internet-delivered secondary prevention interventions aimed at people with CHD. DATA COLLECTION AND ANALYSIS: Two review authors independently assessed risk of bias and extracted data according to the Cochrane Handbook for Systematic Reviews of Interventions. We assessed evidence quality using the GRADE approach and presented this in a 'Summary of findings' table. MAIN RESULTS: Eighteen trials met our inclusion criteria. Eleven studies are complete (1392 participants), and seven are ongoing. Of the completed studies, seven interventions are broad, targeting the lifestyle management of CHD, and four focused on physical activity promotion. The comparison group in trials was usual care (n = 6), minimal intervention (n = 3), or traditional cardiac rehabilitation (n = 2).We found no effects of Internet-based interventions for all-cause mortality (odds ratio (OR) 0.27, 95% confidence interval (CI) 0.04 to 1.63; participants = 895; studies = 6; low-quality evidence). There was only one case of cardiovascular mortality in a control group (participants = 895; studies = 6). No incidences of non-fatal re-infarction were reported across any of the studies. We found no effects for revascularisation (OR 0.69, 95% CI 0.37 to 1.27; participants = 895; studies = 6; low-quality evidence).We found no effects for total cholesterol (mean difference (MD) 0.00, 95% CI -0.27 to 0.28; participants = 439; studies = 4; low-quality evidence), high-density lipoprotein (HDL) cholesterol (MD 0.01, 95% CI -0.06 to 0.07; participants = 437; studies = 4; low-quality evidence), or triglycerides (MD 0.01, 95% CI -0.17 to 0.19; participants = 439; studies = 4; low-quality evidence). We did not pool the data for low-density lipoprotein (LDL) cholesterol due to considerable heterogeneity. Two out of six trials measuring LDL cholesterol detected favourable intervention effects, and four trials reported no effects. Seven studies measured systolic and diastolic blood pressure; we did not pool the data due to substantial heterogeneity. For systolic blood pressure, two studies showed a reduction with the intervention, but the remaining studies showed no effect. For diastolic blood pressure, two studies showed a reduction with the intervention, one study showed an increase with the intervention, and the remaining four studies showed no effect.Five trials measured health-related quality of life (HRQOL). We could draw no conclusions from one study due to incomplete reporting; one trial reported no effect; two studies reported a short- and medium-term effect respectively; and one study reported both short- and medium-term effects.Five trials assessed dietary outcomes: two reported favourable effects, and three reported no effects. Eight studies assessed physical activity: five of these trials reported no physical activity effects, and three reported effectiveness. Trials are yet to measure the impact of these interventions on compliance with medication.Two studies measured healthcare utilisation: one reported no effects, and the other reported increased usage of healthcare services compared to a control group in the intervention group at nine months' follow-up. Two trials collected cost data: both reported that Internet-delivered interventions are likely to be cost-effective.In terms of the risk of bias, the majority of studies reported appropriate randomisation and appropriate concealment of randomisation processes. A lack of blinding resulted in a risk of performance bias in seven studies, and a risk of detection bias in five trials. Two trials were at risk of attrition bias, and five were at risk for reporting bias. AUTHORS' CONCLUSIONS: In general, evidence was of low quality due to lack of blinding, loss to follow-up, and uncertainty around the effect size. Few studies measured clinical events, and of those that did, a very small number of events were reported, and therefore no firm conclusions can be made. Similarly, there was no clear evidence of effect for cardiovascular risk factors, although again the number of studies reporting these was small. There was some evidence for beneficial effects on HRQOL, dietary outcomes, and physical activity, although firm conclusions cannot yet be made. The effects on healthcare utilisation and cost-effectiveness are also inconclusive, and trials are yet to measure the impact of Internet interventions on compliance with medication. The comparison groups differed across trials, and there were insufficient studies with usable data for subgroup analyses. We intend to study the intensity of comparison groups in future updates of this review when more evidence is available. The completion of the ongoing trials will add to the evidence base.

145. Santiago de Araújo Pio C, Chaves GS, Davies P, Taylor RS, Grace SL. Interventions to promote patient utilisation of cardiac rehabilitation. Cochrane Database Syst Rev. 2019;2(2):Cd007131.

BACKGROUND: International clinical practice guidelines routinely recommend that cardiac patients participate in rehabilitation programmes for comprehensive secondary prevention. However, data show that only a small proportion of these patients utilise rehabilitation. OBJECTIVES: First, to assess interventions provided to increase patient enrolment in, adherence to, and completion of cardiac rehabilitation. Second, to assess intervention costs and associated harms, as well as interventions intended to promote equitable CR utilisation in vulnerable patient subpopulations. SEARCH METHODS: Review authors performed a search on 10 July 2018, to identify studies published since publication of the previous systematic review. We searched the Cochrane Central Register of Controlled Trials (CENTRAL); the National Health Service (NHS) Centre for Reviews and Dissemination (CRD) databases (Health Technology Assessment (HTA) and Database of Abstracts of Reviews of Effects (DARE)), in the Cochrane Library (Wiley); MEDLINE (Ovid); Embase (Elsevier); the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCOhost); and Conference Proceedings Citation Index - Science (CPCI-S) on Web of Science (Clarivate Analytics). We checked the reference lists of relevant systematic reviews for additional studies and also searched two clinical trial registers. We applied no language restrictions. SELECTION CRITERIA: We included randomised controlled trials (RCTs) in adults with myocardial infarction, with angina, undergoing coronary artery bypass graft surgery or percutaneous coronary intervention, or with heart failure who were eligible for cardiac rehabilitation. Interventions had to aim to increase utilisation of comprehensive phase II cardiac rehabilitation. We included only studies that measured one or more of our primary outcomes. Secondary outcomes were harms and costs, and we focused on equity. DATA COLLECTION AND ANALYSIS: Two review authors independently screened the titles and abstracts of all identified references for eligibility, and we obtained full papers of potentially relevant trials. Two review authors independently considered these trials for inclusion, assessed included studies for risk of bias, and extracted trial data independently. We resolved disagreements through consultation with a third review author. We performed random-effects meta-regression for each outcome and explored prespecified study characteristics. MAIN RESULTS: Overall, we included 26 studies with 5299 participants (29 comparisons). Participants were primarily male (64.2%). Ten (38.5%) studies included patients with heart failure. We assessed most studies as having low or unclear risk of bias. Sixteen studies (3164 participants) reported interventions to improve enrolment in cardiac rehabilitation, 11 studies (2319 participants) reported interventions to improve adherence to cardiac rehabilitation, and seven studies (1567 participants) reported interventions to increase programme completion. Researchers tested a variety of interventions to increase utilisation of cardiac rehabilitation. In many studies, this consisted of contacts made by a healthcare provider during or shortly after an acute care hospitalisation.Low-quality evidence shows an effect of interventions on increasing programme enrolment (19 comparisons; risk ratio (RR) 1.27, 95% confidence interval (CI) 1.13 to 1.42). Meta-regression revealed that the intervention deliverer (nurse or allied healthcare provider; P = 0.02) and the delivery format (face-to-face; P = 0.01) were influential in increasing enrolment. Low-quality evidence shows interventions to increase adherence were effective (nine comparisons; standardised mean difference (SMD) 0.38, 95% CI 0.20 to 0.55), particularly when they were delivered remotely, such as in home-based programs (SMD 0.56, 95% CI 0.37 to 0.76). Moderate-quality evidence shows interventions to increase programme completion were also effective (eight comparisons; RR 1.13, 95% CI 1.02 to 1.25), but those applied in multi-centre studies were less effective than those given in single-centre studies, leading to questions regarding generalisability. A moderate level of statistical heterogeneity across intervention studies reflects heterogeneity in intervention approaches. There was no evidence of small-study bias for enrolment (insufficient studies to test for this in the other outcomes).With regard to secondary outcomes, no studies reported on harms associated with the interventions. Only two studies reported costs. In terms of equity, trialists tested interventions designed to improve utilisation among women and older patients. Evidence is insufficient for quantitative assessment of whether women-tailored programmes were associated with increased utilisation, and studies that assess motivating women are needed. For older participants, again while quantitative assessment could not be undertaken, peer navigation may improve enrolment. AUTHORS' CONCLUSIONS: Interventions may increase cardiac rehabilitation enrolment, adherence and completion; however the quality of evidence was low to moderate due to heterogeneity of the interventions used, among other factors. Effects on enrolment were larger in studies targeting healthcare providers, training nurses, or allied healthcare providers to intervene face-to-face; effects on adherence were larger in studies that tested remote interventions. More research is needed, particularly to discover the best ways to increase programme completion.

146. Santiago de Araújo Pio C, Chaves GSS, Davies P, Taylor RS, Grace SL. Interventions to promote patient utilisation of cardiac rehabilitation. Cochrane Database Syst Rev. 2019(2).

http://dx.doi.org/10.1002/14651858.CD007131.pub4

- Background International clinical practice guidelines routinely recommend that cardiac patients participate in rehabilitation programmes for comprehensive secondary prevention. However, data show that only a small proportion of these patients utilise rehabilitation. Objectives First, to assess interventions provided to increase patient enrolment in, adherence to, and completion of cardiac rehabilitation. Second, to assess intervention costs and associated harms, as well as interventions intended to promote equitable CR utilisation in vulnerable patient subpopulations. Search methods Review authors performed a search on 10 July 2018, to identify studies published since publication of the previous systematic review. We searched the Cochrane Central Register of Controlled Trials (CENTRAL); the National Health Service (NHS) Centre for Reviews and Dissemination (CRD) databases (Health Technology Assessment (HTA) and Database of Abstracts of Reviews of Effects (DARE)), in the Cochrane Library (Wiley); MEDLINE (Ovid); Embase (Elsevier); the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCOhost); and Conference Proceedings Citation Index â€ Science (CPCIâ€S) on Web of Science (Clarivate Analytics). We checked the reference lists of relevant systematic reviews for additional studies and also searched two clinical trial registers. We applied no language restrictions. Selection criteria We included randomised controlled trials (RCTs) in adults with myocardial infarction, with angina, undergoing coronary artery bypass graft surgery or percutaneous coronary intervention, or with heart failure who were eligible for cardiac rehabilitation. Interventions had to aim to increase utilisation of comprehensive phase II cardiac rehabilitation. We included only studies that measured one or more of our primary outcomes. Secondary outcomes were harms and costs, and we focused on equity. Data collection and analysis Two review authors independently screened the titles and abstracts of all identified references for eligibility, and we obtained full papers of potentially relevant trials. Two review authors independently considered these trials for inclusion, assessed included studies for risk of bias, and extracted trial data independently. We resolved disagreements through consultation with a third review author. We performed randomâ€effects metaâ€regression for each outcome and explored prespecified study characteristics. Main results Overall, we included 26 studies with 5299 participants (29 comparisons). Participants were primarily male (64.2%). Ten (38.5%) studies included patients with heart failure. We assessed most studies as having low or unclear risk of bias. Sixteen studies (3164 participants) reported interventions to improve enrolment in cardiac rehabilitation, 11 studies (2319 participants) reported interventions to improve adherence to cardiac rehabilitation, and seven studies (1567 participants) reported interventions to increase programme completion. Researchers tested a variety of interventions to increase utilisation of cardiac rehabilitation. In many studies, this consisted of contacts made by a healthcare provider during or shortly after an acute care hospitalisation. Lowâ€quality evidence shows an effect of interventions on increasing programme enrolment (19 comparisons; risk ratio (RR) 1.27, 95% confidence interval (CI) 1.13 to 1.42). Metaâ€regression revealed that the intervention deliverer (nurse or allied healthcare provider; P = 0.02) and the delivery format (faceâ€toâ€face; P = 0.01) were influential in increasing enrolment. Lowâ€quality evidence shows interventions to increase adherence were effective (nine comparisons; standardised mean difference (SMD) 0.38, 95% CI 0.20 to 0.55), particularly when they were delivered remotely, such as in homeâ€based programs (SMD 0.56, 95% CI 0.37 to 0.76). Moderateâ€quality evidence shows interventions to increase programme completion were also effective (eight comparisons; RR 1.13, 95% CI 1.02 to 1.25), but those applied in multiâ€ centre studies were less effective than those given in singleâ€centre studies, leading to questions regarding generalisability. A moderate level of statistical heterogeneity across intervention studies reflects heterogeneity in intervention approaches. There was no evidence of smallâ€study bias for enrolment (insufficient studies to test for this in the other outcomes). With regard to secondary outcomes, no studies reported on harms associated with the interventions. Only two studies reported costs. In terms of equity, trialists tested interventions designed to improve utilisation among women and older patients. Evidence is insufficient for quantitative assessment of whether womenâ€tailored programmes were associated with increased utilisation, and studies that assess motivating women are needed. For older participants, again while quantitative assessment could not be undertaken, peer navigation may improve enrolment. Authors' conclusions Interventions may increase cardiac rehabilitation enrolment, adherence and completion; however the quality of evidence was low to moderate due to heterogeneity of the interventions used, among other factors. Effects on enrolment were larger in studies targeting healthcare providers, training nurses, or allied healthcare providers to intervene faceâ€toâ€face; effects on adherence were larger in studies that tested remote interventions. More research is needed, particularly to discover the best ways to increase programme completion. Plain language summary Promoting patient uptake and adherence in cardiac rehabilitation Background Cardiac rehabilitation programmes aid recovery from cardiac events such as heart attack, coronary stent placement, and bypass surgery, and reduce the likelihood of further illness. Cardiac rehabilitation programmes offer the following core components: exercise, education, risk factor management, and psychological counselling/support. Despite the benefits of cardiac rehabilitation, not everyone enrolls, and, of those who do, many people do not adhere to and complete the programme. This review evaluated trials of strategies to promote the utilisation of cardiac rehabilitation (enrolment, adherence, and completion). Search The search was current to July 2018. Study characteristics We searched a wide variety of scientific databases for randomised controlled trials (studies that allocate participants to one of two or more treatment groups in a random manner) in adults (over 18 years of age) who had a heart attack, had angina (chest pain), underwent coronary artery bypass grafting (a surgical procedure that diverts blood around narrowed or clogged sections of the major arteries to improve blood flow and oxygen supply to the heart muscle) or percutaneous coronary intervention (a procedure that opens up blocked coronary arteries), or with heart failure who were eligible for cardiac rehabilitation. Reviewers found 26 trials (5299 participants) that were suitable for inclusion (16 trials of interventions to improve enrolment, eight trials of interventions to improve adherence, and seven trials of interventions to improve programme completion). These studies evaluated a variety of techniques to improve utilisation such as providing peer support, starting cardiac rehabilitation early after hospitalisation, providing patient education, offering cardiac rehabilitation outside a hospital setting, and offering shorter programmes or womenâ€only programmes. Key results Strategies to increase enrolment were effective, particularly those that targeted healthcare providers, training nurses, or allied healthcare providers to intervene faceâ€toâ€face. Interventions to increase adherence to programmes and to increase completion were effective, but it remains unclear which specific strategies were implemented. We found no studies providing information about potential harms and two studies reporting costs of these strategies to increase use of cardiac rehabilitation. Some studies provided interventions to increase rehabilitation utilisation in women and older patients. Evidence wa insufficient for quantitative assessment of whether womenâ€tailored programmes were associated with increased utilisation, but motivating women appears key. For older participants, qualitative analysis suggested that peer support or postdischarge visits may improve enrolment, and group sessions promoting selfâ€regulation skills may increase completion. Quality of the evidence Most of the included studies were of good quality (i.e. low risk of arriving at wrong conclusions because of favouritism by researchers). The quality of the evidence was low for enrolment and adherence and was moderate for completion. Publication bias for enrolment was not evident.

147. Pio CSA, Chaves G, Davies P, Taylor R, Grace S. Interventions to Promote Patient Utilization of Cardiac Rehabilitation: Cochrane Systematic Review and Meta-Analysis. J Clin Med. 2019;8(2).

Too few patients utilize cardiac rehabilitation (CR), despite its benefits. The Cochrane review assessing the effectiveness of interventions to increase CR utilization (enrolment, adherence, and completion) was updated. A search was performed through July 2018 of the Cochrane and MEDLINE (Medical Literature Analysis and Retrieval System Online) databases, among other sources. Randomized controlled trials in adults with myocardial infarction, angina, revascularization, or heart failure were included. Interventions had to aim to increase utilization of comprehensive phase II CR. Two authors independently performed all stages of citation processing. Following the random-effects meta-analysis, meta-regression was undertaken to explore the impact of pre-specified factors. Twenty-six trials with 5299 participants were included (35.8% women). Low-quality evidence showed an effect of interventions in increasing enrolment (risk ratio (RR) = 1.27, 95% confidence interval (CI) = 1.13⁻1.42). Meta-regression analyses suggested that the intervention deliverer (nurse or allied healthcare provider, p = 0.02) and delivery format (face-to-face, p = 0.01) were influential in increasing enrolment. There was low-quality evidence that interventions to increase adherence were effective (standardized mean difference (SMD) = 0.38, 95% CI = 0.20⁻0.55), particularly where remotely-offered (SMD = 0.56, 95% CI = 0.36⁻0.76). There was moderate-quality evidence that interventions to increase program completion were effective (RR = 1.13, 95% CI = 1.02⁻1.25). There are effective interventions to increase CR utilization, but more research is needed to establish specific, implementable materials and protocols, particularly for completion.

148. Hegewald J, Wegewitz UE, Euler U, van Dijk JL, Adams J, Fishta A, et al. Interventions to support return to work for people with coronary heart disease. Cochrane Database Syst Rev. 2019;3(3):Cd010748.

BACKGROUND: People with coronary heart disease (CHD) often require prolonged absences from work to convalesce after acute disease events like myocardial infarctions (MI) or revascularisation procedures such as coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI). Reduced functional capacity and anxiety due to CHD may further delay or prevent return to work. OBJECTIVES: To assess the effects of person- and work-directed interventions aimed at enhancing return to work in patients with coronary heart disease compared to usual care or no intervention. SEARCH METHODS: We searched the databases CENTRAL, MEDLINE, Embase, PsycINFO, NIOSHTIC, NIOSHTIC-2, HSELINE, CISDOC, and LILACS through 11 October 2018. We also searched the US National Library of Medicine registry, clinicaltrials.gov, to identify ongoing studies. SELECTION CRITERIA: We included randomised controlled trials (RCTs) examining return to work among people with CHD who were provided either an intervention or usual care. Selected studies included only people treated for MI or who had undergone either a CABG or PCI. At least 80% of the study population should have been working prior to the CHD and not at the time of the trial, or study authors had to have considered a return-to-work subgroup. We included studies in all languages. Two review authors independently selected the studies and consulted a third review author to resolve disagreements. DATA COLLECTION AND ANALYSIS: Two review authors extracted data and independently assessed the risk of bias. We conducted meta-analyses of rates of return to work and time until return to work. We considered the secondary outcomes, health-related quality of life and adverse events among studies where at least 80% of study participants were eligible to return to work. MAIN RESULTS: We found 39 RCTs (including one cluster- and four three-armed RCTs). We included the return-to-work results of 34 studies in the meta-analyses.Person-directed, psychological counselling versus usual careWe included 11 studies considering return to work following psychological interventions among a subgroup of 615 participants in the meta-analysis. Most interventions used some form of counselling to address participants' disease-related anxieties and provided information on the causes and course of CHD to dispel misconceptions. We do not know if these interventions increase return to work up to six months (risk ratio (RR) 1.08, 95% confidence interval (CI) 0.84 to 1.40; six studies; very low-certainty evidence) or at six to 12 months (RR 1.24, 95% CI 0.95 to 1.63; seven studies; very low-certainty evidence). We also do not know if psychological interventions shorten the time until return to work. Psychological interventions may have little or no effect on the proportion of participants working between one and five years (RR 1.09, 95% CI 0.88 to 1.34; three studies; low-certainty evidence).Person-directed, work-directed counselling versus usual careFour studies examined work-directed counselling. These counselling interventions included advising patients when to return to work based on treadmill testing or extended counselling to include co-workers' fears and misconceptions regarding CHD. Work-directed counselling may result in little to no difference in the mean difference (MD) in days until return to work (MD -7.52 days, 95% CI -20.07 to 5.03 days; four studies; low-certainty evidence). Work-directed counselling probably results in little to no difference in cardiac deaths (RR 1.00, 95% CI 0.19 to 5.39; two studies; moderate-certainty evidence).Person-directed, physical conditioning interventions versus usual careNine studies examined the impact of exercise programmes. Compared to usual care, we do not know if physical interventions increase return to work up to six months (RR 1.17, 95% CI 0.97 to 1.41; four studies; very low-certainty evidence). Physical conditioning interventions may result in little to no difference in return-to-work rates at six to 12 months (RR 1.09, 95% CI 0.99 to 1.20; five studies; low-certainty evidence), and may also result in little to no difference on the rates of patients working after one year (RR 1.04, 95% CI 0.82 to 1.30; two studies; low-certainty evidence). Physical conditioning interventions may result in little to no difference in the time needed to return to work (MD -7.86 days, 95% CI -29.46 to 13.74 days; four studies; low-certainty evidence). Physical conditioning interventions probably do not increase cardiac death rates (RR 1.00, 95% CI 0.35 to 2.80; two studies; moderate-certainty evidence).Person-directed, combined interventions versus usual careWe included 13 studies considering return to work following combined interventions in the meta-analysis. Combined cardiac rehabilitation programmes may have increased return to work up to six months (RR 1.56, 95% CI 1.23 to 1.98; number needed to treat for an additional beneficial outcome (NNTB) 5; four studies; low-certainty evidence), and may have little to no difference on return-to-work rates at six to 12 months' follow-up (RR 1.06, 95% CI 1.00 to 1.13; 10 studies; low-certainty evidence). We do not know if combined interventions increased the proportions of participants working between one and five years (RR 1.14, 95% CI 0.96 to 1.37; six studies; very low-certainty evidence) or at five years (RR 1.09, 95% CI 0.86 to 1.38; four studies; very low-certainty evidence). Combined interventions probably shortened the time needed until return to work (MD -40.77, 95% CI -67.19 to -14.35; two studies; moderate-certainty evidence). Combining interventions probably results in little to no difference in reinfarctions (RR 0.56, 95% CI 0.23 to 1.40; three studies; moderate-certainty evidence).Work-directed, interventionsWe found no studies exclusively examining strictly work-directed interventions at the workplace. AUTHORS' CONCLUSIONS: Combined interventions may increase return to work up to six months and probably reduce the time away from work. Otherwise, we found no evidence of either a beneficial or harmful effect of person-directed interventions. The certainty of the evidence for the various interventions and outcomes ranged from very low to moderate. Return to work was typically a secondary outcome of the studies, and as such, the results pertaining to return to work were often poorly reported. Adhering to RCT reporting guidelines could greatly improve the evidence of future research. A research gap exists regarding controlled trials of work-directed interventions, health-related quality of life within the return-to-work process, and adverse effects.

149. Unverzagt S, Buerke M, de Waha A, Haerting J, Pietzner D, Seyfarth M, et al. Intra‐aortic balloon pump counterpulsation (IABP) for myocardial infarction complicated by cardiogenic shock. Cochrane Database Syst Rev. 2015(3).

http://dx.doi.org/10.1002/14651858.CD007398.pub3

- Background Intra‐aortic balloon pump counterpulsation (IABP) is currently the most commonly used mechanical assist device for patients with cardiogenic shock due to acute myocardial infarction. Although there has been only limited evidence from randomised controlled trials, the previous guidelines of the American Heart Association/American College of Cardiology (AHA/ACC) and the European Society of Cardiology (ESC) strongly recommended the use of the IABP in patients with infarction‐related cardiogenic shock on the basis of pathophysiological considerations, non‐randomised trials and registry data. The recent guidelines downgraded the recommendation based on a meta‐analysis which could only include non‐randomised trials showing conflicting results. Up to now, there have been no guideline recommendations and no actual meta‐analysis including the results of the large randomised multicentre IABP‐SHOCK II Trial which showed no survival benefit with IABP support. This systematic review is an update of the review published in 2011. Objectives To evaluate, in terms of efficacy and safety, the effect of IABP versus non‐IABP or other assist devices guideline compliant standard therapy on mortality and morbidity in patients with acute myocardial infarction complicated by cardiogenic shock. Search methods Searches of CENTRAL , MEDLINE (Ovid) and EMBASE (Ovid), LILACS, IndMed and KoreaMed, registers of ongoing trials and proceedings of conferences were updated in October 2013. Reference lists were scanned and experts in the field contacted to obtain further information. No language restrictions were applied. Selection criteria Randomised controlled trials on patients with acute myocardial infarction complicated by cardiogenic shock. Data collection and analysis Data collection and analysis were performed according to the published protocol. Individual patient data were provided for six trials and merged with aggregate data. Summary statistics for the primary endpoints were hazard ratios (HRs) and odds ratios (ORs) with 95% confidence intervals (CIs). Main results Seven eligible studies were identified from a total of 2314 references. One new study with 600 patients was added to the original review. Four trials compared IABP to standard treatment and three to other percutaneous left assist devices (LVAD). Data from a total of 790 patients with acute myocardial infarction and cardiogenic shock were included in the updated meta‐analysis: 406 patients were treated with IABP and 384 patients served as controls; 339 patients were treated without assisting devices and 45 patients with other LVAD. The HR for all‐cause 30‐day mortality of 0.95 (95% CI 0.76 to 1.19) provided no evidence for a survival benefit. Different non‐fatal cardiovascular events were reported in five trials. During hospitalisation, 11 and 4 out of 364 patients from the intervention groups suffered from reinfarction or stroke, respectively. Altogether 5 out of 363 patients from the control group suffered from reinfarction or stroke. Reocclusion was treated with subsequent re‐revascularization in 6 out of 352 patients from the intervention group and 13 out of 353 patients of the control group. The high incidence of complications such as moderate and severe bleeding or infection in the control groups has to be attributed to interventions with other LVAD. Possible reasons for bias were more frequent in small studies with high cross‐over rates, early stopping and the inclusion of patients with IABP at randomisation. Authors' conclusions Available evidence suggests that IABP may have a beneficial effect on some haemodynamic parameters. However, this did not result in survival benefits so there is no convincing randomised data to support the use of IABP in infarct‐related cardiogenic shock. Plain language summary Intra‐aortic balloon counterpulsation in patients with acute myocardial infarction and cardiogenic shock Cardiogenic shock is a severe condition in which a suddenly weakened heart is not able to pump enough blood to m et the body's energy needs, so not enough oxygen will reach the body’s organs. Cardiogenic shock is a life‐threatening medical emergency and needs to be treated quickly to avoid organ damage or even death of the affected patient. Most often cardiogenic shock is caused by a severe heart attack and the induced damage to the heart muscle. Despite more than 50 years of effort, patients with cardiogenic shock still have a poor prognosis after primary revascularization procedures such as coronary artery bypass grafting or primary percutaneous coronary intervention. The main cause for the development of cardiogenic shock is the loss of myocardial function due to myocardial infarction leading to impaired left ventricular function with unstable haemodynamics and reduced systolic and mean arterial pressures. The reduced blood pressure leads to hypoperfusion and so reduced oxygen supply to vital organs and the corresponding clinical signs. These include cold and pale skin, reduced or a lack of urine output and signs of impaired cerebral function like dizziness or even unconsciousness. On this basis, it was reasoned that the use of mechanical means of augmenting pressure and flow would prove effective. The very first mechanical means of assisting the circulation in such a manner was by a counter pulsation strategy using a device called the intra‐aortic balloon pump (IABP). Through balloon inflations and deflations synchronized with the natural heartbeat the IABP increases diastolic aortic pressure, which enhances diastolic blood flow to the coronary arteries and vital organs, as well as reduces systolic aortic pressure, which reduces afterload and oxygen consumption of the myocardium and increases cardiac output. This support can be provided for a few hours and, in extreme cases, for several weeks. Evidence from earlier published studies suggested that certain patients with acute myocardial infarction complicated by cardiogenic shock and treated by thrombolysis may derive benefit from a period of support with the IABP. However, nowadays the most widely recommended and preferred revascularization procedure is primary percutaneous coronary intervention. In contrast to the previous version of this review, this update now includes data from one large and six small randomised controlled trials. It allows more definitive conclusions about the potential beneficial or harmful clinical effects of IABP support beyond its immediate haemodynamic effects. Complications such as moderate and severe bleeding were more frequently observed in patients treated with more invasive devices than IABP. Small randomised trials suffered from inadequate power to address deaths and harmful effects of IABP and were biased by frequent cross‐over to the more aggressive strategy, early stopping of the trial, or the inclusion of patients with IABP at randomisation. It is most noteworthy that a recently conducted and published large randomised trial showed no evidence for survival benefits of IABP support in patients with infarct‐related cardiogenic shock treated by percutaneous coronary intervention (PCI). On the basis of these data, IABP support is no longer strongly recommended by the European Society of Cardiology (ESC) guidelines for treatment of patients with infarct‐related cardiogenic shock. Rather, IABP use is based on the personal experience and decision of the physician and the particular circumstances of individual patients.

150. Robertson L, Nandhra S. Laparoscopic surgery for elective abdominal aortic aneurysm repair. Cochrane Database Syst Rev. 2017(5).

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- Background Abdominal aortic aneurysm (AAA) is an abnormal dilatation of the infradiaphragmatic aorta that is equal to or greater than 30 mm or a local dilatation of equal to or greater than 50% compared to the expected normal diameter of the artery. AAAs rarely occur in individuals under 50 years of age, but thereafter the prevalence dramatically increases with age, with men at a six‐fold greater risk of developing an AAA than women. Prevalence of AAA has been reported to range from 1.3% in women aged 65 to 80 years to between 4% and 7.7% in men aged 65 to 80 years. There is evidence that the risk of rupture increases as the aneurysm diameter increases from 50 mm to 60 mm. People with AAAs over 55 mm in diameter are therefore generally referred for consideration of repair, as the risk of rupture exceeds the risk of repair. The traditional treatment for AAA is open surgical repair (OSR) which involves a large abdominal incision and is associated with a significant risk of complications. Two less invasive procedures have recently become more widely used: e ndo v ascular a neurysm r epair (EVAR) and laparoscopic repair. EVAR is carried out through sheaths inserted in the femoral artery in the groin: thereafter, a stent graft is placed within the aneurysm sac under radiological image guidance and anchored in place to form a new channel for blood flow. Laparoscopic repair involves the use of a laparoscope which is inserted through small cuts in the abdomen and the synthetic graft is sewn in place to replace the weakened area of the aorta. Laparoscopic AAA repair falls into two categories: hand‐assisted laparoscopic surgery (HALS), where an incision is made to allow the surgeon's hand to assist in the repair; and total laparoscopic surgery (TLS). Both EVAR and laparoscopic repair are favourable over OSR as they are minimally invasive, less painful, associated with fewer complications and lower mortality rate and have a shorter duration of hospital stay. Current evidence suggests that elective laparoscopic AAA repair has a favourable safety profile comparable with that of EVAR, with low conversion rates as well as similar mortality and morbidity rates. As a result, it has been suggested that elective laparoscopic AAA repair may have a role in treating those patients for whom EVAR is unsuitable. Objectives To assess the effects of laparoscopic surgery for elective abdominal aortic aneurysm repair. The primary objective of this review was to assess the perioperative mortality and operative time of laparoscopic (total and hand‐assisted) surgical repair of abdominal aortic aneurysms (AAA) compared to traditional open surgical repair or EVAR. The secondary objective was to assess complication rates, all‐cause mortality (> 30 days), hospital and intensive care unit (ICU) length of stay, conversion and re‐intervention rates, and quality of life associated with laparoscopic (total and hand‐assisted) surgical repair compared to traditional open surgical repair or EVAR. Search methods The Cochrane Vascular Information Specialist (CIS) searched the Specialised Register (last searched August 2016) and CENTRAL (2016, Issue 7). In addition the CIS searched trials registries for details of ongoing or unpublished studies. We searched the reference lists of relevant articles retrieved by electronic searches for additional citations. Selection criteria Randomised controlled trials and controlled clinical trials in which patients with an AAA underwent elective laparoscopic repair (total laparoscopic repair or hand‐assisted laparoscopic repair) compared with either open surgical repair or EVAR. Data collection and analysis Studies identified for potential inclusion were independently assessed for inclusion by at least two review authors. Main results One randomised controlled trial with a total of 100 male participants was included in the review. The trial compared hand‐assisted laparoscopic repair with EVAR and provided results for in‐hospital mortality, operative time, length of hospital stay and lower limb ischaemia. The included study did not report on the other pre‐planned outcomes of this review. No in‐hospital deaths occurred in the study. Hand‐associated laparoscopic repair was associated with a longer operative time (MD 53.00 minutes, 95% CI 36.49 to 69.51) than EVAR. The incidence of lower limb ischaemia was similar between the two treatment groups (risk ratio (RR) 0.50, 95% confidence interval (CI) 0.05 to 5.34). The mean length of hospital stay was 4.2 days and 3.4 days in the hand‐assisted laparoscopic repair and EVAR groups respectively but standard deviations were not reported and therefore it was not possible to independently test the statistical significance of this result. The quality of evidence was downgraded for imprecision due to the inclusion of one small study; and wide confidence intervals and indirectness due to the study including male participants only. No study compared laparoscopic repair (total or hand‐assisted) with open surgical repair or total laparoscopic surgical repair with EVAR. Authors' conclusions There is insufficient evidence to draw any conclusions about effectiveness and safety of laparoscopic (total and hand‐assisted) surgical repair of AAA versus open surgical repair or EVAR, because only one small randomised trial was eligible for inclusion in this review. High‐quality randomised controlled trials are needed. Plain language summary Laparoscopic surgery for abdominal aortic aneurysm Background An abdominal aortic aneurysm (AAA) is an abnormal widening of the abdominal aorta, the main artery supplying blood to the organs in the abdomen and lower part of the body. Between 4% and 7% of men over 65 years of age have an AAA, but it is less common in women. Aneurysms over 55 mm in diameter carry a high risk of rupture which can lead to death; approximately 60% of people with a ruptured AAA die before reaching hospital. People with AAAs over 55 mm are generally referred for repair, as the risk of rupture exceeds the risk of repair. There are three methods of repairing an AAA: surgery, endovascular aneurysm repair (EVAR) and laparoscopic repair. Surgery involves making a large cut in the abdomen, after which the abdominal aorta is exposed and opened and a synthetic graft (tube) is sewn in place to replace the weakened area of the aorta. EVAR involves making a cut in the groin area, after which a stent graft is inserted in collapsed form and opened inside the aneurysm under x‐ray guidance and held in place with a stent. Laparoscopic repair or 'keyhole' AAA surgery is carried out by making very small cuts in the patient’s abdomen, after which a fine telescope (a laparoscope) is inserted through these cuts and the synthetic graft is sewn in place. The benefits of EVAR and laparoscopic repair are that they require smaller incisions, are less painful, have fewer complications, a lower mortality rate and shorter hospital stay than surgical repair. Current evidence suggests that EVAR is the preferred approach for AAA repair. However laparoscopic AAA repair has been suggested as a safe and effective alternative in treating those patients for whom EVAR is unsuitable. This review aimed to assess the effects of laparoscopic surgery for abdominal aortic aneurysms. Study characteristics and key results One randomised controlled trial (current until August 2016), studying 100 male participants and comparing hand‐assisted laparoscopic repair with EVAR, was included in this review. No in‐hospital deaths occurred during the study. The trial showed that hand‐assisted laparoscopic repair took longer to perform than EVAR but there was no difference in the number of patients with reduced blood flow to the leg following either treatment. Quality of evidence At present, there is a lack of randomised controlled trials examining the comparative effectiveness and safety of laparoscopic repair of AAA. The quality of the available evidence was imprecise due to the inclusion of one small study and wide confidence intervals; and indirect because the study includes male participants only. Conclu ions Further research is required before conclusions can be made.

151. Seto AH, Shroff A, Abu-Fadel M, Blankenship JC, Boudoulas KD, Cigarroa JE, et al. Length of stay following percutaneous coronary intervention: An expert consensus document update from the society for cardiovascular angiography and interventions. Catheter Cardiovasc Interv. 2018;92(4):717-31.

Since the publication of the 2009 SCAI Expert Consensus Document on Length of Stay Following percutaneous coronary intervention (PCI), advances in vascular access techniques, stent technology, and antiplatelet pharmacology have facilitated changes in discharge patterns following PCI. Additional clinical studies have demonstrated the safety of early and same day discharge in selected patients with uncomplicated PCI, while reimbursement policies have discouraged unnecessary hospitalization. This consensus update: (1) clarifies clinical and reimbursement definitions of discharge strategies, (2) reviews the technological advances and literature supporting reduced hospitalization duration and risk assessment, and (3) describes changes to the consensus recommendations on length of stay following PCI (Supporting Information Table S1). These recommendations are intended to support reasonable clinical decision making regarding postprocedure length of stay for a broad spectrum of patients undergoing PCI, rather than prescribing a specific period of observation for individual patients.

152. Kim DD, Trikalinos TA, Wong JB. Leveraging Cumulative Network Meta-analysis and Value of Information Analysis to Understand the Evolving Value of Medical Research. Med Decis Making. 2019;39(2):119-29.

BACKGROUND: Leveraging cumulative network meta-analysis (NMA) and value of information (VOI) analysis, this article aims to understand the evolving value of medical research and to identify gaps in the evidence for future research. METHODS: As an illustration, we identified 31 randomized controlled trials (RCT) from 1980 to 2013 that examined a network of 3 interventions for coronary artery disease: medical therapy (MED), percutaneous coronary intervention (PCI), and coronary artery bypass graft (CABG) surgery. We conducted Bayesian NMA to combine evidence from a new RCT with existing knowledge. Then, using the Duke Databank for Cardiovascular Diseases database, we developed an accelerated failure time model to estimate the joint effects of patient characteristics and treatment choices on survival outcomes. With the estimated coefficients and covariance matrices, we projected survival benefits and its surrounding uncertainty among 50,000 simulated patients treated with MED, PCI, or CABG. The value of resolving residual uncertainty from future trials was quantified through the VOI analysis. We repeated these steps for each published RCT to estimate dynamic changes in VOI estimates. RESULTS: Our cumulative NMA found that CABG conferred a lower, but not statistically significant, mortality than PCI (hazard ratio [HR], 0.90; 95% uncertainty interval, 0.80-1.05). MED had a nonsignificantly higher long-term mortality than PCI (HR, 1.11; 0.98-1.31) but significantly higher than CABG (HR, 1.07; 1.23-1.41). The greatest potential gains from future research would come from additional head-to-head trials between CABG v. PCI with the value of future research equaling 0.27 life years per patient. CONCLUSIONS: The combination of cumulative NMA and VOI approaches can improve the efficiency of comparative effectiveness research by using all of the available evidence to determine future research priorities.

153. Williams DM, Finan C, Schmidt AF, Burgess S, Hingorani AD. Lipid lowering and Alzheimer disease risk: A mendelian randomization study. Ann Neurol. 2020;87(1):30-9.

OBJECTIVE: To examine whether genetic variation affecting the expression or function of lipid-lowering drug targets is associated with Alzheimer disease (AD) risk, to evaluate the potential impact of long-term exposure to corresponding therapeutics. METHODS: We conducted Mendelian randomization analyses using variants in genes that encode the protein targets of several approved lipid-lowering drug classes: HMGCR (encoding the target for statins), PCSK9 (encoding the target for PCSK9 inhibitors, eg, evolocumab and alirocumab), NPC1L1 (encoding the target for ezetimibe), and APOB (encoding the target of mipomersen). Variants were weighted by associations with low-density lipoprotein cholesterol (LDL-C) using data from lipid genetics consortia (n up to 295,826). We meta-analyzed Mendelian randomization estimates for regional variants weighted by LDL-C on AD risk from 2 large samples (total n = 24,718 cases, 56,685 controls). RESULTS: Models for HMGCR, APOB, and NPC1L1 did not suggest that the use of related lipid-lowering drug classes would affect AD risk. In contrast, genetically instrumented exposure to PCSK9 inhibitors was predicted to increase AD risk in both of the AD samples (combined odds ratio per standard deviation lower LDL-C inducible by the drug target = 1.45, 95% confidence interval = 1.23-1.69). This risk increase was opposite to, although more modest than, the degree of protection from coronary artery disease predicted by these same methods for PCSK9 inhibition. INTERPRETATION: We did not identify genetic support for the repurposing of statins, ezetimibe, or mipomersen for AD prevention. Notwithstanding caveats to this genetic evidence, pharmacovigilance for AD risk among users of PCSK9 inhibitors may be warranted. ANN NEUROL 2020;87:30-39.

