3D SYSTEMS

CT scanning
protocol

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Thank you for taking a moment to read this protocol. The quality of the CT or CBCT scan is the most important aspect of creating case-specific anatomical models. Your observation of the recommendations made in this protocol will have a significant impact on the accuracy of the final model. We understand concerns about keeping the radiation dose to your patients as low as reasonably achievable, therefore, please apply these guidelines as appropriate to your patients. Please do not hesitate to contact your Sales Representative.

Please keep in mind the following key points

- Please use a 3D scanning routine that provides high resolution images as would be suitable for image guided surgery, stereotactic planning or other 3D applications. It may be useful to consult with your CT vendor's Application Specialist for advice on optimal parameters for your machine that provide the best scan with acceptable radiation dose levels.
- Acquire scans at a high spatial resolution. Series should be acquired with thin, contiguous image slices (equivalent thickness and spacing of 1.25 mm or less) and as small a field of view (FOV) as possible while still including the patient's anatomy of interest.
- Please provide images in the original scanning plane. If software post-processing is performed to reorient or reformat the scan volume, then a series of thin slice images in the original acquisition plane MUST be included.
- Do not use gantry tilt during image acquisition. Images acquired with gantry tilt then post-processed to reorient images (i.e. "take out" tilt) are not acceptable.

- Please ensure that scans are free from motion artifact. Patient must remain completely still through the entire scan. If patient motion occurs, the scan must be restarted. Image distortion from patient motion can severely compromise the accuracy of a model.
- Image artifact caused by metallic implants can obscure anatomy of interest. Please take steps to minimise artifact from the presence of metal. It is useful to position the patient so that the occlusal plane is parallel to the image plane (see figure). This can help to limit artifact from metallic dental restorations to the region around the teeth.
- Archive the entire study in uncompressed DICOM format on CD-R or DVD for shipping.

Recommended protocol for medical CT scanners

Scan spacing	1.25 mm (equal to slice thickness)
Pixel size	0.60 mm or less
Field of view	20.0 - 25.0 cm
Algorithm (examples)	GE: standard (not bone or detail) (Siemens: H30s, Toshiba: FC20, Philips: B)
Gantry tilt	0°
Archive media	CD or DVD
File type	DICOM (uncompressed)
Series	Original/primary/axial (no recon, reformat or post process data)

Recommended protocol for medical CBCT scanners

Scan time	Longest available
Voxel size	0.3 - 0.5mm
Field of view	Largest available
File type	CT (one file per slice)
Reconstruction	Axial
Compression	Uncompressed

Patient positioning

Occlusal plane should be parallel to the gantry.
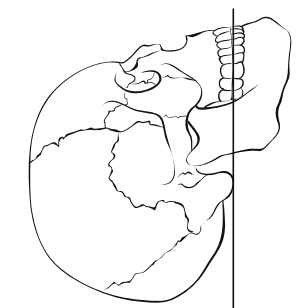
Please visit
www.3dsystems.com/medicaldata for digital transfer of DICOM images.

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