### ABO Sample Cases (Rev. 3.1.21)





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# Disclaimer

- The following sample questions and answers were composed and vetted by a panel of experts in orthodontics and are intended to provide an example of the types of cases and questions that make up the actual examination.
- During the actual examination, trained examiners, who are all board certified orthodontists, will score responses using rubrics as guides to their decision making.
- Using the rubrics help to create consistency in the decisions the examiners will make as examinees deliver their oral responses. The rubrics are not absolute, as there may be other acceptable answers that are not listed.

# **Disclaimer Continued**

- The ABO has developed multiple versions of the case-based scenario examination to be used during a test administration cycle. Although the set of cases and questions used on the different versions will not all be the same, all versions follow the same content framework as defined by the practice analysis study.
- Scores will be computed using equating procedures to ensure that all versions are of the same difficulty.
- Review of these sample cases does not guarantee that a candidate will pass the examination.

### **Classification** Domain 1: Data Gathering and Diagnosis

### Prompt

Assess the skeletal maturation of this patient and determine the skeletal maturity from those indicators.





### A proficient response may include:

- 1. Width of epiphysis equal in width to diaphysis
- 2. Lack of presence of the adductor sesamoid
- 3. Lack of epiphyseal capping
- 4. Lack of epiphyseal fusion
- 5. Evaluation of skeletal maturation indictors suggest patient is at level 3-4, approaching peak velocity of growth -significant growth remaining

















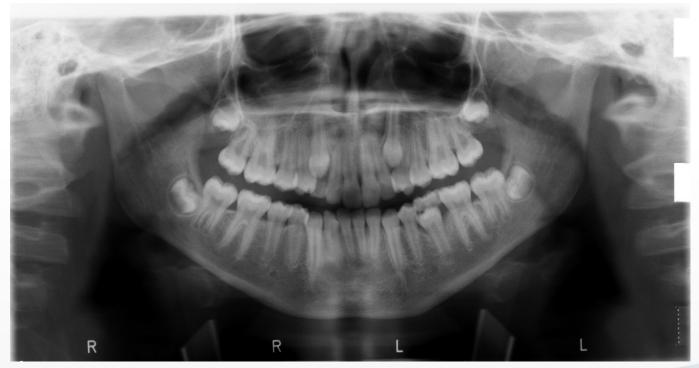
















### Classification

**Domain 2: Treatment Objectives and Planning** 

#### Prompt

Provided that the crowding in the maxillary arch will be corrected with maxillary expansion and extraction of first premolars, describe how the mandibular crowding could be resolved without compromising the facial profile.

#### A proficient response might include:

- 1. Non extraction in the mandibular arch
- 2. Maintaining the leeway space on mandibular left deciduous second molar
- 3. Maximum anchorage on mandibular molars to move mandibular anterior teeth to the left and left canine and premolars distally
- 4. IPR on anterior teeth as needed

#### **Possible acceptance response:**

- Non extraction treatment with any of the following:
  - IPR
  - LLHA
  - Stopped flush arch wire
- → Must include preservation of leeway space (LL E)
- Must be a non-extraction treatment in the mandibular arch

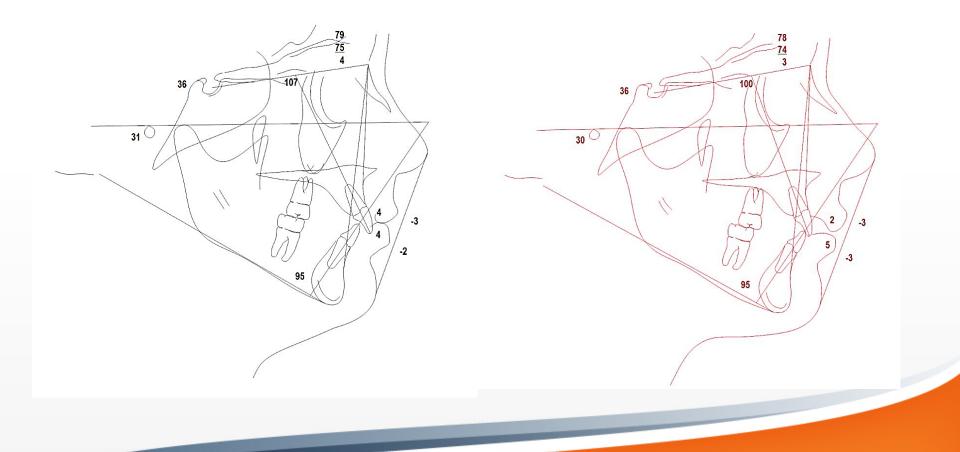
### Classification

### Domain 4: Critical Analysis and Outcomes Assessment

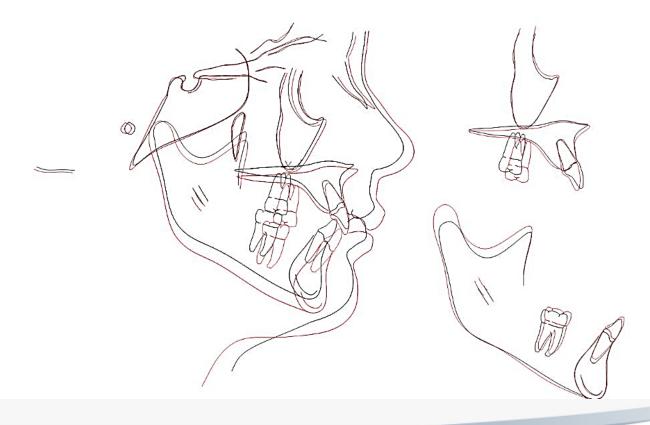
### Prompt

Using the superimpositions, identify the hard tissue changes that resulted from growth and those that resulted from treatment (22 months treatment time).