154. Claes J, Buys R, Budts W, Smart N, Cornelissen VA. Longer-term effects of home-based exercise interventions on exercise capacity and physical activity in coronary artery disease patients: A systematic review and meta-analysis. Eur J Prev Cardiol. 2017;24(3):244-56.

Background Exercise-based cardiovascular rehabilitation (CR) improves exercise capacity (EC), lowers cardiovascular risk profile and increases physical functioning in the short term. However, uptake of and adherence to a physically active lifestyle in the long run remain problematic. Home-based (HB) exercise programmes have been introduced in an attempt to enhance long-term adherence to recommended levels of physical activity (PA). The current systematic review and meta-analysis aimed to compare the longer-term effects of HB exercise programmes with usual care (UC) or centre-based (CB) CR in patients referred for CR. Design Systematic review and meta-analysis. Methods Non-randomised controlled trials (RCTs) or randomised trials comparing the effects of HB exercise programmes with UC or CB rehabilitation on EC and/or PA, with a follow-up period of ≥12 months and performed in coronary artery disease patients, were searched in four databases (PubMed, EMBASE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Cochrane Central Register of Controlled trials (CENTRAL)) from their inception until September 7, 2016. Standardised mean differences (SMDs) were calculated and pooled by means of random effects models. Risk of bias, publication bias and heterogeneity among trials were also assessed. Results Seven studies could be included in the meta-analysis on EC, but only two studies could be included in the meta-analysis on PA (total number of 1440 patients). The results showed no significant differences in EC between HB rehabilitation and UC (SMD 0.10, 95% confidence interval (CI) -0.13 to 0.33). There was a small but significant difference in EC in favour of HB compared to CB rehabilitation (SMD 0.25, 95% CI 0.02-0.48). No differences were found for PA (SMD 0.37, 95% CI -0.18 to 0.92). Conclusions HB exercise is slightly more effective than CB rehabilitation in terms of maintaining EC. The small number of studies warrants the need for more RCTs evaluating the long-term effects of different CR interventions on EC and PA behaviour, as this is the ultimate goal of CR.

155. Ergatoudes C, Thunström E, Rosengren A, Björck L, Bengtsson Boström K, Falk K, et al. Long-term secondary prevention of acute myocardial infarction (SEPAT) - guidelines adherence and outcome. BMC Cardiovasc Disord. 2016;16(1):226.

BACKGROUND: A number of registry studies have reported suboptimal adherence to guidelines for cardiovascular prevention during the first year after acute myocardial infarction (AMI). However, only a few studies have addressed long-term secondary prevention after AMI. This study evaluates prevention guideline adherence and outcome of guideline-directed secondary prevention in patients surviving 2 years after AMI. METHODS: Patients aged 18-85 years at the time of their index AMI were consecutively identified from hospital discharge records between July 2010 and December 2011 in Gothenburg, Sweden. All patients who agreed to participate in the study (16.2%) were invited for a structured interview, physical examinations and laboratory analysis 2 years after AMI. Guideline-directed secondary preventive goals were defined as optimally controlled blood pressure, serum cholesterol, glucose, regular physical activity, smoking cessation and pharmacological treatment. RESULTS: The mean age of the study cohort (n = 200) at the index AMI was 63.0 ± 9.7 years, 79% were men. Only 3.5% of the cohort achieved all six guideline-directed secondary preventive goals 2 years after infarction. LDL < 1.8 mmol/L was achieved in 18.5% of the cohort, regular exercise in 45.5% and systolic blood pressure <140 mmHg in 57.0%. Anti-platelet therapy was used by 97% of the patients, beta-blockers by 83.0%, angiotensin-converting enzyme inhibitors/angiotensin receptor blockers by 76.5% and statins by 88.5%. During follow-up, non-fatal adverse cardiovascular events (cardiac hospitalization, recurrent acute coronary syndrome, angina pectoris, new percutaneous coronary intervention, new onset of atrial fibrillation, post-infarct heart failure, pacemaker implantation, stroke/transient ischemic attack (TIA), cardiac surgery and cardiac arrest) occurred in 47% of the cohort and readmission due to cardiac causes in 30%. CONCLUSIONS: Our data showed the failure of secondary prevention in our daily clinical practice and high rate of non-fatal adverse cardiovascular events 2 years after AMI.

156. Pelland-Marcotte MC, Amiri N, Avila ML, Brandão LR. Low molecular weight heparin for prevention of central venous catheter‐related thrombosis in children. Cochrane Database Syst Rev. 2020(6).

http://dx.doi.org/10.1002/14651858.CD005982.pub3

- Background The prevalence of children diagnosed with thrombotic events has been increasing in the last decades. The most common thrombosis risk factor in neonates, infants and children is the placement of a central venous catheter (CVC). It is unknown if anticoagulation prophylaxis with low molecular weight heparin (LMWH) decreases CVC‐related thrombosis in children. This is an update of the Cochrane Review published in 2014. Objectives To determine the effect of LMWH prophylaxis on the incidence of CVC‐related thrombosis and major and minor bleeding complications in children. Further objectives were to determine the effect of LMWH on occlusion of CVCs, number of days of CVC patency, episodes of catheter‐related bloodstream infection (CRBSI), other side effects of LMWH (allergic reactions, abnormal coagulation profile, heparin‐induced thrombocytopaenia and osteoporosis) and mortality during therapy. Search methods The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, Embase and CINAHL databases and World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov trials registers to 7 May 2019. We undertook reference checking of identified trials to identify additional studies. Selection criteria We included randomised controlled trials (RCTs) and quasi‐randomised trials comparing LMWH to no prophylaxis (placebo or no treatment), or low‐dose unfractionated heparin (UFH) either as continuous infusion or flushes (low‐dose UFH aims to ensure the patency of the central line but has no systemic anticoagulation activity), given to prevent CVC‐related thrombotic events in children. We selected studies conducted in children aged 0 to 18 years. Data collection and analysis Two review authors independently identified eligible studies, which were assessed for study methodology including bias, and extracted unadjusted data where available. In the data analysis step, all outcomes were analysed as binary or dichotomous outcomes. The effects of interventions were summarised with risk ratios (RR) and their respective 95% confidence intervals (CI). We assessed the certainty of evidence for each outcome using the GRADE approach. Main results One additional study was included for this update bringing the total to two included studies (with 1135 participants). Both studies were open‐label RCTs comparing LMWH with low‐dose UFH to prevent CVC‐related thrombosis in children. We identified no studies comparing LMWH with placebo or no treatment. Meta‐analysis found insufficient evidence of an effect of LMWH prophylaxis in reducing the incidence of CVC‐related thrombosis in children with CVC, compared to low‐dose UFH (RR 0.68, 95% CI 0.27 to 1.75; 2 studies; 787 participants; low‐certainty evidence). One study (158 participants) reported symptomatic and asymptomatic CVC‐related thrombosis separately and detected no evidence of a difference between LMWH and low‐dose UFH (RR 1.03, 95% CI 0.21 to 4.93; low‐certainty evidence; RR 1.17, 95% CI 0.45 to 3.08; low‐certainty evidence; for symptomatic and asymptomatic participants respectively). There was insufficient evidence to determine whether LMWH impacts the risk of major bleeding (RR 0.27, 95% CI 0.05 to 1.67; 2 studies; 813 participants; low‐certainty evidence); or minor bleeding. One study reported minor bleeding in 53.3% of participants in the LMWH arm and in 44.7% of participants in the low‐dose UFH arm (RR 1.20, 95% CI 0.91 to 1.58; 1 study; 158 participants; very low‐certainty evidence), and the other study reported no minor bleeding in either group (RR: not estimable). Mortality during the study period was reported in one study, where two deaths occurred during the study period. Both were unrelated to thrombotic events and occurred in the low‐dose UFH arm. The second study did not report mortality during therapy per arm but showed similar 5‐year overall survival (low‐certainty evidence). No additional adverse effects were reported. Ot er pre‐specified outcomes (including CVC occlusion, patency and CRBSI) were not reported. Authors' conclusions Pooling data from two RCTs did not provide evidence to support the use of prophylactic LWMH for preventing CVC‐related thrombosis in children (low‐certainty evidence). Evidence was also insufficient to confirm or exclude a difference in the incidence of major and minor bleeding complications in the LMWH prophylaxis group compared to low‐dose UFH (low and very low certainty respectively). No evidence of a clear difference in overall mortality was seen. Studies did not report on the outcomes catheter occlusion, days of catheter patency, episodes of CRBSI and other side effects of LMWH (allergic reactions, abnormal coagulation profile, heparin‐induced thrombocytopaenia and osteoporosis). The certainty of the evidence was downgraded due to risk of bias of the included studies, imprecision and inconsistency, preventing conclusions in regards to the efficacy of LMWH prophylaxis to prevent CVC‐related thrombosis in children. Plain language summary Do blood thinners prevent blood clots in children who are treated using central lines? Background Central lines are thin flexible tubes that are inserted into a person’s vein to provide medical care. They are used to deliver medicines, fluids or nutrients (to feed the patient) directly into the bloodstream. However, they can cause the blood to clot (form into a small lump). This prevents blood from flowing normally in the blood vessels. Blood clots can cause symptoms such as pain or swelling, but can also happen without any symptoms. They can lead to serious health problems and death, if they move and become stuck in major veins or in the lungs. Since the 1990s, blood clots in children in general have become more common, notably due to the rise in blood clots in children treated with central lines. We reviewed the existing research to find out if giving children a blood thinning medicine called low molecular weight heparin (LMWH) protects against blood clots. We also wanted to know whether LMWH increases the risk of minor or severe bleeding, death or other unwanted (adverse) side effects. What did we find? We searched the scientific literature in May 2019. We found two studies (one more than when we last searched in 2014). The studies compared what happens in children (aged up to 18 years old) treated using central lines who received LMWH and those who did not. A total of 1135 children were followed for between 30 and 64 days. During that time, the number of blood clots, bleeding episodes and deaths were recorded. One study also looked at the number of deaths five years after treatment. The two studies we found did not allow us to determine with certainty whether or not LMWH protects children with central lines from getting blood clots (with or without symptoms). The studies also did not allow us to determine whether children on LMWH were more likely to experience bleeding (minor or severe), or whether LMWH increases or reduces the risk of death. The two studies did not report any additional adverse effects caused by LMWH. Certainty of the evidence We judged the certainty of the evidence to be low for blood clots, low for major bleeding, very low for minor bleeding, and low for mortality. The certainty of the evidence was low or very low because: ⦁ there were differences in the way blood clots, bleeding and mortality were measured between studies; ⦁ there were few studies and events; and ⦁ the researchers and children in the studies knew who was receiving LMWH and who was not, which can influence results. It is likely that future studies will have an important impact on our understanding of the role of LMWH to prevent blood clots and its side effects. Conclusion We need more studies on whether LMWH prevents blood clots in children who are treated using central venous lines.

157. Kontsevaya AV, Bates K, Schirmer H, Bobrova N, Leon D, McKee M. Management of patients with acute ST-segment elevation myocardial infarction in Russian hospitals adheres to international guidelines. Open Heart. 2020;7(1):e001134.

OBJECTIVE: Russia has one of the highest cardiovascular mortality rates. Modernisation of the Russian health system has been accompanied by a substantial increase in uptake of percutaneous coronary intervention (PCI), which substantially reduces the risk of mortality in patients with acute ST-elevation myocardial infarction (STEMI). This paper aims to describe contemporary Hospital treatment of acute STEMI among patients in a range of hospitals in the Russian Federation. METHODS: This study used data from a prospective observational cohort of 1128 suspected patients with myocardial infarction recruited in both PCI and non-PCI hospitals across 13 regions and multiple levels of the health system in Russia. The primary objective was to examine the use of reperfusion strategies in patients with STEMI. RESULTS: Among patients reaching PCI centres within 12 hours of symptom onset, the vast majority received angiography and PCI, regardless of age, sex and comorbidity, in line with current European Society of Cardiology guidelines. CONCLUSION: Patients reaching Russian hospitals are very likely to receive appropriate treatment, although performance varies. The best hospitals can serve as beacons of good practice as PCI facilities continue to expand across Russia where geography allows.

158. Ciffone N, Dokken BB. Medical management of acute coronary syndromes. J Am Assoc Nurse Pract. 2017;29(4):224-35.

BACKGROUND: Recent updates to clinical guidelines and pharmacological indications have added to the complexity of acute coronary syndrome (ACS) management. Advanced practice nurses working with ACS patients need clear and up-to-date information to optimize patient care. PURPOSE: To provide a practical overview of the management of ACS from patient presentation through to long-term secondary prevention based on recent guidelines and randomized controlled trials, with particular emphasis on medical management. METHODS: Systematically reviewed recent studies and guidelines published 2011-2015 using PubMed search terms including "ACS management," "ACS hospital care," and "ACS secondary prevention." CONCLUSIONS: The last decade has seen an increase in the number of antithrombotic (anticoagulant and antiplatelet) agents and an expansion of their licensed indications for treatment of ACS patients. Future trials will help identify which subgroups of patients will gain the greatest benefit from more intense antithrombotic therapy. IMPLICATIONS FOR PRACTICE: Management of ACS is dependent on individual patient characteristics and risk stratification. Greater choice among therapies available for acute and long-term management will help to achieve optimal, patient-tailored care.

159. Qin SL, He CY, Xu JS, Lai XY, Liu SS, He WP. Meta-analysis of coronary artery bypass graft surgery combined with stem cell transplantation in the treatment of ischemic heart diseases. Coron Artery Dis. 2015;26(2):170-5.

OBJECTIVE: The use of bone marrow cells (BMCs) to regenerate the myocardium and vessels is a new treatment for ischemic heart diseases (IHD) that has been receiving attention. In this study, a meta-analysis was used to analyze the efficacy of combining coronary artery bypass graft (CABG) surgery with BMC transplantation in the treatment of IHD. METHODS AND RESULTS: MEDLINE, EMBASE, Cochrane, CNKI, WAN-FANG, and WEI-PU databases were searched. The main inclusion criteria were as follows: (a) studies that analyzed patients diagnosed with chronic IHD. (b) Studies that had randomized-controlled trials. (c) Studies that included research comparing the efficacy of CABG and CABG combined with bone BMC transplantation in the treatment of IHD. (d) Studies with specific enumeration data at the end of the follow-up with a follow-up time of at least 3 months. Nine randomized trials were included. There were 158 patients in the group that received the treatment of CABG surgery as well as stem cell transplantation, referred to as the 'cell transplantation group.' A total of 147 patients were in the group that only received the treatment of CABG surgery, referred to as the 'CABG group'. Our data show that not only did stem cell transplantation significantly improve left ventricular ejection fraction (odds ratio=11.7, 95% confidence interval: 4.04-19.36; P=0.003) but it also significantly reduced the left ventricular end-diastolic volume and left ventricular end-systolic volume (P<0.001). CONCLUSION: BMC transplantation is associated with a significant improvement in left ventricular ejection fraction and the attenuation of left ventricular remodeling.

160. Wang L, Pei D, Ouyang YQ, Nie X. Meta-analysis of risk and protective factors for gastrointestinal bleeding after percutaneous coronary intervention. Int J Nurs Pract. 2019;25(1):e12707.

AIM: To quantitatively analyse factors related to gastrointestinal bleeding after percutaneous coronary intervention and provide evidence for the prevention of gastrointestinal bleeding. DATA SOURCES AND REVIEW METHODS: Cochrane Library, Pubmed, Embase, and Ovid databases were searched from inception to 31 May 2018; case-control and cohort studies published in English were included. The methodological quality of each study was assessed by two independent reviewers using the Newcastle-Ottawa Scale. Meta-analysis was performed using Revman version 5.3. RESULTS: A total of 16 publications yielded data about risk factors. It was found that age older than 70 years, age (per 10-year increase), female sex, baseline anaemia, history of smoking, history of using alcohol, history of peptic ulcer disease, chronic renal failure, previous bleeding, shock, congestive heart failure, acute myocardial infarction, prior use of inotropic medications, and prior use of antithrombotic medications were positively associated with gastrointestinal bleeding. Four articles yielded data about protective factors. It was found that proton-pump inhibitor and bivalirudin therapy were negatively associated with gastrointestinal bleeding after percutaneous coronary intervention. CONCLUSION: This research found risk and protective factors which can assist in effective management of this potentially fatal complication.

161. Zhao Y, Yu BY, Liu Y, Liu Y. Meta-Analysis of the Effect of Obstructive Sleep Apnea on Cardiovascular Events After Percutaneous Coronary Intervention. Am J Cardiol. 2017;120(6):1026-30.

Increasing evidence proved that obstructive sleep apnea (OSA) is associated with a variety of diseases, especially cardiovascular diseases. This study systematically reviewed the existing publications to assess the influence of OSA on cardiovascular survival among patients who underwent percutaneous coronary intervention. Eleven eligible publications, including 3,008 participants, were finally evaluated. Eight studies conducted adjustment of risk ratio for potential cardiovascular risk factors, 5 studies defined OSA groups as AHI (apnea hypopnea index) ≥15/hour, whereas the remaining eligible studies used AHI ≥5/hour, AHI ≥10/hour, or AHI ≥30/hour as the criteria. According to the result from 5 studies that use AHI ≥15/hour as OSA group, the existence of OSA could, to some extent, increase the risk of cardiovascular events (risk ratio 1.59, 95% confidence interval 1.22 to 2.06). Meanwhile, hazard ratio was also observed in separate co-morbidities, such as cardiac death, all-cause mortality, stroke, target lesion revascularization, non-fatal myocardial infarction, hospitalization for heart failure, and recurrence of acute coronary syndrome, regardless if the estimates are varied among studies. In conclusion, OSA can independently increase the risk of cardiovascular events, even after adjustment for confounders. Sleep health should be given utmost importance due to its extensive influence on cardiovascular disorders.

162. Bohannon RW, Crouch R. Minimal clinically important difference for change in 6-minute walk test distance of adults with pathology: a systematic review. J Eval Clin Pract. 2017;23(2):377-81.

RATIONALE, AIMS, AND OBJECTIVES: The 6-minute walk test (6MWT) is widely used as a test of functional exercise capacity. Several studies have reported the minimal clinically important difference (MCID) for the 6MWT; however, the findings of the studies have not been examined in the context of one another. In this review, we aimed to summarize available information on the MCID for the 6MWT performed by patients with pathology. METHODS: Relevant literature was identified by searches of 3 electronic databases (PubMed, Scopus, and Cumulative Index of Nursing and Allied Health), examination of article reference lists, and consultation with an expert. Inclusion necessitated that articles (1) be original, full length, and peer reviewed, (2) report an MCID for the 6MWT, and (3) focus on adults with medical issues. Articles were excluded if the MCID was determined by a procedure other than receiver operating characteristic curve analysis. Articles were abstracted for information on participants, interventions, 6MWT distance, and the determination of MCID. Quality was assessed using a hybrid 9-item (0- to 18-point) instrument. RESULTS: Six articles were selected based on the inclusion and exclusion criteria. The populations studied included people with chronic obstructive pulmonary disease, lung cancer, coronary artery disease, diffuse parenchymal lung disease, and non-cystic fibrosis bronchiectasis and adults with fear of falling. Mean baseline 6MWT distances ranged from 295 to 551 m. The MCIDs for which the area under the receiver operating characteristic curve was at least 0.70 ranged from 14.0 to 30.5 m. CONCLUSIONS: Based on our findings, a change of 14.0 to 30.5 m may be clinically important across multiple patient groups.

163. Tai ES, Chia BL, Bastian AC, Chua T, Ho SC, Koh TS, et al. Ministry of Health Clinical Practice Guidelines: Lipids. Singapore Med J. 2017;58(3):155-66.

The Ministry of Health (MOH) has updated the Clinical Practice Guidelines on Lipids to provide doctors and patients in Singapore with evidence-based treatment for lipids. This article reproduces the introduction and executive summary (with recommendations from the guidelines) from the MOH Clinical Practice Guidelines on Lipids, for the information of SMJ readers. Chapters and page numbers mentioned in the reproduced extract refer to the full text of the guidelines, which are available from the Ministry of Health website: http://www.moh.gov.sg/content/moh\_web/healthprofessionalsportal/doctors/guidelines/cpg\_medical.html.

164. Brørs G, Pettersen TR, Hansen TB, Fridlund B, Hølvold LB, Lund H, et al. Modes of e-Health delivery in secondary prevention programmes for patients with coronary artery disease: a systematic review. BMC Health Serv Res. 2019;19(1):364.

BACKGROUND: Electronic health (e-Health) interventions are emerging as an effective alternative model for improving secondary prevention of coronary artery disease (CAD). The aim of this study was to describe the effectiveness of different modes of delivery and components in e-Health secondary prevention programmes on adherence to treatment, modifiable CAD risk factors and psychosocial outcomes for patients with CAD. METHOD: A systematic review was carried out based on articles found in MEDLINE, CINAHL, and Embase. Studies evaluating secondary prevention e-Health programmes provided through mobile-Health (m-Health), web-based technology or a combination of m-Health and web-based technology were eligible. The main outcomes measured were adherence to treatment, modifiable CAD risk factors and psychosocial outcomes. The quality appraisal of the studies included was conducted using the Joanna Briggs Institute critical appraisal tool for RCT. The results were synthesised narratively. RESULT: A total of 4834 titles were identified and 1350 were screened for eligibility. After reviewing 123 articles in full, 24 RCTs including 3654 participants with CAD were included. Eight studies delivered secondary prevention programmes through m-Health, nine through web-based technology, and seven studies used a combination of m-Health and web-based technology. The majority of studies employed two or three secondary prevention components, of which health education was employed in 21 studies. The m-Health programmes reported positive effects on adherence to medication. Most studies evaluating web-based technology programmes alone or in combination with m-Health also utilised traditional CR, and reported improved modifiable CAD risk factors. The quality appraisal showed a moderate methodological quality of the studies. CONCLUSION: Evidence exists that supports the use of e-Health interventions for improving secondary prevention of CAD. However, a comparison across studies highlighted a wide variability of components and outcomes within the different modes of delivery. High quality trials are needed to define the most efficient mode of delivery and components capable of addressing a favourable outcome for patients. TRIAL REGISTRATION: Not applicable.

165. Rossini R, Tarantini G, Musumeci G, Masiero G, Barbato E, Calabrò P, et al. A Multidisciplinary Approach on the Perioperative Antithrombotic Management of Patients With Coronary Stents Undergoing Surgery: Surgery After Stenting 2. JACC Cardiovasc Interv. 2018;11(5):417-34.

Perioperative management of antithrombotic therapy in patients treated with coronary stents undergoing surgery remains poorly defined. Importantly, surgery represents a common reason for premature treatment discontinuation, which is associated with an increased risk in mortality and major adverse cardiac events. However, maintaining antithrombotic therapy to minimize the incidence of perioperative ischemic complications may increase the risk of bleeding complications. Although guidelines provide some recommendations with respect to the perioperative management of antithrombotic therapy, these have been largely developed according to the thrombotic risk of the patient and a definition of the hemorrhagic risk specific to each surgical procedure, key to defining the trade-off between ischemia and bleeding, is not provided. These observations underscore the need for a multidisciplinary collaboration among cardiologists, anesthesiologists, hematologists and surgeons to reach this goal. The present document is an update on practical recommendations for standardizing management of antithrombotic therapy management in patients treated with coronary stents (Surgery After Stenting 2) in various types of surgery according to the predicted individual risk of thrombotic complications against the anticipated risk of surgical bleeding complications. Cardiologists defined the thrombotic risk using a "combined ischemic risk" approach, while surgeons classified surgeries according to their inherent hemorrhagic risk. Finally, a multidisciplinary agreement on the most appropriate antithrombotic treatment regimen in the perioperative phase was reached for each surgical procedure.

166. Rossini R, Oltrona Visconti L, Musumeci G, Filippi A, Pedretti R, Lettieri C, et al. A multidisciplinary consensus document on follow-up strategies for patients treated with percutaneous coronary intervention. Catheter Cardiovasc Interv. 2015;85(5):E129-39.

The number of percutaneous coronary interventions (PCI) is increasing worldwide. Follow-up strategies after PCI are extremely heterogeneous and can greatly affect the cost of medical care. Of note, clinical evaluations and non-invasive exams are often performed to low risk patients. In the present consensus document, practical advises are provided with respect to a tailored follow-up strategy on the basis of patients' risk profile. Three strategies follow-up have been defined and types and timing of clinical and instrumental evaluations are reported. Clinical and interventional cardiologists, cardiac rehabilitators, and general practitioners, who are in charge to manage post-PCI patients, equally contributed to the creation of the present document.

167. Chen H, Cade BE, Gleason KJ, Bjonnes AC, Stilp AM, Sofer T, et al. Multiethnic Meta-Analysis Identifies RAI1 as a Possible Obstructive Sleep Apnea-related Quantitative Trait Locus in Men. Am J Respir Cell Mol Biol. 2018;58(3):391-401.

Obstructive sleep apnea (OSA) is a common heritable disorder displaying marked sexual dimorphism in disease prevalence and progression. Previous genetic association studies have identified a few genetic loci associated with OSA and related quantitative traits, but they have only focused on single ethnic groups, and a large proportion of the heritability remains unexplained. The apnea-hypopnea index (AHI) is a commonly used quantitative measure characterizing OSA severity. Because OSA differs by sex, and the pathophysiology of obstructive events differ in rapid eye movement (REM) and non-REM (NREM) sleep, we hypothesized that additional genetic association signals would be identified by analyzing the NREM/REM-specific AHI and by conducting sex-specific analyses in multiethnic samples. We performed genome-wide association tests for up to 19,733 participants of African, Asian, European, and Hispanic/Latino American ancestry in 7 studies. We identified rs12936587 on chromosome 17 as a possible quantitative trait locus for NREM AHI in men (N = 6,737; P = 1.7 × 10(-8)) but not in women (P = 0.77). The association with NREM AHI was replicated in a physiological research study (N = 67; P = 0.047). This locus overlapping the RAI1 gene and encompassing genes PEMT1, SREBF1, and RASD1 was previously reported to be associated with coronary artery disease, lipid metabolism, and implicated in Potocki-Lupski syndrome and Smith-Magenis syndrome, which are characterized by abnormal sleep phenotypes. We also identified gene-by-sex interactions in suggestive association regions, suggesting that genetic variants for AHI appear to vary by sex, consistent with the clinical observations of strong sexual dimorphism.

168. Su SF, Yeh WT. Music Interventions in Percutaneous Coronary Procedures: A Meta-Analysis. Clin Nurs Res. 2019:1054773819883171.

To clarify the effectiveness of music intervention for improving the well-being of patients undergoing coronary procedures for coronary heart disease, we conducted full-text searches of various databases (MEDLINE, Cochrane Library, CINAHL, ProQuest, and Airiti Library; 1966-2019) to identify randomized controlled trials and quasi-experimental studies of music intervention in recipients of angiography or percutaneous coronary intervention. Outcome measures included anxiety, discomfort, pain, heart rate, and blood pressure. The Cochrane methodology, Jadad Quality Score, and ROBINS-I were employed to evaluate evidence from 10 studies. Music intervention reduced anxiety (effect size: Z = 2.15, p = .03; six studies) and discomfort of lying (Z = 2.40, p = .02; two studies), but did not affect pain (Z = 0.94; two studies), heart rate (Z = 0.94; five studies), or blood pressure (systolic, Z = 1.27; diastolic, Z = 1.32; four studies) (all p > .05). The heterogeneity among studies was high. Large-scale, transcultural, high-quality trials are warranted to confirm the benefit of music intervention in patients undergoing coronary procedures.

169. Muhammad I, He HG, Kowitlawakul Y, Wang W. Narrative review of health-related quality of life and its predictors among patients with coronary heart disease. Int J Nurs Pract. 2016;22(1):4-14.

This paper summarizes the empirical evidence concerning health-related quality of life (HRQoL) of patients with coronary heart disease (CHD) and attempts to identify its significant predictors. A systematic search of the literature from 2002 to 2012 was conducted using seven electronic databases (CINAHL, ScienceDirect, Medline, Scopus, PsycINFO, PubMed and Web of Science) using the search terms 'HRQoL'. 'CHD', 'social support', 'depression', 'anxiety', 'psychosocial factors', 'sociodemographic factors', 'clinical factors' and 'predictors'. A total of 1052 studies were retrieved, of which 24 articles were included in this review. Previous studies have consistently demonstrated the negative impact of CHD on HRQoL, citing three major types of predictive factors: sociodemographic, clinical and psychosocial factors. Studies have also highlighted the advantageous use of HRQoL as a gauge for treatment satisfaction and efficacy. There are, however, few studies that collectively investigate the relationship among concepts such as HRQoL, anxiety and depression, social support, and sociodemographic and clinical factors in relation to CHD. This review highlights the need to conduct further study on HRQoL of patients with CHD in the Asian context. Such research will promote patient-centric care and improved patient satisfaction through incorporation of the concept of HRQoL into clinical practice.

170. Chew DP, Scott IA, Cullen L, French JK, Briffa TG, Tideman PA, et al. National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand: Australian clinical guidelines for the management of acute coronary syndromes 2016. Med J Aust. 2016;205(3):128-33.

INTRODUCTION: The modern care of suspected and confirmed acute coronary syndrome (ACS) is informed by an extensive and evolving evidence base. This clinical practice guideline focuses on key components of management associated with improved clinical outcomes for patients with chest pain or ACS. These are presented as recommendations that have been graded on both the strength of evidence and the likely absolute benefit versus harm. Additional considerations influencing the delivery of specific therapies and management strategies are presented as practice points. MAIN RECOMMENDATIONS: This guideline provides advice on the standardised assessment and management of patients with suspected ACS, including the implementation of clinical assessment pathways and subsequent functional and anatomical testing. It provides guidance on the: diagnosis and risk stratification of ACS; provision of acute reperfusion therapy and immediate post-fibrinolysis care for patients with ST segment elevation myocardial infarction; risk stratification informing the use of routine versus selective invasive management for patients with non-ST segment elevation ACS; administration of antithrombotic therapies in the acute setting and considerations affecting their long term use; and implementation of an individualised secondary prevention plan that includes both pharmacotherapies and cardiac rehabilitation. Changes in management as a result of the guideline: This guideline has been designed to facilitate the systematic integration of the recommendations into a standardised approach to ACS care, while also allowing for contextual adaptation of the recommendations in response to the individual's needs and preferences. The provision of ACS care should be subject to continuous monitoring, feedback and improvement of quality and patient outcomes.

171. Doyle F, Freedland K, Carney R, de Jonge P, Dickens C, Pedersen S, et al. Network meta-analysis of randomised trials of pharmacological, psychotherapeutic, exercise and collaborative care interventions for depressive symptoms in patients with coronary artery disease: hybrid systematic review of systematic reviews protocol. Syst Rev. 2019;8(1):71.

BACKGROUND: Depression is common in patients with coronary artery disease (CAD) and is associated with poorer outcomes and higher costs. Several randomised controlled trials (RCTs) targeting depression, of various modalities (including pharmacological, psychotherapeutic and other approaches), have been conducted and summarised in pairwise meta-analytic reviews. However, no study has considered the cumulative evidence within a network, which can provide valuable indirect comparisons and information about the relative efficacy of interventions. Therefore, we will adopt a review of review methodology to develop a network meta-analysis (NMA) of depression interventions for depression in CAD. METHODS: We will search relevant databases from inception for systematic reviews of RCTs of depression treatments for people with CAD, supplementing this with comprehensive searches for recent or ongoing studies. We will extract data from and summarise characteristics of individual RCTs, including participants, study characteristics, outcome measures and adverse events. Cochrane risk of bias ratings will also be extracted or if not present will be conducted by the authors. RCTs that compare depression treatments (grouped as pharmacological, psychotherapeutic, combined pharmacological/psychotherapeutic, exercise, collaborative care) to placebo, usual care, waitlist control or attention controls, or directly in head-to-head comparisons, will be included. Primary outcomes will be the change in depressive symptoms (summarised with a standardised mean difference) and treatment acceptability (treatment discontinuation: % of people who withdrew). Secondary outcomes will include change in 6-month depression outcomes, health-related quality of life (HRQoL), mortality, cardiovascular morbidity, health services use and adverse events. Secondary analyses will form further networks with individual anti-depressants and psychotherapies. We will use frequentist, random effects multivariate network meta-analysis to synthesise the evidence for depression intervention and to achieve a ranking of treatments, using Stata. Rankograms and surface under the cumulative ranking curves will be used for treatment ranking. Local and global methods will evaluate consistency. GRADE will be used to assess evidence quality for primary outcomes. DISCUSSION: The present review will address uncertainties about the evidence in terms of depression management in CAD and may allow for a ranking of treatments, including providing important information for future research efforts. SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42018108293.

172. Jamé S, Wittenberg E, Potter MB, Fleischmann KE. The new lipid guidelines: what do primary care clinicians think? Am J Med. 2015;128(8):914.e5-.e10.

BACKGROUND: Little is known about the opinions of primary care clinicians regarding the newly released 2013 American College of Cardiology/American Heart Association (ACC/AHA) Guidelines for the Prevention of Primary and Secondary Atherosclerotic Disease. This survey was created to assess the awareness, attitudes, and practices of primary care clinicians on adoption of the new guidelines and to explore obstacles to implementation and suggestions for improving shared decision-making. METHODS: Six hundred practicing clinicians within the San Francisco Bay Area Collaborative Research Network were invited to participate in this cross-sectional, Internet-based pilot survey of primary care clinicians. These survey data were collected in March 2014, approximately 4 months after the release of the new guidelines and 1 month after the release of the ACC/AHA risk estimator application. RESULTS: One hundred eighty-three clinicians responded to the survey. Of those respondents, 176 (96%) were aware of the guidelines. The majority (64%) reported implementing the new guidelines with at least some of their patients, while a minority (25%) reported adopting the guidelines for many of their patients. Disagreeing with the guidelines was the main hindrance to adoption. CONCLUSIONS: While many primary care clinicians are aware of the new guidelines, a substantial proportion has yet to implement them into their clinical practice, and obstacles remain for full adoption. Further understanding of clinicians' views, opinions, and needs is necessary to optimize the approach to lipid management and ensure integration into current practice.

173. Molino CG, Romano-Lieber NS, Ribeiro E, de Melo DO. Non-Communicable Disease Clinical Practice Guidelines in Brazil: A Systematic Assessment of Methodological Quality and Transparency. PLoS One. 2016;11(11):e0166367.

BACKGROUND: Annually, non-communicable diseases (NCDs) kill 38 million people worldwide, with low and middle-income countries accounting for three-quarters of these deaths. High-quality clinical practice guidelines (CPGs) are fundamental to improving NCD management. The present study evaluated the methodological rigor and transparency of Brazilian CPGs that recommend pharmacological treatment for the most prevalent NCDs. METHODS: We conducted a systematic search for CPGs of the following NCDs: asthma, atrial fibrillation, benign prostatic hyperplasia, chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease and/or stable angina, dementia, depression, diabetes, gastroesophageal reflux disease, hypercholesterolemia, hypertension, osteoarthritis, and osteoporosis. CPGs comprising pharmacological treatment recommendations were included. No language or year restrictions were applied. CPGs were excluded if they were merely for local use and referred to NCDs not listed above. CPG quality was independently assessed by two reviewers using the Appraisal of Guidelines Research and Evaluation instrument, version II (AGREE II). MAIN FINDINGS: "Scope and purpose" and "clarity and presentation" domains received the highest scores. Sixteen of 26 CPGs were classified as low quality, and none were classified as high overall quality. No CPG was recommended without modification (77% were not recommended at all). After 2009, 2 domain scores ("rigor of development" and "clarity and presentation") increased (61% and 73%, respectively). However, "rigor of development" was still rated < 30%. CONCLUSION: Brazilian healthcare professionals should be concerned with CPG quality for the treatment of selected NCDs. Features that undermined AGREE II scores included the lack of a multidisciplinary team for the development group, no consideration of patients' preferences, insufficient information regarding literature searches, lack of selection criteria, formulating recommendations, authors' conflict of interest disclosures, and funding body influence.

174. Emami H, Takx RAP, Mayrhofer T, Janjua S, Park J, Pursnani A, et al. Nonobstructive Coronary Artery Disease by Coronary CT Angiography Improves Risk Stratification and Allocation of Statin Therapy. JACC Cardiovasc Imaging. 2017;10(9):1031-8.

OBJECTIVES: This study sought to determine prognostic value of nonobstructive coronary artery disease (CAD) for atherosclerotic cardiovascular disease (ASCVD) events and to determine whether incorporation of this information into the pooled cohort equation reclassifies recommendations for statin therapy as defined by the 2013 guidelines for cholesterol management of the American College of Cardiology and American Heart Association (ACC/AHA). BACKGROUND: Detection of nonobstructive CAD by coronary computed tomography angiography may improve risk stratification and permit individualized and more appropriate allocation of statin therapy. METHODS: This study determined the pooled hazard ratio of nonobstructive CAD for ASCVD events from published studies and incorporated this information into the ACC/AHA pooled cohort equation. The study calculated revised sex- and ethnicity-based 10-year ASCVD risk and determined boundaries corresponding to the original 7.5% risk for ASCVD events. It also assessed reclassification for statin eligibility by incorporating the results from meta-analysis to individual patients from a separate cohort. RESULTS: This study included 2 studies (2,295 subjects; 66% male; prevalence of nonobstructive CAD, 47%; median follow-up, 49 months; 67 ASCVD events). The hazard ratio of nonobstructive CAD for ASCVD events was 3.2 (95% confidence interval: 1.5 to 6.7). Incorporation of this information into the pooled cohort equation resulted in reclassification toward statin eligibility in individuals with nonobstructive CAD, with an original ASCVD score of 3.0% and 5.9% or higher in African-American women and men and a score of 4.4% and 4.6% or higher in Caucasian women and men, respectively. The absence of nonobstructive CAD resulted in reclassification toward statin ineligibility if the original ASCVD score was as 10.0% and 17.9% or lower in African-American women and men and 13.7% and 14.3% or lower in Caucasian women and men, respectively. Reclassification is observed in 14% of patients. CONCLUSIONS: Detection of nonobstructive CAD by coronary computed tomography angiography improves risk stratification and permits individualized and more appropriate allocation of statin therapy across sex and ethnicity groups.

175. Wang B, Zhang Y, Wang X, Hu T, Li J, Geng J. Off-hours presentation is associated with short-term mortality but not with long-term mortality in patients with ST-segment elevation myocardial infarction: A meta-analysis. PLoS One. 2017;12(12):e0189572.

BACKGROUND: The association between off-hours presentation and mortality in patients with ST-segment elevation myocardial infarction (STEMI) remains unclear. We performed a meta-analysis to assess the impact of off-hours presentation on short- and long-term mortality among STEMI patients. METHODS: We searched PubMed, EMBASE, and the Cochrane Library from their inception to 10 July 2016. Studies were eligible if they evaluated the relationship of off-hours (weekend and/or night) presentation with short- and/or long-term mortality. RESULTS: A total of 30 studies with 33 cohorts involving 192,658 STEMI patients were included. Off-hours presentation was associated with short-term mortality (odds ratio [OR] 1.07, 95% confidence interval [CI] 1.02-1.12, P = 0.004) but not with long-term mortality (OR 1.00, 95% CI 0.94-1.07, P = 0.979). No significant heterogeneity was observed. The outcomes remained the same after sensitivity analyses and trim and fill analyses. Subgroup analyses showed that STEMI patients undergoing primary percutaneous coronary intervention do not have a higher risk of short-term mortality (OR 1.061, 95% CI 0.993-1.151). In addition, higher mortality was observed only during hospitalization (OR 1.072, 95% CI 1.022-1.125), not at the 30-day, 1-year or long-term follow-ups. CONCLUSIONS: Off-hours presentation was associated with an increase in short-term mortality, but not long-term mortality, among STEMI patients. Clinical approaches to decrease short-term mortality regardless of the time of presentation should be evaluated in future studies.

176. Kowalewski M, Pawliszak W, Malvindi PG, Bokszanski MP, Perlinski D, Raffa GM, et al. Off-pump coronary artery bypass grafting improves short-term outcomes in high-risk patients compared with on-pump coronary artery bypass grafting: Meta-analysis. J Thorac Cardiovasc Surg. 2016;151(1):60-77.e1-58.

