

Dynajoint X-ray Protocol



Clinical Indication and Pre-Imaging Assessment

Indication for a custom TMJ implant, which may include:

- Severe TMJ ankylosis
- End-stage TMJ osteoarthritis
- Condylar resorption
- Failed previous TMJ prosthesis
- Post-traumatic condylar defects
- Congenital deformities

Patient Preparation

The patient must remove:

- Dentures
- Removable orthodontic appliances
- Metallic jewelry
- Piercings
- Hearing aids

Occlusion Position

- Teeth in maximum intercuspation (closed mouth) is usually required for prosthetic design.
- Sometimes an open-mouth scan may also be requested to assess joint dynamics.

Head Stabilization

The patient must maintain a stable head position to avoid motion artifacts.



CT Acquisition Protocol

High-resolution craniofacial CT scan is require

Scan Area

The scan must include:

- Entire mandible
- Both temporomandibular joints
- Temporal bones
- Zygomatic arches
- Maxilla (for occlusal reference)

FOV (Field of View)

18–25 cm FOV to include the full mandible and skull base.

Slice Thickness

- Slice thickness:
- $\leq 0.5\text{--}0.625$ mm

Thicker slices reduce the precision of the 3D reconstruction.

Imaging Parameters

- Tube voltage: 120 kVp
- Tube current: 200–300 mAs (depending on scanner)
- Slice thickness: 0.5–0.625 mm
- Matrix: 512×512

Image Export for Implant Design

DICOM Export

Images must be exported as:

- DICOM format
- No compression
- Original resolution

These files will be used for:

- 3D segmentation
- Surgical planning
- CAD design of the custom implant

Complete CT dataset must be shared with RESDEVMED,LDA. RESDEVMED do not need the patient's identification.



CT/CBCT image verification

Before sending the CT to the implant manufacturer, the surgeon must verify:

- No motion artifacts
- Complete visualization of TMJ structures
- Clear cortical bone boundaries
- No truncated anatomy
- Proper occlusion position
- Adequate slice thickness

If any issues are detected, the scan must be repeated.

Clinical Considerations

Radiation Dose

Since the scan involves the craniofacial skeleton:

- Apply ALARA principle (As Low As Reasonably Achievable)
- Avoid unnecessary repeat scans.

Metal Artifacts from Dental Restorations

Dental implants or crowns may cause artifacts that interfere with segmentation.

Possible solutions:

- Metal artifact reduction algorithms
- Adjusting gantry angle
- Higher kVp settings

Occlusion Accuracy

Occlusion is crucial for implant positioning.

If occlusion is unstable:

- A bite registration splint may be used.

Clinical Considerations

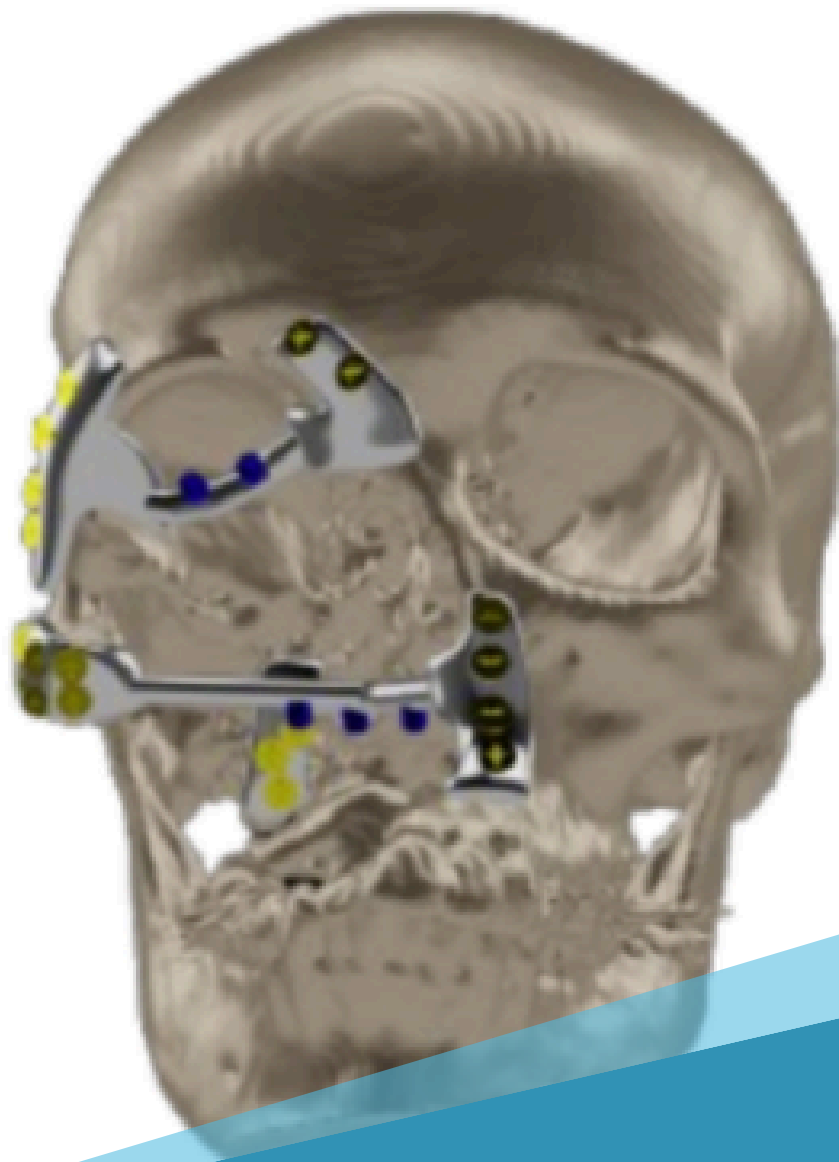
Bilateral Imaging

Even for unilateral TMJ reconstruction, the contralateral joint must be scanned, because:

- It serves as anatomical reference
- Allows symmetry analysis.

Patient Movement

- Motion artifacts will:
- Distort the mandibular contour
- Affect implant fit
- Therefore strict immobilization is essential.



Thank you



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V.01	11/03/2026	Creation of the document