#### **Question 4**







#### **Question 4**

#### A proficient response may include:

- 1. Maxilla
  - a. Vertical change was the result of growth
  - b. Retracted at A point due to treatment
- 2. Mandible
  - a. Pogonion (the chin) was displaced inferiorly and anteriorly due to growth
- 3. Maxillary Molars
  - a. Moved mesially more than expected from growth
  - b. Erupted with growth and extruded slightly more than would have been expected from normal growth

### Sample Case #1 Question 4 (Continued)

- 1. Maxillary incisors
  - a. Retracted due to treatment
  - b. Held vertically due to treatment
- 2. Mandibular molars
  - a. Erupted with growth
  - b. Moved mesial slightly with growth
  - c. Mandibular incisors moved slightly forward as a result of growth
  - d. Mandibular incisors moved vertical as expected from growth





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### **Opening Scenario**:

An 8-year, 10-month-old male has been referred by a dentist for an orthodontic evaluation of permanent tooth eruption. The mother's chief complaint is that "my son grinds his teeth at night."



**Domain 1:** Data Gathering and Diagnosis

### Prompt

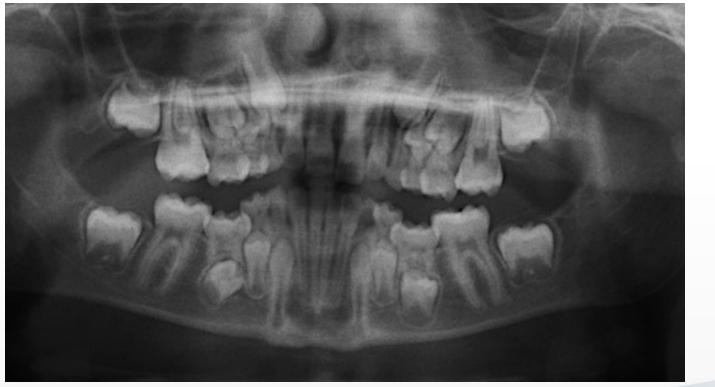
Identify all dental abnormalities evident in the intraoral photographs and the panoramic radiograph.













### **Question 1**

#### A proficient response may include:

- 1. Ankylosis of the mandibular second deciduous molars
- 2. Supra eruption of the maxillary second deciduous molars
- 3. Mesio-angulated mandibular right second premolar
- 4. Mesial tipping of the mandibular first molars
- 5. Mandibular anterior crowding with lingually displaced left lateral incisor
- 6. Reduced attach gingiva on the mandibular right central incisor
- 7. Deep overbite

**Classification** Domain 1: Data Gathering and Diagnosis Domain 2: Treatment Objectives and Planning

#### Prompt

List the potential complications associated with the ankylosis of the mandibular second deciduous molars.

A proficient response may include:

- 1. Ectopic eruption of the mandibular second premolars
- 2. Tipping of adjacent teeth
- 3. Further submergence of the ankylosed mandibular second deciduous molars
- 4. Periodontal bony defect on the ankylosed teeth
- 5. Impaction of mandibular second premolars
- 6. Decreased arch length
- 7. Lateral open bite
- 8. Extruded antagonist maxillary tooth





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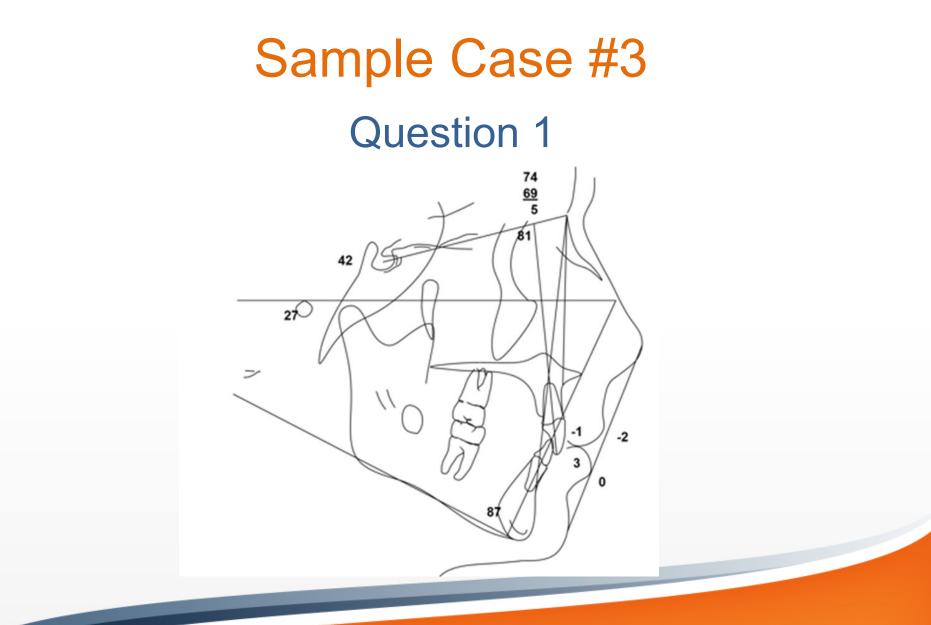
### **Opening Scenario**:

A 12-year, 5-month-old female presents without a chief complaint. Her dentist recommended an orthodontic consultation.

