

# Dental Hygiene Faculty OSCE Workshop

Valerie Nieto, RDH, MS

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# Valerie Nieto, RDH, MS

## Education

- Grand Rapids Community College *ASDH*
- University of Michigan, School of Dentistry *BSDH*
- University of Michigan, Rackham Graduate School *MSDH*

## Career

- University of Michigan, School of Dentistry *Clinical Lecturer*

## Other

- American Institute of Dental Public Health *Research Specialist*
- ADEA SIG *Chair Elect*
- Michigan Dental Hygienists' Association *Treasurer*
- Colgate Dental Educators Network *OSCE Advisory Board*



# Course Objectives

**Value** the purpose of OSCE as an evaluation tool in dental hygiene education

**Discuss** the *potential* role of OSCE in CODA Compliance

**Review** the fundamental characteristics of an OSCE

**Recognize** various evaluation methodologies of OSCE

**Develop** OSCE station-evaluations related to dental hygiene education

# CPR Course

1. Course work
2. Simulated Demonstration

# Objective Structured Clinical Examination

OSCE

# OSCE

Definition

# Objective Structured Clinical Examination OSCE

Observed

Performance-  
based

Objective  
Assessment

Psychomotor  
Cognitive  
Affective

Structured  
&  
Standardized

Harden R, et al. Br Med J. 1975.  
Nieto, et al. J Dent Hyg. 2020.