OBJECTIVES: To assess the benefits and risks of off-pump coronary artery bypass (OPCAB) versus coronary artery bypass grafting (CABG) through a meta-analysis of randomized controlled trials (RCTs), and to investigate the relationship between outcomes and patient risk profile. METHODS: PubMed, Embase, the Cumulative Index of Nursing and Allied Health Literature, Scopus, Web of Science, Cochrane Library, and major conference proceedings databases were searched for RCTs comparing OPCAB and CABG and reporting short-term (≤ 30 days) outcomes. Endpoints assessed were all-cause mortality, myocardial infarction (MI), and cerebral stroke. RESULTS: The meta-analysis included 100 studies, with a total of 19,192 subjects. There was no difference between the 2 techniques with respect to all-cause mortality and MI (odds ratio [OR], 0.88; 95% confidence interval [CI], 0.71-1.09; P = .25; I(2) = 0% and OR, 0.90; 95% CI, 0.77-1.05; P = .19; I(2) = 0%, respectively). OPCAB was associated with a significant 28% reduction in the odds of cerebral stroke (OR, 0.72; 95% CI, 0.56-0.92; P = .009; I(2) = 0%). A significant relationship between patient risk profile and benefits from OPCAB was found in terms of all-cause mortality (P < .01), MI (P < .01), and cerebral stroke (P < .01). CONCLUSIONS: OPCAB is associated with a significant reduction in the odds of cerebral stroke compared with conventional CABG. In addition, benefits of OPCAB in terms of death, MI, and cerebral stroke are significantly related to patient risk profile, suggesting that OPCAB should be strongly considered in high-risk patients.

177. Shaefi S, Mittel A, Loberman D, Ramakrishna H. Off-Pump Versus On-Pump Coronary Artery Bypass Grafting-A Systematic Review and Analysis of Clinical Outcomes. J Cardiothorac Vasc Anesth. 2019;33(1):232-44.

Surgical coronary artery bypass grafting (CABG) is the standard of care for revascularization of left main or three-vessel coronary artery disease. The off-pump coronary artery bypass graft (OPCAB) procedure avoids the use of cardiopulmonary bypass. Theoretically, OPCAB may improve long-term outcomes by reducing the rates of perioperative myocardial injury, stroke, neurocognitive impairment, and cardiac-related mortality. Several high-quality clinical trials have been conducted since OPCAB became popular in the 1990s and have demonstrated no benefit of OPCAB over traditional CABG with respect to these outcomes despite favorable short-term reductions in transfusion requirements and other postoperative complications. Ultimately, OPCAB is associated with less effective myocardial revascularization and does not entirely prevent complications traditionally associated with cardiopulmonary bypass. This article reviews major high-quality trials of OPCAB versus traditional CABG with respect to both short- and long-term clinical outcomes.

178. Tam KW, Wu MY, Siddiqui FJ, Chan ESY, Zhu Y, Jafar TH. Omega‐3 fatty acids for dialysis vascular access outcomes in patients with chronic kidney disease. Cochrane Database Syst Rev. 2018(11).

http://dx.doi.org/10.1002/14651858.CD011353.pub2

- Background Maintaining long‐term vascular access patency is necessary for high quality haemodialysis (HD) treatment of patients with the terminal and most serious stage of chronic kidney disease (CKD) ‐ end‐stage kidney disease (ESKD). Oral supplementation with omega‐3 fatty acids (ω‐3FA) may help to prevent blockage of the vascular access by reducing the risk of thrombosis and stenosis. Objectives To evaluate the efficacy and safety of ω‐3FA supplementation versus placebo or no treatment for maintaining vascular access patency in ESKD patients undergoing HD. Search methods We searched the Cochrane Kidney and Transplant Register of Studies up to 23 July 2018 through contact with the Information Specialist using search terms relevant to this review. Studies in the Register are identified through searches of CENTRAL, MEDLINE, EMBASE, conference proceedings, the International Clinical Trials Register (ICTRP) Search Portal, and ClinicalTrials.gov. Selection criteria Randomised controlled trials (RCTs) of omega‐3 fatty acids versus placebo that assessed the patency of arteriovenous fistula (AVF) or arteriovenous graft (AVG) types of vascular access in ESKD patients. Data collection and analysis We assessed the risk of bias of each eligible study using the Cochrane Risk of Bias tool and made separate overall risk of bias judgments for the efficacy and safety outcomes. The certainty of evidence was assessed using the GRADE approach. The primary efficacy outcome was loss of vascular patency and the primary safety outcomes were occurrences of serious adverse events (e.g. death, hospitalisation, cardiovascular events, major bleeding). Secondary outcomes were the occurrence of non‐serious adverse events (e.g. minor bleeding, gastrointestinal events and other adverse events). Efficacy effects were reported as risk ratios (RR) and safety effects as risk differences (RD) with 95% confidence intervals (CI). Studies were pooled separately by type of vascular access using a random‐effects model. Main results Five studies (833 participants) were included; one was a very small pilot study of 7 participants. All studies compared oral ω‐3FA supplements against placebo. Four studies enrolled participants with arteriovenous grafts (AVGs), and the other had participants with arteriovenous fistulas (AVFs). The risk of bias for both efficacy and safety outcomes was unclear for all studies, due mainly to incomplete reporting for allocation concealment and incompleteness of study follow‐up. In AVF patients, ω‐3FA supplementation probably makes little or no difference to the 12‐month risk of patency loss (1 study, 536 participants: RR 1.01, 95% CI 0.84 to 1.21; moderate certainty evidence), risk of death (1 study, 567 participants: RD 0.00, 95% CI ‐0.03 to 0.02; moderate certainty evidence) and risk of hospitalisation (1 study, 567 participants: RD 0.00, 95% CI ‐0.08 to 0.08; low certainty evidence). There was no information on cardiovascular events and major bleeding. In AVG patients, it is very uncertain whether ω‐3FA supplementation reduces the risk of patency loss within 6 months (2 studies, 41 participants: RR 0.91, 95% CI 0.36 to 2.28; very low certainty evidence) or 12 months (2 studies, 220 participants: RR 0.59, 95% CI 0.27 to 1.31; very low certainty evidence). ω‐3FA supplementation may make little or no difference to the risk of death within 6 to 12 months in AVG patients (4 studies, 261 participants: RD 0.01, 95% CI ‐0.05 to 0.07; low certainty evidence). It is very uncertain if ω‐3FA supplementation increases the risk of hospitalisation (3 studies, 65 participants: RD 0.08, 95% CI ‐0.11 to 0.28; very low certainty evidence), changes the risk of cardiovascular events (4 studies, 261 participants: RD ‐0.02, 95% CI ‐0.11 to 0.07; very low certainty evidence), or increases the risk of major bleeding (3 studies, 65 participants: RD 0.08, 95% CI ‐0.11 to 0.28; very low certainty evidence) within 6 to 12 months in AVG patients. There may be an increase in the risk of mild g strointestinal adverse reactions (3 studies, 65 participants: RD 0.25, 95% CI 0.07 to 0.43; low certainty evidence) such as a sensation of bloatedness, gas or a fishy aftertaste. Authors' conclusions In CKD patients with an AVF, there is moderate certainty that ω‐3FA supplementation makes little or no difference to preventing patency loss; and in patients with an AVG, it is very uncertain that ω‐3FA supplementation prevents patency loss within 12 months. Plain language summary Fish oil for preventing blockage of haemodialysis vascular access in patients with kidney failure What is the issue? Patients requiring long‐term haemodialysis (HD) because of poorly functioning kidneys need a reliable and efficient method of circulating blood at high flow rates between their bodies and the HD machine. Arteriovenous fistulas (AVFs) and grafts (AVGs) are the two main methods of achieving such long‐term vascular access. An AVF is a surgically constructed direct connection (fistula) between a patient's artery and vein. An AVG is a synthetic flexible hollow tubing (graft) that indirectly connects a patient's artery and vein and is usually used when a fistula cannot be created. During HD, the fistula or graft is pierced by needles (cannulated) connected to the dialysis machine. The patency of these artificial connections may be blocked by blood clots (thrombosis) or by a narrowing (stenosis) of the vein. The risk of this occurring is lower for AVFs, making it the method of choice. When a blockage does occur, HD cannot be performed and surgical or radiological salvage procedures will be urgently required. Omega‐3 fatty acid fish oils can reduce blood viscosity and might conceivably reduce the risk of blood clots and blood vessel narrowing, hence improving long‐term vascular access and quality of HD. What did we do? We collected data from studies that tested HD patients with supplements of omega‐3 fatty acid fish oils against placebo and that reported results for preventing vascular access blockage and for the following side‐effects ‐ death, hospitalisation, cardiovascular events, major bleeding, minor bleeding, gastrointestinal events, and other adverse events. We analysed and reported the results separately for patients with AVFs and AVGs. What did we find? We found five randomised controlled trials (RCTs) that studied a total of 833 participants; one was a very small pilot study of seven participants. Four studies involved patients with AVGs; there was only one study of AVFs. The outcomes were measured over a period of six or 12 months. There were reservations about the overall quality of all the studies, making us moderately to highly uncertain about the evidence. In AVF patients, we are moderately certain that fish oil supplements do not prevent blockage nor do they cause additional harm but the evidence only comes from one study. In AVG patients, we are very uncertain of the evidence for preventing blockage or causing serious harm, but there may be an increased risk of mild digestive side‐effects such as a sensation of bloatedness, gas or a fishy aftertaste. Conclusions There is limited high quality data on the benefits of omega‐3 fish oil supplementation for preventing HD blockage in kidney failure patients. We did not find strong evidence that omega‐3 fish oil supplements could prevent blockage of HD vascular access or that it increases the risk of serious and non‐serious side‐effects. All the evidence for preventing blockages come from just one or two studies, so more and better quality studies are needed.

179. Cuminetti G, Bonadei I, Vizzardi E, Sciatti E, Lorusso R. On-Pump Coronary Artery Bypass Graft: The State of the Art. Rev Recent Clin Trials. 2019;14(2):106-15.

BACKGROUND: Coronary artery bypass grafting (CABG) remains the standard of care for patients with coronary artery disease (CAD). Debate exists concerning several factors, which include percutaneous coronary intervention (PCI) vs. CABG, single vs. bilateral mammary artery grafts, radial artery vs. saphenous vein grafts, right internal mammary artery vs. radial artery grafts, endoscopic vs. open vein-graft harvesting, and on-pump vs. off- pump surgery. Moreover, challenging is the management of diabetic patients with CAD undergoing CABG. This review reports current indications, practice patterns, and outcomes of CABG. METHODS: Randomized controlled trials comparing CABG to other therapeutical strategies for CAD were searched through MEDLINE, EMBASE, Cochrane databases, and proceedings of international meetings. RESULTS: Large multicenter randomized and observational studies (SYNTAX, BEST, PRECOMBAT, ASCERT) have reported excellent outcomes in CABG patients, with always fewer rates of operative mortality and major morbidity, than PCI. The 10-year follow-up of ARTS II trial showed no difference between single and bilateral mammary artery. BARI 2D, MASS II, CARDia, FREEDOM trials showed that CABG is the best choice for diabetic patients. CONCLUSION: CABG still represents one of the most widespread major surgeries, with well-known benefits on symptoms and prognosis in patients with CAD. However, further studies and follow-up data are needed to validate these evidences.

180. Navarese EP, Andreotti F, Schulze V, Kołodziejczak M, Buffon A, Brouwer M, et al. Optimal duration of dual antiplatelet therapy after percutaneous coronary intervention with drug eluting stents: meta-analysis of randomised controlled trials. BMJ. 2015;350:h1618.

OBJECTIVE: To assess the benefits and risks of short term (<12 months) or extended (>12 months) dual antiplatelet therapy (DAPT) versus standard 12 month therapy, following percutaneous coronary intervention with drug eluting stents. DESIGN: Meta-analysis of randomised controlled trials. DATA SOURCES: PubMed, Embase, Cumulative Index to Nursing and Allied Health Literature, Scopus, Web of Science, Cochrane Library, and major congress proceedings, searched from 1 January 2002 to 16 February 2015. REVIEW METHODS: Trials comparing short term (<12 months) or extended (>12 months) DAPT regimens with standard 12 month duration of therapy. Primary outcomes were cardiovascular mortality, myocardial infarction, stent thrombosis, major bleeding, and all cause mortality. RESULTS: 10 randomised controlled trials (n=32,287) were included. Compared to 12 month DAPT, a short term course of therapy was associated with a significant reduction in major bleeding (odds ratio 0.58 (95% confidence interval 0.36 to 0.92); P=0.02) with no significant differences in ischaemic or thrombotic outcomes. Extended versus 12 month DAPT yielded a significant reduction in the odds of myocardial infarction (0.53 (0.42 to 0.66); P<0.001) and stent thrombosis (0.33 (0.21 to 0.51); P<0.001), but more major bleeding (1.62 (1.26 to 2.09); P<0.001). All cause but not cardiovascular death was also significantly increased (1.30 (1.02 to 1.66); P=0.03). CONCLUSIONS: Compared with a standard 12 month duration, short term DAPT (<12 months) after drug eluting stent implementation yields reduced bleeding with no apparent increase in ischaemic complications, and could be considered for most patients. In selected patients with low bleeding risk and very high ischaemic risk, extended DAPT (>12 months) could be considered. The increase in all cause but not cardiovascular death with extended DAPT requires further investigation.

181. Kakou-Guikahue M, N'Guetta R, Anzouan-Kacou JB, Kramoh E, N'Dori R, Ba SA, et al. Optimizing the management of acute coronary syndromes in sub-Saharan Africa: A statement from the AFRICARDIO 2015 Consensus Team. Arch Cardiovasc Dis. 2016;109(6-7):376-83.

BACKGROUND: Whereas the coronary artery disease death rate has declined in high-income countries, the incidence of acute coronary syndromes (ACS) is increasing in sub-Saharan Africa, where their management remains a challenge. AIM: To propose a consensus statement to optimize management of ACS in sub-Saharan Africa on the basis of realistic considerations. METHODS: The AFRICARDIO-2 conference (Yamoussoukro, May 2015) reviewed the ongoing features of ACS in 10 sub-Saharan countries (Benin, Burkina-Faso, Congo-Brazzaville, Guinea, Ivory Coast, Mali, Mauritania, Niger, Senegal, Togo), and analysed whether improvements in strategies and policies may be expected using readily available healthcare facilities. RESULTS: The outcome of patients with ACS is affected by clearly identified factors, including: delay to reaching first medical contact, achieving effective hospital transportation, increased time from symptom onset to reperfusion therapy, limited primary emergency facilities (especially in rural areas) and emergency medical service (EMS) prehospital management, and hence limited numbers of patients eligible for myocardial reperfusion (thrombolytic therapy and/or percutaneous coronary intervention [PCI]). With only five catheterization laboratories in the 10 participating countries, PCI rates are very low. However, in recent years, catheterization laboratories have been built in referral cardiology departments in large African towns (Abidjan and Dakar). Improvements in patient care and outcomes should target limited but selected objectives: increasing awareness and recognition of ACS symptoms; education of rural-based healthcare professionals; and developing and managing a network between first-line healthcare facilities in rural areas or small cities, emergency rooms in larger towns, the EMS, hospital-based cardiology departments and catheterization laboratories. CONCLUSION: Faced with the increasing prevalence of ACS in sub-Saharan Africa, healthcare policies should be developed to overcome the multiple shortcomings blunting optimal management. European and/or North American management guidelines should be adapted to African specificities. Our consensus statement aims to optimize patient management on the basis of realistic considerations, given the healthcare facilities, organizations and few cardiology teams that are available.

182. Tully PJ, Wittert GA, Turnbull DA, Beltrame JF, Horowitz JD, Cosh S, et al. Panic disorder and incident coronary heart disease: a systematic review and meta-analysis protocol. Syst Rev. 2015;4:33.

BACKGROUND: The clinical presentation of panic disorder and panic attack overlaps many symptoms typically experienced in coronary heart disease (CHD). Etiological links between panic disorder and CHD are controversial and remain largely tenuous. This systematic review aims to pool together data regarding panic disorder with respect to incident CHD or myocardial infarction. METHODS/DESIGN: Electronic databases (MEDLINE, EMBASE, PsycINFO and SCOPUS) will be searched using a search strategy exploding the topics for CHD and panic disorder. Authors and reference lists of included studies will also be contacted to identify additional published and unpublished studies. Eligibility criteria are as follows: POPULATION: persons without CHD who meet criteria for panic disorder, panic attack, anxiety neurosis or elevated panic disorder symptoms; Comparison: persons without CHD who do not meet criteria for panic disorder, panic attack, anxiety neurosis or elevated panic disorder symptoms; OUTCOME: verified fatal and non-fatal CHD at follow-up; including coronary revascularization procedure, coronary artery disease, and myocardial infarction. Studies adopting self-report CHD will be ineligible. Screening will be undertaken by two independent reviewers with disagreements resolved through discussion. Data extraction will include original data specified as hazard ratios, risk ratios, and original cell data if available. Risk of bias assessment will be undertaken by two independent reviewers. Meta-analytic methods will be used to synthesize the data collected relating to the CHD outcomes with Cochrane Review Manager 5.3. DISCUSSION: This systematic review aims to clarify whether panic disorder is associated with elevated risk for subsequent CHD. An evaluation of the etiological links between panic disorder with incident CHD might inform evidence-based clinical practice and policy concerning triaging chest pain patients, diagnostic assessment, and psychiatric intervention with panic disorder patients. SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42014014891 .

183. Nikolaou NI, Welsford M, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, et al. Part 5: Acute coronary syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation. 2015;95:e121-46.

184. O'Connor RE, Al Ali AS, Brady WJ, Ghaemmaghami CA, Menon V, Welsford M, et al. Part 9: Acute Coronary Syndromes: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2015;132(18 Suppl 2):S483-500.

185. Anderson L, Brown JPR, Clark AM, Dalal H, Rossau HKK, Bridges C, et al. Patient education in the management of coronary heart disease. Cochrane Database Syst Rev. 2017(6).

http://dx.doi.org/10.1002/14651858.CD008895.pub3

- Background Coronary heart disease (CHD) is the single most common cause of death globally. However, with falling CHD mortality rates, an increasing number of people live with CHD and may need support to manage their symptoms and improve prognosis. Cardiac rehabilitation is a complex multifaceted intervention which aims to improve the health outcomes of people with CHD. Cardiac rehabilitation consists of three core modalities: education, exercise training and psychological support. This is an update of a Cochrane systematic review previously published in 2011, which aims to investigate the specific impact of the educational component of cardiac rehabilitation. Objectives 1. To assess the effects of patient education delivered as part of cardiac rehabilitation, compared with usual care on mortality, morbidity, health‐related quality of life (HRQoL) and healthcare costs in patients with CHD. 2. To explore the potential study level predictors of the effects of patient education in patients with CHD (e.g. individual versus group intervention, timing with respect to index cardiac event). Search methods We updated searches from the previous Cochrane review, by searching the Cochrane Central Register of Controlled Trials (CENTRAL) (Cochrane Library, Issue 6, 2016), MEDLINE (Ovid), Embase (Ovid), PsycINFO (Ovid) and CINAHL (EBSCO) in June 2016. Three trials registries, previous systematic reviews and reference lists of included studies were also searched. No language restrictions were applied. Selection criteria 1. Randomised controlled trials (RCTs) where the primary interventional intent was education delivered as part of cardiac rehabilitation. 2. Studies with a minimum of six‐months follow‐up and published in 1990 or later. 3. Adults with a diagnosis of CHD. Data collection and analysis Two review authors independently screened all identified references for inclusion based on the above inclusion criteria. One author extracted study characteristics from the included trials and assessed their risk of bias; a second review author checked data. Two independent reviewers extracted outcome data onto a standardised collection form. For dichotomous variables, risk ratios and 95% confidence intervals (CI) were derived for each outcome. Heterogeneity amongst included studies was explored qualitatively and quantitatively. Where appropriate and possible, results from included studies were combined for each outcome to give an overall estimate of treatment effect. Given the degree of clinical heterogeneity seen in participant selection, interventions and comparators across studies, we decided it was appropriate to pool studies using random‐effects modelling. We planned to undertake subgroup analysis and stratified meta‐analysis, sensitivity analysis and meta‐regression to examine potential treatment effect modifiers. We used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to evaluate the quality of the evidence and the GRADE profiler (GRADEpro GDT) to create summary of findings tables. Main results This updated review included a total of 22 trials which randomised 76,864 people with CHD to an education intervention or a 'no education' comparator. Nine new trials (8215 people) were included for this update. We judged most included studies as low risk of bias across most domains. Educational 'dose' ranged from one 40 minute face‐to‐face session plus a 15 minute follow‐up call, to a four‐week residential stay with 11 months of follow‐up sessions. Control groups received usual medical care, typically consisting of referral to an outpatient cardiologist, primary care physician, or both. We found no difference in effect of education‐based interventions on total mortality (13 studies, 10,075 participants; 189/5187 (3.6%) versus 222/4888 (4.6%); random effects risk ratio (RR) 0.80, 95% CI 0.60 to 1.05; moderate quality evidence). Individual causes of mortality were reported rarely, and we were unable to report separate results for cardiovascular mortality or non‐car iovascular mortality. There was no evidence of a difference in effect of education‐based interventions on fatal and/or non fatal myocardial infarction (MI) (2 studies, 209 participants; 7/107 (6.5%) versus 12/102 (11.8%); random effects RR 0.63, 95% CI 0.26 to 1.48; very low quality of evidence). However, there was some evidence of a reduction with education in fatal and/or non‐fatal cardiovascular events (2 studies, 310 studies; 21/152 (13.8%) versus 61/158 (38.6%); random effects RR 0.36, 95% CI 0.23 to 0.56; low quality evidence). There was no evidence of a difference in effect of education on the rate of total revascularisations (3 studies, 456 participants; 5/228 (2.2%) versus 8/228 (3.5%); random effects RR 0.58, 95% CI 0.19 to 1.71; very low quality evidence) or hospitalisations (5 studies, 14,849 participants; 656/10048 (6.5%) versus 381/4801 (7.9%); random effects RR 0.93, 95% CI 0.71 to 1.21; very low quality evidence). There was no evidence of a difference between groups for all cause withdrawal (17 studies, 10,972 participants; 525/5632 (9.3%) versus 493/5340 (9.2%); random effects RR 1.04, 95% CI 0.88 to 1.22; low quality evidence). Although some health‐related quality of life (HRQoL) domain scores were higher with education, there was no consistent evidence of superiority across all domains. Authors' conclusions We found no reduction in total mortality, in people who received education delivered as part of cardiac rehabilitation, compared to people in control groups (moderate quality evidence). There were no improvements in fatal or non fatal MI, total revascularisations or hospitalisations, with education. There was some evidence of a reduction in fatal and/or non‐fatal cardiovascular events with education, but this was based on only two studies. There was also some evidence to suggest that education‐based interventions may improve HRQoL. Our findings are supportive of current national and international clinical guidelines that cardiac rehabilitation for people with CHD should be comprehensive and include educational interventions together with exercise and psychological therapy. Further definitive research into education interventions for people with CHD is needed. Plain language summary Education for people with coronary heart disease Review question What are the effects of patient education delivered as part of cardiac rehabilitation, compared with usual care on mortality, morbidity, health‐related quality of life (HRQoL) and healthcare costs in patients with coronary heart disease (CHD)? Background Coronary heart disease (CHD) is the single most common cause of death globally. However, more people now live with heart disease and may need support to manage symptoms and reduce risk of future problems such as heart attacks. Education is a common element of cardiac rehabilitation, which aims to improve the health and outcomes of people with heart disease. This is an update of a review last published in 2011. Search date We searched up to June 2016. Study characteristics We searched the scientific literature for randomised controlled trials (experiments that randomly allocate participants to one of two or more treatment groups) looking at the effectiveness of education‐based treatments compared with no education in people of all ages with CHD. We included nine new trials which involved 8215 people with coronary heart disease that compared patient education with no education. We included a total of 22 trials that studied 76,864 people with heart disease, most of whom had survived heart attack, and had undergone heart bypass surgery or angioplasty (a procedure which opens blocked vessels that supply blood to heart muscle). Study funding sources Sixteen studies reported sources of funding; six did not report funding sources. One study was funded by an industrial sponsor, four by health insurance companies and 11 by government or public sources. Key results Findings of this update are similar to the last review version (2011). Patient education, as part of a cardiac rehabilitation programme, does ot contribute to fewer deaths, further heart attacks, heart by‐pass or angioplasty, or admission to hospital for heart‐related problems. There is some evidence of fewer other heart‐related events and improvements in health‐related quality of life with education‐based interventions. Individual causes of death were not reported, so we were unable to determine how many people in the studies died from heart‐related causes or other causes of death. Although there is insufficient information at present to fully understand the benefits or harms of patient education for people with heart disease, our findings broadly support current guidelines that people with heart disease should receive comprehensive rehabilitation that includes education. Further research is needed to evaluate the most clinically and cost‐effective ways of providing education for people with heart disease. Quality of evidence   Overall, evidence was assessed as very low to moderate quality.

186. Kim C, Hong SJ, Ahn CM, Kim JS, Kim BK, Ko YG, et al. Patient-Centered Decision-Making of Revascularization Strategy for Left Main or Multivessel Coronary Artery Disease. Am J Cardiol. 2018;122(12):2005-13.

Patient preference plays an important role in daily practice; however, its implication has not been well investigated regarding treatment strategy for complex coronary artery disease. We prospectively evaluated a trend of patient-centered decision-making of revascularization strategy in patients with multivessel or unprotected left main coronary artery disease. A standardized protocol that favors coronary artery bypass graft surgery (CABG) as the primary treatment of choice, rather than percutaneous coronary intervention, was adopted. According to the protocol, patients decided whether or not they received CABG. Among the 763 consecutively enrolled patients, 293 patients (38%) consented to receive CABG. Fifty-six percent of patients with a high Synergy between PCI with Taxus and Cardiac Surgery (SYNTAX) score chose CABG. SYNTAX score was independently correlated with consent to receive CABG in each patient SYNTAX score stratum. In-stent restenosis was an independent predictor of choosing CABG in patients with low and intermediate SYNTAX scores. Unprotected left main coronary artery disease was negatively correlated with the decision to choose CABG in patients with intermediate SYNTAX score. Reasons for declining CABG included refusal of open-heart surgery in 318 patients (68%), mild presentation of angina symptoms in 132 patients (28%), low self-confidence to expect long-term survival in 120 patients (26%), and economic factors in 10 patients (2%). Short-term major adverse cardiac and cerebrovascular events occurred in about 1% of patients without significant differences between the 2 groups. In conclusion, despite the preferred use of the CABG protocol, more than half of the patients declined CABG. Patient-centered decision-making as well as heart team approach should be considered in real-world practice situations.

187. Lee JM, Hwang D, Park J, Kim KJ, Ahn C, Koo BK. Percutaneous Coronary Intervention at Centers With and Without On-Site Surgical Backup: An Updated Meta-Analysis of 23 Studies. Circulation. 2015;132(5):388-401.

BACKGROUND: Emergency coronary artery bypass grafting for unsuccessful percutaneous coronary intervention (PCI) is now rare. We aimed to evaluate the current safety and outcomes of primary PCI and nonprimary PCI at centers with and without on-site surgical backup. METHODS AND RESULTS: We performed an updated systematic review and meta-analysis by using mixed-effects models. We included 23 high-quality studies that compared clinical outcomes and complication rates of 1 101 123 patients after PCI at centers with or without on-site surgery. For primary PCI for ST-segment-elevation myocardial infarction (133 574 patients), all-cause mortality (without on-site surgery versus with on-site surgery: observed rates, 4.8% versus 7.2%; pooled odds ratio [OR], 0.99; 95% confidence interval, 0.91-1.07; P=0.729; I(2)=3.4%) or emergency coronary artery bypass grafting rates (observed rates, 1.5% versus 2.4%; pooled OR, 0.76; 95% confidence interval, 0.56-1.01; P=0.062; I(2)=42.5%) did not differ by presence of on-site surgery. For nonprimary PCI (967 549 patients), all-cause mortality (observed rates, 1.6% versus 2.1%; pooled OR, 1.15; 95% confidence interval, 0.94-1.41; P=0.172; I(2)=67.5%) and emergency coronary artery bypass grafting rates (observed rates, 0.5% versus 0.8%; pooled OR, 1.14; 95% confidence interval, 0.62-2.13; P=0.669; I(2)=81.7%) were not significantly different. PCI complication rates (cardiogenic shock, stroke, aortic dissection, tamponade, recurrent infarction) also did not differ by on-site surgical capability. Cumulative meta-analysis of nonprimary PCI showed a temporal decrease of the effect size (OR) for all-cause mortality after 2007. CONCLUSIONS: Clinical outcomes and complication rates of PCI at centers without on-site surgery did not differ from those with on-site surgery, for both primary and nonprimary PCI. Temporal trends indicated improving clinical outcomes in nonprimary PCI at centers without on-site surgery.

188. Banning AP, Baumbach A, Blackman D, Curzen N, Devadathan S, Fraser D, et al. Percutaneous coronary intervention in the UK: recommendations for good practice 2015. Heart. 2015;101 Suppl 3(Suppl 3):1-13.

Over the last 35 years, there has been dramatic progress in the technology and applicability of percutaneous techniques to treat obstructive coronary heart disease. Percutaneous coronary intervention (PCI) has a considerable evidence base and it is firmly established as the most common procedure used in the invasive treatment of patients with coronary heart disease in the UK. This set of guidelines aims to address specifically issues relating to PCI and not the growing subspecialty of structural heart disease intervention. It is not intended to provide a review of the entire evidence base for coronary intervention. The evidence base relating to PCI is extensively reviewed in international guidelines and the British Cardiovascular Intervention society endorses these guidelines and their updates. The guidelines presented here focus on issues pertinent to practice within the UK and set out a recommended template to ensure optimal delivery of patient care.

189. Yang N, Liu J, Liu J, Hao Y, Huo Y, Smith SC, Jr., et al. Performance on management strategies with Class I Recommendation and A Level of Evidence among hospitalized patients with non-ST-segment elevation acute coronary syndrome in China: Findings from the Improving Care for Cardiovascular Disease in China-Acute Coronary Syndrome (CCC-ACS) project. Am Heart J. 2019;212:80-90.

BACKGROUND: This study aimed to examine hospital performance on evidence-based management strategies for non-ST-segment elevation acute coronary syndrome (NSTE-ACS) and variations across hospitals. METHODS: Improving Care for Cardiovascular Disease in China (CCC)-ACS project is an ongoing registry and quality improvement project, with 150 tertiary hospitals recruited across China. We examined hospital performance on nine management strategies (Class I Recommendations with A Level of Evidence) based on established guidelines. We also evaluated the proportion of patients receiving defect-free care, which was defined as the care that included all the required management strategies for which the patient was eligible. The hospital-level variations in the performance were examined. RESULTS: From 2014 to 2018, 28,170 NSTE-ACS patients were included. Overall, 16% of patients received defect-free care. Higher-performing metrics were statin at discharge (93%), cardiac troponin measurement (92%), dual antiplatelet therapy (DAPT) within 24 hours (90%), and DAPT at discharge (85%). These were followed by metrics of β-blocker at discharge (69%), angiotensin converting enzyme inhibitor/angiotensin receptor blocker (ACEI/ARB) at discharge (59%), and risk stratification (56%). Lower-performing metrics were smoking cessation counseling (35%) and percutaneous coronary intervention (PCI) within recommended times (33%). The proportion of patients receiving defect-free care substantially varied across hospitals, ranging from 0% to 58% (Median (interquartile range):12% (7%-21%)). There were large variations across hospitals in performance on risk stratification, smoking cessation counseling, PCI within recommended times, ACEI/ARB at discharge and β-blocker at discharge. CONCLUSIONS: About one in six NSTE-ACS patients received defect-free care, and the performance varied across hospitals.

190. Huang TC, Tseng PT, Wu MN, Stubbs B, Carvalho AF, Lin PY, et al. Periodic limb movements during sleep are associated with cardiovascular diseases: A systematic review and meta-analysis. J Sleep Res. 2019;28(3):e12720.

Periodic limb movements during sleep present with repetitive movements, typically in the lower limbs, during sleep. Periodic limb movements during sleep have been proposed to be associated with increased risk of heart diseases. The aim of this study was to examine the co-morbidity rates of heart disease, including acute myocardial infarction, coronary artery disease and cardiovascular disease, in subjects with or without periodic limb movements during sleep through a meta-analysis. An electronic review of PubMed, Embase, ScienceDirect, Cochrane Library, ProQuest, Web of Science, ClinicalKey and ClinicalTrials.gov was performed. Clinical studies, case-controlled trials and cohort studies were all included in the search. Case reports or series, and non-clinical studies were excluded. A meta-analysis of the results of six studies comparing the prevalence of coronary artery disease/acute myocardial infarction/cardiovascular disease in subjects with/without periodic limb movements during sleep was performed. There were significantly higher co-morbidity rates of coronary artery disease (odds ratio = 1.568, 95% confidence interval: 1.187-2.073, p = 0.002) and cardiovascular disease (odds ratio = 1.279, 95% confidence interval: 1.095-1.494, p = 0.002), but not acute myocardial infarction (odds ratio = 1.272, 95% confidence interval = 0.942-1.718, p = 0.117), in the periodic limb movements during sleep group than in the non-periodic limb movements during sleep group. This meta-analysis highlights the importance of a significantly high prevalence of coronary artery disease and cardiovascular disease in subjects with periodic limb movements during sleep. Further studies should be focused on the potential pathophysiology, and whether treatment for periodic limb movements during sleep can improve the outcome of heart disease.

191. Blessberger H, Kammler J, Domanovits H, Schlager O, Wildner B, Azar D, et al. Perioperative beta‐blockers for preventing surgery‐related mortality and morbidity. Cochrane Database Syst Rev. 2018(3).

http://dx.doi.org/10.1002/14651858.CD004476.pub3

- Background Randomized controlled trials have yielded conflicting results regarding the ability of beta‐blockers to influence perioperative cardiovascular morbidity and mortality. Thus routine prescription of these drugs in unselected patients remains a controversial issue. Objectives The objective of this review was to systematically analyse the effects of perioperatively administered beta‐blockers for prevention of surgery‐related mortality and morbidity in patients undergoing any type of surgery while under general anaesthesia. Search methods We identified trials by searching the following databases from the date of their inception until June 2013: MEDLINE, Embase , the Cochrane Central Register of Controlled Trials (CENTRAL), Biosis Previews, CAB Abstracts, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Derwent Drug File, Science Citation Index Expanded, Life Sciences Collection, Global Health and PASCAL. In addition, we searched online resources to identify grey literature. Selection criteria We included randomized controlled trials if participants were randomly assigned to a beta‐blocker group or a control group (standard care or placebo). Surgery (any type) had to be performed with all or at least a significant proportion of participants under general anaesthesia. Data collection and analysis Two review authors independently extracted data from all studies. In cases of disagreement, we reassessed the respective studies to reach consensus. We computed summary estimates in the absence of significant clinical heterogeneity. Risk ratios (RRs) were used for dichotomous outcomes, and mean differences (MDs) were used for continuous outcomes. We performed subgroup analyses for various potential effect modifiers. Main results We included 88 randomized controlled trials with 19,161 participants. Six studies (7%) met the highest methodological quality criteria (studies with overall low risk of bias: adequate sequence generation, adequate allocation concealment, double/triple‐blinded design with a placebo group, intention‐to‐treat analysis), whereas in the remaining trials, some form of bias was present or could not be definitively excluded (studies with overall unclear or high risk of bias). Outcomes were evaluated separately for cardiac and non‐cardiac surgery. CARDIAC SURGERY (53 trials) We found no clear evidence of an effect of beta‐blockers on the following outcomes. • All‐cause mortality: RR 0.73, 95% CI 0.35 to 1.52, 3783 participants, moderate quality evidence. • Acute myocardial infarction (AMI): RR 1.04, 95% CI 0.71 to 1.51, 3553 participants, moderate quality evidence. • Myocardial ischaemia: RR 0.51, 95% CI 0.25 to 1.05, 166 participants, low quality evidence. • Cerebrovascular events: RR 1.52, 95% CI 0.58 to 4.02, 1400 participants, low quality evidence. • Hypotension: RR 1.54, 95% CI 0.67 to 3.51, 558 participants, low quality evidence. • Bradycardia: RR 1.61, 95% CI 0.97 to 2.66, 660 participants, low quality evidence. • Congestive heart failure: RR 0.22, 95% CI 0.04 to 1.34, 311 participants, low quality evidence. Beta‐blockers significantly reduced the occurrence of the following endpoints. • Ventricular arrhythmias: RR 0.37, 95% CI 0.24 to 0.58, number needed to treat for an additional beneficial outcome (NNTB) 29, 2292 participants, moderate quality evidence. • Supraventricular arrhythmias: RR 0.44, 95% CI 0.36 to 0.53, NNTB five, 6420 participants, high quality evidence. • On average, beta‐blockers reduced length of hospital stay by 0.54 days (95% CI ‐0.90 to ‐0.19, 2450 participants, low quality evidence). NON‐CARDIAC SURGERY (35 trials) Beta‐blockers significantly increased the occurrence of the following adverse events. • All‐cause mortality: RR 1.25, 95% CI 1.00 to 1.57, 11,413 participants, low quality of evidence, number needed to treat for an additional harmful outcome (NNTH) 167. • Hypotension: RR 1.50, 95% CI 1.38 to 1.64, NNTH 16, 10,947 participants, high quality evidence • Bradycardia: RR 2.23, 95% CI 1.48 to 3.36, NNTH 21, 11,033 participants, moderate quality evidence. We found a potential increase in the occurrence of the following outcomes with the use of beta‐blockers. • Cerebrovascular events: RR 1.59, 95% CI 0.93 to 2.71, 9150 participants, low quality evidence. Whereas no clear evidence of an effect was found when all studies were analysed, restricting the meta‐analysis to low risk of bias studies revealed a significant increase in cerebrovascular events with the use of beta‐blockers: RR 2.09, 95% CI 1.14 to 3.82, NNTH 265, 8648 participants. Beta‐blockers significantly reduced the occurrence of the following endpoints. • AMI: RR 0.73, 95% CI 0.61 to 0.87, NNTB 76, 10,958 participants, high quality evidence. • Myocardial ischaemia: RR 0.51, 95% CI 0.34 to 0.77, NNTB nine, 978 participants, moderate quality evidence. • Supraventricular arrhythmias: RR 0.73, 95% CI 0.57 to 0.94, NNTB 112, 8744 participants, high quality evidence. We found no clear evidence of an effect of beta‐blockers on the following outcomes. • Ventricular arrhythmias: RR 0.68, 95% CI 0.31 to 1.49, 476 participants, moderate quality evidence. • Congestive heart failure: RR 1.18, 95% CI 0.94 to 1.48, 9173 participants, moderate quality evidence. • Length of hospital stay: mean difference ‐0.45 days, 95% CI ‐1.75 to 0.84, 551 participants, low quality evidence. Authors' conclusions According to our findings, perioperative application of beta‐blockers still plays a pivotal role in cardiac surgery , as they can substantially reduce the high burden of supraventricular and ventricular arrhythmias in the aftermath of surgery. Their influence on mortality, AMI, stroke, congestive heart failure, hypotension and bradycardia in this setting remains unclear. In non‐cardiac surgery, evidence shows an association of beta‐blockers with increased all‐cause mortality. Data from low risk of bias trials further suggests an increase in stroke rate with the use of beta‐blockers. As the quality of evidence is still low to moderate, more evidence is needed before a definitive conclusion can be drawn. The substantial reduction in supraventricular arrhythmias and AMI in this setting seems to be offset by the potential increase in mortality and stroke. Plain language summary Influence of beta‐blockers on perioperative adverse events Any type of surgery is associated with an increased stress response, which can make the body vulnerable to untoward outcomes. These outcomes may range from death to a heart attack and rhythm disturbances to heart failure, stroke and the like. Beta‐blockers are drugs that attenuate this stress response, which results in slowing down of heart rate and a fall in blood pressure. Whereas on the one hand, these effects are desirable to fight the stress response, the same effects—if pronounced—may cause very low blood pressure, a very low pulse and ultimately stroke or death. In our analysis of current evidence (88 randomized controlled trials with 19,161 participants: heart surgery—53 trials, other types of surgery—35 trials), we showed that beta‐blockers had a protective effect against rhythm disturbances after heart surgery. We found no evidence of an effect of beta‐blockers on death; on the occurrence of heart attacks, strokes or heart failure; or on development of disproportionately low blood pressure or slow pulse during this type of surgery. Length of hospital stay after heart surgery was reduced by about 0.5 days in patients taking beta‐blockers. In non‐cardiac surgery, beta‐blockers increased the risk of death and stroke, the latter only when a representative group of high‐quality trials was analysed. The protective effect against heart attacks and rhythm disturbances was counterbalanced by this increased risk of death and stroke. We could not identify evidence of an effect of beta‐blockers on heart failure or length of stay in this group of patients. In conclusion, perioperative use of beta‐blockers seems benefici l overall in cardiac surgery , as they can substantially reduce the high burden of rhythm disturbances after cardiac surgery. Their influence on death, heart attacks, stroke, heart failure or development of disproportionately low blood pressure or slow pulse in this setting remains unclear. In non‐cardiac surgery, evidence shows an increase in death and a potential increase in stroke rate with the use of beta‐blockers. The substantial reduction in rhythm disturbances and heart attacks in this setting seems to be offset by this potential increase in mortality and stroke. As the quality of evidence is still low to moderate, more evidence is needed before a definitive conclusion can be drawn.

