IMAGING PROTOCOL

for digital planning in orthognathic surgery

CT / CBCT acquisition and dental data only

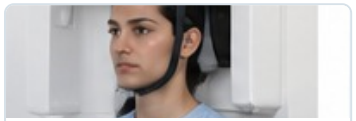
ACCURACY · REPRODUCIBILITY · PREDICTABILITY

The quality of digital planning depends directly on the quality of the imaging acquisition and the dental data. Following the protocol = surgical predictability.

1 CT / CBCT ACQUISITION

GENERAL PRINCIPLES

- Scan in an upright position (seated / standing)
- Natural Head Position (NHP)
- Mandible in centric relation (CR)
- No chin support
- No forehead support / bands across the forehead
- Patient in slight disocclusion during the scan



Correct positioning

Chin support — incorrect

✓ RECOMMENDED

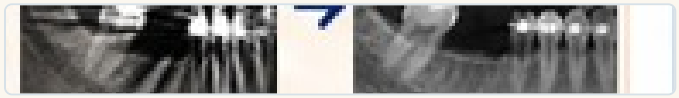
Stabilise the head with posterior support and a light forehead band only if necessary.

✗ DO NOT USE

Chin support (it deforms the soft tissues) or any pressure on the maxilla.

! IMPORTANT — METAL ARTEFACT REDUCTION

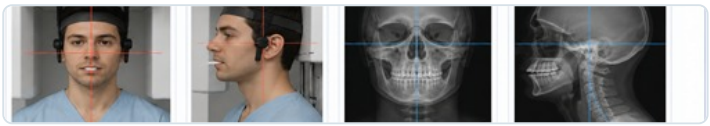
Enable the metal-artefact-reduction protocol during CT / CBCT acquisition — it reduces streaks and shadows from metallic materials (braces, fillings, implants).



2 RECOMMENDED CT / CBCT PARAMETERS

PARAMETER	CT (SPIRAL)	CBCT (CONE-BEAM)
FOV (field of view)	Full head (min. 16–22 cm)	Full head (min. 16–22 cm)
Matrix	≥ 512 × 512	≥ 512 × 512
Slice thickness (Z)	0.5–1.0 mm (reconstruction)	0.3–0.6 mm
In-plane reconstruction (X,Y)	0.5–0.7 mm	0.3–0.4 mm
Orientation	Axial, preferably	Axial, preferably
Contrast agent	NO	NO
Scan time	Per device protocol	20–40 sec
Table feed (CT spiral)	< 3 mm / rotation	—
Metal-artefact-reduction protocol	**ENABLED**	**ENABLED**

2.1 — SCAN VERIFICATION (SCOUT)



Correct positioning · Head symmetry · No chin support · NHP & CR respected

Wax wafer: a wax occlusal record of the CR position — use it to keep the mandible in centric relation during the scan, if necessary.

2.2 — OCCLUSION IN CR (CENTRIC RELATION)

✓ CORRECT — IN CR

- Uniform bilateral contacts
- Relaxed mandible
- Condyles centric

✗ INCORRECT — OTHER POSITION

- Anterior / lateral shift
- Non-uniform contacts
- Condyles not centric

3 DENTAL DATA (MANDATORY)

CBCT alone does not provide precise occlusal information on its own — dental data completes the picture.

! THREE SCANS ARE REQUIRED

We always need a dedicated scan of each arch plus the bite — the CT / CBCT alone is not enough:

- **Upper jaw** — full maxillary arch
- **Lower jaw** — full mandibular arch
- **Occlusion** — both arches together, in centric relation (CR)

3.1 — OPTIONS FOR CAPTURING DENTAL DATA

1. Intraoral scan (preferred)

- High accuracy · STL directly usable · reproducible

2. Plaster models

- Scanned with an optical scanner or lab CBCT · includes the CR occlusion

3.2 — FILE FORMATS: DENTAL DATA

Intraoral scan	`.STL (binary / ASCII) · .PLY · .OBJ`
Scanned models (optical / CBCT)	`.STL · .PLY · .OBJ`
Occlusion in CR	`.STL — both arches, same relation`

3.3 — FILE FORMATS: CT / CBCT

Imaging data	`.dcm · .DICOM (uncompressed)`
Reconstructions / surface	`.dcm · .DICOM`
Volume export (optional)	`DICOMDIR (.dcm series)`

GENERAL RECOMMENDATIONS

- Always provide the complete data set (all DICOM files)
- Avoid lossy compression on export
- Include patient and orientation information
- Communicate the CR position and the type of record used

FOR OPTIMAL RESULTS

- Always follow the positioning and scan parameters
- Provide complete, correct dental data
- Share the relevant details with the planning team

SIMPLIFIED WORKFLOW

CT / CBCT acquisition + **Dental data** occlusion in CR + **Integration** & planning → **3D surgical** planning

KEY MESSAGE

Planning quality depends on two essentials:

1. Correct CT / CBCT acquisition per protocol

2. Complete, precise dental data in CR