American Board of Orthodontics (ABO)

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Electronic Cast Radiograph-Evaluation (CR-E)

https://americanboardortho.com/media/1191/grading-system-casts-radiographs.pdf

American Board of Orthodontics (ABO) Electronic Cast-Radiograph Evaluation (CR-E)

Established nearly one hundred years ago, the specialty of orthodontics has made great advances in the orthodontic care that is now available to the public. The result of that care, however, is absent of any credible objective treatment assessment that can be consistently measured. With the development of the new electronic ABO/CR-E assessment tool, we now have a consistent and statistically dependable method to address this past deficiency.

The purpose of this technology is:

1. To determine-with statistical accuracy-a consistent method to evaluate orthodontic treatment outcomes.
2. To assess the areas of needed clinical improvement in a practitioner's result.
3. To provide the American Board of Orthodontics the ability to establish a standard of care that will aid in protecting the public's welfare when receiving orthodontic care from a dental practitioner.

The past decade has seen a meteoric rise in orthodontic software development and its capabilities. A continuous development with positive clinical additions to Ortho Insight 3D™ software is no exception.

The following are the important steps taken by the ABO for the development of a dependable CR-E assessment tool.

Step One:

- Definition and establishment of dental landmark locations in the initial and finished dentition ("feature points")

Step Two:

- Establishment of requirements for the accurate creation, duplication and printing of digital models
- Creation of a method for accepting measurable digital models in a nonproprietary manner (DICOM).10 (see 3DPrinting Stereolithic Final Models)[2]

American Board of Orthodontics (ABO) Electronic Cast-Radiograph Evaluation (CR-E)

Step Three:

- Creation of the electronic CR-E measuring tool to objectively evaluate and measure treatment outcomes (finished orthodontic treatment results).
- To enhance the reliability and validity of the exam, the Board established a Cast Radiograph-Evaluation tool(CR-E ruler) to evaluate the final dental casts and panoramic radiographs. This scoring system was developed systematically through a series of field tests and the Board has used this initial system-with continuous updates-to evaluate clinical case reports since 1999[3].

Step Four:

The Board continuously evaluates the needs of the profession. In response to changes within the profession and in society, the ABO has modified the clinical exam from a case-based oral examination to a scenario-based virtual clinical examination. These changes to the examination required:

a) The creation of an electronic CR-E measuring tool to objectively assess treatment results virtually.

b) Training in the use of this software.

c) Testing of the new electronic measuring tool for reliability.

d) Statistical assessment of the electronic CR-E measuring tool in a **non-graded portion** of the scenario-based virtual clinical examination.

e) Subsequent modification/s of the software if necessary based on the statistical assessment of the digital software[4, 5]

The American Board of Orthodontics (ABO)

- **The Mission of The American Board of Orthodontics** is to elevate the quality of orthodontic care for the public by promoting excellence through certification, education and professional collaboration.
- **The Vision: The American Board of Orthodontics** is the global leader in orthodontic board certification that sets the standards of care for excellence in orthodontics and dentofacial orthopedics.

The new virtual ABO Scenario-based Clinical Examination will be administered at testing centers worldwide and has far reaching implications. It removes physical barriers for the attainment of board certification with the goals to increase the numbers of ABO certified orthodontists worldwide and to improve the quality of orthodontic care being delivered to patients.

References:

1. ABO Morphological Points ©
2. https://www.americanboardortho.com/media/1157/abo-digital-model-requirements.pdf
3. https://www.americanboardortho.com/media/1191/grading-system-casts-radiographs.pdf
4. ABO Model Analysis Revised Final Document © jg _vk 12_30_2020
5. ABO CR-E Power Point© jg _vk 12_30_2020

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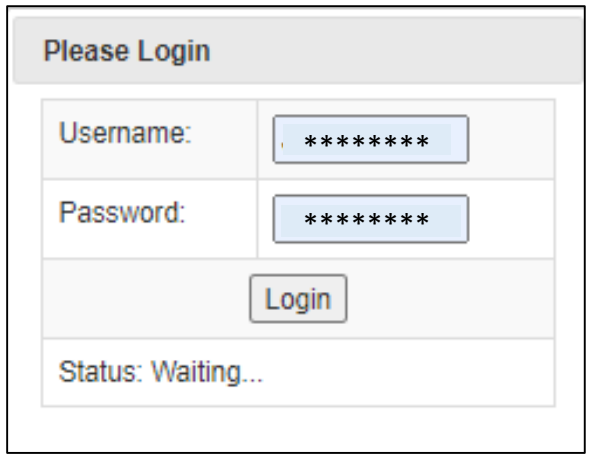
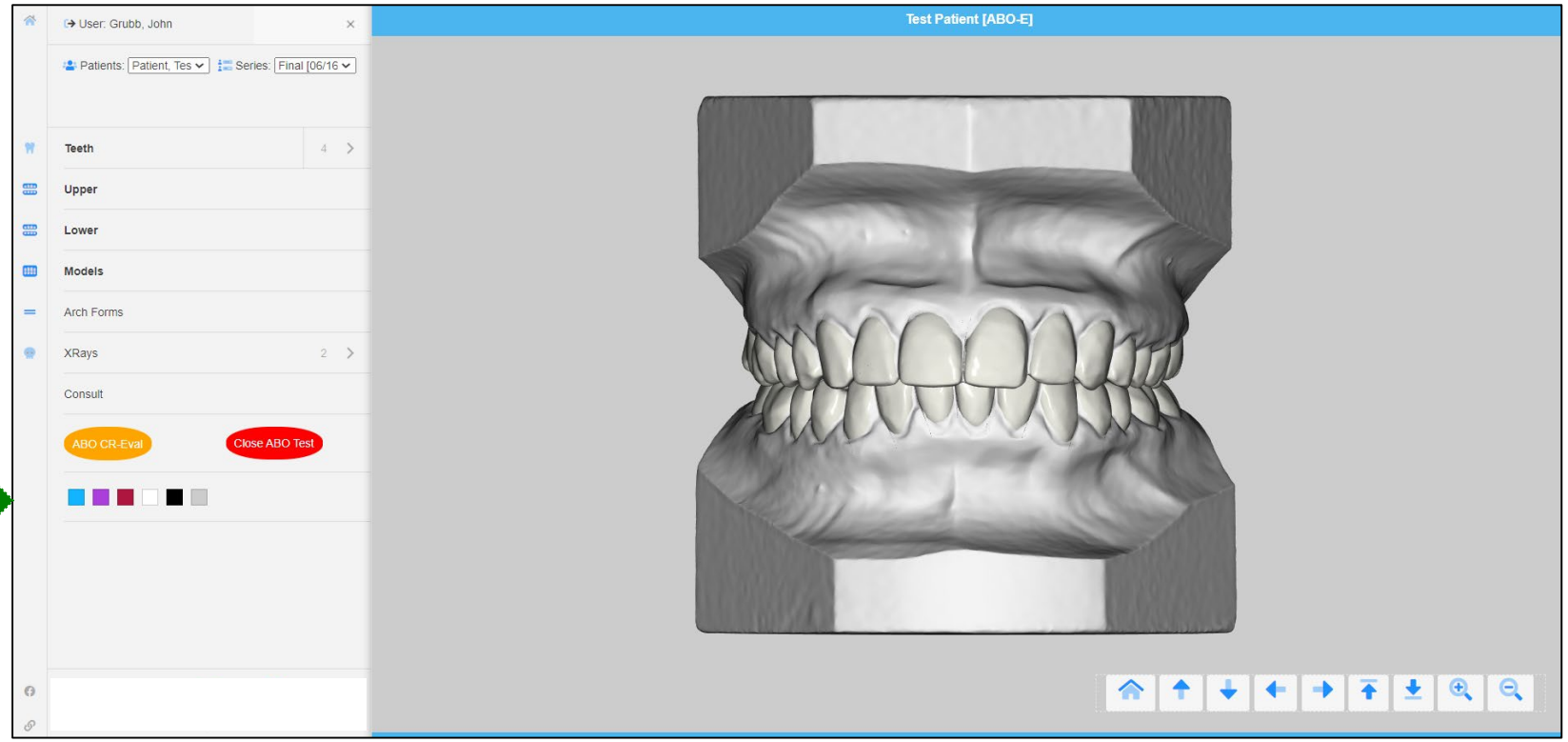
1. Ortho-Share 3D(™)-Online

https://viewer.motionview3d.com/index.php

2.





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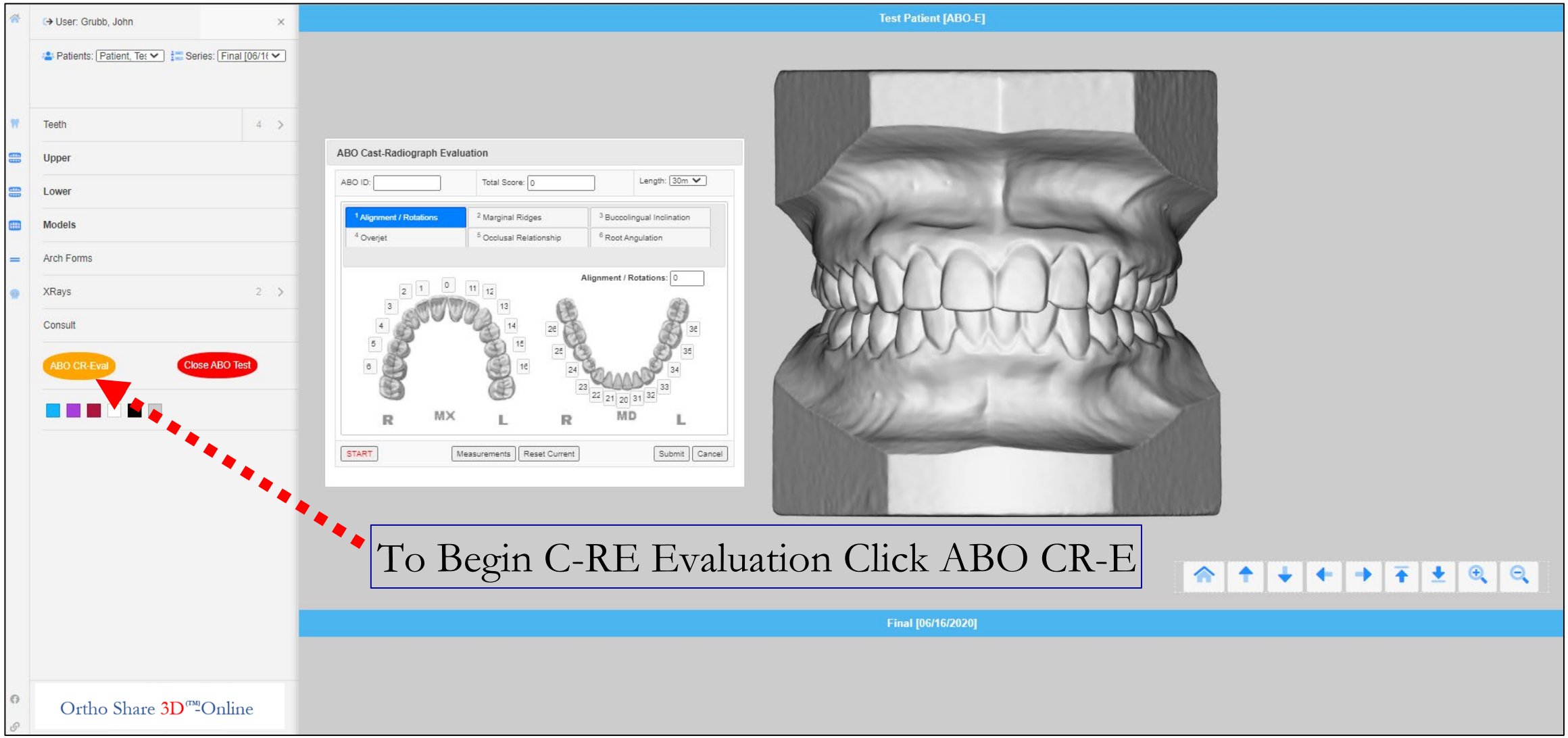


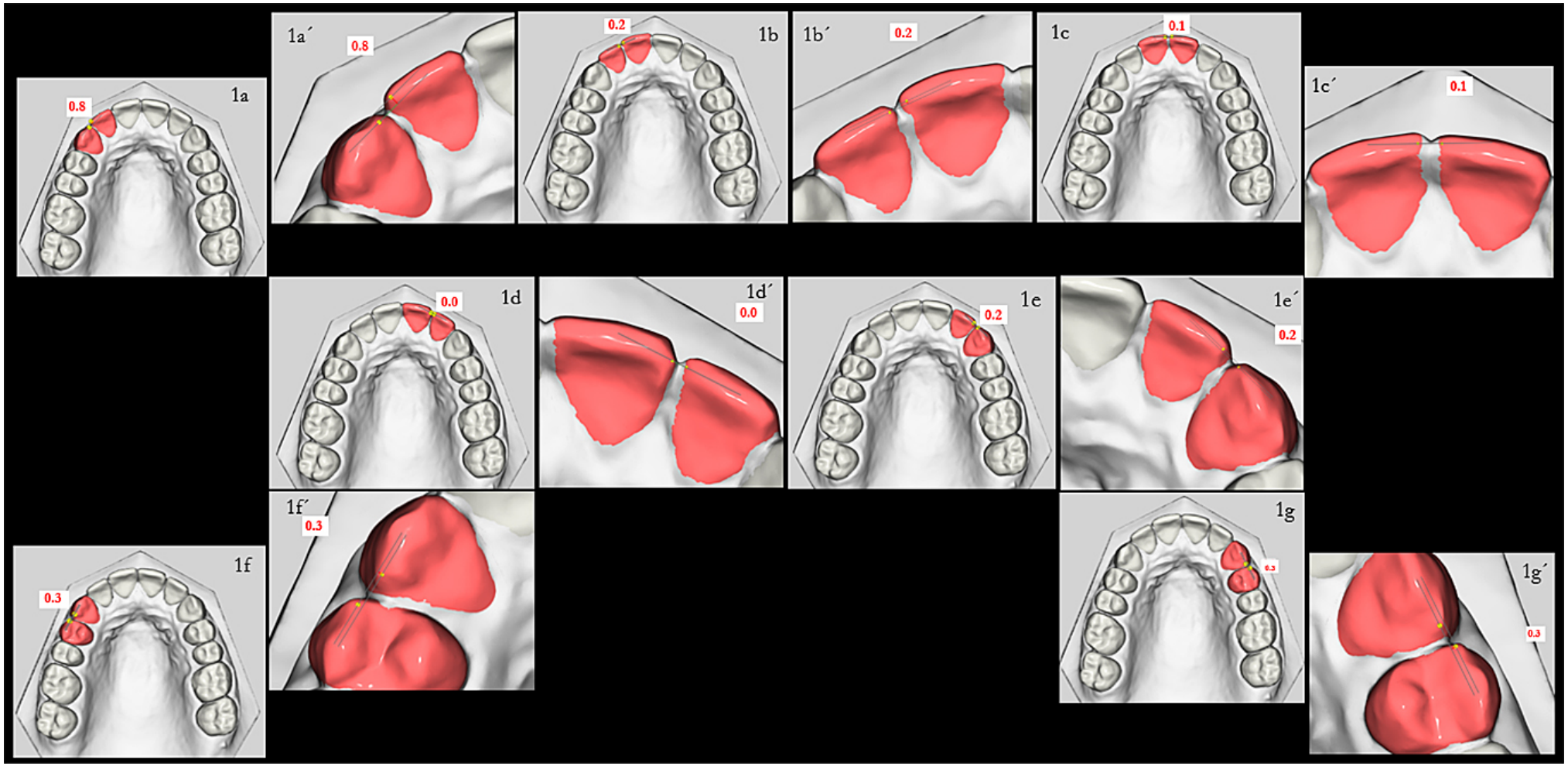
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 1

ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Maxillary and Mandibular Anterior Alignment

In the maxillary and mandibular anterior regions, proper alignment is characterized by coordination of alignment of the incisal edges and lingual incisor surfaces of the maxillary incisors and canines (figs. 1a-g´)



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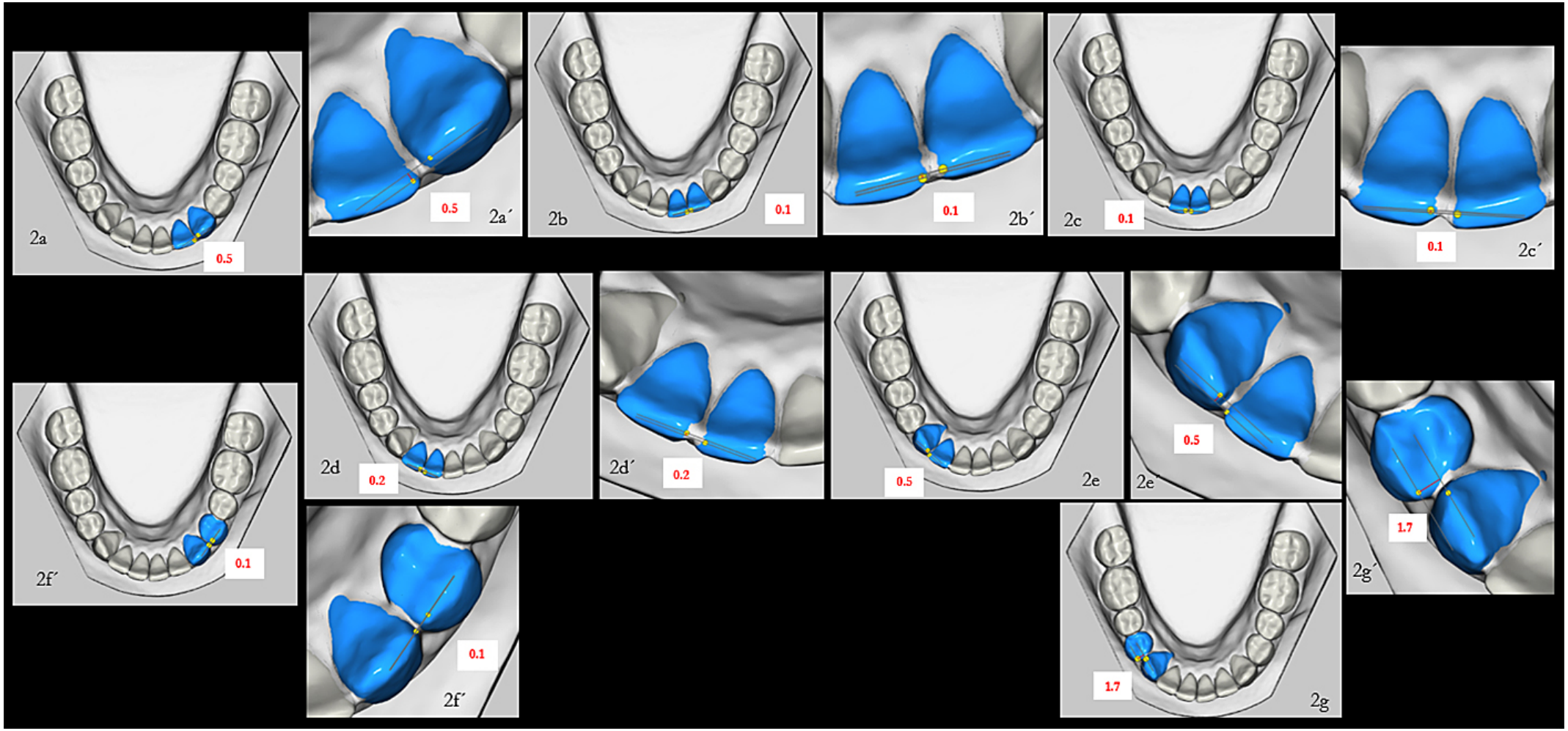
Maxillary and Mandibular Anterior Alignment

and the incisal edges of the labial surfaces of the mandibular incisors and canines (figs. 2a-g´)



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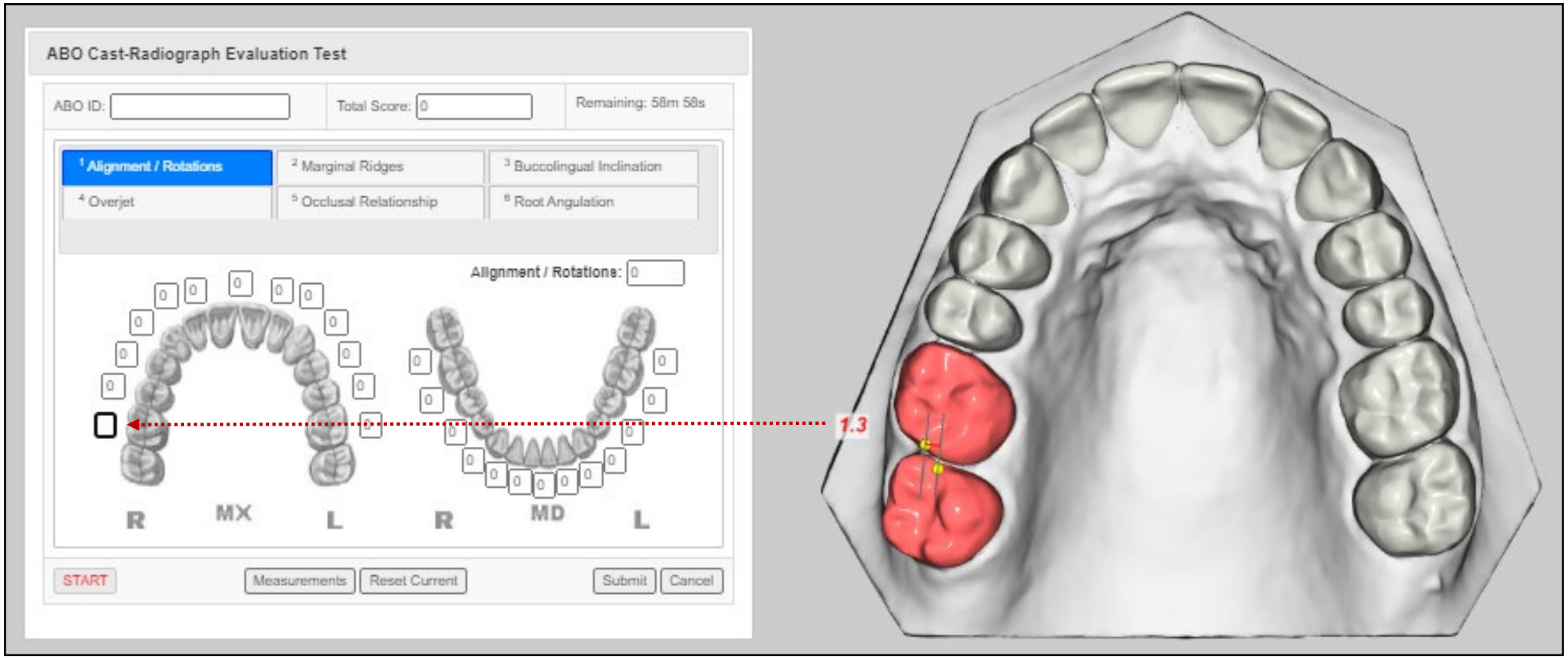

Reference: ABO CR-E Model Analysis Revised Final Document

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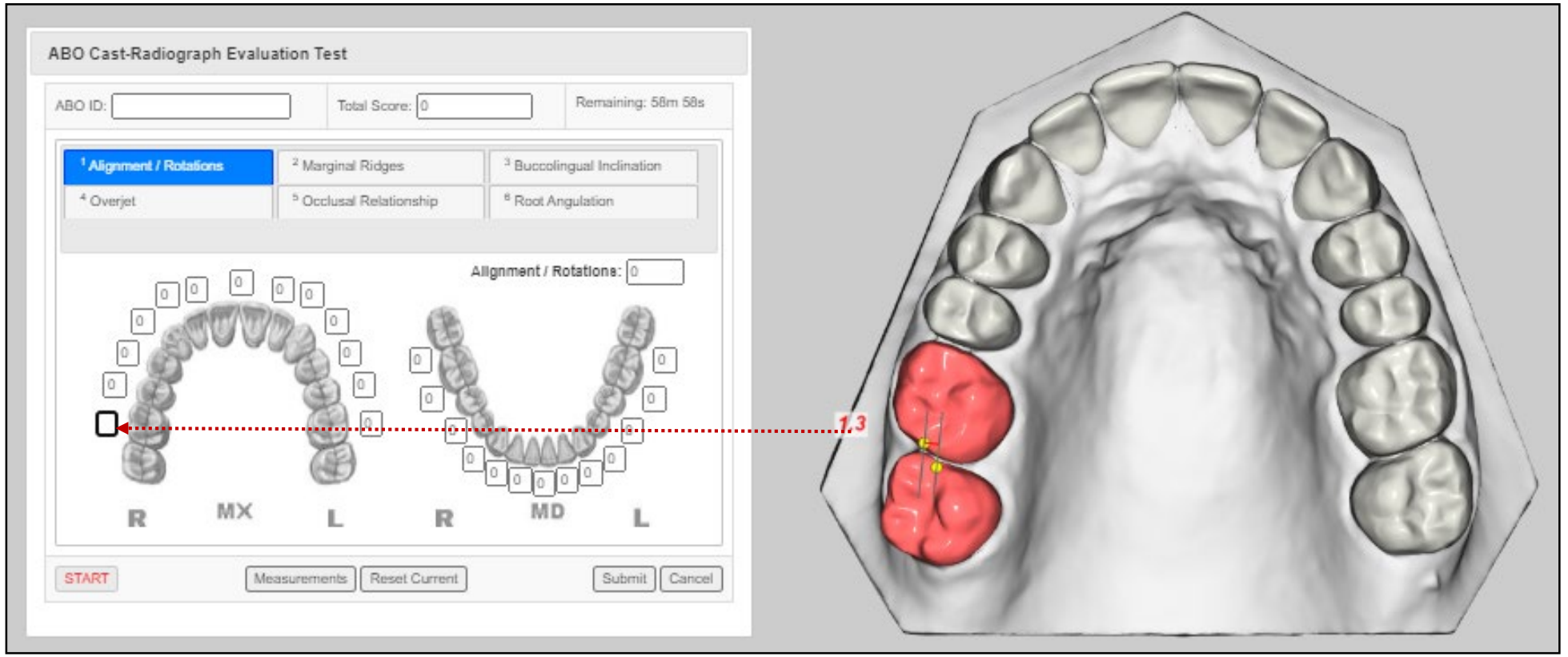
Step # 2



1. Alignment of the maxillary right 2nd molar and 1st molar is 1.3 therefore a number two (2) is placed in the highlighted box.
2. When placing a value in this box it will activate the next assessment area.

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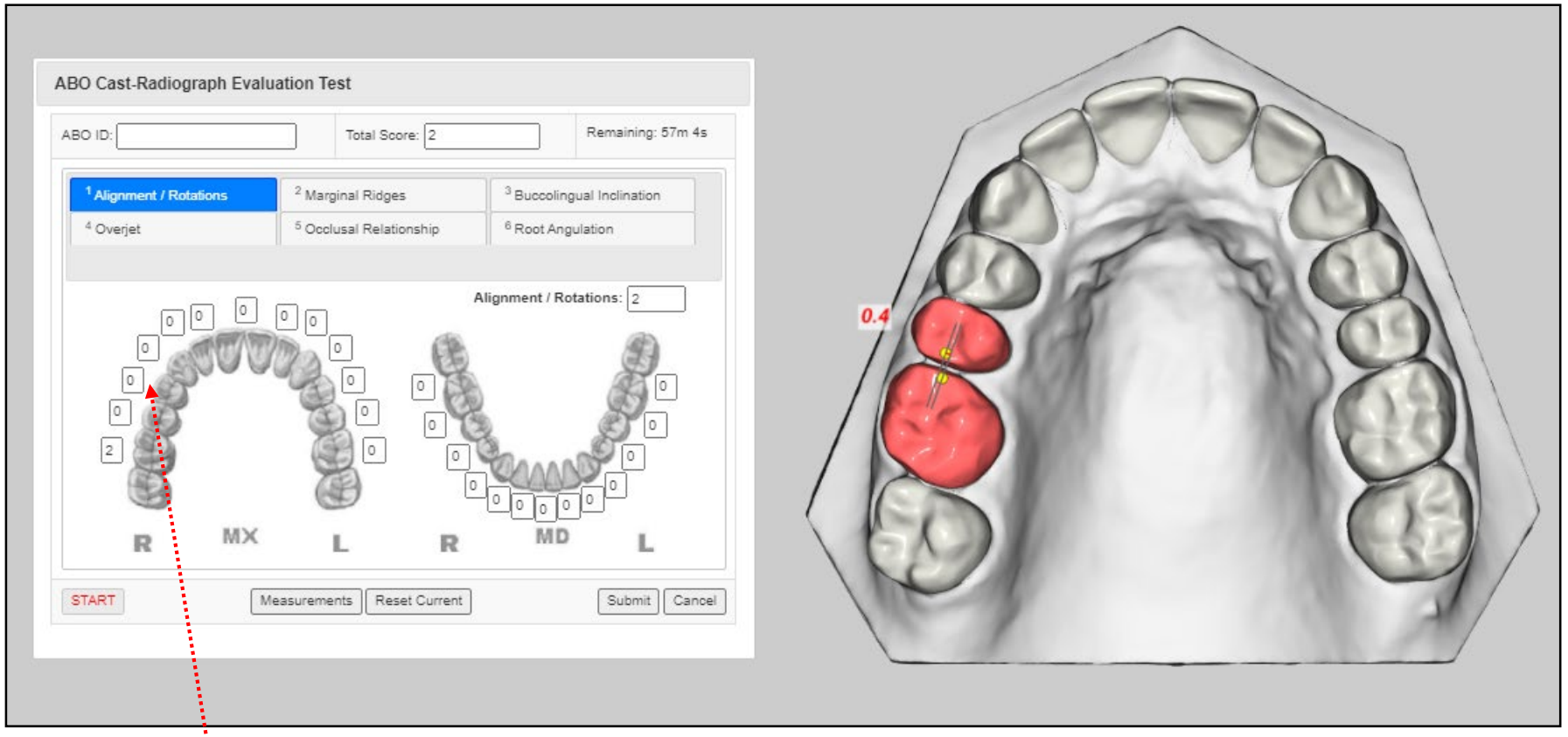
Step # 3



1. Alignment of the maxillary right 1st molar and 2nd premolar is 0.4 therefore a number zero (0) is placed in the highlighted box.
2. When placing a value in this box it will activate the next assessment area.