# Objective Structured Clinical Examination

## Designed – 1970's

- Replace
  - Traditional Clinical Exams
  - Subjective

## Clinical Assessment

- Objective
- Structured
- Standardized



# Value

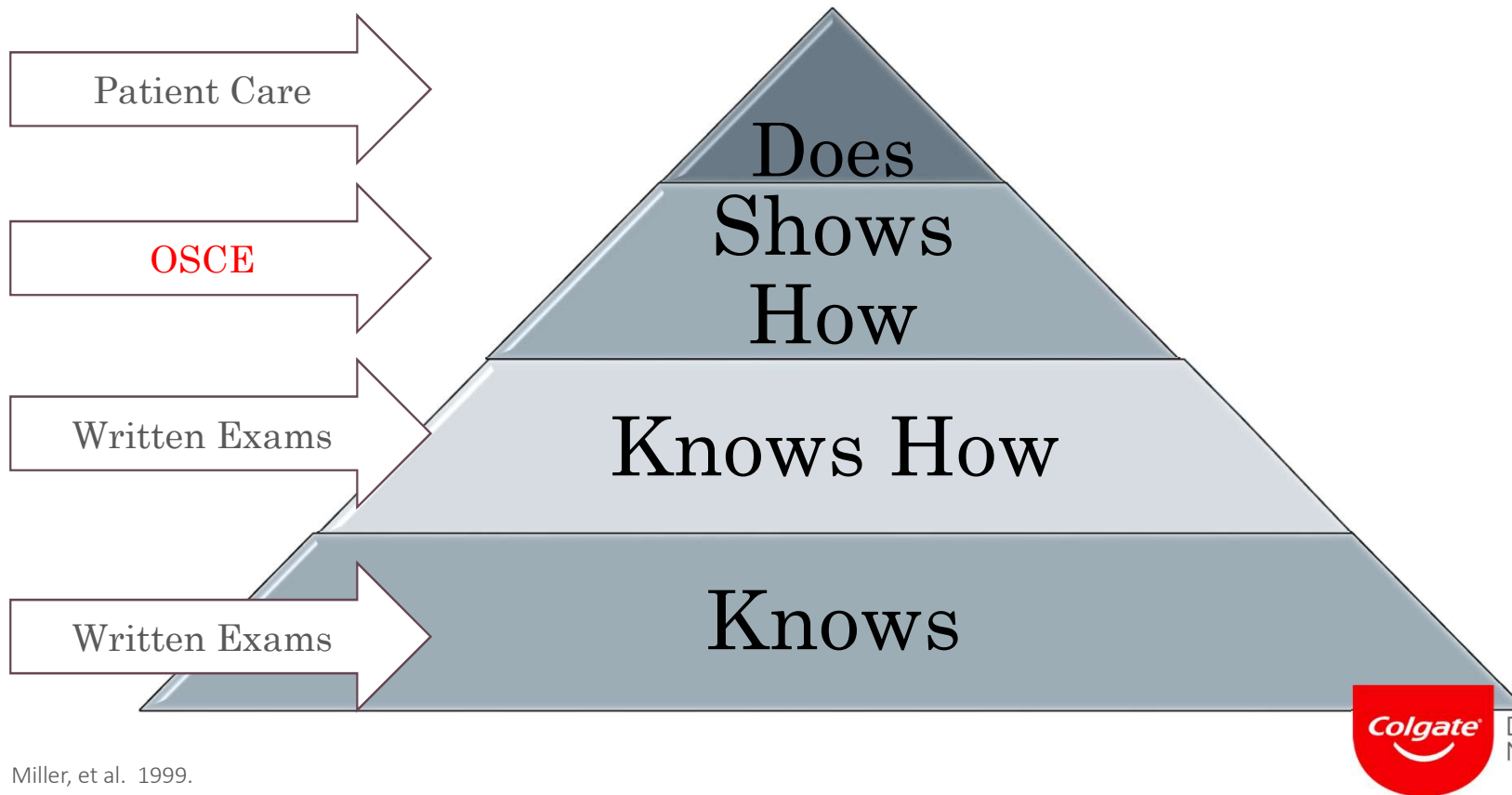
Purpose of OSCE

Value  
Didactic

Clinical



# Miller Model



Miller, et al. 1999.

# Value



OSCEs influence student learning and program development.



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# Value



## Student Learning

- Summative & formative assessment
- Assess learner progress
- Predict future performance
- Pathway for remediation
- Improve learning & outcomes

# Value

## Program Development

- Promote faculty calibration
- Evaluate course delivery
- Assess course - curriculum content
- Evaluate instructors
- Program improvement based on results



