

This document outlines requirements that should supplement any in-house protocol for CT, MRI, and/or X-ray data.

OSSIS uses patient specific imaging as a crucial input for the design and manufacture of custom implants and models. The images are critical and adherence to this protocol is important. Please follow instructions and ensure that all images are saved in DICOM format.

Contact your local OSSIS representative with any queries, or if you require support when implementing this protocol.

This protocol details requirements for CT, MRI, and X-ray across different regions of the body. Refer to the scan modality for the specific area prescribed.

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Contact OSSIS if imaging referral is for any other region.

**Note:** If the patient has had a recent scan in the region prescribed, there is a possibility that OSSIS can use the existing imaging. Please contact OSSIS if the patient has imaging as per below:

### CT Scan

- Scan is less than 6 months old
- Scan slice thickness is 2 mm or less

### MRI or X-Ray

- Scan is less than 6 months old

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## 1. Pelvis



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	Captures all bone and soft tissue of the entire pelvis (from above iliac crests to below ischial tuberosity) All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Axial images only
Matrix	512×512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms (for metal include an additional artefact reduction reconstruction if available, such as O-MAR)
Techniques To Reduce Metal Artefact	Lowering pitch with thinner reconstructed slices, increasing kVp, and increasing HU scan range CT scale if possible

### MRI INSTRUCTIONS:

If available and cleared, contrast can be given, and scan acceleration techniques used.

MRI Requirements	
FOV	As above
Acquisition	Two scans with thinnest slices feasible <ul style="list-style-type: none"> <li>- One using the highest definition parameters for diagnostic tumour imaging</li> <li>- One with the highest definition parameters for enhancing bone boundary definition (this will be used to align MRI and CT scans)</li> </ul>

### X-RAY INSTRUCTIONS:

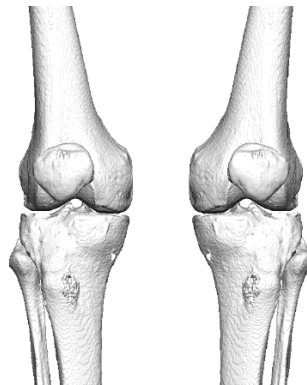
AP Standing\* X-Ray

X-Ray Requirements	
Direct AP with patient standing	
Hands and arms away from pelvis	
Scan must include entire pelvis and proximal femurs	
*If patient is unable to stand, perform AP Supine X-Ray	



**Note:** If patient has an in-situ acetabular implant and can stand, perform additional Lateral X-Ray

## 2. Knee



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	10 cm* proximal and distal of both knees All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Axial images only
Matrix	512x512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms (for metal include an additional artefact reduction reconstruction if available, such as O-MAR)
Techniques To Reduce Metal Artefact	Lowering pitch with thinner reconstructed slices, increasing kVp, and increasing HU scan range CT scale if possible

\*for patients getting imaged due to a tumour, contact OSSIS to confirm FOV

### MRI INSTRUCTIONS:

If available and cleared, contrast can be given, and scan acceleration techniques used.

MRI Requirements	
FOV	As above
Acquisition	Two scans with thinnest slices feasible <ul style="list-style-type: none"> <li>- One using the highest definition parameters for diagnostic tumour imaging</li> <li>- One with the highest definition parameters for enhancing bone boundary definition (this will be used to align MRI and CT scans)</li> </ul>

### X-RAY INSTRUCTIONS:

AP Standing\*\* X-Ray

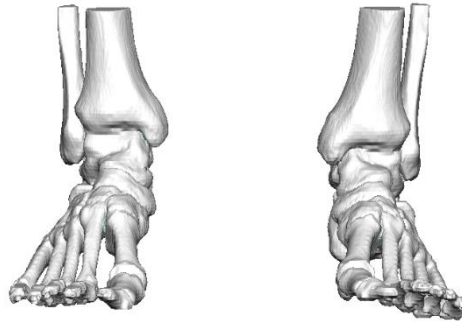
Lateral Standing\*\* X-Ray

X-Ray Requirements
Direct AP with patient standing
Lateral with patient standing
Scan must include affected knee

\*\*If patient is unable to stand, perform AP and Lateral Supine X-Rays



## 3. Foot/Ankle



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	1 cm distal of foot to 10 cm proximal to ankle joint of both sides All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Axial images only
Matrix	512x512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms (for metal include an additional artefact reduction reconstruction if available, such as O-MAR)
Techniques To Reduce Metal Artefact	Lowering pitch with thinner reconstructed slices, increasing kVp, and increasing HU scan range CT scale if possible