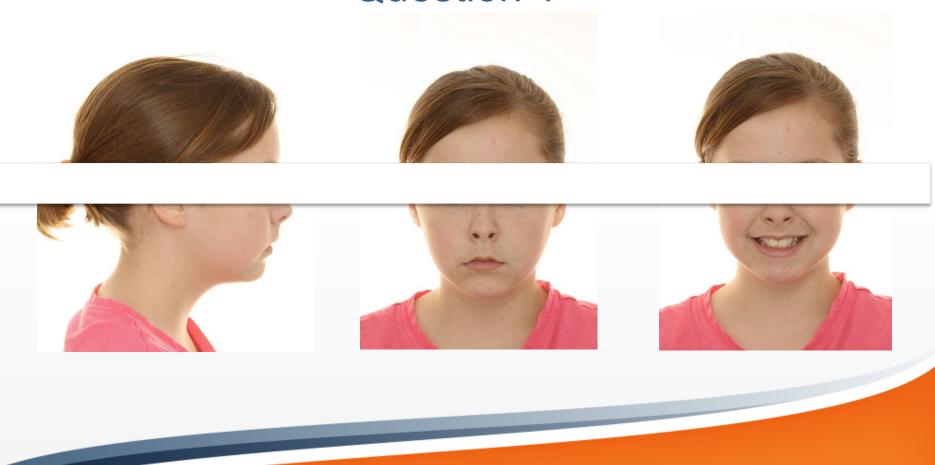












### **Classification** Domain 1: Data Gathering and Diagnosis

**Prompt** List the skeletal components of this patient's malocclusion.

### A proficient response may include:

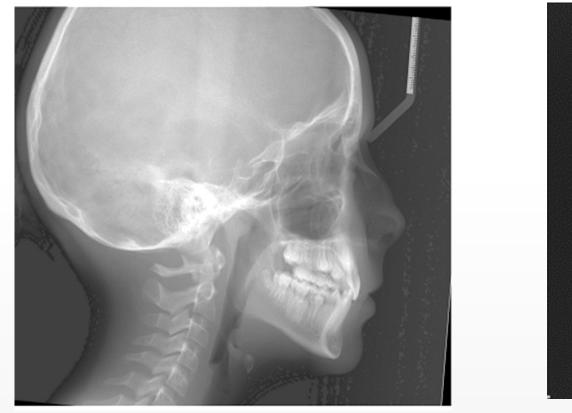
- 1. Steep cranial base
- 2. Skeletal Class II
- 3. Normal maxilla in AP
- 4. Retrusive/retrognathic mandible
- 5. Normodivergent (hyperdivergent tendency is also an acceptable

### Classification

**Domain 2: Treatment Objectives and Planning** 

#### **Prompt**

Describe the patient's skeletal stage and growth potential.





### A proficient response may include:

- 1. Patient is expected to grow (1-1.5 years) based on:
  - Cervical Vertebral Maturation Stage (CVMS) is 2 (accept between 2 and 3)
  - Skeletal Maturation Indicator (SMI) is 3 to 4

#### **Classification**

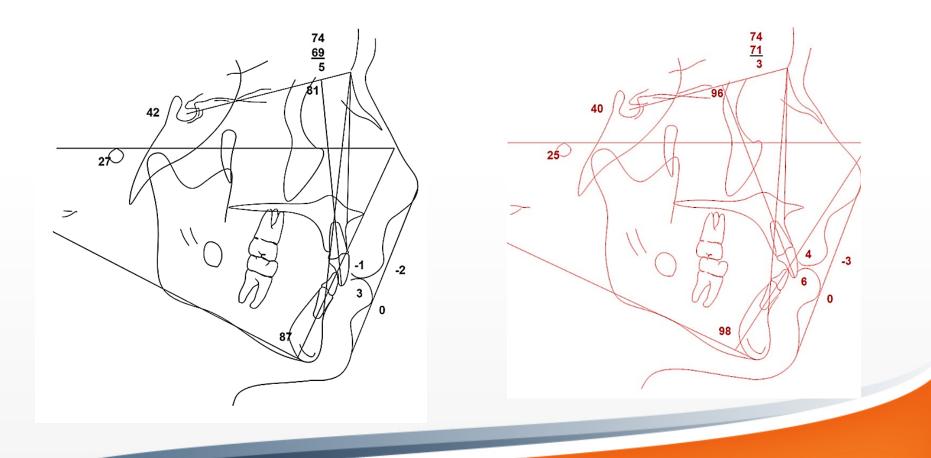
**Domain 4: Critical Analysis and Outcomes Assessment** 

#### Prompt

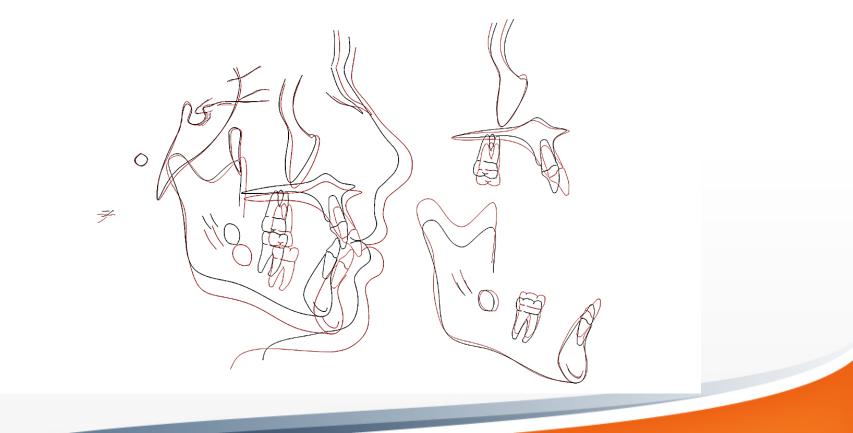
This patient was treated with comprehensive, non extraction orthodontic treatment. The time between preand post-treatment records was 34 months.

What <u>dental</u> changes occurred as the result of treatment?