192. Kheiri B, Abdalla A, Osman M, Barbarawi M, Zayed Y, Haykal T, et al. Personalized antiplatelet therapy in patients with coronary artery disease undergoing percutaneous coronary intervention: A network meta-analysis of randomized clinical trials. Catheter Cardiovasc Interv. 2019;94(2):181-6.

OBJECTIVES: This study aimed to evaluate the efficacy and safety of genotype- and phenotype-guided intensified antiplatelet therapy compared with conventional therapy in patients undergoing stent implantation. BACKGROUND: Although potent P2Y(12) receptor inhibitors are recommended for percutaneous coronary intervention (PCI)-treated acute coronary syndrome, their usage is limited by a high bleeding risk. Therefore, personalized antiplatelet therapy could provide a valuable foundation for selection of antiplatelet therapy in this population. METHODS: We conducted a Bayesian network meta-analysis for all randomized clinical trials (RCTs) that evaluated genotype- and/or phenotype-guided therapy in PCI-treated coronary artery disease. RESULTS: Thirteen RCTs were included with a total of 6,845 patients. The results showed no significant differences in major adverse cardiovascular events (MACE) between the treatment options ((genotype guided vs. standard of care; OR 0.64; 95% CI: 0.38-1.05) and (phenotype vs. standard of care; OR 0.93; 95% CI: 0.54-1.37)). In addition, no significant differences were demonstrated in bleeding events ((genotype guided vs. standard of care; OR 0.73; 95% CI: 0.45-1.25) and (phenotype vs. standard of care; OR 0.90; 95% CI: 0.62-1.39)). CONCLUSIONS: In this mixed treatment meta-analysis of RCTs, neither genotype- nor phenotype-guided antiplatelet therapy in patients with PCI-treated coronary artery disease was superior to conventional therapy.

193. Chang KL, Weitzel K, Schmidt S. Pharmacogenetics: Using Genetic Information to Guide Drug Therapy. Am Fam Physician. 2015;92(7):588-94.

Clinical pharmacogenetics, the use of genetic data to guide drug therapy decisions, is beginning to be used for medications commonly prescribed by family physicians. However, clinicians are largely unfamiliar with principles supporting clinical use of this type of data. For example, genetic variability in the cytochrome P450 2D6 drug metabolizing enzyme can alter the clinical effects of some opioid analgesics (e.g., codeine, tramadol), whereas variability in the CYP2C19 enzyme affects the antiplatelet agent clopidogrel. If testing is performed, patients who are ultrarapid or poor metabolizers of CYP2D6 should avoid codeine use (and possibly tramadol, hydrocodone, and oxycodone) because of the potential for increased toxicity or lack of effectiveness. Patients undergoing percutaneous coronary intervention for acute coronary syndromes who are known to be poor metabolizers of CYP2C19 should consider alternate antiplatelet therapy (e.g., ticagrelor, prasugrel). Some guidelines are available that address appropriate drug therapy changes, and others are in development. Additionally, a number of clinical resources are emerging to support family physicians in the use of pharmacogenetics. When used appropriately, pharmacogenetic testing can be a practical tool to optimize drug therapy and avoid medication adverse effects.

194. Robertson L, McBride O, Burdess A. Pharmacomechanical thrombectomy for iliofemoral deep vein thrombosis. Cochrane Database Syst Rev. 2016(11).

http://dx.doi.org/10.1002/14651858.CD011536.pub2

- Background Deep venous thrombosis (DVT) occurs in approximately one in 1000 adults every year, and has an annual mortality of 14.6%. In particular, iliofemoral DVT can lead to recurrent thrombosis and post‐thrombotic syndrome (PTS), a painful condition which can lead to chronic venous insufficiency, oedema, and ulceration. It causes significant disability, impaired quality of life, and economic burden. Early thrombus removal techniques have been advocated in patients with an iliofemoral DVT in order to improve vein patency, prevent valvular dysfunction, and reduce future complications, such as post‐thrombotic syndrome and venous ulceration. One such technique is pharmacomechanical thrombectomy, a combination of catheter‐based thrombectomy and catheter‐directed thrombolysis. Objectives To assess the effects of pharmacomechanical thrombectomy versus anticoagulation (alone or with compression stockings), mechanical thrombectomy, thrombolysis, or other endovascular techniques in the management of people with acute DVT of the iliofemoral vein. Search methods The Cochrane Vascular Information Specialist searched the Specialised Register (last searched December 2015) and the Cochrane Register of Studies (last searched December 2015). We searched clinical trials databases for details of ongoing or unpublished studies and the reference lists of relevant articles retrieved by electronic searches for additional citations. Selection criteria Randomised controlled trials in which patients with an iliofemoral deep vein thrombosis were allocated to receive pharmacomechanical thrombectomy versus anticoagulation, mechanical thrombectomy, thrombolysis (systemic or catheter directed thrombolysis), or other endovascular techniques for the treatment of iliofemoral DVT. Data collection and analysis At least two review authors independently assessed studies identified for potential inclusion. Main results We found no randomised controlled trials that met the eligibility criteria for this review. We identified one ongoing study. Authors' conclusions There were no randomised controlled trials that assessed the effects of pharmacomechanical thrombectomy versus anticoagulation (alone or with compression stockings), mechanical thrombectomy, thrombolysis, or other endovascular techniques in the management of people with acute DVT of the iliofemoral vein that met the eligibility criteria for this review. Further high quality randomised controlled trials are needed. Plain language summary Pharmacomechanical thrombectomy for iliofemoral deep vein thrombosis Background Deep vein thrombosis (DVT) is a condition in which a blood clot forms in the deep vein of the leg or pelvis. It affects approximately 1 in 1000 people. If it is not treated, the clot can travel in the blood, and block the arteries in the lungs. This life‐threatening condition is called a pulmonary embolism and occurs in approximately 3 to 4 in 10,000 people. Another side‐effect of DVT is post‐thrombotic syndrome (PTS), a condition in which the patient suffers pain, swelling, and changes in the skin of the leg, which can lead to an ulcer. This causes significant disability and diminished qualify of life, and is costly to the healthcare system. One way to prevent another blood clot or PTS is to remove the clot. There are a number of ways to do this. A catheter can be inserted into the vein and the clot removed directly (mechanical thrombectomy), the clot can be broken down through the use of drugs infused into a vein in the foot or directly at the site of the clot using a catheter and X‐ray control (pharmacomechanical thrombolysis), or a combination of the two procedures. This review aimed to measure how safe and effective pharmacomechanical thrombectomy is, compared to other techniques. Key results There were no randomised controlled trials that met the inclusion criteria of this review (current until December 2015). We identified one ongoing study. Quality of evidence At present, there is a lack of randomised controlled trials that examine the comparative effectiveness and safety of pharmacomechanical thrombectomy in the management of patients with DVT. Conclusion Further research is required before conclusions can be made.

195. Aerts M, Minalu G, Bösner S, Buntinx F, Burnand B, Haasenritter J, et al. Pooled individual patient data from five countries were used to derive a clinical prediction rule for coronary artery disease in primary care. J Clin Epidemiol. 2017;81:120-8.

OBJECTIVE: To construct a clinical prediction rule for coronary artery disease (CAD) presenting with chest pain in primary care. STUDY DESIGN AND SETTING: Meta-Analysis using 3,099 patients from five studies. To identify candidate predictors, we used random forest trees, multiple imputation of missing values, and logistic regression within individual studies. To generate a prediction rule on the pooled data, we applied a regression model that took account of the differing standard data sets collected by the five studies. RESULTS: The most parsimonious rule included six equally weighted predictors: age ≥55 (males) or ≥65 (females) (+1); attending physician suspected a serious diagnosis (+1); history of CAD (+1); pain brought on by exertion (+1); pain feels like "pressure" (+1); pain reproducible by palpation (-1). CAD was considered absent if the prediction score is <2. The area under the ROC curve was 0.84. We applied this rule to a study setting with a CAD prevalence of 13.2% using a prediction score cutoff of <2 (i.e., -1, 0, or +1). When the score was <2, the probability of CAD was 2.1% (95% CI: 1.1-3.9%); when the score was ≥ 2, it was 43.0% (95% CI: 35.8-50.4%). CONCLUSIONS: Clinical prediction rules are a key strategy for individualizing care. Large data sets based on electronic health records from diverse sites create opportunities for improving their internal and external validity. Our patient-level meta-analysis from five primary care sites should improve external validity. Our strategy for addressing site-to-site systematic variation in missing data should improve internal validity. Using principles derived from decision theory, we also discuss the problem of setting the cutoff prediction score for taking action.

196. Pursnani A, Schlett CL, Mayrhofer T, Celeng C, Zakroysky P, Bamberg F, et al. Potential for coronary CT angiography to tailor medical therapy beyond preventive guideline-based recommendations: insights from the ROMICAT I trial. J Cardiovasc Comput Tomogr. 2015;9(3):193-201.

BACKGROUND: Coronary CT angiography (CCTA) is used in the emergency department to rule out acute coronary syndrome in low-intermediate risk patients. OBJECTIVES: We evaluated the potential of CCTA to tailor aspirin (ASA) and statin therapy in acute chest pain patients. METHODS: We included all patients in the ROMICAT I trial who underwent CCTA before admission. Results of CCTA were blinded to caretakers. We documented ASA and statin therapy at admission and discharge and determined change in medications during hospitalization, agreement of discharge medications with contemporaneous guidelines, and agreement with the presence and severity of coronary artery disease (CAD) as determined by CCTA. RESULTS: We included 368 patients (53 ± 12 years; 61% male). Baseline medical therapy at presentation included 27% on ASA and 24% on statin. Most patients who qualified for secondary prevention were on ASA and statin therapy at discharge (95% and 80%, respectively), whereas among those qualifying for primary prevention therapy, only 59% of patients were on aspirin and 33% were on statin at discharge. Excluding secondary prevention patients, among those with CCTA-detected CAD, only 66/131 (50%) were on ASA at discharge and only 53/131 (40%) were on statin. Conversely, in those without CCTA-detected CAD, 54/156 (35%) were on ASA and 20/151 (13%) were on statin at discharge. CONCLUSION: There are significant discrepancies between discharge prescription of statin and ASA with the presence and extent of CAD. CCTA presents an efficient opportunity to tailor medical therapy to CAD in patients undergoing CCTA as part of their acute chest pain evaluation.

197. Gupta D, Tang F, Masoudi FA, Jones PG, Chan PS, Daugherty SL. Practitioner Gender and Quality of Care in Ambulatory Cardiology Practices: A Report From the National Cardiovascular Data Practice Innovation and Clinical Excellence (PINNACLE) Registry. J Cardiovasc Nurs. 2018;33(3):255-60.

BACKGROUND: Some studies suggest that female practitioners are more likely to provide guideline-concordant care than male practitioners; however, little is known about the role of practitioner gender in cardiology. OBJECTIVE: The aim of the study was to measure the association between practitioner gender and adherence to the cardiovascular performance measures in the American College of Cardiology's ambulatory Practice Innovation and Clinical Excellence Registry. METHODS: Patients with at least 1 outpatient visit with a unique practitioner were included. Among eligible patients, adherence to 7 guideline-supported performance measures for coronary artery disease, heart failure, and atrial fibrillation over 12 months after registry entry was compared by practitioner gender using hierarchical models adjusting for practitioner type (physicians vs advance practice practitioners) and number of visits. RESULTS: The study cohort included 1493 individual practitioners who saw 769 139 patients; 80% of practitioners were men. Male practitioners were more often physicians compared with female practitioners (98.2% vs 43.7%, P < .01). Accounting for practitioner category and visit frequency, guideline adherence rates were similar by practitioner gender for all measures with the exception of marginally higher rates for coronary artery disease performance measures for male practitioners compared with female practitioners (antiplatelet: rate ratio [RR] = 1.06; 95% confidence interval [CI], 1.03-1.09; β-blockers: RR = 1.06; 95% CI, 1.01-1.10; and lipid-lowering drug: RR = 1.07; 95% CI, 1.04-1.10) and atrial fibrillation (oral anticoagulants: RR = 1.05; 95% CI, 1.01-1.09). CONCLUSION: Male practitioners marginally outperformed their female counterparts in ambulatory practices enrolled in a voluntary cardiovascular performance improvement registry program. Overall low adherence to some performance measures suggests room for improvement among all practitioners.

198. Ravani P, Quinn RR, Oliver MJ, Karsanji DJ, James MT, MacRae JM, et al. Pre‐emptive correction for haemodialysis arteriovenous access stenosis. Cochrane Database Syst Rev. 2016(1).

http://dx.doi.org/10.1002/14651858.CD010709.pub2

- Background Guidelines recommend routine arteriovenous (AV) graft and fistula surveillance (technology‐based screening) in addition to clinical monitoring (physical examination) for early identification and pre‐emptive correction of a stenosis before the access becomes dysfunctional. However, consequences on patient‐relevant outcomes of pre‐emptive correction of a stenosis in a functioning access as opposed to deferred correction, i.e. correction postponed to when the access becomes dysfunctional, are uncertain. Objectives We aimed to evaluate 1) whether pre‐emptive correction of an AV access stenosis improves clinically relevant outcomes; 2) whether the effects of pre‐emptive correction of an AV access stenosis differ by access type (fistula versus graft), aim (primary and secondary prophylaxis), and surveillance method for primary prophylaxis (Doppler ultrasound for the screening of functional and anatomical changes versus measurement of the flow in the access); and 3) whether other factors (dialysis duration, access location, configuration or materials, algorithm for referral for intervention, intervention strategies (surgical versus radiological or other), or study design) explain the heterogeneity that might exist in the effect estimates. Search methods We searched the Cochrane Kidney and Transplant Specialised Register to 30 November 2015 using search terms relevant to this review. Selection criteria We included all studies of any access surveillance method for early identification and pre‐emptive treatment of an AV access stenosis. Data collection and analysis We extracted data on potentially remediable and irremediable failure of the access (i.e. thrombosis and access loss respectively); infection and mortality; and resource use (hospitalisation, diagnostic and intervention procedures). Analysis was by a random effects model and results expressed as risk ratio (RR), hazard ratio (HR) or incidence rate ratio (IRR) with 95% confidence intervals (CI). Main results We identified 14 studies (1390 participants), nine enrolled adults without a known access stenosis (primary prophylaxis; three studies including people using fistulas) and five enrolled adults with a documented stenosis in a non‐dysfunctional access (secondary prophylaxis; three studies in people using fistulas). Study follow‐up ranged from 6 to 38 months, and study size ranged from 58 to 189 participants. In low‐ to moderate‐quality evidence (based on GRADE criteria) in adults treated with haemodialysis, relative to no surveillance and deferred correction, surveillance with pre‐emptive correction of an AV stenosis reduced the risk of thrombosis (RR 0.79, 95% CI 0.65 to 0.97; I² = 30%; 18 study comparisons, 1212 participants), and probably improves the longevity of AV access (RR 0.80, 95% CI 0.64 to 0.99; I² = 0%; 11 study comparisons, 972 participants). In analyses subgrouped by access type, pre‐emptive stenosis correction did not reduce the risk of thrombosis (RR 0.95, 95% CI 0.8 to 1.12; I² = 0%; 11 study comparisons, 697 participants) or access loss in grafts (RR 0.87, 95% CI 0.69 to 1.11; I² = 0%; 7 study comparisons; 662 participants), but did reduce the risk of thrombosis (RR 0.5, 95% CI 0.35 to 0.71; I² = 0%; 7 study comparisons, 515 participants) and the risk of access loss in fistulas (RR 0.5, 95% CI 0.29 to 0.86; I² = 0%; 4 studies; 310 participants). Three of the four studies reporting access loss data in fistulas (199 participants) were conducted in the same centre. Insufficient data were available to assess whether benefits vary by prophylaxis aim in fistulas (i.e. primary and secondary prophylaxis). Although the magnitude of the effects of pre‐emptive stenosis correction was considerable for patient‐centred outcomes, results were either heterogeneous or imprecise. While pre‐emptive stenosis correction may reduce the rates of hospitalisation (IRR 0.54, 95% CI 0.31 to 0.93; I² = 67%; 4 study comparisons, 219 participants) and use of catheters (IRR 0.58, 95% CI 0.35 to 0.98; I² = 53%; 6 s udy comparisons, 394 participants), it may also increase the rates of diagnostic procedures (IRR 1.78, 95% CI 1.18 to 2.67; I² = 62%; 7 study comparisons, 539 participants), infection (IRR 1.74, 95% CI 0.78 to 3.91; I² = 0%; 3 studies, 248 participants) and mortality (RR 1.38, 95% CI 0.91 to 2.11; I² = 0%; 5 studies, 386 participants). In general, risk of bias was high or unclear in most studies for many domains we assessed. Four studies were published after 2005 and only one had evidence of registration within a trial registry. No study reported information on authorship and/or involvement of the study sponsor in data collection, analysis, and interpretation. Authors' conclusions Pre‐emptive correction of a newly identified or known stenosis in a functional AV access does not improve access longevity. Although pre‐emptive stenosis correction may be promising in fistulas existing evidence is insufficient to guide clinical practice and health policy. While pre‐emptive stenosis correction may reduce the risk of hospitalisation, this benefit is uncertain whereas there may be a substantial increase (i.e. 80%) in the use of access‐related procedures and procedure‐related adverse events (e.g. infection, mortality). The net effects of pre‐emptive correction on harms and resource use are thus unclear. Plain language summary Pre‐emptive correction of stenosis of the arteriovenous access for haemodialysis An arteriovenous access consists of a direct surgical connection between an artery and a vein in the arm (fistula) or a plastic conduit connecting an artery and a vein (graft). If these forms of access become dysfunctional the delivery of dialysis therapy becomes suboptimal. The most common cause of access dysfunction is the development of a restriction or conduit narrowing called 'stenosis'. Because early correction of stenosis is considered critical to maintain the patency (openness) of the access and prolong its use, guidelines recommend regular surveillance of the access (i.e. screening based on diagnostic tests) in addition to or instead of a physical exam (clinical monitoring) to identify and treat early lesions. In this review we included 14 studies, randomising 1390 participants to either a pre‐emptive correction of an access stenosis (i.e. before the access became dysfunctional) or a deferred correction of an access stenosis (i.e. if and when the access became dysfunctional). This review shows that pre‐emptive correction of an arteriovenous access stenosis does not improve longevity of the access overall. In people using grafts pre‐emptive correction does not reduce the risk of thrombosis or access loss. In people using fistulas pre‐emptive stenosis correction reduces the risk of thrombosis and may prolong the longevity of the access. However, this surveillance and pre‐emptive correction strategy may increase the number of access‐related procedures and procedure‐related adverse events. This systematic review presents, to clinicians and patients, evidence‐based data that do not support the use of access surveillance and pre‐emptive correction of stenosis in grafts. Although surveillance and pre‐emptive correction of stenosis reduce the risk of thrombosis and may reduce the risk of access loss in fistulas, they may also increase the risk of procedure‐related adverse events and health‐care cost. Large multicentre clinical trials are necessary in this patient population to better clarify potential harms and expected benefits of routine surveillance and pre‐emptive correction of fistula stenosis.

199. Arora S, Shemisa K, Vaduganathan M, Qamar A, Gupta A, Garg SK, et al. Premature Ticagrelor Discontinuation in Secondary Prevention of Atherosclerotic CVD: JACC Review Topic of the Week. J Am Coll Cardiol. 2019;73(19):2454-64.

Ticagrelor is a cornerstone of modern antithrombotic therapy alongside aspirin in patients with acute coronary syndrome and after percutaneous coronary intervention. Adverse effects such as bleeding and dyspnea have been associated with premature ticagrelor discontinuation, which may limit any potential advantage of ticagrelor over clopidogrel. The randomized trials of ticagrelor captured adverse events, offering the opportunity to more precisely quantify these effects across studies. Therefore, a meta-analysis of 4 randomized clinical trials of ticagrelor conducted between January 2007 and June 2017 was performed to quantify the incidence and causes of premature ticagrelor discontinuation. Among 66,870 patients followed for a median 18 months, premature ticagrelor discontinuation was seen in 25%; bleeding was the most common cause of discontinuation followed by dyspnea. Versus the comparators, the relative risk of dyspnea-related discontinuation during follow-up was 6.4-fold higher, the relative risk of bleeding was 3.2-fold higher, and the relative risk of discontinuation due to any adverse event was 59% higher for patients receiving ticagrelor. Understanding these potential barriers to adherence to ticagrelor is crucial for informed patient-physician decision making and can inform future efforts to improve ticagrelor adherence. This review discusses the incidence, causes, and biological mechanisms of ticagrelor-related adverse effects and offers strategies to improve adherence to ticagrelor.

200. Katsura M, Kuriyama A, Takeshima T, Fukuhara S, Furukawa TA. Preoperative inspiratory muscle training for postoperative pulmonary complications in adults undergoing cardiac and major abdominal surgery. Cochrane Database Syst Rev. 2015(10).

http://dx.doi.org/10.1002/14651858.CD010356.pub2

- Background Postoperative pulmonary complications (PPCs) have an impact on the recovery of adults after surgery. It is therefore important to establish whether preoperative respiratory rehabilitation can decrease the risk of PPCs and to identify adults who might benefit from respiratory rehabilitation. Objectives Our primary objective was to assess the effectiveness of preoperative inspiratory muscle training (IMT) on PPCs in adults undergoing cardiac or major abdominal surgery. We looked at all‐cause mortality and adverse events. Search methods We searched the Cochrane Central Register of Controlled Trials (CENTRAL; 2014, Issue 10), MEDLINE (1966 to October 2014), EMBASE (1980 to October 2014), CINAHL (1982 to October 2014), LILACS (1982 to October 2014), and ISI Web of Science (1985 to October 2014). We did not impose any language restrictions. Selection criteria We included randomized controlled trials that compared preoperative IMT and usual preoperative care for adults undergoing cardiac or major abdominal surgery. Data collection and analysis Two or more review authors independently identified studies, assessed trial quality, and extracted data. We extracted the following information: study characteristics, participant characteristics, intervention details, and outcome measures. We contacted study authors for additional information in order to identify any unpublished data. Main results We included 12 trials with 695 participants; five trials included participants awaiting elective cardiac surgery and seven trials included participants awaiting elective major abdominal surgery. All trials contained at least one domain judged to be at high or unclear risk of bias. Of greatest concern was the risk of bias associated with inadequate blinding, as it was impossible to blind participants due to the nature of the study designs. We could pool postoperative atelectasis in seven trials (443 participants) and postoperative pneumonia in 11 trials (675 participants) in a meta‐analysis. Preoperative IMT was associated with a reduction of postoperative atelectasis and pneumonia, compared with usual care or non‐exercise intervention (respectively; risk ratio (RR) 0.53, 95% confidence interval (CI) 0.34 to 0.82 and RR 0.45, 95% CI 0.26 to 0.77). We could pool all‐cause mortality within postoperative period in seven trials (431 participants) in a meta‐analysis. However, the effect of IMT on all‐cause postoperative mortality is uncertain (RR 0.40, 95% CI 0.04 to 4.23). Eight trials reported the incidence of adverse events caused by IMT. All of these trials reported that there were no adverse events in both groups. We could pool the mean duration of hospital stay in six trials (424 participants) in a meta‐analysis. Preoperative IMT was associated with reduced length of hospital stay (MD ‐1.33, 95% CI ‐2.53 to ‐0.13). According to the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) Working Group guidelines for evaluating the impact of healthcare interventions, the overall quality of studies for the incidence of pneumonia was moderate, whereas the overall quality of studies for the incidence of atelectasis, all‐cause postoperative death, adverse events, and duration of hospital stay was low or very low. Authors' conclusions We found evidence that preoperative IMT was associated with a reduction of postoperative atelectasis, pneumonia, and duration of hospital stay in adults undergoing cardiac and major abdominal surgery. The potential for overestimation of treatment effect due to lack of adequate blinding, small‐study effects, and publication bias needs to be considered when interpreting the present findings. Plain language summary Breathing training before surgery for reducing lung complications after surgery in adults undergoing heart and major abdominal surgery Background and review question Despite advances regarding patient care in the last few decades, breathing complications as a result of lung injury after surgery such as pneumonia are the leading cause of sicknes and death in adults undergoing heart and major abdominal surgery. Training of breathing muscles using a small device at home before surgery seems to make breathing easier and helps strengthen muscles of respiration after surgery. This training may help reduce breathing complications after surgery and may lead to improved patient care and overall health care cost savings for the public health system. We wanted to establish whether training of breathing muscles before surgery can reduce the risk of lung complications and to identify who in particular might benefit from such training. Objective We reviewed the evidence about the effects of breathing training before surgery on lung complications after surgery in adults undergoing heart or major abdominal surgery. Study characteristics We included 12 trials with 695 participants. Five of the 12 studies included participants awaiting planned heart surgery, and seven studies included participants awaiting planned major abdominal surgery. The evidence is current to October 2014. Key results This review showed that training of breathing muscles before surgery reduced the risk of some lung complications (atelectasis and pneumonia) after surgery and the length of hospital stay, compared with usual care. However, the effect of this training on in‐hospital death after surgery is unclear and needs further investigation. The trials did not report any undesirable effects associated with training of breathing muscles, and no study reported on costs resulting from breathing training using a device. Quality of evidence and conclusion Although the available evidence is insufficient in terms of the quality and size of trials, we can conclude that training of breathing muscles before surgery prevents lung complications after surgery. This training is easily performed at home under the supervision of a physiotherapist. The training of breathing muscles therefore appears to be a suitable option as one of the preparations for planned surgery, especially for adults awaiting high‐risk heart and abdominal surgery. Other surgeries, such as oesophageal resection (removal of part of the gastrointestinal tract 'food pipe'), should be evaluated; cost‐effectiveness and patient‐reported outcomes should be reported. The potential for overestimation of treatment effect needs to be considered when interpreting the present findings, as the quality of evidence is low to moderate.

201. Robson A, Sturman J, Williamson P, Conboy P, Penney S, Wood H. Pre-treatment clinical assessment in head and neck cancer: United Kingdom National Multidisciplinary Guidelines. J Laryngol Otol. 2016;130(S2):S13-s22.

This is the official guideline endorsed by the specialty associations involved in the care of head and neck cancer patients in the UK. This paper provides recommendations on the pre-treatment clinical assessment of patients presenting with head and neck cancer. Recommendations • Comorbidity data should be collected as it is important in the analysis of survival, quality of life and functional outcomes after treatment as well as for comparing results of different treatment regimens and different centres. (R) • Patients with hypertension of over 180/110 or associated target organ damage, should have antihypertensive medication started pre-operatively as per British Hypertension Society guidelines. (R) • Rapidly correcting pre-operative hypertension with beta blockade appears to cause higher mortality due to stroke and hypotension and should not be used. (R) • Patients with poorly controlled or unstable ischaemic heart disease should be referred for cardiology assessment pre-operatively. (G) • Patients within one year of drug eluting stents should be discussed with the cardiologist who was responsible for their percutaneous coronary intervention pre-operatively with regard to cessation of antiplatelet medication due to risk of stent thrombosis. (G) • Patients with multiple recent stents should be managed in a centre with access to interventional cardiology. (G) • Surgery after myocardial infarction should be delayed if possible to reduce mortality risk. (R) • Patients with critical aortic stenosis (AS) should be considered for pre-operative intervention. (G) • Clopidogrel should be discontinued 7 days pre-operatively; warfarin should be discontinued 5 days pre-operatively. (R) • Patients with thromboembolic disease or artificial heart valves require heparin therapy to bridge peri-operative warfarin cessation, this should start 2 days after last warfarin dose. (R) • Cardiac drugs other than angotensin-converting enzyme inhibitors and angiotensin II antagonists should be continued including on the day of surgery. (R) • Angotensin-converting enzyme inhibitors and angiotensin II antagonists should be withheld on the day of surgery unless they are for the treatment of heart failure. (R) • Post-operative care in a critical care area should be considered for patients with heart failure or significant diastolic dysfunction. (R) • Patients with respiratory disease should have their peri-operative respiratory failure risk assessed and critical care booked accordingly. (G) • Patients with severe lung disease should be assessed for right heart disease pre-operatively. (G) • Patients with pulmonary hypertension and right heart failure will be at extraordinarily high risk and should have the need for surgery re-evaluated. (G) • Perioperative glucose readings should be kept within 4-12 mmol/l. (R) • Patients with a high HbA1C facing urgent surgery should have their diabetes management assessed by a diabetes specialist. (G) • Insulin-dependent diabetic patients must not omit insulin for more than one missed meal and will therefore require an insulin replacement regime. (R) • Patients taking more than 5 mg of prednisolone daily should have steroid replacement in the peri-operative period. (R) • Consider proton pump therapy for patients taking steroids in the peri-operative phase if they fit higher risk criteria. (R) • Surgery within three months of stroke carries high risk of further stroke and should be delayed if possible. (R) • Patients with rheumatoid arthritis should have flexion/extension views assessed by a senior radiologist pre-operatively. (R) • Patients at risk of post-operative cognitive dysfunction and delirium should be highlighted at pre-operative assessment. (G) • Patients with Parkinson's disease (PD) must have enteral access so drugs can be given intra-operatively. Liaison with a specialist in PD is essential. (R) • Intravenous iron should be considered for anaemia in the urgent head and neck cancer patient. (G) • Preoperative blood transfusion should be avoided where possible. (R) • Where pre-operative transfusion is essential it should be completed 24-48 hours pre-operatively. (R) • An accurate alcohol intake assessment should be completed for all patients. (G) • Patients considered to have a high level of alcohol dependency should be considered for active in-patient withdrawal at least 48 hours pre-operatively in liaison with relevant specialists. (R) • Parenteral B vitamins should be given routinely on admission to alcohol-dependent patients. (R) • Smoking cessation, commenced preferably six weeks before surgery, decreases the incidence of post-operative complications. (R) • Antibiotics are necessary for clean-contaminated head and neck surgery, but unnecessary for clean surgery. (R) • Antibiotics should be administered up to 60 minutes before skin incision, as close to the time of incision as possible. (R) • Antibiotic regimes longer than 24 hours have no additional benefit in clean-contaminated head and neck surgery. (R) • Repeat intra-operative antibiotic dosing should be considered for longer surgeries or where there is major blood loss. (R) • Local antibiotic policies should be developed and adhered to due to local resistance patterns. (G) • Individual assessment for venous thromboembolism (VTE) risk and bleeding risk should occur on admission and be reassessed throughout the patients' stay. (G) • Mechanical prophylaxis for VTE is recommended for all patients with one or more risk factors for VTE. (R) • Patients with additional risk factors of VTE and low bleeding risk should have low molecular weight heparin at prophylactic dose or unfractionated heparin if they have severe renal impairment. (R).

202. Yan F, Liu H, Jiang W. Prevalence and associated factors of mortality after percutaneous coronary intervention for adult patients with ST elevation myocardial infarction: A systematic review and meta-analysis protocol. Medicine (Baltimore). 2019;98(26):e16226.

BACKGROUND: The percutaneous coronary intervention (PCI) has been one of the fastest growing therapeutic interventions for patients with ST elevation myocardial infarction (STEMI). However, the mortality of patients with STEMI after PCI is uncertain currently. There is a paucity of systematic review on the associated factors of mortality among patients with STEMI after PCI. Therefore, this meta-analysis was designed to synthesize available evidence on the prevalence and associated factors of mortality after PCI for adult patients with STEMI. METHODS: Both case-control and cohort studies reporting on mortality after PCI for patients with STEMI, published in Chinese and English will be eligible for inclusion. Studies from 12 databases covering the period from 2008 to present will be considered for systematic searches. Two reviewers will independently screen and select studies, extract data, and assess methodologic quality. When available, meta-analysis will be performed. Pooled proportions of mortality, and proportions in the exposed and unexposed groups, and population attributable fraction of each factor will be calculated by a suitable transformation of proportions. If necessary, meta-regression models, subgroup analysis, sensitivity analysis, funnel plot, and Egger test will be performed. Narrative synthesis will be done where meta-analysis cannot be performed. Reporting of this protocol will comply with the preferred reporting items for systematic review and meta-analyses (PRISMA-P) guidelines. RESULTS: This systematic review will be developed according to the meta-analysis of observational studies in epidemiology (MOOSE) guidelines. CONCLUSION: This study will provide a comprehensive review on the available evidence regarding the prevalence and associated factors of mortality for patients with STEMI following PCI. This review will be constrained by the divergence of definition and assessment of specific factors between studies. However, the development of a qualitative description of definition and assessment tools will also provide an overview of the current practice. Formal ethical approval is not required since the secondary data will be collected for systematic review. The findings will be disseminated in a relevant peer-reviewed journal and academic presentations. SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42017070969.

203. Dilip C, Cholamugath S, Baby M, Pattani D. Prevalence of cardiovascular risk factors and management practices of acute coronary syndrome in a tertiary care hospital. J Basic Clin Physiol Pharmacol. 2015;26(6):547-54.

BACKGROUND: A prospective study of patients with acute coronary syndrome (ACS), who met the inclusion criteria, was carried out. It was conducted in the cardiology department of tertiary care referral hospital in Kerala. An attempt was made to identify and determine the prevalence of cardiovascular risk factors in patients presenting with ACS and to evaluate the current treatment practice pattern of ACS and to compare it with standard treatment guidelines, thereby improving the quality of life of patients. METHODS: Data of patients who met the inclusion criteria were collected in specially designed data collection form. The form included the patient data such as demographics, risk factors, procedures performed during the hospital stay, and in-hospital and discharge drug therapy. Patients with ACS included those with ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), and unstable angina (UA). Descriptive statistics were performed. All statistical analysis was done using Statistical Package for Social Sciences (SPSS) software version 16.0. RESULTS: A total of 100 patients were studied having mean age of 62.57 years±12.18 years. Fifty-one percent were having NSTEMI, 33% were having STEMI, and 16% were having UA. Hypertension (63%) and diabetes (51%) were more prevalent in both men and women. Smoking among males was consistently high (48.6%), being highest among adults. Cardiac procedures performed include percutaneous transluminal coronary angioplasty (PTCA) in 45%, coronary angiogram (CAG) in 20%, and coronary artery bypass graft surgery (CABG) in 7%. In-hospital medications were antiplatelets (100%), thrombolytics (28%), statins (97%), anticoagulants (80%), nitrates (73%), β-blocker (32%), angiotensin-converting enzyme inhibitor (6%), angiotensin receptor blocker (9%), potassium opener (7%), vasodilator (1%), calcium channel blocker (9%), α-blocker (7%), and α+β blocker (7%). CONCLUSIONS: The contemporary profile of treatment patterns for patients with ACS indicates an improved adherence to the guidelines. The alarmingly high rate of modifiable risk factors remains a cause of concern and a challenge that needs to be tackled, as better control of cardiovascular risk factors is expected to have a favorable impact on the incidence of ACS.

204. Ge Z, Baber U, Claessen BE, Farhan S, Chandrasekhar J, Li SX, et al. The prevalence, predictors and outcomes of guideline-directed medical therapy in patients with acute myocardial infarction undergoing PCI, an analysis from the PROMETHEUS registry. Catheter Cardiovasc Interv. 2019;93(3):E112-e9.

OBJECTIVES: To investigate the prevalence, predictors and associations between guideline-directed medical therapy (GDMT) and clinical outcomes in acute myocardial infarction (AMI) patients undergoing percutaneous coronary intervention (PCI) from eight academic centers in the United States. BACKGROUND: Evidence for GDMT in patients with AMI comes from randomized controlled trials. The use of GDMT in clinical practice is unknown in this setting. METHODS: PROMETHEUS is a multicenter observational registry comprising 19,914 patients with acute coronary syndrome (ACS) undergoing PCI. Patients with AMI were divided into two groups based on the prescription of GDMT or not (non-GDMT) at discharge. GDMT was defined according to American College of Cardiology/American Heart Association (ACC/AHA) class I recommendations, specifically, dual antiplatelet therapy, statin and beta-blocker for all AMI patients, and additional ACEI/ARB in patients with left ventricular ejection fraction (LVEF) less than 40%, hypertension, diabetes mellitus (DM) or chronic kidney disease (CKD). The primary endpoint was major adverse cardiovascular events (MACE) defined as a composite of all-cause death, MI, stroke or unplanned target vessel revascularization (TVR) at 1 year. RESULTS: Out of 4,834 patients with AMI, 3,356 (69.4%) patients were discharged on GDMT. Patients receiving GDMT were more often younger and male. Compared with non-GDMT patients, GDMT patients had a significantly lower frequency of comorbidities. Predictors of greater GDMT prescription at discharge were ST-segment elevation myocardial infarction (STEMI), and increased body mass index (BMI), whereas hypertension, prior PCI, anemia and CKD were associated with less GDMT prescription. At 1 year, the use of GDMT was associated with a significantly lower incidence of MACE (13.7% vs. 22.5%; adjusted HR 0.68; 95%CI 0.58-0.80; P < 0.001), death (3.7% vs. 9.4%; adjusted HR 0.61; 95%CI 0.46-0.80; P < 0.001), and unplanned TVR (8.4% vs. 11.3%; adjusted HR 0.76; 95%CI 0.61-0.96; P = 0.020). However, there were no significant differences in the incidence of MI (4.3% vs. 7.0%; adjusted HR 0.75; 95%CI 0.56-1.01; P = 0.056), stroke (1.5% vs. 2.0%; adjusted HR 0.79; 95%CI 0.47-1.34; P = 0.384) between the two groups. CONCLUSION: In a contemporary practice setting in the United States, GDMT was utilized in just over two-thirds of AMI patients undergoing PCI. Predictors of GDMT prescription at discharge included STEMI, BMI and absence of hypertension, CKD, anemia or prior PCI. Use of GDMT was associated with significantly lower risk of 1-year MACE and mortality.

205. Rao M, Xavier D, Devi P, Sigamani A, Faruqui A, Gupta R, et al. Prevalence, treatments and outcomes of coronary artery disease in Indians: A systematic review. Indian Heart J. 2015;67(4):302-10.

AIM: To conduct a systematic review on the prevalence, risk factors, treatments and outcomes of Coronary Artery Disease (CAD) in Indians. METHODS AND RESULTS: We conducted a systematic review of studies in Indians with CAD from Jan 1969 to Oct 2012. Initial search yielded 3885 studies and after review 288 observational studies were included. The prevalence of CAD in urban areas was 2.5%-12.6% and in rural areas, 1.4%-4.6%. The prevalence of risk factors was: smoking (8.9-40.5%), hypertension (13.1-36.9%) and diabetes mellitus (0.2-24.0%). The median time to reach hospital after an MI was 360 min. In hospital rates of drug use were: antiplatelets 68%-97.9%, beta blockers 47.3%-65.8% and ACEIs 27.8-56.8%. CONCLUSIONS: In this first systematic review of CAD in India, prevalence of risk factors is high, treatments delayed and use of evidence based treatments variable.

206. Murphy E, Vellinga A, Byrne M, Cupples ME, Murphy AW, Buckley B, et al. Primary care organisational interventions for secondary prevention of ischaemic heart disease: a systematic review and meta-analysis. Br J Gen Pract. 2015;65(636):e460-8.

BACKGROUND: Ischaemic heart disease (IHD) is the most common cause of death worldwide. AIM: To determine the long-term impact of organisational interventions for secondary prevention of IHD. DESIGN AND SETTING: Systematic review and meta-analysis of studies from CENTRAL, MEDLINE(®), Embase, and CINAHL published January 2007 to January 2013. METHOD: Searches were conducted for randomised controlled trials of patients with established IHD, with long-term follow-up, of cardiac secondary prevention programmes targeting organisational change in primary care or community settings. A random-effects model was used and risk ratios were calculated. RESULTS: Five studies were included with 4005 participants. Meta-analysis of four studies with mortality data at 4.7-6 years showed that organisational interventions were associated with approximately 20% reduced mortality, with a risk ratio (RR) for all-cause mortality of 0.79 (95% confidence interval [CI] = 0.66 to 0.93), and a RR for cardiac-related mortality of 0.74 (95% CI = 0.58 to 0.94). Two studies reported mortality data at 10 years. Analysis of these data showed no significant differences between groups. There were insufficient data to conduct a meta-analysis on the effect of interventions on hospital admissions. Additional analyses showed no significant association between organisational interventions and risk factor management or appropriate prescribing at 4.7-6 years. CONCLUSION: Cardiac secondary prevention programmes targeting organisational change are associated with a reduced risk of death for at least 4-6 years. There is insufficient evidence to conclude whether this beneficial effect is maintained indefinitely.

