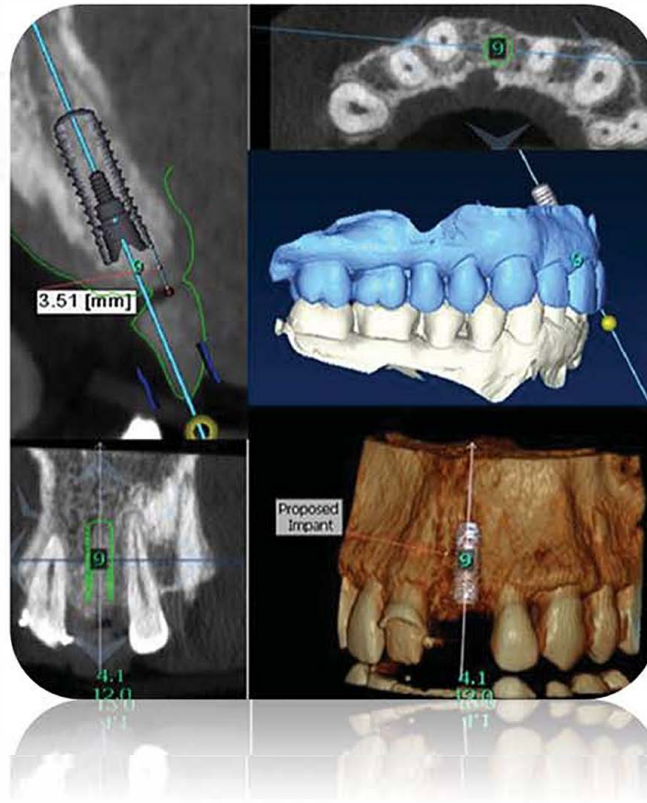


a3Dimage

MOBILE CONE BEAM CT



UNDERSTANDING DIGITAL DENTISTRY:
CBCT AND INTRA-ORAL 3D SCANNING

CBCT



NewTom VGi

- *Vertical Patient Positioning
- *Medical Grade Tube Head
- *Rotating Anode
- *.3mm Focal Spot
- *Flat Panel
- *Safe Beam™ Technology (reduces radiation based on patient size)
- *Scan time: 18sec
- *X-Ray time: 5.2sec

As the leading 3D CBCT on the market, NewTom is setting the industry standard for patient experience and safety, image quality, and 3D case diagnosis.

Choose the right implant software for your 3D case planning

In2Guide
Total Implant Solution

Cover every process of implant procedure from diagnosis planning, surgery, to prosthesis with In2Guide™



coDiagnostiX™

The sophisticated and user-friendly implant planning software.



iTERO

DIGITAL MODELS SYSTEM

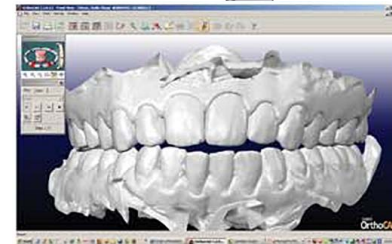
The iTero Experience

- *No More Goop, Gagging, or Discomfort
- *No tray and putty experience
- *Less mess more accuracy
- *Faster more detailed digital models
- *3D high quality imaging for better case planning



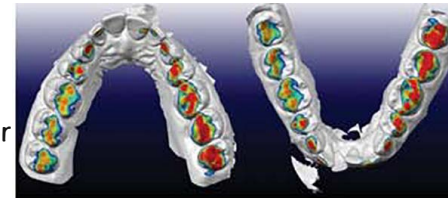
Digital Models

iTero scans utilize 11-micron surface-tooth recognition software to create a highly accurate digital model of the patient's anatomical structure.



Contact Points

The iTero software allows doctors to examine the contact points of a patient's occlusion. Once a virtual wax-up is made contact points can be examined again to facilitate the fabrication of a provisional or a final crown.





a3Dimage MOBILE CONE BEAM CT

iTero Scan and Merge to CBCT

Doctors can perform implant placement using 3D imaging when the patient meets the specifications for an accurate merge of the iTero and CBCT scans. Your imaging center is responsible for all workflow leading up to treatment planning.