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# Value

## JCNDE

- **Clinical Licensure Exam Changes**

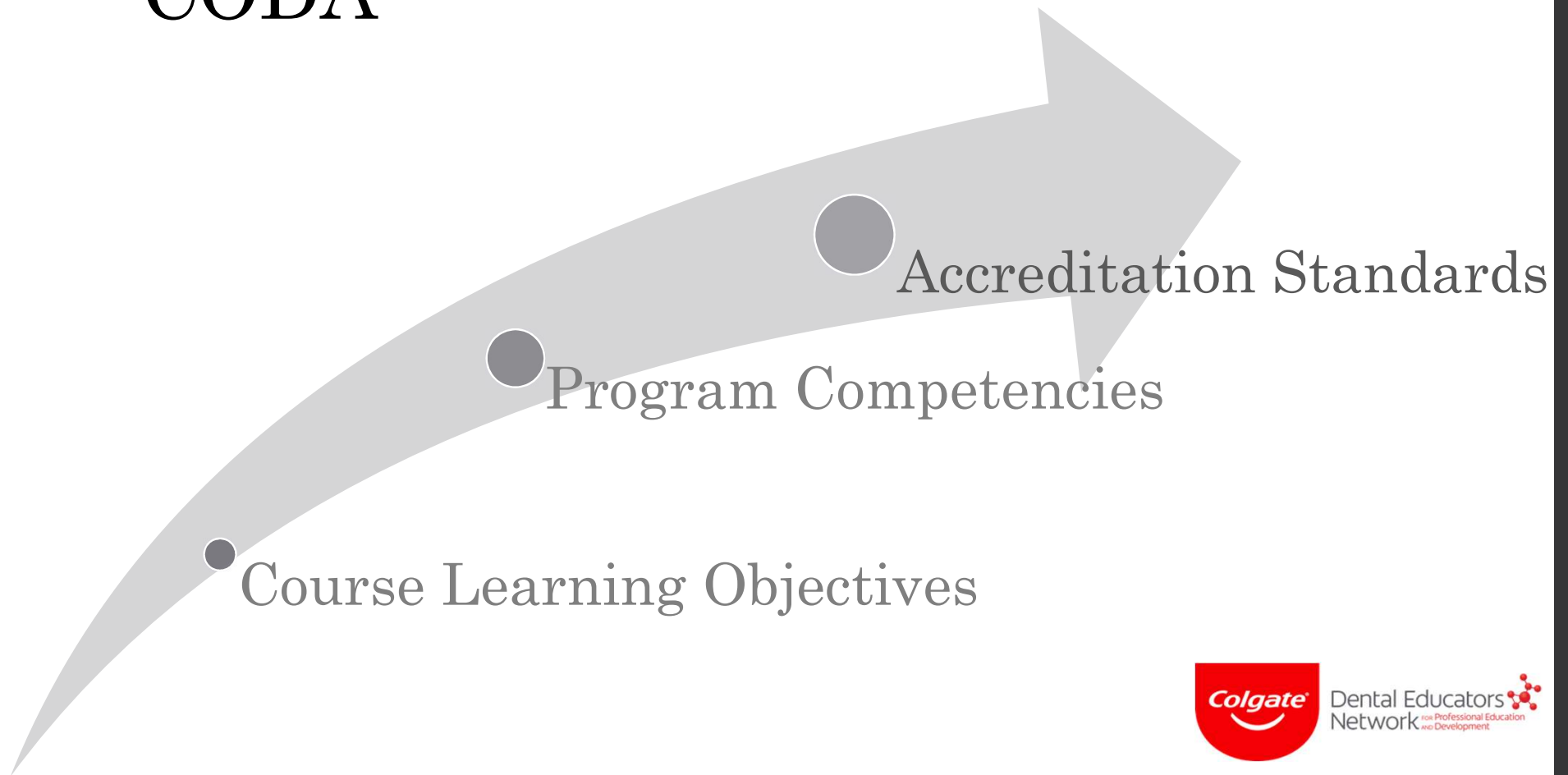
- **2021** - *Dental Hygiene Licensure Objective Structured Clinical Examination* (DHLOSCE)
- **2022** – content development
- **2023** – development of test items & materials
- **2024** – anticipated launch

# CODA

How can OSCEs *potentially* help with CODA compliance???



# CODA



# CODA STANDARDS

## 1-1 d&e

The program must demonstrate its effectiveness using a formal and ongoing planning and assessment process that is systematically documented by:

- d. Assessing and analyzing the outcomes, including **measures of student achievement**
- e. Use of the outcomes assessment results for **annual program improvement** and **reevaluation of program goals**

# CODA STANDARDS

## 2-6

The dental hygiene program must define and list the competencies needed for graduation. The dental hygiene program must employ student evaluation methods that measure all defined program competencies. These competencies and evaluation methods must be written and communicated to the enrolled students.

Examples of evidence:

- Evaluation forms

# CODA STANDARDS

2-23

Graduates must be competent in problem solving strategies related to comprehensive patient care & management.

Examples of evidence:

- **Evaluation mechanisms** designed to monitor **knowledge** and **performance**
- **Outcome assessment mechanisms** demonstrating application of **critical thinking skills**

# Thoughts???

Value the purpose of OSCE

CODA Compliance

# Fundamental Characteristics

Global View

Circuits

Blueprints

Station Content



# Fundamental Characteristics

Global View





Planning an OSCE is like planning a wedding...

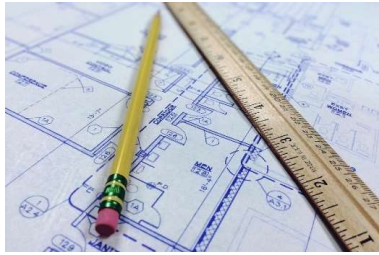
**Decide:**

- ✓ Objectives being tested
- ✓ Topics being tested
- ✓ Number of stations
  - ✓ Station times
- ✓ Number of faculty to help
  - ✓ Resources needed....