### X-RAY INSTRUCTIONS:

Oblique Standing\* X-Ray

Lateral Standing\* X-Ray

#### X-Ray Requirements

Oblique with patient standing

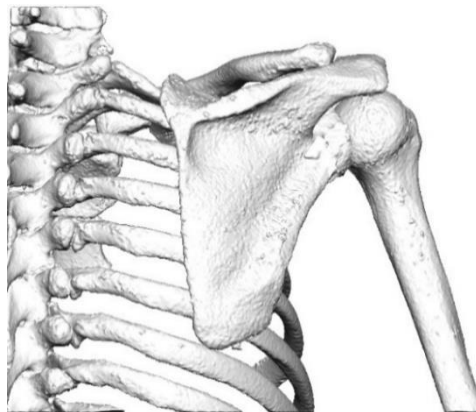
Lateral with patient standing

Scan must include entire bone structure, including 10 cm of tibia of affected side

\*If patient is unable to stand perform Oblique and Lateral Supine X-Rays



## 4. Scapula



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	Entire scapula and acromioclavicular joint, extending 10 cm distal of proximal humerus. Centre the shoulder of interest in the isocentre of the gantry. All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Axial images only
Matrix	512×512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms (for metal include an additional artefact reduction reconstruction if available, such as O-MAR)
Techniques To Reduce Metal Artefact	Lowering pitch with thinner reconstructed slices, increasing kVp, and increasing HU scan range CT scale if possible

### MRI INSTRUCTIONS:

If available and cleared, contrast can be given, and scan acceleration techniques used.

MRI Requirements	
FOV	As above
Acquisition	Two scans with thinnest slices feasible <ul style="list-style-type: none"> <li>- One using the highest definition parameters for diagnostic tumour imaging</li> <li>- One with the highest definition parameters for enhancing bone boundary definition (this will be used to align MRI and CT scans)</li> </ul>

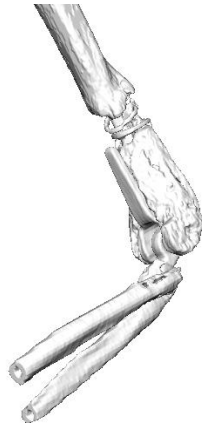
### X-RAY INSTRUCTIONS:

AP X-Ray

Lateral X-Ray

X-Ray Requirements
Direct AP
Lateral
Scan must include entire bone structure with 10 cm of humerus of affected side

## 5. Elbow



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	Entire elbow including 10 cm proximal and distal of the elbow joint All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Axial images only
Matrix	512x512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms (for metal include an additional artefact reduction reconstruction if available, such as O-MAR)
Techniques To Reduce Metal Artefact	Lowering pitch with thinner reconstructed slices, increasing kVp, and increasing HU scan range CT scale if possible
Patient Positioning	Elbow to be in supine and in full extension (if patient is capable)

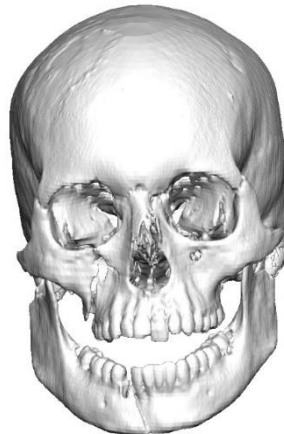
### X-RAY INSTRUCTIONS:

AP X-Ray

Lateral X-Ray

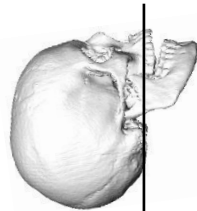
X-Ray Requirements	
Direct AP	
Lateral	
Scan must include entire bone structure on affected side with 10 cm of humerus, radius, and ulnar	

## 6. Craniomaxillofacial



### CT SCAN INSTRUCTIONS:

CT Scan Requirements	
Gantry Tilt/Oblique Angle	0°
FOV	Reduce FOV so bounds patients head, 200 mm is often adequate All slices to have same field of view, reconstruction centre, and table height
Slice Thickness	No more than 1.25 mm with thinnest collimation possible
Pitch	0.5:1
Slice Increment	50%
Reconstruction Planes	Each Axial, Coronal, and Sagittal
Matrix	512x512
Reconstruction Algorithm/s	Bone/Sharp/High Resolution, and Standard Algorithms
Patient Position	Position patient so the hard palate is parallel to the axial image plane



If available have the patient hold a bite block for the duration of the scan

## 7. File Format And Transfer

### DICOM Information

All images should be in DICOM format\* and contain the following information:

- Patient name
- Patient date of birth
- Side of analysis
- Date of scan
- Radiology practice name

\*For CT DICOM images the scanner should be set “raw image” format, with no compression. The complete dataset of primary DICOM images must be provided.

### Additional Information

Radiology notes should accompany the imaging.

For CT scan, include scout image/s in data sent to OSSIS.

### File Transfer

Four methods of image transfer are available:

- OSSIS Website (via Ambra system); [www.ossis.com/image-upload](http://www.ossis.com/image-upload)
- Patient Archiving and Communication System (PACS)
- Fileshare
- Mail images on a CD or USB

Image transfer must be discussed with OSSIS prior to sending images.

Do not send hardcopy films to OSSIS.

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