

## CT PROTOCOL

Reference Guide



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## 1. INTRODUCTION

This document provides guidelines to follow when performing CT scans that are required by Medacta International for the MySpine Webplanner software. Spatial parameters (slice thickness, spacing, FOV, etc.) cannot be changed. Radiographic technique settings can be adjusted minimally to suit your CT system. Medacta International reserves the right to refuse scans performed with settings outside of this protocol.

## 2. PATIENT POSITION

Patient must be at isocenter in the gantry.

## 3. IMAGE SPECIFICATIONS

|                         |                                            |
|-------------------------|--------------------------------------------|
| IMAGE TYPE              | Axial only                                 |
| AUTO Ma (milliAmpere)   | 30 mA (or higher)                          |
| MATRIX                  | 512 x 512 pixels                           |
| SLICE THICKNESS         | 0.5mm to 1.0 mm (0.6 or 0.625 is standard) |
| DISTANCE BETWEEN SLICES | Equal to (or less than) slice thickness    |
| PITCH                   | 0.9 - 1.0                                  |
| DFOV                    | 15 - 20 cm (20 cm is preferable)           |

|                           |                                        |
|---------------------------|----------------------------------------|
| ROTATIONAL TIME           | 0.8 seconds*                           |
| kV (kiloVolts)            | 120 kV (or higher)                     |
| ALGORITHM                 | Bone                                   |
| EXPOSURE TIME             | 500 milliseconds (or more)             |
| SCAN FIELD OF VIEW (SFOV) | Large body                             |
| ROTATIONAL SPEED          | 11 - 14 mm/rot (reduce if too "noisy") |

\* If settings only allow 0.5 or 1.0 second please choose 1.0 second

## 4. IMPORTANT SCAN NOTES

- For Siemens CT systems:
  - If applicable, make sure that Fixed Axial is turned ON (generally applicable to Siemens GO systems)
  - If applicable, make sure that FAST is turned OFF
- If there are in-situ implants, apply a MAR (Metal Artifact Reduction) Algorithm if available.
- For the C-Spine scans, please include the atlas (Cervical #1) to T1 (Thoracic #1).
- For T-Spine scans, please include C7 (Cervical #7) to L1 (Lumbar #1).
- For L-Spine scans, please include T12 (Thoracic #12) to S1 (Sacrum #1).
- For Sacrum scans, please include L5 (Lumbar #5) to full Pelvis (Sacrum and Ilii).
- For the cage planning, it is mandatory to at least have the complete CT scan of the level above and below the disc to be treated. **Moreover, it is recommended to scan from T12 to Sacrum.**
- To evaluate the sagittal balance, a lateral standing X-ray is needed. During the acquisition, the upper extremities must not interfere with the X-ray of the spine. The vertebral boundaries must be easily recognizable in order to take the proper landmark acquisition (see figure 1). To display the 2D-3D matching, the A-P standing X-ray is necessary. It is recommended to have an X-ray that includes all of C2 down to the head of the femur.