# Fundamental Characteristics



CHECKLIST



Objective

Circuit

Station One



Station Two



Station Three



Station Four



# Fundamental Characteristics

## Objective

- Same skills assessed
- Pre-determined criteria
- Standardized – predetermined evaluation tools
- Calibrated instructors

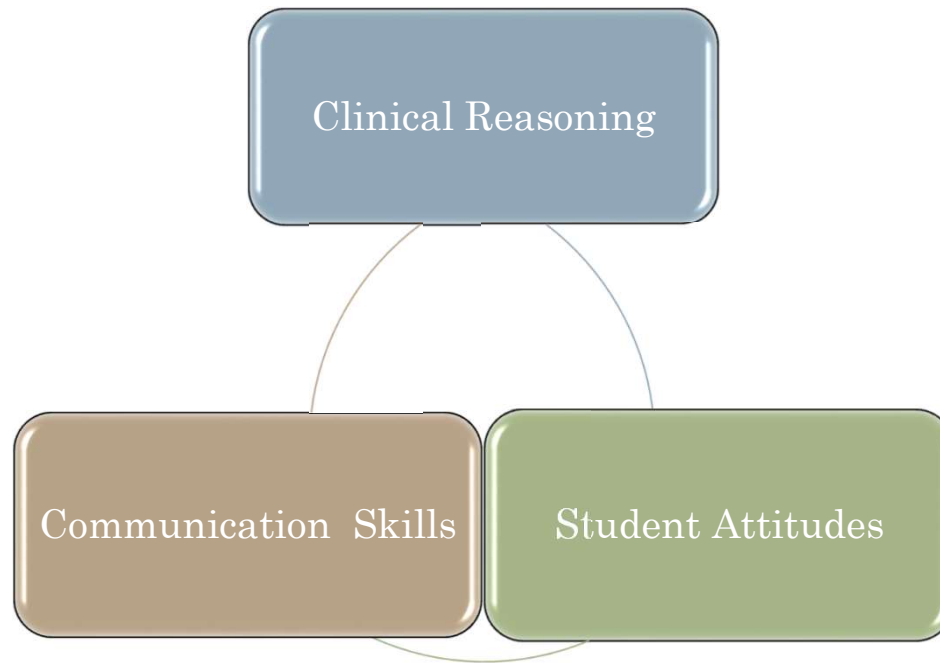
## Structured

- Timed
- Station-based
- Blueprinted

## Clinical Examination

- Apply clinical skills
- Theoretical knowledge

# OSCEs Assess Performance



Harden R, et al. Br Med J. 1975.