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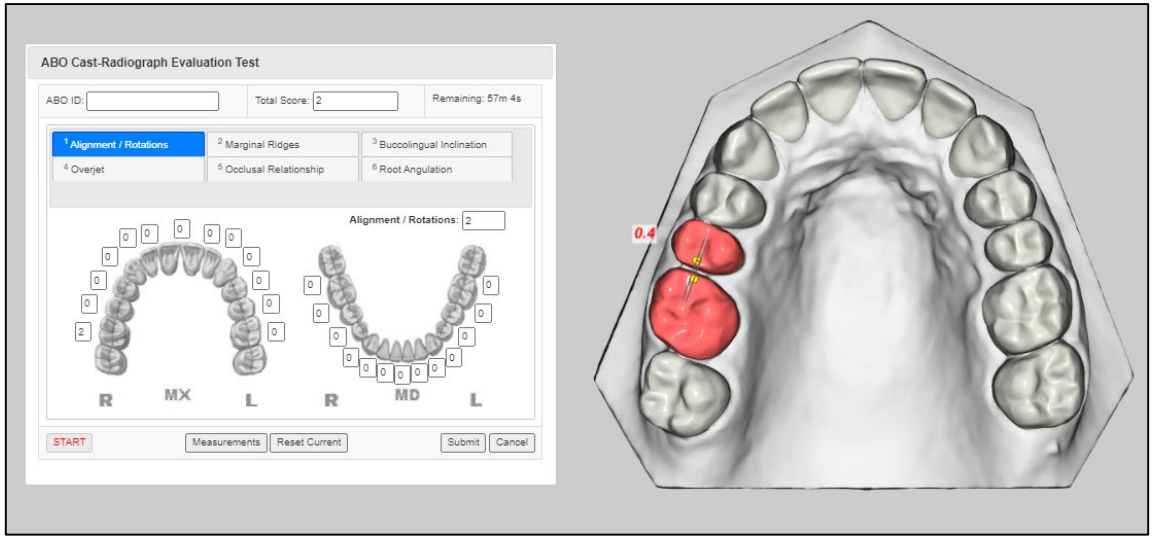

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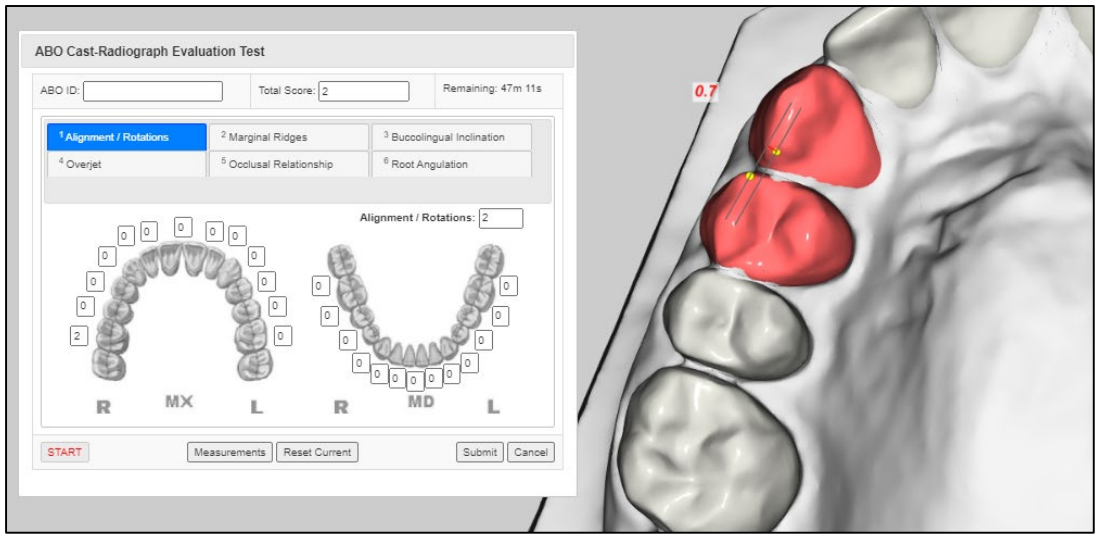

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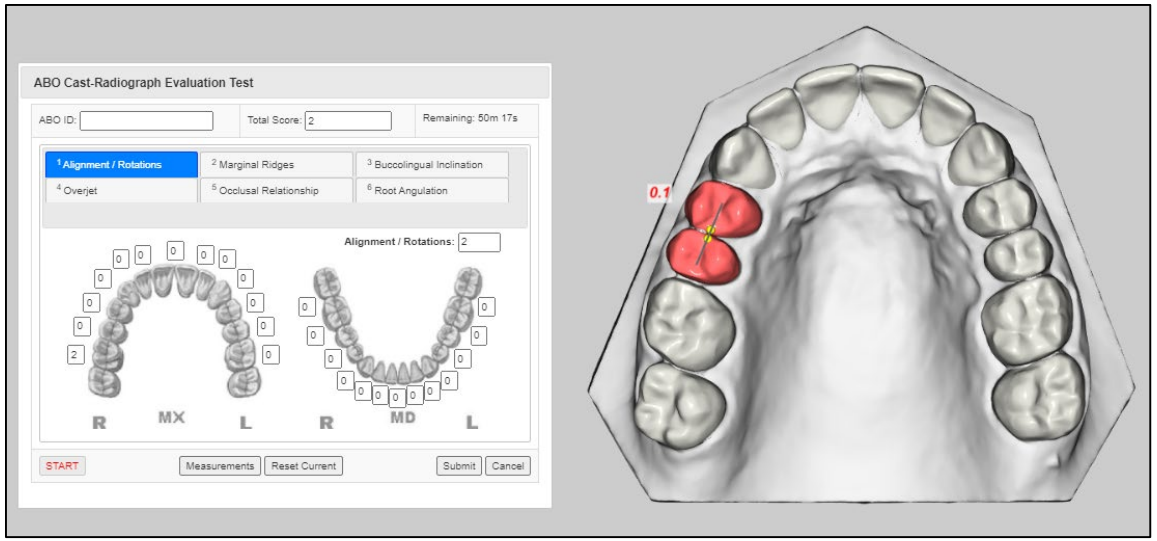

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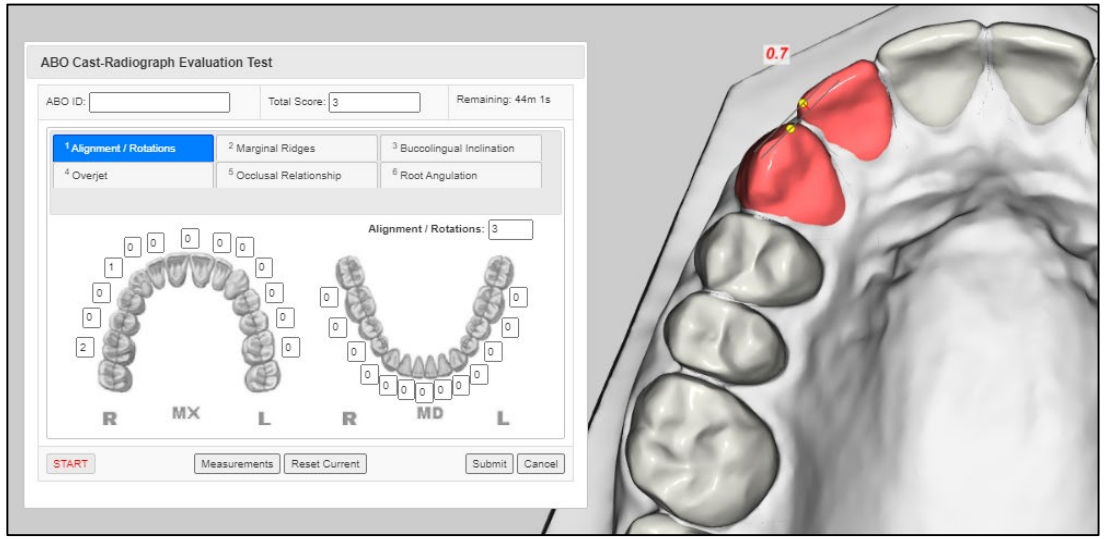

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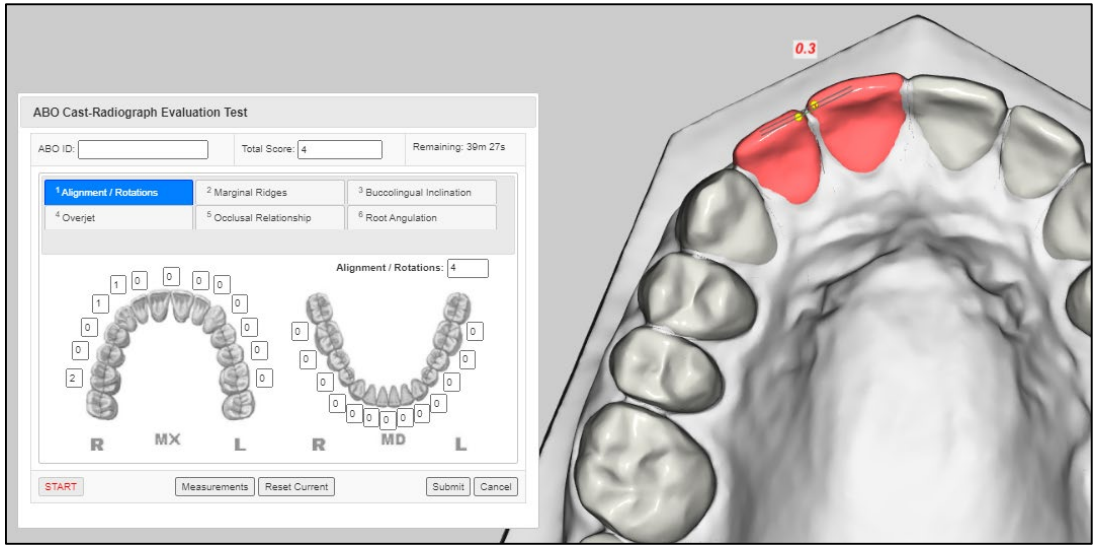

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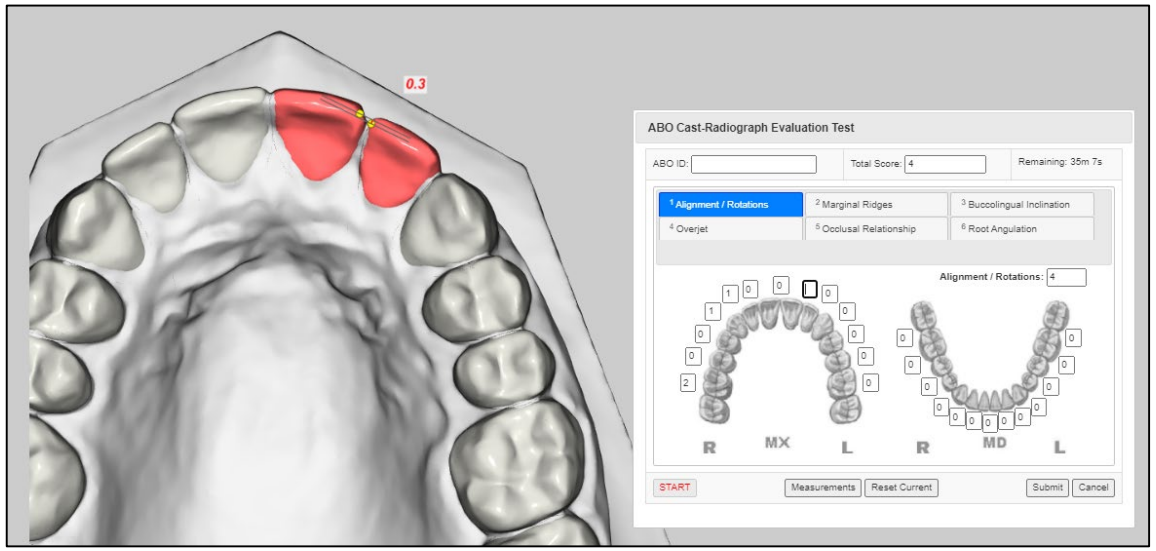

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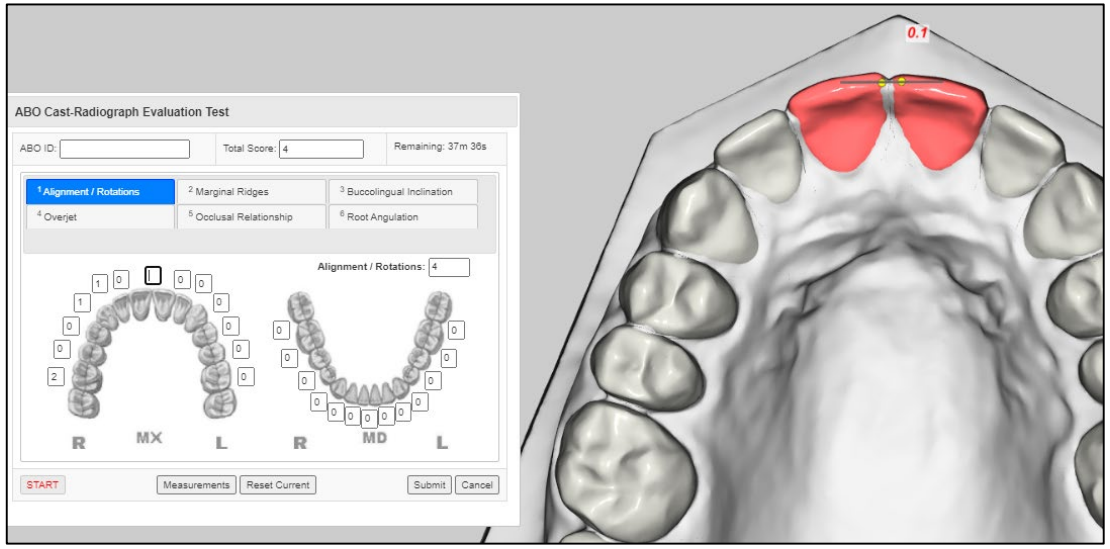

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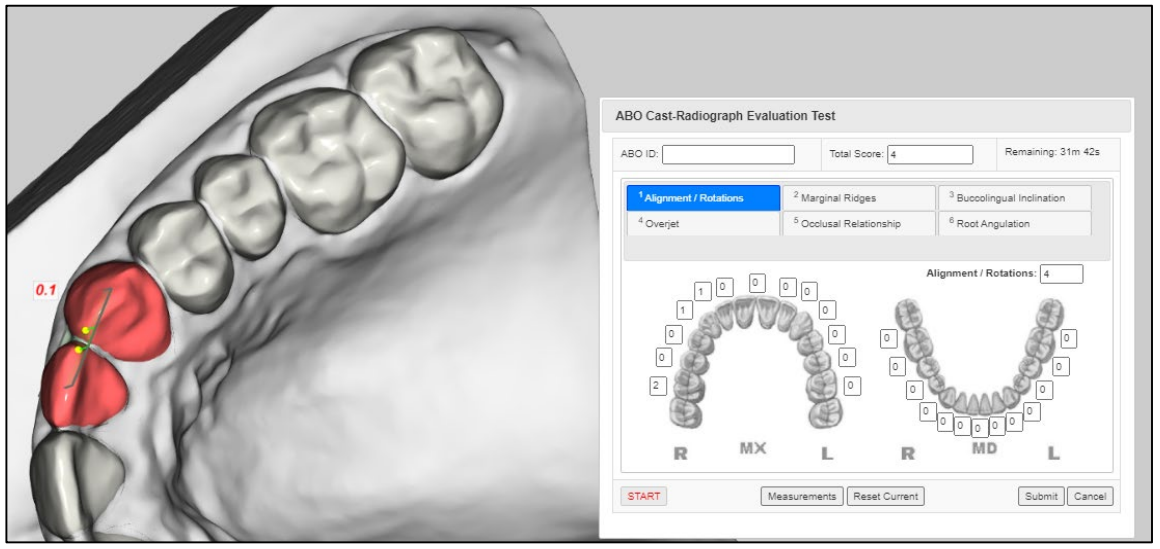

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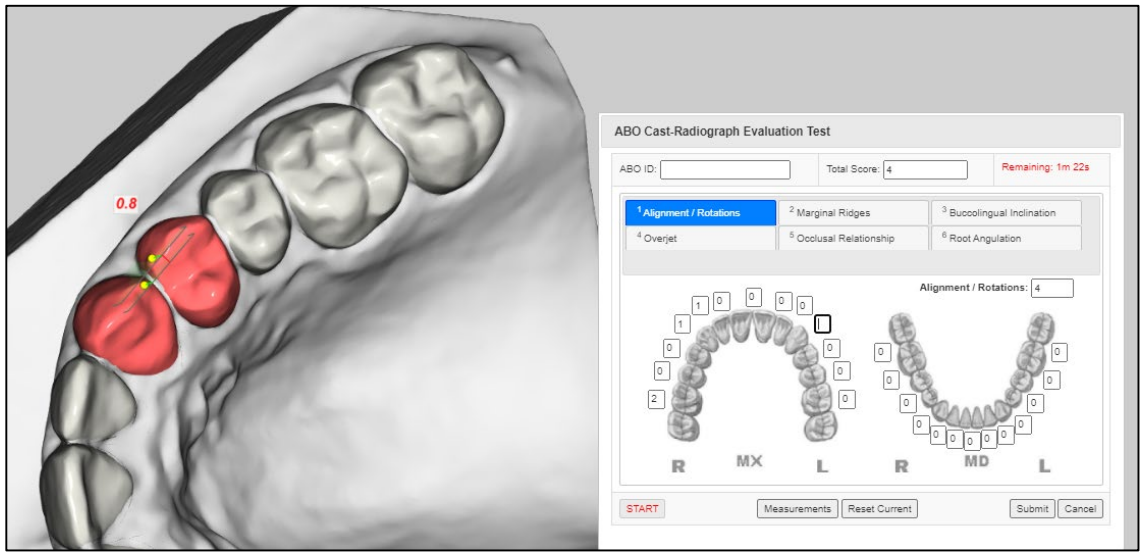

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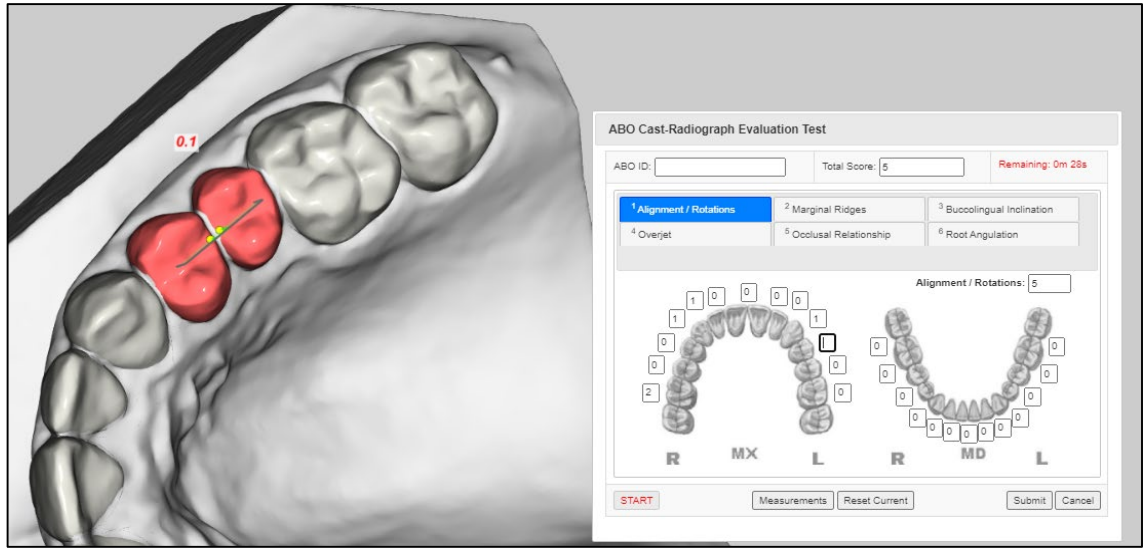

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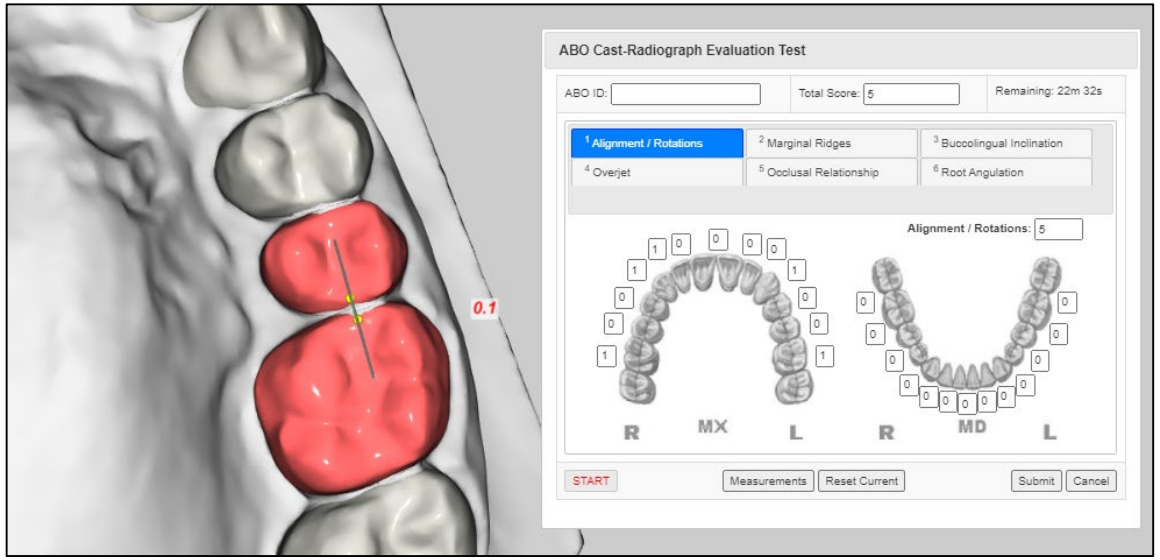

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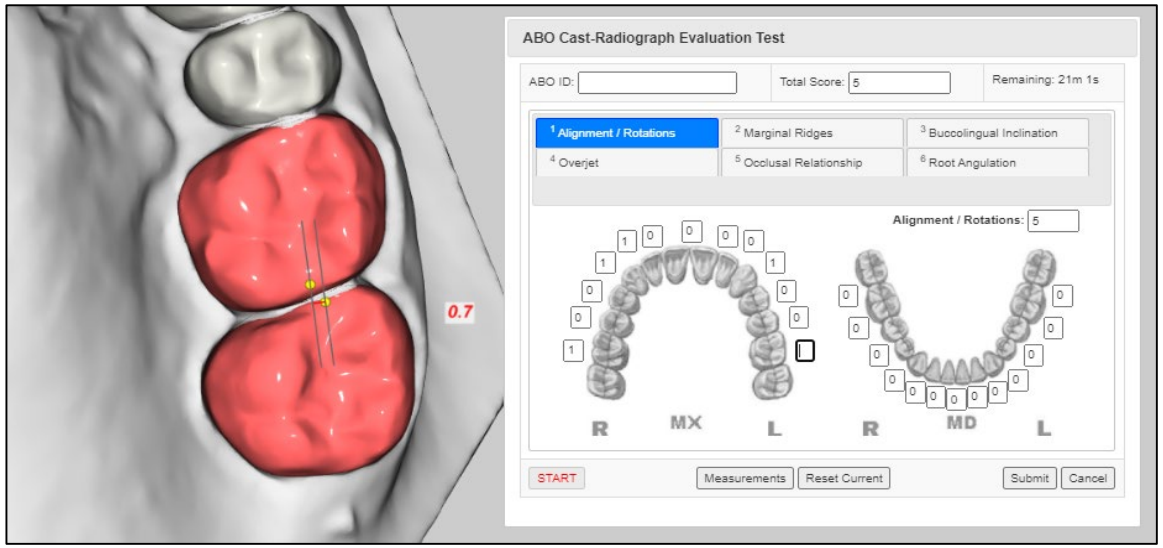

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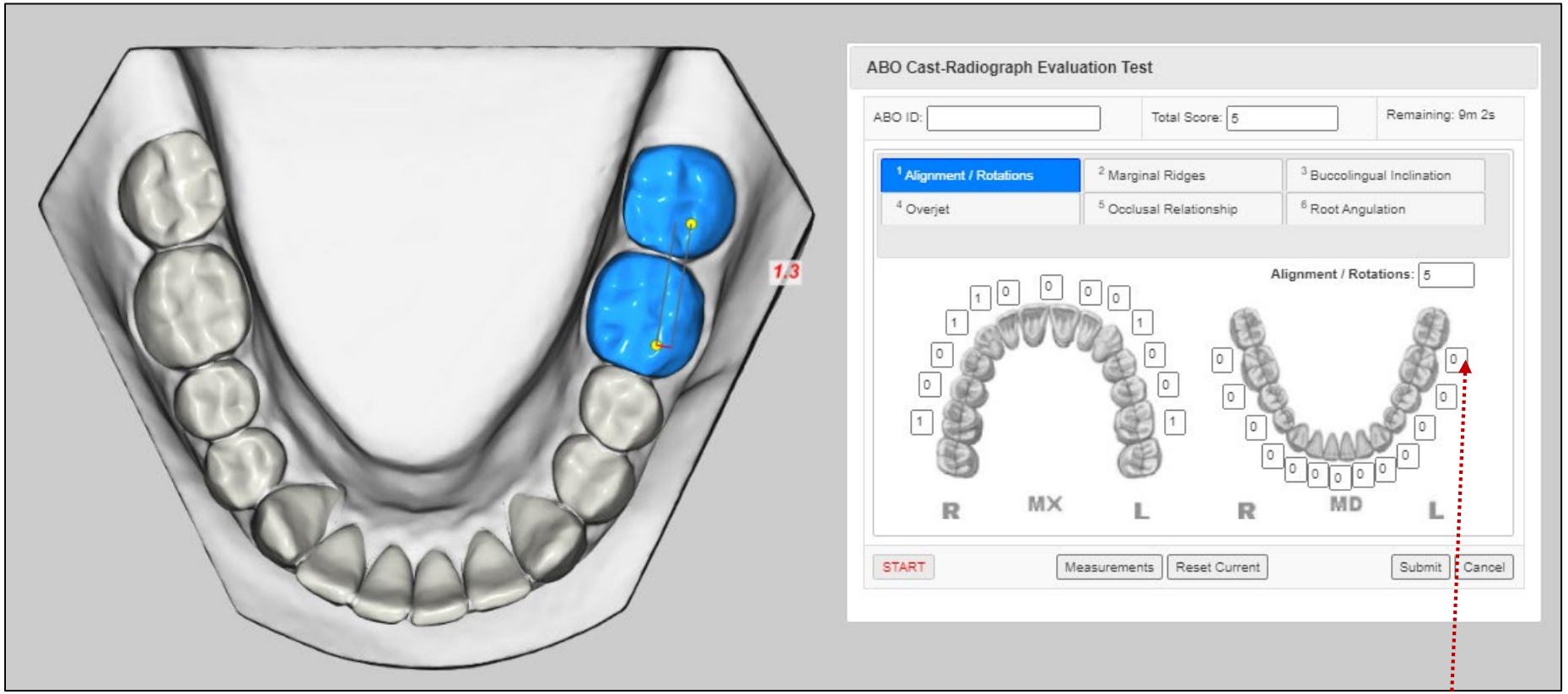

1. Alignment of the mandibular left 2nd molar and 1st molar is 1.3 therefore a number two (2) is placed in the highlighted box.
2. When placing a value in this box it will activate the next assessment area.

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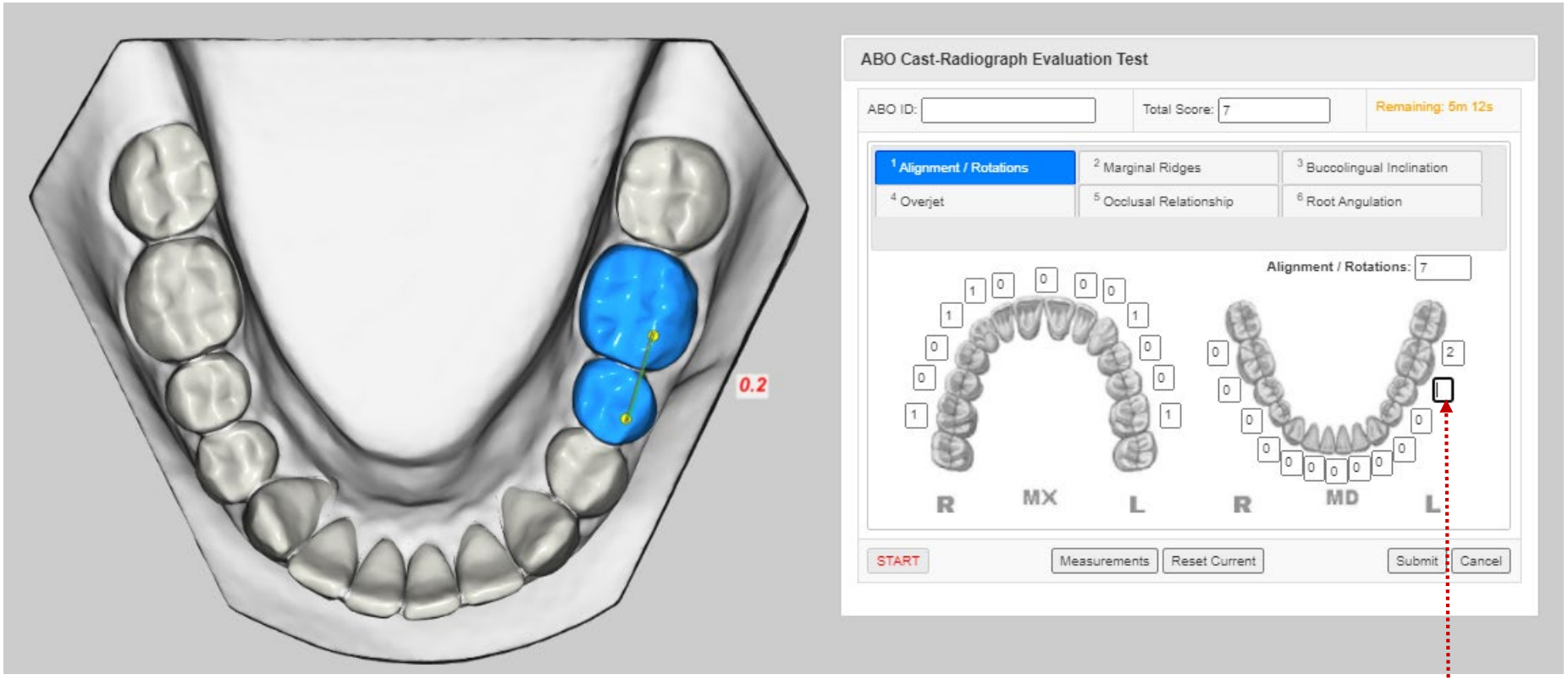
Step # 17



1. Alignment of the mandibular left 1st molar and 2nd premolar is 0.2 therefore a number zero (0) is placed in the highlighted box.
2. When placing a value in this box it will activate the next assessment area.

