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CT SCAN PROTOCOL FOREARM

Purpose and Summary

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.

NOTE

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General Scan Requirements

- 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.

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.

RECONSTRUCTION

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.

Scanning Parameters

Region of interest / Axial Scan	From the elbow to the carpal meta-carpal joint
	
Collimation	<p>Slice thickness: 0.625mm or smaller</p> <p>Slice increment: Contiguous Slices</p>
kVp	90-120 (higher for obese patients or metal hardware in scan region)
mAs	As given by the automatic system
Pitch	Use 1 or smaller
Field of View (FOV)	Use the smallest FOV possible to capture the required bone regions. 200mm x 200mm or smaller
Matrix	Use a 512 x 512 matrix
Kernel / Algorithm	Bone / Details

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.

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.

NOTE

We recommend building a “Materialise forearm” in your CT scanner with the appropriate ranges and parameters.

IMPORTANT

Retain a permanent archive (PACS) copy of the RAW data of images (as scanned by the original parameters and in the uncompressed format).

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