# Dental Hygiene Education Topics

## Acquire Health History

Medical  
Dental  
Social

## Practical Skills

Instrumentation  
Infection Control  
Assemble LA Syringe

## Perform Procedure

Clean Prosthesis  
Acquire Impressions  
Administer LA  
Set up Nitrous Tanks

## Interpretation

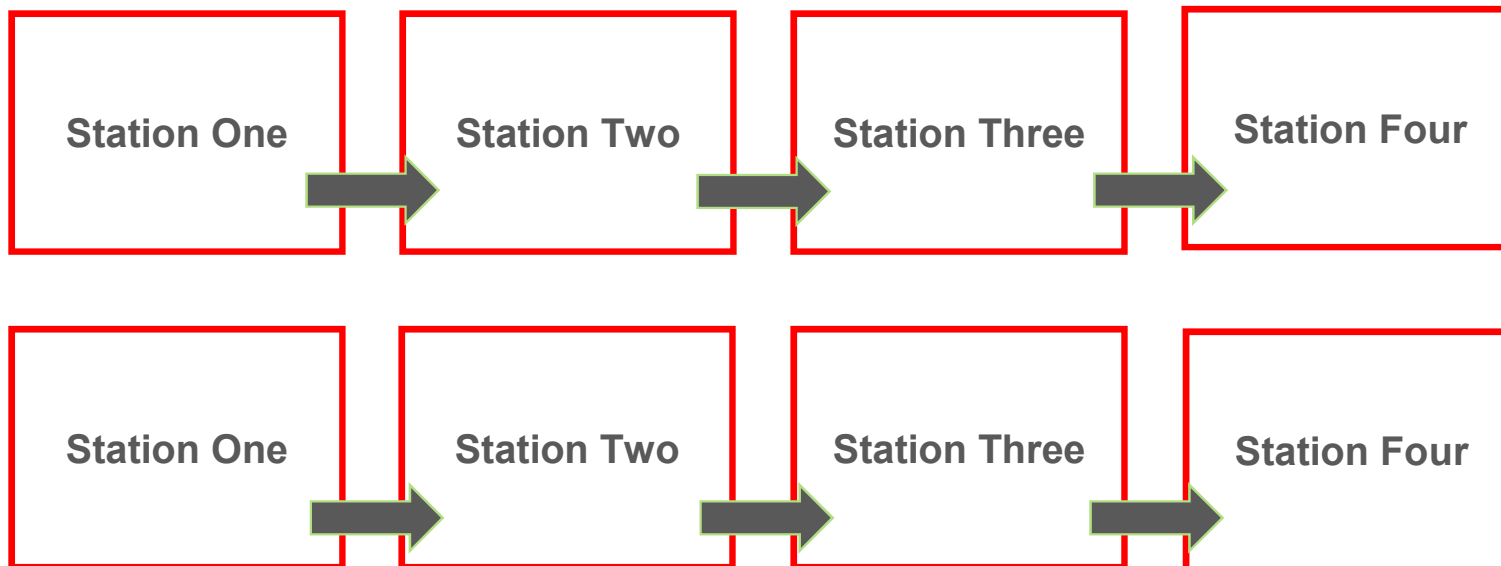
Radiographs  
Perio-chart  
Re-evaluation

