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CT SCAN PROTOCOL
Hip

Purpose and Summary

The purpose of this CT protocol is to obtain detailed data regarding the 3-dimensional characteristics of the hip joint. The resulting scans will be used to prepare a virtual 3D model. This virtual 3D model is intended for the design of patient-specific instrumentation or a patient-specific implant. The following instructions are important. Please read them carefully before scanning.
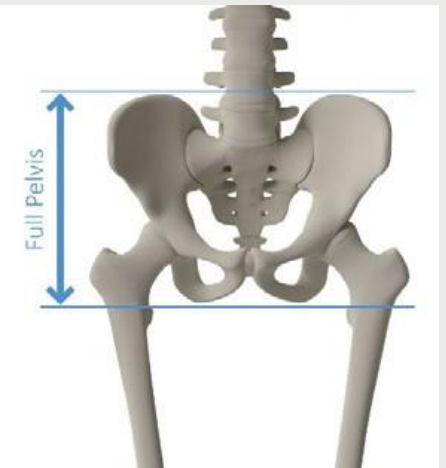
NOTE

CT scan quality can directly affect the design of guides and implants. Please ensure that all protocol steps are followed for optimum scan quality.

General Scan Requirements

- Remove any non-fixed metal prosthesis, jewelry or zippers that might interfere with the region to be scanned.
- Discuss the procedure with the patient. The patient must not move during any part of the scanning sequence.
- Position the patient to maximize comfort and minimize motion.
- Only true axial slices are allowed: no oblique or reformatted images and no gantry tilt.
- If additional algorithms can be applied and seem beneficial to facilitate diagnostics (e.g. scatter or artefact reduction), these DICOM sets can be added, but separately from the required images.

Anatomy of interest : Hip

Patient position and posture	Patient laying supine with legs extended.	
	Legs in natural alignment with neutral rotation.	
	No un-natural tilt or lift of the pelvis.	
	Arms folded upward away from the pelvis.	
Anatomy to be scanned	The complete pelvis needs to be scanned from above the most superior point of the ilium down to below the most inferior point at the ischium.	

SCAN PARAMETERS

Imaging modality	CT
Scanner type	A conventional CT machine can be used. Please make sure that images taken with your scanner fulfill the minimum requirements stated below.
Field of View (FOV)	FOV ≤ 50 cm Adjust the image so that it fills the entire screen without cutting off any of the anatomy for imaging. Make sure to include both hemi-pelves! Only bony regions are of interest, capturing all of the soft tissues is unnecessary.
Table position	The CT couch must **NOT** be raised or lowered between slices. The FOV or X and Y centering must **NOT** be altered between slices during scanning.
Collimation	Slice thickness: **1.5 mm** (preferred value). A fixed value between 1 and 3 mm is acceptable.
	Slice increment: all slices must be contiguous or overlapping. Slice increment should NOT be greater than the chosen slice thickness. Table increment is dependent on patient anatomy.
Matrix	512 x 512
Reconstruction algorithm(s)	A **STANDARD or SOFT TISSUE algorithm**, without edge enhancement should be used.
	If additional algorithms can be applied and seem beneficial to facilitate diagnostics (e.g. scatter or artefact reduction), these DICOM sets can be added but separately.
	Axial images must be provided.
	No obliqueness; no gantry tilt; no oblique reconstructions; no MPR's.
	3D reconstruction can be added.

DATA TRANSMISSION

File Format

- Provide the image data in standard DICOM format (axial).
- Uncompressed DICOM data is necessary for processing. Lossy and other forms of compression are NOT allowed (ISO 10918-1, ISO 14495-1, ISO 15444-1 or ISO 13818-1).

Data anonymisation

- Do not erase patient name and ID.
- Ensure necessary rights are obtained for transfer of data to Materialise.
- Data will be anonymized by Materialise on receipt of the data, after cross-check with prescription of the surgeon to ensure the images of the right patient are provided.

Scan data

ONLY send the following images:

- The requested CT images at the given parameters
- The accompanying scout view
- An accompanying 3D reconstruction (if available)
- Recent diagnostic X-ray images of the hip (if available)

IMPORTANT

Your site should keep an archive (PACS) copy of the CT exams, in **uncompressed** DICOM format and the original scanning parameters.

Transfer scan data to Materialise

A) By DVD or CD-ROM, labelled and shipped to:

Materialise NV
Attn. Imaging Dpt.
Technologielaan 15
B-3001 Leuven
BELGIUM

NOTE

It is advised to use a dedicated courier service and check for (short) delivery duration!

B) Via secure FTP upload: details can be provided on simple request by sending an email to: cases@materialise.be, or call +32 16 744 971.

Send notification

- Finally, notify Materialise of your shipment/upload, either by sending an email to: cases@materialise.be, or simply call +32 16 744 971.
- Please mention the name of the surgeon, patient ID, and name of the zip file that has been uploaded.