- A proficient response may include:
- 1. Maxillary incisors were proclined due to treatment
- 2. Mandibular incisors were proclined due to treatment
- 3. Maxillary first molar extruded due to treatment
- 4. All other A-P and vertical changes in tooth position were the result of normal growth

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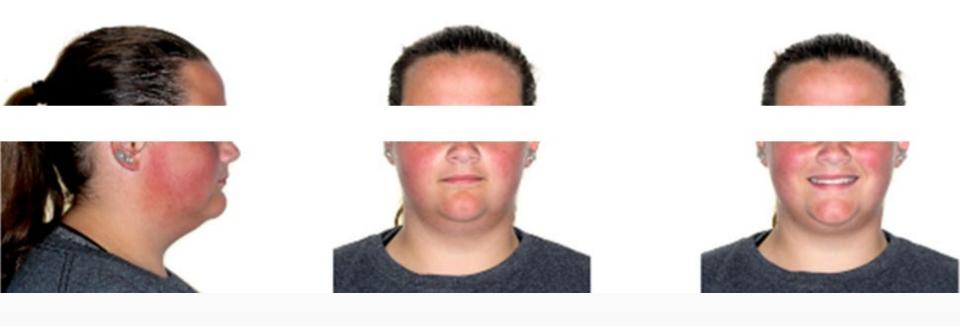




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Measure	Value
SNA	89.4
SNB	86.1
ANB	3.2
Wits	-1.6
FMA	15.8
SN- <u>GoGn</u>	19.9
U1-SN	105.6
IMPA	92.6
Upper lip	-8.0
Lower lip	-7.1

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### **Opening Scenario:**

### A 14-year, 9-month-old female presents with a chief complaint that "I don't like my bite."



#### Describe the facial characteristics of this patient.



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#### **Fully Proficient Model Response**

The examinee's response must include five or more of the following:

- 1. Straight profile
- 2. Prominent soft tissue pogonion
- 3. Deep mentolabial sulcus
- 4. Obtuse nasiolabial angle
- 5. Obtuse chin-throat angle/ Poor chin-neck contour
- 6. Deficient vermillion display
- 7. Thin lips

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#### Question #1

### **Borderline Proficient Model Response**

The examinee's response must include four of the above responses.

### **Not Proficient Model Response**

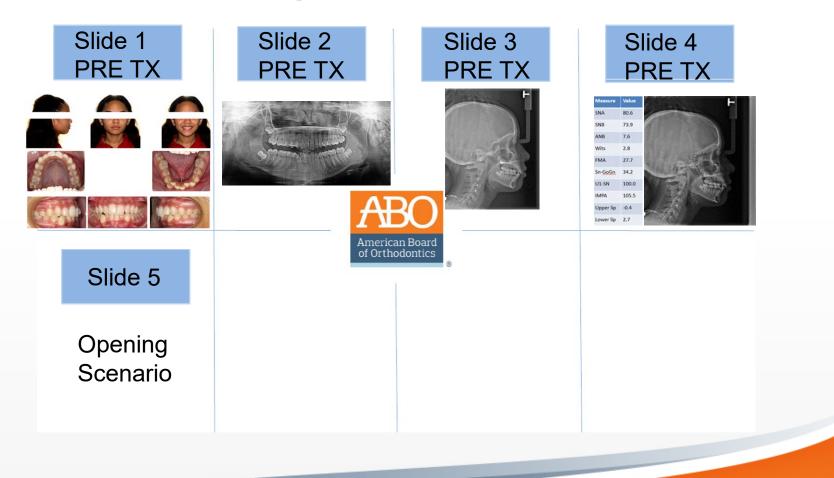
The examinee's response includes three or less of the above responses.

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Measure	Value
SNA	80.6
SNB	73.9
ANB	7.6
Wits	2.8
FMA	27.7
Sn- <u>GoGn</u>	34.2
U1-SN	100.0
IMPA	105.5
Upper lip	-0.4
Lower lip	2.7

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#### **Opening Scenario:**

A 13-year, 8-month-old female patient presents with the chief complaint that "My teeth are not straight."



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Question #1

Identify treatment objectives for the maxillary and mandibular incisors.



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#### **Fully Proficient Model Response**

The examinee's response must include five of the following:

- 1. Retract the maxillary incisors
- 2. Control maxillary incisor torque
- 3. Minimize vertical changes to maxillary incisors
- 4. Retrocline mandibular incisors
- 5. Control mandibular incisor torque
- 6. Intrude mandibular incisors (level curve of spee)
- 7. Correct the mandibular dental midline

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# Question #1

#### **Borderline Proficient Model Response**

The examinee's response <u>must</u> include four of the above responses.

### Not Proficient Model Response

The examinee's response includes three or less of the above responses.

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# **Mock Board Exam**







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#### **Opening Scenario:**

A 15-year, 2-month-old female presents with crowding and an open bite. The patient's chief complaint is that "my teeth are ugly."



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### **Classification** Domain 1: Data Gathering and Diagnosis

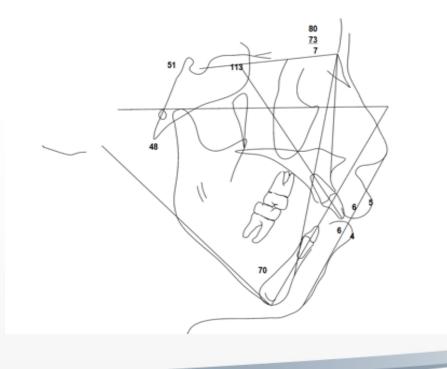
**Prompt** List the <u>skeletal</u> components of this patient's open bite.

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#### **Question 1**









# **Prospective Examinees to Answer**



#### A proficient response may include:

- 1. Steep mandibular plane
- 2. Increased gonial angle
- 3. Increased lower anterior facial height
- 4. Short ramus height
- 5. Decreased posterior facial height to anterior facial height ratio
- 6. Decreased palatal plane to SN angle
- 7. Constricted maxilla

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#### **Question 2**

Classification Domain 1: Data Gathering and Diagnosis

**Prompt** List the dental components of this patient's open bite.

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#### **Question 2**









# **Prospective Examinees to Answer**



#### A possible proficient response may include:

- 1. Constricted maxillary arch
- 2. Overeruption of maxillary molars
- 3. Proclination of maxillary incisors
- 4. Infra-erupted maxillary incisors
- 5. Overeruption of mandibular molars
- 6. Reverse curve of Spee in the mandibular arch (Infraeruption of the mandibular incisors)
- 7. Increased curve of Spee in the maxillary arch
- 8. Increased curve of Wilson in the mandibular arch

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### **Question 3**

#### Classification

**Domain 1: Data Gathering and Diagnosis** 

#### Prompt

Based on the intraoral photographs and cephalogram, what are the possible etiologies for this malocclusion?