207. Lowe MJ, Lightfoot NJ. The prognostic implication of perioperative cardiac enzyme elevation in patients with fractured neck of femur: A systematic review and meta-analysis. Injury. 2020;51(2):164-73.

BACKGROUND: Neck of Femur (NOF) fractures are a common injury in comorbid elderly patients which are associated with increased rates of morbidity and mortality following fracture. Because of their injury, patients can experience reductions in quality of life and independent living leading to transfer to nursing home or dependent levels of care. Numerous factors are associated with either complications or reductions in survival following fractured NOF. From the VISION cohort there is evidence that troponin elevation in the post-operative period following a diverse range of non-cardiac surgical procedures may lead to an increased risk of mortality in the absence of classical ischaemic or cardiac symptoms. The aim of this systematic review and meta-analysis is to validate the utility of perioperative troponin elevation as a prognostic indicator for mortality and cardiac morbidity in those with fractured NOF. METHODS: The PRISMA guidelines for the conduct of meta-analyses were followed. An electronic search was conducted of the EMBASE, MEDLINE (Ovid) and Biosis databases. Studies were included for analysis if they stratified outcomes by perioperative troponin elevation in surgically managed fractured NOF and reported sufficient data on troponin elevation and mortality following surgery. Primary and secondary outcomes assessed were all-cause post-operative mortality and a composite measure of cardiac complications (myocardial infarction, cardiac failure and arrhythmia) respectively. RESULTS: Eleven studies met inclusion criteria giving a total of 1363 patients. Overall, 497 patients (36.5%) experienced an elevation in troponin levels following surgery. Perioperative troponin elevation was significantly associated with all-cause mortality (OR 2.6; 95% CI 1.5 - 4.6; p <0.001) and cardiac complications (OR 7.4; 95% CI 3.5 - 15.8; p <0.001). Patient factors significantly associated with troponin elevation included pre-existing coronary artery disease, cardiac failure, hypertension, previous stroke and previous myocardial infarction. CONCLUSION: Perioperative troponin elevation is significantly associated with increased mortality and post-operative cardiac complications following fractured NOF and may be a useful prognostic indicator in these patients. Future research should further stratify patients by the magnitude of troponin elevation and further refine the risk factors.

208. Richards SH, Anderson L, Jenkinson CE, Whalley B, Rees K, Davies P, et al. Psychological interventions for coronary heart disease. Cochrane Database Syst Rev. 2017;4(4):Cd002902.

BACKGROUND: Coronary heart disease (CHD) is the most common cause of death globally, although mortality rates are falling. Psychological symptoms are prevalent for people with CHD, and many psychological treatments are offered following cardiac events or procedures with the aim of improving health and outcomes. This is an update of a Cochrane systematic review previously published in 2011. OBJECTIVES: To assess the effectiveness of psychological interventions (alone or with cardiac rehabilitation) compared with usual care (including cardiac rehabilitation where available) for people with CHD on total mortality and cardiac mortality; cardiac morbidity; and participant-reported psychological outcomes of levels of depression, anxiety, and stress; and to explore potential study-level predictors of the effectiveness of psychological interventions in this population. SEARCH METHODS: We updated the previous Cochrane Review searches by searching the following databases on 27 April 2016: CENTRAL in the Cochrane Library, MEDLINE (Ovid), Embase (Ovid), PsycINFO (Ovid), and CINAHL (EBSCO). SELECTION CRITERIA: We included randomised controlled trials (RCTs) of psychological interventions compared to usual care, administered by trained staff, and delivered to adults with a specific diagnosis of CHD. We selected only studies estimating the independent effect of the psychological component, and with a minimum follow-up of six months. The study population comprised of adults after: a myocardial infarction (MI), a revascularisation procedure (coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI)), and adults with angina or angiographically defined coronary artery disease (CAD). RCTs had to report at least one of the following outcomes: mortality (total- or cardiac-related); cardiac morbidity (MI, revascularisation procedures); or participant-reported levels of depression, anxiety, or stress. DATA COLLECTION AND ANALYSIS: Two review authors independently screened titles and abstracts of all references for eligibility. A lead review author extracted study data, which a second review author checked. We contacted study authors to obtain missing information. MAIN RESULTS: This review included 35 studies which randomised 10,703 people with CHD (14 trials and 2577 participants added to this update). The population included mainly men (median 77.0%) and people post-MI (mean 65.7%) or after undergoing a revascularisation procedure (mean 27.4%). The mean age of participants within trials ranged from 53 to 67 years. Overall trial reporting was poor, with around a half omitting descriptions of randomisation sequence generation, allocation concealment procedures, or the blinding of outcome assessments. The length of follow-up ranged from six months to 10.7 years (median 12 months). Most studies (23/35) evaluated multifactorial interventions, which included therapies with multiple therapeutic components. Ten studies examined psychological interventions targeted at people with a confirmed psychopathology at baseline and two trials recruited people with a psychopathology or another selecting criterion (or both). Of the remaining 23 trials, nine studies recruited unselected participants from cardiac populations reporting some level of psychopathology (3.8% to 53% with depressive symptoms, 32% to 53% with anxiety), 10 studies did not report these characteristics, and only three studies excluded people with psychopathology.Moderate quality evidence showed no risk reduction for total mortality (risk ratio (RR) 0.90, 95% confidence interval (CI) 0.77 to 1.05; participants = 7776; studies = 23) or revascularisation procedures (RR 0.94, 95% CI 0.81 to 1.11) with psychological therapies compared to usual care. Low quality evidence found no risk reduction for non-fatal MI (RR 0.82, 95% CI 0.64 to 1.05), although there was a 21% reduction in cardiac mortality (RR 0.79, 95% CI 0.63 to 0.98). There was also low or very low quality evidence that psychological interventions improved participant-reported levels of depressive symptoms (standardised mean difference (SMD) -0.27, 95% CI -0.39 to -0.15; GRADE = low), anxiety (SMD -0.24, 95% CI -0.38 to -0.09; GRADE = low), and stress (SMD -0.56, 95% CI -0.88 to -0.24; GRADE = very low).There was substantial statistical heterogeneity for all psychological outcomes but not clinical outcomes, and there was evidence of small-study bias for one clinical outcome (cardiac mortality: Egger test P = 0.04) and one psychological outcome (anxiety: Egger test P = 0.012). Meta-regression exploring a limited number of intervention characteristics found no significant predictors of intervention effects for total mortality and cardiac mortality. For depression, psychological interventions combined with adjunct pharmacology (where deemed appropriate) for an underlying psychological disorder appeared to be more effective than interventions that did not (β = -0.51, P = 0.003). For anxiety, interventions recruiting participants with an underlying psychological disorder appeared more effective than those delivered to unselected populations (β = -0.28, P = 0.03). AUTHORS' CONCLUSIONS: This updated Cochrane Review found that for people with CHD, there was no evidence that psychological treatments had an effect on total mortality, the risk of revascularisation procedures, or on the rate of non-fatal MI, although the rate of cardiac mortality was reduced and psychological symptoms (depression, anxiety, or stress) were alleviated; however, the GRADE assessments suggest considerable uncertainty surrounding these effects. Considerable uncertainty also remains regarding the people who would benefit most from treatment (i.e. people with or without psychological disorders at baseline) and the specific components of successful interventions. Future large-scale trials testing the effectiveness of psychological therapies are required due to the uncertainty within the evidence. Future trials would benefit from testing the impact of specific (rather than multifactorial) psychological interventions for participants with CHD, and testing the targeting of interventions on different populations (i.e. people with CHD, with or without psychopathologies).

209. Kisely SR, Campbell LA, Yelland MJ, Paydar A. Psychological interventions for symptomatic management of non-specific chest pain in patients with normal coronary anatomy. Cochrane Database Syst Rev. 2015;2015(6):Cd004101.

BACKGROUND: Recurrent chest pain in the absence of coronary artery disease is a common problem which sometimes leads to excess use of medical care. Although many studies have examined the causes of pain in these patients, few clinical trials have evaluated treatment. This is an update of a Cochrane review originally published in 2005 and last updated in 2010. The studies reviewed in this paper provide an insight into the effectiveness of psychological interventions for this group of patients. OBJECTIVES: To assess the effects of psychological interventions for chest pain, quality of life and psychological parameters in people with non-specific chest pain. SEARCH METHODS: We searched the Cochrane Library (CENTRAL, Issue 4 of 12, 2014 and DARE Issue 2 of 4, 2014), MEDLINE (OVID, 1966 to April week 4 2014), EMBASE (OVID, 1980 to week 18 2014), CINAHL (EBSCO, 1982 to April 2014), PsycINFO (OVID, 1887 to April week 5 2014) and BIOSIS Previews (Web of Knowledge, 1969 to 2 May 2014). We also searched citation lists and contacted study authors. SELECTION CRITERIA: Randomised controlled trials (RCTs) with standardised outcome methodology that tested any form of psychotherapy for chest pain with normal anatomy. Diagnoses included non-specific chest pain (NSCP), atypical chest pain, syndrome X or chest pain with normal coronary anatomy (as either inpatients or outpatients). DATA COLLECTION AND ANALYSIS: Two review authors independently selected studies for inclusion, extracted data and assessed quality of studies. We contacted trial authors for further information about the included RCTs. MAIN RESULTS: We included two new papers, one of which was an update of a previously included study. Therefore, a total of 17 RCTs with 1006 randomised participants met the inclusion criteria, with the one new study contributing an additional 113 participants. There was a significant reduction in reports of chest pain in the first three months following the intervention: random-effects relative risk = 0.70 (95% CI 0.53 to 0.92). This was maintained from three to nine months afterwards: relative risk 0.59 (95% CI 0.45 to 0.76). There was also a significant increase in the number of chest pain-free days up to three months following the intervention: mean difference (MD) 3.00 (95% CI 0.23 to 5.77). This was associated with reduced chest pain frequency (random-effects MD -2.26, 95% CI -4.41 to -0.12) but there was no evidence of effect of treatment on chest pain frequency from three to twelve months (random-effects MD -0.81, 95% CI -2.35 to 0.74). There was no effect on severity (random-effects MD -4.64 (95% CI -12.18 to 2.89) up to three months after the intervention. Due to the nature of the main interventions of interest, it was impossible to blind the therapists as to whether the participant was in the intervention or control arm. In addition, in three studies the blinding of participants was expressly forbidden by the local ethics committee because of issues in obtaining fully informed consent . For this reason, all studies had a high risk of performance bias. In addition, three studies were thought to have a high risk of outcome bias. In general, there was a low risk of bias in the other domains. However, there was high heterogeneity and caution is required in interpreting these results. The wide variability in secondary outcome measures made it difficult to integrate findings from studies. AUTHORS' CONCLUSIONS: This Cochrane review suggests a modest to moderate benefit for psychological interventions, particularly those using a cognitive-behavioural framework, which was largely restricted to the first three months after the intervention. Hypnotherapy is also a possible alternative. However, these conclusions are limited by high heterogeneity in many of the results and low numbers of participants in individual studies. The evidence for other brief interventions was less clear. Further RCTs of psychological interventions for NSCP with follow-up periods of at least 12 months are needed.

210. de Cordova PB, Johansen ML, Riman KA, Rogowski J. Public Reporting of Cardiac Outcomes for Patients With Acute Myocardial Infarction: A Systematic Review of the Evidence. J Cardiovasc Nurs. 2019;34(2):115-23.

BACKGROUND: Percutaneous coronary intervention (PCI) is recognized by both the American Heart Association and the American College of Cardiology as an optimal therapy to treat patients experiencing acute myocardial infarction (AMI) with ST-segment elevation myocardial infarction. A health policy aimed at improving outcomes for the patient with AMI is public reporting of whether a patient received a PCI. OBJECTIVE: A systematic review was conducted to evaluate the effect of public reporting for patients with AMI, specifically for those patients who receive PCI. METHODS: EMBASE, MEDLINE, Academic Search Premier, Google Scholar, and PubMed were searched from inception through August 2017. Articles were selected for inclusion if researchers evaluated public reporting and included an outcome for whether a patient received a PCI during hospitalization for an AMI. Methodological quality of the included studies was evaluated, and findings were synthesized. RESULTS: Eight studies of high methodological quality were included in the review. Most studies found that, in areas of public reporting, patients were less likely to undergo a PCI and high-risk patients did not undergo a PCI. Researchers also found that patients with AMI had lower in-hospital mortality after the implementation of public reporting, but only if these patients received a PCI. CONCLUSIONS: Although public reporting may have had intentions of improving care, there is strong evidence that this policy did not result in more timely PCIs or improved mortality of patients with AMI. In fact, public reporting resulted in unintended consequences of not providing care for the most vulnerable patients in fear of an adverse outcome.

211. Buggeskov KB, Grønlykke L, Risom EC, Wei ML, Wetterslev J. Pulmonary artery perfusion versus no perfusion during cardiopulmonary bypass for open heart surgery in adults. Cochrane Database Syst Rev. 2018(2).

http://dx.doi.org/10.1002/14651858.CD011098.pub2

- Background Available evidence has been inconclusive on whether pulmonary artery perfusion during cardiopulmonary bypass (CPB) is associated with decreased or increased mortality, pulmonary events, and serious adverse events (SAEs) after open heart surgery. To our knowledge, no previous systematic reviews have included meta‐analyses of these interventions. Objectives To assess the benefits and harms of single‐shot or continuous pulmonary artery perfusion with blood (oxygenated or deoxygenated) or a preservation solution compared with no perfusion during cardiopulmonary bypass (CPB) in terms of mortality, pulmonary events, serious adverse events (SAEs), and increased inflammatory markers for adult surgical patients. Search methods We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, Science Citation Index Expanded, and advanced Google for relevant studies. We handsearched retrieved study reports and scanned citations of included studies and relevant reviews to ensure that no relevant trials were missed. We searched for ongoing trials and unpublished trials in the World Health Organization International Clinical Trials Registry Platform (ICTRP) and at clinicaltrials.gov (4 July 2017). We contacted medicinal firms producing preservation solutions to retrieve additional studies conducted to examine relevant interventions. Selection criteria We included randomized controlled trials (RCTs) that compared pulmonary artery perfusion versus no perfusion during CPB in adult patients (≧ 18 years). Data collection and analysis Two independent review authors extracted data, conducted fixed‐effect and random‐effects meta‐analyses, and calculated risk ratios (RRs) or odds ratios (ORs) for dichotomous outcomes. For continuous data, we have presented mean differences (MDs) and 95% confidence intervals (CIs) as estimates of the intervention effect. To minimize the risk of systematic error, we assessed risk of bias of included trials. To reduce the risk of random errors caused by sparse data and repetitive updating of cumulative meta‐analyses, we applied Trial Sequential Analyses (TSAs). We used GRADE principles to assess the quality of evidence. Main results We included in this review four RCTs (210 participants) reporting relevant outcomes. Investigators randomly assigned participants to pulmonary artery perfusion with blood versus no perfusion during CPB. Only one trial included the pulmonary artery perfusion intervention with a preservation solution; therefore we did not perform meta‐analysis. Likewise, only one trial reported patient‐specific data for the outcome "pulmonary events"; therefore we have provided no results from meta‐analysis. Instead, review authors added two explorative secondary outcomes for this version of the review: the ratio of partial pressure of oxygen in arterial blood (PaO 2 ) to fraction of inspired oxygen (FiO 2 ); and intubation time. Last, review authors found no comparable data for the secondary outcome inflammatory markers. The effect of pulmonary artery perfusion on all‐cause mortality was uncertain (Peto OR 1.78, 95% CI 0.43 to 7.40; TSA adjusted CI 0.01 to 493; 4 studies, 210 participants; GRADE: very low quality). Sensitivity analysis of one trial with overall low risk of bias (except for blinding of personnel during the surgical procedure) yielded no evidence of a difference for mortality (Peto OR 1.65, 95% CI 0.27 to 10.15; 1 study, 60 participants). The TSA calculated required information size was not reached and the futility boundaries did not cross; thus this analysis cannot refute a 100% increase in mortality. The effect of pulmonary artery perfusion with blood on SAEs was likewise uncertain (RR 1.12, 95% CI 0.66 to 1.89; 3 studies, 180 participants; GRADE: very low quality). Data show an association between pulmonary artery perfusion with blood during CPB and a higher postoperative PaO 2 /FiO 2 ratio (MD 27.80, 95% CI 5.67 to 49.93; 3 studies, 119 participants; TSA adjusted CI 5.67 to 49.93; GRADE: very low quality), a though TSA could not confirm or refute a 10% increase in the PaO 2 /FiO 2 ratio, as the required information size was not reached. Authors' conclusions The effects of pulmonary artery perfusion with blood during cardiopulmonary bypass (CPB) are uncertain owing to the small numbers of participants included in meta‐analyses. Risks of death and serious adverse events may be higher with pulmonary artery perfusion with blood during CPB, and robust evidence for any beneficial effects is lacking. Future randomized controlled trials (RCTs) should provide long‐term follow‐up and patient stratification by preoperative lung function and other documented risk factors for mortality. One study that is awaiting classification (epub abstract with preliminary results) may change the results of this review when full study details have been published. Plain language summary The effects of perfusing the pulmonary circuit during open heart surgery in adults Review question During open heart surgery, the heart‐lung machine temporarily takes over the function of the heart and lungs. During extracorporeal circulation (ECC), only the systemic circuit is perfused with oxygenated blood with no blood supply to the lungs. This systematic review assesses the beneficial and harmful effects of additional perfusion of the pulmonary circuit with blood or a preservation solution compared with no blood supply to the lungs during ECC in adults undergoing open heart surgery. We report numbers of deaths, serious adverse events, and pulmonary events (for this version of the review, mechanical ventilation and oxygenation after surgery). Background Pulmonary complications are often seen after open heart surgery with ECC when insufficient perfusion of the lungs leads to reduced tissue oxygenation. Previous trials have led to different conclusions on whether additional perfusion of the pulmonary circuit during ECC may decrease or increase risks of death, serious adverse events, and pulmonary events. This systematic review follows the Cochrane method for systematic reviews to access evidence from randomized controlled trials (RCTs). We identified four RCTs (210 participants) reporting on risk of death and mechanical ventilation time. Three trials reported on serious adverse events and oxygenation after surgery. All trials were conducted without direct industry funding. The number of participants in each trial ranged from 30 to 89. The mean age of participants was 59 years (range 37 to 70 years), and 65% were women. Types of surgery included coronary artery bypass graft and valve replacement surgery. Only one trial included the intervention pulmonary perfusion with a preservation solution. Therefore, in this version of the review, we report only results of the intervention pulmonary perfusion with blood compared with no perfusion during ECC. Key results Pulmonary perfusion with blood during cardiopulmonary bypass was not associated with increased risk of death nor with decreased serious adverse events and mechanical ventilation time. Trial results do not prove that a higher oxygenation value after surgery was beneficial or harmful for pulmonary perfusion with blood during ECC. Quality and quantity of the evidence Only one of the included trials had low risk of bias (except for blinding of personnel during the surgical procedure). Trials randomly assigned 210 participants, and the number of participants required to detect or reject a 100% risk ratio reduction in deaths was not reached; therefore observed results are uncertain. Overall the quality of evidence is low.

212. Lee ES, Vedanthan R, Jeemon P, Kamano JH, Kudesia P, Rajan V, et al. Quality Improvement for Cardiovascular Disease Care in Low- and Middle-Income Countries: A Systematic Review. PLoS One. 2016;11(6):e0157036.

BACKGROUND: The majority of global cardiovascular disease (CVD) burden falls on people living in low- and middle-income countries (LMICs). In order to reduce preventable CVD mortality and morbidity, LMIC health systems and health care providers need to improve the delivery and quality of CVD care. OBJECTIVES: As part of the Disease Control Priorities Three (DCP3) Study efforts addressing quality improvement, we reviewed and summarized currently available evidence on interventions to improve quality of clinic-based CVD prevention and management in LMICs. METHODS: We conducted a narrative review of published comparative clinical trials that evaluated efficacy or effectiveness of clinic-based CVD prevention and management quality improvement interventions in LMICs. Conditions selected a priori included hypertension, diabetes, hyperlipidemia, coronary artery disease, stroke, rheumatic heart disease, and congestive heart failure. MEDLINE and EMBASE electronic databases were systematically searched. Studies were categorized as occurring at the system or patient/provider level and as treating the acute or chronic phase of CVD. RESULTS: From 847 articles identified in the electronic search, 49 met full inclusion criteria and were selected for review. Selected studies were performed in 19 different LMICs. There were 10 studies of system level quality improvement interventions, 38 studies of patient/provider interventions, and one study that fit both criteria. At the patient/provider level, regardless of the specific intervention, intensified, team-based care generally led to improved medication adherence and hypertension control. At the system level, studies provided evidence that introduction of universal health insurance coverage improved hypertension and diabetes control. Studies of system and patient/provider level acute coronary syndrome quality improvement interventions yielded inconclusive results. The duration of most studies was less than 12 months. CONCLUSIONS: The results of this review suggest that CVD care quality improvement can be successfully implemented in LMICs. Most studies focused on chronic CVD conditions; more acute CVD care quality improvement studies are needed. Longer term interventions and follow-up will be needed in order to assess the sustainability of quality improvement efforts in LMICs.

213. Rao C, Du J, Li X, Li J, Zhang H, Zhao Y, et al. Rationale and design of a randomized cluster trial to improve guideline-adherence of secondary preventive drugs prescription after coronary artery bypass grafting in China: Measurement and Improvement Studies of Surgical Coronary Revascularization: Secondary Prevention (MISSION-1) Study. Am Heart J. 2016;178:9-18.

OBJECTIVES: The benefits of secondary preventive drugs after coronary artery bypass grafting have been thoroughly established. However, the prescription rates of these drugs are low at discharge in China. We sought to evaluate the effectiveness of continuous quality improvement with mobile-based interventions for clinicians on improving the guideline-adherence of secondary preventive drugs prescription. METHODS AND RESULTS: The quality MISSION-1 study is a cluster-randomized controlled trial. We enrolled 60 hospitals with a bypass surgery volume of more than 30 a year and randomly assigned them into the intervention group or the control group in a 1:1 ratio using minimized random grouping. The intervention group undertakes a series of mobile-based interventions, while the control group maintains a routine practice pattern. All sites consecutively register patients who underwent isolated coronary artery bypass grafting and submit in-hospital data. We require supporting documents regarding prescription information at discharge to adjudicate the outcome measures. The estimated sample size of enrolled patients is 9,600. The primary outcome measure is the prescription rate of statins for eligible patients at discharge. The secondary outcome measures are β-blockers, angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, and optimal medical therapy. MISSION-1 study is now recruiting patients. CONCLUSIONS: The MISSION-1 study has the potential to identify the effectiveness of interventions on improving secondary prevention adherence at discharge after bypass surgery in China and further disseminate findings to other settings to improve the quality of care.

214. Ramee S, Anwaruddin S, Kumar G, Piana RN, Babaliaros V, Rab T, et al. The Rationale for Performance of Coronary Angiography and Stenting Before Transcatheter Aortic Valve Replacement: From the Interventional Section Leadership Council of the American College of Cardiology. JACC Cardiovasc Interv. 2016;9(23):2371-5.

Transcatheter aortic valve replacement (TAVR) is an effective, nonsurgical treatment option for patients with severe aortic stenosis. The optimal treatment strategy for treating concomitant coronary artery disease (CAD) has not been tested prospectively in a randomized clinical trial. Nevertheless, it is standard practice in the United States to perform coronary angiography and percutaneous coronary intervention for significant CAD at least 1 month before TAVR. All existing clinical trials were designed using this strategy. Therefore, it is wrong to extrapolate current American College of Cardiology/American Heart Association Appropriate Use Criteria against invasive procedures in asymptomatic patients to the TAVR population when evaluating the quality of care by cardiologists or hospitals. In this statement from the Interventional Section Leadership Council of the ACC, it is recommended that percutaneous coronary intervention should be considered in all patients with significant proximal coronary stenosis in major coronary arteries before TAVR, even though the indication is not covered in current guidelines.

215. Ramsden CE, Zamora D, Majchrzak-Hong S, Faurot KR, Broste SK, Frantz RP, et al. Re-evaluation of the traditional diet-heart hypothesis: analysis of recovered data from Minnesota Coronary Experiment (1968-73). BMJ. 2016;353:i1246.

OBJECTIVE: To examine the traditional diet-heart hypothesis through recovery and analysis of previously unpublished data from the Minnesota Coronary Experiment (MCE) and to put findings in the context of existing diet-heart randomized controlled trials through a systematic review and meta-analysis. DESIGN: The MCE (1968-73) is a double blind randomized controlled trial designed to test whether replacement of saturated fat with vegetable oil rich in linoleic acid reduces coronary heart disease and death by lowering serum cholesterol. Recovered MCE unpublished documents and raw data were analyzed according to hypotheses prespecified by original investigators. Further, a systematic review and meta-analyses of randomized controlled trials that lowered serum cholesterol by providing vegetable oil rich in linoleic acid in place of saturated fat without confounding by concomitant interventions was conducted. SETTING: One nursing home and six state mental hospitals in Minnesota, United States. PARTICIPANTS: Unpublished documents with completed analyses for the randomized cohort of 9423 women and men aged 20-97; longitudinal data on serum cholesterol for the 2355 participants exposed to the study diets for a year or more; 149 completed autopsy files. INTERVENTIONS: Serum cholesterol lowering diet that replaced saturated fat with linoleic acid (from corn oil and corn oil polyunsaturated margarine). Control diet was high in saturated fat from animal fats, common margarines, and shortenings. MAIN OUTCOME MEASURES: Death from all causes; association between changes in serum cholesterol and death; and coronary atherosclerosis and myocardial infarcts detected at autopsy. RESULTS: The intervention group had significant reduction in serum cholesterol compared with controls (mean change from baseline -13.8%v-1.0%; P<0.001). Kaplan Meier graphs showed no mortality benefit for the intervention group in the full randomized cohort or for any prespecified subgroup. There was a 22% higher risk of death for each 30 mg/dL (0.78 mmol/L) reduction in serum cholesterol in covariate adjusted Cox regression models (hazard ratio 1.22, 95% confidence interval 1.14 to 1.32; P<0.001). There was no evidence of benefit in the intervention group for coronary atherosclerosis or myocardial infarcts. Systematic review identified five randomized controlled trials for inclusion (n=10,808). In meta-analyses, these cholesterol lowering interventions showed no evidence of benefit on mortality from coronary heart disease (1.13, 0.83 to 1.54) or all cause mortality (1.07, 0.90 to 1.27). CONCLUSIONS: Available evidence from randomized controlled trials shows that replacement of saturated fat in the diet with linoleic acid effectively lowers serum cholesterol but does not support the hypothesis that this translates to a lower risk of death from coronary heart disease or all causes. Findings from the Minnesota Coronary Experiment add to growing evidence that incomplete publication has contributed to overestimation of the benefits of replacing saturated fat with vegetable oils rich in linoleic acid.

216. Benstoem C, Stoppe C, Liakopoulos OJ, Ney J, Hasenclever D, Meybohm P, et al. Remote ischaemic preconditioning for coronary artery bypass grafting (with or without valve surgery). Cochrane Database Syst Rev. 2017(5).

http://dx.doi.org/10.1002/14651858.CD011719.pub3

- Background Despite substantial improvements in myocardial preservation strategies, coronary artery bypass grafting (CABG) is still associated with severe complications. It has been reported that remote ischaemic preconditioning (RIPC) reduces reperfusion injury in people undergoing cardiac surgery and improves clinical outcome. However, there is a lack of synthesised information and a need to review the current evidence from randomised controlled trials (RCTs). Objectives To assess the benefits and harms of remote ischaemic preconditioning in people undergoing coronary artery bypass grafting, with or without valve surgery. Search methods In May 2016 we searched CENTRAL, MEDLINE, Embase and Web of Science. We also conducted a search of ClinicalTrials.gov and the International Clinical Trials Registry Platform (ICTRP). We also checked reference lists of included studies. We did not apply any language restrictions. Selection criteria We included RCTs in which people scheduled for CABG (with or without valve surgery) were randomly assigned to receive RIPC or sham intervention before surgery. Data collection and analysis Two review authors independently assessed trials for inclusion, extracted data and checked them for accuracy. We calculated mean differences (MDs), standardised mean differences (SMDs) and risk ratios (RR) using a random‐effects model. We assessed quality of the trial evidence for all primary outcomes using the GRADE methodology. We completed a ’Risk of bias’ assessment for all studies and performed sensitivity analysis by excluding studies judged at high or unclear risk of bias for sequence generation, allocation concealment and incomplete outcome data. We contacted authors for missing data. Our primary endpoints were 1) composite endpoint (including all‐cause mortality, non‐fatal myocardial infarction or any new stroke, or both) assessed at 30 days after surgery, 2) cardiac troponin T (cTnT, ng/L) at 48 hours and 72 hours, and as area under the curve (AUC) 72 hours (µg/L) after surgery, and 3) cardiac troponin I (cTnI, ng/L) at 48 hours, 72 hours, and as area under the curve (AUC) 72 hours (µg/L) after surgery. Main results We included 29 studies involving 5392 participants (mean age = 64 years, age range 23 to 86 years, 82% male). However, few studies contributed data to meta‐analyses due to inconsistency in outcome definition and reporting. In general, risk of bias varied from low to high risk of bias across included studies, and insufficient detail was provided to inform judgement in several cases. The quality of the evidence of key outcomes ranged from moderate to low quality due to the presence of moderate or high statistical heterogeneity, imprecision of results or due to limitations in the design of individual studies. Compared with no RIPC, we found that RIPC has no treatment effect on the rate of the composite endpoint with RR 0.99 (95% confidence interval (CI) 0.78 to 1.25); 2 studies; 2463 participants; moderate‐quality evidence. Participants randomised to RIPC showed an equivalent or better effect regarding the amount of cTnT release measured at 72 hours after surgery with SMD ‐0.32 (95% CI ‐0.65 to 0.00); 3 studies; 1120 participants; moderate‐quality evidence; and expressed as AUC 72 hours with SMD ‐0.49 (95% CI ‐0.96 to ‐0.02); 3 studies; 830 participants; moderate‐quality evidence. We found the same result in favour of RIPC for the cTnI release measured at 48 hours with SMD ‐0.21 (95% CI ‐0.40 to ‐0.02); 5 studies; 745 participants; moderate‐quality evidence; and measured at 72 hours after surgery with SMD ‐0.37 (95% CI ‐0.59 to ‐0.15); 2 studies; 459 participants; moderate‐quality evidence. All other primary outcomes showed no differences between groups (cTnT release measured at 48 hours with SMD ‐0.14, 95% CI ‐0.33 to 0.06; 4 studies; 1792 participants; low‐quality evidence and cTnI release measured as AUC 72 hours with SMD ‐0.17, 95% CI ‐0.48 to 0.14; 2 studies; 159 participants; moderate‐quality evidence). We als found no differences between groups for all‐cause mortality after 30 days, non‐fatal myocardial infarction after 30 days, any new stroke after 30 days, acute renal failure after 30 days, length of stay on the intensive care unit (days), any complications and adverse effects related to ischaemic preconditioning. We did not assess many patient‐centred/salutogenic‐focused outcomes. Authors' conclusions We found no evidence that RIPC has a treatment effect on clinical outcomes (measured as a composite endpoint including all‐cause mortality, non‐fatal myocardial infarction or any new stroke, or both, assessed at 30 days after surgery). There is moderate‐quality evidence that RIPC has no treatment effect on the rate of the composite endpoint including all‐cause mortality, non‐fatal myocardial infarction or any new stroke assessed at 30 days after surgery, or both. We found moderate‐quality evidence that RIPC reduces the cTnT release measured at 72 hours after surgery and expressed as AUC (72 hours). There is moderate‐quality evidence that RIPC reduces the amount of cTnI release measured at 48 hours, and measured 72 hours after surgery. Adequately‐designed studies, especially focusing on influencing factors, e.g. with regard to anaesthetic management, are encouraged and should systematically analyse the commonly used medications of people with cardiovascular diseases. Plain language summary Effects of remote ischaemic preconditioning in patients undergoing coronary artery bypass graft surgery (with or without valve surgery) Review question We reviewed the evidence about the effect of remote ischaemic preconditioning (RIPC, the temporary blockage of arterial blood flow to one arm or one leg before surgery after induction of anaesthesia) in people undergoing coronary artery bypass graft surgery with or without additional valve surgery. Background Coronary artery disease (CAD) results from progressive blockage of the coronary arteries. If coronary arteries are partly or fully blocked, they cannot supply the heart with enough oxygen. Symptoms of CAD include shortness of breath, pain in the upper body (e.g. arms, left shoulder, back, etc). CAD can be treated with medical therapy, percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). Despite substantial improvements in surgical strategies, cardiac surgery is associated with severe complications. Several approaches have been implemented to reduce the risk during surgery (hypothermia, cardioplegic solutions, and the limitation of procedure times). These strategies have led to a pronounced reduction in mortality and morbidity, however, biomarkers of ischaemia indicate persisting postoperative myocardial damage. RIPC has been reported to reduce these biomarkers of ischaemia in people who undergo cardiac surgery. The aim of this systematic review was to assess whether this practice improves clinical outcomes. Study characteristics We searched scientific databases for randomised trials in which people scheduled for CABG (with or without valve surgery) were randomly assigned to receive RIPC or sham intervention before surgery. The evidence is current to May 2016. We did not identify any source of bias related to the funding of included studies. Key results We identified 29 studies involving 5392 participants (mean age = 64 years, age range 23 to 86 years, 82% male). RIPC does not improve clinical outcome in people undergoing CABG with or without valve surgery (measured as a composite endpoint including all‐cause mortality, non‐fatal myocardial infarction or any new stroke, or both, assessed at 30 days after surgery, moderate‐quality evidence). There is moderate‐quality evidence that RIPC reduces the amount of cardiac troponin T release measured at 72 hours and measured as AUC (72 hours). There is moderate‐quality evidence that cardiac troponin I release measured at 48 hours and 72 hours after surgery is lower in the RIPC group than in the control group. Regarding troponin T measured at 48 hours and troponin I measured as AUC 7 hours after surgery there was no difference between groups (low‐ and moderate‐quality evidence). However, this effect on biomarkers does not result in improved clinical outcome. Quality of the evidence We used reliable methods to assess the quality of the trial evidence. The quality of the evidence of key outcomes ranged from moderate to low quality due to the presence of moderate or high statistical heterogeneity, imprecision of results or due to limitations in the design of individual studies.

217. Byrne RA, Stefanini GG, Capodanno D, Onuma Y, Baumbach A, Escaned J, et al. Report of an ESC-EAPCI Task Force on the evaluation and use of bioresorbable scaffolds for percutaneous coronary intervention: executive summary. EuroIntervention. 2018;13(13):1574-86.

A previous Task Force of the European Society of Cardiology (ESC) and European Association of Percutaneous Cardiovascular Interventions (EAPCI) provided a report on recommendations for the non-clinical and clinical evaluation of coronary stents. Following dialogue with the European Commission, the Task Force was asked to prepare an additional report on the class of devices known as bioresorbable scaffolds (BRS). Five BRS have CE-mark approval for use in Europe. Only one device -the Absorb bioresorbable vascular scaffold- has published randomized clinical trial data and this data show inferior outcomes to conventional drug-eluting stents (DES) at 2-3 years. For this reason, at present BRS should not be preferred to conventional DES in clinical practice. The Task Force recommends that new BRS devices should undergo systematic non-clinical testing according to standardized criteria prior to evaluation in clinical studies. A clinical evaluation plan should include data from a medium sized, randomized trial against DES powered for a surrogate end point of clinical efficacy. Manufacturers of successful devices receive CE- mark approval for use and must have an approved plan for a large-scale randomized clinical trial with planned long-term follow-up.

218. Texakalidis P, Tzoumas A, Giannopoulos S, Jonnalagadda AK, Jabbour P, Rangel-Castilla L, et al. Risk Factors for Restenosis After Carotid Revascularization: A Meta-Analysis of Hazard Ratios. World Neurosurg. 2019;125:414-24.

BACKGROUND: Carotid artery restenosis after carotid endarterectomy (CEA) or carotid artery stenting (CAS) will occur in 3%-30% of cases. Restenosis can lead to more frequent clinical and imaging monitoring and the potential for reoperation. We sought to define the demographic, clinical, and radiographic characteristics that influence the restenosis risk after carotid revascularization. METHODS: The present study was performed in accordance with the PRISMA (preferred reporting items for systematic reviews and meta-analyses) guidelines. A random effects model meta-analysis of hazard ratios (HRs) was conducted. RESULTS: Eighteen studies with 17,106 patients were included. Diabetes (HR, 1.68; 95% confidence interval [CI], 1.00-2.83; I(2), 76.7%), dyslipidemia (HR, 1.77; 95% CI, 1.08-2.91; I(2), 22.5%), female gender (HR, 1.50; 95% CI, 1.14-1.98, I(2), 0%), chronic kidney disease (HR, 4.15; 95% CI, 1.69-10.19; I(2), 44.5%), hypertension (HR, 1.99; 95% CI, 1.07-3.72; I(2), 68%), smoking (HR, 1.65; 95% CI, 1.15-2.37; I(2), 54.3%), and pretreatment stenosis >70% (HR, 1.04; 95% CI, 1.0-1.08; I(2), 0%) showed a statistically significant increase in restenosis risk after carotid revascularization. Subgroup analyses of CEA and CAS showed that female gender and smoking status were significantly associated with recurrent stenosis after CEA but not after CAS. In contrast, hypertension was associated with restenosis after CAS but not after CEA. Patch endarterectomy (HR, 0.33; 95% CI, 0.22-0.50; I(2), 0%) and symptomatic status at presentation in the CAS group (HR, 0.61; 95% CI, 0.41-0.90; I(2), 0%) were associated with a decreased risk of restenosis. Antiplatelet use and coronary artery disease were not associated with restenosis risk. CONCLUSIONS: Diabetes, dyslipidemia, female gender, renal failure, hypertension, and smoking were associated with an increased risk of restenosis, and patch endarterectomy and symptomatic status at presentation were associated with a decreased risk of carotid restenosis. Both female gender and current smoking status were only associated with recurrent stenosis after CEA, and hypertension was only associated with restenosis after CAS.

219. Poorzand H, Tsarouhas K, Hozhabrossadati SA, Khorrampazhouh N, Bondarsahebi Y, Bacopoulou F, et al. Risk factors of premature coronary artery disease in Iran: A systematic review and meta-analysis. Eur J Clin Invest. 2019;49(7):e13124.

BACKGROUND: The aim of this study was to determine the mean age at which coronary artery disease (CAD) hase decreased in recent years in Iran. This systematic review and meta-analysis compares the prevalence of different risk factors of premature CAD (PCAD) in patients vs healthy individuals. METHODS: Medline, Web of Science, Embase and Scientific Information Database were searched for studies about PCAD risk factors in Iran until 28 October 2017. Observational studies of Iranians, comparing risk factors between patients with PCAD and age- and sex-matched healthy subjects, were included. Fixed-effects and random-effects model were used for pooling data. Odds ratio (OR) with 95% CI and mean difference were used for effect size estimation among studies. RESULTS: Twelve studies were eligible for meta-analysis. Diabetes mellitus (OR: 2.4, 95% CI: 1.9-3.03; P = 0.0001, I(2 ) = 25.5%; P = 0.2), family history of CAD (OR: 2.09, 95% CI: 1.22-3.6; P = 0.007, I(2)  = 86%; P = 0.0001), dyslipidaemia (OR: 2.05, 95% CI: 1.15-3.64; P = 0.01, I(2)  = 54%; P = 0.08), smoking (OR: 1.65, 95% CI: 1.11-2.46; P = 0.01, I(2)  = 77.2%; P = 0.000) and hypertension (OR: 1.35, 95% CI: 1.21 to-1.50; P < 0.001, I(2)  = 31%, P = 0.1) associated with PCAD. Sensitivity analysis demonstrated that patients with PCAD had significantly lower levels of high-density lipoprotein (HDL) cholesterol and significantly higher levels of triglycerides compared to healthy subjects (MD: -2.56, 95% CI: -3.54 to -1.58, P < 0.001, I(2)  = 42%, P = 0.01 and MD: 21.17, 95% CI: 14.73-27.62, P < 0.001, I(2)  = 80.12%, P < 0.001, respectively). It should be noted that although high levels of heterogeneity in LDL and HDL values among the studies were observed, when dyslipidaemia was studied as a binary variable, no significant heterogeneity among studies was observed. CONCLUSION: Diabetes mellitus, family history of CAD, dyslipidaemia, smoking, and hypertension were significantly and positively associated with CAD in young adults compared to healthy age- and sex-matched population in Iran.

