



CT SCANNING PROTOCOL

General Overview:

In order to fabricate a CBCT based surgical guide we require uncompressed DICOM3 data from a Cone Beam CT or Medical CT. The records and type of scan we require depend upon the software and the technique to be utilized. The cone beam settings and scanning instructions mostly remain consistent regardless of the type of scan (variances in the box to the right). The models or impressions should be of high quality because the accuracy of the surgery depends upon these initial records. The restorative tooth position must be determined using an existing appliance - a denture tooth setup, or a virtual or diagnostic wax-up. This should be approved by the restoring dentist and/or the patient. In order to begin the diagnostic process complete our CT Order Form with explicit instructions on the restorative goals and requirements.

General scanning instructions:

- Set the table height so that the mandible or maxilla is centered in the scan field.
- All slices must have the same field of view and table height.
- Scanning with a field of view that is too large can compromise the resolution of the reformatted images. Scanning with a field of view that is too small can cause the jaw to not fit in all the axial images.
- Not overlapping the axial slices can reduce the quality of the reformatted images.
- Scan all slices of the study in the same direction.
- Scan with the same slice spacing; the slice spacing must be less than or equal to
- the slice thickness. The slice thickness should not be larger than 1mm.
- All of the remaining teeth/scan prosthesis should be completely visible in the
- images up to the occlusal plane.
- The gantry tilt should be 0 degrees.

Cone Beam Settings

General
0.4 Voxels
Scan Time 20 Seconds
FOV 140 and 170mm
Stitched scans on small FOV Matrix 512x512

System Specific Instructions

Kodak System=Scan Appliance should be scanned at KV 80 Ma 2

Galileos System = Scan Appliance must be scanned inside of the special Sirona aluminum scan cylinder Part # 6299759 using settings: 42 MAS w/o Hi Contrast VO1

PlanMeca=Scan Appliance should be scanned at KV 70 Ma 10

Preparation of the patient

- Remove any non-fixed metal dentures or prosthesis in addition to any jewelry that might interfere with the region to be scanned. Non-metal dentures may be worn during the scanning.
- If the patient has a scan prosthesis (radiographic template), it should be worn.
- Make the patient comfortable and instruct him/her not to move during the procedure. Normal breathing is acceptable, but any other movement, such as tilting and turning the head can cause motion artifacts that compromise the reformatted images, requiring the patient to be rescanned.

Aligning the patient

- For correct alignment, the transaxial CT slice plane should be parallel to the occlusal plane of the upper jaw (see figure 2). The gantry tilt is 0°. Ideally, you should determine the occlusal plane using the patient's scan prosthesis. If the patient does not have a scan prosthesis, use the existing teeth to align the patient.
- Stabilize the relationship of the jaws during the scan.
- Scan patient with arches opened using cotton rolls or a bite registration index.

Positioning for the mandible

- Position the first slice just below the inferior border of the mandible. Position the last slice just above the lower teeth, or in the absence of teeth, set the last slice just above the superior border of the mandibular ridge. If the patient is wearing a scan prosthesis, position the last slice just above the prosthesis. It is critical you include the entire prosthesis in the scanned study and that no teeth or prosthesis are visible in the last slice.

Positioning for the maxilla

- Position the first slice just below the upper teeth. In the patient is edentulous, and is wearing a scan prosthesis, position the first slice just below the prosthesis. It is critical you include the entire prosthesis in the scanned study. Position the last slice 4 to 5 mm above the floor of the nasal cavity.

Positioning and Scanning the Scan Appliance Separately (without patient)

- The scan appliance should be placed on Styrofoam (Polystyrene), foam, or on the guide holder specifically designed for this purpose and supplied by the Cone Beam manufacturer.
The appliance should be positioned in the same orientation as scanned in the patient's mouth.