Figure 1

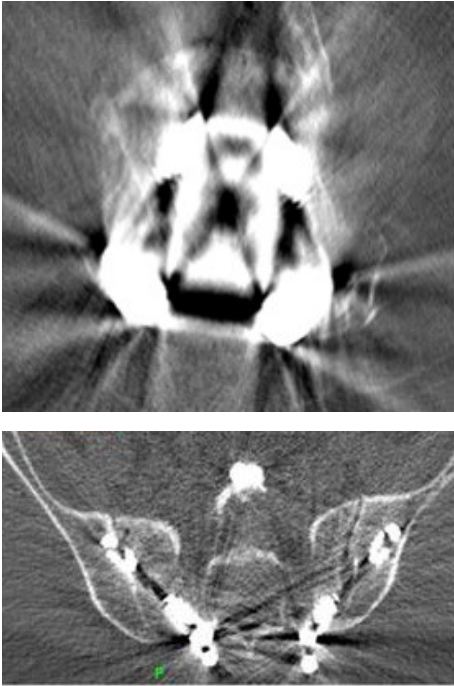
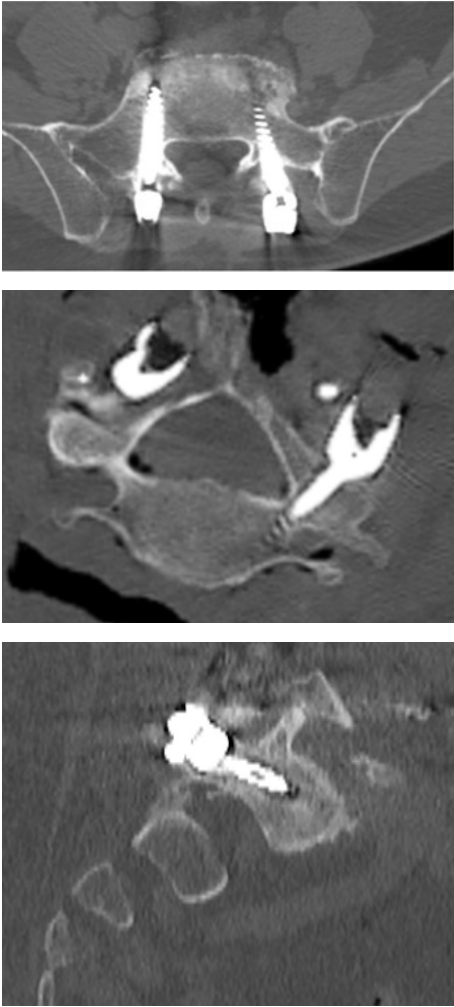
## 5. IMAGE EXPORT

- Scan must be exported as a primary scan (.DICOM).
- Re-sampled and secondary series will be rejected.
- Derived and reconstructed images will not be accepted.
- Do not include localizers within the series.
- No lossy compression on the images. Image data should be exported in the raw format (MONOCHROME2) or compressed using JPEG2000 lossless.

## 6. CT SCAN EXAMPLES

The following figures show examples of conformed and non-conformed CT scans.

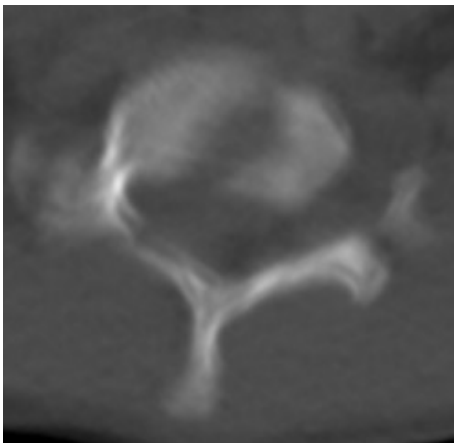
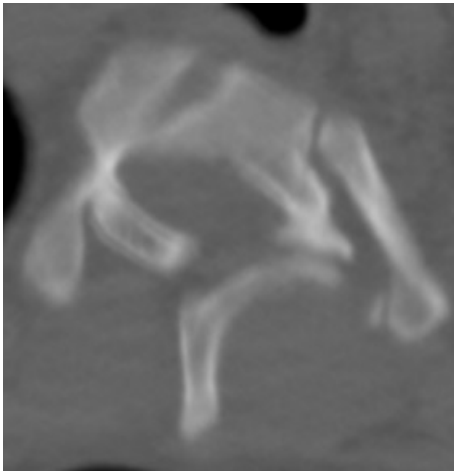
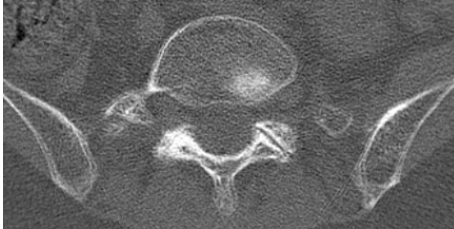
### PRESENCE OF IN-SITU IMPLANTS

| <p><b>NOT CONFORMED</b></p> <p>High scattering noise caused by in-situ implants: in this case, applying a MAR (Metal Artifact Reduction) algorithm is suggested.</p> | <p><b>CONFORMED</b></p> <p>Scattering noise caused by in-situ implants can be reduced by applying appropriate filters, such as the MAR (Metal Artifact Reduction) algorithm, allowing the vertebral contours to be properly identified.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                    |                                                                                                                                                          |