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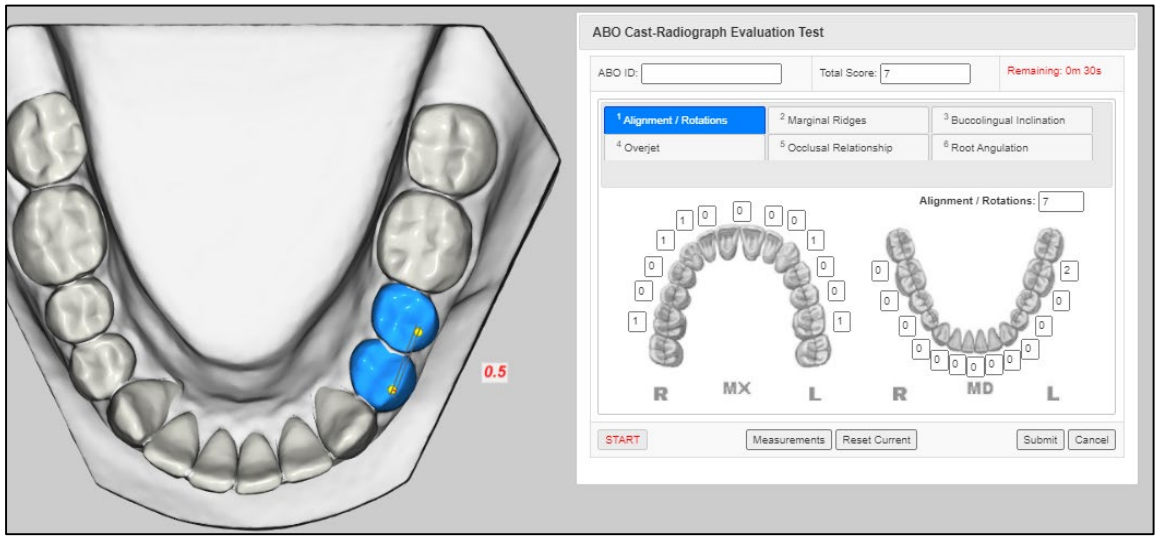
Step # 18



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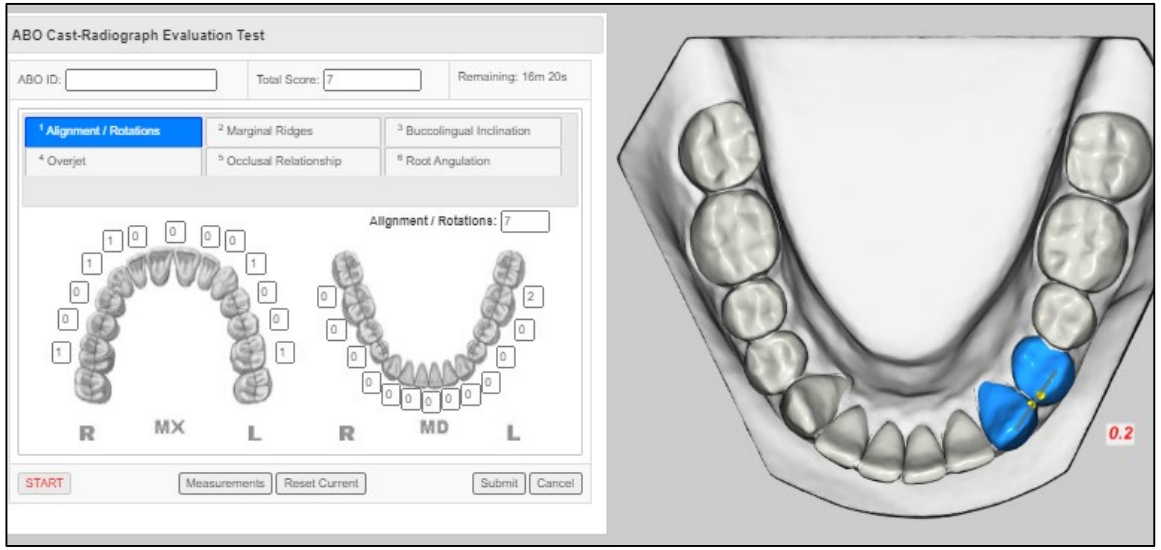

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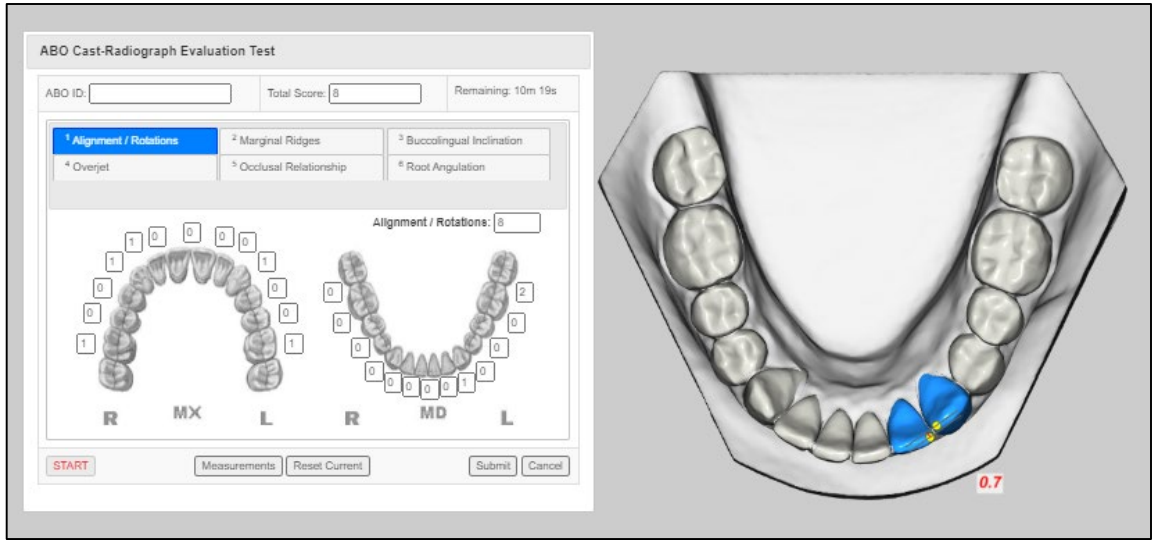

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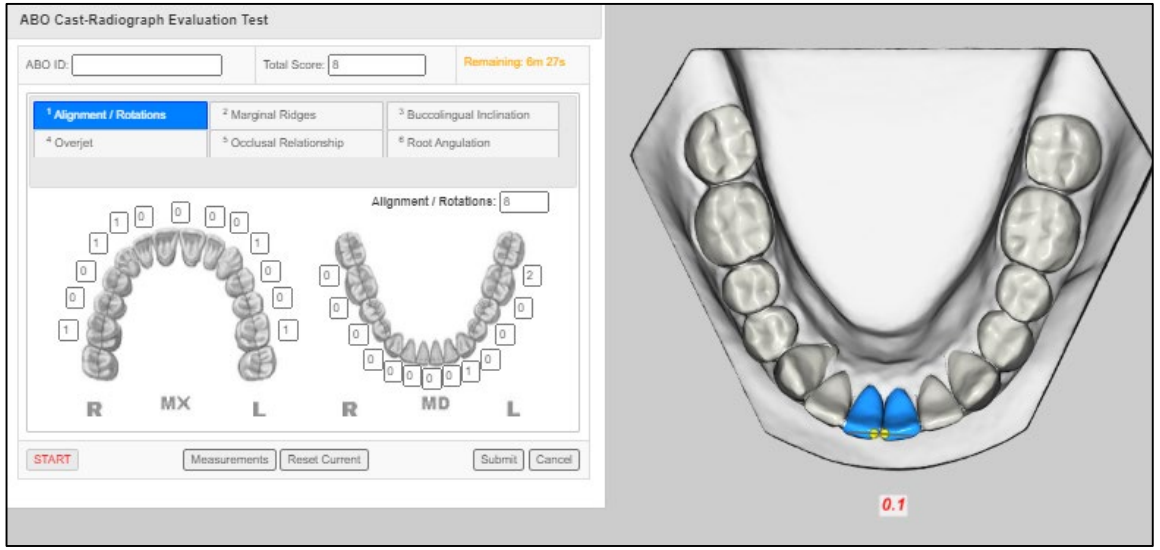

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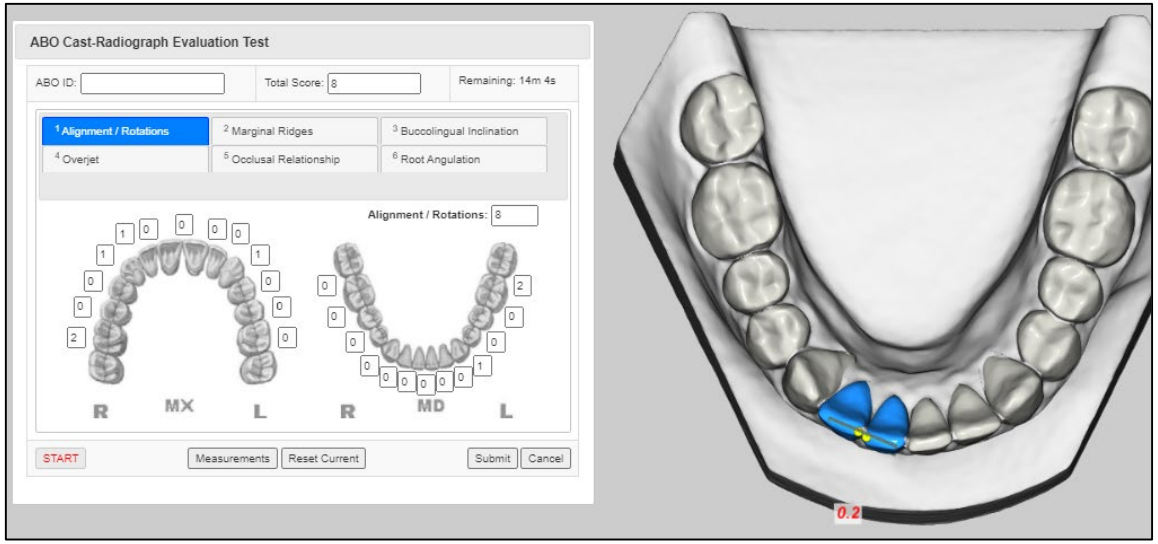

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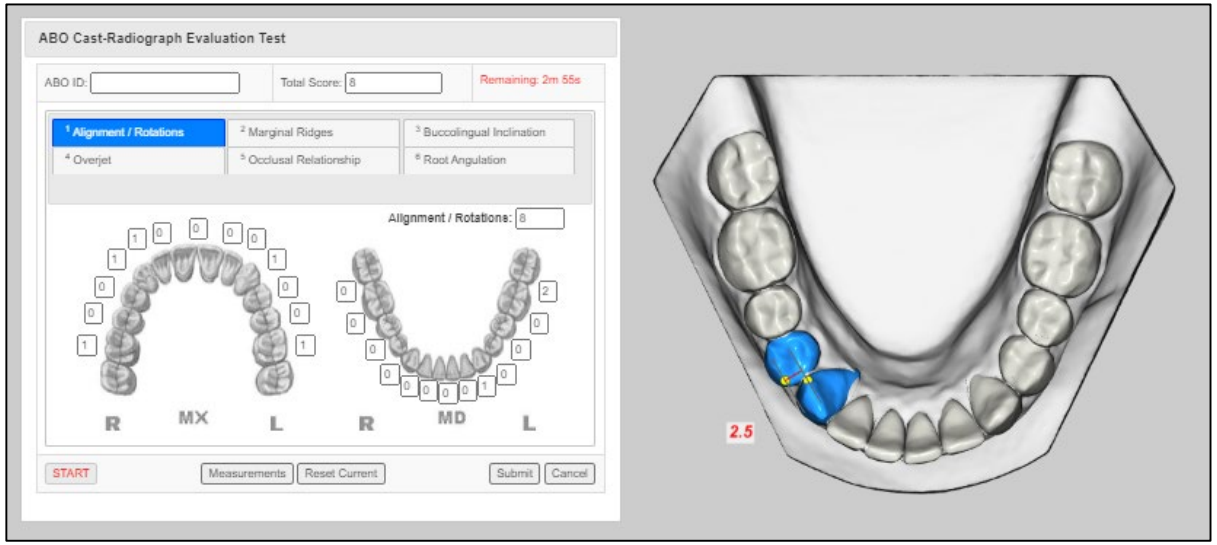

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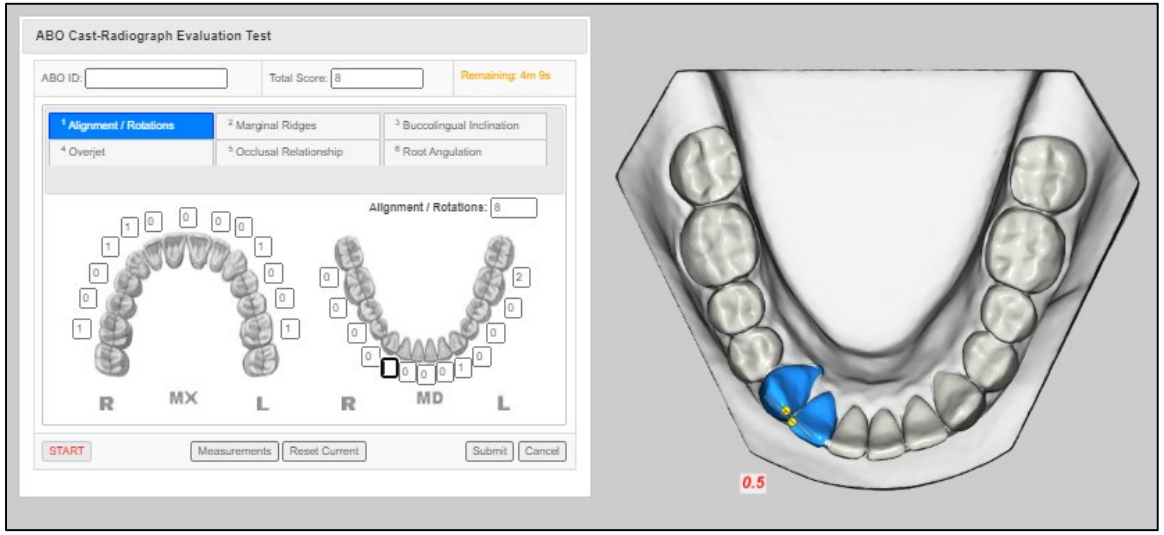

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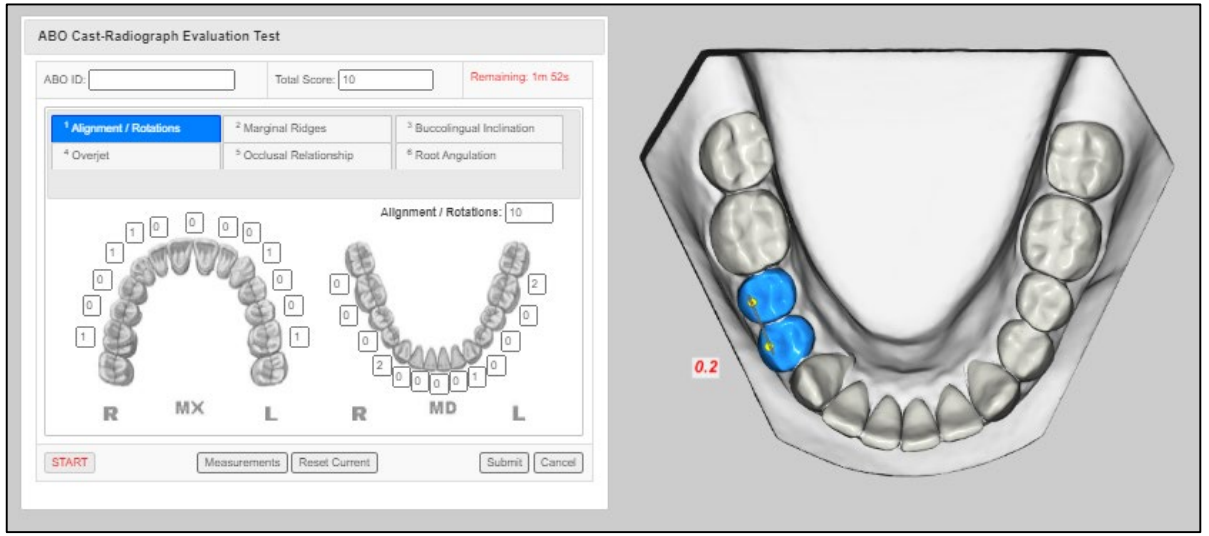

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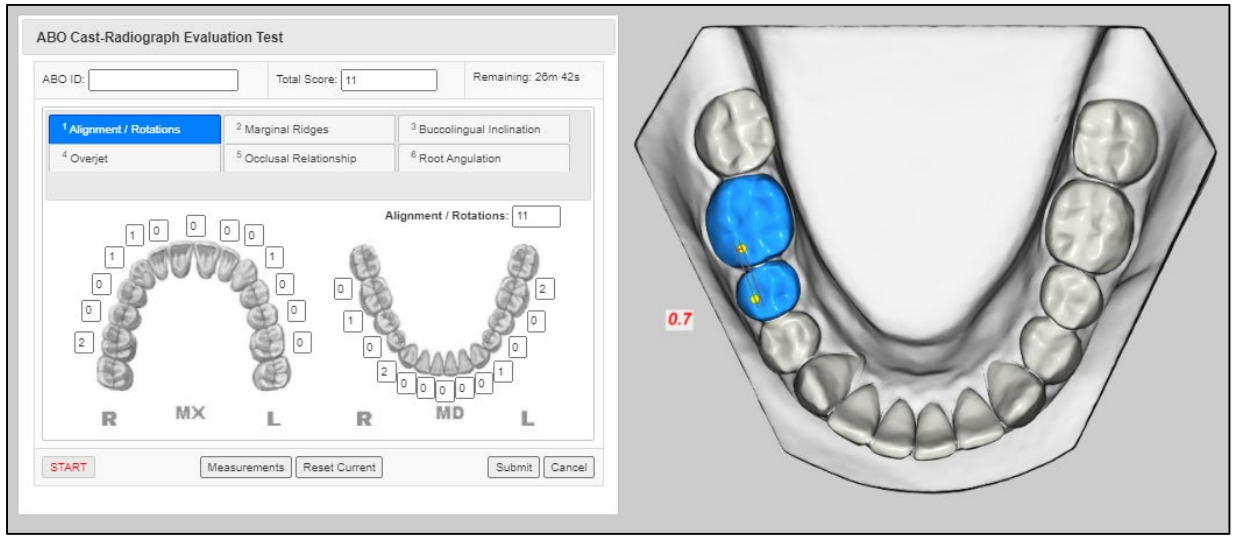
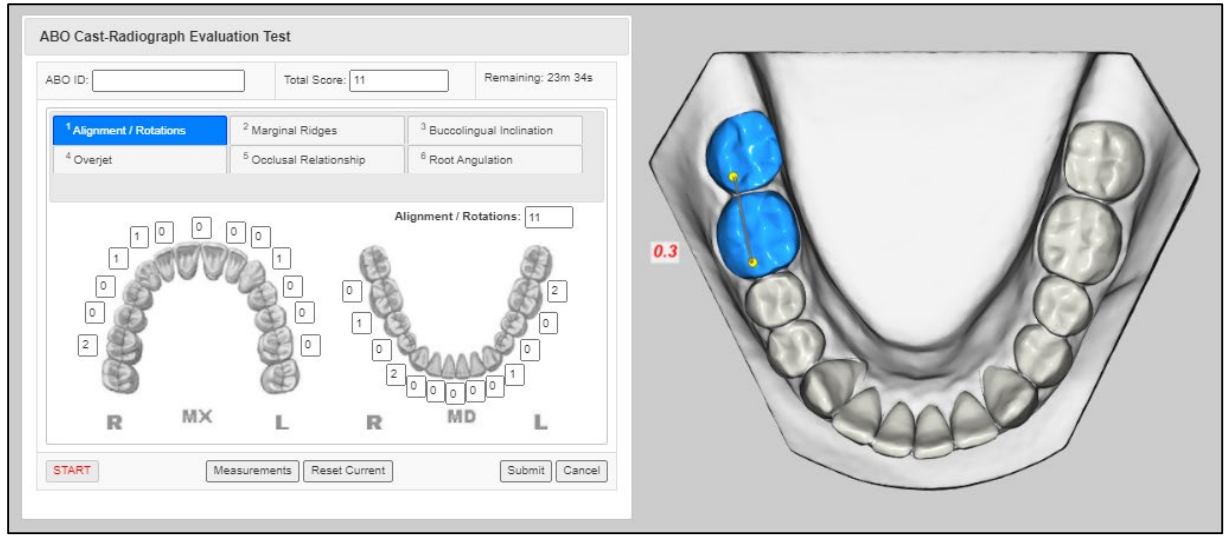
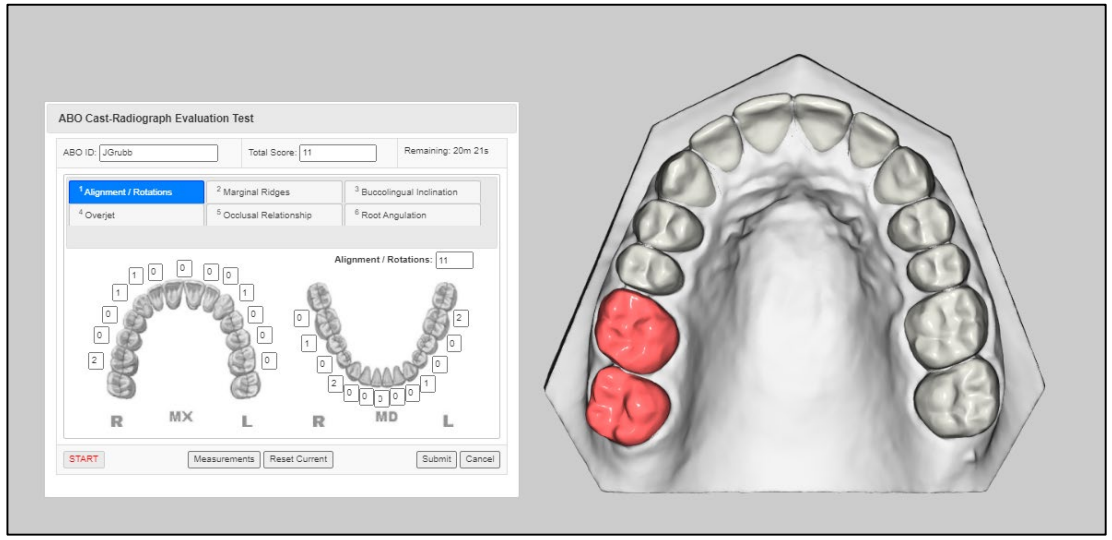
Step # 26

Step # 27







An examinee may go back and check each of the alignment numbers and change them if necessary after completing this area of analysis or at the completion of the total evaluation.

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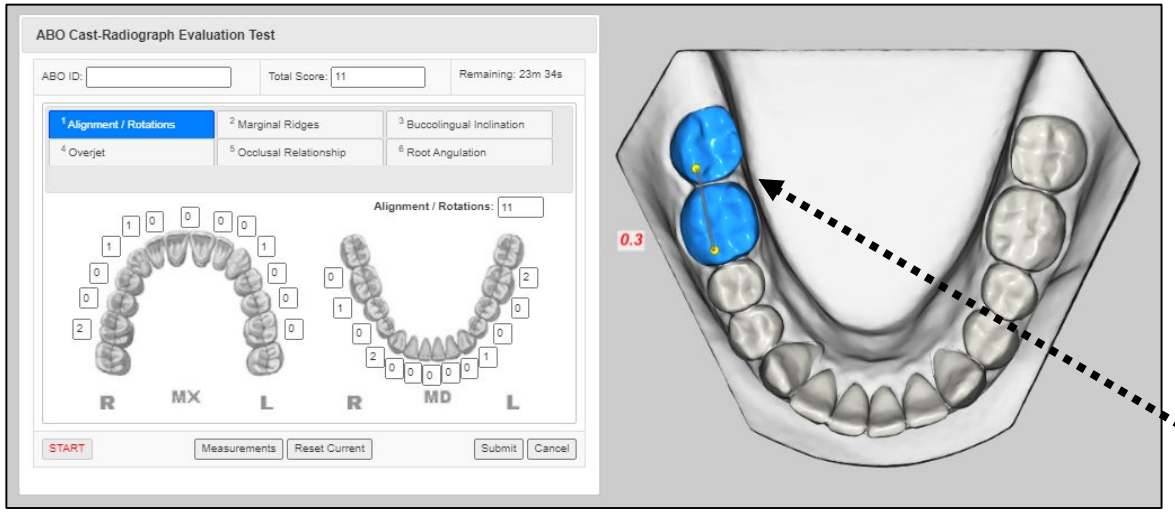
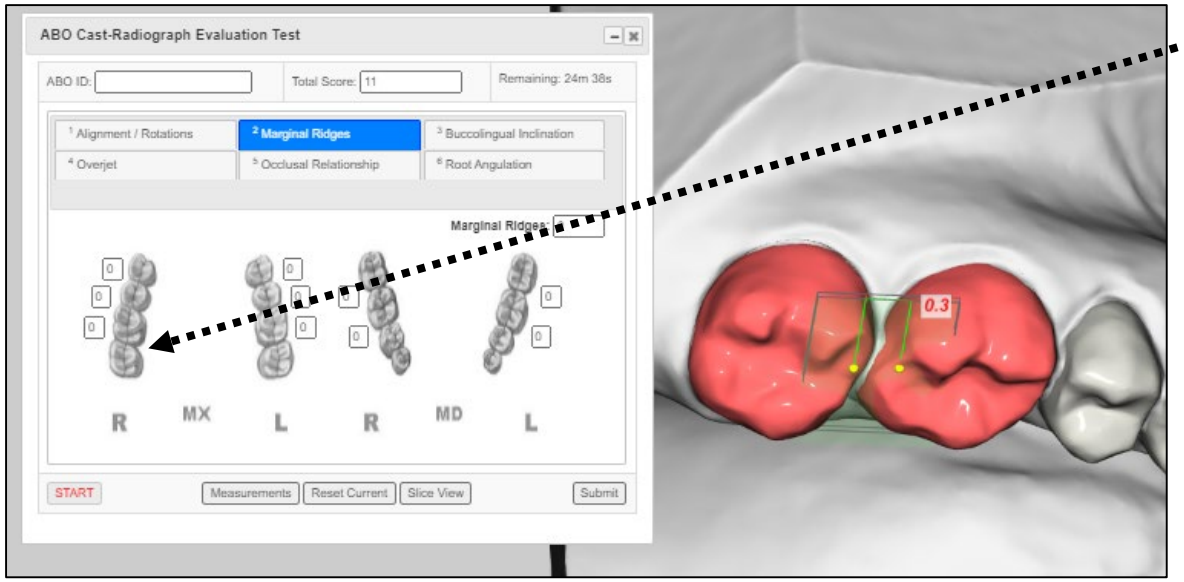
Mandibular Alignment



When this button is activated by adding **0 points**, the mandibular alignment will transfer to the next assessment **Marginal Ridges**

Step # 1

Marginal Ridges



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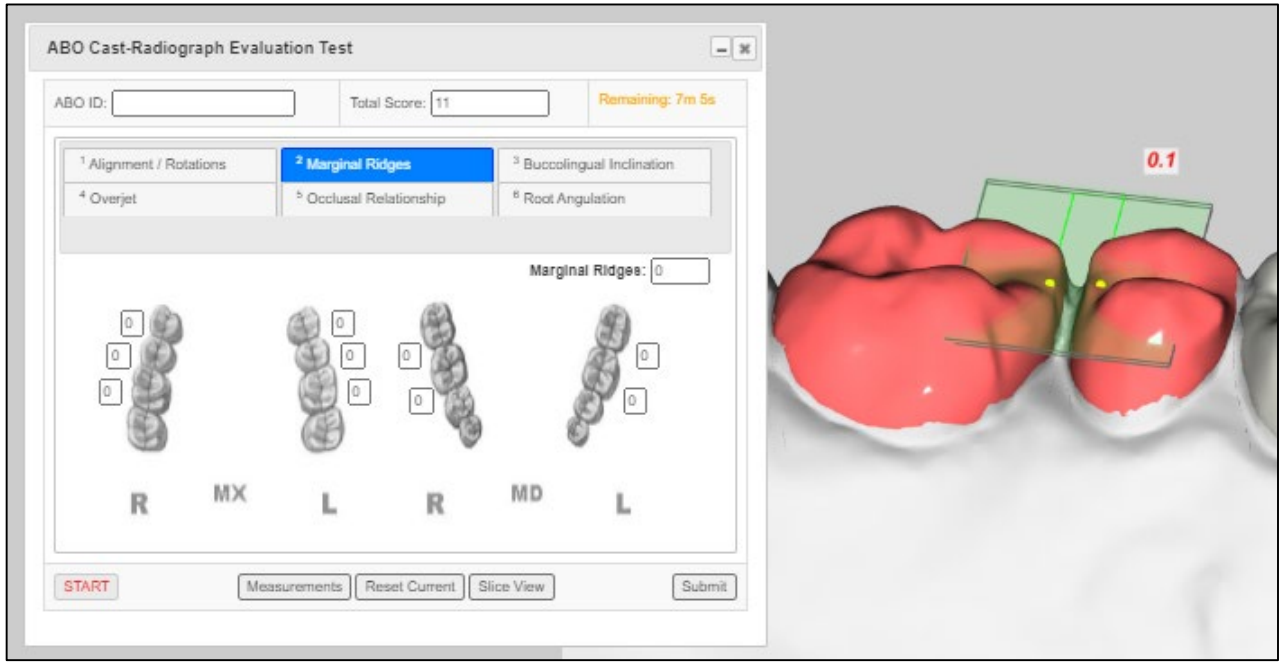
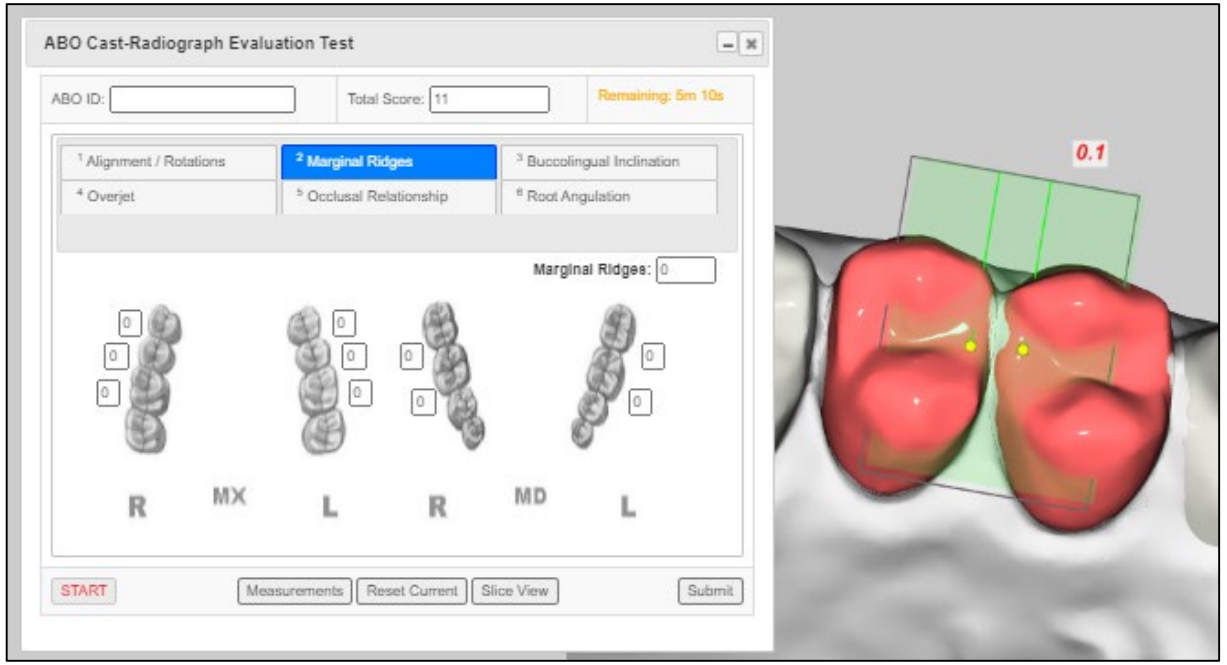
Step # 2

