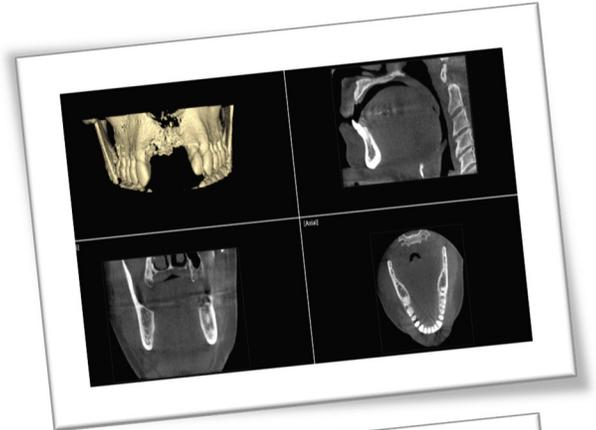# Scanning Protocols for Implant Cases

There are (3) three different scans needed for every implant case regardless of the case type.
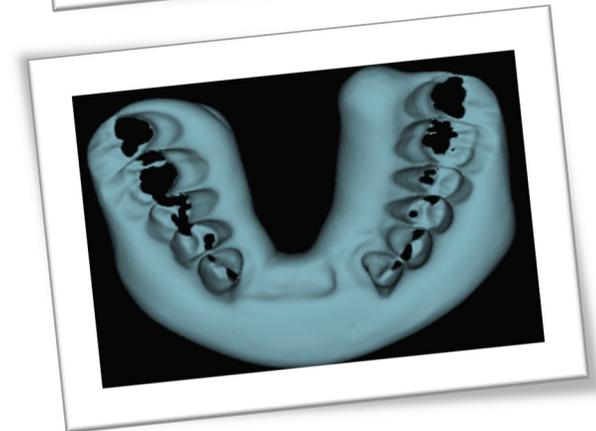
1. **The Patient Scan** – Only one time is required.
   Scan the patient with cotton Rolls.

2. **The Impression Scan**
   Maxilla or Mandible whichever is receiving the implant.

3. **The Bite Registration Scan** –
   Bite needs to be scanned separately.

Note1: The bite registration should always be taken using PVS putty in centric occlusion. Do not open the bite when you take it out. Also, do not use blue mousse for the bite and instead use standard PVS putty material. The putty material provides better results than blue mousse.

Note2: Please make sure that you place a "**ONE INCH FOAM** on the Chin holder before scanning in order to separate the bite registration, the Impressions, and the dentures. The foam will act as a separating agent to avoid fusion of the scanned objects with the chin holder.

Scanning Protocols for Implant Cases

4. **Pre – Scan:**
    a. Remove all non-fixed dentures, prosthesis, or retainers. Remove all jewelry in the field of the x-ray.
    b. Position the patient in the normal fashion, sitting upright or lying down, depending on your machine. Head should be positioned parallel to the x-ray beam and looking straight ahead.
    c. Separate the upper and lower arches of the patient with two cotton rolls. One on each side of the mouth.
    d. A tongue blade is used to determine the occlusal plane. Tilt the head, so that the occlusal plane is parallel to the x-ray beam.
    e. **Patient positioning:**
        i. **Maxilla**: scan the patient with the maxillary plane as horizontal as possible to the x-ray beam. Use a tongue depressor to determine the plane if necessary.
        ii. **Mandible**: scan the patient with the mandibular plane as horizontal as possible to the x-ray beam. Use a tongue depressor to determine the plane if necessary.
        iii. **If both**: scan the patient with the mandibular plane as horizontal as possible to the x-ray beam. Use a tongue depressor to determine the plane if necessary.

5. **Scan Settings:**
    a. Use a minimum of 0.3 mm voxel size for the scan.
        i. If using a medical CT, use 0.3 mm contiguous axial or helical slices.
    b. Save the images in a multi-file, non-compressed DICOM 3 format.
    c. Use the same scan settings for all scans related to this patient.

6. **Field of View:**
    a. Please include the bottom of the mandible, if the area of interest includes the mandible.
    b. Please include the TMJ, if the area of interest includes the maxilla.

7. **Scan Instructions:**
    a. Make the patient as comfortable as possible.
    b. Ask the patient not to move or swallow during the exam. Ask to close their eyes, as these may impart motion into the images.
    c. Position patient in the usual fashion. For cone beam CT, use chin cup and headrest.
    d. Scan the patient.
    e. Check the images for motion before sending the patient out.

8. **Scanning of the Impressions, Dentures, and Bite registration.**
    1. Place a one inch flat piece of FOAM between the item scanned and the stent holder of the CT. The foam will act to separate the scan data of the object from the stent holder.
    2. Place the item to be scanned in the same orientation as its position in the person's mouth (see figures). We have discovered inaccuracies of the scan data when the item scanned is upside down.
    3. Verify the dentures must have radio opaque markers on them (see below).

9. **Uploading DICOM instructions:**
    1. DICOM data requirements
        a. DICOM 3 data
        b. Non-compressed multi file format.
    2. Upload all of the DICOM data files to the appropriate folder on the InPronto inSCAN online module.

