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CT SCAN PROTOCOL

HUMERUS

Important Information

This CT scanning protocol consists of a localizer and a detailed axial scan of the humerus. The CT scan quality needs to identify clear bony edges and surface detail 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

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

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.
- We request a bilateral scan - left and right humerus. In order to reduce the scanned area, make two acquisitions having the arm in 90 degrees abduction, one after the other one. If this is not possible, put the patient in supine position, arms at sides of the body and with the shoulder in neutral rotation.
- Always place a marker indicating the side. Use a marker that does not 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 change the table position between images so that all images create one unified volume.

FIELD OF VIEW (FOV)

If possible capture the full humerus and provide two separate image sets with a maximum FOV of 20 cm.

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.

KERNEL

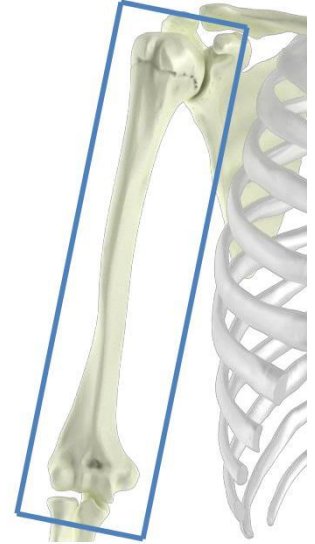
Use a soft tissue/moderate reconstruction algorithm, with no edge enhancement.

Localizer

Scout - Full humerus

Helical Scan

Region of interest	Humerus
Slice thickness	1.25mm or smaller
Slice increment	≤ ½ of slice thickness (50% overlap)
kVp	90-120
mAs	As given by the automatic system
Pitch	Use 1 or smaller
Field of View (FOV)	Use 20cm or smaller
Matrix	Use a 512 x 512 matrix
Kernel / Algorithm	Moderate / Soft tissue



Reconstruction and Delivery of the Images

- **No** secondary reconstructions; images must be scanned at the given parameters or more strict.
- **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 **primary 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).

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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.

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