Specifications for an Accurate Merge with CBCT:

- *At least 4 teeth on same arch
- *Pre-molar and molar on same side that each have an opposing tooth
- *Without these specifications an iTero scan will not work due to lack of a virtual articulator and therefore vertical height cannot be established.

Imaging Center Workflow

- 1) iTero Scan performed on patient
- 2) CBCT Scan performed on patient
- 3) iTero file is sent to CyberMed OnDemand3D or lab of your choosing

CyberMed/Lab Workflow

- 4) OnDemand3D/Lab Virtual Ceramist receives iTero file
- 5) Virtual Ceramist constructs virtual wax-up
- 6) Virtual wax-up file is sent back to imaging center

Imaging Center Workflow cont.

- 7) Imaging center receives virtual wax-up file and merges it with CBCT
- 8) Case files and accurate merge is organized and sent as email to doctor

Doctor's Workflow

- 9) Doctor plans implant surgery based on virtual wax-up and CBCT merge
- 10) Implant software case planning is completed and surgical guide can be fabricated

iTero Scan



Virtual Wax-up



Implant Case Planning

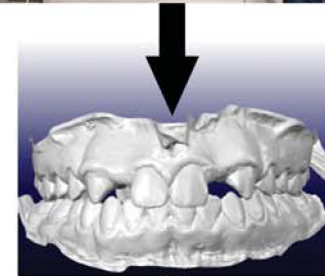


3

iTero Scan



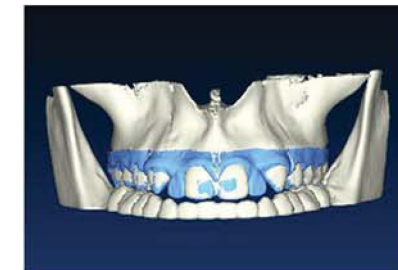
CBCT Scan



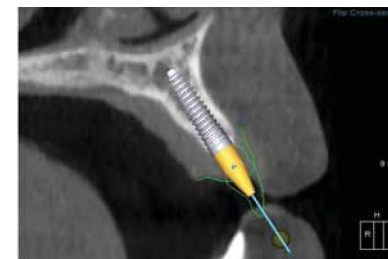
Digital Model



Virtual Wax-Up



iTero derived wax-up merged with CBCT scan



In2Guide implant placement with abutment



Merged scans imported into 3D treatment planning software



iTero Scan and Merge to CBCT Patient with Provisional

If the provisional represents the final prosthesis it can be used as a virtual wax up for planning. The cement on the provisional will need to be removed so that the patient can be scanned with and without the provisional in place.

Specifications for an Accurate Merge with CBCT:

- *At least 4 teeth on same arch
- *Pre-molar and molar on same side that each have an opposing tooth
- *Without these specifications, an iTero scan will not work due to lack of a virtual articulator and therefore vertical height cannot be established.



Doctor's Workflow

- 1) Remove cement from provisional
- 2) Send patient to imaging center with removed provisional for scan
 - **Patient must be able to remove and replace provisional themselves**

Imaging Center Workflow

- 3) iTero Scan of patient with provisional removed
- 4) iTero Scan of patient with provisional in place
- 5) CBCT scan of patient with provisional removed
- 6) iTero files are sent to CyberMed OnDemand3D



CyberMed/LabWorkflow

- 7) OnDemand3D/Lab Virtual Ceramist receives both iTero files
- 8) Virtual Ceramist constructs virtual wax-up of patient and prosthesis based on scan with provisional
 - Virtual wax-up includes accurate prosthesis as illustrated on 29 + 30
- 9) Virtual wax-up file is sent back to imaging center

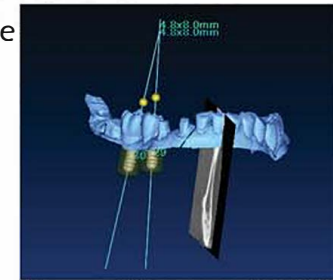


Imaging Center Workflow cont.