# Circuits & Circuit Maps

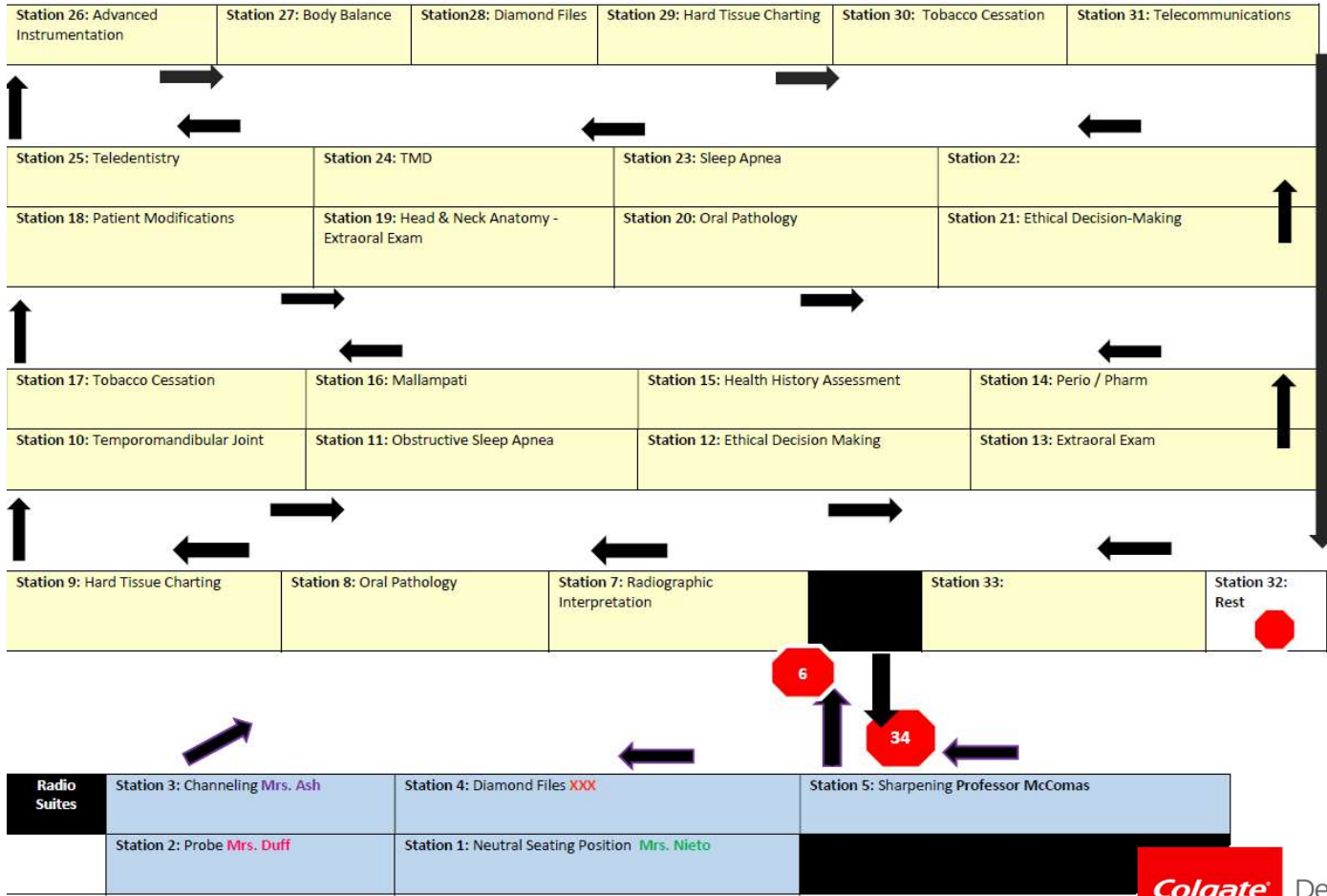
Fundamental Characteristics



# Circuits



## Student Circuit Map



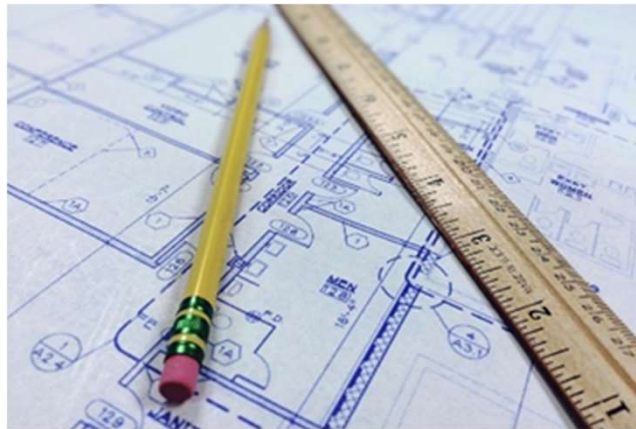
# Blueprints

Fundamental Characteristics





# Blueprints



Blueprints are the foundation of OSCE development.  
Tool used to track exam content.

# Blueprint Example

Station	Topic	Patient Type	Examiner Type	Evaluation Tool	Feedback Type
1	Health History	None	None	Rubric	Written
2	Vitals	Simulated	Observed	Checklist	Written
3	Extra Oral Exam	Simulated	Proctored	Rating Scale	Written: Examiner Verbal: Patient
4	Intra Oral Exam	Simulated	Proctored	Rating Scale	Written: Examiner Verbal: Patient
5	Radiographic Interpretation	None	None	Rubric	Written
6	Root Planing	Typodont	Observed	Checklist	Written
7	Patient Education	Simulated	Observed	Rating Scale	Written
8	Treatment Note	None	None	Rubric	Written
9	Channeling Strokes	Typodont	Observed	Checklist	Written

# Blueprint Example

## **Station One: Gracey 11/12**

(12 points)

### OSCE Objective & Performance Criteria:

- ✓ Identify correct instrument based on station instructions
- ✓ Perform instrumentation skill accurately – checklist
- ✓ Achieve a score of 9 points or above ~  
    < 9 points = required remediation