Marginal Ridges

Step # 3





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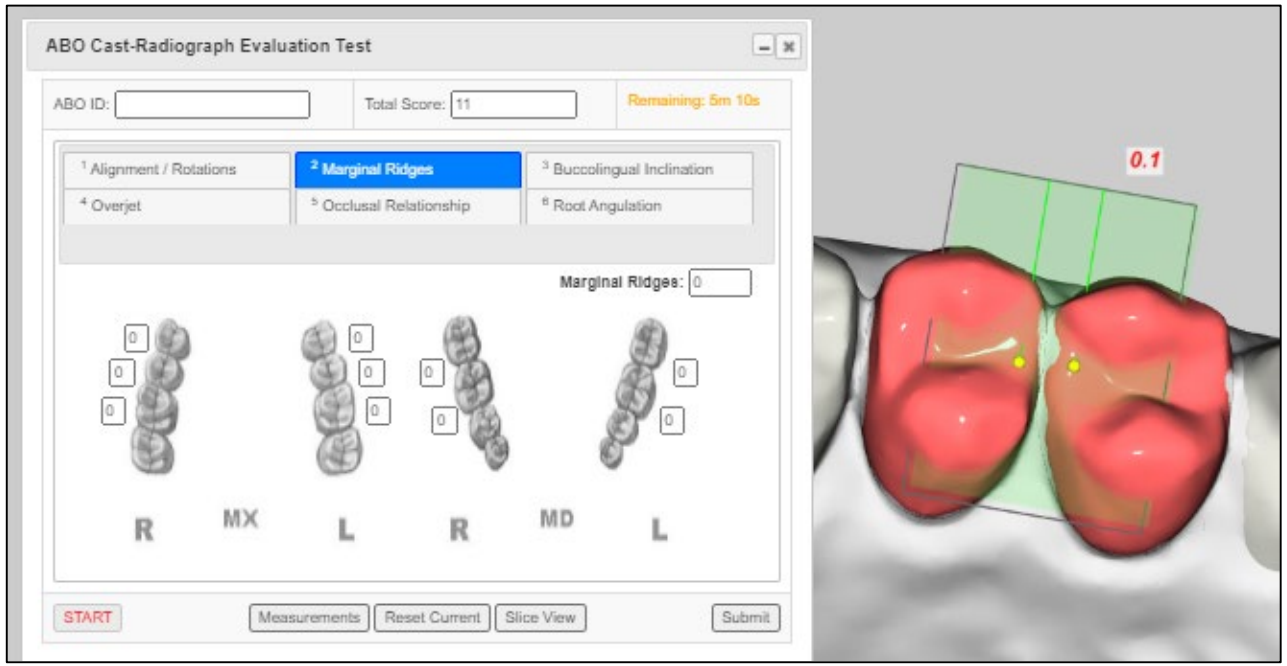
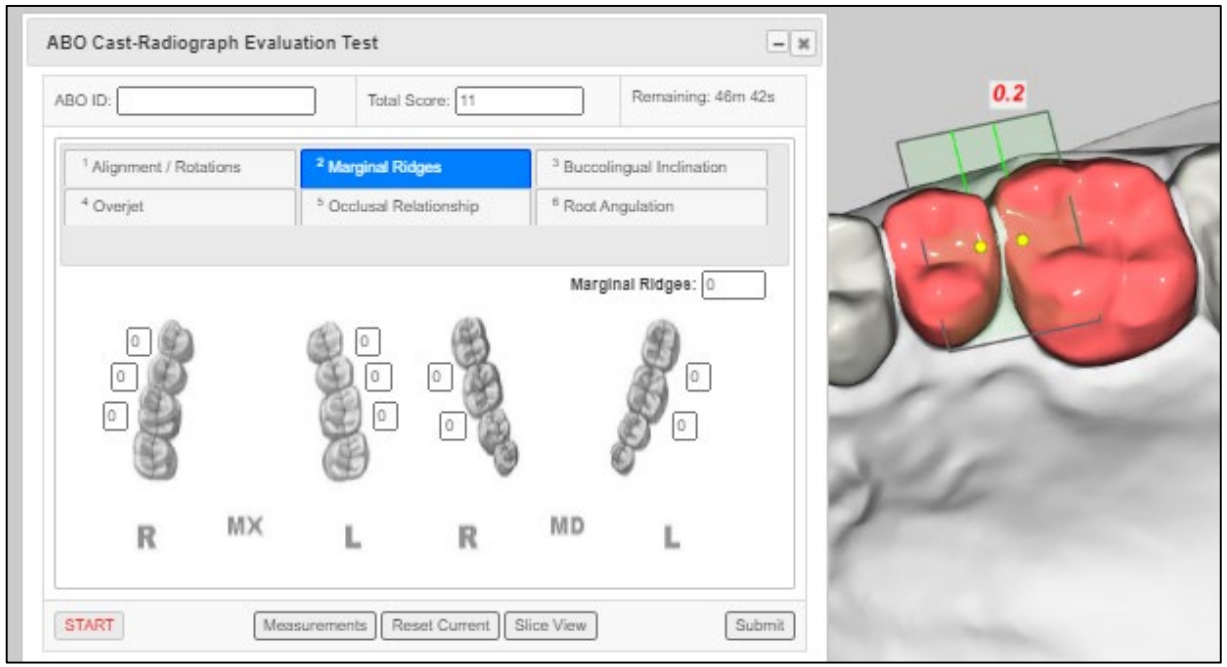
Step # 4

Marginal Ridges

Step # 5





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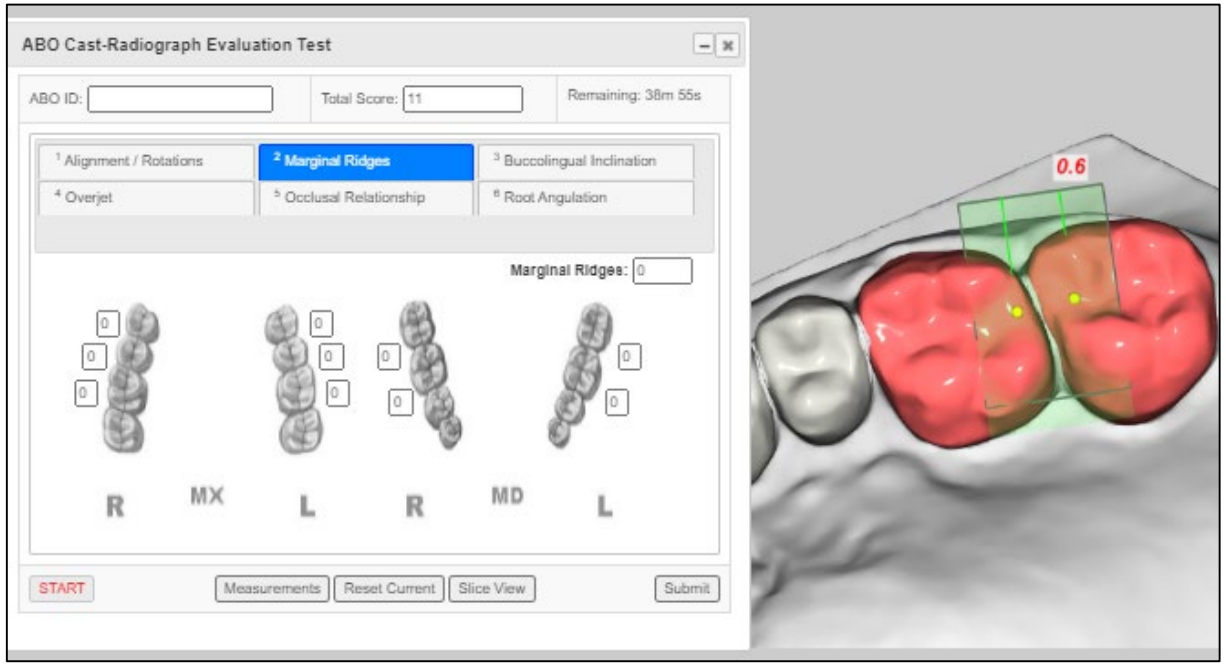
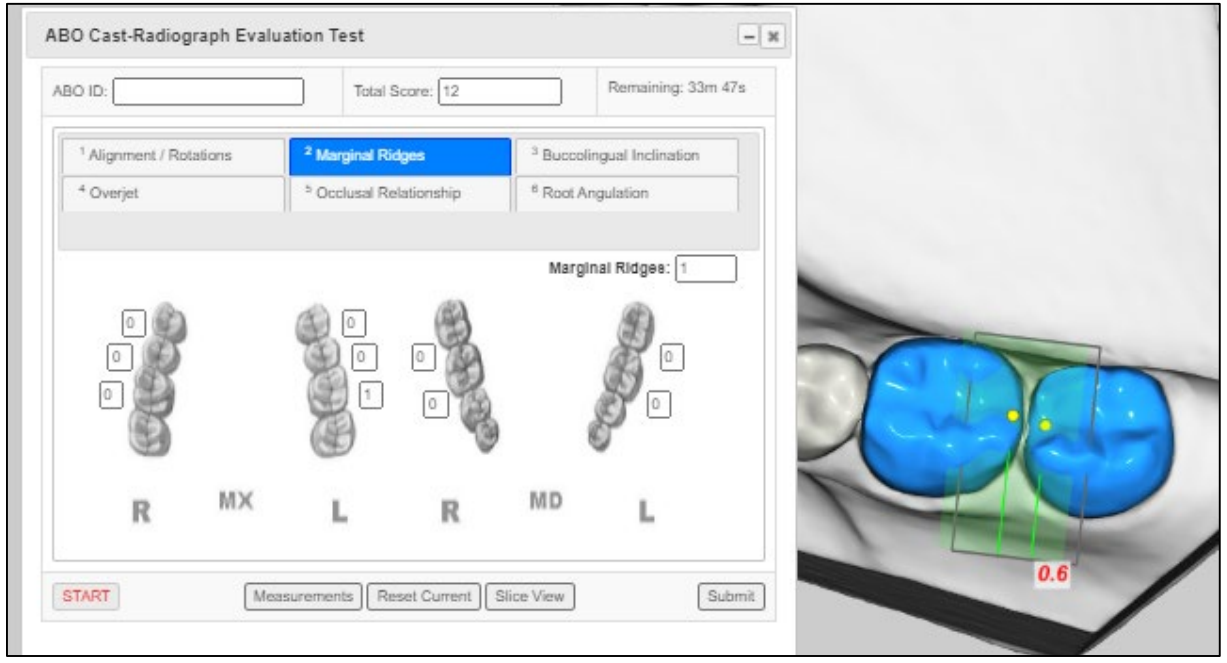
Step # 6

Marginal Ridges

Step # 7





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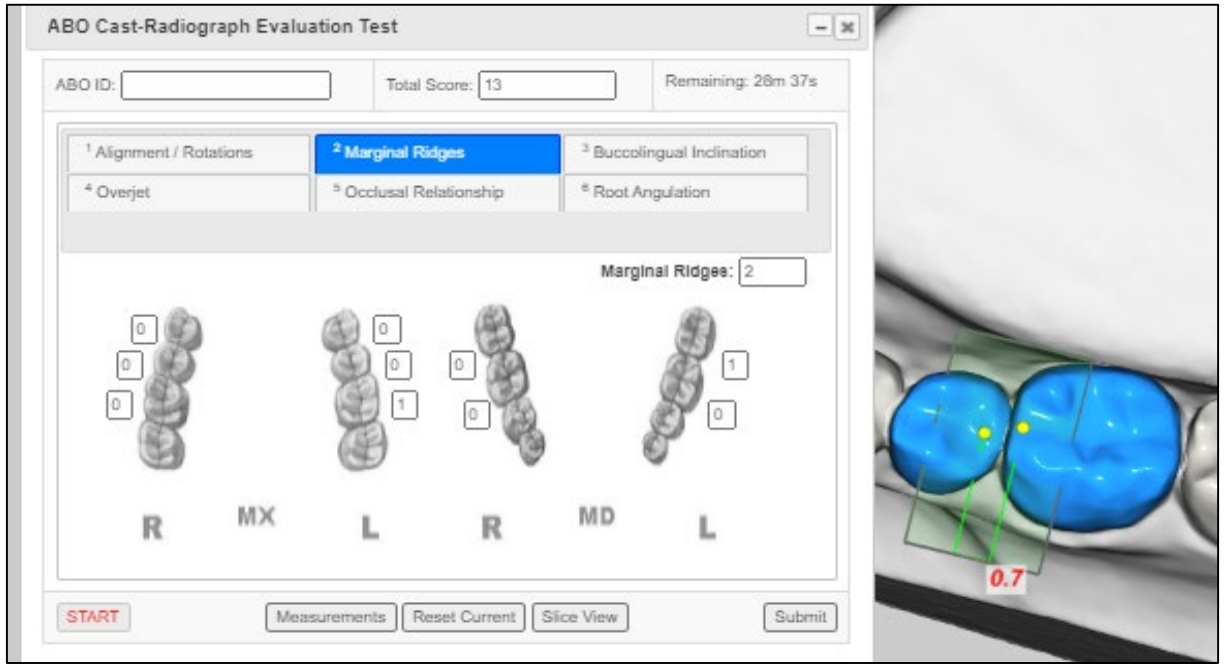
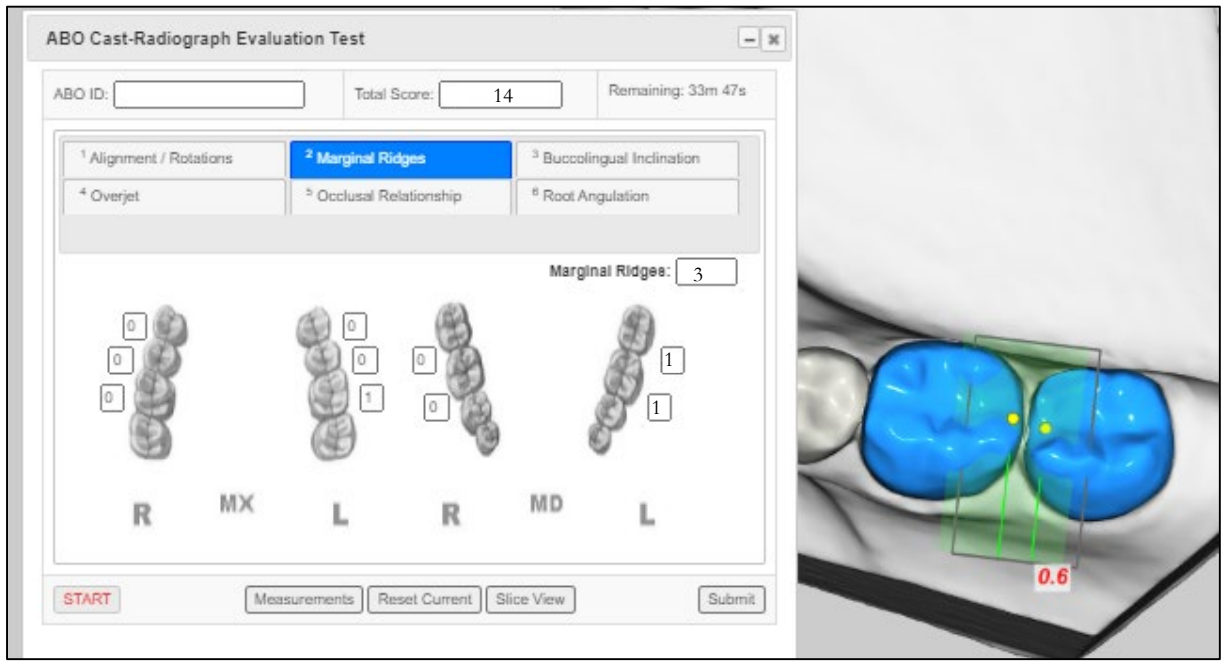
Step # 8

Marginal Ridges

Step # 9

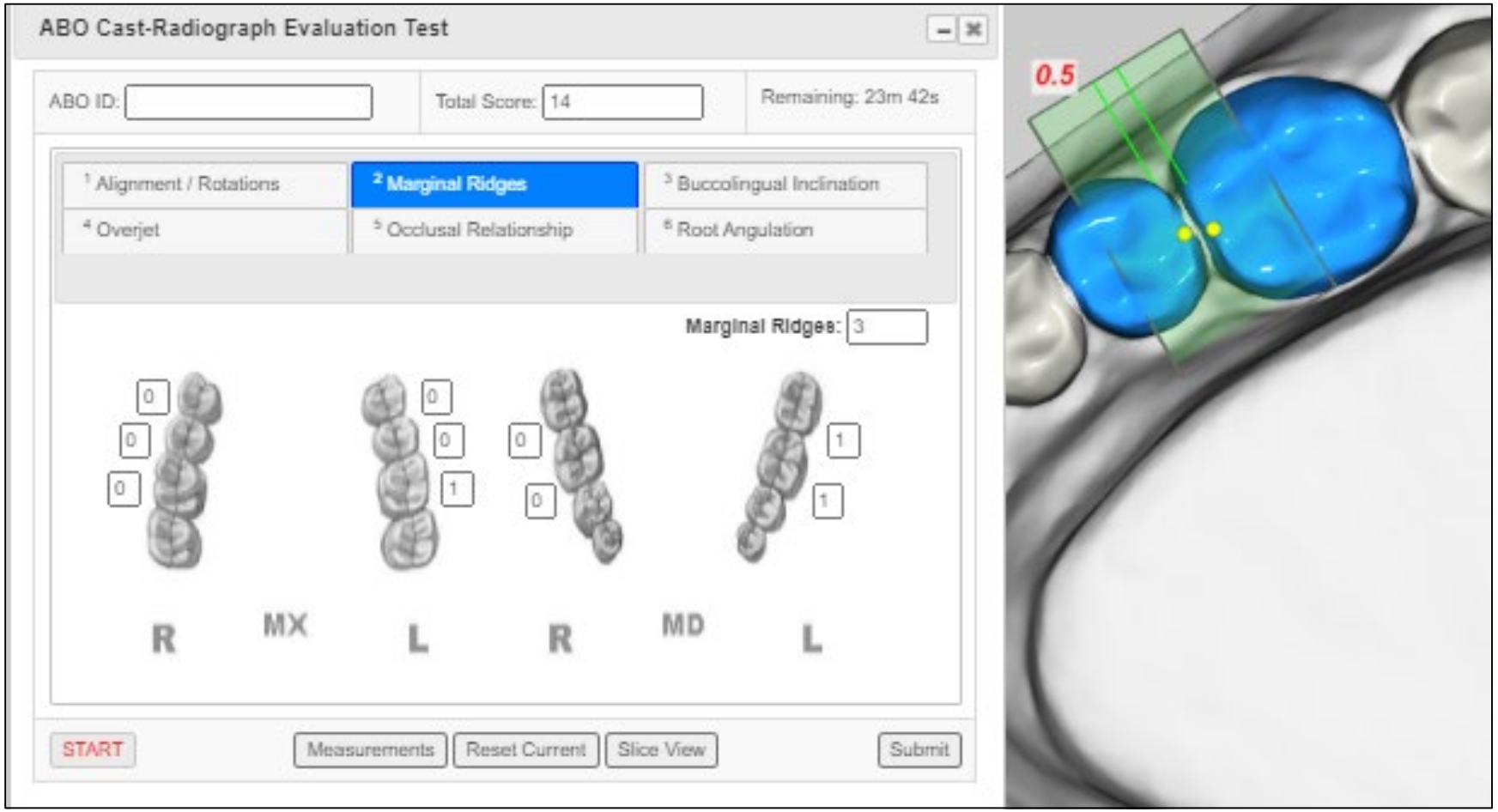




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 10

Marginal Ridges

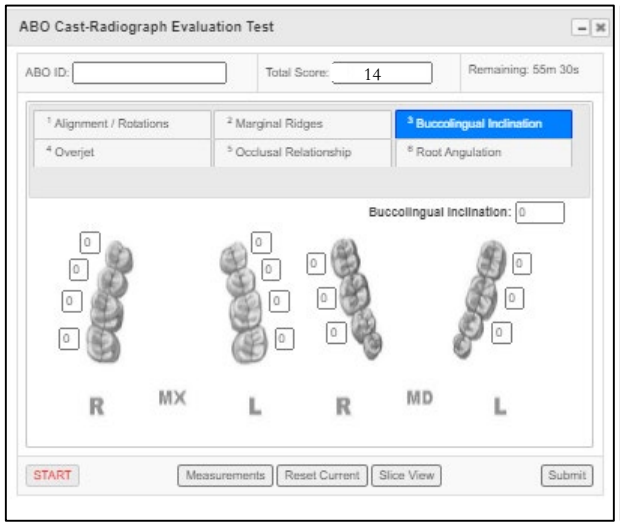


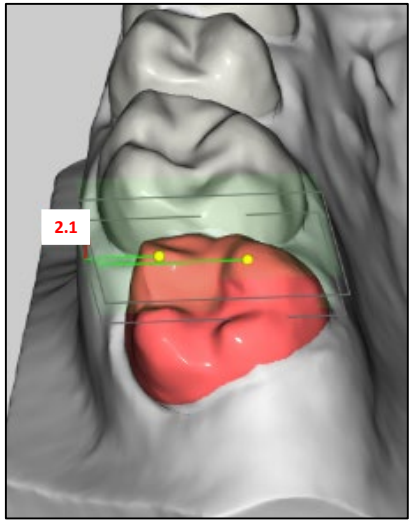
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

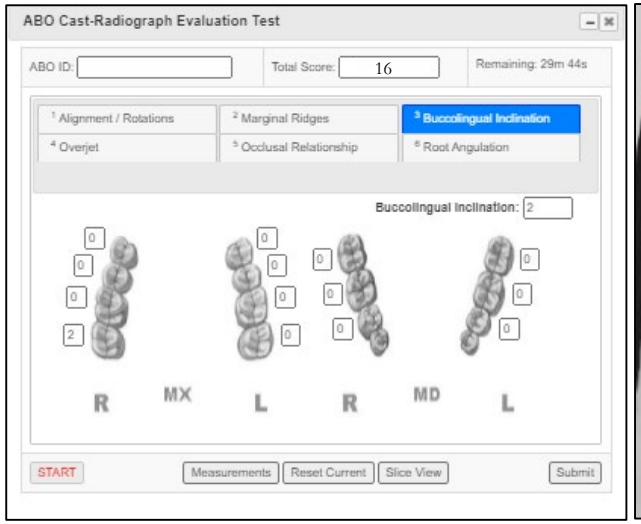
Step # 1

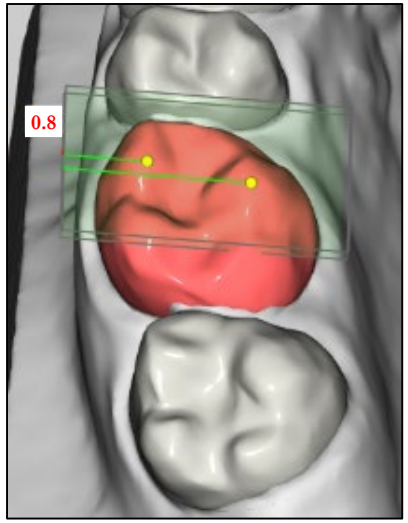
Maxillary Buccolingual Inclination

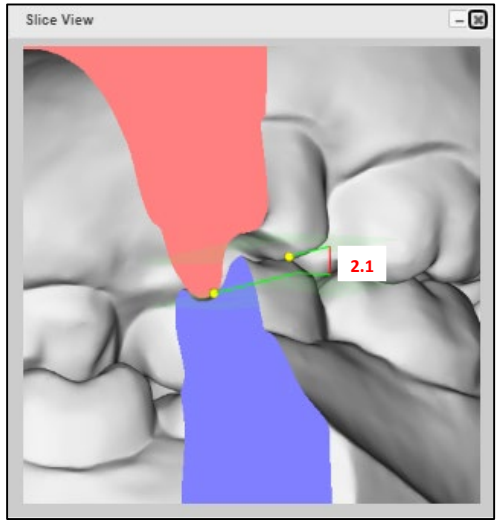
Step # 2

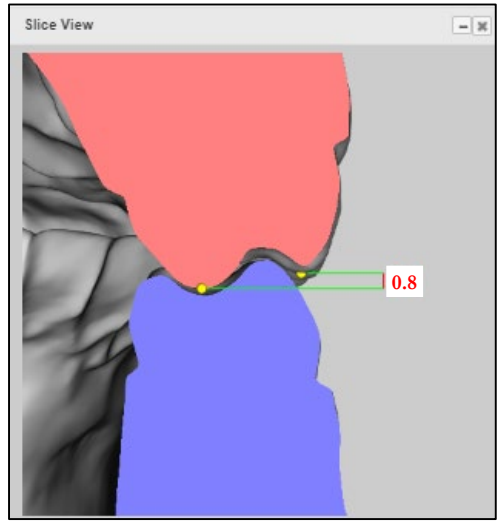










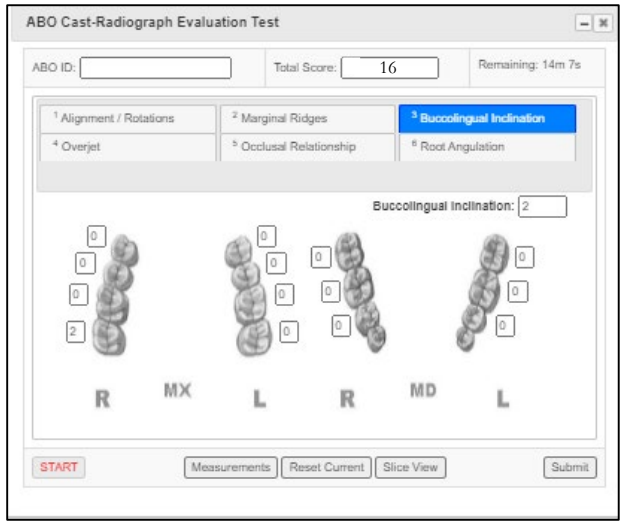


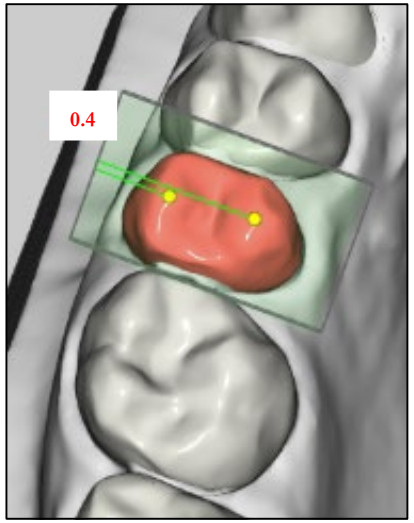
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

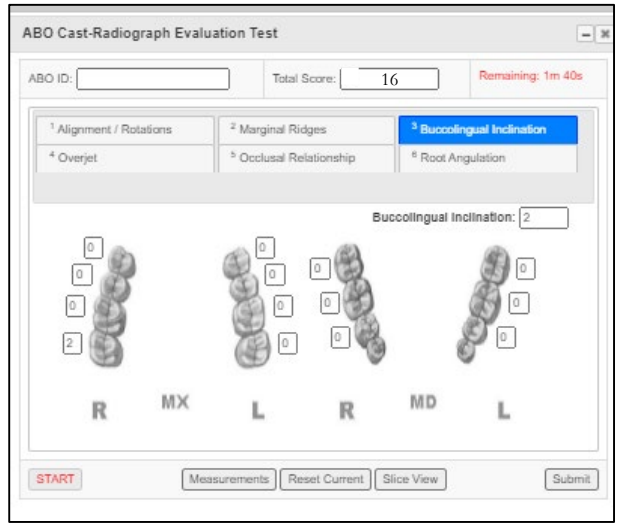
Step # 3

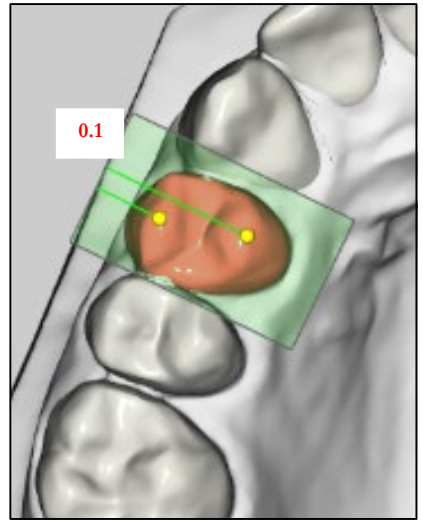
Maxillary Buccolingual Inclination

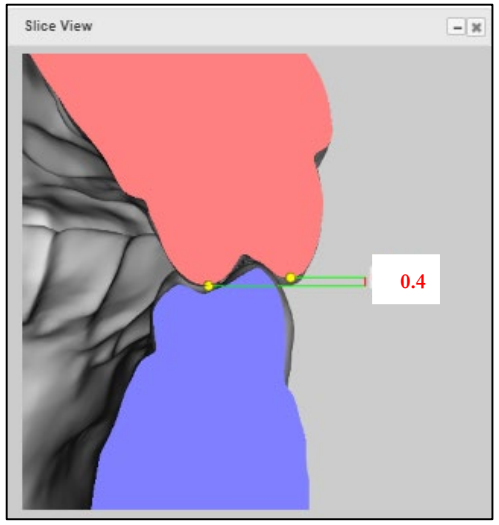
Step # 4

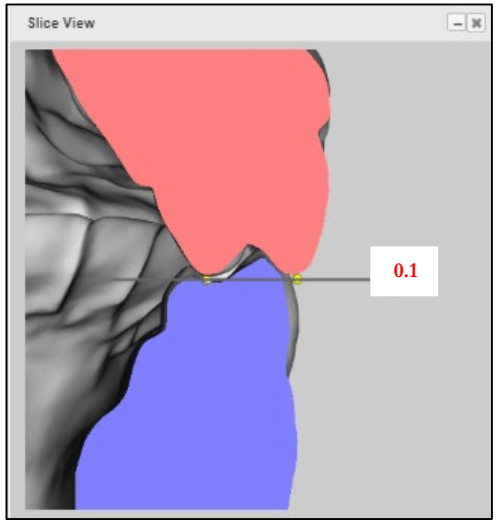










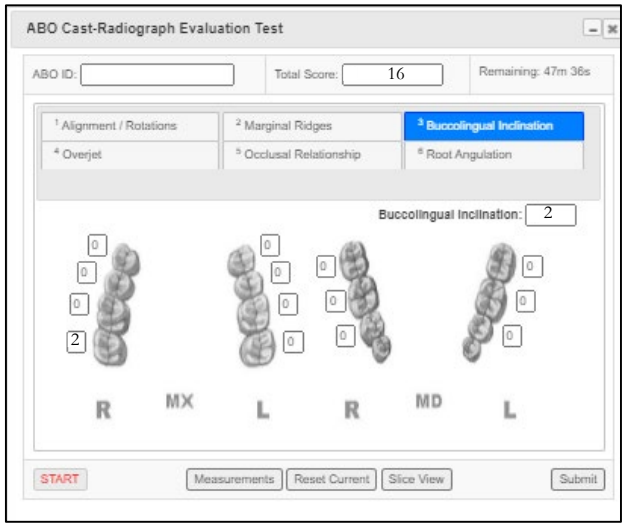


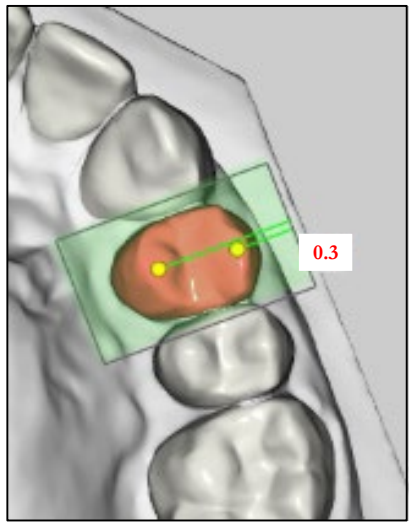
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

