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CT SCAN PROTOCOL

LEG-LOW DOSE POST-OP

Important Information

This CT scanning protocol consists of a localizer and a detailed axial scan of 3 short regions of the lower extremity: ankle, knee, and hip. The CT scan quality (with clear bony edges and details) is critical for an accurate post-op analysis of the data. Deviations from this protocol may result in an unusable scan.

Please contact Materialise's support team if you require further clarification.

NOTE

CT scan quality (with clear bony edges and details) is critical for an accurate post-op analysis of the data.

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.
- Position the patient as follows: supine, feet first (SFF), patellae pointing forward and the knees in maximal extension, toes pointing straight up.
- Always place a marker on the contra lateral knee (for indication of left or right). Use a marker that doesn't hinder the quality of the CT scan.
- If an implant is present in the contra lateral knee, elevate the contra lateral knee to prevent artifacts appearing in the joint line of interest.

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 (25cm by 25cm maximum) to capture the whole of the required bone regions. This will require careful alignment of the leg to capture the femoral head, knee and talus.

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

Materialise NV, +32 (0) 16 744 930, ortho@materialise.com, SGC.CustomerSupport@materialise.com

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

- We recommend building a "**Materialise leg low dose post-op**" in your CT scanner(s) with the appropriate ranges and parameters.
- **GE users tip**: if you do not have a pre-defined protocol built: select "repeat series" between scan ranges to scan the next range.
- **Do not select "add a group**".
- Localizer. Scout: From the ankle joint to above the femoral head of the hip (sagittal and coronal).

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Areas of Interest

Region of interest of Axial 1	Hip region: from below to above the femoral head
Collimation	Slice thickness: 3.00mm
	Slice increment: 3.00mm (Contiguous Slices)
kVp	90 (120 for obese patients or metal hardware in hip region)
mAs	As given by the automatic system
Pitch	Use 2 or smaller
Field of View (FOV)	Use 20cm or smaller (bilateral: max 32cm)
Matrix	Use a 512 x 512 matrix
Kernel / Algorithm	Moderate / soft tissue (**DO NOT** use “bone”)
Region of interest of Axial 2	Hip region: from 5cm below through 25cm above the knee joint.
Collimation	Slice thickness: 1.25mm - 1.50mm
	Slice increment: 1.25mm - 1.50mm (contiguous slices)
kVp	120
mAs	As given by the automatic system
Pitch	Use 1 or smaller
Field of View (FOV)	Use 25cm or smaller (bilateral: max 32cm)
Matrix	Use a 512 x 512 matrix
Kernel / Algorithm	Moderate / soft tissue (**DO NOT** use “bone”)
Region of interest of Axial 3	Ankle region: a few cm’s below and above the ankle joint
Collimation	Slice thickness: 3.0mm
	Slice increment: 3.0mm (contiguous slices)
kVp	90
mAs	As given by the automatic system
Pitch	Use 2 or smaller
Field of View (FOV)	Use 25cm or smaller (bilateral: max 32cm)
Matrix	Use a 512 x 512 matrix
Kernel / Algorithm	Moderate / soft tissue (**DO NOT** use “bone”)

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.

NOTE
We recommend building a "Materialise leg low dose post-op" in your CT scanner with the appropriate ranges and parameters.

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.

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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