Procedural Skill: Psychomotor / Cognitive

Student Instructions: written

### Faculty Instructions:

- ✓ Faculty observed
- ✓ Scoring sheet (checklist) w/ directions

Patient Type: Typodont

### List of resources:

- ✓ Instructions
- ✓ Nevi 4, Gracey 3/4, 11/12, 13/14
- ✓ Score sheet
- ✓ Typodont
- ✓ Gloves
- ✓ Hand sanitizer
- ✓ Writing utensil



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# Blueprint Example

<p><b>Station One: Gracey 11/12</b> (12 points)</p> <p><u>OSCE Objective &amp; Performance Criteria:</u></p> <ul style="list-style-type: none"> <li>✓ Identify correct instrument based on station instructions</li> <li>✓ Perform instrumentation skill accurately – checklist</li> <li>✓ Achieve a score of 9 points or above ~ &lt; 9 points = required remediation</li> </ul> <p><u>Procedural Skill:</u> Psychomotor / Cognitive</p> <p><u>Student Instructions:</u> Written</p> <p><u>Faculty Instructions:</u></p> <ul style="list-style-type: none"> <li>✓ Faculty observed</li> <li>✓ Scoring sheet (checklist) w/ directions</li> </ul> <p><u>Patient Type:</u> Typodont</p> <p><u>List of resources:</u></p> <ul style="list-style-type: none"> <li>✓ Instructions</li> <li>✓ Nevi 4, Gracey 3/4, 11/12, 13/14</li> <li>✓ Score sheet</li> <li>✓ Typodont</li> <li>✓ Gloves</li> <li>✓ Hand sanitizer</li> <li>✓ Writing utensil</li> </ul>	<p><b>Station Two: Radiograph Mounting</b> (8 points)</p> <p><u>OSCE Objective &amp; Performance Criteria:</u></p> <ul style="list-style-type: none"> <li>✓ Organize radiographs and achieve a score of 80% or above</li> </ul> <p><u>Procedural Skill:</u> Psychomotor / Cognitive</p> <p><u>Student Instructions:</u> Written</p> <p><u>Faculty Instructions:</u></p> <ul style="list-style-type: none"> <li>✓ Faculty observed</li> <li>✓ Scoring sheet (checklist) w/ directions</li> </ul> <p><u>Patient Type:</u> None</p> <p><u>List of Resources</u></p> <ul style="list-style-type: none"> <li>✓ Instructions</li> <li>✓ Empty FMX mount X8</li> <li>✓ 18 FMX radiographs (loose) X8</li> <li>✓ Drop box for completed mounts</li> </ul>	<p><b>Station Three: Document Oral Manifestation</b> (10 points)</p> <p><u>OSCE Objective &amp; Performance Criteria:</u></p> <ul style="list-style-type: none"> <li>✓ Recognize abnormal anatomy of the oral cavity</li> <li>✓ Accurately record soft tissue findings and achieve a score of 80% or above</li> </ul> <p><u>Procedural Skill:</u> Psychomotor / Cognitive / Affective</p> <p><u>Student Instructions:</u> Written</p> <p><u>Faculty Instructions:</u></p> <ul style="list-style-type: none"> <li>✓ Not faculty observed</li> <li>✓ Graded after exam with scoring sheet (checklist)</li> </ul> <p><u>Patient Type:</u> None</p> <p><u>List of Resources</u></p> <ul style="list-style-type: none"> <li>✓ Instructions</li> <li>✓ Medical History (diagnosis &amp; drug list)</li> <li>✓ Intraoral Images</li> <li>✓ Student form</li> <li>✓ Writing utensil</li> <li>✓ Answer key</li> </ul>
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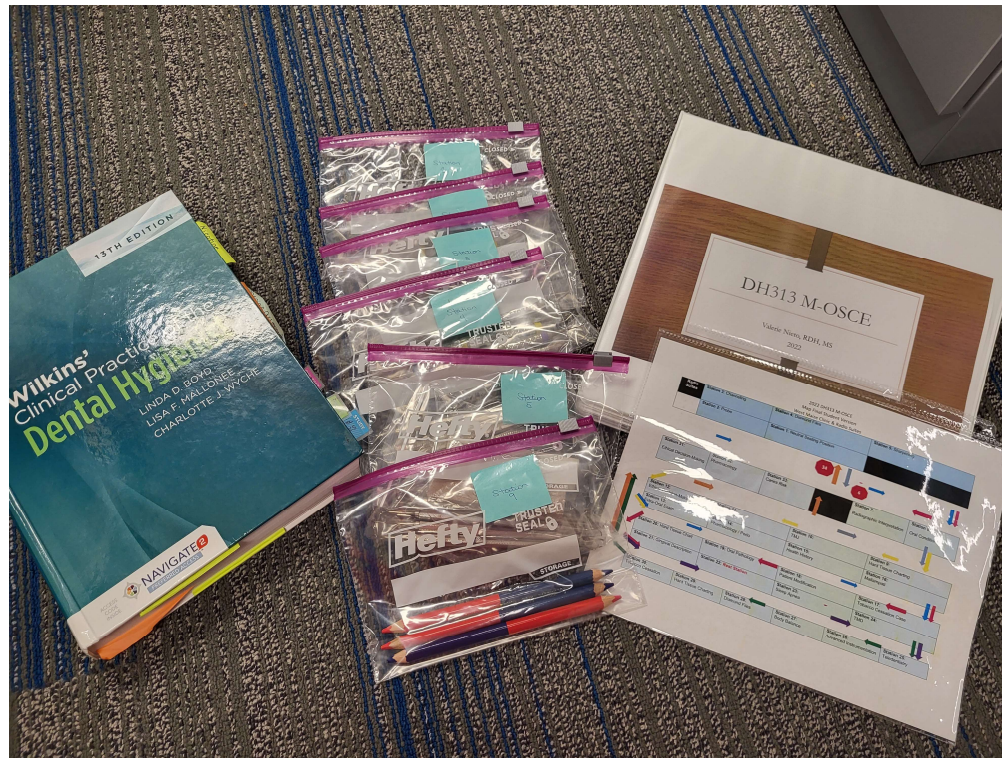
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# Station Resource List