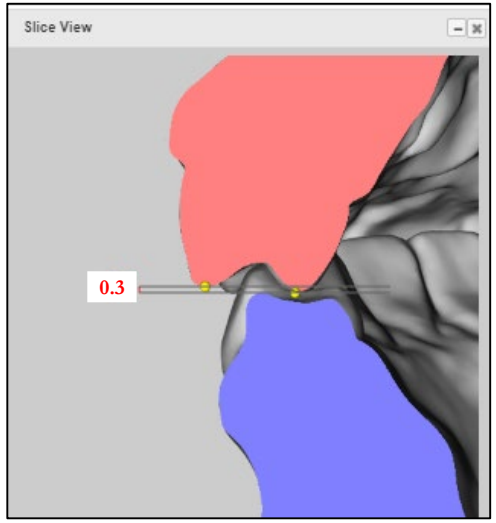
Step # 5

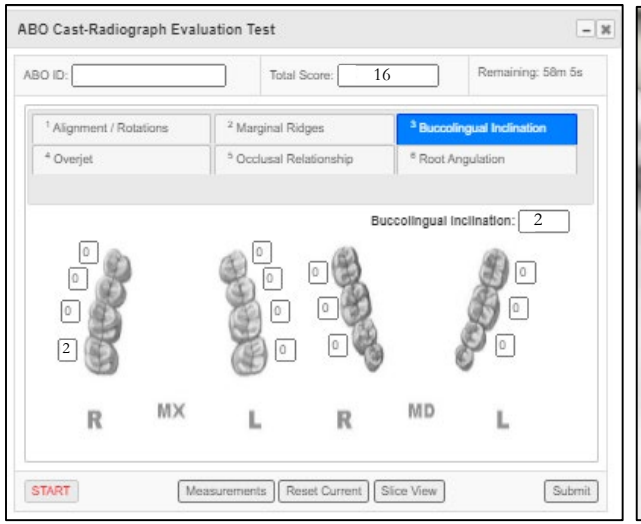
Maxillary Buccolingual Inclination

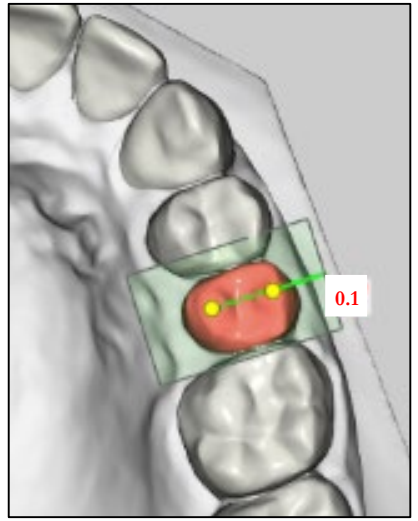
Step # 6

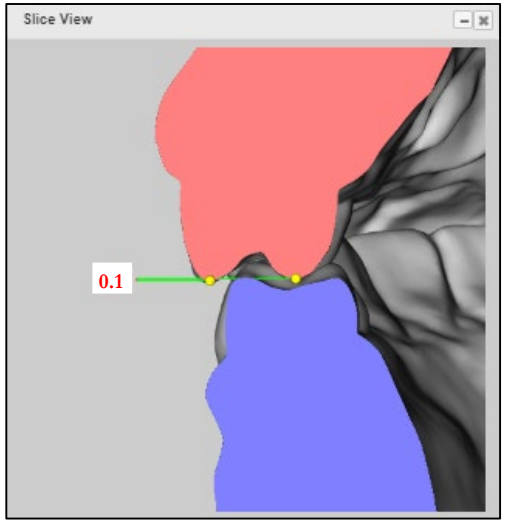










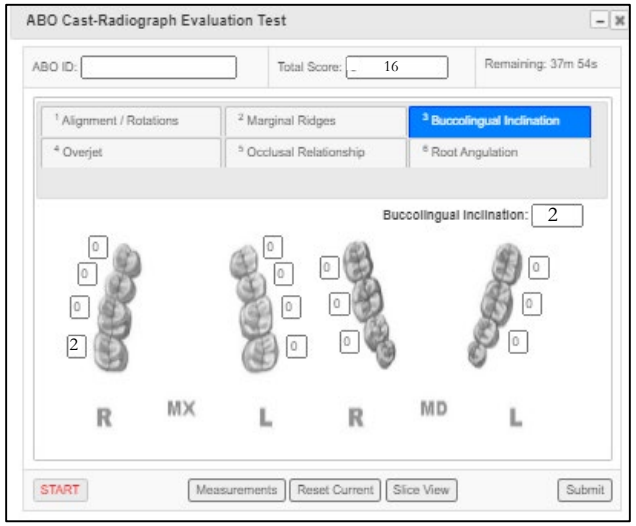


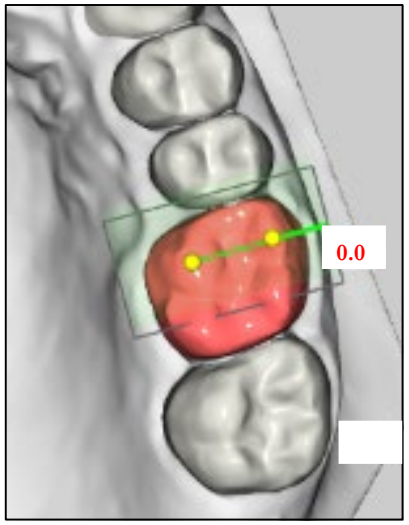
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

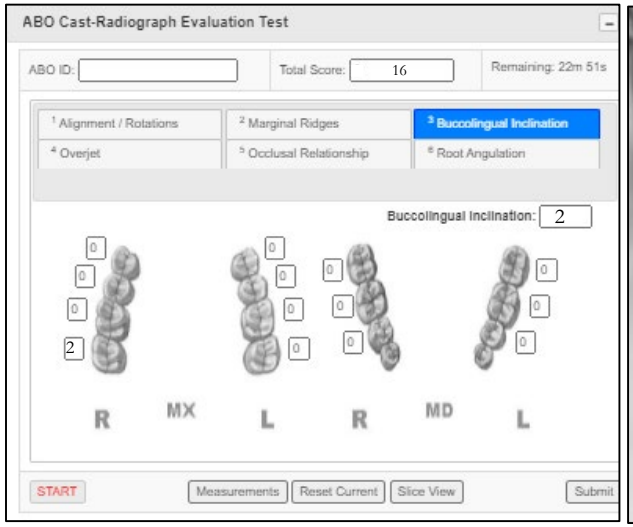
Step # 7

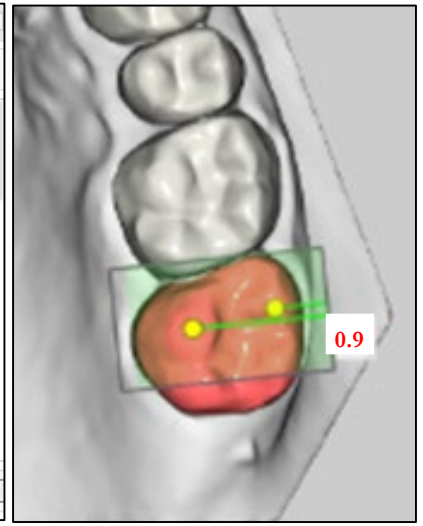
Maxillary Buccolingual Inclination

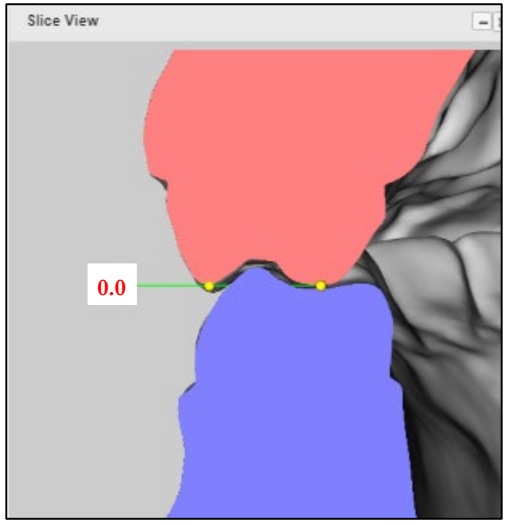
Step # 8

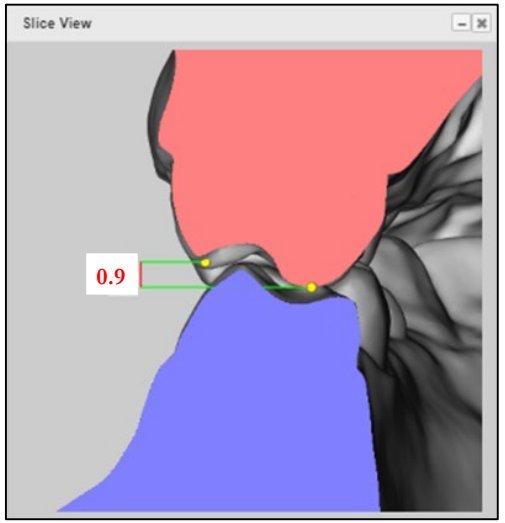










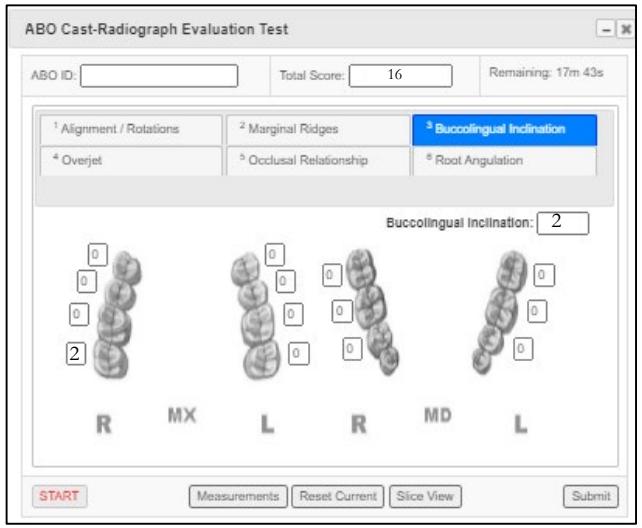


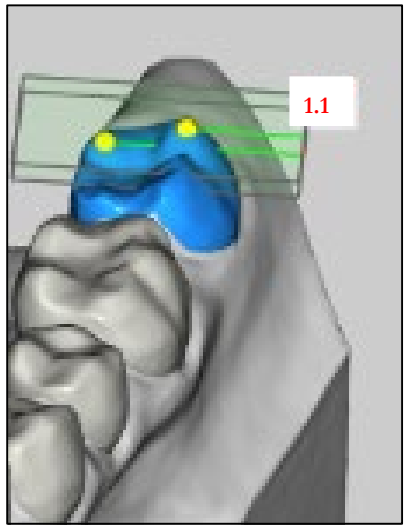
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

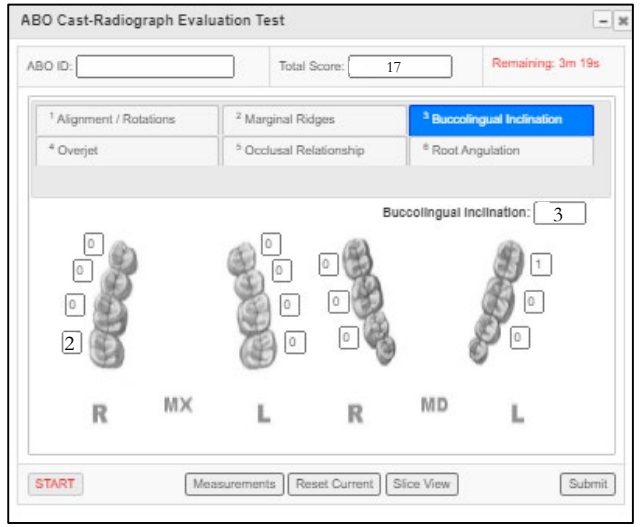
Step # 9

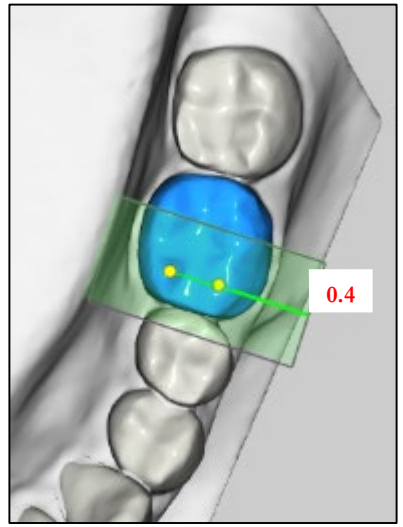
Mandibular Buccolingual Inclination

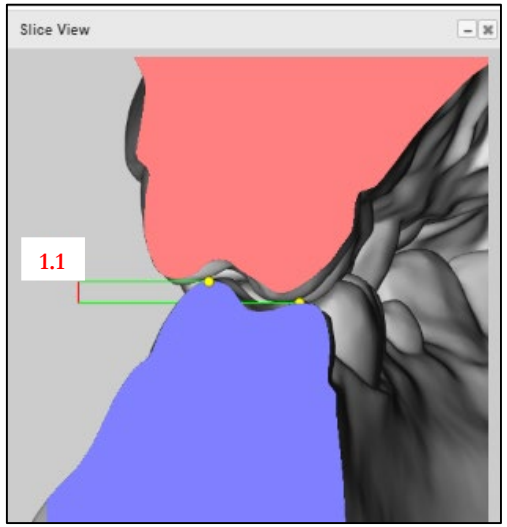
Step # 10

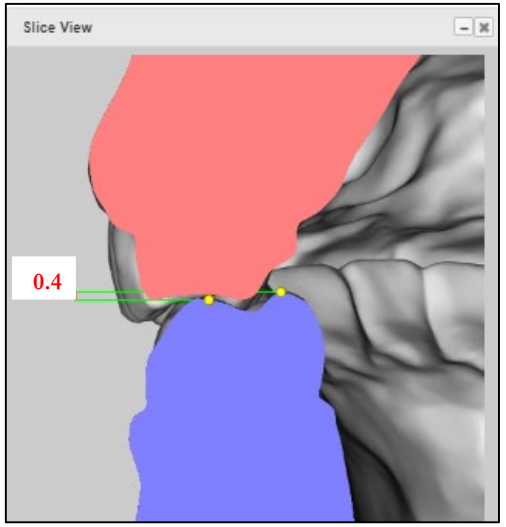










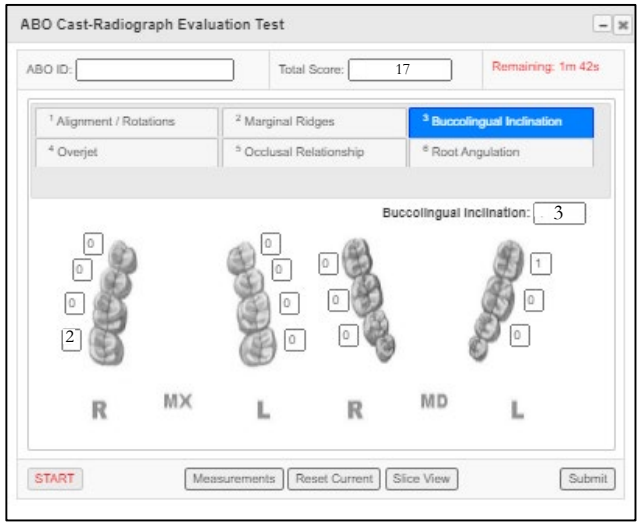


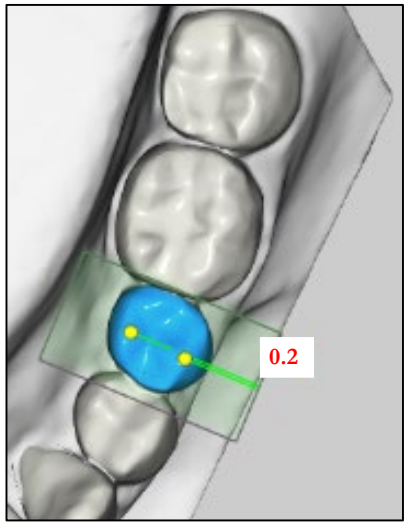
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

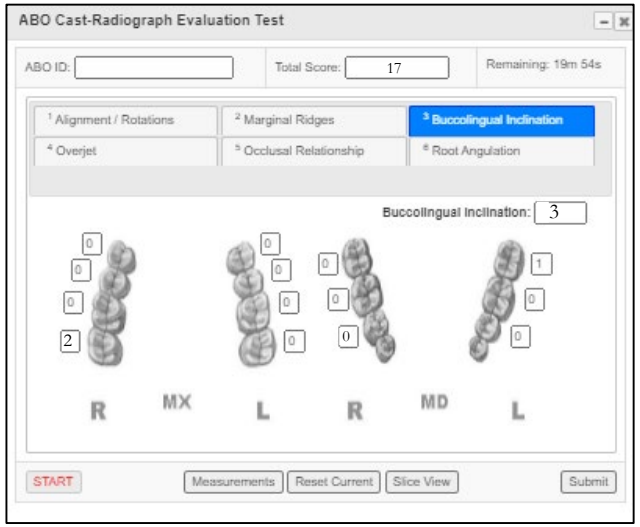
Step # 11

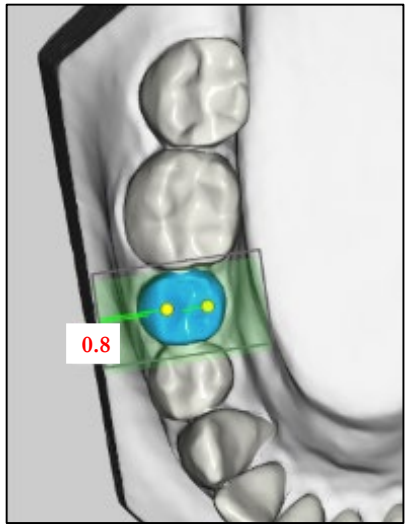
Mandibular Buccolingual Inclination

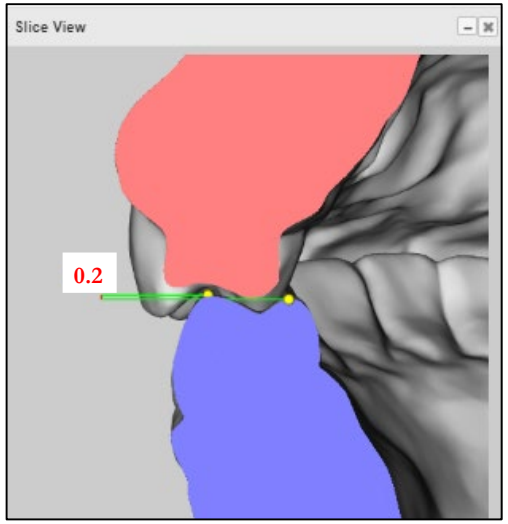
Step # 12

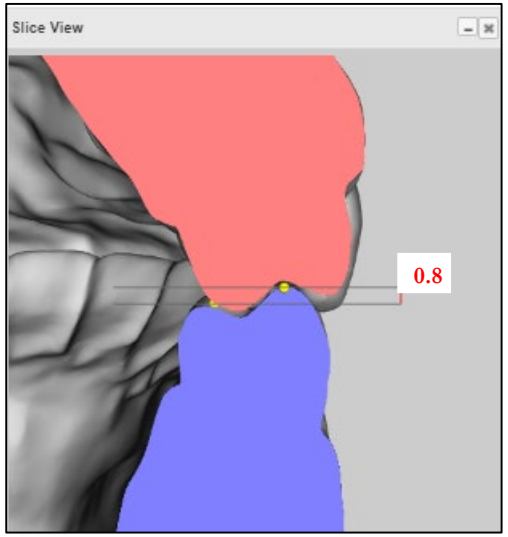










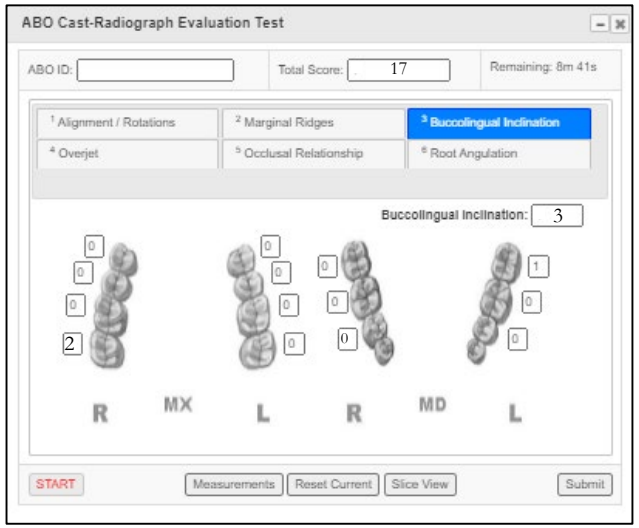


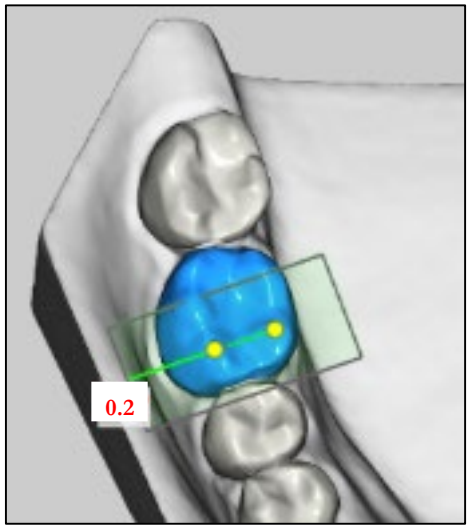
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

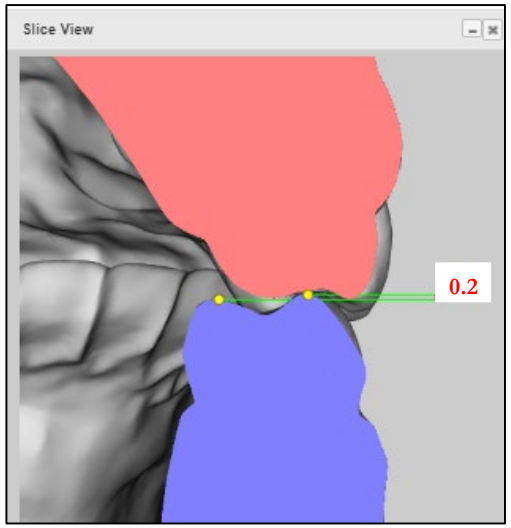
Step # 13

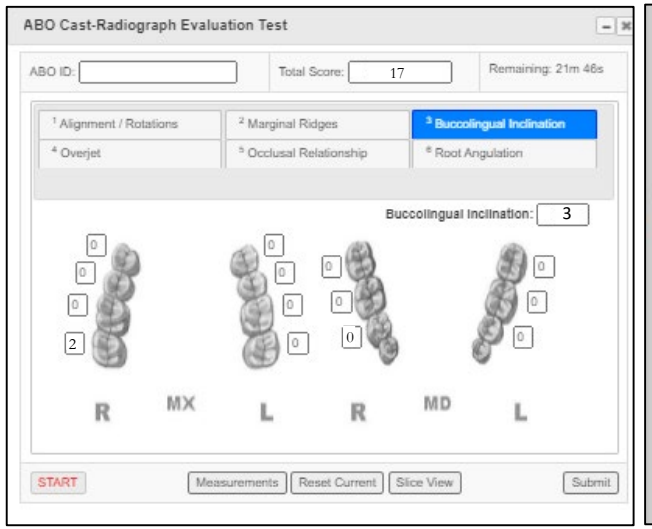
Mandibular Buccolingual Inclination

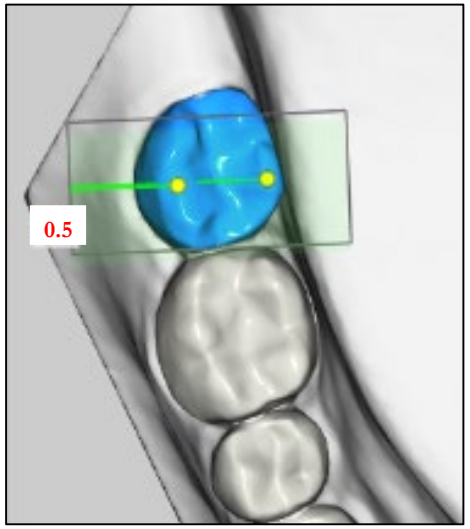
Step # 14

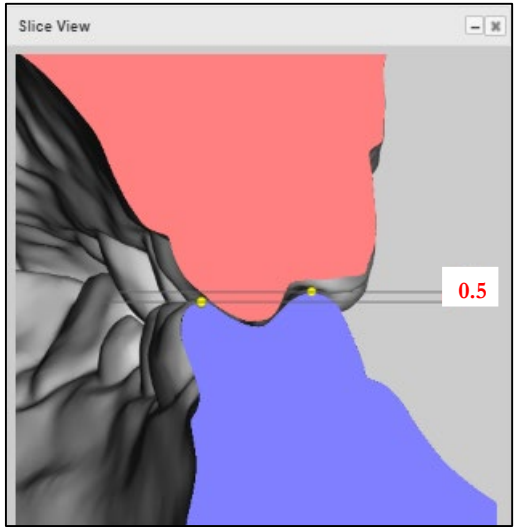






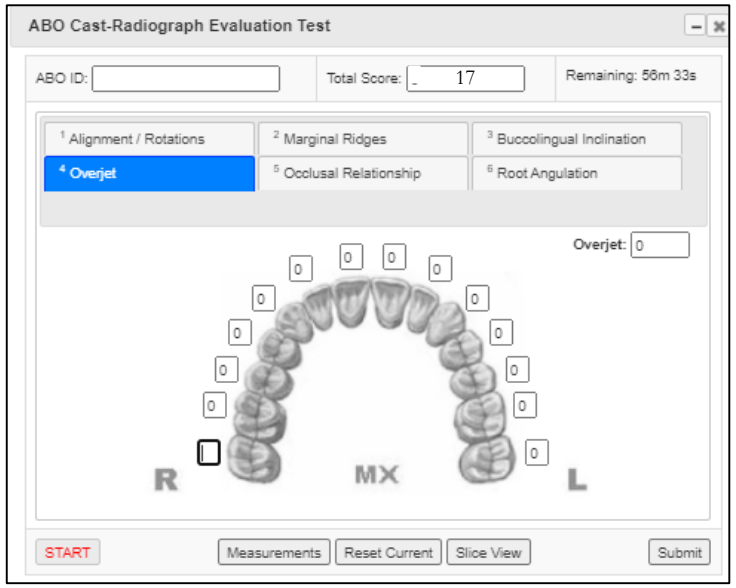




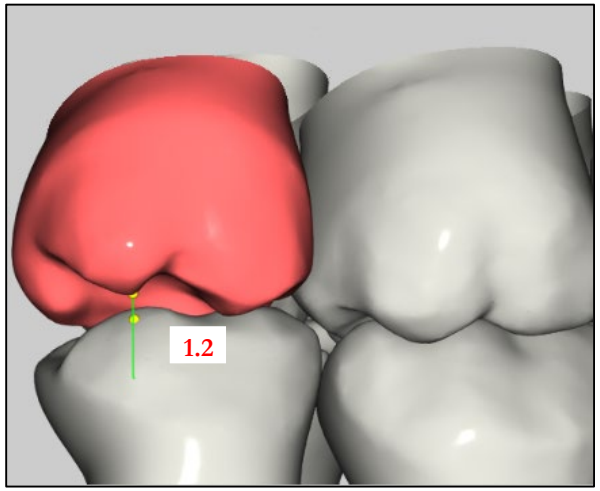


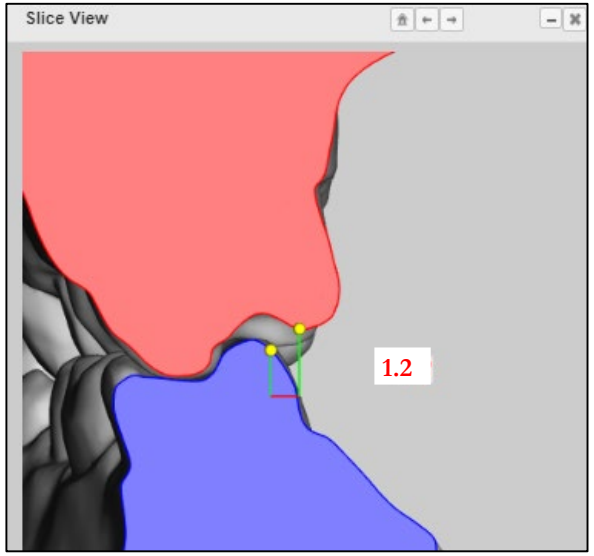
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 1



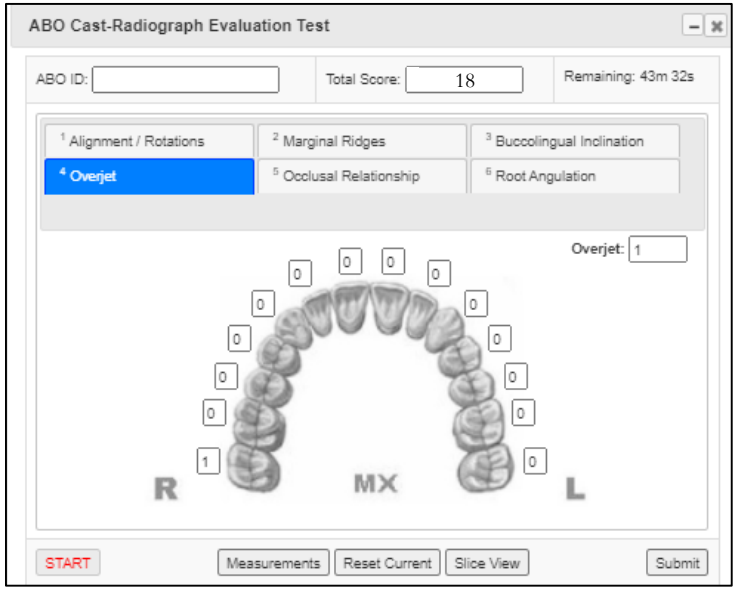
Posterior Overjet





ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 2



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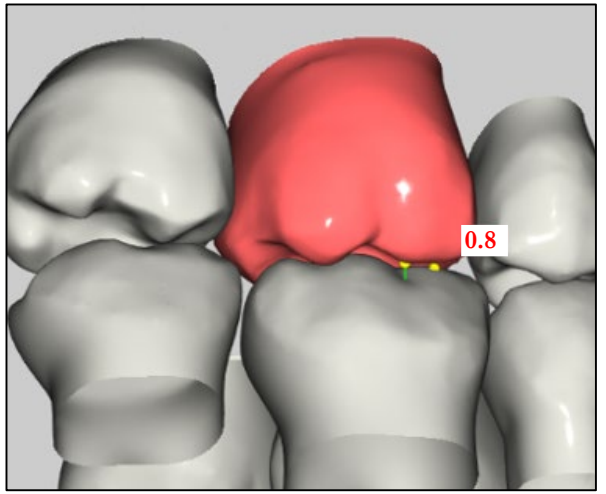
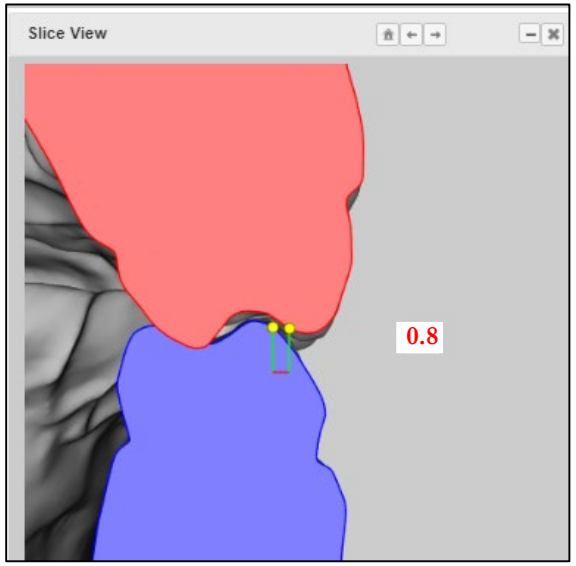
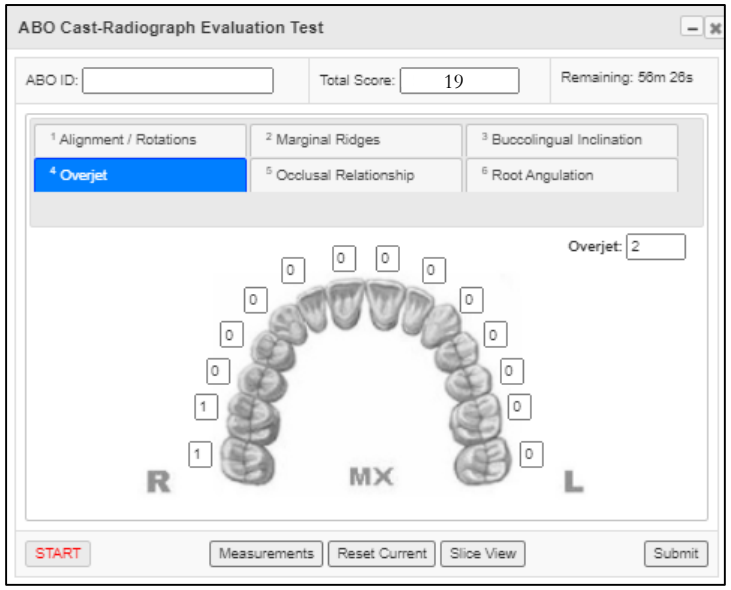