220. Li H, Tong Q, Guo L, Yu S, Li Y, Cao Q, et al. Risk of Coronary Artery Disease in Patients With Systemic Lupus Erythematosus: A Systematic Review and Meta-analysis. Am J Med Sci. 2018;356(5):451-63.

BACKGROUND: The association between chronic inflammation and the accelerated development of atherosclerosis is well recognized. However, it remains controversial as to whether the risk of coronary artery disease (CAD) is elevated in patients with systemic lupus erythematosus (SLE). The objective of this meta-analysis was to obtain a better estimate of the risk of CAD in patients with SLE. METHODS: An English-restricted literature review was conducted according to PRISMA guidelines using key databases, surveying all articles published through October 31, 2017. Specific search terms included "SLE" and "coronary artery disease" as well as appropriate MeSH terms. The Newcastle-Ottawa scale was used for quality assessment. RESULTS: Nine studies were identified and included in this meta-analysis. The pooled risk ratio of CAD in patients with SLE was 3.39 (95% CI: 2.15-5.35). The statistical heterogeneity of this meta-analysis was high, with an I2 value of 79.5%. An elevated risk of CAD was consistently observed in both female and male SLE patients (pooled risk ratio: 3.27 [95% CI: 2.01-5.30] and 3.16 [95% CI: 2.02-4.94], respectively). CONCLUSIONS: SLE patients are at significantly higher risk of developing CAD. However, as relatively few studies were available for incorporation into this meta-analysis, there is a clear need for further studies with larger sample sizes that better parse gender-related differences in CAD susceptibility among SLE patients. Future work to standardize cardiovascular risk factor identification and monitoring in SLE patients is also needed.

221. Silver SA, Shah PM, Chertow GM, Harel S, Wald R, Harel Z. Risk prediction models for contrast induced nephropathy: systematic review. BMJ. 2015;351:h4395.

OBJECTIVES: To look at the available literature on validated prediction models for contrast induced nephropathy and describe their characteristics. DESIGN: Systematic review. DATA SOURCES: Medline, Embase, and CINAHL (cumulative index to nursing and allied health literature) databases. REVIEW METHODS: Databases searched from inception to 2015, and the retrieved reference lists hand searched. Dual reviews were conducted to identify studies published in the English language of prediction models tested with patients that included derivation and validation cohorts. Data were extracted on baseline patient characteristics, procedural characteristics, modelling methods, metrics of model performance, risk of bias, and clinical usefulness. Eligible studies evaluated characteristics of predictive models that identified patients at risk of contrast induced nephropathy among adults undergoing a diagnostic or interventional procedure using conventional radiocontrast media (media used for computed tomography or angiography, and not gadolinium based contrast). RESULTS: 16 studies were identified, describing 12 prediction models. Substantial interstudy heterogeneity was identified, as a result of different clinical settings, cointerventions, and the timing of creatinine measurement to define contrast induced nephropathy. Ten models were validated internally and six were validated externally. Discrimination varied in studies that were validated internally (C statistic 0.61-0.95) and externally (0.57-0.86). Only one study presented reclassification indices. The majority of higher performing models included measures of pre-existing chronic kidney disease, age, diabetes, heart failure or impaired ejection fraction, and hypotension or shock. No prediction model evaluated its effect on clinical decision making or patient outcomes. CONCLUSIONS: Most predictive models for contrast induced nephropathy in clinical use have modest ability, and are only relevant to patients receiving contrast for coronary angiography. Further research is needed to develop models that can better inform patient centred decision making, as well as improve the use of prevention strategies for contrast induced nephropathy.

222. Gandapur Y, Kianoush S, Kelli HM, Misra S, Urrea B, Blaha MJ, et al. The role of mHealth for improving medication adherence in patients with cardiovascular disease: a systematic review. Eur Heart J Qual Care Clin Outcomes. 2016;2(4):237-44.

Cardiovascular disease is a leading cause of morbidity and mortality worldwide, and a key barrier to improved outcomes is medication non-adherence. The aim of this study is to review the role of mobile health (mHealth) tools for improving medication adherence in patients with cardiovascular disease. We performed a systematic search for randomized controlled trials that primarily investigated mHealth tools for improving adherence to cardiovascular disease medications in patients with hypertension, coronary artery disease, heart failure, peripheral arterial disease, and stroke. We extracted and reviewed data on the types of mHealth tools used, preferences of patients and healthcare providers, the effect of the mHealth interventions on medication adherence, and the limitations of trials. We identified 10 completed trials matching our selection criteria, mostly with <100 participants, and ranging in duration from 1 to 18 months. mHealth tools included text messages, Bluetooth-enabled electronic pill boxes, online messaging platforms, and interactive voice calls. Patients and healthcare providers generally preferred mHealth to other interventions. All 10 studies reported that mHealth interventions improved medication adherence, though the magnitude of benefit was not consistently large and in one study was not greater than a telehealth comparator. Limitations of trials included small sample sizes, short duration of follow-up, self-reported outcomes, and insufficient assessment of unintended harms and financial implications. Current evidence suggests that mHealth tools can improve medication adherence in patients with cardiovascular diseases. However, high-quality clinical trials of sufficient size and duration are needed to move the field forward and justify use in routine care.

223. Liu Y, Cheng J, Guo X, Mo J, Gao B, Zhou H, et al. The roles of PAI-1 gene polymorphisms in atherosclerotic diseases: A systematic review and meta-analysis involving 149,908 subjects. Gene. 2018;673:167-73.

BACKGROUND: The roles of plasminogen activator inhibitor-1 (PAI-1) gene polymorphisms in atherosclerotic diseases were intensively analyzed, but the results of these studies were inconsistent. Therefore, we performed this study to better assess the relationship between PAI-1 genetic variations and atherosclerosis. METHODS: Eligible studies were searched in PubMed, Medline, Embase and Web of Science. Odds ratios (ORs) with 95% confidence intervals (CIs) were used to assess relationship between PAI-1 polymorphisms and atherosclerotic diseases. RESULTS: Ninety-nine studies involving 62,739 cases and 87,169 controls were finally included. Significant associations with the risk of atherosclerosis were detected for the rs2227631 polymorphism in the dominant model (95% CI 0.84-1.00), for the rs1799889 polymorphism in the dominant (95% CI 1.01-1.18), recessive (95% CI 0.90-0.98) and allele (95% CI 1.01-1.12) models. Further subgroup analyses based on type of disease and ethnicity of participants suggested that the rs2227631 polymorphism was significantly associated with the risk of coronary artery disease in the dominant (95% CI 0.71-0.94) and allele (95% CI 0.80-0.94) models, whereas the rs1799889 polymorphism was significantly associated with the risk of myocardial infarction (dominant model: 95% CI 1.09-1.57; recessive model: 95% CI 0.71-0.96; allele model: 95% CI 1.05-1.28) and cerebral infarction (dominant model: 95% CI 1.68-3.51; additive model: 95% CI 0.39-0.77; allele model: 95% CI 1.23-2.00). Moreover, the rs1799889 polymorphism was also significantly correlated with the risk of atherosclerosis in both Asians (dominant model: 95% CI 1.10-1.83; allele model: 95% CI 1.03-1.41) and Caucasians (recessive model: 95% CI 0.87-0.97; allele model: 95% CI 1.01-1.12). CONCLUSION: In conclusion, our findings indicate that PAI-1 rs2227631 and rs1799889 polymorphisms may serve as genetic biomarkers of atherosclerotic diseases.

224. Lu C, Filion KB, Eisenberg MJ. The Safety and Efficacy of Absorb Bioresorbable Vascular Scaffold: A Systematic Review. Clin Cardiol. 2016;39(1):48-55.

Bioresorbable stents are novel devices designed to overcome the long-term limitations of permanent stent implantation. The Absorb bioresorbable vascular scaffold (BVS; Abbott Vascular, Santa Clara, CA) was the first bioresorbable stent with Conformité Européenne mark approval in coronary vessels and has been the subject of multiple clinical studies. Despite its potential advantages, the safety and efficacy of BVS remain unclear. To address this, we conducted a systematic review to examine the safety and efficacy of BVS. The MEDLINE, Embase, Current Index to Nursing & Allied Health Literature (CINAHL), Cochrane, and Science Citation Index Expanded (SCIE) databases were searched for studies examining BVS safety and efficacy. Our search was restricted to studies published in English or French. Outcomes of interest include cardiac death, myocardial infarction, target-lesion revascularization, restenosis, and composite endpoints. Eleven studies met our inclusion criteria (n = 2990), which included 1 randomized controlled trial and 10 cohort studies (2 controlled). These studies varied in size (11-1189) and follow-up duration (1-60 months). The incidence of major adverse cardiac events ranged from 2.6% to 15.5%, with no statistically significant difference between BVS and control in studies that included a comparison group. Although available data are limited, current evidence is promising and suggests that the use of BVS is not associated with a significant increase in major cardiac events in the short term. Numerous randomized controlled trials are currently in progress that will further improve our understanding of the safety and efficacy of this device.

225. Gong W, Li A, Ai H, Shi H, Wang X, Nie S. Safety of early discharge after primary angioplasty in low-risk patients with ST-segment elevation myocardial infarction: A meta-analysis of randomised controlled trials. Eur J Prev Cardiol. 2018;25(8):807-15.

Background Early discharge after successful primary angioplasty is common, but the evidence supporting the practice is still lacking. We therefore performed a meta-analysis assessing the safety of early discharge after primary angioplasty in low-risk patients with ST-segment elevation myocardial infarction (STEMI). Methods Randomised controlled trials were identified and extracted from PubMed, Embase, Cochrane Library databases and reference lists of relevant papers. Heterogeneity was analysed using the I(2) test. If there was a lack of heterogeneity, fixed effects models would be used for the meta-analysis, otherwise random effects models were used. Statistical analyses were performed using Review Manager 5.3. Results Five randomised controlled trials involving 1575 STEMI patients met the criteria. Meta-analysis showed that the early discharge strategy group had a significantly shortened length of hospital stay compared to the conventional discharge strategy group (standardised mean difference -1.46, 95% confidence interval (CI) -2.04 to -0.88; P < 0.0001), and there was no difference in mortality and readmission rates between the two groups (risk ratio 0.78, 95% CI 0.50 to 1.22; P = 0.41). Conclusions The findings of this meta-analysis suggested that the early discharge strategy after successful primary angioplasty is safe among selected low-risk STEMI patients. A shorter hospital stay could benefit both the patients and the healthcare systems.

226. Bundhun PK, Soogund MZ, Huang WQ. Same Day Discharge versus Overnight Stay in the Hospital following Percutaneous Coronary Intervention in Patients with Stable Coronary Artery Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. PLoS One. 2017;12(1):e0169807.

BACKGROUND: New research in interventional cardiology has shown the demand for percutaneous coronary interventions (PCI) to have increased tremendously. Effective treatment with a lower hospital cost has been the aim of several PCI capable centers. This study aimed to compare the adverse clinical outcomes associated with same day discharge versus overnight stay in the hospital following PCI in a population of randomized patients with stable coronary artery disease (CAD). METHODS: The National Library of Medicine (MEDLINE/PubMed), the Cochrane Registry of Randomized Controlled Trials and EMBASE databases were searched (from March to June 2016) for randomized trials comparing same-day discharge versus overnight stay in the hospital following PCI. Main endpoints in this analysis included adverse cardiovascular outcomes observed during a 30-day period. Statistical analysis was carried out by the RevMan 5.3 software whereby odds ratios (OR) and 95% confidence intervals (CIs) were calculated with respect to a fixed or a random effects model. RESULTS: Eight randomized trials with a total number of 3081 patients (1598 patients who were discharged on the same day and 1483 patients who stayed overnight in the hospital) were included. Results of this analysis showed that mortality, myocardial infarction (MI) and major adverse cardiac events (MACEs) were not significantly different between same day discharge versus overnight stay following PCI with OR: 0.22, 95% CI: 0.04-1.35; P = 0.10, OR: 0.68, 95% CI: 0.33-1.41; P = 0.30 and OR: 0.45, 95% CI: 0.20-1.02; P = 0.06 respectively. Blood transfusion and re-hospitalization were also not significantly different between these two groups with OR: 0.64, 95% CI: 0.13-3.21; P = 0.59 and OR: 1.53, 95% CI: 0.88-2.65; P = 0.13 respectively. Similarly, any adverse event, major bleeding and repeated revascularization were also not significantly different between these two groups of patients with stable CAD, with OR: 0.42, 95% CI: 0.05-3.97; P = 0.45, OR: 0.73, 95% CI: 0.15-3.54; P = 0.69 and OR: 0.67, 95% CI: 0.14-3.15; P = 0.61 respectively. CONCLUSION: In terms of adverse cardiovascular outcomes, same day discharge was neither superior nor inferior to overnight hospital stay following PCI in those patients with stable CAD. However, future research will have to emphasize on the long-term consequences.

227. Naidu SS, Aronow HD, Box LC, Duffy PL, Kolansky DM, Kupfer JM, et al. SCAI expert consensus statement: 2016 best practices in the cardiac catheterization laboratory: (Endorsed by the cardiological society of india, and sociedad Latino Americana de Cardiologia intervencionista; Affirmation of value by the Canadian Association of interventional cardiology-Association canadienne de cardiologie d'intervention). Catheter Cardiovasc Interv. 2016;88(3):407-23.

228. Abbara S, Blanke P, Maroules CD, Cheezum M, Choi AD, Han BK, et al. SCCT guidelines for the performance and acquisition of coronary computed tomographic angiography: A report of the society of Cardiovascular Computed Tomography Guidelines Committee: Endorsed by the North American Society for Cardiovascular Imaging (NASCI). J Cardiovasc Comput Tomogr. 2016;10(6):435-49.

In response to recent technological advancements in acquisition techniques as well as a growing body of evidence regarding the optimal performance of coronary computed tomography angiography (coronary CTA), the Society of Cardiovascular Computed Tomography Guidelines Committee has produced this update to its previously established 2009 "Guidelines for the Performance of Coronary CTA" (1). The purpose of this document is to provide standards meant to ensure reliable practice methods and quality outcomes based on the best available data in order to improve the diagnostic care of patients. Society of Cardiovascular Computed Tomography Guidelines for the Interpretation is published separately (2). The Society of Cardiovascular Computed Tomography Guidelines Committee ensures compliance with all existing standards for the declaration of conflict of interest by all authors and reviewers for the purpose ofclarity and transparency.

229. Goldfarb M, Slobod D, Dufresne L, Brophy JM, Sniderman A, Thanassoulis G. Screening Strategies and Primary Prevention Interventions in Relatives of People With Coronary Artery Disease: A Systematic Review and Meta-analysis. Can J Cardiol. 2015;31(5):649-57.

BACKGROUND: Relatives of people with coronary artery disease are at high risk of cardiovascular (CV) disease, but the effect of focused screening and treatment of this population is uncertain. METHODS: We searched the Cochrane Library, Medline, and Embase from inception until June 30, 2014 for articles that described screening strategies and primary prevention interventions targeting family members of patients with coronary artery disease to reduce CV risk. Results were pooled using a random-effects meta-analysis. RESULTS: We identified 18 studies that reported screening strategies and 15 reporting interventions to reduce CV risk. Proband willingness to refer relatives for screening was high (n = 6 studies, pooled rate = 87%; 95% confidence interval [CI], 80%-95%). Studies using a screening strategy in which the relative was contacted by health care professionals reported a pooled participation rate of 88% (95% CI, 78%-99%). The quality of interventional studies was highly variable. Random-effects meta-analysis of the highest quality randomized studies (n = 6) consisting of a specialized risk factor intervention compared with usual care was consistent with modest improvements in low-density lipoprotein cholesterol control (-0.18 mmol/L low-density lipoprotein cholesterol, 95% CI, -0.35 to -0.001; P = 0.048). Improvements in diet, smoking rates, exercise, and blood pressure were also observed with active intervention; however, reported outcomes were heterogeneous precluding a formal meta-analysis. CONCLUSIONS: Screening strategies that target family members, particularly when led by a health care professional, achieve a high participation rate. Although the available evidence is of variable quality, interventions that target individuals with a family history of coronary artery disease appear to be feasible and might be effective in improving certain risk factors or health behaviours but their long-term CV benefits remain uncertain.

230. Parry M, Bjørnnes AK, Victor JC, Ayala AP, Lenton E, Clarke H, et al. Self-Management Interventions for Women With Cardiac Pain: A Systematic Review and Meta-analysis. Can J Cardiol. 2018;34(4):458-67.

BACKGROUND: Cardiac pain is considered the primary indicator of coronary artery disease (CAD). Existing reviews lack appropriate numbers of women or sex-based subgroup analyses, or both; thus, the benefits of self-management (women with cardiac pain actively participating in their own care and treatment) remain uncertain. METHODS: Using methods described by the Evidence for Policy and Practice Information and Co-ordinating Centre at the Institute of Education, 7 databases were systematically searched to examine and synthesize the evidence on self-management interventions for women with cardiac pain and cardiac pain equivalents, such as fatigue, dyspnea, and exhaustion. RESULTS: Our search yielded 22,402 article titles and abstracts. Of these, 57 randomized controlled trials were included in a final narrative synthesis, comprising data from 13,047 participants, including 5299 (41%) women. Self-management interventions targeting cardiac pain in women compared with a control population reduced (1) cardiac pain frequency and cardiac pain proportion (obstructive and nonobstructive CAD), (2) fatigue at 12 months, and (3) dyspnea at 2 months. There was no evidence of group differences in postprocedural (percutaneous coronary intervention or cardiac surgery) pain. Results indicated that self-management interventions for cardiac pain were more effective if they included a greater proportion of women (standardized mean difference [SMD], -0.01; standard error, 0.003; P = 0.02), goal setting (SMD, -0.26; 95% confidence interval [CI], -0.49 to -0.03), and collaboration/support from health care providers (SMD, -0.57; 95% CI, -1.00 to -0.14). CONCLUSIONS: The results of this review suggest that self-management interventions reduce cardiac pain and cardiac pain equivalents.

231. Kwok CS, Kontopantelis E, Kuligowski G, Gray M, Muhyaldeen A, Gale CP, et al. Self-Reported Sleep Duration and Quality and Cardiovascular Disease and Mortality: A Dose-Response Meta-Analysis. J Am Heart Assoc. 2018;7(15):e008552.

Background There is growing evidence that sleep duration and quality may be associated with cardiovascular harm and mortality. Methods and Results We conducted a systematic review, meta-analysis, and spline analysis of prospective cohort studies that evaluate the association between sleep duration and quality and cardiovascular outcomes. We searched MEDLINE and EMBASE for these studies and extracted data from identified studies. We utilized linear and nonlinear dose-response meta-analysis models and used DerSimonian-Laird random-effects meta-analysis models of risk ratios, with inverse variance weighting, and the I(2) statistic to quantify heterogeneity. Seventy-four studies including 3 340 684 participants with 242 240 deaths among 2 564 029 participants who reported death events were reviewed. Findings were broadly similar across both linear and nonlinear dose-response models in 30 studies with >1 000 000 participants, and we report results from the linear model. Self-reported duration of sleep >8 hours was associated with a moderate increased risk of all-cause mortality, with risk ratio , 1.14 (1.05-1.25) for 9 hours, risk ratio, 1.30 (1.19-1.42) for 10 hours, and risk ratio, 1.47 (1.33-1.64) for 11 hours. No significant difference was identified for periods of self-reported sleep <7 hours, whereas similar patterns were observed for stroke and cardiovascular disease mortality. Subjective poor sleep quality was associated with coronary heart disease (risk ratio , 1.44; 95% confidence interval, 1.09-1.90), but no difference in mortality and other outcomes. Conclusions Divergence from the recommended 7 to 8 hours of sleep is associated with a higher risk of mortality and cardiovascular events. Longer duration of sleep may be more associated with adverse outcomes compared with shorter sleep durations.

232. Byrne M, Doherty S, Fridlund BGA, Mårtensson J, Steinke EE, Jaarsma T, et al. Sexual counselling for sexual problems in patients with cardiovascular disease. Cochrane Database Syst Rev. 2016(2).

http://dx.doi.org/10.1002/14651858.CD010988.pub2

- Background Sexual problems are common among people with cardiovascular disease. Although clinical guidelines recommend sexual counselling for patients and their partners, there is little evidence on its effectiveness. Objectives To evaluate the effectiveness of sexual counselling interventions (in comparison to usual care) on sexuality‐related outcomes in patients with cardiovascular disease and their partners. Search methods We searched CENTRAL, MEDLINE, EMBASE, and three other databases up to 2 March 2015 and two trials registers up to 3 February 2016. Selection criteria Randomised controlled trials (RCTs) and quasi‐RCTs, including individual and cluster RCTs. We included studies that compared any intervention to counsel adult cardiac patients about sexual problems with usual care. Data collection and analysis We used standard methodological procedures expected by Cochrane. Main results We included three trials with 381 participants. We were unable to pool the data from the included studies due to the differences in interventions used; therefore we synthesised the trial findings narratively. Two trials were conducted in the USA and one was undertaken in Israel. All trials included participants who were admitted to hospital with myocardial infarction (MI), and one trial also included participants who had undergone coronary artery bypass grafting. All trials followed up participants for a minimum of three months post‐intervention; the longest follow‐up timepoint was five months. One trial (N = 92) tested an intensive (total five hours) psychotherapeutic sexual counselling intervention delivered by a sexual therapist. One trial (N = 115) used a 15‐minute educational video plus written material on resuming sexual activity following a MI. One trial (N = 174) tested the addition of a component that focused on resumption of sexual activity following a MI within a hospital cardiac rehabilitation programme. The quality of the evidence for all outcomes was very low. None of the included studies reported any outcomes from partners. Two trials reported sexual function. One trial compared intervention and control groups on 12 separate sexual function subscales and used a repeated measures analysis of variance (ANOVA) test. They reported statistically significant differences in favour of the intervention. One trial compared intervention and control groups using a repeated measures analysis of covariance (ANCOVA), and concluded: "There were no significant differences between the two groups [for sexual function] at any of the time points". Two trials reported sexual satisfaction. In one trial, the authors compared sexual satisfaction between intervention and control and used a repeated measured ANOVA; they reported "differences were reported in favour of the intervention". One trial compared intervention and control with a repeated measures ANCOVA and reported: "There were no significant differences between the two groups [for sexual satisfaction] at any of the timepoints". All three included trials reported the number of patients returning to sexual activity following MI. One trial found some evidence of an effect of sexual counselling on reported rate of return to sexual activity (yes/no) at four months after completion of the intervention (relative risk (RR) 1.71, 95% confidence interval (CI) 1.26 to 2.32; one trial, 92 participants, very low quality of evidence). Two trials found no evidence of an effect of sexual counselling on rate of return to sexual activity at 12 week (RR 1.01, 95% CI 0.94 to 1.09; one trial, 127 participants, very low quality of evidence) and three month follow‐up (RR 0.98, 95% CI 0.88 to 1.10; one trial, 115 participants, very low quality of evidence). Two trials reported psychological well‐being. In one trial, no scores were reported, but the trial authors stated: "No treatment effects were observed on state anxiety as measured in three points in time". In the other trial no scores were reported but, based on results of a repeated measures ANCOVA to compare intervention and ontrol groups, the trial authors stated: "The experimental group had significantly greater anxiety at one month post MI". They also reported: "There were no significant differences between the two groups [for anxiety] at any other time points". One trial reporting relationship satisfaction and one trial reporting quality of life found no differences between intervention and control. No trial reported on satisfaction in how sexual issues were addressed in cardiac rehabilitation services. Authors' conclusions We found no high quality evidence to support the effectiveness of sexual counselling for sexual problems in patients with cardiovascular disease. There is a clear need for robust, methodologically rigorous, adequately powered RCTs to test the effectiveness of sexual counselling interventions for people with cardiovascular disease and their partners. Plain language summary Sexual counselling interventions for sexual problems in people with heart disease Review question Are sexual counselling interventions helpful in reducing sexual problems for people with heart disease and their partners? Background People with heart disease are more likely than people without heart disease to report sexual problems. Sexual counselling for people with heart disease is when a health professional supports a person to safely return to sexual activity after their heart event, by giving them information and helping them to deal with their concerns and anxieties. Study characteristics We searched the international literature up to March 2015 for studies that compared any intervention designed to address and counsel people with heart disease in relation to sexual problems with usual care. Key results Three randomised controlled trials (clinical trials where people are allocated at random to one of two or more treatments) that included 381 participants in total met our inclusion criteria. The interventions tested in these studies were quite different from each other. All studies included people who had been admitted to hospital with a heart attack. These studies do not provide strong evidence that sexual counselling can improve sexual outcomes for people with heart disease or their partners. One study, which reported the effects of an intensive intervention, involved five hours of sexual counselling provided by a psychotherapist. It reported improved sexual functioning and satisfaction, and reduced length of time taken for people to return to sexual activity following a cardiac event, in people that received the intervention compared to usual care. The other two studies reported no differences between people that received the intervention and usual care on these outcomes (both studies measured rate of return to sexual activity following a cardiac event; one of these two studies measured sexual functioning and satisfaction). There was no evidence that sexual counselling has an effect on quality of life (measured in one study) or marital satisfaction (measured in one study). One study found that patients who received a 15‐minute sexual counselling educational video plus written material had higher levels of anxiety than usual care, as well as better knowledge about sex after a heart attack, one month after their cardiac event, but not at any other timepoints. Quality of the evidence The evidence was of very low quality. We judged the included studies to be at high risk of bias and study results were poorly reported. Bearing this in mind, the results of this review should be interpreted with caution.

233. Vaduganathan M, Michel A, Hall K, Mulligan C, Nodari S, Shah SJ, et al. Spectrum of epidemiological and clinical findings in patients with heart failure with preserved ejection fraction stratified by study design: a systematic review. Eur J Heart Fail. 2016;18(1):54-65.

BACKGROUND: Heart failure with preserved ejection fraction (HFpEF) represents a major global and economic burden, but its epidemiological, clinical, and outcome data have varied according to study design. METHODS AND RESULTS: We conducted a systematic review of published HFpEF clinical trials and observational studies (community-based studies and registries) from August 1998 to July 2013 using PubMed and EMBASE databases. Two independent investigators manually screened and extracted relevant data. We included 62 articles (19 describing clinical trials, 12 describing community-based observational studies, and 31 describing registries). The ejection fraction (EF) cut-off values ranged widely for HFpEF from >40% to >55%. However, differences in EF cut-offs were not clearly associated with incidence and prevalence data across studies. Of all patients with heart failure in community studies, 33-84% had HFpEF, which tended to be higher than reported in registries. The HFpEF patients in included studies were primarily older, white (>70%) patients with hypertension (∼50-90%) and coronary artery disease (up to 60%). All-cause mortality and all-cause hospitalizations ranged from 13% to 23% (26-50 months follow-up) and 55% to 67% (37-50 months follow-up), respectively, in clinical trials; cardiovascular causes accounted for 70% of both outcomes. All-cause mortality tended to be higher in registries than in clinical trials and community-based observational studies up to 5 years into follow-up. CONCLUSIONS: Important differences in EF thresholds, epidemiological indices, clinical profiles, treatment patterns, and outcomes exist across contemporary HFpEF clinical trials, observational studies, and registries. Precision in definition and inclusion of more uniform populations may facilitate improved profiling of HFpEF patients.

234. Hayes SN, Kim ESH, Saw J, Adlam D, Arslanian-Engoren C, Economy KE, et al. Spontaneous Coronary Artery Dissection: Current State of the Science: A Scientific Statement From the American Heart Association. Circulation. 2018;137(19):e523-e57.

Spontaneous coronary artery dissection (SCAD) has emerged as an important cause of acute coronary syndrome, myocardial infarction, and sudden death, particularly among young women and individuals with few conventional atherosclerotic risk factors. Patient-initiated research has spurred increased awareness of SCAD, and improved diagnostic capabilities and findings from large case series have led to changes in approaches to initial and long-term management and increasing evidence that SCAD not only is more common than previously believed but also must be evaluated and treated differently from atherosclerotic myocardial infarction. High rates of recurrent SCAD; its association with female sex, pregnancy, and physical and emotional stress triggers; and concurrent systemic arteriopathies, particularly fibromuscular dysplasia, highlight the differences in clinical characteristics of SCAD compared with atherosclerotic disease. Recent insights into the causes of, clinical course of, treatment options for, outcomes of, and associated conditions of SCAD and the many persistent knowledge gaps are presented.

235. Luckraz H, Norell M, Buch M, James R, Cooper G. Structure and functioning of a multidisciplinary 'Heart Team' for patients with coronary artery disease: rationale and recommendations from a joint BCS/BCIS/SCTS working group. Eur J Cardiothorac Surg. 2015;48(4):524-9.

The decision-making process in the management of patients with ischaemic heart disease has historically been the responsibility of the cardiologist and encompasses medical management, percutaneous coronary intervention (PCI) or coronary artery bypass surgery (CABG). Currently, there is significant geographical variability in the PCI:CABG ratio. There are now emerging recommendations that this decision-making process should be carried out through a multidisciplinary approach, namely the Heart Team. This work was carried out on behalf of The British Cardiovascular Society (BCS), Society for Cardiothoracic Surgery in Great Britain and Ireland (SCTS) and British Cardiovascular Intervention Society (BCIS). This manuscript sets out the principles for the functioning of the Heart Team. This work has been approved by the Executive Committees of BCS/BCIS/SCTS.

236. Stefanini GG, Kolh P. Structure and functioning of the Heart Team: primum non nocere. Eur J Cardiothorac Surg. 2015;48(4):529-30.

237. Lin ZC, Loveland PM, Johnston RV, Bruce M, Weller CD. Subfascial endoscopic perforator surgery (SEPS) for treating venous leg ulcers. Cochrane Database Syst Rev. 2019(3).

http://dx.doi.org/10.1002/14651858.CD012164.pub2

- Background Venous leg ulcers are complex, costly, and their prevalence is expected to increase as populations age. Venous congestion is a possible cause of venous leg ulcers, which subfascial endoscopic perforator surgery (SEPS) attempts to address by removing the connection between deep and superficial veins (perforator veins). The effectiveness of SEPS in the treatment of venous leg ulcers, however, is unclear. Objectives To assess the benefits and harms of subfascial endoscopic perforator surgery (SEPS) for the treatment of venous leg ulcers. Search methods In March 2018 we searched the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); Ovid MEDLINE (including In‐Process & Other Non‐Indexed Citations); Ovid Embase and EBSCO CINAHL Plus. We also searched clinical trials registries for ongoing and unpublished studies, and scanned reference lists of included studies as well as reviews, meta‐analyses and health technology reports to identify additional studies. There were no restrictions with respect to language, date of publication or study setting. Selection criteria We included randomised controlled trials (RCTs) of interventions that examined the use of SEPS independently or in combination with another intervention for the treatment of venous leg ulcers. Data collection and analysis Two review authors independently selected studies for inclusion, extracted data, assessed risk of bias, and assessed the certainty of evidence using the GRADE approach. Main results We included four RCTs with a total of 322 participants. There were three different comparators: SEPS plus compression therapy versus compression therapy (two trials); SEPS versus the Linton procedure (a type of open surgery) (one trial); and SEPS plus saphenous surgery versus saphenous surgery (one trial). The age range of participants was 30 to 82, with an equal spread of male and female participants. All trials were conducted in hospital settings with varying durations of follow‐up, from 18 months to 6 years. One trial included participants who had both healed and active ulcers, with the rest including only participants with active ulcers. There was the potential for reporting bias in all trials and performance bias and detection bias in three trials. Participants in the fourth trial received one of two surgical procedures, and this study was at low risk of performance bias and detection bias. SEPS + compression therapy versus compression therapy (2 studies; 208 participants) There may be an increase in the proportion of healed ulcers at 24 months in people treated with SEPS and compression therapy compared with compression therapy alone (risk ratio (RR) 1.17, 95% confidence interval (CI) 1.03 to 1.33; 1 study; 196 participants); low‐certainty evidence (downgraded twice, once for risk of bias and once for imprecision). It is uncertain whether SEPS reduces the risk of ulcer recurrence at 24 months (RR 0.85, 95% CI 0.26 to 2.76; 2 studies; 208 participants); very low‐certainty evidence (downgraded three times, twice for very serious imprecision and once for risk of bias). The included trials did not measure or report the following outcomes; time to complete healing, health‐related quality of life (HRQOL), adverse events, pain, duration of hospitalisation, and district nursing care requirements. SEPS versus Linton approach (1 study; 39 participants ) It is uncertain whether there is a difference in ulcer healing at 24 months between participants treated with SEPS and those treated with the Linton procedure (RR 0.95, 95% CI 0.83 to 1.09; 1 study; 39 participants); very low‐certainty evidence (downgraded three times, twice for very serious imprecision and once for risk of bias). It is also uncertain whether there is a difference in risk of recurrence at 60 months: (RR 0.47, 95% CI 0.10 to 2.30; 1 study; 39 participants); very low‐certainty evidence (downgraded three times, twice for very serious imprecision and once for risk of bias). The Linton procedure is possibly associated wi h more adverse events than SEPS (RR 0.04, 95% CI 0.00 to 0.60; 1 study; 39 participants); very low‐certainty evidence (downgraded three times, twice for very serious imprecision and once for risk of bias). The outcomes time to complete healing, HRQOL, pain, duration of hospitalisation and district nursing care requirements were either not measured, reported or data were not available for analysis. SEPS + saphenous surgery versus saphenous surgery (1 study; 75 participants) It is uncertain whether there is a difference in ulcer healing at 12 months between participants treated with SEPS and saphenous surgery versus those treated with saphenous surgery alone (RR 0.96, 95% CI 0.64 to 1.43; 1 study; 22 participants); very low certainty evidence (downgraded three times, twice for very serious imprecision and once for high risk of reporting bias). It is also uncertain whether there is a difference in the risk of recurrence at 12 months: (RR 1.03, 95% CI 0.15 to 6.91; 1 study; 75 participants); very low certainty evidence (downgraded three times, twice for very serious imprecision and once for high risk of reporting bias). Finally, we are uncertain whether there is an increase in adverse events in the SEPS group (RR 2.05, 95% CI 0.86 to 4.90; 1 study; 75 participants); very low certainty evidence (downgraded three times, twice for very serious imprecision and once for high risk of reporting bias). The outcomes time to complete healing, HRQOL, serious adverse events, pain, duration of hospitalisation, and district nursing care requirements were either not measured, reported or data were not available for analysis. Authors' conclusions The role of SEPS for the treatment of venous leg ulcers remains uncertain. Only low or very low‐certainty evidence was available for inclusion. Due to small sample sizes and risk of bias in the included studies, we were unable to determine the potential benefits and harms of SEPS for this purpose. Only four studies met our inclusion criteria, three were very small, and one was poorly reported. Further high‐quality studies addressing the use of SEPS in venous leg ulcer management are likely to change the conclusions of this review. Plain language summary Does subfascial endoscopic perforator surgery (leg‐vein surgery) help heal venous leg ulcers? What is the aim of this review? Subfascial endoscopic perforator surgery (SEPS) involves cutting and closing off damaged perforator veins (blood vessels that link superficial and deep veins) in the leg. The aim of this review was to find out whether SEPS can help heal venous leg ulcers (slow‐healing skin wounds caused by poor blood flow through leg veins). We collected and analysed all relevant randomised controlled trials (a type of study in which participants are assigned to one of two or more treatment groups using a random method, which provides the most reliable evidence) to answer this question and identified four studies for inclusion. Key messages It is uncertain whether SEPS is beneficial or safe as a treatment for venous leg ulcers, as the certainty of the evidence collected is low or very low, and the included studies involved small numbers of participants. What was studied in the review? Venous leg ulcers are a common and costly health problem. These chronic wounds often take months to heal and have a high chance of recurrence after healing. Venous leg ulcers can be caused by veins that do not work properly, which results in blood flowing in the wrong direction between the superficial and deep veins in the leg. Blood that does not flow correctly causes increased pressure and inflammation, leading to skin breakdown and ulceration in the lower leg. Subfascial endoscopic perforator surgery can prevent blood from flowing in the wrong direction by cutting and tying veins that link the superficial and deep veins. It is unclear if SEPS is more effective than other treatment options such as compression bandages or stockings, which are the standard treatment for venous leg ulcers. We therefore investigated if this surgical technique can help ve ous leg ulcers heal more quickly. We also considered whether the surgery had any side effects, and if it impacted study participants' quality of life, experience of pain, or time spent in hospital and nursing care. What are the main results of the review? We included four studies in the review which dated from 1997 to 2011 and compared SEPS with other treatments for venous leg ulcers. The studies involved a total of 322 participants, ranging in age from 30 to 82 years, with an equal number of males and females. Two studies compared SEPS and compression stockings with compression alone; one study compared SEPS against the Linton surgical procedure (a type of open surgery on leg veins); and one study compared SEPS in addition to saphenous vein surgery (surgery on the largest superficial vein in the leg) versus saphenous vein surgery alone. We concluded that the evidence is insufficient to determine if SEPS results in better, worse, or the same outcomes as compression treatment in terms of ulcer healing. There may be a benefit of SEPS in terms of proportion of ulcers healed at 24 months, however evidence for this is of low certainty. It is also unclear due to the very low certainty of the evidence if SEPS as an addition to saphenous surgery, or as compared to the Linton approach, makes any difference in venous leg ulcer healing. No studies reported on quality of life, serious side effects or home nursing care requirements for study participants. All four studies were small in size, with the largest including 200 participants, and the other three studies reporting on 75 participants or fewer. This factor, along with poor study design methods, means that the evidence about the role of SEPS in treating venous leg ulcers is of low or very low certainty. It therefore remains unclear whether SEPS is beneficial or safe in venous leg ulcer treatment, and further high‐quality studies with larger sample sizes are likely to change the conclusions of this review. How up‐to‐date is this review? We searched for all studies published up to March 2018.

238. Patel RS, Tragante V, Schmidt AF, McCubrey RO, Holmes MV, Howe LJ, et al. Subsequent Event Risk in Individuals With Established Coronary Heart Disease. Circ Genom Precis Med. 2019;12(4):e002470.

BACKGROUND: The Genetics of Subsequent Coronary Heart Disease (GENIUS-CHD) consortium was established to facilitate discovery and validation of genetic variants and biomarkers for risk of subsequent CHD events, in individuals with established CHD. METHODS: The consortium currently includes 57 studies from 18 countries, recruiting 185 614 participants with either acute coronary syndrome, stable CHD, or a mixture of both at baseline. All studies collected biological samples and followed-up study participants prospectively for subsequent events. RESULTS: Enrollment into the individual studies took place between 1985 to present day with a duration of follow-up ranging from 9 months to 15 years. Within each study, participants with CHD are predominantly of self-reported European descent (38%-100%), mostly male (44%-91%) with mean ages at recruitment ranging from 40 to 75 years. Initial feasibility analyses, using a federated analysis approach, yielded expected associations between age (hazard ratio, 1.15; 95% CI, 1.14-1.16) per 5-year increase, male sex (hazard ratio, 1.17; 95% CI, 1.13-1.21) and smoking (hazard ratio, 1.43; 95% CI, 1.35-1.51) with risk of subsequent CHD death or myocardial infarction and differing associations with other individual and composite cardiovascular endpoints. CONCLUSIONS: GENIUS-CHD is a global collaboration seeking to elucidate genetic and nongenetic determinants of subsequent event risk in individuals with established CHD, to improve residual risk prediction and identify novel drug targets for secondary prevention. Initial analyses demonstrate the feasibility and reliability of a federated analysis approach. The consortium now plans to initiate and test novel hypotheses as well as supporting replication and validation analyses for other investigators.