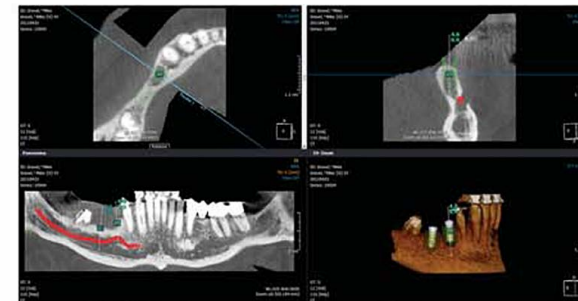
- 10) Imaging center receives virtual wax-up file
- 11) Virtual wax-up is merged to CBCT
- 12) Accurate merge verified and case files are emailed to doctor

Doctor's Workflow cont.

- 13) Merged case files are imported into 3D treatment planning software
- 14) Doctor begins implant case planning
- 15) Surgical Guide is fabricated and guided surgery can begin!



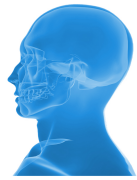
Merged iTero and CBCT



Verification of Implant Placement



Surgical Guide



iTero Scan of Model and Merge to CBCT

Traditional impressions can be scanned by the iTero when the patient specifications for an intra-oral iTero scan are not met.

Specifications for an accurate merge to CBCT:

- 4 teeth or more in entire mouth
- Polyvinyl siloxane (PVS) impressions or alginate if necessary
- *plaster model must be poured immediately with alginate impression**
- Diagnostic Wax-up fabricated



Doctor's Workflow

- 1) Impression Specifications:
 - no drag
 - no pull
 - no bubbles
 - cover palette
 - deep into vestibule
 - cover retro molar pad
- 2) Diagnostic wax-up and Plaster model
 - Once plaster model is poured the the diagnostic wax-up can be fabricated by the doctor
 - This wax-up must represent the final prosthesis (shape/size of teeth)
 - The upper/lower impressions must be articulated with mounted hinge
 - *articulator establishes vertical heights in mouth, proper teeth positioning, and how prosthetic teeth will inter-digitate**
- 3) Diagnostic wax-up and Plaster model sent to a3Dimage for iTero scan.



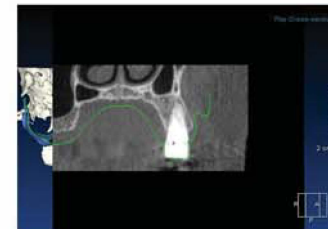
Imaging Center Workflow

- 4) Model complete with diagnostic wax-up or prosthesis is scanned using the iTero Intra-Oral scanner.
 - iTero scan provides 3D Stereolithographic model (STL file) of plaster model
- 5) CBCT scan taken of patient without anything in mouth
- 6) CBCT and STL file merged into 3D treatment planning software and emailed to doctor



Doctor's Workflow cont.

- 7) Doctor receives merged iTero and CBCT file and imports it into implant software for 3D case planning
- 8) Implant case planning begins and surgical guide can be ordered and fabricated





Partially Edentulous Patient Dual Scan

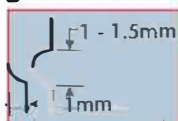


Doctor's Workflow

- 1) Take preferred Polyvinyl siloxane (PVS) impression or if necessary, alginate impression with a plaster model poured immediately
 - *Impression Specifications:
 - no drag
 - no pull
 - no bubbles
 - cover palette
 - deep into vestibule
 - cover retro molar pad
- 2) Prepare Plaster Models
 - Must accurately reproduce the buccal and lingual margins
 - Vestibule must be clear and understated
- 3) Fabricate Radiographic Guide
 - *The accuracy of this guide is very important, as it will be the basis for fabricating the surgical guide
 - Use clear orthodontic acrylic
 - Tooth position and size should represent the final prosthesis
 - The crowns should be distinctively represented on the facial/buccal and occlusal aspects of guide
 - Guide should cover occlusal surface of full arch
 - Guide should extend over the gums on lingual/palatal side
- 4) Drill 6 gutta percha filled markers (GPM)
 - Use #2 round bur to 1mm depth
 - All lingual
 - On varying horizontal planes
 - On flange, below gingival plane on the mandible - above on maxilla
 - Fill holes flush with gutta percha

note: gutta percha markers do not represent implant sites. They facilitate the merge of the scanned guide to the CBCT scan.