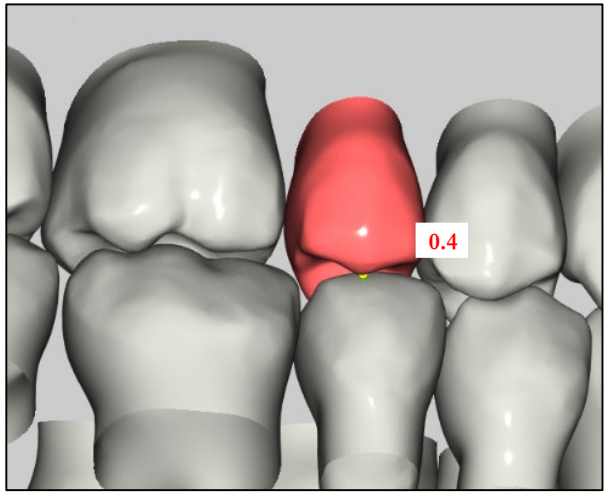


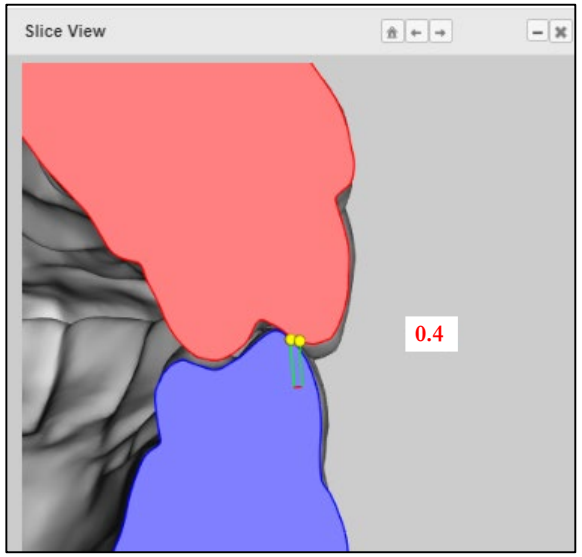
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 3



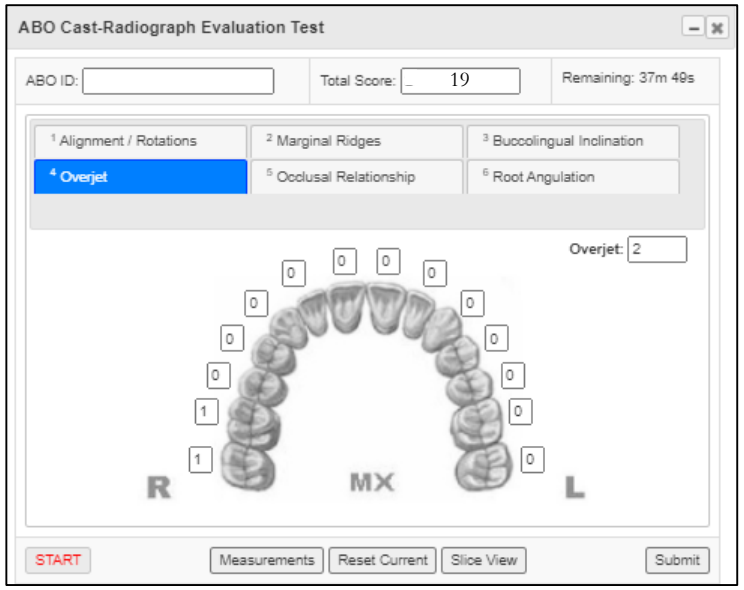
Posterior Overjet



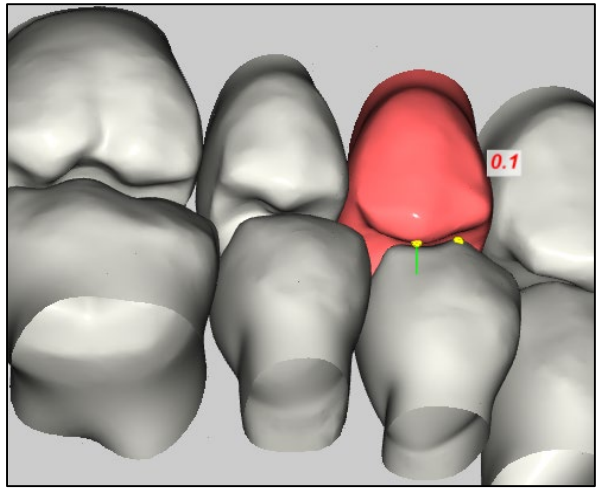


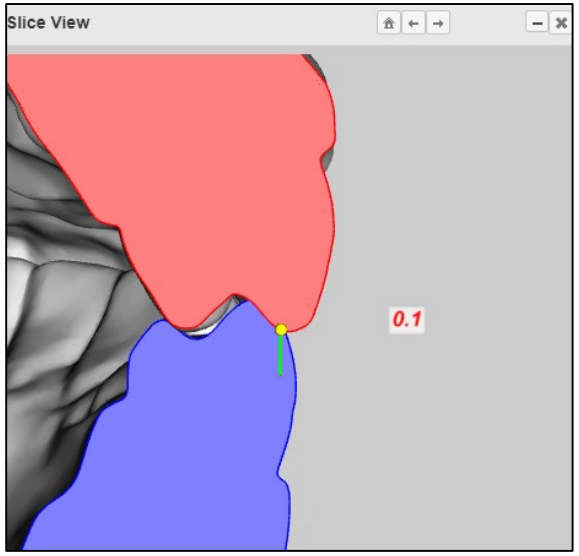
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 4



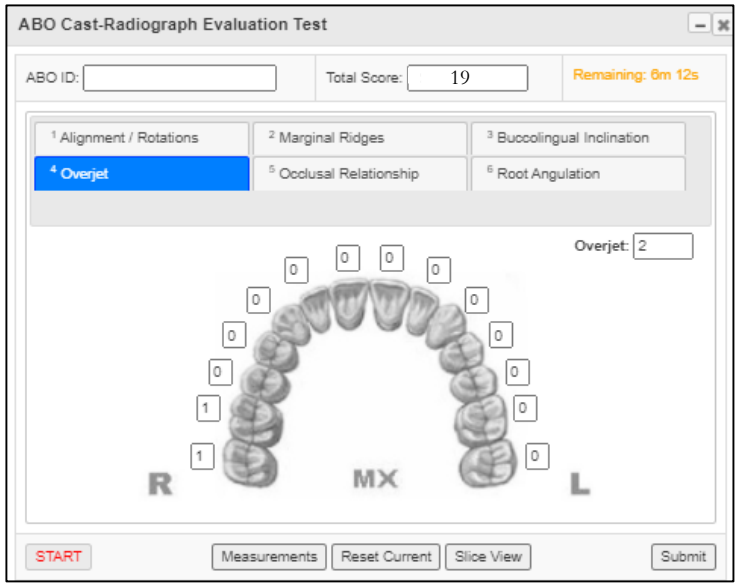
Posterior Overjet





ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 5



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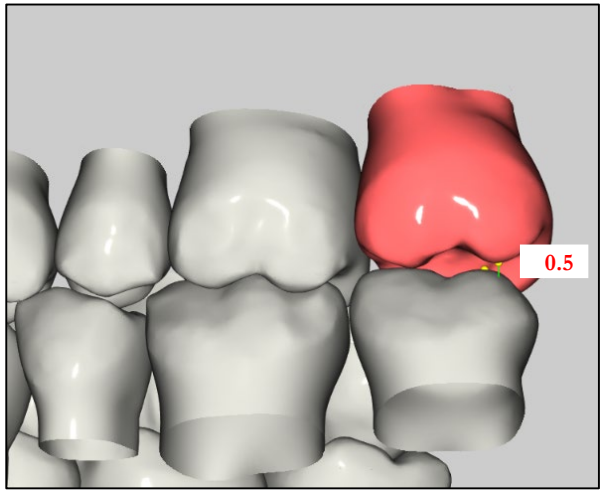
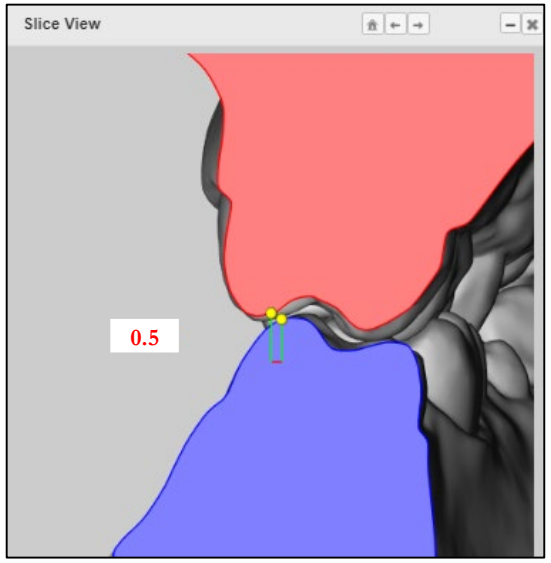
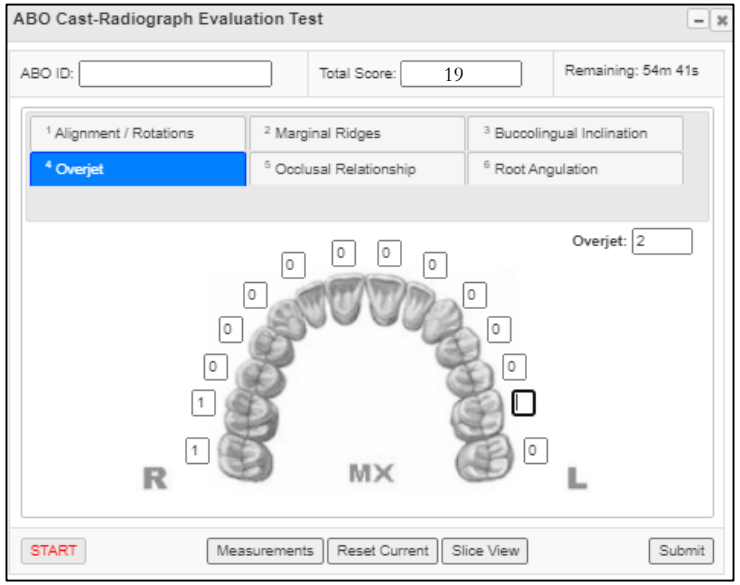




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 6



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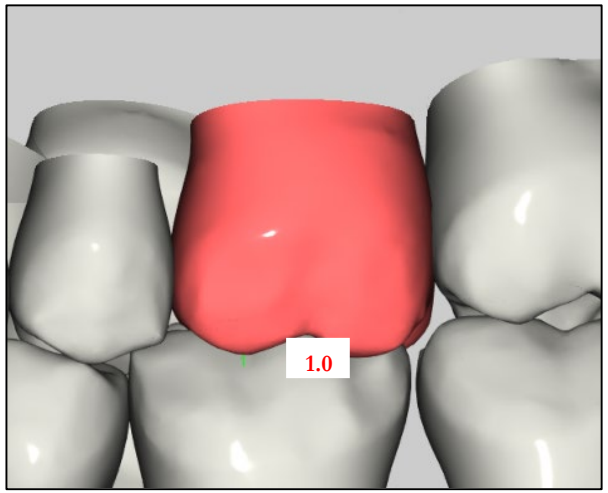
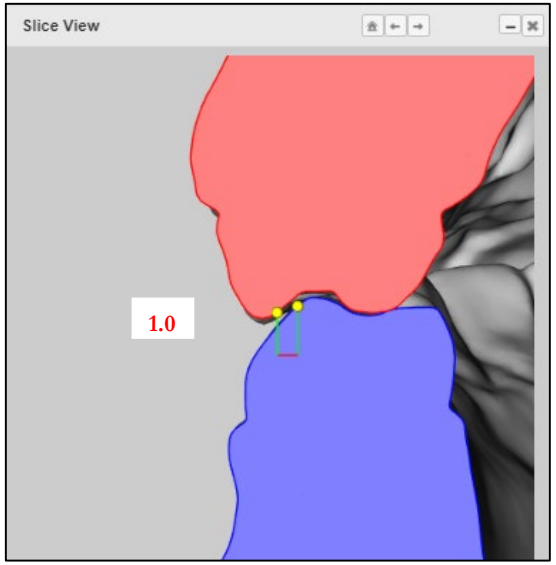
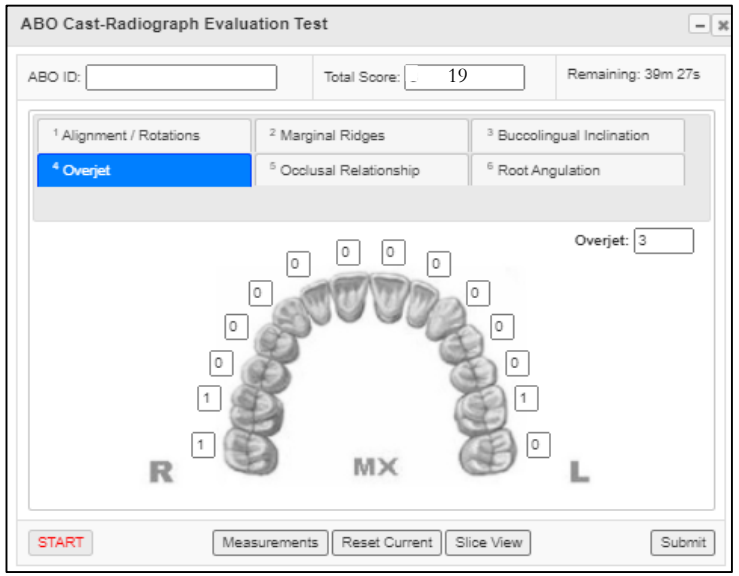




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 7



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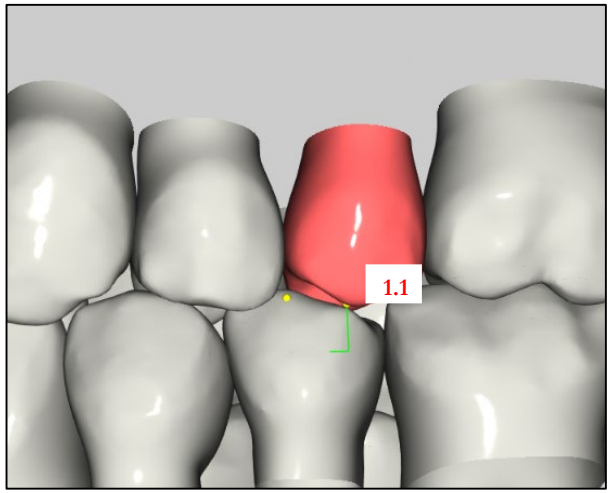
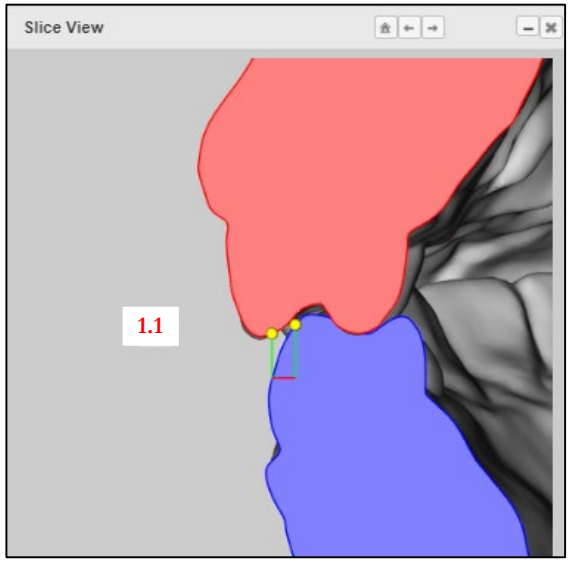
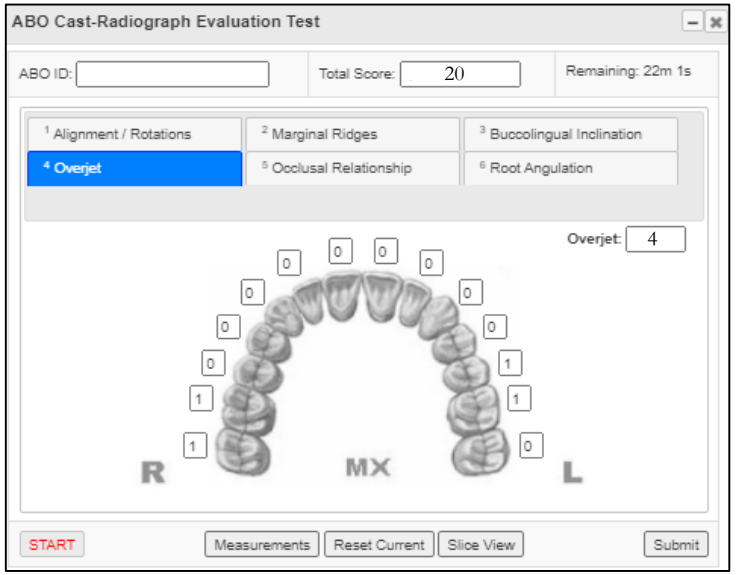




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 8



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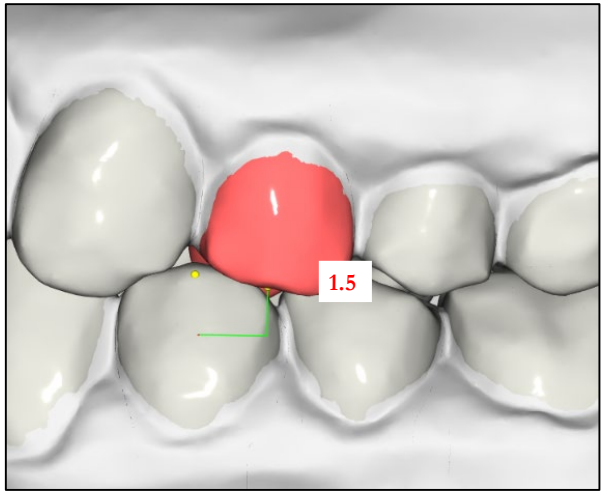
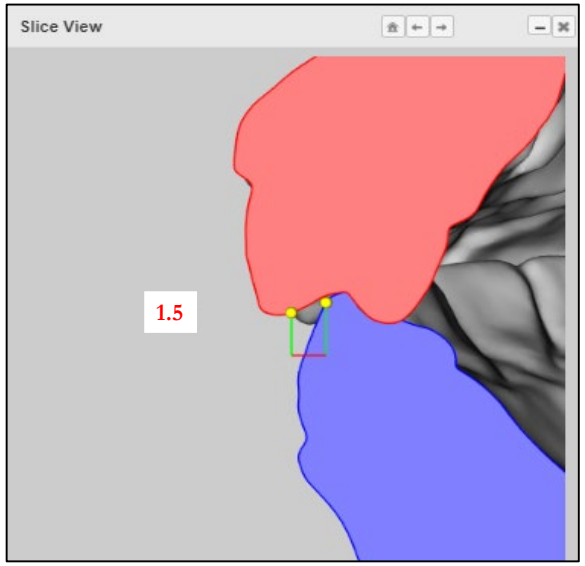
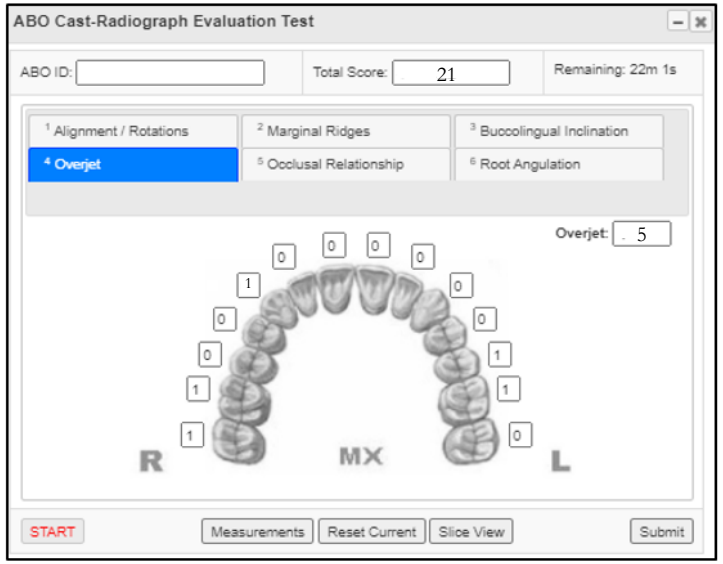


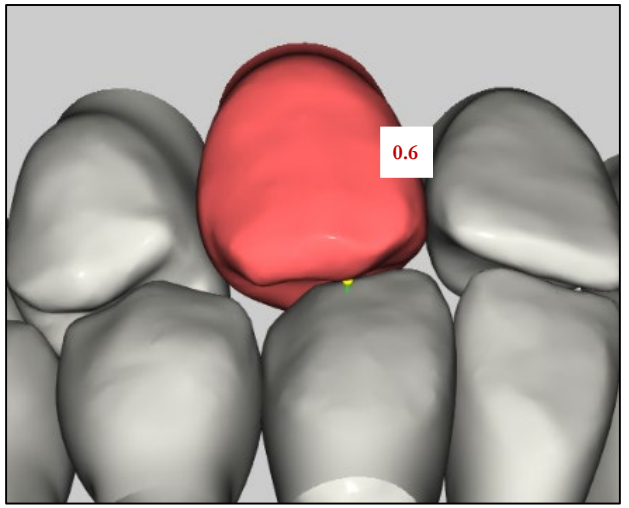


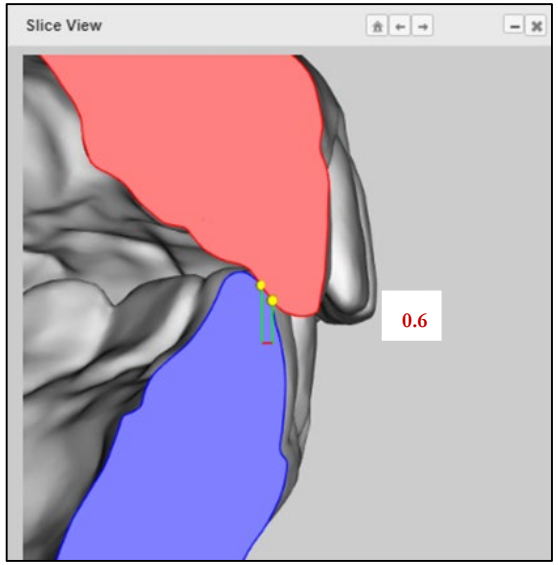
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 1



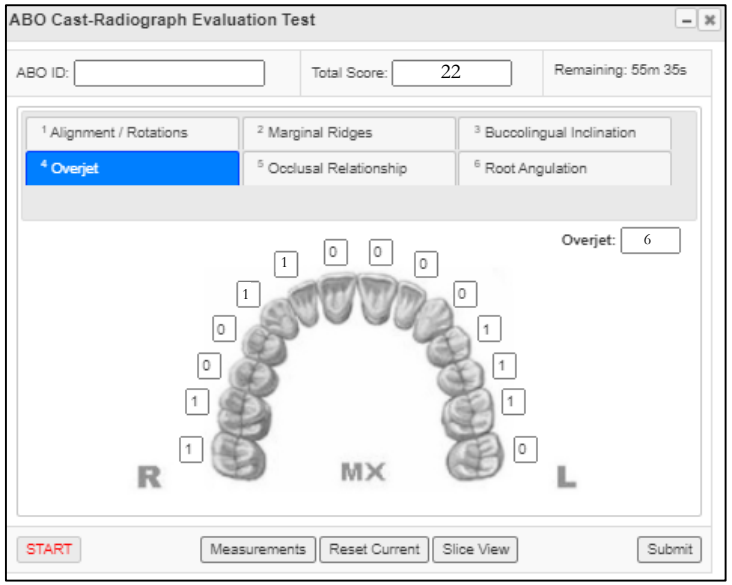
Anterior Overjet





ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 2



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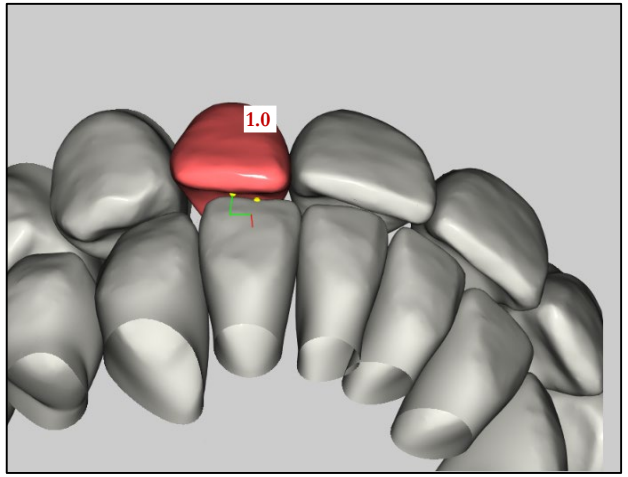
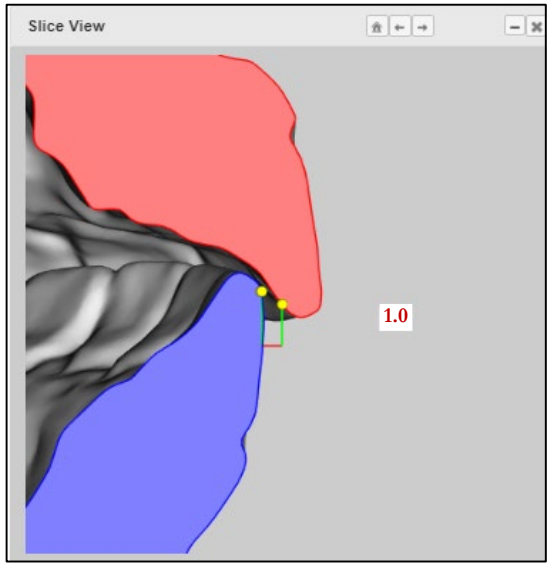
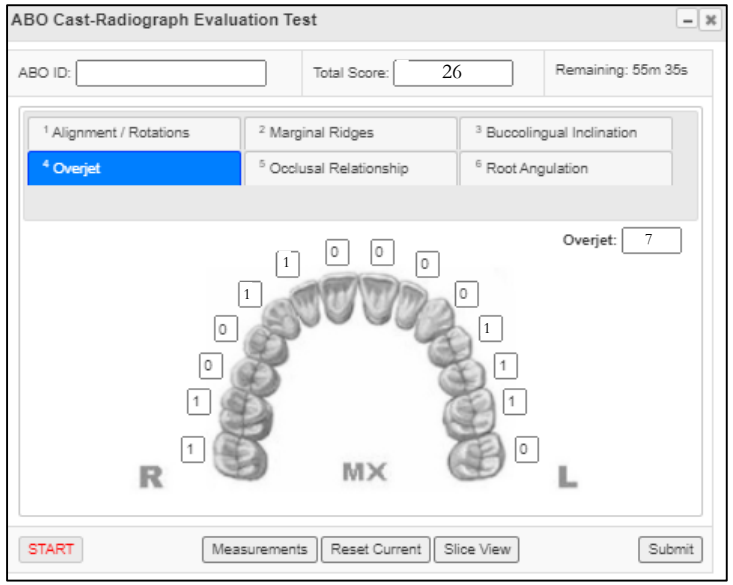




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 3



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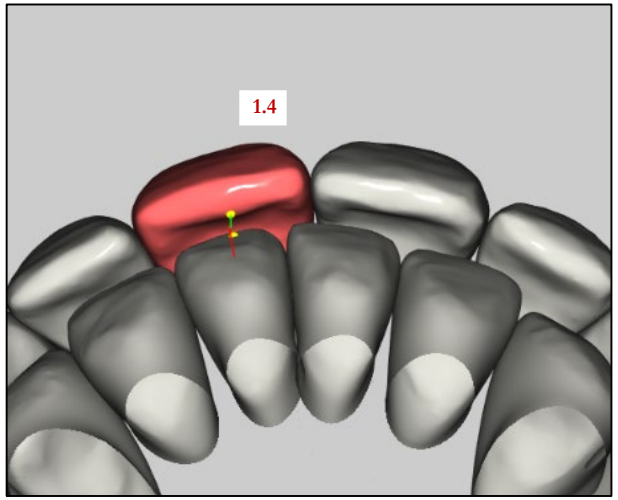
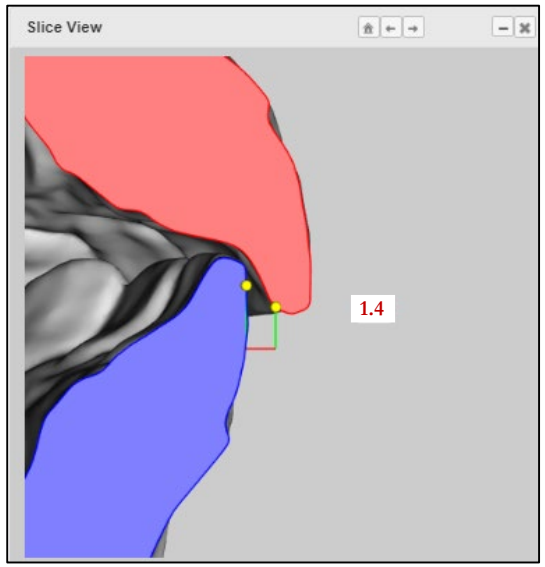
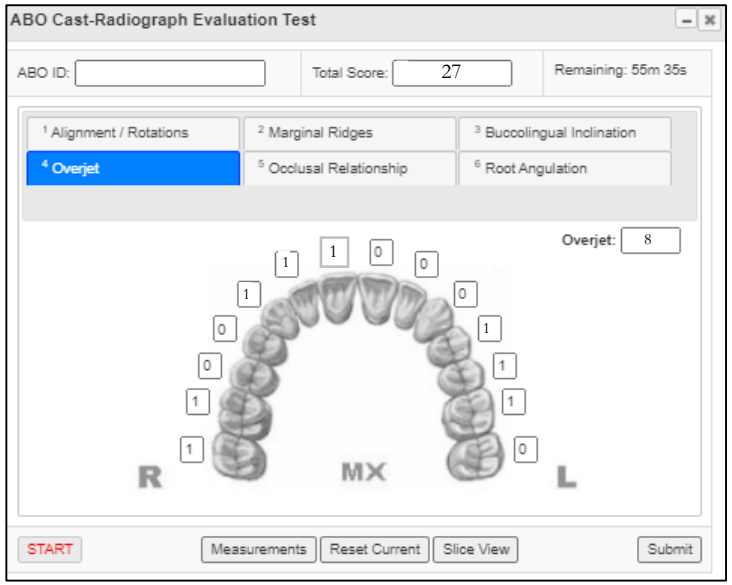