#### A proficient response may include:

- 1. Genetic component
- 2. Abnormal tongue size/posture
- 3. Abnormal tongue function
- 4. Inadequate airway/obligatory mouth breather
- 5. Myopathy or muscle weakness

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# Sample Question #6 Question 4

#### Classification

**Domain 1: Data Gathering and Diagnosis** 

#### **Prompt**

Based on the images you have seen so far, what other diagnostic tests or assessments would you undertake or request prior to initiating treatment on this patient?

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#### **Question 4**

- A proficient response may include:
- 1. CBCT
- 2. Airway assessment (polysomnography)
- 3. Evaluation of tongue posture (Myofunctional evaluation)
- 4. Evaluation of tongue function (Myofunctional evaluation)
- 5. Electromyographic evaluation
- 6. Serial cephalograms to determine whether progressive or static problem
- 7. TEC99 scan

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#### Classification

**Domain 2: Treatment Objectives and Planning** 

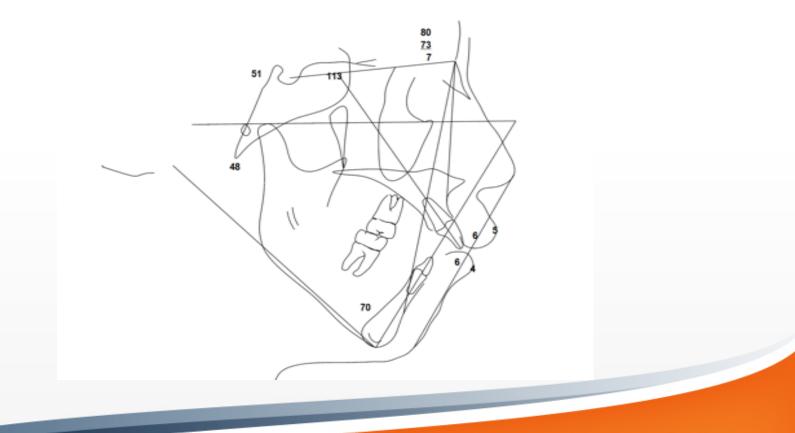
#### **Prompt**

Assuming orthognathic surgical correction, describe the ideal skeletal treatment objectives for this patient.

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#### A proficient response may include:

- 1. Maxillary advancement
- 2. Maxillary expansion
- 3. Posterior maxillary impaction
- 4. Reduction of lower anterior facial height
- 5. Reduction of SN mandibular plane angle
- 6. Advance the mandible (improvement of chin projection)

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#### Question 6

#### Classification **Domain 2: Treatment Objectives and Planning**

#### Prompt Describe the ideal treatment plan for this patient.

\*Refer to images in question #5



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#### A proficient response may include:

- 1. Maxillary orthopedic expansion, or surgically assisted maxillary expansion (SARME), or segmental Le Fort I surgery
- 2. Extraction of two maxillary premolars
- 3. Extraction of all third molars
- 4. Maxillary LeFort I surgery with posterior impaction
- 5. Mandibular forward rotation and bilateral sagittal split ramus osteotomy for advancement
- 6. Vertical reduction/AP augmentation genioplasty

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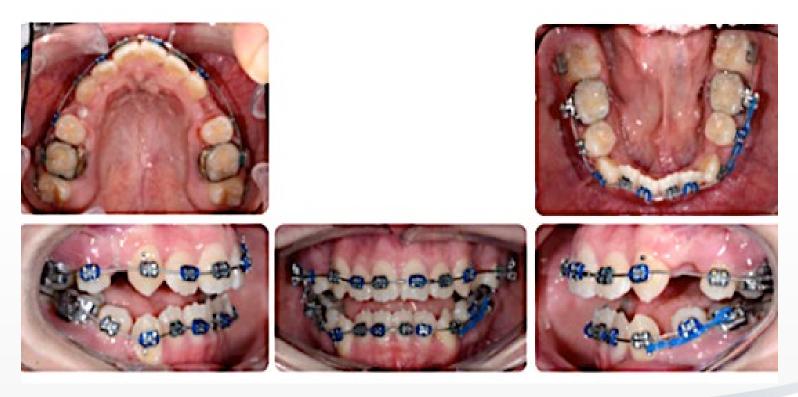
#### **Classification**

Domain 3: Treatment Implementation and Management

#### Prompt

The patient has declined orthognathic surgery after treatment has been implemented. What are the next steps to attempt to correct the patient's open bite?

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#### A proficient response may include:

- 1. Trans-palatal arch
- 2. Mandibular lingual arch
- 3. Intrusion of mandibular molars using TADs
- 4. Intrusion of maxillary molars using TADs or zygomatic plates

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**Opening Scenario**:

- Chief Complaint: "My front teeth don't fit right and I don't like my smile".
- This patient is a young Adult Hispanic female



Question 1

Classification **Domain: Data Gathering and Diagnosis** 

Prompt What cephalometric measurements may be used for the diagnosis of vertical skeletal pattern of this patient?