GPM Dimensions



NOTE Dual Scans can be used for most patients. a3Dimage recommends the Dual Scan for patients with 3 teeth or less.

*Fabricate Bite Support for use during CBCT scan

- Ensure no overlap of incisal or posterior occlusion
- Use stiff, radiolucent bite support material
- Cover Complete Arch
- If teeth are missing in opposing arch fill edentulous space with index material to make contact with alveolar ridge



5) Send patient with radiographic guide and bite support to imaging center

Imaging Center Workflow

- 6) CBCT scan performed on patient wearing radiographic guide utilizing bite support
- 7) CBCT scan performed on radiographic guide alone
- 8) Scans are merged in implant software
- 9) If the doctor's workflow protocol is followed, the Dual Scan will show that the surgical guide and radiographic guide have an identical fit to the cast and patient.
- 10) Merged files are sent to doctor

Doctor's Workflow cont.

- 11) Import merged files into implant software for 3D case planning
- 12) Order surgical guide
- 13) Verify Step.9 by placing surgical guide and radiographic guide on cast and patient prior to surgery
- 14) Perform guided surgery!



Fully Edentulous Patient Dual Scan

Doctor's Workflow

- 1) Ideal prototype denture fabricated
 - Teeth of proper size, shape, length
 - Established occlusion
 - no metal components
 - 2.5 - 3mm thickness
 - Buccal flanges w/ length for gutta percha markers
 - Hard reline only - no soft reline
 - Excellent fit to soft tissue and patient cast
 - No radio-opaque components

- 2) Drill 6 gutta percha filled markers (GPM)
 - Use #2 round bur to 1mm depth
 - All lingual
 - On varying horizontal planes
 - On flange, below gingival plane on the mandible - above on maxilla
 - Fill holes flush with gutta percha

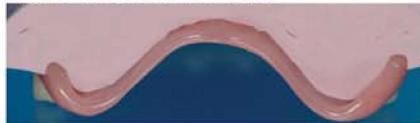
note: gutta percha markers do not represent implant sites. They facilitate the merge of the scanned denture to the CBCT scan.

- 3) Fabricate Bite Support
 - Stiff radiolucent material
 - Cover complete arch
 - Must cover complete occlusal surface of denture teeth
 - Purpose: Bite support ensures complete contact of intaglio surface to soft tissue of palette

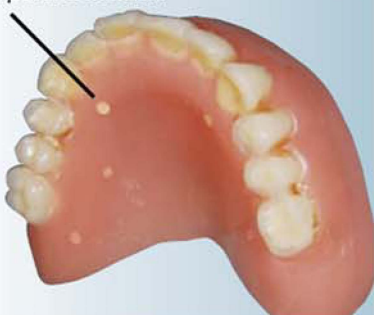
- 4) Send GPM-filled denture and bite support to imaging center



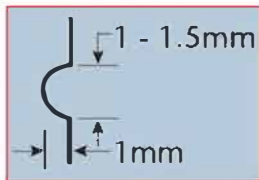
Fit of denture to cast



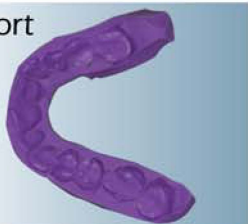
Gutta percha Markers



GPM Specs

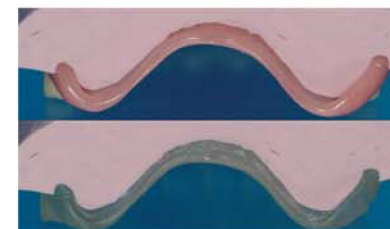


Bite Support



Imaging Center Workflow

- 5) CBCT scan performed on patient wearing denture with bite support in place
- 6) CBCT scan performed on denture alone with gutta percha markers
- 7) Scans are merged in implant software
- 8) If the doctor's workflow protocol is followed the Dual Scan will show that the intaglio surfaces of the surgical guide and denture are ensured to have an identical fit to the cast and patient.
- 9) Treatment planning begins and the radiographic surgical guide is fabricated