239. Ulug P, Powell JT, Martinez MM, Ballard DJ, Filardo G. Surgery for small asymptomatic abdominal aortic aneurysms. Cochrane Database Syst Rev. 2020(7).

http://dx.doi.org/10.1002/14651858.CD001835.pub5

- Background An abdominal aortic aneurysm (AAA) is an abnormal ballooning of the major abdominal artery. Some AAAs present as emergencies and require surgery; others remain asymptomatic. Treatment of asymptomatic AAAs depends on many factors, but the size of the aneurysm is important, as risk of rupture increases with aneurysm size. Large asymptomatic AAAs (greater than 5.5 cm in diameter) are usually repaired surgically; very small AAAs (less than 4.0 cm diameter) are monitored with ultrasonography. Debate continues over the roles of early repair versus surveillance with repair on subsequent enlargement in people with asymptomatic AAAs of 4.0 cm to 5.5 cm diameter. This is the fourth update of the review first published in 1999. Objectives To compare mortality and costs, as well as quality of life and aneurysm rupture as secondary outcomes, following early surgical repair versus routine ultrasound surveillance in people with asymptomatic AAAs between 4.0 cm and 5.5 cm in diameter. Search methods The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, two other databases, and two trials registers to 10 July 2019. We handsearched conference proceedings and checked reference lists of relevant studies. Selection criteria We included randomised controlled trials where people with asymptomatic AAAs of 4.0 cm to 5.5 cm were randomly allocated to early repair or imaging‐based surveillance at least every six months. Outcomes had to include mortality or survival. Data collection and analysis Three review authors independently extracted data, which were cross‐checked by other team members. Outcomes were mortality, costs, quality of life, and aneurysm rupture. For mortality, we estimated risk ratios (RR) (endovascular aneurysm repair only), hazard ratios (HR) (open repair only), and 95% confidence intervals (CI) based on Mantel‐Haenszel Chi 2 statistics at one and six years (open repair only) following randomisation. Main results We found no new studies for this update. Four trials with 3314 participants fulfilled the inclusion criteria. Two trials compared early open repair with surveillance and two trials compared early endovascular repair (EVAR) with surveillance. We used GRADE to access the certainty of the evidence for mortality and cost, which ranged from high to low. We downgraded the certainty in the evidence from high to moderate and low due to risk of bias concerns and imprecision (some outcomes were only reported by one study). All four trials showed an early survival benefit in the surveillance group (due to 30‐day operative mortality with repair) but no evidence of differences in long‐term survival. One study compared early open repair with surveillance with an adjusted HR of 0.88 (95% CI 0.75 to 1.02, mean follow‐up 10 years; HR 1.21, 95% CI 0.95 to 1.54, mean follow‐up 4.9 years). Pooled analysis of participant‐level data from the two trials comparing early open repair with surveillance (maximum follow‐up seven to eight years) showed no evidence of a difference in survival (propensity score‐adjusted HR 0.99, 95% CI 0.83 to 1.18; 2226 participants; high‐certainty evidence). This lack of treatment effect did not vary to three years by AAA diameter (P = 0.39), participant age (P = 0.61), or for women (HR 0.84, 95% CI 0.62 to 1.11). Two studies compared EVAR with surveillance and there was no evidence of a survival benefit for early EVAR at 12 months (RR 1.92, 95% CI 0.73 to 5.06; 846 participants; low‐certainty evidence). Two trials reported costs. The mean UK health service costs per participant over the first 18 months after randomisation were higher in the open repair surgery than the surveillance group (GBP 4978 in the repair group versus GBP 3914 in the surveillance group; mean difference (MD) GBP 1064, 95% CI 796 to 1332; 1090 participants; moderate‐certainty evidence). There was a similar difference after 12 years. The mean USA hospital costs for participants at six months after randomisation were higher in the VAR group than in the surveillance group (USD 33,471 with repair versus USD 5520 with surveillance; MD USD 27,951, 95% CI 25,156 to 30,746; 614 participants; low‐certainty evidence). After four years, there was no evidence of a difference in total medical costs between groups (USD 48,669 with repair versus USD 46,112 with surveillance; MD USD 2557, 95% CI –8043 to 13,156; 614 participants; low‐certainty evidence). All studies reported quality of life but used different assessment measurements and results were conflicting. All four studies reported aneurysm rupture. There were very few ruptures reported in the trials of EVAR versus surveillance up to three years. In the trials of open surgery versus surveillance, there were ruptures to at least six years and there were more ruptures in the surveillance group, but most of these ruptures occurred in aneurysms that had exceeded the threshold for surgical repair. Authors' conclusions There was no evidence of an advantage to early repair for small AAA (4.0 cm to 5.5 cm), regardless of whether open repair or EVAR is used and, at least for open repair, regardless of patient age and AAA diameter. Thus, neither early open nor early EVAR of small AAAs is supported by currently available evidence. Long‐term data from the two trials investigating EVAR are not available, so, we can only draw firm conclusions regarding outcomes after the first few years for open repair. Research regarding the risks related to and management of small AAAs in ethnic minorities and women is urgently needed, as data regarding these populations are lacking. Plain language summary Surgery for small abdominal aortic aneurysms that do not cause symptoms Background An aneurysm is a ballooning of an artery (blood vessel), which, in the case of an abdominal aortic aneurysm (AAA), occurs in the major artery in the abdomen (aorta). Ruptured AAAs cause death unless surgical repair is rapid, which is difficult to achieve. Surgery is recommended for people with aneurysms bigger than 5.5 cm in diameter or who have associated pain, to relieve symptoms and reduce the risk of rupture and death. However, there are risks with surgery. Surgical repair consists of re‐lining the aorta with strong synthetic material, either by open surgery or endovascular repair (a minimally invasive keyhole procedure). Small asymptomatic (no symptoms) AAAs are at low risk of rupture and are monitored through regular imaging so they can be surgically repaired if they grow. Key results We found four well‐conducted trials that randomised 3314 participants with small (diameter 4.0 cm to 5.5 cm) asymptomatic AAAs to early repair or regular, routine ultrasounds to check for aneurysm growth (surveillance) (search current to 10 July 2019). In the surveillance group, the aneurysm was repaired if it was enlarging, reached 5.5 cm in diameter, or became symptomatic. The trials showed an early survival benefit in the surveillance group because of the number of deaths within 30 days of surgery (operative mortality). The trials found no difference in long‐term survival between early repair (open or endovascular) and surveillance over three to eight years of follow‐up. After three years, about 31% of the participants randomised to surveillance eventually had the aneurysm repaired, rising to 75% after 12 years. Two trials reported costs. For the first 18 months, costs were lower with surveillance than either open repair or endovascular repair. After four years, one trial found similar total medical costs for early endovascular repair and surveillance groups. After 12 years, another trial found lower hospital costs with surveillance than with open repair. The four studies used different ways to measure quality of life and results were conflicting. The percentage of aneurysm ruptures in the surveillance group appeared higher in the trials using open repair but these have not restricted participants to those with aortic anatomy suitable for endovascular repair. Most ruptures were in people whose previous aneurysm diameter exceeded the threshold fo surgical repair. Reliability of the evidence The methods within the studies using open repair were good and the reliability of the evidence was high to moderate for the two trials comparing open repair with surveillance. For the two trials comparing endovascular repair with surveillance, the risk of bias was unclear to high and the reliability of the evidence was low. The four trials suggest no overall advantage with early surgery for small AAAs (4.0 cm to 5.5 cm). The two trials comparing early open surgical repair to surveillance found this result holds true regardless of patient age or aneurysm size (within the range of 4.0 cm to 5.5 cm diameter). Furthermore, the two trials that focused on endovascular repair, also found no benefit over surveillance. Neither early open nor early endovascular repair of small AAAs is supported by the current evidence.

240. Ede CJ, Nikolova D, Brand M. Surgical portosystemic shunts versus devascularisation procedures for prevention of variceal rebleeding in people with hepatosplenic schistosomiasis. Cochrane Database Syst Rev. 2018(8).

http://dx.doi.org/10.1002/14651858.CD011717.pub2

- Background Hepatosplenic schistosomiasis is an important cause of variceal bleeding in low‐income countries. Randomised clinical trials have evaluated the outcomes of two categories of surgical interventions, shunts and devascularisation procedures, for the prevention of variceal rebleeding in people with hepatosplenic schistosomiasis. The comparative overall benefits and harms of these two interventions are unclear. Objectives To assess the benefits and harms of surgical portosystemic shunts versus oesophagogastric devascularisation procedures for the prevention of variceal rebleeding in people with hepatosplenic schistosomiasis. Search methods We searched the Cochrane Hepato‐Biliary Group Controlled Trials Register, CENTRAL, MEDLINE, Embase, Science Citation Index Expanded, LILACS, reference lists of articles, and proceedings of relevant associations for trials that met the inclusion criteria (date of search 11 January 2018). Selection criteria Randomised clinical trials comparing surgical portosystemic shunts versus oesophagogastric devascularisation procedures for the prevention of variceal rebleeding in people with hepatosplenic schistosomiasis. Data collection and analysis Two review authors independently assessed the trials and extracted data using methodological standards expected by Cochrane. We assessed risk of bias according to domains and risk of random errors with GRADE and Trial Sequential Analysis. We assessed the certainty of evidence using the GRADE approach. Main results We found two randomised clinical trials including 154 adult participants, aged between 18 years and 65 years, diagnosed with hepatosplenic schistosomiasis. One of the trials randomised participants to proximal splenorenal shunt versus distal splenorenal shunt versus oesophagogastric devascularisation with splenectomy, and the other randomised participants to distal splenorenal shunt versus oesophagogastric devascularisation with splenectomy. In both trials the diagnosis of hepatosplenic schistosomiasis was made based on clinical and biochemical assessments. The trials were conducted in Brazil and Egypt. Both trials were at high risk of bias. We are uncertain as to whether surgical portosystemic shunts improved all‐cause mortality compared with oesophagogastric devascularisation with splenectomy due to imprecision in the trials (risk ratio (RR) 2.35, 95% confidence interval (CI) 0.55 to 9.92; participants = 154; studies = 2). We are uncertain whether serious adverse events differed between surgical portosystemic shunts and oesophagogastric devascularisation with splenectomy (RR 2.26, 95% CI 0.44 to 11.70; participants = 154; studies = 2). None of the trials reported on health‐related quality of life. We are uncertain whether variceal rebleeding differed between surgical portosystemic shunts and oesophagogastric devascularisation with splenectomy (RR 0.39, 95% CI 0.13 to 1.23; participants = 154; studies = 2). We found evidence suggesting an increase in encephalopathy in the shunts group versus the devascularisation with splenectomy group (RR 7.51, 95% CI 1.45 to 38.89; participants = 154; studies = 2). We are uncertain whether ascites and re‐interventions differed between surgical portosystemic shunts and oesophagogastric devascularisation with splenectomy. We computed Trial Sequential Analysis for all outcomes, but the trial sequential monitoring boundaries could not be drawn because of insufficient sample size and events. We downgraded the overall certainty of the body of evidence for all outcomes to very low due to risk of bias and imprecision. Authors' conclusions Given the very low certainty of the available body of evidence and the low number of clinical trials, we could not determine an overall benefit or harm of surgical portosystemic shunts compared with oesophagogastric devascularisation with splenectomy. Future randomised clinical trials should be designed with sufficient statistical power to assess the benefits and harms of surgical portosystemic shunts versus oesophagogastric devascularisations wi h or without splenectomy and with or without oesophageal transection. Plain language summary Surgical treatment (shunts compared with devascularisation) for preventing variceal rebleeding due to schistosomiasis of the liver and spleen Background Schistosomiasis ('bilharzia' or 'snail fever') is a water‐borne disease caused by parasites known as blood flukes. Blood flukes are released by fresh water snails and penetrate the skin of humans (swimmers and others in close contact with water). Here, they migrate into the venous circulation, settling in various typical sites such as the gut, the urinary bladder, and the liver, where they cause local inflammation. In the liver, they result in Symmer's pipe‐stem periportal fibrosis, with the consequent complication of increased portal blood pressure. Infected people may develop varices (enlarged blood vessels within the wall of the oesophagus and stomach). Bleeding from these varices is not uncommon and can result in death. Although several methods exist to stop the initial bleeding, it may recur with the same risk of death as during the initial bleed without further treatment. The first‐line treatment to prevent variceal rebleeding is with medications (non‐selective beta‐blockers to lower the portal blood pressure) combined with endoscopic method (use of a long tube fitted with a camera to locate and close the varices with elastic bands). This involves repeated treatment sessions, hence treatment success is heavily dependent on patient compliance, which in low income countries may be adversely affected by eco‐social factors such as transport costs. Surgery is an alternative treatment option. There are two broad surgical categories to decrease the risk of repeat bleeding from varices: these are either shunts (a channel that diverts all or part of the bloodstream from the liver to the general blood circulation) or devascularisation surgery (disconnection of the enlarged blood vessels in the walls of the oesophagus and stomach). Either treatment may be performed as a once‐off procedure to prevent variceal rebleeding. However, it is not clear which of these treatments offers the best result. We aimed to determine the benefits and harms of shunts compared with devascularisation in preventing variceal rebleeding due to schistosomiasis of the liver and spleen. Study characteristics We found two randomised clinical trials (types of studies in which participants are assigned to treatment group using a random method) involving a total of 154 adult participants who received either a non‐selective shunt surgery, a selective shunt surgery, or devascularisation surgery. However, the design of both trials was of insufficient quality, as the numbers of trial participants were small, and some participant information was lacking. One of the trials was funded by an institutional grant, and how funding was obtained for the other trial was not clear. We assessed both trials as at high risk of bias. Key results There were no significant differences in the number of participants who had repeat bleeding, adverse effects of treatment, or deaths between the shunt surgery and the devascularisation group, but participants who had devascularisation were less likely to suffer encephalopathy (disease of the brain due to damage from toxins produced by the liver). Neither of the trials addressed quality of life after treatment. Conclusions Given the very low certainty of the evidence due to the way the clinical trials were performed, limited trial data and trial participants, we were unable to determine whether one treatment is better than the other. We suggest that future trials include a sufficient number of randomised participants to be able to obtain meaningful results on patient‐relevant outcomes and allow objective comparison of these two surgery types.

241. Bruschettini M, O'Donnell CPF, Davis PG, Morley CJ, Moja L, Calevo MG. Sustained versus standard inflations during neonatal resuscitation to prevent mortality and improve respiratory outcomes. Cochrane Database Syst Rev. 2020(3).

http://dx.doi.org/10.1002/14651858.CD004953.pub4

- Background At birth, infants' lungs are fluid‐filled. For newborns to have a successful transition, this fluid must be replaced by air to enable gas exchange. Some infants are judged to have inadequate breathing at birth and are resuscitated with positive pressure ventilation (PPV). Giving prolonged (sustained) inflations at the start of PPV may help clear lung fluid and establish gas volume within the lungs. Objectives To assess the benefits and harms of an initial sustained lung inflation (SLI) (> 1 second duration) versus standard inflations (≤ 1 second) in newborn infants receiving resuscitation with intermittent PPV. Search methods We used the standard search strategy of Cochrane Neonatal to search the Cochrane Central Register of Controlled Trials (CENTRAL; 2019, Issue 3), MEDLINE via PubMed (1966 to 1 April 2019), Embase (1980 to 1 April 2019), and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to 1 April 2019). We also searched clinical trials databases, conference proceedings, and the reference lists of retrieved articles to identify randomised controlled trials and quasi‐randomised trials . Selection criteria Randomised controlled trials (RCTs) and quasi‐RCTs comparing initial sustained lung inflation (SLI) versus standard inflations given to infants receiving resuscitation with PPV at birth. Data collection and analysis We assessed the methodological quality of included trials using Cochrane Effective Practice and Organisation of Care Group (EPOC) criteria (assessing randomisation, blinding, loss to follow‐up, and handling of outcome data). We evaluated treatment effects using a fixed‐effect model with risk ratio (RR) for categorical data; and mean standard deviation (SD), and weighted mean difference (WMD) for continuous data. We used the GRADE approach to assess the quality of evidence. Main results Ten trials enrolling 1467 infants met our inclusion criteria. Investigators in nine trials (1458 infants) administered sustained inflation with no chest compressions. Use of sustained inflation had no impact on the primary outcomes of this review: mortality in the delivery room (typical RR 2.66, 95% confidence interval (CI) 0.11 to 63.40 (I² not applicable); typical RD 0.00, 95% CI −0.02 to 0.02; I² = 0%; 5 studies, 479 participants); and mortality during hospitalisation (typical RR 1.09, 95% CI 0.83 to 1.43; I² = 42%; typical RD 0.01, 95% CI −0.02 to 0.04; I² = 24%; 9 studies, 1458 participants). The quality of the evidence was low for death in the delivery room because of limitations in study design and imprecision of estimates (only one death was recorded across studies). For death before discharge the quality was moderate: with longer follow‐up there were more deaths (n = 143) but limitations in study design remained. Among secondary outcomes, duration of mechanical ventilation was shorter in the SLI group (mean difference (MD) −5.37 days, 95% CI −6.31 to −4.43; I² = 95%; 5 studies, 524 participants; low‐quality evidence). Heterogeneity, statistical significance, and magnitude of effects of this outcome are largely influenced by a single study at high risk of bias: when this study was removed from the analysis, the size of the effect was reduced (MD −1.71 days, 95% CI −3.04 to −0.39; I² = 0%). Results revealed no differences in any of the other secondary outcomes (e.g. risk of endotracheal intubation outside the delivery room by 72 hours of age (typical RR 0.91, 95% CI 0.79 to 1.04; I² = 65%; 5 studies, 811 participants); risk of surfactant administration during hospital admission (typical RR 0.99, 95% CI 0.91 to 1.08; I² = 0%; 9 studies, 1458 participants); risk of chronic lung disease (typical RR 0.99, 95% CI 0.83 to 1.18; I² = 0%; 4 studies, 735 participants); pneumothorax (typical RR 0.89, 95% CI 0.57 to 1.40; I² = 34%; 8 studies, 1377 infants); or risk of patent ductus arteriosus requiring pharmacological treatment (typical RR 0.99, 95% CI 0.87 to 1.12; I² = 48%; 7 studies, 1127 infants). The quality of evidence for these secondary outcomes was moderate (limitations in study design ‒ GRADE) except for pneumothorax (low quality: limitations in study design and imprecision of estimates ‒ GRADE). We could not perform any meta‐analysis in the comparison of the use of initial sustained inflation versus standard inflations in newborns receiving resuscitation with chest compressions because we identified only one trial for inclusion (a pilot study of nine preterm infants). Authors' conclusions Our meta‐analysis of nine studies shows that sustained lung inflation without chest compression was not better than intermittent ventilation for reducing mortality in the delivery room (low‐quality evidence ‒ GRADE) or during hospitalisation (moderate‐quality evidence ‒ GRADE), which were the primary outcomes of this review. However, the single largest study, which was well conducted and had the greatest number of enrolled infants, was stopped early for higher mortality rate in the sustained inflation group. When considering secondary outcomes, such as rate of intubation, rate or duration of respiratory support, or bronchopulmonary dysplasia, we found no benefit of sustained inflation over intermittent ventilation (moderate‐quality evidence ‒ GRADE). Duration of mechanical ventilation was shortened in the SLI group (low‐quality evidence ‒ GRADE); this result should be interpreted cautiously, however, as it might have been influenced by study characteristics other than the intervention. There is no evidence to support the use of sustained inflation based on evidence from our review. Plain language summary Prolonged lung inflation for resuscitation of babies at birth Review question Does the use of prolonged (or sustained) lung inflation (> 1 second duration) rather than standard inflations (≤ 1 second) improve survival and other important outcomes among newly born babies receiving resuscitation at birth? Background At birth, the lungs are filled with fluid which must be replaced by air for babies to breathe properly. Some babies have difficulty establishing effective breathing at birth, and one in every 20 to 30 babies receives help to do so. A variety of devices are used to help babies begin normal breathing. Some of these devices allow caregivers to give long (or sustained) inflations. These sustained inflations may help inflate the lungs and may keep the lungs inflated better than if they are not used. Study characteristics We collected and analysed all relevant studies to answer the review question and found 10 studies enrolling 1467 infants. In all studies, babies were born before the due date (from 23 to 36 weeks of gestational age). The sustained inflation lasted between 15 and 20 seconds at pressure between 20 and 30 cmH₂O. Most studies provided one or more additional sustained inflations in cases of poor clinical response, for example persistent low heart rate. We analysed one study (which included only nine babies) separately because researchers combined use of sustained or standard inflations with chest compressions, an additional intervention that might help babies begin normal breathing. Key results The included studies showed no important differences among babies who received sustained versus standard inflations in terms of mortality, rate of intubation during the first three days of life, or chronic lung disease. Babies receiving sustained inflation at birth may spend fewer days on mechanical ventilation. The results of several ongoing studies might help us to determine whether sustained inflations are beneficial or harmful. At present we cannot exclude small to moderate differences between the two treatments. Quality of evidence The quality of evidence is low to moderate because only a small number of studies have looked at this intervention, few babies were included in these studies and some studies could have been better designed. How up to date is this review? We searched for studies that had been published up to April 2019.

242. Worrall-Carter L, McEvedy S, Kuhn L, Scruth E, MacIsaac A, Rahman MA. Systematic Review and Meta-analyses Investigating Whether Risk Stratification Explains Lower Rates of Coronary Angiography Among Women With Non-ST-Segment Elevation Acute Coronary Syndrome. J Cardiovasc Nurs. 2017;32(2):112-24.

BACKGROUND: Guidelines recommend that all non-ST-segment elevation acute coronary syndrome (NSTEACS) patients with high-risk features receive a coronary angiogram. We hypothesised that the widely reported gender disparity in the use of angiography might be the result of women more frequently being stratified into the lower-risk category. OBJECTIVES: The aim of the study was to review studies reporting risk stratification of NSTEACS patients by gender, compare risk profiles, and assess impact on use of coronary angiography. METHODS: PubMed, Scopus, and EMBASE databases were searched on June 17, 2014, using MeSH terms/subheadings and/or key words with no further limits. The search revealed 1230 articles, of which 25 met our objective. RESULTS: Among the 28 risk-stratified populations described in the 25 articles, women were more likely to be stratified as high-risk in 13 studies; men were more likely to be stratified as high-risk in 3 studies. After meta-analyses, women had a 23% higher odds of being stratified as high-risk than did men (P = .001). Lower-risk patients were more likely to receive an angiogram in 15 study populations. CONCLUSIONS: Contrary to our hypothesis, this review showed that women with NSTEACS are more likely than men to be considered high-risk when stratified using a range of risk assessment methods. Lower rates of angiography in women form part of a broader treatment-risk paradox, which may involve gender bias in the selection of patients for invasive therapy.

243. Huang K, Liu W, He D, Huang B, Xiao D, Peng Y, et al. Telehealth interventions versus center-based cardiac rehabilitation of coronary artery disease: A systematic review and meta-analysis. Eur J Prev Cardiol. 2015;22(8):959-71.

BACKGROUND: Cardiac rehabilitation (CR) is an evidence-based recommendation for patients with coronary artery disease (CAD). However, CR is dramatically underutilized. Telehealth interventions have the potential to overcome barriers and may be an innovative model of delivering CR. This review aimed to determine the effectiveness of telehealth intervention delivered CR compared with center-based supervised CR. METHOD: Medline, Embase, the Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library and the Chinese BioMedical Literature Database (CBM), were searched to April 2014, without language restriction. Existing randomized controlled trials, reviews, relevant conference lists and gray literature were checked. Randomized controlled trials that compared telehealth intervention delivered CR with traditional center-based supervised CR in adults with CAD were included. Two reviewers selected studies and extracted data independently. Main clinical outcomes including clinical events, modifiable risk factors or other endpoints were measured. RESULTS: Fifteen articles reporting nine trials were reviewed, most of which recruited patients with myocardial infarction or revascularization. No statistically significant difference was found between telehealth interventions delivered and center-based supervised CR in exercise capacity (standardized mean difference (SMD) -0.01; 95% confidence interval (CI) -0.12-0.10), weight (SMD -0.13; 95% CI -0.30-0.05), systolic and diastolic blood pressure (mean difference (MD) -1.27; 95% CI -3.67-1.13 and MD 1.00; 95% CI -0.42-2.43, respectively), lipid profile, smoking (risk ratio (RR) 1.03; 95% CI 0.78-1.38), mortality (RR 1.15; 95% CI 0.61-2.19), quality of life and psychosocial state. CONCLUSIONS: Telehealth intervention delivered cardiac rehabilitation does not have significantly inferior outcomes compared to center-based supervised program in low to moderate risk CAD patients. Telehealth intervention offers an alternative deliver model of CR for individuals less able to access center-based cardiac rehabilitation. Choices should reflect preferences, anticipation, risk profile, funding, and accessibility to health service.

244. Temporary Emergency Guidance to STEMI Systems of Care During the COVID-19 Pandemic: AHA's Mission: Lifeline. Circulation. 2020;142(3):199-202.

245. Wikkelsø A, Wetterslev J, Møller AM, Afshari A. Thromboelastography (TEG) or thromboelastometry (ROTEM) to monitor haemostatic treatment versus usual care in adults or children with bleeding. Cochrane Database Syst Rev. 2016(8).

http://dx.doi.org/10.1002/14651858.CD007871.pub3

- Background Severe bleeding and coagulopathy are serious clinical conditions that are associated with high mortality. Thromboelastography (TEG) and thromboelastometry (ROTEM) are increasingly used to guide transfusion strategy but their roles remain disputed. This review was first published in 2011 and updated in January 2016. Objectives We assessed the benefits and harms of thromboelastography (TEG)‐guided or thromboelastometry (ROTEM)‐guided transfusion in adults and children with bleeding. We looked at various outcomes, such as overall mortality and bleeding events, conducted subgroup and sensitivity analyses, examined the role of bias, and applied trial sequential analyses (TSAs) to examine the amount of evidence gathered so far. Search methods In this updated review we identified randomized controlled trials (RCTs) from the following electronic databases: Cochrane Central Register of Controlled Trials (CENTRAL; 2016, Issue 1); MEDLINE; Embase; Science Citation Index Expanded; International Web of Science; CINAHL; LILACS; and the Chinese Biomedical Literature Database (up to 5 January 2016). We contacted trial authors, authors of previous reviews, and manufacturers in the field. The original search was run in October 2010. Selection criteria We included all RCTs, irrespective of blinding or language, that compared transfusion guided by TEG or ROTEM to transfusion guided by clinical judgement, guided by standard laboratory tests, or a combination. We also included interventional algorithms including both TEG or ROTEM in combination with standard laboratory tests or other devices. The primary analysis included trials on TEG or ROTEM versus any comparator. Data collection and analysis Two review authors independently abstracted data; we resolved any disagreements by discussion. We presented pooled estimates of the intervention effects on dichotomous outcomes as risk ratio (RR) with 95% confidence intervals (CIs). Due to skewed data, meta‐analysis was not provided for continuous outcome data. Our primary outcome measure was all‐cause mortality. We performed subgroup and sensitivity analyses to assess the effect based on the presence of coagulopathy of a TEG‐ or ROTEM‐guided algorithm, and in adults and children on various clinical and physiological outcomes. We assessed the risk of bias through assessment of trial methodological components and the risk of random error through TSA. Main results We included eight new studies (617 participants) in this updated review. In total we included 17 studies (1493 participants). A total of 15 trials provided data for the meta‐analyses. We judged only two trials as low risk of bias. The majority of studies included participants undergoing cardiac surgery. We found six ongoing trials but were unable to retrieve any data from them. Compared with transfusion guided by any method, TEG or ROTEM seemed to reduce overall mortality (7.4% versus 3.9%; risk ratio (RR) 0.52, 95% CI 0.28 to 0.95; I 2 = 0%, 8 studies, 717 participants, low quality of evidence) but only eight trials provided data on mortality, and two were zero event trials. Our analyses demonstrated a statistically significant effect of TEG or ROTEM compared to any comparison on the proportion of participants transfused with pooled red blood cells (PRBCs) (RR 0.86, 95% CI 0.79 to 0.94; I 2 = 0%, 10 studies, 832 participants, low quality of evidence), fresh frozen plasma (FFP) (RR 0.57, 95% CI 0.33 to 0.96; I 2 = 86%, 8 studies, 761 participants, low quality of evidence), platelets (RR 0.73, 95% CI 0.60 to 0.88; I 2 = 0%, 10 studies, 832 participants, low quality of evidence), and overall haemostatic transfusion with FFP or platelets (low quality of evidence ) . Meta‐analyses also showed fewer participants with dialysis‐dependent renal failure. We found no difference in the proportion needing surgical reinterventions (RR 0.75, 95% CI 0.50 to 1.10; I 2 = 0%, 9 studies, 887 participants, low quality of evidence) and excessive bleeding events or massive transfusion (RR 0.38, 95% CI 0.38 to 1.77 I 2 = 34%, 2 studies, 280 participants, low quality of evidence ) . The planned subgroup analyses failed to show any significant differences. We graded the quality of evidence as low based on the high risk of bias in the studies, large heterogeneity, low number of events, imprecision, and indirectness. TSA indicates that only 54% of required information size has been reached so far in regards to mortality, while there may be evidence of benefit for transfusion outcomes. Overall, evaluated outcomes were consistent with a benefit in favour of a TEG‐ or ROTEM‐guided transfusion in bleeding patients. Authors' conclusions There is growing evidence that application of TEG‐ or ROTEM‐guided transfusion strategies may reduce the need for blood products, and improve morbidity in patients with bleeding. However, these results are primarily based on trials of elective cardiac surgery involving cardiopulmonary bypass, and the level of evidence remains low. Further evaluation of TEG‐ or ROTEM‐guided transfusion in acute settings and other patient categories in low risk of bias studies is needed. Plain language summary Blood clotting analysers (TEG or ROTEM) versus any comparison to guide the use of blood products in adults or children with bleeding Background The ability to make a sufficient blood clot is crucial in participants with bleeding. Clotting can be measured by various tests. TEG and ROTEM tests have the advantage of showing the total clotting capacity. These tests are performed at the bedside, and generally provide a rapid and useful result, guiding clinicians towards a more goal‐directed transfusion management. Objective In the present systematic review we set out to assess the benefits and harms of a TEG‐ or ROTEM‐guided use of blood products in comparison with standard tests, or doctors clinical judgement, in the treatment of bleeding patients. Evidence is current to January 2016. Study characteristics We identified 17 randomized controlled trials comparing TEG‐ or ROTEM‐guided use of blood transfusion to guidance from the clinical judgement of doctors or standard laboratory tests, or both. The included trials were conducted mainly in adults in need of cardiac surgery, and involved 1493 participants. Key results In terms of efficacy, the use of TEG or ROTEM tests seem to reduce the need for all types of blood transfusions. However, we could not find fewer participants in need of further operations due to continuous bleeding, or at risk of massive bleeding with transfusion. Despite signs of benefit in regards to survival, our findings are hampered by the overall low quality of included studies. Assessment of harms indicated a reduced risk of kidney failure, while no other significant adverse ‐events were found. However, the reported adverse event rates were very low. All included trials except two were marred by high risk of bias. Quality of evidence Due to few events and many poorly designed trials, we consider our overall findings to be of low quality evidence in favour of TEG and ROTEM use in the management of bleeding patients.

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247. Kolh P, Kurlansky P, Cremer J, Lawton J, Siepe M, Fremes S. Transatlantic Editorial: A Comparison Between European and North American Guidelines on Myocardial Revascularization. Ann Thorac Surg. 2016;101(6):2031-44.

248. Kolh P, Kurlansky P, Cremer J, Lawton J, Siepe M, Fremes S. Transatlantic editorial: A comparison between European and North American guidelines on myocardial revascularization. J Thorac Cardiovasc Surg. 2016;152(2):304-16.

249. Kotronias RA, Kwok CS, George S, Capodanno D, Ludman PF, Townend JN, et al. Transcatheter Aortic Valve Implantation With or Without Percutaneous Coronary Artery Revascularization Strategy: A Systematic Review and Meta-Analysis. J Am Heart Assoc. 2017;6(6).

BACKGROUND: Recent recommendations suggest that in patients with severe aortic stenosis undergoing transcatheter aortic valve implantation and coexistent significant coronary artery disease, the latter should be treated before the index procedure; however, the evidence basis for such an approach remains limited. We performed a systematic review and meta-analysis to study the clinical outcomes of patients with coronary artery disease who did or did not undergo revascularization prior to transcatheter aortic valve implantation. METHODS AND RESULTS: We conducted a search of Medline and Embase to identify studies evaluating patients who underwent transcatheter aortic valve implantation with or without percutaneous coronary intervention. Random-effects meta-analyses with the inverse variance method were used to estimate the rate and risk of adverse outcomes. Nine studies involving 3858 participants were included in the meta-analysis. Patients who underwent revascularization with percutaneous coronary intervention had a higher rate of major vascular complications (odd ratio [OR]: 1.86; 95% confidence interval [CI], 1.33-2.60; P=0.0003) and higher 30-day mortality (OR: 1.42; 95% CI, 1.08-1.87; P=0.01). There were no differences in effect estimates for 30-day cardiovascular mortality (OR: 1.03; 95% CI, 0.35-2.99), myocardial infarction (OR: 0.86; 95% CI, 0.14-5.28), acute kidney injury (OR: 0.89; 95% CI, 0.42-1.88), stroke (OR: 1.07; 95% CI, 0.38-2.97), or 1-year mortality (OR: 1.05; 95% CI, 0.71-1.56). The timing of percutaneous coronary intervention (same setting versus a priori) did not negatively influence outcomes. CONCLUSIONS: Our analysis suggests that revascularization before transcatheter aortic valve implantation confers no clinical advantage with respect to several patient-important clinical outcomes and may be associated with an increased risk of major vascular complications and 30-day mortality. In the absence of definitive evidence, careful evaluation of patients on an individual basis is of paramount importance to identify patients who might benefit from elective revascularization.

250. Waite LH, Phan YL, Spinler SA. Translating Guidelines Into Practice: Interpreting the 2016 ACC Expert Consensus Decision Pathway on the Role of Non-Statin Therapies for LDL-Cholesterol Lowering in the Management of Atherosclerotic Cardiovascular Disease Risk. Ann Pharmacother. 2017;51(10):914-20.

OBJECTIVE: In 2016, the American College of Cardiology released a decision pathway, based on expert consensus, to guide use of non-statin agents in the management of atherosclerotic cardiovascular disease risk. The purpose of this article is to assist practitioners, health systems and managed care entities with interpreting this consensus statement in order to simplify implementation of the recommendations into patient care. METHODS: Major themes from the consensus statement are briefly summarized and explained. Drug therapy recommendations are condensed into a single algorithm, while tables correlate each recommended regimen with the appropriate patient population from both a patient-level and systems-level perspective. Finally, a patient case with evidence-based decision support is explored. RESULTS: These tools allow practitioners to make appropriate patient-specific decisions about the use of non-statin pharmacotherapy and enable health systems and managed care entities to more readily identify guideline-appropriate use of these agents upon review of patient profiles or prescribing patterns. CONCLUSION: This article provides resources for healthcare providers that facilitate uptake of these recommendations into clinical practice.

251. Goel PK, Menon A, Mullasari AS, Valaparambil AK, Pinto B, Pahlajani D, et al. Transradial access for coronary diagnostic and interventional procedures: Consensus statement and recommendations for India: Advancing Complex CoronariES Sciences through TransRADIAL intervention in India - ACCESS RADIAL™: Clinical consensus recommendations in collaboration with Cardiological Society of India (CSI). Indian Heart J. 2018;70(6):922-33.

Radial access for cardiac catheterization and intervention in India has been growing steadily over the last decade with favorable clinical outcomes. However, its usage by interventional cardiologists varies greatly among Indian operators and hospitals due to large geographic disparities in health care delivery systems and practice patterns. It also remains unclear whether the advantages, as well as limitations of transradial (TR) intervention (as reported in the western literature), are applicable to developing countries like India or not. An evidence-based review involving various facets of radial procedure for cardiac catheterization, including practical, patient-related and technical issues was conducted by an expert committee that formed a part of Advancing Complex CoronariES Sciences through TransRADIAL intervention (ACCESS RADIAL™) Advisory Board. Emerging challenges in redefining TR management based on evidence supporting practices were discussed to formulate these final recommendations through consensus.

252. Singh S, Singh M, Grewal N, Khosla S. Transradial vs Transfemoral Percutaneous Coronary Intervention in ST-Segment Elevation Myocardial Infarction: A Systemic Review and Meta-analysis. Can J Cardiol. 2016;32(6):777-90.

BACKGROUND: The objective of this meta-analysis to evaluate safety and efficacy of transradial vs the transfemoral approach for primary percutaneous coronary intervention (PCI) in ST-segment elevation myocardial infarction (STEMI) patients. METHODS: Randomized controlled trials that compared the transfemoral vs the transradial approach in STEMI patients who underwent PCI were searched in PubMed, Embase, CENTRAL, Cumulative Index to Nursing and Allied Health Literature, and clinicaltrials.gov. Random effect models were used to pool effect sizes. RESULTS: Sixteen trials, comprising data from 9726 patients, were included in the meta-analysis. All-cause mortality (risk ratio [RR], 0.68; 95% confidence interval [CI], 0.54-0.85; relative risk reduction [RRR], 32.8%; I(2) = 0), major bleeding (RR 0.56; 95% CI, 0.42-0.74; RRR, 48.1%; I(2) = 0), access site bleeding (RR, 0.38; 95% CI, 0.29-0.50; RRR, 63.9%; I(2) = 0), major adverse cardiovascular events (RR, 0.80; 95% CI, 0.68-0.94; RRR, 19.3%; I(2) = 0), and length of hospital stay (standardized mean difference, -0.38 days; 95% CI, -0.46 to -0.31 days) were significantly lower with the transradial compared with the transfemoral approach. The greatest reduction in major bleeding was found in the subgroup with trials recruiting only primary PCI participants compared with varying proportions of rescue PCIs. Glycoprotein IIb/IIIa inhibitor use and cross-over rates did not have a significant association with outcome measures in the subgroup analysis. Incidence of stroke was numerically greater with the transradial approach but did not achieve statistical significance (RR, 1.22; 95% CI, 0.56-2.66; I(2) = 0). Overall statistical heterogeneity (I(2)) was very low except for length of hospital stay. CONCLUSIONS: The transradial approach for PCI in STEMI patients significantly reduced all-cause mortality, major and access site bleeding, major adverse cardiovascular events, and length of hospital stay. Difference in stroke incidence was not statistically significant with the transradial vs the transfemoral approach.