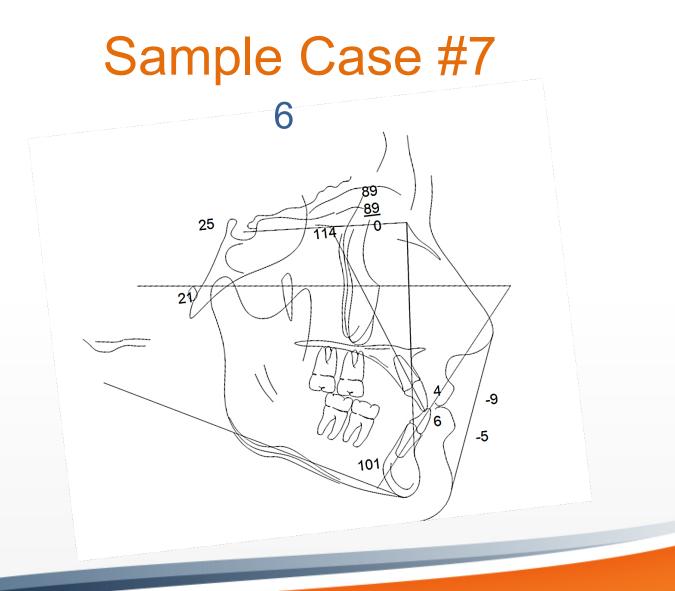
List of Relevant Images 5,6



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#### **Fully Proficient Model Response**

- The candidate answers at least 5 of the following:
  - 1. FMA
  - 2. GoGn-SN (OR constructed GoMe-SN)
  - 3. N-Me (mm)
  - 4. S-Go (mm)
  - 5. S-Go/N-Me (%)
  - 6. ANS-Me
  - 7. Gonial angle
  - 8. Y-axis

#### **Borderline Proficient Model Response**

- The candidate answers 4 of the above Not Proficient Model Response
- The candidate answers 3 or less of the above

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**Classification** Domain: Data Gathering and Diagnosis

**Prompt** Describe your interpretation of the initial cephalometric tracing.

List of Relevant Images 2, 5, 6

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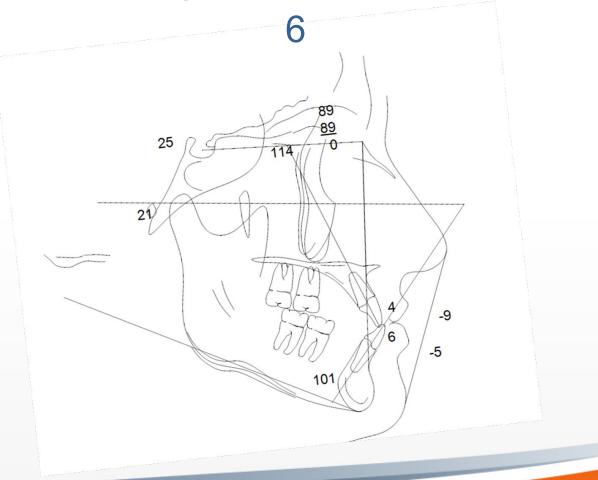
2



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#### **Fully Proficient Model Response**

- The candidate should answer 6 or more of the following:
  - 1. Canted (Flat) anterior cranial base (SN)
  - 2. Skeletal Class III (ANB: 0)
  - 3. Retrognathic maxilla (or mid-face deficiency)
  - 4. Prognathic mandible
  - 5. Proclined maxillary incisors
  - 6. Proclined mandibular incisors
  - 7. Retruded upper lip to E-line
  - 8. Decreased FMA

#### **Borderline Proficient Model Response**

• The candidate answers 5 of the above.

#### **Not Proficient Model Response**

The candidate only answers 4 or less of the above.

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#### Classification

**Domain: Treatment Objectives and Planning** 

#### Prompt

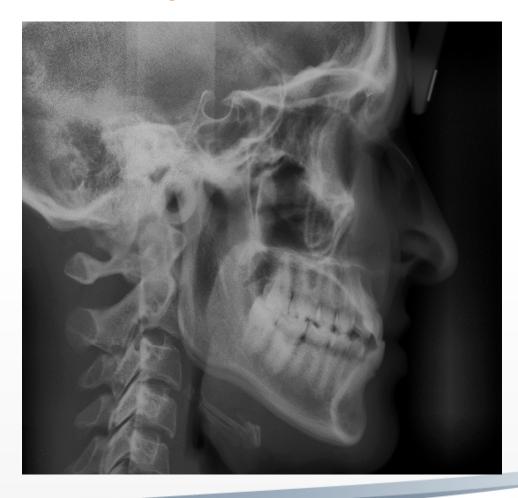
Assuming this patient has no facial concerns and denies orthognathic surgery, what are your dental and skeletal treatment objectives?

List of relevant images 2, 5, 6

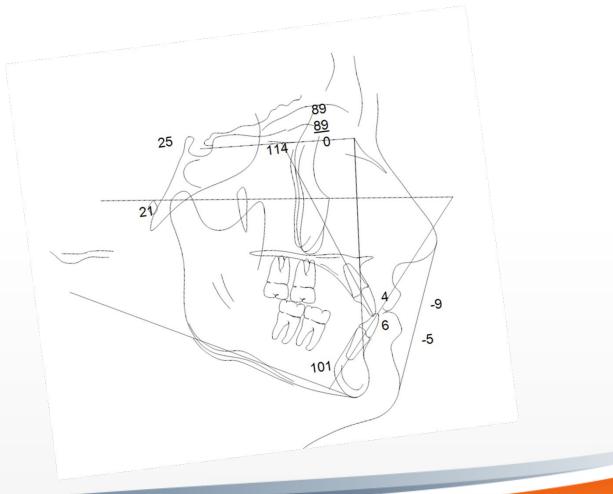




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#### **Question 3**

#### **Fully Proficient Model Response**

- The candidate should answer 7 or more of the following:
  - 1. Obtain Class I canine and molar relationship
  - 2. Maintain the maxillary incisor A-P position.
  - 3. Lingual crown torque and retract the mandibular incisors
  - 4. Distalize the mandibular posterior teeth
  - 5. Correct the anterior cross-bite
  - 6. Establish proper overbite and overjet
  - 7. Correct the posterior cross-bites (maxillary right second molar and maxillary left second premolar)
  - 8. Maintain mandibular inter-canine width
  - 9. Increase tooth display on smiling
  - 10. Make provisions to address the Bolton tooth size discrepancy

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# Sample Case #7 Question 3

#### **Borderline Proficient Model Response**

• The candidate should answer 4 of the above.