Fit of denture/guide to cast

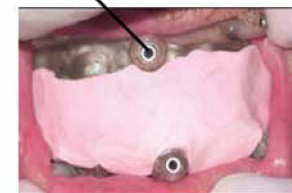
Doctor's Workflow cont.

- 10) Doctor receives surgical guide and duplicate denture with drilling sleeves for fixation pins
- 11) Step 8 is verified by placing surgical guide on original cast of patient
- 12) Bite Support returns with patient
 - Bite support used to articulate fixation of duplicate denture
- 13) Allow patient to bite down for 90sec to engage soft tissue of alveolar ridge and ensure position of duplicate denture
- 14) Remove support and hold duplicate in place to mark tissue punch sites
- 15) Remove duplicate denture for tissue punch
- 16) Replace duplicate denture and bite support, then allow patient to bite down for additional 90sec to engage soft tissue
- 17) Use 1mm drill to depth for fixation pins of the surgical guide while patient bites
- 18) Remove duplicate and bite support, replace with surgical guide, place fixation pins and begin guided surgery!



Bite Support

drill/pin site



Fixed Surgical Guide

iTero Scan and Merge to CBCT Extraction and Immediate Implant Placement

When a doctor would like to perform an extraction and immediate implant placement on a single implant site, Your imaging center can do most of the workflow leading up to case planning if the patient meets the specifications for an iTero and CBCT scan merge.

Specifications for an Accurate Merge with CBCT

- *At least 4 teeth on same arch
- *Pre-molar and molar on same side that each have an opposing tooth
- *Without these specifications, an iTero scan will not work due to the lack of a virtual articulator and therefore vertical height cannot be established.

Imaging Center Workflow

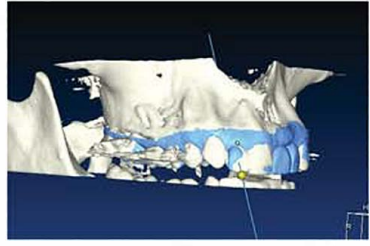
- 1) iTero Scan performed on patient
- 2) CBCT Scan performed on patient

Immediate Merge

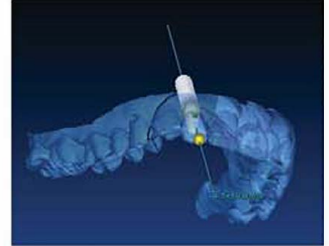
- * The imaging center can perform an immediate merge of the iTero and CBCT scans if the tooth being extracted represents the final prosthesis
 - If not representative, a virtual wax up by CyberMed/Lab is required

Imaging Center Workflow cont

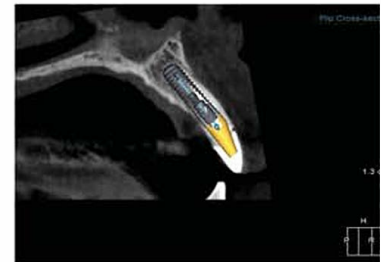
- 3) Imaging center creates merged iTero and CBCT file
- 4) Case files and accurate merge is organized and sent as email to doctor



immediate implant with merged cross sections



implant emergence profile with abutment



implant abutment



Fractured tooth with a crown that represents position of final prosthesis

Doctor's Workflow

- 5) Doctor imports case files into 3D treatment planning software
- 6) Doctor plans implant surgery using virtual wax-up and CBCT merge
- 7) Surgical guide is fabricated and guided surgery is performed