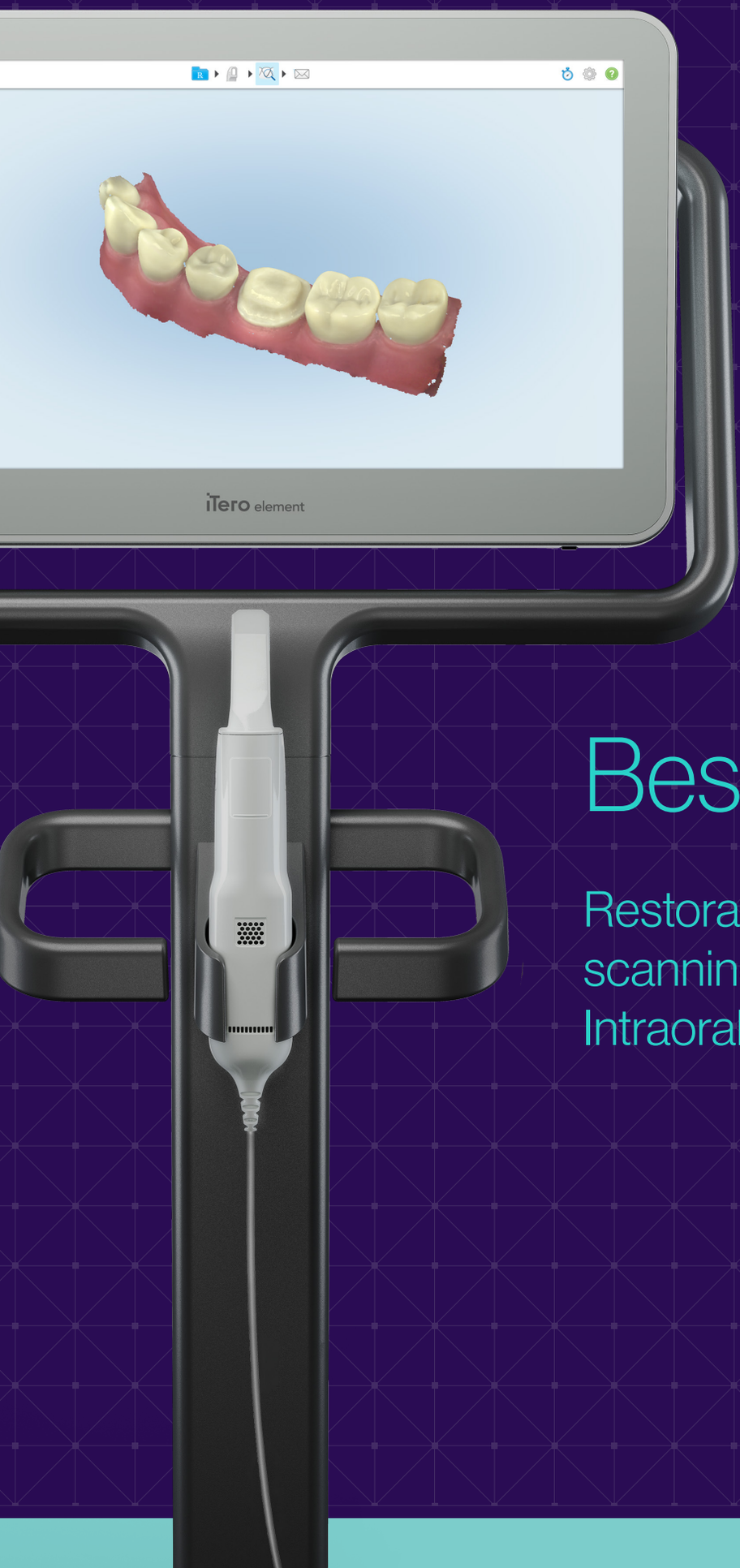


Best practices

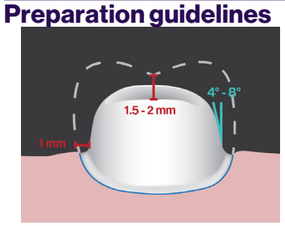
Restorative dentistry and digital scanning with the iTero Element Intraoral Scanner.