#### **Not Proficient Model Response**

• The candidate should only answers 3 or fewer of the above.



# Sample Case #7 Question 4

#### Classification

**Domain: Treatment Objectives and Planning** 

#### **Prompt**

From the post-treatment records and superimposition identify possible treatment mechanics that could achieve the observed results.

List of Relevant Images 2, 7, 8 -11, 12





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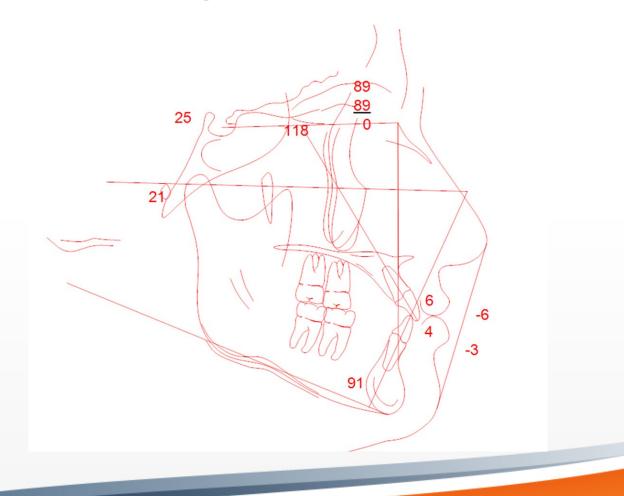




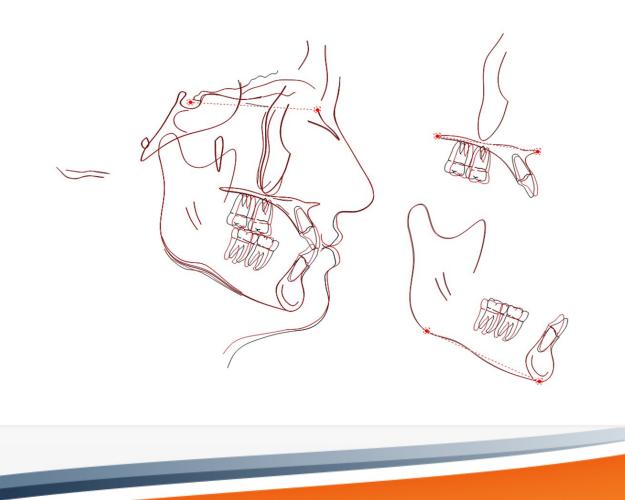








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### **Prospective Examinees to Answer**



#### **Question 4**

#### **Fully Proficient Model Response**

- Candidate should answer all of the following:
  - 1. Distalization of the mandibular dentition using intra-arch mechanics and TADs as anchorage
  - 2. Mesialization of the maxillary dentition
  - 3. IPR on mandibular anterior teeth
  - 4. Reduced use of Class III elastics
  - 5. Utilization of short class III elastics
- **Borderline Proficient Model Response**
- Mention #1 and any other 2
  Not Proficient Model Response
- No mention of 1

### **Question 5**

#### Classification

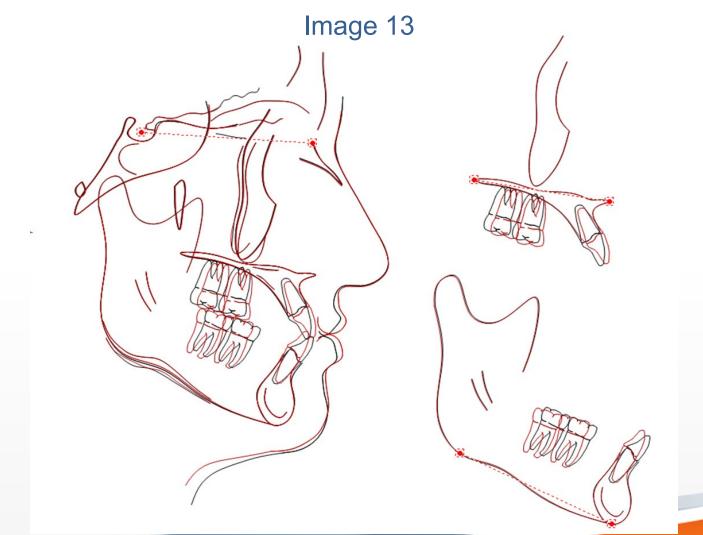
Domain: Critical analysis and outcomes assessment

#### Prompt

Please interpret the superimpositions regarding the dental and skeletal changes from treatment

List of relevant image 13





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### Sample Case #7 Question 5

#### **Fully Proficient Model Response**

- The candidate should answer at least 6 of the following:
  - 1. Increased maxillary incisor proclination
  - 2. Increased mandibular incisor retroclination
  - 3. Slight extrusion of the maxillary molars
  - 4. Maxillary molars moved mesially
  - 5. Mandibular molars moved distally
  - 6. No skeletal changes noted from treatment
  - 7. Slight advancement of upper and lower lips/improved lip projection

# Sample Case #7 **Question 5**

#### **Borderline Proficient Model Response**

The candidate should answer 5 of the above

#### **Not Proficient Model Response**

The candidate only answers 4 or fewer of the above





# How to Prepare

ABO case outcomes assessment tools:
 – Cast Radiograph Evaluation (CRE)
 – Case Management Form (CMF)

Cephalometric Superimposition Technique
 and Interpretation



# ABO Case Management Form (CMF)



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# **Case Management Form**

#### **Reasons for the ABO Case Management Form**

- 1. Self evaluation (quantified)
- 2. Evaluation/judgement of each parameter (quantified)
- 3. Evaluation of records (quantified)
- 4. Scores can be scored/digitally retrieved (demonstrates trends)
  - A numerical VTO
  - Self evaluation
  - Monitors record quality



