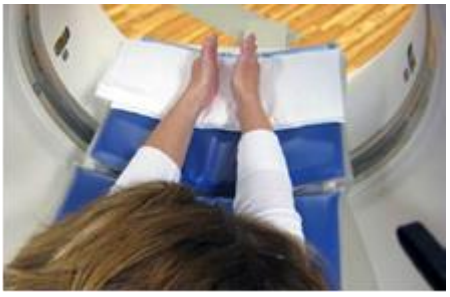
Forearm
CT Scanning Protocol

Important Information

This CT scanning protocol consists of a localizer and a detailed axial scan of the (bilateral) forearm.
The CT scan quality (with clear bony edges and details) is critical to the production of accurate patient-specific surgical instruments. Deviations from this protocol may result in an unusable scan and delay of surgery.
Please contact Materialise's support team if you require further clarification.

Patient Preparation

- Remove any non-fixed metal prosthesis, jewelry, zippers that might interfere with the region to be scanned.
- Make the patient comfortable and instruct him/her not to move during the procedure. If any movement is detected the patient will need to be rescanned as this will prevent the accurate development of the patient-specific model.
- Try to position the head out of the field of view (FOV).
- Try to position the patient prone with arms in front of him/her and with palms facing each other in the neutral position. (If this is really impossible, position the patient in the supine position).
- Scan forearms, with (both) arms above the head. Make sure the patient's elbows are propped up, if needed, to allow for even scanning within the same plane. Place forearms as close together as possible to fit into the designated FOV.
- Always place a marker near the contra lateral arm (for indication of left or right).
  Use a marker that doesn't hinder the quality of the CT scan.



Scanning Instructions

Table position

- Set the table height so that the area to be scanned is centered in the scan field. **DO NOT** raise or lower the CT table between slices. **DO NOT** alter the X or Y centering between scans. Center points must be identical.

Field of view (FOV)

- Use the smallest FOV possible (20cm by 20cm maximum) to capture the whole of the required bone regions.
- Scan all slices with the same FOV, reconstruction center AND table height (coordinate system).
- Capturing all of the soft tissue is unnecessary, only the bony regions are of interest.

No gantry tilt

Bilateral imaging

- Bilateral imaging can be accomplished with a single acquisition.

Scanning Parameters

We recommend building a 'Materialise forearm' in your CT scanner(s) with the appropriate ranges and parameters.

Localizer

Scout: From the elbow to the carpal meta-carpal joint.

Axial Scan

Region of interest:	From the elbow to the carpal meta-carpal joint.
Kv:	90-120
mAs:	As given by the automatic system.
Pitch:	≤ 1
Matrix:	512 x 512
FOV:	≤ 20 x 20 cm
Collimation:	
Slice thickness:	≤ 0.625 mm
Slice increment:	Contiguous Slices
Kernel / Algorithm:	Bone / details

Reconstruction and Delivery of the Images

- **No** secondary reconstructions; images must be scanned at the given parameters or smaller.
- **No** obliqueness; **no** gantry tilt and **no** oblique reconstructions.
- **No** reformatting into coronal or sagittal planes; **no** MPR's. **No** 3D reconstructions.

Very Important

- Provide the complete data set of **raw /original DICOM images** to the surgeon.
- **Lossy compression is NOT allowed** (ISO_10918_1, ISO_14495_1, ISO_15444_1 or ISO_13818_1).
- **Only send the images needed for our procedure: 1 localizer + 1 set of axial images**
- Do not send any recons, reformats, viewer software, etc.
- **Important:** Retain a permanent archive (PACS) copy of the RAW data of images (as scanned by the original parameters and in the uncompressed format).