A. Patient Scan

1. Separate the upper and lower arches of the patient with two cotton rolls.

2. Place a tongue blade with the plane of occlusion perpendicular to the floor under the cotton rolls on one side of the arch.

3. Scan the patient and export the DICOM file and save it under patient DICOM directory.

B. Impression Scan

1. Put upper PVS impression on chin holder in the same direction that the impression was placed in the patient's mouth.

2. Scan impression and export DICOM data and save it in a separate folder under Maxillary PVS impression DICOM.

3. Put lower PVS impression on chin holder in the same direction that the impression was placed in the patient's mouth.

4. Scan impression and export DICOM data and save it in a separate folder under Mandibular PVS impression DICOM.

C. Bite Registration Scan

1. Put bite registration on chin holder. This bite should've been taken in the patient's mouth in centric occlusion just like a conventional crown and bridge bite.

2. Scan bite registration and export DICOM data and save it in a separate folder under Bite PVS impression DICOM.

A.   Patient Scan

1. Separate the upper and lower arches of the patient with two cotton rolls.

2. Place a tongue blade with the plane of occlusion perpendicular to the floor under the cotton rolls on one side of the arch.

3. Scan the patient and export the DICOM file and save it under patient DICOM directory.

B.   Impression Scan

1. Put upper PVS impression on chin holder in the same direction that the impression was placed in the patient's mouth.

2. Scan impression and export DICOM data and save it in a separate folder under Maxillary PVS impression DICOM.

3. Put lower PVS impression on chin holder in the same direction that the impression was placed in the patient's mouth.

4. Scan impression and export DICOM data and save it in a separate folder under Mandibular PVS impression DICOM.

C.   Bite Registration Scan

1. Put bite registration on chin holder. This bite should've been taken in the patient's mouth in centric occlusion just like a conventional crown and bridge bite.

2. Scan bite registration and export DICOM data and save it in a separate folder under Bite PVS impression DICOM.

A. Patient Scan

1. Separate marked or duplicate denture and opposing arch with cotton rolls on each side of patient's mouth.

2. Place a tongue blade with place of occlusion perpendicular to floor under the cotton rolls on one side of the arch.

3. Scan the patient and export the DICOM file and save it under patient DICOM directory.

B. Impression Scan

1. Put denture on chin holder in the same direction that the denture was in the patient's mouth.

2. Scan denture and export DICOM data and save it in a separate folder under Maxillary or Mandibular denture DICOM.

3. Put upper or lower impression on chin holder in same direction that the impression was placed in the patient's mouth.

4. Scan impression and export DICOM data and save it in a separate folder under Maxillary or Mandibular PVS impression DICOM.

C. Bite Registration Scan

1. Place bite registration on chin holder. The bite should've been taken in the patient's mouth in centric occlusion just like a conventional crown and bridge bite with the denture in place against the opposing arch.

2. Scan bite and export DICOM data and save it under Bite PVS impression DICOM.

3. Export DICOM data and save it in a separate folder under Bite PVS impression DICOM.

A.   *Patient Scan*

1. Separate upper & lower Maxillary & Mandibular denture or duplicate denture with cotton rolls on each side of patient's mouth.

2. Place a tongue blade with plane of occlusion perpendicular to floor under cotton rolls on one side of arch.

3. Scan the patient and export the DICOM file and save it under patient DICOM directory.

B.   *Impression Scan*

1. Put upper denture on chin holder in same direction that the denture was in the patient's mouth.

2. Scan denture and export DICOM data and save it in a separate folder under Maxillary denture DICOM.

3. Place lower denture on chin holder in same direction that the denture was in patient's mouth.

4. Scan denture & export DICOM data and save it in a separate folder under Mandibular denture DICOM.

C.   *Bite Registration Scan*

1. Place PVS bite registration on chin holder. This bite should've been taken in the patient's mouth in centric occlusion just like a conventional crown and bridge bite with two dentures in place.

2. Scan bite registration and export DICOM data and save it in a separate folder under Bite PVS impression DICOM.

Taking the bite registration of the patient in centric occlusion

1. Roll PVS putty into a "hot dog" like roll ensuring that the PVS putty is thicker in the distal extension area.

2. Place it over patient's occlusal area around the arch and position thicker portion in the distal extension.

3. Ask patient to bite down ensuring that the bite is accurate and that the midline matches.

4. Mold putty around the teeth and ensure the distal extension bite captures tissue on one side and teeth on the other.

Placement of the radiographic markers prior to scanning

1. Duplicate denture with clear acrylic or use the original denture. Place at least eight markers on the duplicated denture or original.

2. Place three radiographic markers on palatal or lingual areas at least 6-8mm below the CEJ of the teeth.

3. Put one marker on each side of buccal flange distal to Canine using gutta purcha material.

4. The holes should be at least 2 to 3mm in diameter and about 1.5 to 2mm deep.

5. Polish surface with a rubber wheel so that the surface of the gutta purcha is smooth.

6. The markers should not be placed in line - they should be tri-podded.