### Case Management Form (CMF)

		PRE TX A	PROG A1	POST TX B	DIFF.		EXA	MINEE	TX OBJE	CTIVES		PRE TX DBJ	POST TX RESUL	Score
SNA®					0.0	A-P MX					C	0	00	0
SNB°				1	0.0	A-P MN					ğ	0	00	0
ANB°	-				0.0								μ	-
SN-MP***	e (				0.0	VERT MX					8		80	0
FMA°					0.0	VERT MN					ŝ	0	00	0
				D	ENTAL	ANALYSIS	(D)							
1 TO NA m	m				0.0						00	0	001	0
1 TO SN°					0.0	A-P MX					Ĕ		01	
- 1 TO NB m	m				0.0	A-P					00	0	00	0
- 1 TO MP°					0.0	MN								
						VERT					00	0 1	0 0 0 1	0
₫ TO ₫ WID	тн				0.0	TRANS MX					00	0		0
ETO EWID	тн			1	0.0	TRANS MN					Ö	0	00	0
3 TO 3 WID	тн				0.0	TRANS ANT					Ö	0	00	0
CURVE OF SPEE					0.0	CURVE OF SPEE					Ö	0	00	0
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PRE-TX A LOR PROG. A1	0	1	0	1	0	1	0	1	0	1			٥	1						
FINAL B	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	SUB-TOTAL RECORDS	

#### OVERALL ANALYSIS

TREAT	MENT PLANN	ING / MECHANOTHER	RAFY		FINAL TREA	TMENT RESULTS			
0 ACCEPT	1	2 DEFICIENCIES	3	0 ACCEPT	1	DEFICIENCIES	3	SUB-TOTAL OVERALL ANALYSIS	
0131000								TOTAL	

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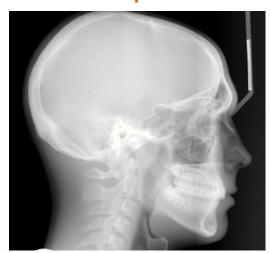


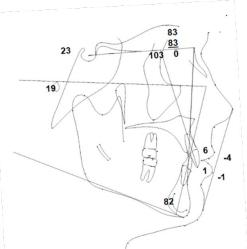
### Case Management Form Sample Case #8



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### Case Management Form Sample Case #8 Initial Records

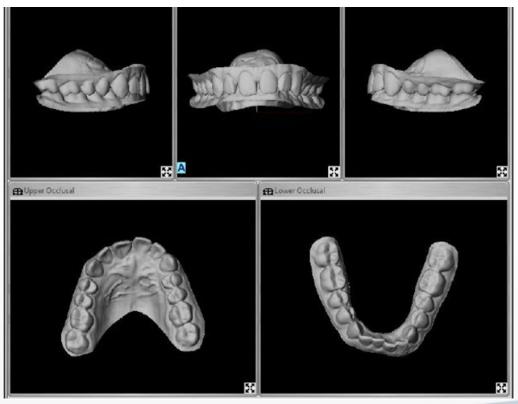








### Case Management Form Sample Case #8



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# Case Management Form Sample Case #8 Skeletal Analysis

	PRE TX A	PROG A1	POST TX B	DIFF.  A-B
SNA°	83.1		82.9	0.2
SNB°	83		81.8	1.2
ANB°	0.1		1.1	1.0
SN-MP°**	23.4		24.7	1.3
FMA°	19.2		21.2	2.0

### Case Management Form Sample Case #8 Dental Analysis

<u>1</u> TO NA mm	6.6	4.6	2.0
<u>1</u> TO SN°	103.2	107	3.8
- 1 TO NB mm	1.1	3.6	2.5
- 1 TO MP°	82.2	96.1	13.9

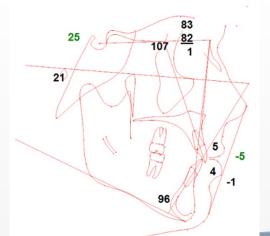
<u>6 TO 6 WIDTH</u>	39.2	39.7	0.5
	40.4	41	0.6
	23	24.9	1.9
CURVE OF SPEE	4	1	3.0
MANDIBULAR ARCH FORM	ov	ov	SAME

### Sample Case #8 Management Form



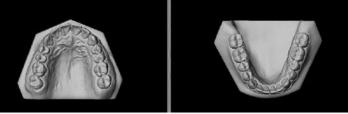
### Sample Case #8 Management Form











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# **Closing Points**





The highest commitment to excellence.

# **Test Technique Pointers**

- Read the question carefully
- Use the images presented for each question
- Be mindful of time and number of questions
- Remember you cannot go back to previous questions
- Provide detailed short and concise answers
- Incorrect answers are deducted
- Review ABO study guide often
- All written responses will be considered when evaluating and scoring the question

# **Case Management Form**

- Remember 3 planes of space
- Use precise and concise description
- Use appropriate terminology
- Treatment objectives and treatment plan should be in line with patient's needs not wants
- Actively participate in academic or study club case reviews

# **Superimpositions**

- Know radiographic analysis
- Review all 3 ABO superimposition videos (ABO website)
- Master superimposition interpretation skills
- Be able to differentiate changes from growth and treatment mechanics
- Read Buschang/Tadlock Guidelines for Assessing Growth and Development of the Orthodontic Patient. Seminars in Orthodontics, 2017

# Prepare!!!!

With each patient ask yourself:

- What happened
- Where did it happen
- Why did it happen ( is it good/bad?)
- What is next?
- Are we still on target?
- Prepare by being a continuous serious student!!!

# **Certification Makes a Difference**

- For you....personal accomplishment, ongoing self-assessment, commitment to being a continual learner
- For your future....a way to differentiate yourself, for future employment and from other practitioners performing orthodontics
- For our specialty....commitment to the highest standard of patient care



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### **Thank You!**