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 4



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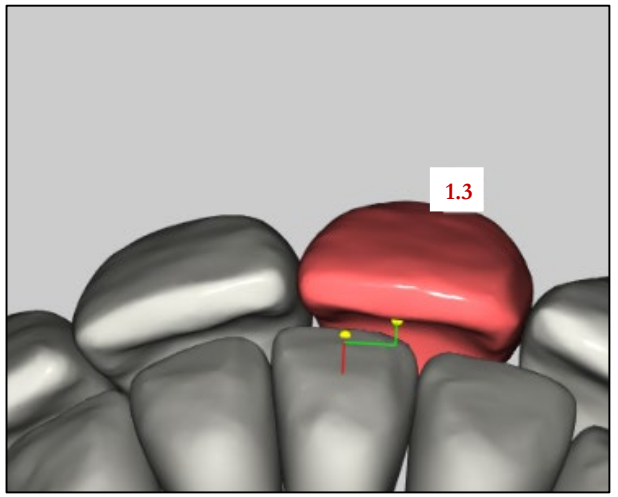
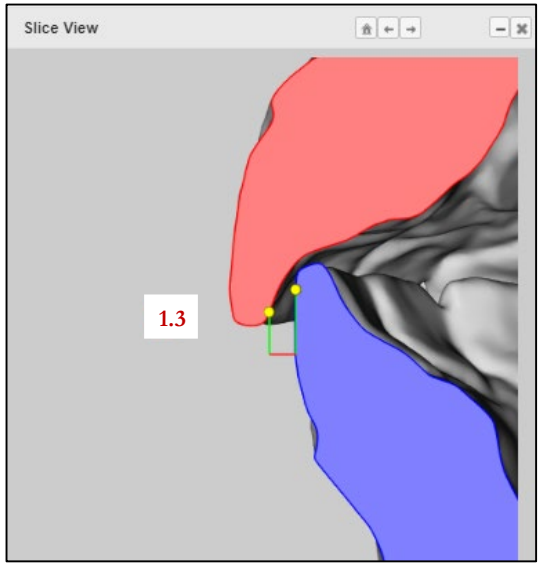
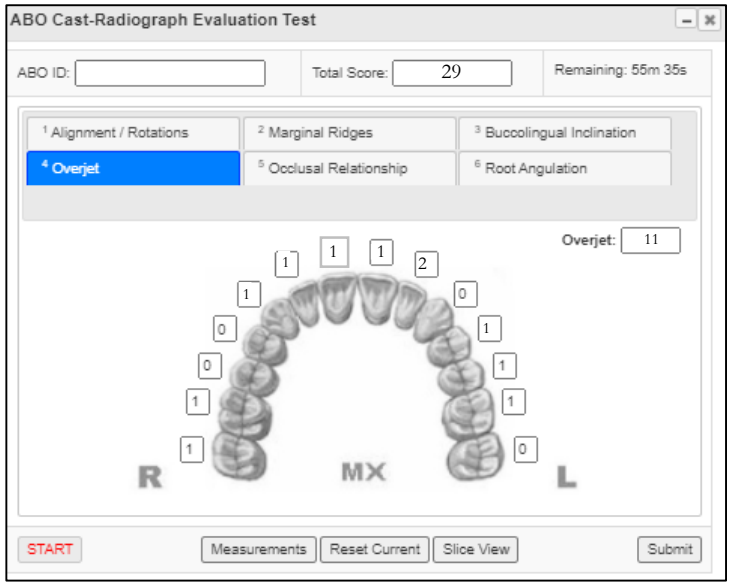




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 5



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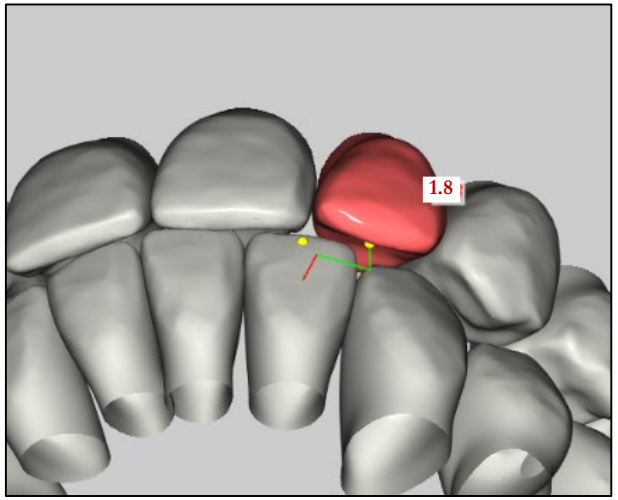
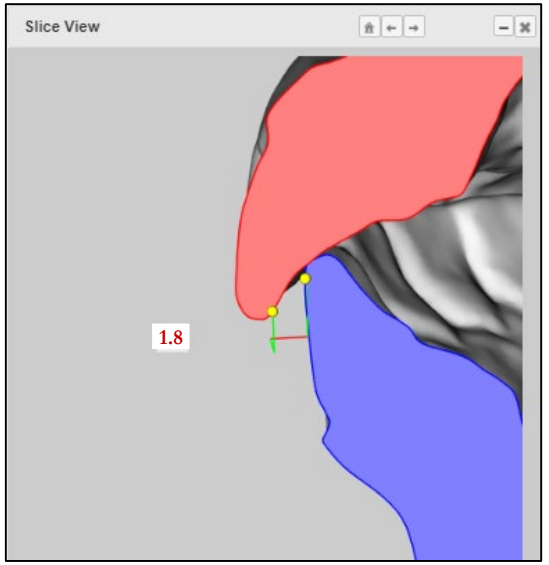
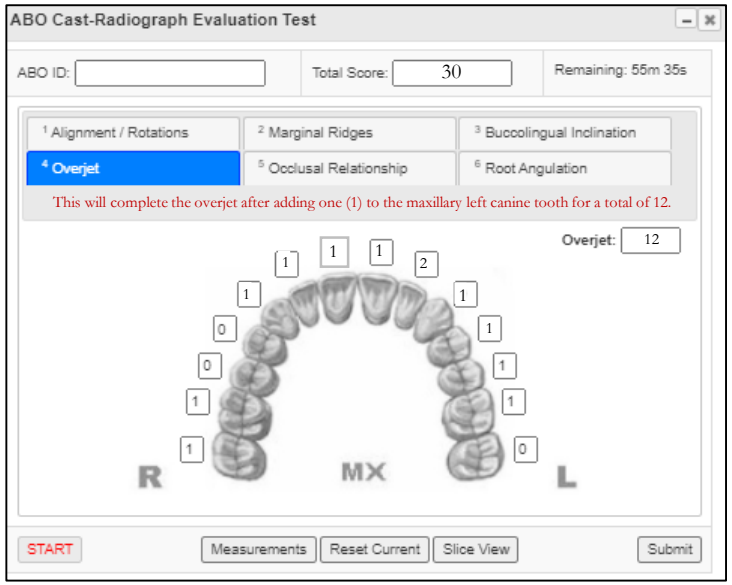




ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Step # 6



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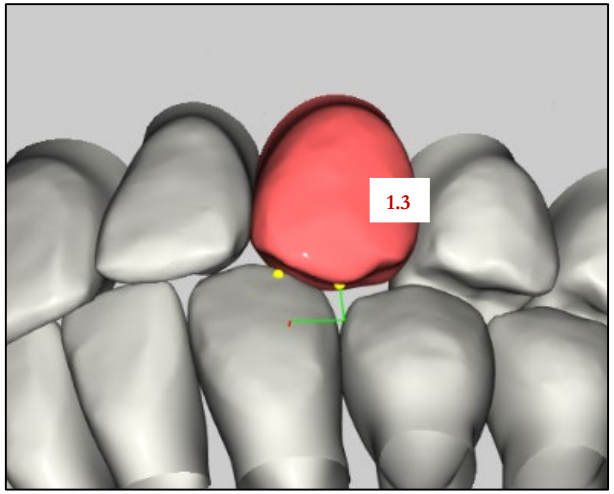
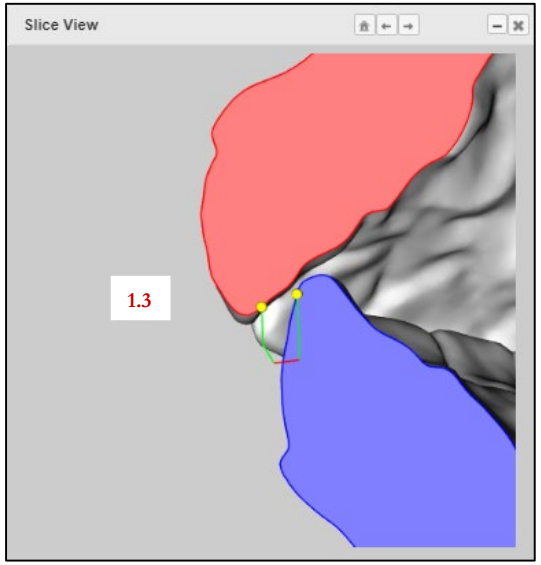
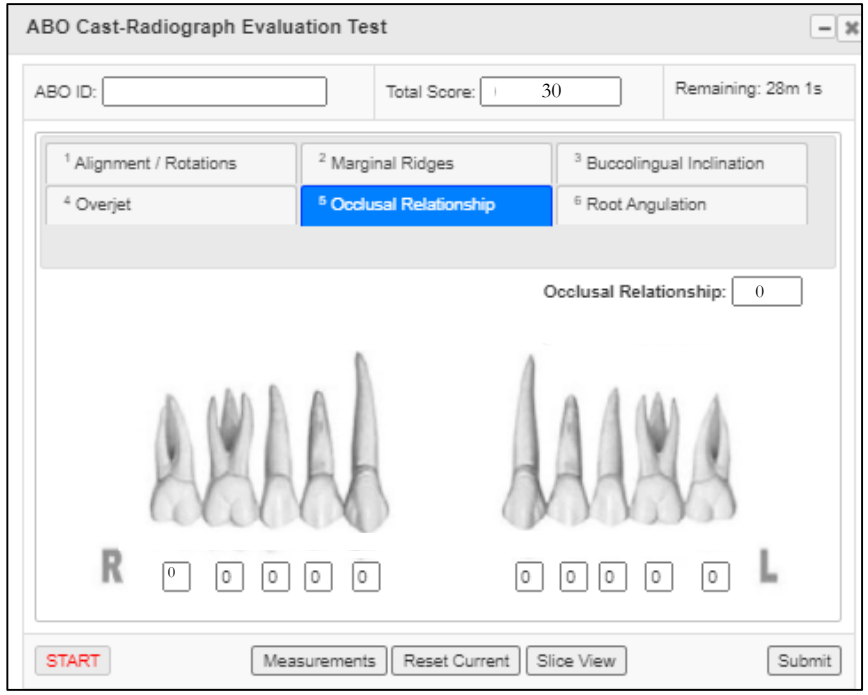


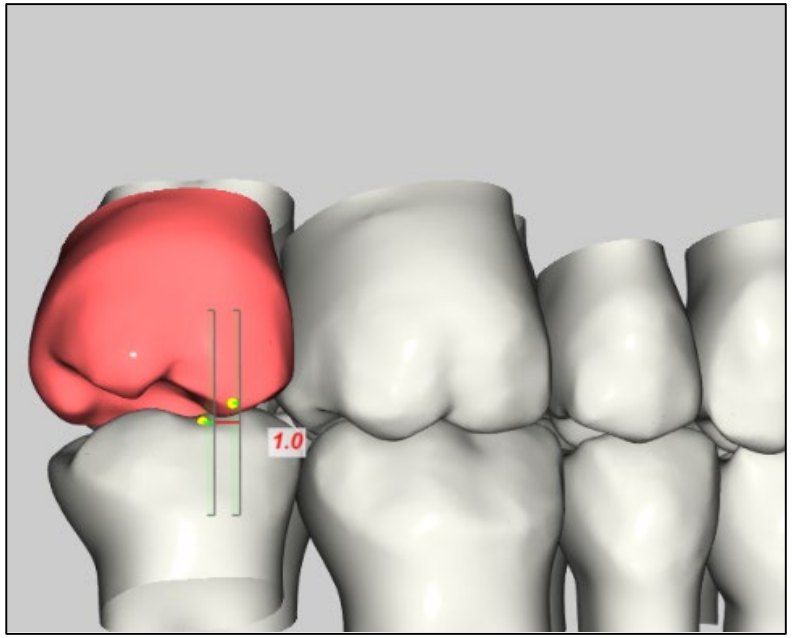


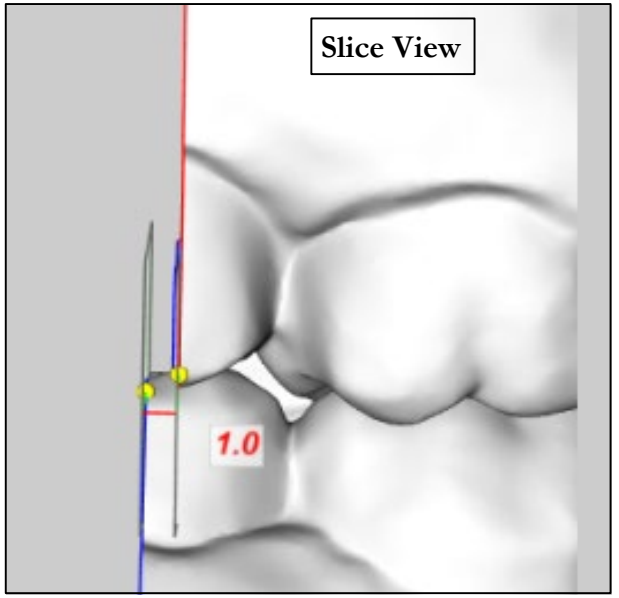
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 1



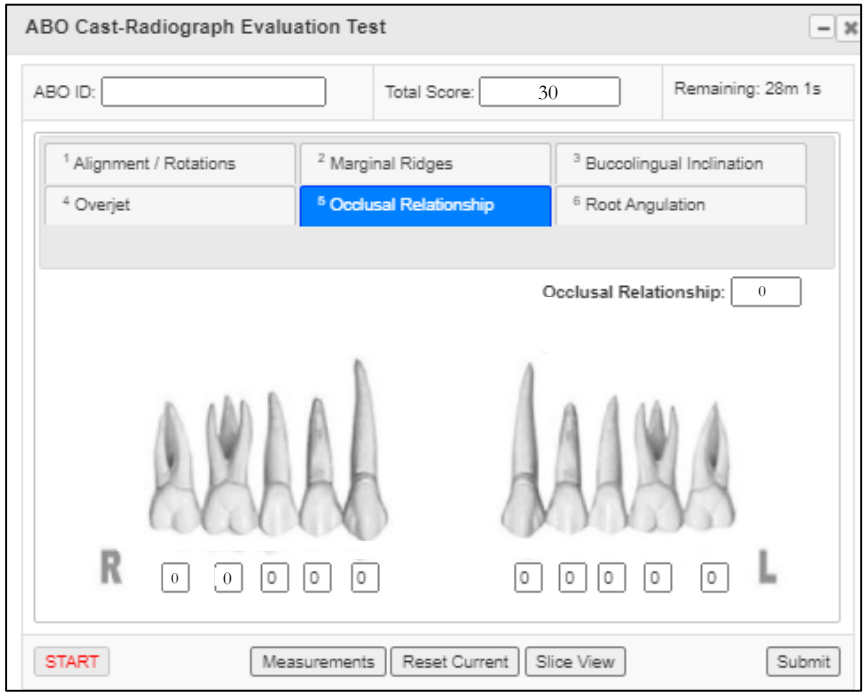


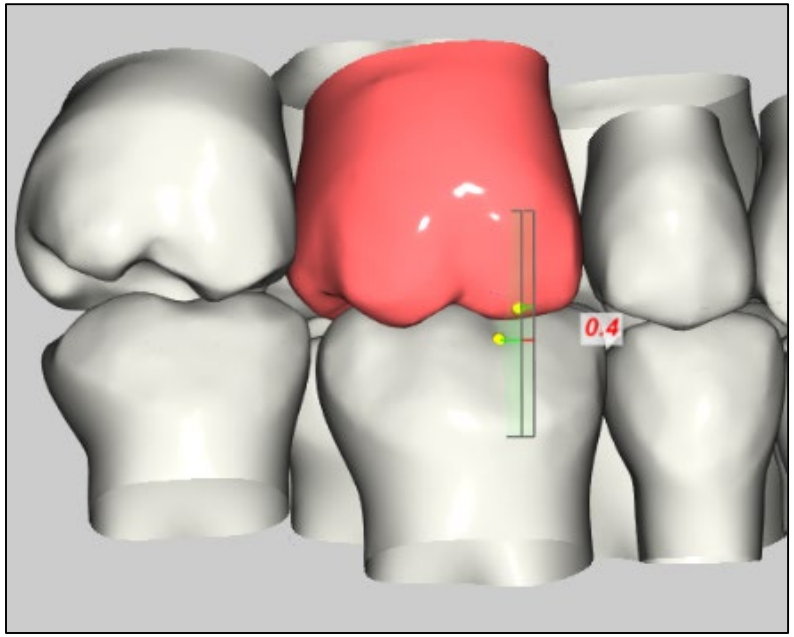


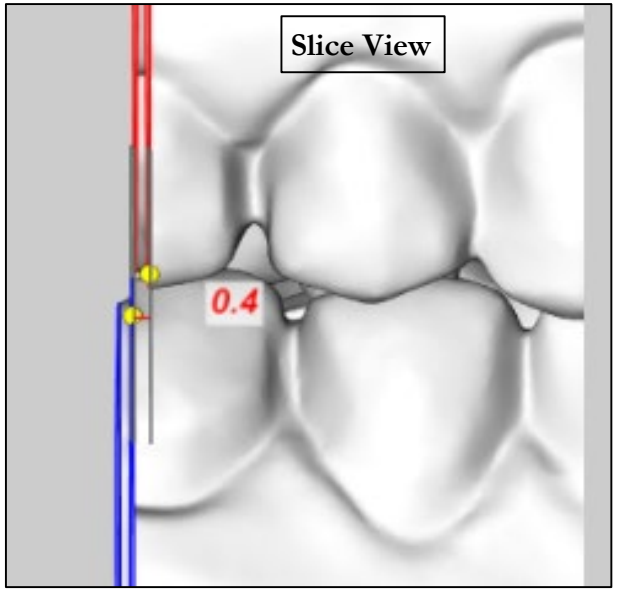
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 2



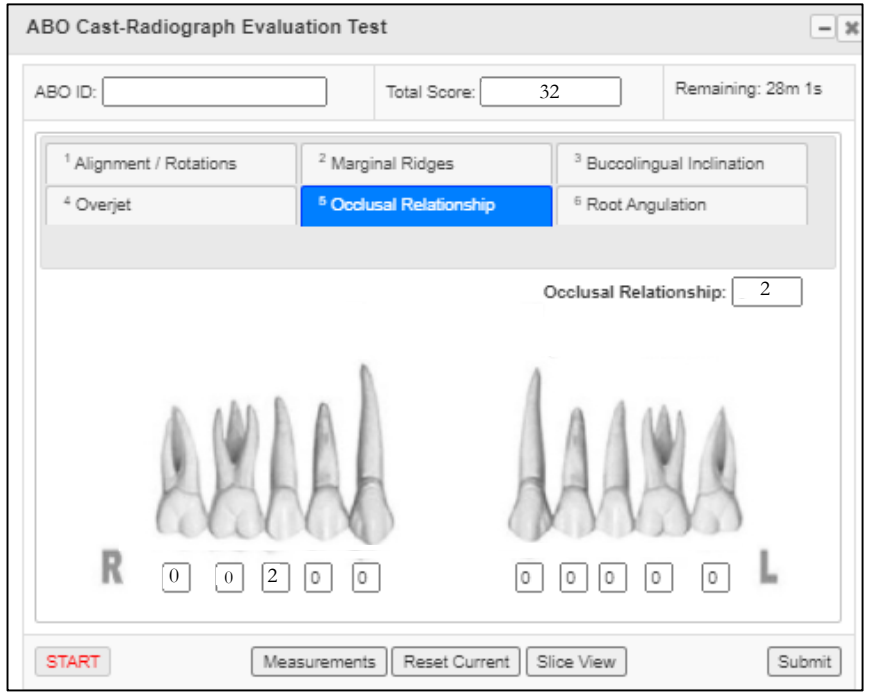


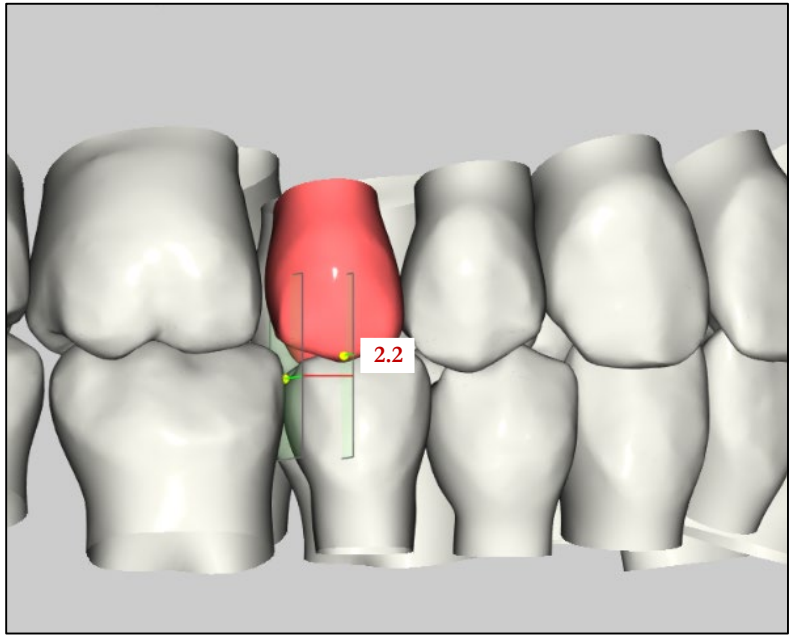


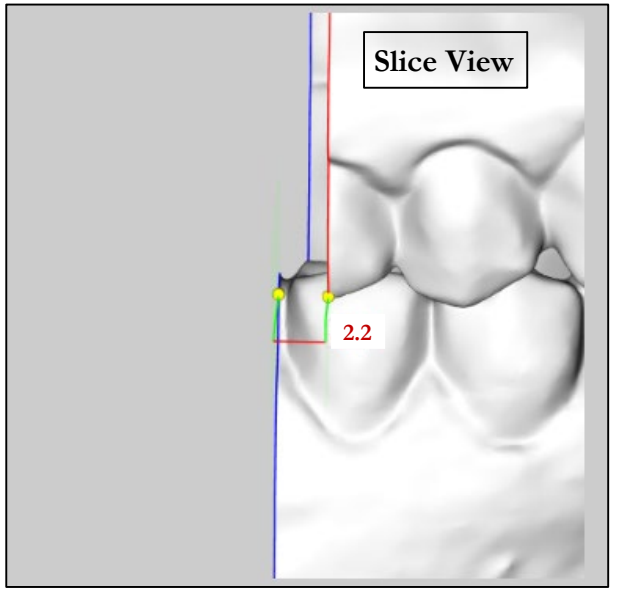
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 3



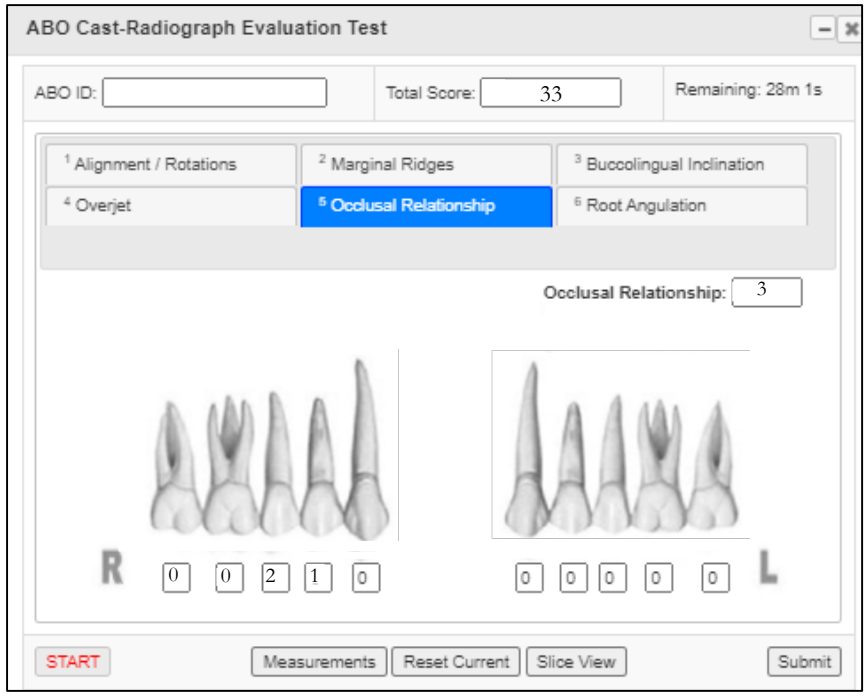


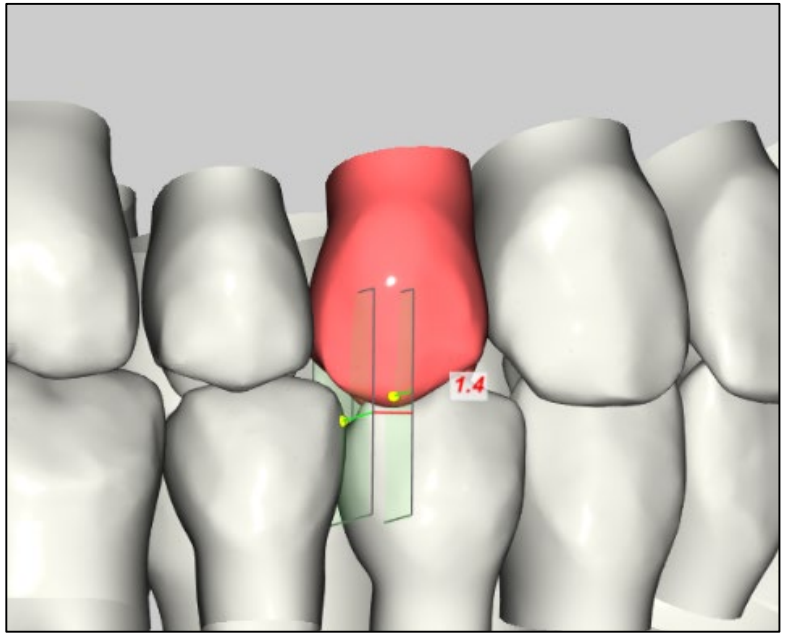


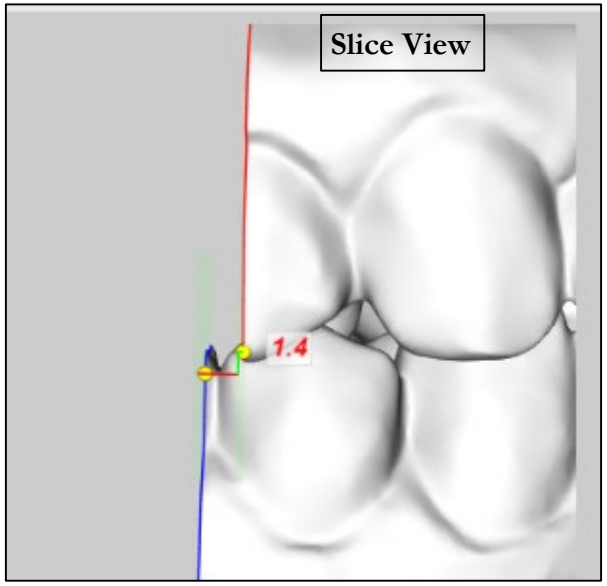
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 4