# MOVEMENTS DURING THE SCAN

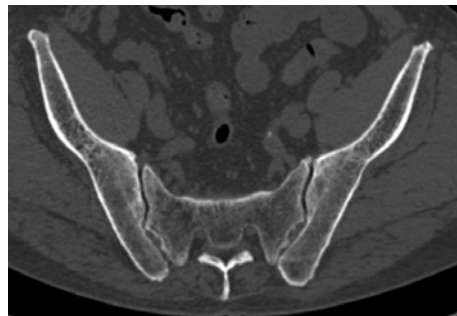
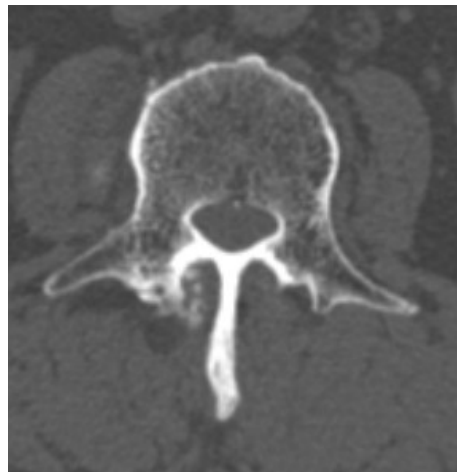
## NOT CONFORMED

Split cortical bone contours were caused by patient movement during the scan, resulting in the inability to properly perform the 3D reconstruction. The real bone contours cannot be correctly identified.



## CONFORMED

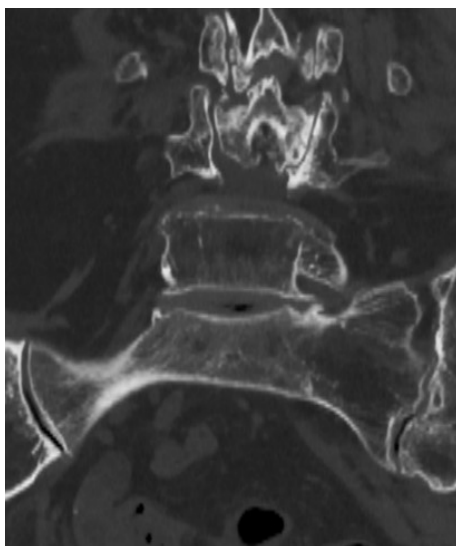
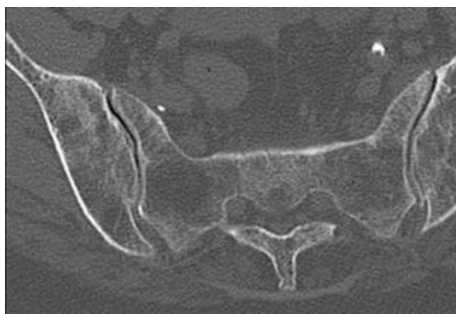
No movement occurred in the scan, therefore the bone contours can be properly identified.