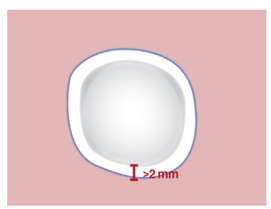
Dental restorations are designed to help maintain the form, function, and aesthetics of teeth. The accuracy of the final restoration depends on the accuracy of the recorded dimensions of the preparation. Margin placement and margin design are known to be the two main factors that govern the future health of a restored tooth. Therefore, careful step-by-step planning and clear communication with your lab is vital to achieving a successful result. The best practices described in this document are guidelines only and do not supersede your professional judgment, skills and duties.

A few preliminary considerations in operative dentistry

Zirconia is a popular material of choice in contemporary restorative dentistry for crowns, dental bridges, and implants with characteristic properties such as compatibility, high fracture resistance, radiopacity, and super aesthetics. The following guidelines apply to zirconia restorations and materials with similar properties.[1,2]

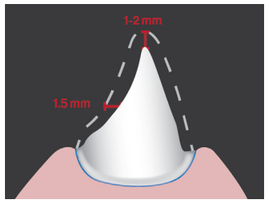
Preparation guidelines

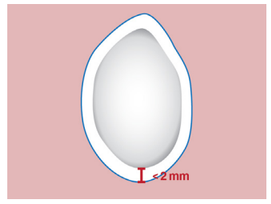




Posterior crowns

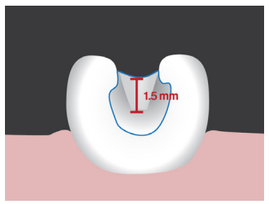
- Sufficient room for wall thickness with a minimum of 0.5mm and between 1-1.5mm or 1.5 to 2mm occlusal reduction
- Prep taper to be in between an angle of 4-8 degrees
- Visible and continuous circumferential chamfer
- Well rounded occlusal edges

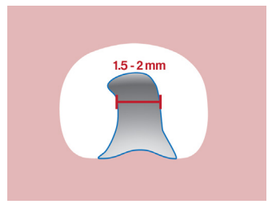




Anterior restorations

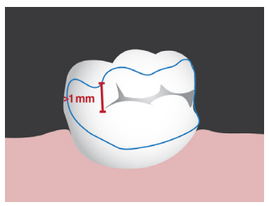
- Sufficient room for wall thickness with a minimum of 0.3mm and between 1-1.5mm or 1.8 to 2mm incisal reduction
- Visible and continuous circumferential chamfer with at least 0.5mm reduction at the gingival margin
- Vertical and horizontal prep of the tooth should have an angle of approximately 5 degrees
- Well rounded incisal edges

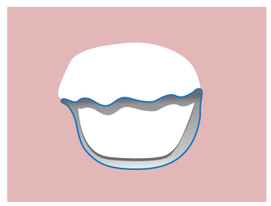




Inlay restorations

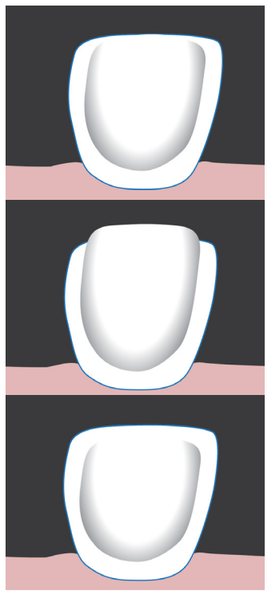
- Rounded internal line angles
- Butt joint margin
- 1 to 1.5mm wide gingival floor
- 1.5-2mm isthmus width
- 1.5mm isthmus depth





Onlay restorations

- Rounded internal line angles
- Butt joint margin
- 1 to 1.5mm wide gingival floor
- 1.5-2mm isthmus width



Veneers

- A circumferential, continuous clear visible chamfer margin
- Provide the horizontal and vertical preparation with an angle of at least 5 degrees - avoid beveling
- Incisal reduction between 1.5-2mm
- All occlusal and incisal edges should be rounded
- Correct preparation of the chamfer margins interproximally allows the appropriate bulk of ceramic

Factors to consider while evaluating the tooth preparation for a crown (extracoronal restoration)

Feather edge

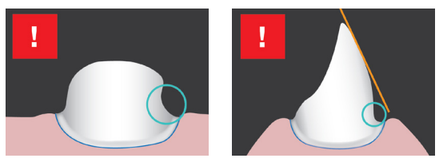
- While knife edge/feather edge margins provide conservation of tooth structure and acute margins in some cases, it may also create complications in milling with material limitations. Feather-edged margins on full coverage restorations should be avoided as they may result in:
  - Axial reduction fading out
  - Over-contouring
  - Susceptibility to distortion