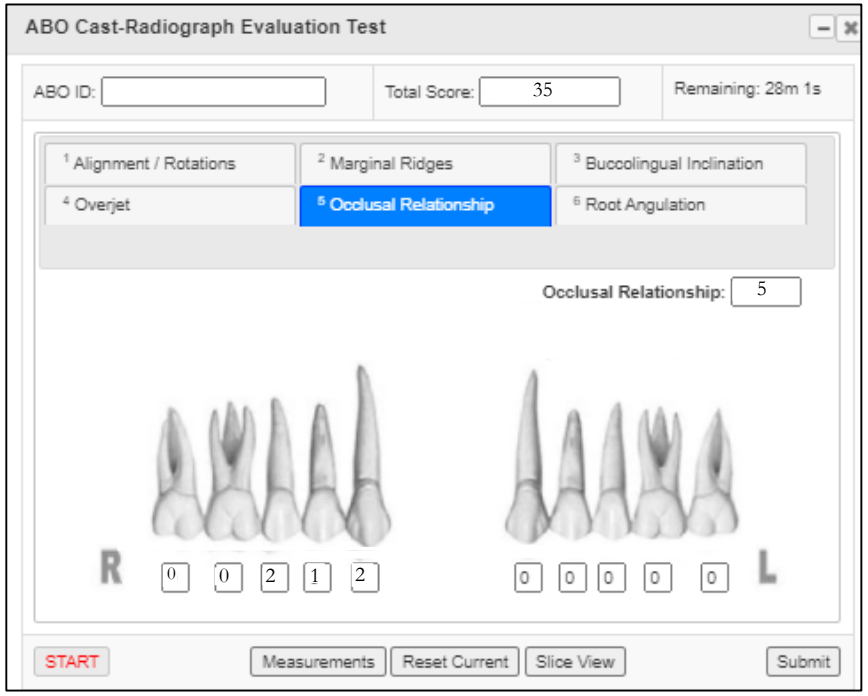


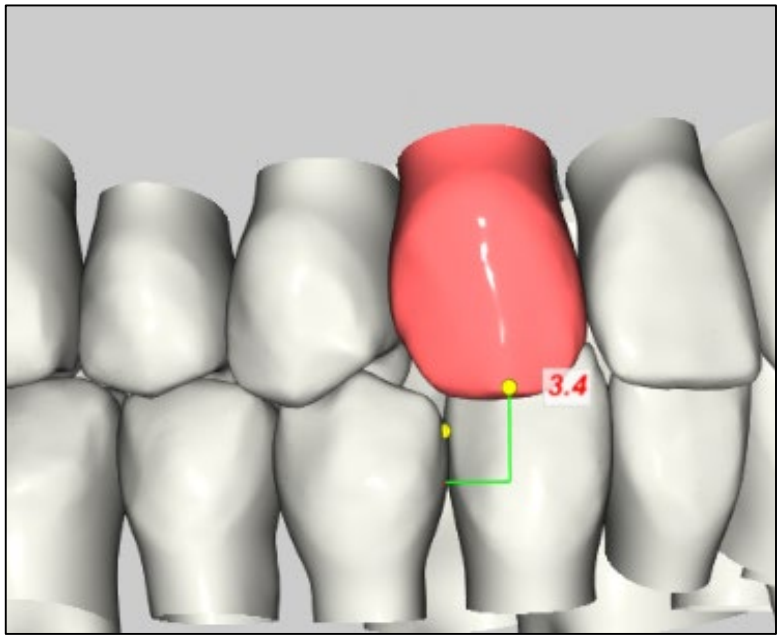


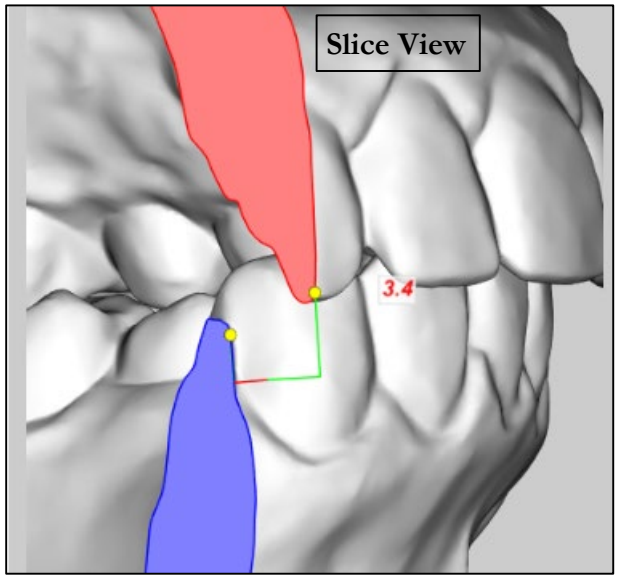
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 5



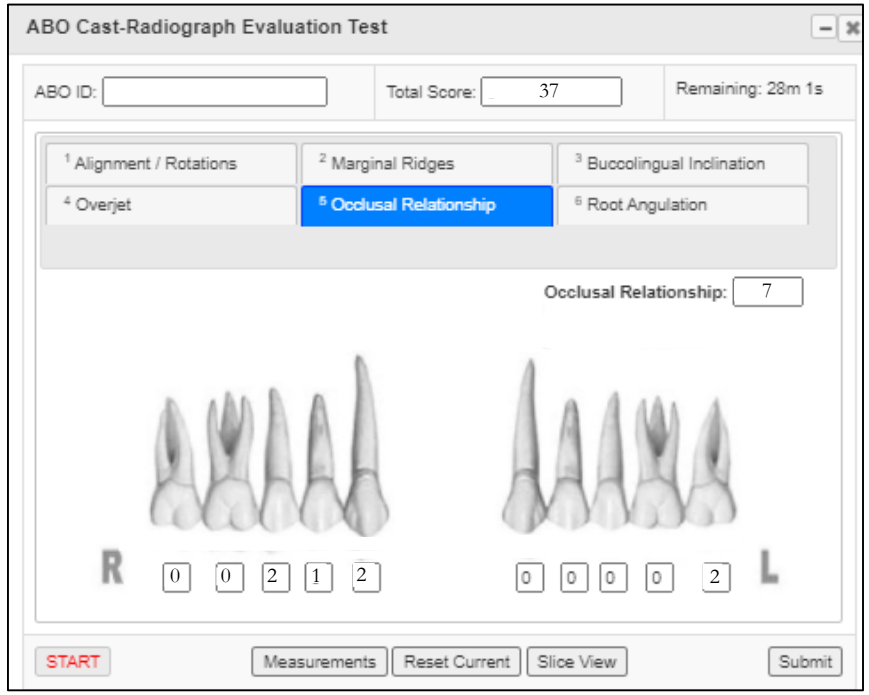


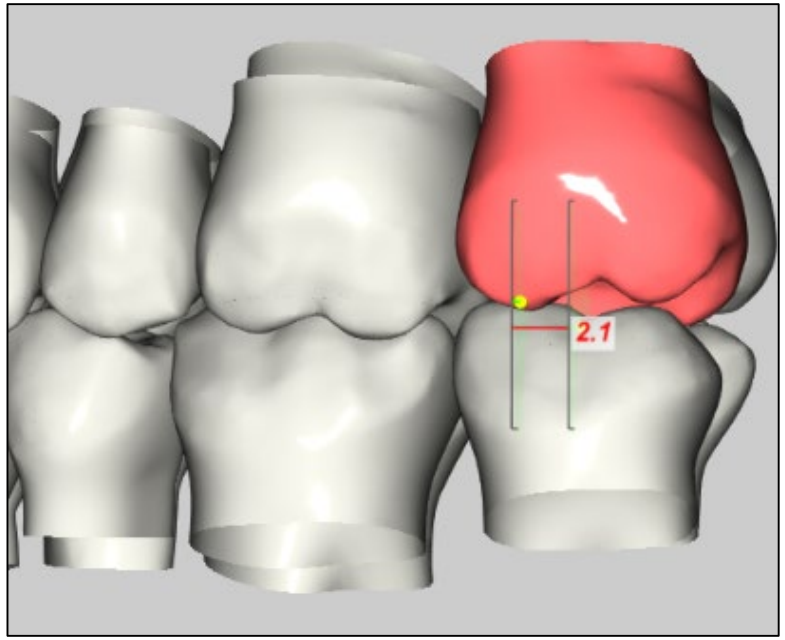


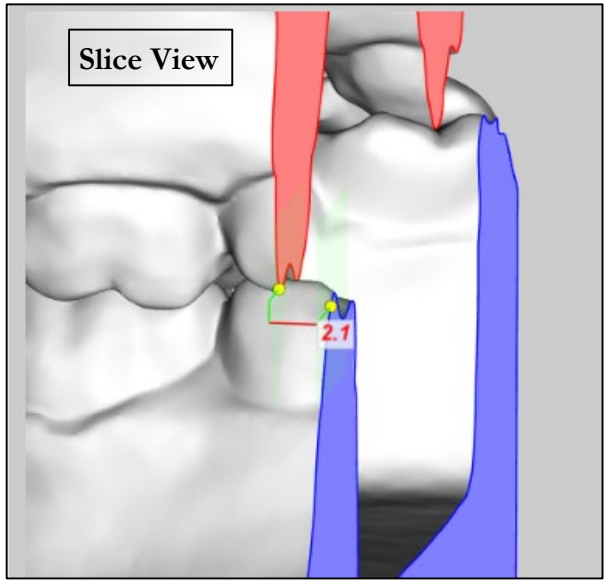
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 6



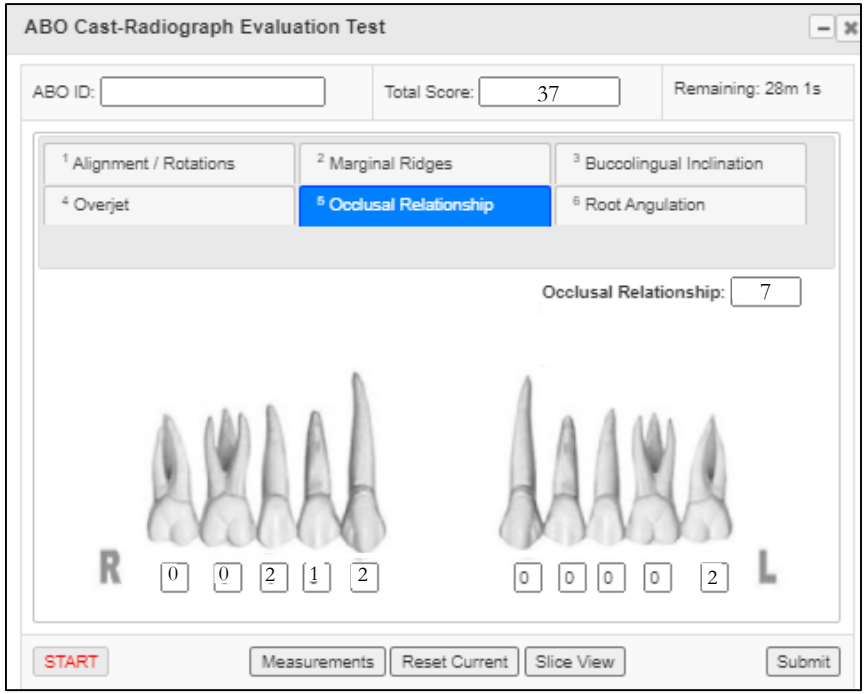


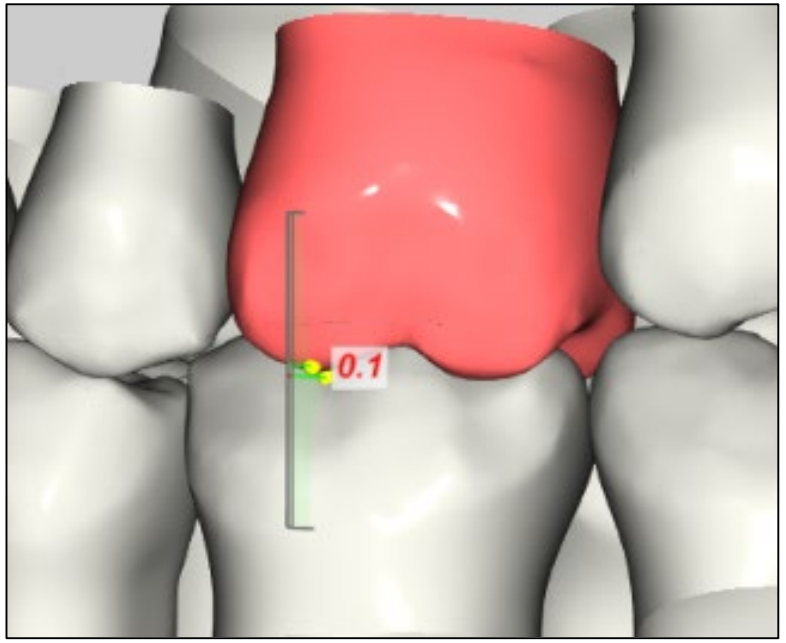


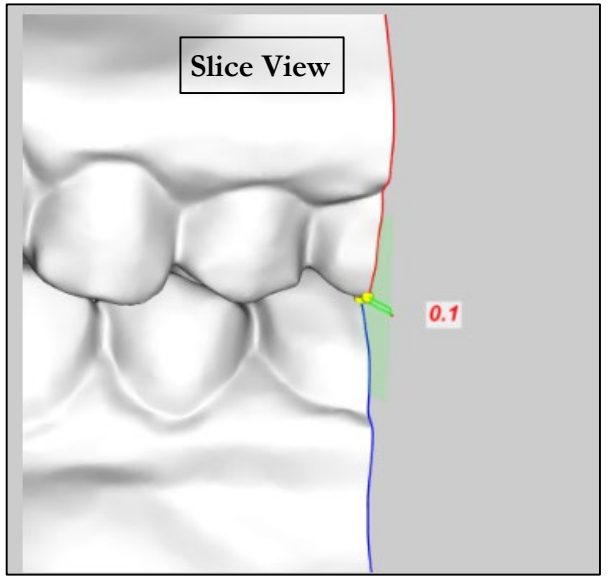
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 7



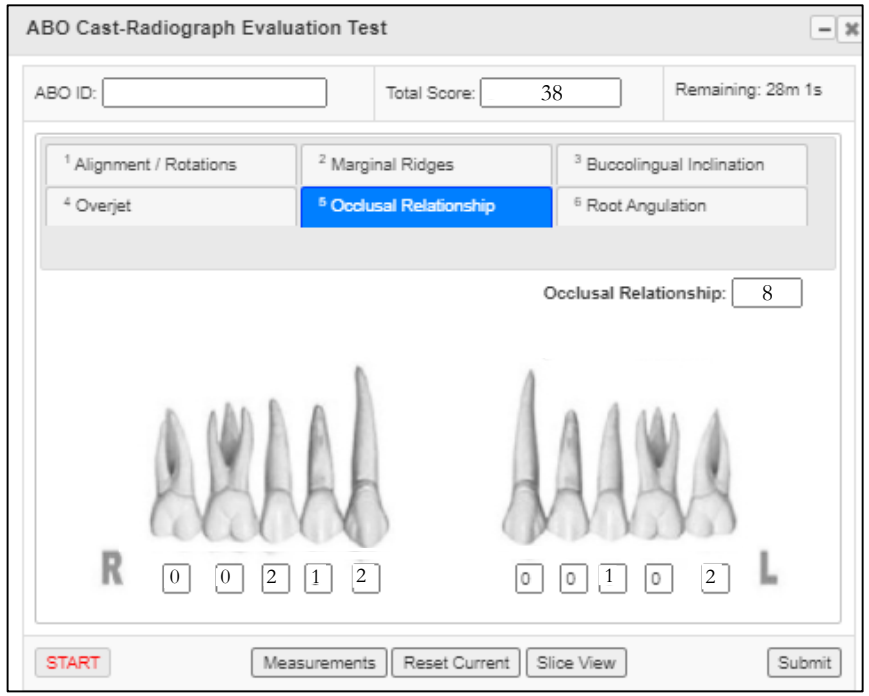


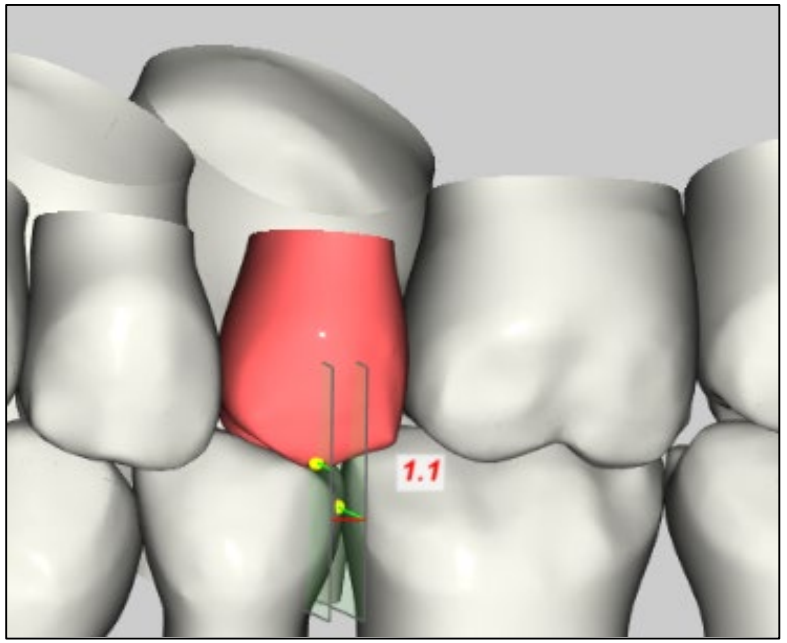


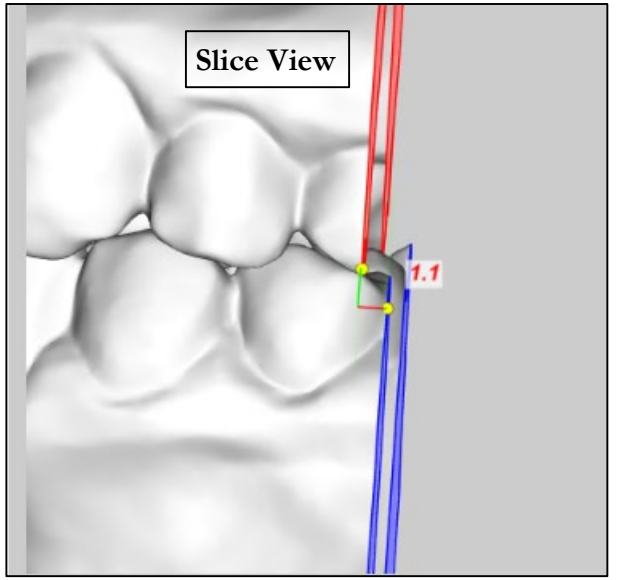
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 8



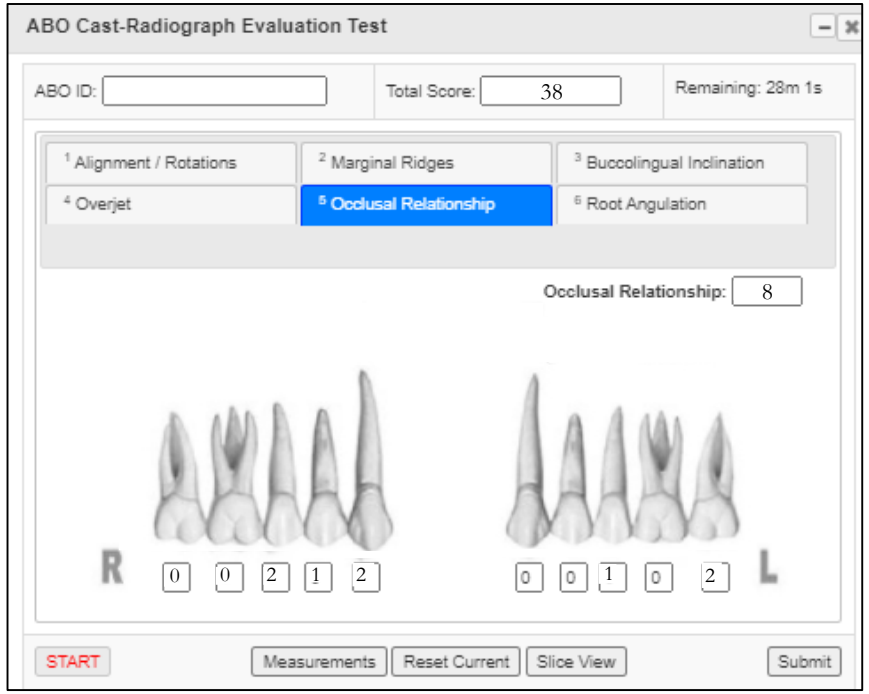


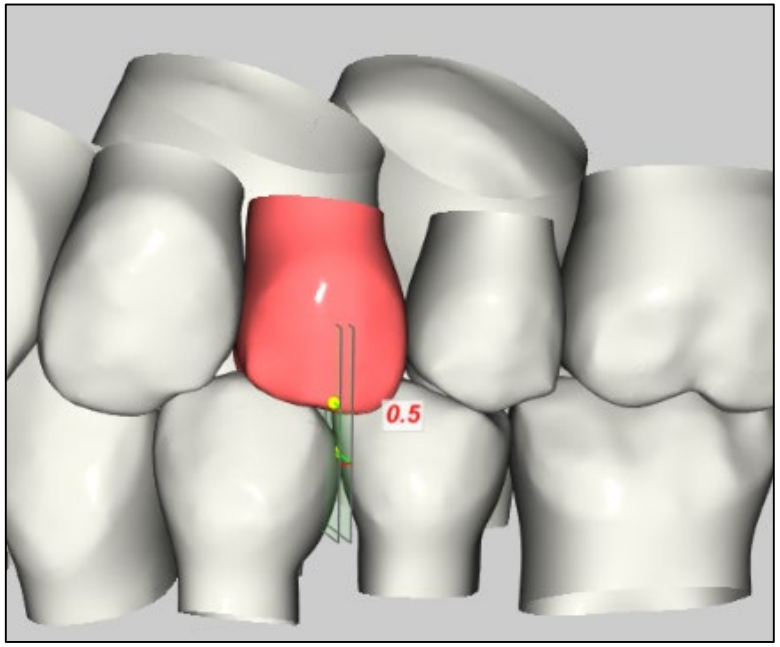


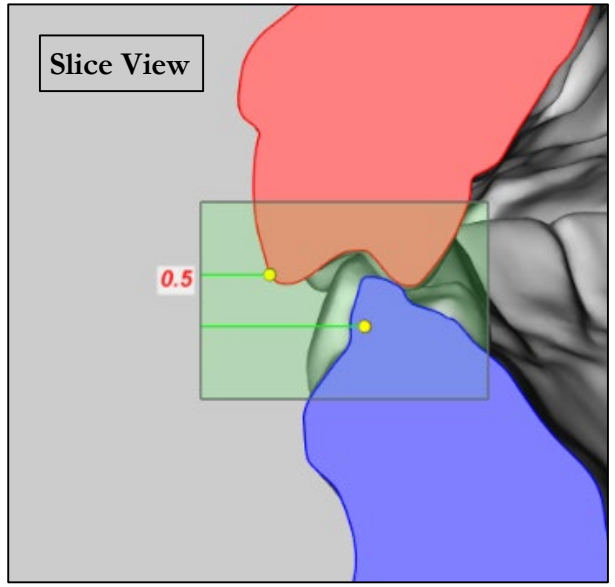
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Occlusal Relationship

Step # 9



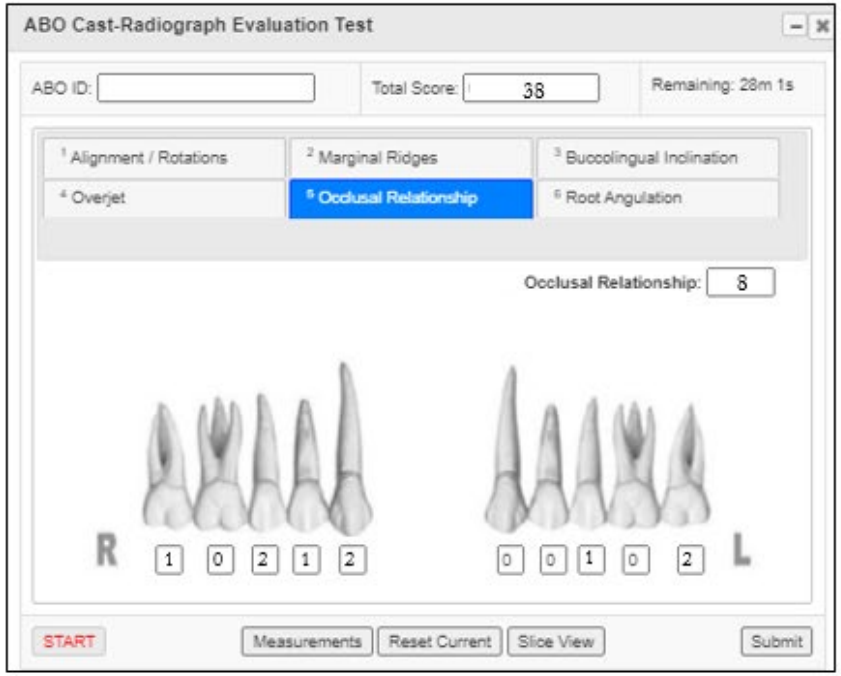


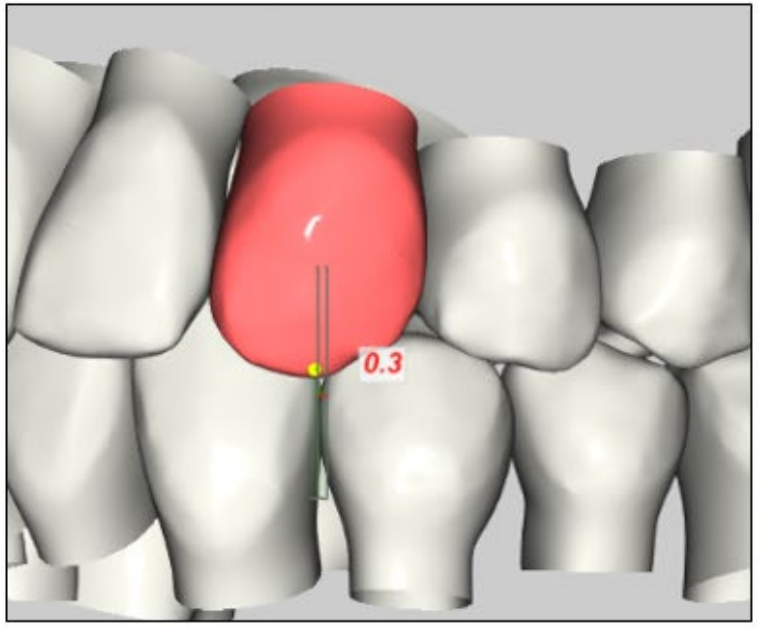


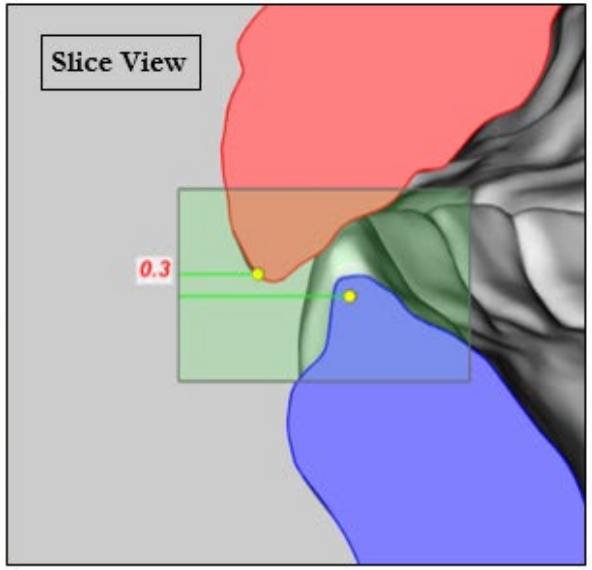
ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

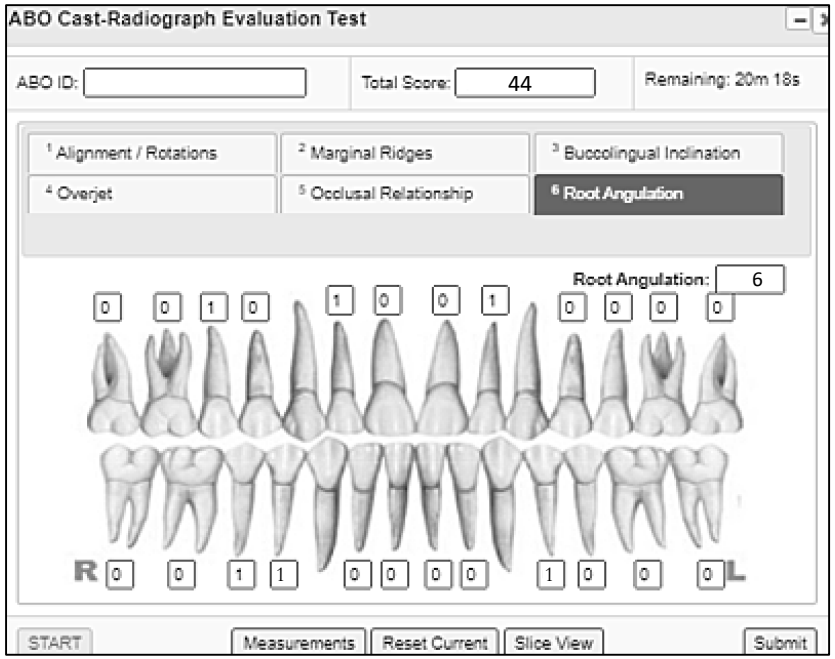
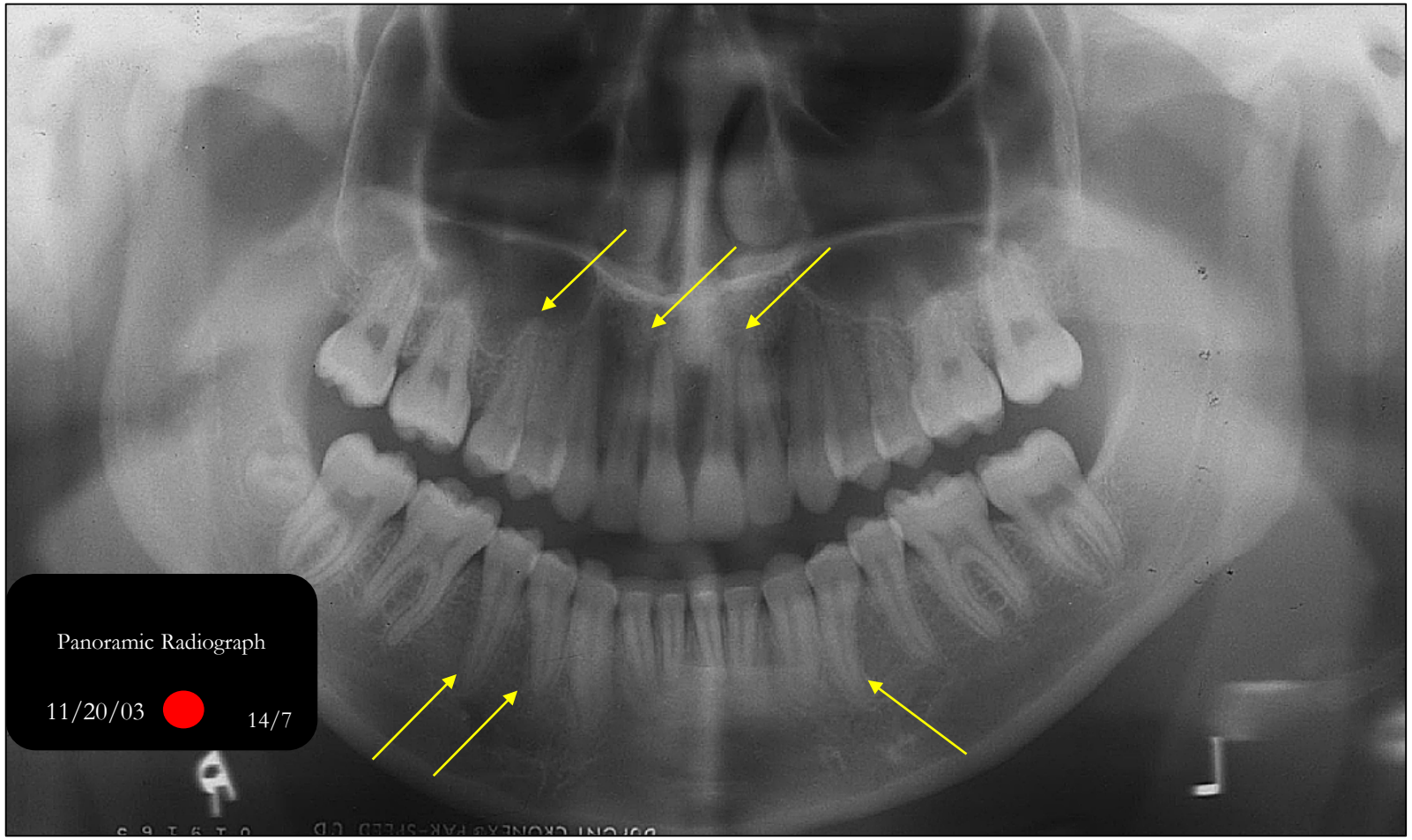
Occlusal Relationship

Step # 10







ABO Cast Radiograph-Evaluation (CR-E)Using Ortho Share 3D™-Online Web Viewer

Root Angulation