## SACRUM AND ILIA NOT COMPLETELY SCANNED

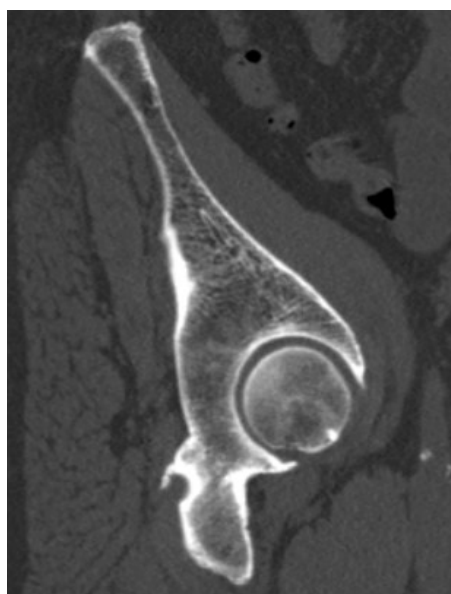
### NOT CONFORMED

The sacrum and ilia are not scanned completely, so the sacroiliac screws can't be properly planned due to the unknown pelvic anatomy.



### CONFORMED

The sacrum and ilia are properly scanned, including at least the sciatic notch and full mediolateral encumbrance of each ilium, allowing for the accurate planning of sacroiliac screws.

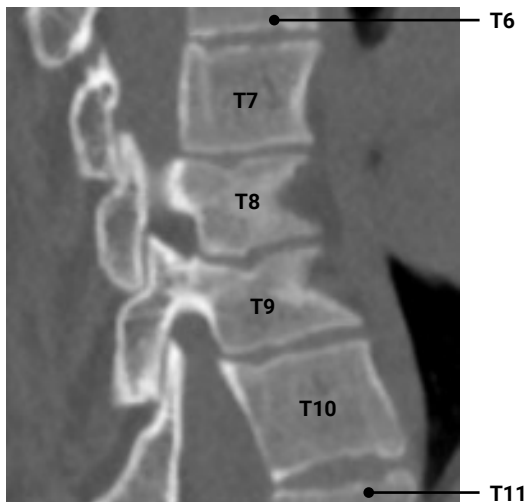


## INCOMPLETE VERTEBRAL SCAN

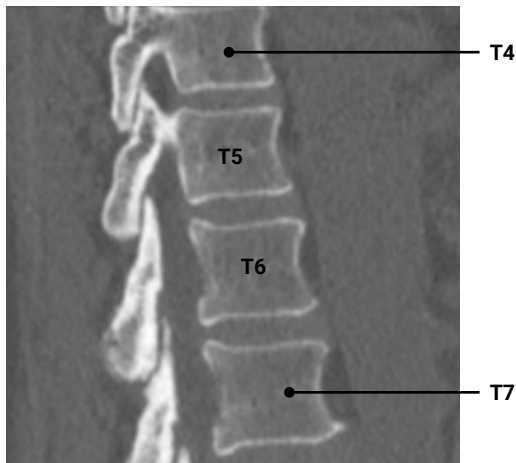
### NOT CONFORMED

It is crucial to include adjacent vertebrae with anatomical reference points to ensure accurate identification and counting. Incomplete vertebrae will not be accepted, since all vertebrae intended for treatment must be fully included in the scan.

In the picture below, T6 and T11 are partially cut, making it impossible to check for impingements with these vertebrae. The only vertebrae that can be properly planned are T8 and T9.



In the picture below, T7 is partially cut, making it impossible to plan screws for this vertebra. Moreover, T3 is absent. The only vertebrae that can be properly planned are T5 and T6.



### CONFORMED

All vertebrae intended for treatment are fully in the scan. Additionally, the adjacent vertebrae with anatomical reference points are present to ensure accurate identification and counting.

In the picture below, the scan is complete from T9 to the Sacrum. All the vertebrae from T10 to the Sacrum can be properly planned.



## 7. CONTACT INFORMATION

For more information or questions, do not hesitate to contact Medacta International by email at [radiology@medacta.ch](mailto:radiology@medacta.ch).

## NOTES







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**REDEFINING BETTER  
IN ORTHOPAEDICS  
AND SPINE SURGERY**

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MySpine®  
CT Protocol

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