Angled preps

- Angled and inconsistency in tooth preparations leads to compromised retention and presents challenges for milling

Sharp incisal or occlusal edges

- Sharp incisal or occlusal edges may cause minor/major fit problems or in some cases, premature fractures of the restoration

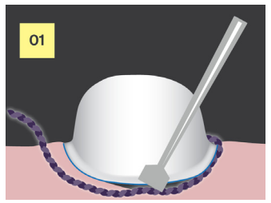


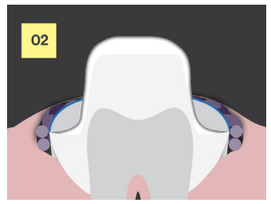
Undercuts

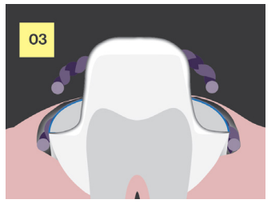
- Undercuts may be present where two axial walls face in opposite directions. In some cases, the presence of undercuts cause failure of seating the restoration

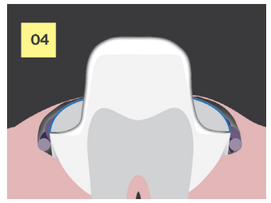
iTero restorative scan plan

Best practices to achieve a high quality digital scan





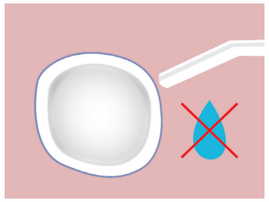




Ensure clear and visible margins

Soft tissue retraction: Double cord technique

- A double cord gingival retraction method is recommended with one cord left in the sulcus during the scanning procedure in order to record clear and concise margins



Isolation of the operative field

Goals of isolation:

- Moisture control (saliva, blood and/or GCF, retraction and access, safe and aseptic operating field)
- Commonly used isolation methods:

  Rubber dam, gingival retraction cord, cotton rolls, air syringe, and medications as needed

Utilise the dental chair light as needed

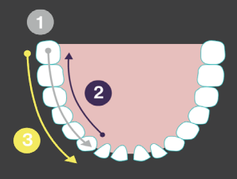
- Arrangements for alternative sources of light during scanning is not required as the iTero Element Intraoral Scanner has its own source of light

iTero restorative scanning protocol

To begin scanning: light will be emitted from the wand when activated. Wait 10 seconds to allow for defogging of the lens. Place the wand in the patient's mouth at the starting point before pressing and releasing a side button to start scanning.

STEPS

01

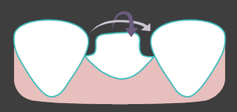


Step 1: Scanning the opposing arch

- Begin by placing the wand flat on the occlusal surface. Once the starting location in the viewfinder is confirmed, press and release either of the side buttons to begin scanning
- After scanning the occlusal anatomy, roll to the lingual, and finish with the buccal

Note: Full arch scan is not necessary if prepping one tooth

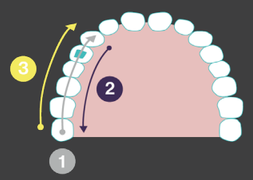
02



Step 2: Scanning the prep tooth

- Ensure that the prepped tooth is dry
- Center the prep within the viewfinder crosshair
- Begin scanning with an occlusal view of the prep to visualise the margin
- Roll from the lingual to the buccal of the prep
- Roll from the distal to the mesial of the prep
- Immediately review and fill any significant voids

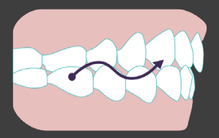
03



Step 3: Scanning the prep arch

- Scan the occlusal surface for the desired area
- Roll to the lingual to scan the lingual surfaces
- Roll to the buccal to scan the buccal surfaces
- To capture the adjacent contacts lay the wand tip flat on the occlusal surface and angle the wand tip to capture desired areas, or place the wand tip on the side of the prep and rotate the wand tip to capture the contacts

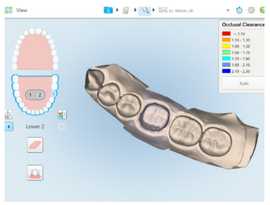
04



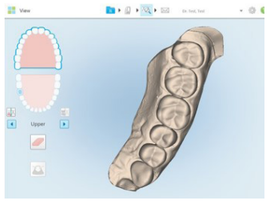
Step 4: Scanning the bite

- Scan the patient while biting in centric occlusion
- Be sure to scan the bite in a previously captured area
- Center the wand between the upper and lower arches and slowly move the wand in a wave-like motion to ensure sufficient capture of the occlusion