253. Di Nisio M, Peinemann F, Porreca E, Rutjes AWS. Treatment for superficial infusion thrombophlebitis of the upper extremity. Cochrane Database Syst Rev. 2015(11).

http://dx.doi.org/10.1002/14651858.CD011015.pub2

- Background Although superficial thrombophlebitis of the upper extremity represents a frequent complication of intravenous catheters inserted into the peripheral veins of the forearm or hand, no consensus exists on the optimal management of this condition in clinical practice. Objectives To summarise the evidence from randomised clinical trials (RCTs) concerning the efficacy and safety of (topical, oral or parenteral) medical therapy of superficial thrombophlebitis of the upper extremity. Search methods The Cochrane Vascular Group Trials Search Co‐ordinator searched the Specialised Register (last searched April 2015) and the Cochrane Register of Studies (2015, Issue 3). Clinical trials registries were searched up to April 2015. Selection criteria RCTs comparing any (topical, oral or parenteral) medical treatment to no intervention or placebo, or comparing two different medical interventions (e.g. a different variant scheme or regimen of the same intervention or a different pharmacological type of treatment). Data collection and analysis We extracted data on methodological quality, patient characteristics, interventions and outcomes, including improvement of signs and symptoms as the primary effectiveness outcome, and number of participants experiencing side effects of the study treatments as the primary safety outcome. Main results We identified 13 studies (917 participants). The evaluated treatment modalities consisted of a topical treatment (11 studies), an oral treatment (2 studies) and a parenteral treatment (2 studies). Seven studies used a placebo or no intervention control group, whereas all others also or solely compared active treatment groups. No study evaluated the effects of ice or the application of cold or hot bandages. Overall, the risk of bias in individual trials was moderate to high, although poor reporting hampered a full appreciation of the risk in most studies. The overall quality of the evidence for each of the outcomes varied from low to moderate mainly due to risk of bias and imprecision, with only single trials contributing to most comparisons. Data on primary outcomes improvement of signs and symptoms and side effects attributed to the study treatment could not be statistically pooled because of the between‐study differences in comparisons, outcomes and type of instruments to measure outcomes. An array of topical treatments, such as heparinoid or diclofenac gels, improved pain compared to placebo or no intervention. Compared to placebo, oral non‐steroidal anti‐inflammatory drugs reduced signs and symptoms intensity. Safety issues were reported sparsely and were not available for some interventions, such as notoginseny creams, parenteral low‐molecular‐weight heparin or defibrotide. Although several trials reported on adverse events with topical heparinoid creams, Essaven gel or phlebolan versus control, the trials were underpowered to adequately measure any differences between treatment modalities. Where reported, adverse events with topical treatments consisted mainly of local allergic reactions. Only one study of 15 participants assessed thrombus extension and symptomatic venous thromboembolism with either oral non‐steroidal anti‐inflammatory drugs or low‐molecular‐weight heparin, and it reported no cases of either. No study reported on the development of suppurative phlebitis, catheter‐related bloodstream infections or quality of life. Authors' conclusions The evidence about the treatment of acute infusion superficial thrombophlebitis is limited and of low quality. Data appear too preliminary to assess the effectiveness and safety of topical treatments, systemic anticoagulation or oral non‐steroidal anti‐inflammatory drugs. Plain language summary Treatment for superficial infusion thrombophlebitis of the upper extremity Background Superficial thrombophlebitis is an inflammatory condition of the veins just below the surface of the skin. The development of superficial thrombophlebitis frequently complicates the insertion of needles into the veins for ca heters to give medication or fluids in hospitalised patients. The best treatment for these blood clots in the hands and arms remains unclear. While local treatment has the potential to improve the painful symptoms and patient discomfort, it may not prevent complications, including infection or the extension or transit of the clot into the deep vein system. Study characteristics and key results In the current review, which looked for studies up to April 2015, we identified 13 studies involving 917 participants. Eleven studies evaluated topical treatments (medication applied to the skin), two trials studied an oral treatment, and two studies assessed a parenteral treatment (via injection or infusion). Seven studies used a control group that received no treatment or a placebo, whereas all others also or solely compared two active treatment groups. No study evaluated the effects of ice or the application of cold or hot bandages. Overall, topical treatments resulted in a higher and faster improvement of the clinical signs and symptoms compared to placebo or no intervention. Reporting on safety data was limited, with no available information on some treatments (notoginseny creams, parenteral low‐molecular‐weight heparin or defibrotide). Although some studies reported on harmful side effects with topical heparinoid creams, Essaven gel or phlebolan, the trials were too small in size to adequately measure any differences between treatments. Reported side effects of topical treatments consisted mainly of local allergic reactions. Only one study with 15 participants assessed anything other than localised control of the condition. That study reported on extension of the clot or symptomatic venous thromboembolism (when the blood clot breaks loose and travels in the blood stream), observing no cases when treated orally with non‐steroidal anti‐inflammatory drugs or with low‐molecular‐weight heparin. None of the studies reported on the development of suppurative or septic phlebitis (when pus is formed inside the vein or around the vein wall or both), catheter‐related bloodstream infections or quality of life. Quality of the evidence Some of the included studies may have been biased due to design limitations, but we could not always assess this risk because the original researchers did not always provide enough information to judge. The overall quality of the evidence for each of the outcomes varied from low to moderate, mainly because the studies had design flaws or were very small. We could not analyse data on primary outcomes together because the trials examined different treatments, in different ways, looking at different outcomes. In short, the evidence about the treatment of acute infusion superficial thrombophlebitis is limited and of low quality, and we do not have enough information to recommend the use of any of the treatments studied.

254. Capodanno D, Lip GY, Windecker S, Huber K, Kirchhof P, Boriani G, et al. Triple antithrombotic therapy in atrial fibrillation patients with acute coronary syndromes or undergoing percutaneous coronary intervention or transcatheter aortic valve replacement. EuroIntervention. 2015;10(9):1015-21.

255. Luo Z, Zhang T, Wang S, He Y, Ye Q, Cao W. The Trp64Arg polymorphism in β3 adrenergic receptor (ADRB3) gene is associated with adipokines and plasma lipids: a systematic review, meta-analysis, and meta-regression. Lipids Health Dis. 2020;19(1):99.

BACKGROUND: Recently, some studies claim that adipokines may modulate plasma lipids. More interestingly, the ADRB3 Trp64Arg polymorphism may regulate adipokines and play an essential role in lipids metabolism. This study aims to clarify the associations of ADRB3 Trp64Arg polymorphism with plasma adipokines and lipid levels. METHODS: Twenty-two studies (5527 subjects) and 121 studies (54,059 subjects) were respectively identified for the association analyses of adipokines and lipids. Standardized mean difference (SMD) and 95% confidence interval (CI) were used to estimate the strength of the Trp64Arg variant in adipokines and plasma lipids. All results were recalculated after eliminating the studies with heterogeneity. RESULTS: The carriers of the C allele (Arg at 64th position was encoded by the C allele) had higher levels of leptin and lower levels of adiponectin than the non-carriers. The carriers of the C allele had higher levels of triglycerides (TG), total cholesterol (TC), and lower levels of high-density lipoprotein cholesterol (HDL-C) than the non-carriers. Subgroup analysis certified an ethnicity (Asians), disease status (obesity), and gender (females) specific association. Sensitivity analysis indicated that the analysis results were robust and stable. Meta-regression indicated that obesity was related to adiponectin. CONCLUSIONS: The C allele carriers of Trp64Arg polymorphism had a slight but significant influence on lipid levels, and the remarkable effects specific existed in obese Asian women. The associations of Trp64Arg polymorphism with dyslipidemia may partly be mediated by the effect of this polymorphism on adipokines. The association of Trp64Arg polymorphism with obesity may partly be mediated by the effect of this polymorphism on adipokines. The C allele carriers had abnormal levels of adipokines and lipids, and it indicated that the Trp64Arg polymorphism might represent a genetic risk factor for coronary artery disease (CAD).

256. Brass P, Hellmich M, Kolodziej L, Schick G, Smith AF. Ultrasound guidance versus anatomical landmarks for internal jugular vein catheterization. Cochrane Database Syst Rev. 2015(1).

http://dx.doi.org/10.1002/14651858.CD006962.pub2

- Background Central venous catheters (CVCs) can help with diagnosis and treatment of the critically ill. The catheter may be placed in a large vein in the neck (internal jugular vein), upper chest (subclavian vein) or groin (femoral vein). Whilst this is beneficial overall, inserting the catheter risks arterial puncture and other complications and should be performed with as few attempts as possible. Traditionally, anatomical ‘landmarks’ on the body surface were used to find the correct place in which to insert catheters, but ultrasound imaging is now available. A Doppler mode is sometimes used to supplement plain ‘two‐dimensional’ ultrasound. Objectives The primary objective of this review was to evaluate the effectiveness and safety of two‐dimensional (imaging ultrasound (US) or ultrasound Doppler (USD)) guided puncture techniques for insertion of central venous catheters via the internal jugular vein in adults and children. We assessed whether there was a difference in complication rates between traditional landmark‐guided and any ultrasound‐guided central vein puncture. Our secondary objectives were to assess whether the effect differs between US and USD; whether the effect differs between ultrasound used throughout the puncture ('direct') and ultrasound used only to identify and mark the vein before the start of the puncture procedure (indirect'); and whether the effect differs between different groups of patients or between different levels of experience among those inserting the catheters. Search methods We searched the Central Register of Controlled Trials (CENTRAL) (2013, Issue 1), MEDLINE (1966 to 15 January 2013), EMBASE (1966 to 15 January 2013), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to 15 January 2013 ), reference lists of articles, 'grey literature' and dissertations. An additional handsearch focused on intensive care and anaesthesia journals and abstracts and proceedings of scientific meetings. We attempted to identify unpublished or ongoing studies by contacting companies and experts in the field, and we searched trial registers. We reran the search in August 2014. We will deal with identified studies of interest when we update the review. Selection criteria We included randomized and quasi‐randomized controlled trials comparing two‐dimensional ultrasound or Doppler ultrasound with an anatomical 'landmark' technique during insertion of internal jugular venous catheters in both adults and children. Data collection and analysis Three review authors independently extracted data on methodological quality, participants, interventions and outcomes of interest using a standardized form. A priori, we aimed to perform subgroup analyses, when possible, for adults and children, and for experienced operators and inexperienced operators. Main results Of 735 identified citations, 35 studies enrolling 5108 participants fulfilled the inclusion criteria. The quality of evidence was very low for most of the outcomes and was moderate at best for four of the outcomes. Most trials had an unclear risk of bias across the six domains, and heterogeneity among the studies was significant. Use of two‐dimensional ultrasound reduced the rate of total complications overall by 71% (14 trials, 2406 participants, risk ratio (RR) 0.29, 95% confidence interval (CI) 0.17 to 0.52; P value < 0.0001, I² = 57%), and the number of participants with an inadvertent arterial puncture by 72% (22 trials, 4388 participants, RR 0.28, 95% CI 0.18 to 0.44; P value < 0.00001, I² = 35%). Overall success rates were modestly increased in all groups combined at 12% (23 trials, 4340 participants, RR 1.12, 95% CI 1.08 to 1.17; P value < 0.00001, I² = 85%), and similar benefit was noted across all subgroups. The number of attempts needed for successful cannulation was decreased overall (16 trials, 3302 participants, mean difference (MD) ‐1.19 attempts, 95% CI ‐1.45 to ‐0.92; P value < 0.00001, I² = 96%) and in all subgroups. Use of two‐dimensional ultrasound increased the ch nce of success at the first attempt by 57% (18 trials, 2681 participants, RR 1.57, 95% CI 1.36 to 1.82; P value < 0.00001, I² = 82%) and reduced the chance of haematoma formation (overall reduction 73%, 13 trials, 3233 participants, RR 0.27, 95% CI 0.13 to 0.55; P value 0.0004, I² = 54%). Use of two‐dimensional ultrasound decreased the time to successful cannulation by 30.52 seconds (MD ‐30.52 seconds, 95% CI ‐55.21 to ‐5.82; P value 0.02, I² = 97%). Additional data are available to support use of ultrasound during, not simply before, line insertion. Use of Doppler ultrasound increased the chance of success at the first attempt by 58% (four trials, 199 participants, RR 1.58, 95% CI 1.02 to 2.43; P value 0.04, I² = 57%). No evidence showed a difference for the total numbers of perioperative and postoperative complications/adverse events (three trials, 93 participants, RR 0.52, 95% CI 0.16 to 1.71; P value 0.28), the overall success rate (seven trials, 289 participants, RR 1.09, 95% CI 0.95 to 1.25; P value 0.20), the total number of attempts until success (two trials, 69 participants, MD ‐0.63, 95% CI ‐1.92 to 0.66; P value 0.34), the overall number of participants with an arterial puncture (six trials, 213 participants, RR 0.61, 95% CI 0.21 to 1.73; P value 0.35) and time to successful cannulation (five trials, 214 participants, each using a different definition for this outcome; MD 62.04 seconds, 95% CI ‐13.47 to 137.55; P value 0.11) when Doppler ultrasound was used. It was not possible to perform analyses for the other outcomes because they were reported in only one trial. Authors' conclusions Based on available data, we conclude that two‐dimensional ultrasound offers gains in safety and quality when compared with an anatomical landmark technique. Because of missing data, we did not compare effects with experienced versus inexperienced operators for all outcomes (arterial puncture, haematoma formation, other complications, success with attempt number one), and so the relative utility of ultrasound in these groups remains unclear and no data are available on use of this technique in patients at high risk of complications. The results for Doppler ultrasound techniques versus anatomical landmark techniques are also uncertain. Plain language summary Ultrasound guidance versus anatomical landmarks for internal jugular vein catheterization People who are critically ill sometimes need a catheter in a central vein to help with diagnosis and treatment. The catheter may be placed in a large vein in the neck (internal jugular vein), upper chest (subclavian vein) or groin (femoral vein). However, this procedure carries risks such as arterial puncture (puncturing an artery instead of the vein might result in a haematoma, which can become infected or can lead to compression of the carotid artery) and other complications (thrombosis, embolism, pneumothorax, nerve injury) and should be performed with as few attempts as possible. Puncture‐related complications can result from patient‐specific features such as an abnormal weight‐to‐height ratio, variations in anatomical structure (the probability of which is given in the literature as up to 29%), thrombosis‐related changes in wall structure ( Caridi 1998 ; Denys 1991 ; Ferral 1998 ; McIntyre 1992 ), an existing hypovolaemia or a coagulopathy ( Bernard 1971 ). In addition, the experience of the practitioner ( Bernard 1971 ), the environment in which the insertion is effected ( Bo‐Linn 1982 ), the position and the risk inherent in the particular puncture procedure contribute to the occurrence of complications. In the past, ‘landmarks’ on the body surface were used to find the correct place to insert catheters, but ultrasound imaging is now available. This Cochrane systematic review compared landmark techniques versus ultrasound to guide the insertion of a catheter into the large vein in the neck (the internal jugular vein). In 2013 we included in the review 35 studies enrolling 5108 participants (adults and children). These studies were varied, and heir quality was moderate at best. We reran the search in August 2014. We will deal with any studies of interest when we update the review. Nevertheless, ultrasound offered some benefits. Using ultrasound reduced the rate of complications (‐71%), including severe bruising (‐73%) and accidental puncturing of an artery instead of the vein (72%). It also increased success rates, including success rates at the first attempt (+57%) and reduced the time taken to perform the procedure. None of the included studies reported on death or patient‐reported outcomes (patient discomfort). Based on available data, we conclude that two‐dimensional ultrasound offers improved safety and quality when compared with an anatomical landmark technique, but these findings do not necessarily hold for all users or for patients at high risk of complications. The relative utility of ultrasound when operators are experienced or inexperienced in central line insertion, however, remains unclear for some outcomes. The results for Doppler ultrasound techniques versus an anatomical landmark technique are also uncertain.

257. Brass P, Hellmich M, Kolodziej L, Schick G, Smith AF. Ultrasound guidance versus anatomical landmarks for subclavian or femoral vein catheterization. Cochrane Database Syst Rev. 2015(1).

http://dx.doi.org/10.1002/14651858.CD011447

- Background Central venous catheters can help with diagnosis and treatment of the critically ill. The catheter may be placed in a large vein in the neck (internal jugular vein), upper chest (subclavian vein) or groin (femoral vein). Whilst this is beneficial overall, inserting the catheter risks arterial puncture and other complications and should be performed in as few attempts as possible. In the past, anatomical ‘landmarks’ on the body surface were used to find the correct place to insert these catheters, but ultrasound imaging is now available. A Doppler mode is sometimes used to supplement plain ‘two‐dimensional’ ultrasound. Objectives The primary objective of this review was to evaluate the effectiveness and safety of two‐dimensional ultrasound (US)‐ or Doppler ultrasound (USD)‐guided puncture techniques for subclavian vein, axillary vein and femoral vein puncture during central venous catheter insertion in adults and children. We assessed whether there was a difference in complication rates between traditional landmark‐guided and any ultrasound‐guided central vein puncture. When possible, we also assessed the following secondary objectives: whether a possible difference could be verified with use of the US technique versus the USD technique; whether there was a difference between using ultrasound throughout the puncture ('direct') and using it only to identify and mark the vein before starting the puncture procedure ('indirect'); and whether these possible differences might be evident in different groups of patients or with different levels of experience among those inserting the catheters. Search methods We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (2013, Issue 1), MEDLINE (1966 to 15 January 2013), EMBASE (1966 to 15 January 2013), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to 15 January 2013), reference lists of articles, 'grey literature' and dissertations. An additional handsearch focused on intensive care and anaesthesia journals and abstracts and proceedings of scientific meetings. We attempted to identify unpublished or ongoing studies by contacting companies and experts in the field, and we searched trial registers. We reran the search in August 2014. We will deal with any studies of interest when we update the review. Selection criteria Randomized and quasi‐randomized controlled trials comparing two‐dimensional ultrasound or Doppler ultrasound versus an anatomical ‘landmark’ technique during insertion of subclavian or femoral venous catheters in both adults and children. Data collection and analysis Three review authors independently extracted data on methodological quality, participants, interventions and outcomes of interest using a standardized form. We performed a priori subgroup analyses. Main results Altogether 13 studies enrolling 2341 participants (and involving 2360 procedures) fulfilled the inclusion criteria. The quality of evidence was very low (subclavian vein N = 3) or low (subclavian vein N = 4, femoral vein N = 2) for most outcomes, moderate for one outcome (femoral vein) and high at best for two outcomes (subclavian vein N = 1, femoral vein N = 1). Most of the trials had unclear risk of bias across the six domains, and heterogeneity among the studies was significant. For the subclavian vein (nine studies, 2030 participants, 2049 procedures), two‐dimensional ultrasound reduced the risk of inadvertent arterial puncture (three trials, 498 participants, risk ratio (RR) 0.21, 95% confidence interval (CI) 0.06 to 0.82; P value 0.02, I² = 0%) and haematoma formation (three trials, 498 participants, RR 0.26, 95% CI 0.09 to 0.76; P value 0.01, I² = 0%). No evidence was found of a difference in total or other complications (together, US, USD), overall (together, US, USD), number of attempts until success (US) or first‐time (US) success rates or time taken to insert the catheter (US). For the femoral vein, fewer data were available for analysis (four studies, 311 participants, 311 procedu es). No evidence was found of a difference in inadvertent arterial puncture or other complications. However, success on the first attempt was more likely with ultrasound (three trials, 224 participants, RR 1.73, 95% CI 1.34 to 2.22; P value < 0.0001, I² = 31%), and a small increase in the overall success rate was noted (RR 1.11, 95% CI 1.00 to 1.23; P value 0.06, I² = 50%). No data on mortality or participant‐reported outcomes were provided. Authors' conclusions On the basis of available data, we conclude that two‐dimensional ultrasound offers small gains in safety and quality when compared with an anatomical landmark technique for subclavian (arterial puncture, haematoma formation) or femoral vein (success on the first attempt) cannulation for central vein catheterization. Data on insertion by inexperienced or experienced users, or on patients at high risk for complications, are lacking. The results for Doppler ultrasound techniques versus anatomical landmark techniques are uncertain. Plain language summary Ultrasound guidance versus anatomical landmarks for subclavian or femoral vein catheterization People who are critically ill sometimes need a central venous catheter to help with diagnosis and treatment. The catheter may be placed in a large vein in the neck (internal jugular vein), upper chest (subclavian/axillary vein) or groin (femoral vein). However, this procedure carries risks such as arterial puncture and other complications and should be performed with as few attempts as possible. Traditionally, anatomical ‘landmarks’ on the body surface were used to find the correct place to insert catheters, but ultrasound imaging is now available. This Cochrane systematic review compared landmark techniques versus ultrasound guidance. The evidence is current to´January 2013. We included in the review 13 studies enrolling 2341 participants (and involving 2360 procedures). The studies were varied, and their quality was not high. We reran the search in August 2014. We will deal with any studies of interest when we update the review. Nevertheless, ultrasound offered some benefits, as it reduced the risk of arterial puncture and severe bruising in subclavian vein catheterization. Fewer data were available for femoral vein catheterization, but success rates seemed to be higher with ultrasound. No evidence showed a significant difference in complication rates or in time taken to cannulate at either site. On the basis of available data, we conclude that two‐dimensional ultrasound offers small advantages in safety and quality when compared with an anatomical landmark technique for subclavian vein (reduced arterial puncture and haematoma formation) or femoral vein (reduced success on the first attempt) cannulation for central vein catheterization, but these findings do not necessarily hold for all groups of ultrasound users or for patients at high risk for complications. The results for Doppler ultrasound techniques versus anatomical landmark techniques are uncertain.

258. Mason PJ, Shah B, Tamis-Holland JE, Bittl JA, Cohen MG, Safirstein J, et al. An Update on Radial Artery Access and Best Practices for Transradial Coronary Angiography and Intervention in Acute Coronary Syndrome: A Scientific Statement From the American Heart Association. Circ Cardiovasc Interv. 2018;11(9):e000035.

Transradial artery access for percutaneous coronary intervention is associated with lower bleeding and vascular complications than transfemoral artery access, especially in patients with acute coronary syndromes. A growing body of evidence supports adoption of transradial artery access to improve acute coronary syndrome-related outcomes, to improve healthcare quality, and to reduce cost. The purpose of this scientific statement is to propose and support a "radial-first" strategy in the United States for patients with acute coronary syndromes. This document also provides an update to previously published statements on transradial artery access technique and best practices, particularly as they relate to the management of patients with acute coronary syndromes.

259. Heidbuchel H, Verhamme P, Alings M, Antz M, Diener HC, Hacke W, et al. Updated European Heart Rhythm Association Practical Guide on the use of non-vitamin K antagonist anticoagulants in patients with non-valvular atrial fibrillation. Europace. 2015;17(10):1467-507.

The current manuscript is an update of the original Practical Guide, published in June 2013[Heidbuchel H, Verhamme P, Alings M, Antz M, Hacke W, Oldgren J, et al. European Heart Rhythm Association Practical Guide on the use of new oral anticoagulants in patients with non-valvular atrial fibrillation. Europace 2013;15:625-51; Heidbuchel H, Verhamme P, Alings M, Antz M, Hacke W, Oldgren J, et al. EHRA practical guide on the use of new oral anticoagulants in patients with non-valvular atrial fibrillation: executive summary. Eur Heart J 2013;34:2094-106]. Non-vitamin K antagonist oral anticoagulants (NOACs) are an alternative for vitamin K antagonists (VKAs) to prevent stroke in patients with non-valvular atrial fibrillation (AF). Both physicians and patients have to learn how to use these drugs effectively and safely in clinical practice. Many unresolved questions on how to optimally use these drugs in specific clinical situations remain. The European Heart Rhythm Association set out to coordinate a unified way of informing physicians on the use of the different NOACs. A writing group defined what needs to be considered as 'non-valvular AF' and listed 15 topics of concrete clinical scenarios for which practical answers were formulated, based on available evidence. The 15 topics are (i) practical start-up and follow-up scheme for patients on NOACs; (ii) how to measure the anticoagulant effect of NOACs; (iii) drug-drug interactions and pharmacokinetics of NOACs; (iv) switching between anticoagulant regimens; (v) ensuring adherence of NOAC intake; (vi) how to deal with dosing errors; (vii) patients with chronic kidney disease; (viii) what to do if there is a (suspected) overdose without bleeding, or a clotting test is indicating a risk of bleeding?; (xi) management of bleeding complications; (x) patients undergoing a planned surgical intervention or ablation; (xi) patients undergoing an urgent surgical intervention; (xii) patients with AF and coronary artery disease; (xiii) cardioversion in a NOAC-treated patient; (xiv) patients presenting with acute stroke while on NOACs; and (xv) NOACs vs. VKAs in AF patients with a malignancy. Additional information and downloads of the text and anticoagulation cards in >16 languages can be found on an European Heart Rhythm Association web site (www.NOACforAF.eu).

260. Hou H, Ge S, Zhao L, Wang C, Wang W, Zhao X, et al. An Updated Systematic Review and Meta-analysis of Association Between Adiponectin Gene Polymorphisms and Coronary Artery Disease. OMICS. 2017;21(6):340-51.

Coronary artery disease (CAD) is a significant contributor to global health burden. Adiponectin gene single nucleotide polymorphisms (SNPs) have been associated with CAD susceptibility, but with inconsistent results across the studies. We present, in this study, an updated meta-analysis to discern the genetic susceptibility of adiponectin SNPs in relation to CAD. PubMed and EMBASE databases were used to identify the relevant published articles using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Pooled odds ratios and 95% confidence intervals were generated to assess the strength of the associations. Thirty-five articles with a total of 28,947 participants (mean age 55.3 years, 11,632 cases/17,315 controls, 19,443 males/8353 females, and 1151 persons with unspecified gender data) were included. The dominant, recessive, and additive models were applied. We found that the SNPs +45T>G (rs2241766), -4034A>C (rs822395), and -11391G>A (rs17300539) were linked to CAD development. In addition, +276G>T (rs1501299) SNP was associated with a decreased susceptibility to CAD among Caucasians. We did not find an association between the CAD susceptibility and the -11377C>G (rs266729) SNP. These observations offer new potential genetic biomarker candidates in relation to CAD, and warrant further research in independent world populations.

261. Hawryluk Ł, Sterliński M, Marczak M, Miśko J, Podgórski JK, Szwed H. The use of 1.5 T magnetic resonance imaging for therapeutic decisions in patients with cardiac implantable electronic devices and significant neurological, neurosurgical and neuro-oncology diagnostic indications. Neurol Neurochir Pol. 2015;49(1):16-23.

Between September 2009 and May 2014 the classification of 36 patients with cardiac implantable electronic devices (CIEDs) in terms of the feasibility of MRI scanning due to strong clinical indications was carried out. Finally MRI examinations were performed in 20 patients, of whom 27 studies were conducted and a total number of 35 anatomical regions were scanned. Neurological, neurosurgical and neuro-oncology indications for MRI were reported in 19 patients (95%) in whom 26 MRI studies (96.3%) were performed, and 34 anatomical regions (97.1%) were scanned. One patient had indications for MRI in the field of cardiology. Medical information obtained from 27 MRI studies allowed decisions to be made regarding the treatment in all patients. After 8 studies (29.6%), patients were classified into 9 different neurosurgical procedures. In the case of the remaining 19 studies (70.4%), there were no indications for surgical treatment and the decisions to implement conservative treatment were made. There were no complications related to the implanted CIEDs observed: neither immediate nor in the follow-up.

262. Arnold SV, de Lemos JA, Rosenson RS, Ballantyne CM, Liu Y, Mues KE, et al. Use of Guideline-Recommended Risk Reduction Strategies Among Patients With Diabetes and Atherosclerotic Cardiovascular Disease. Circulation. 2019;140(7):618-20.

263. Zhou X, Cao K, Kou S, Qu S, Li H, Yu Y, et al. Usefulness of CHADS(2) score for prognostic stratification of patients with coronary artery disease: A systematic review and meta-analysis of cohort studies. Int J Cardiol. 2017;228:906-11.

OBJECTIVE: To evaluate the role of CHADS(2) score on predicting ischaemic stroke or transient ischaemic attack (TIA) and death in patients with coronary artery disease (CAD), irrespective of the presence or absence of atrial fibrillation (AF). METHODS: We searched for cohort studies that reported risk estimates for incidence of ischaemic stroke/TIA or mortality by levels of CHADS(2) score in Medline/PubMed and Embase. Random effects models were used to calculate pooled risk ratios (RRs) and 95% confidence intervals (CIs). RESULTS: Eight cohort studies (7 prospective and 1 retrospective) enrolling 31,509 patients with CAD were included. The pooled RR of mortality was 2.38 (95% CI 1.63-3.47) for CHADS(2) score≥2, and of stroke/TIA incidence was 2.19 (1.55-3.08). In patients without AF, CHADS(2) score≥2 was associated with increased mortality (pooled RR 3.14 95% CI 2.14-4.61) and stroke/TIA incidence (pooled 2.81, 2.08-3.78) In patients with AF, the pooled RR of mortality for CHADS(2) score≥2 was 1.57 (1.07-2.28), but no significant association was found between CHADS(2) score and stroke/TIA incidence (pooled RR 1.21, 95% CI 0.84-1.73). CONCLUSIONS: CHADS(2) score can predict mortality in patients with CAD. However, higher CHADS(2) score is associated with increased incidence of stroke/TIA only in patients without AF.

264. Lu L, Nan S, Zhang S, Lu X, Duan H. Using openEHR's Guideline Definition Language for Representing Percutaneous Coronary Intervention Patient Safety Rules in a Dynamic Checklist System. Stud Health Technol Inform. 2019;264:1714-5.

openEHR's Guideline Definition Language is designed for standardizing clinical decision support systems. In this study, we use Guideline Definition Language to represent patient safety rules in pre-operation of Percutaneous Coronary Intervention for the dynamic checklist system. After using Guideline Definition Language in this case, we had some results about its expression adaptability to requirements of patient safety rules.

265. Pi Y, Roe MT, Holmes DN, Chiswell K, Garvey JL, Fonarow GC, et al. Utilization, Characteristics, and In-Hospital Outcomes of Coronary Artery Bypass Grafting in Patients With ST-Segment-Elevation Myocardial Infarction: Results From the National Cardiovascular Data Registry Acute Coronary Treatment and Intervention Outcomes Network Registry-Get With The Guidelines. Circ Cardiovasc Qual Outcomes. 2017;10(8).

BACKGROUND: There are limited data on the utilization and outcomes of coronary artery bypass grafting (CABG) among ST-segment-elevation myocardial infarction (STEMI) patients in contemporary practice. METHODS AND RESULTS: Using data from National Cardiovascular Data Registry Acute Coronary Treatment and Intervention Outcomes Network Registry-Get With The Guidelines between 2007 and 2014, we analyzed trends in CABG utilization and hospital-level variation in CABG rates. Patients undergoing CABG during the index admission were categorized by the most common scenarios: (1) CABG only as the primary reperfusion strategy; (2) CABG after primary percutaneous coronary intervention; and (3) CABG after fibrinolytic therapy. A total of 15 145 patients (6.3% of the STEMI population) underwent CABG during the index hospitalization, with a decrease in utilization from 8.3% in 2007 to 5.4% in 2014 (trend P value <0.001). The hospital-level use of CABG in STEMI varied widely from 0.5% to 36.2% (median, 5.3%; interquartile range [IQR], 3.5%-7.8%; P value <0.001). Of all patients undergoing CABG, 45.8% underwent CABG only, 38.7% had CABG after percutaneous coronary intervention, and 8.2% CABG after fibrinolytic therapy. The median time intervals from cardiac catheterization/percutaneous coronary intervention to CABG were 23.3 hours (IQR, 3.0-70.3 hours) in CABG only, 49.7 hours (IQR, 3.2-70.3 hours) in CABG after percutaneous coronary intervention, and 56.6 hours (IQR, 22.7-96.0 hours) in CABG after fibrinolytic therapy. The Acute Coronary Treatment and Intervention Outcomes Network mortality risk scores differed modestly (median, 33; IQR, 28-40 versus median, 32; IQR, 27-38) between CABG and non-CABG patients. Patients undergoing CABG had similar in-hospital mortality rate (5.4% versus 5.1%) as those not treated with CABG. CONCLUSIONS: CABG is performed infrequently in STEMI patients during the index hospitalization, with rates declining in contemporary US practice over time. There was marked hospital-level variation in the use of CABG, and CABG was typically performed within 1 to 3 days after angiography. Observed mortality rates appear low, suggesting that CABG might be safely performed in select STEMI patients in a timely fashion.

266. Din JN, Snow TM, Rao SV, Klinke WP, Nadra IJ, Della Siega A, et al. Variation in practice and concordance with guideline criteria for length of stay after elective percutaneous coronary intervention. Catheter Cardiovasc Interv. 2017;90(5):715-22.

BACKGROUND: Considerable variability remains as regards the appropriate and safe length of stay after elective PCI. We performed a survey of interventional cardiologists to identify current views on appropriate and safe length of stay after PCI. METHODS: We created an online survey using the commercially available SurveyMonkey application. This was sent to interventional cardiologists in the US, Canada and the UK with the assistance of the national interventional cardiology societies (SCAI, CAIC/CCS, BCIS/BCS) as well as being made available on the theheart.org website. RESULTS: 505 interventional cardiologists responded, of which 237 were practicing in the US. Of those from the US, 52% were not aware of any guidelines for length of stay and 48% reported that their unit did not have a standard practice for length of stay. Same-day discharge after PCI was practiced as routine by 14% of cardiologists in the US versus 32% of cardiologists from Canada (P = 0.003) and 57% (P < 0.0001) from the UK. Amongst respondents, there was significant variation between respondents and divergence from published SCAI guidelines regarding appropriate length of stay for patient specific and procedural related clinical factors. CONCLUSIONS: There is considerable variation in practice patterns regarding length of stay after PCI. Whilst most cardiologists practice overnight observation, a significant minority utilize same-day discharge. There is also lack of familiarity with published guidelines. This variation and knowledge gap confirms an urgent need for updated guidelines and a concerted effort to educate cardiologists on appropriate post-PCI length of stay. © 2017 Wiley Periodicals, Inc.

267. Welt FGP, Klein LW, Tamis-Holland J, Blankenship J, Duffy PL, Cigarroa J, et al. Views of Appropriate Use Criteria for catheterization and percutaneous coronary revascularization by practicing interventional cardiologists: Results of a survey of American College of Cardiology Interventional Section members. Catheter Cardiovasc Interv. 2019;93(5):875-9.

OBJECTIVES: The American College of Cardiology (ACC) Interventional Section Council leadership sought to examine the views of interventional cardiologists regarding the practical implementation and the value of the Appropriate Use Criteria (AUC) in their clinical practice. BACKGROUND: The ACC AUC for revascularization were originally intended to assess trends in revascularization patterns by hospitals and physicians to ensure that both under- and over-utilization were minimized. As a quality assurance tool, the AUC were designed to allow physicians to obtain insight into their practice patterns and improve their practice. Recent trends toward tying payment to performance have raised concerns that these criteria will be incorrectly applied to individual patient reimbursement, which is not what they were designed to do. Consequently, the AUC have become controversial, not for their value in quality assessment, but for the manner in which agencies have used the AUC as a tool to potentially deny payment for certain patients. METHODS: Utilizing an online survey, members of the ACC Interventional Section were queried regarding the use of AUC, how they use them, and how they feel utilization impacts the care of patients. RESULTS: We found substantial variability in how the AUC were utilized and concern regarding the value of AUC. Among our findings was that respondents were split (51% vs 49%) regarding the value of AUC to patients and/or their laboratory. CONCLUSIONS: In this article, we discuss the implications of these findings and consider options on how AUC might be made a better-accepted and more impactful tool for clinicians and patients.

268. Noonan MC, Wingham J, Taylor RS. 'Who Cares?' The experiences of caregivers of adults living with heart failure, chronic obstructive pulmonary disease and coronary artery disease: a mixed methods systematic review. BMJ Open. 2018;8(7):e020927.

OBJECTIVE: To assess the experiences of unpaid caregivers providing care to people with heart failure (HF) or chronic obstructive pulmonary disease (COPD) or coronary artery disease (CAD). Design Mixed methods systematic review including qualitative and quantitative studies. Data sources Databases searched: Medline Ebsco, PsycInfo, CINAHL Plus with Full Text, Embase, Web of Science, Ethos: The British Library and ProQuest. Grey literature identified using: Global Dissertations and Theses and Applied Sciences Index and hand searches and citation checking of included references. Search time frame: 1 January 1990 to 30 August 2017. ELIGIBILITY CRITERIA FOR SELECTING STUDIES: Inclusion was limited to English language studies in unpaid adult caregivers (>18 years), providing care for patients with HF, COPD or CAD. Studies that considered caregivers for any other diagnoses and studies undertaken in low-income and middle-income countries were excluded. Quality assessment of included studies was conducted by two authors. DATA ANALYSIS/SYNTHESIS: A results-based convergent synthesis was conducted. RESULTS: Searches returned 8026 titles and abstracts. 54 studies-21 qualitative, 32 quantitative and 1 mixed method were included. This totalled 26 453 caregivers who were primarily female (63%), with median age of 62 years. Narrative synthesis yielded six concepts related to caregiver experience: (1) mental health, (2) caregiver role, (3) lifestyle change, (4) support for caregivers, (5) knowledge and (6) relationships. There was a discordance between paradigms regarding emerging concepts. Four concepts emerged from qualitative papers which were not present in quantitative papers: (1) expert by experience, (2) vigilance, (3) shared care and (4) time. CONCLUSION: Caregiving is life altering and complex with significant health implications. Health professionals should support caregivers who in turn can facilitate the recipient to manage their long-term condition. Further longitudinal research exploring the evolution of caregiver experiences over time of patients with chronic cardiopulmonary conditions is required. TRIAL REGISTRATION NUMBER: CRD42016053412.

269. Healy D, Clarke‐Moloney M, Hannigan A, Walsh S. Wound drainage for lower limb arterial surgery. Cochrane Database Syst Rev. 2016(11).

http://dx.doi.org/10.1002/14651858.CD011111.pub2

- Background Drains are often used in leg wounds after vascular surgery procedures despite uncertainty regarding their benefits. Drains are placed with the aim of reducing the incidence and size of blood or fluid collections. Conversely, drains may predispose patients to infection and may prolong hospitalisation. Surgeons need robust data regarding the effects of drains on complications following lower limb arterial surgery. Objectives To determine whether routine placement of wound drains results in fewer complications following lower limb arterial surgery than no drains. Search methods In June 2016 we searched: the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL; the Cochrane Library); Ovid MEDLINE; Ovid MEDLINE (In‐Process & Other Non‐Indexed Citations); Ovid EMBASE and EBSCO CINAHL. We also searched clinical trial registries for ongoing studies.There were no restrictions with respect to language, date of publication or study setting. Selection criteria We considered randomized controlled trials (RCTs) that evaluated the use of any type of drain in lower limb arterial surgery. Data collection and analysis Two authors independently determined study eligibility, extracted data and performed an assessment of bias. An effort was made to contact authors for missing data. The methods and results of each eligible study were summarised and we planned to pool data in meta‐analyses when it was considered appropriate, based upon clinical and statistical homogeneity. Main results We identified three eligible trials involving a total of 222 participants with 333 groin wounds. Suction drainage was compared with no drainage in all studies. Two studies were parallel‐group, randomized controlled trials, and one was a split‐body, randomized controlled trial. Trial settings were not clearly described. Patients undergoing bypass and endarterectomy procedures were included, but none of the studies provided details on the severity of the underlying arterial disease. We deemed all of the studies to be at a high risk of bias in three or more domains of the 'Risk of bias' assessment and overall the evidence was of very low quality. Two out of three studies had unit of analysis errors (with multiple wounds within patients analysed as independent) and it was not possible to judge the appropriateness of the analysis of the third. Meta‐analysis was not appropriate, firstly because of clinical heterogeneity, and secondly because we were not able to adjust for the analysis errors in the individual trials. One trial yielded data on surgical site infections (SSI; the primary outcome of the review): there was no clear difference between drained and non‐drained wounds for SSI (risk ratio 1.33; 95% confidence interval 0.30 to 5.94; 50 participants with bilateral groin wounds; very low quality evidence). It was not possible to evaluate any other outcomes from this trial. The results from the other two studies are unreliable because of analysis errors and reporting omissions. Authors' conclusions The data upon which to base practice in this area are limited and prone to biases. Complete uncertainty remains regarding the potential benefits and harms associated with the use of wound drains in lower limb arterial surgery due to the small number of completed studies and weaknesses in their design and conduct. Higher quality evidence is needed to inform clinical decision making. To our knowledge, no trials on this topic are currently active. Plain language summary Drains for leg artery surgery Review question A surgical drain is a tube used to remove blood, pus or other fluid from a wound. We reviewed the evidence about whether inserting wound drains following leg artery surgery resulted in fewer complications compared with no drains. Background Patients who have severe blockages in the arteries of their legs often need to have the blockages treated. These blockages can be treated with surgery, and there are several different types of operation that can be used. Arterial bypass is n operation in which the blockage is bypassed by using a piece of vein or a synthetic tube so that the blood can go around the obstruction. An endarterectomy is an operation where the surgeon removes the fatty material that is causing the blockage, thereby improving the flow of blood. Sometimes after surgery on leg arteries, surgeons place drainage tubes in the wounds. It is thought that these drains may help to reduce infection, prevent the build‐up of blood or other fluids in the wound, and avoid some other complications after operations. These benefits are not proven and nobody knows if drains are truly helpful. It is possible that drains could cause harm by allowing infection into a wound, by causing bleeding and by prolonging the time a patient spends in hospital. Nobody knows if surgeons should use drains in every wound all of the time, or only in cases where they think a drain is needed. Study characteristics In June 2016 we searched for randomised controlled trials (RCTs) involving the use of drains after leg artery surgery. We identified three eligible trials involving 333 wounds in 222 patients, mainly aged over 65, who had leg artery surgery. Both men and women were included and all of the wounds were in the groin area as part of bypass and endarterectomy operations to improve blood flow. Key results The studies involved small numbers of patients and were not clearly described. All three studies had serious weaknesses in the way they were designed and performed. The results of the individual studies do not provide reliable information because of weaknesses in study design. It is unclear whether wound drains are beneficial or harmful because we did not find any useful information. None of the studies gave information on whether drains shortened or lengthened the number of days that patients had to spend in hospital. None of the studies gave information about how drains affect patients' quality of life. Quality of the evidence Overall, we found that the quality of the evidence about the effects of drains after leg artery surgery was very low and we were not able to tell whether drains lead to benefits or harms for patients. Better quality research is needed if patients and healthcare providers think that this is an important topic. This plain language summary is up to date as of 8 June 2016.