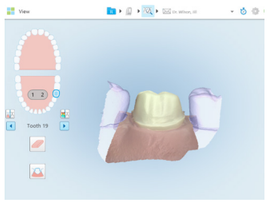
Evaluating the digital model



- Rotate the model to evaluate occlusal, lingual, buccal, mesial, and distal surfaces of the adjacent teeth

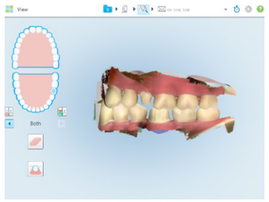


- Once the segments have been scanned, tap the view icon at the top of the touchscreen display to view the digital model in high resolution. After the case has been processed, evaluate the model to ensure that it is accurate and complete (i.e., check for any missing areas of anatomy)



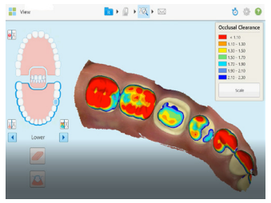
- Prep review checklist:

  Margin is clearly visible, prep is fully captured, prep is clear of overlapping tissue or other obstructions that affect the margin



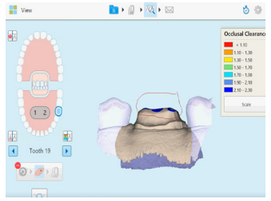
- Verify that the patient's bite is in centric occlusion

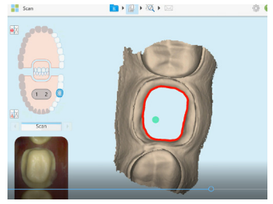
Additional tools

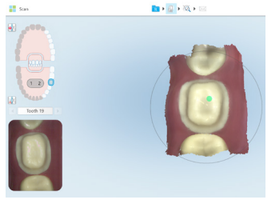


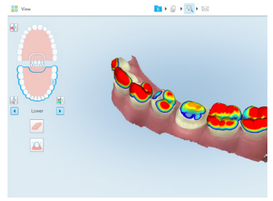
Occlusal Clearance Tool

- The Occlusal Clearance Tool ensures that the prep has sufficient reduction for the material chosen in the Rx



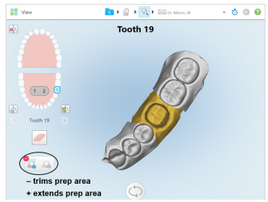






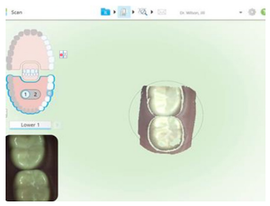
Occlusal Clearance Legend

- Utilise the Occlusal Clearance Legend to determine the distance between opposing teeth
- Red areas on the prep indicate areas of inadequate occlusal clearance for the restoration, reduce the prep as required and rescan using the Eraser Tool
- To make any adjustments ensure that you are in the buccal view, then select the Eraser Tool
- Circle the area that will be modified on the model
- Adjust the clearance on patient's tooth
- Select Scan Tool to scan the modified circled area
- Activate View Tool
- Confirm the reduction was adequate

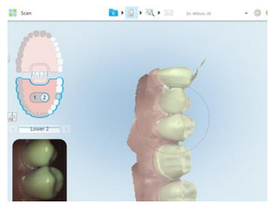


Prep Separation Tool

- The Prep Separation Tool is used to analyse the tooth prep and surrounding areas in high resolution



"1" Pre-treatment, indicated by the green background



"2" Post-treatment, indicated by the blue background

Pre-treatment scan

- Allows recording the tooth anatomy before the tooth preparation
- Enables the lab to copy the original anatomy to the new restoration
- Data will be available on the following CAD-CAM System: 3 Shape and Exocad

Learn more at **iTero.com**

The iTero Element 5D scanner is not available for sale in the United States. iTero Element 5D is currently available in: Canada, European Union, and any other country that accepts CE marking including Australia, New Zealand and Hong Kong

Align Technology BV
Arlandaweg 161, 1043 HS Amsterdam, The Netherlands.

Reference

[1] Strudevant's Art and Science of Operative dentistry, Seventh edition – Andre V. Ritter, Lee Q. Boushell, Ricardo Walter

[2] Phillip's science of dental materials, Anusavice – Eleventh edition

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