Station	Supplies
1	Colored Pencils: pink X3
2	Typodont / Chair mount Magnetometer Contra-angled inserts / Mirror
3	Vision Curvette + instrument
5	Typodont / Chair mount Probe- Mirror
6	Colored Pencils: red & blue X3
13	Typodont / Chair mount 11/12 – 13/14 – 204S – Nevi
15	Barnhart, Gracey 1/2 , 11/12 13/14, H5/33, 204S
16	Calculus typodont / Chair mount Explorer – Mirror
	Station number signs Arrow signs Rest-station stop signs Tape Plastic paper protectors 4X Clip Boards Extra pencils *Exam packets (31) *Answer keys (5) *Student / station directions (32) *Faculty directions / evaluations (31 X 3) *OSCE Blueprint *OSCE Map

# Station Prep



# Evaluation Methods

Checklists, Rubrics, Answer Keys

Student Evaluations

Couse Evaluations

Program Evaluation



# Checklists

<b>Nabers (N2) Probe Tooth #3</b>		
<b>Identified correct:</b>	Yes	No
Instrument		
Tooth (3)		
Tooth Surface (buccal)		
<b>Demonstrated correct:</b>		
Typodont Position		
Illumination		
Grasp		
Working end		
Adaptation		
Activation (rotated into furcation)		
Removal		
<b>Total Yes:</b>		/10
<b>Comments:</b>		



# Rubrics

Rubric 15 points			
Criteria			
Discussion Board Participation	<b>5-4 points</b>  Presentation uploaded to discussion board on time.  Responded to at least two classmates' presentations within the assigned timeframe. Replied to at least two classmates' questions in own discussion thread within the assigned timeframe.	<b>3-2 points</b>  Presentation uploaded to discussion board on time.  Responded to at least one- classmate presentation within the assigned timeframe. Replied to at least one question in own discussion thread within the assigned timeframe.	<b>1-0 points</b>  Presentation not uploaded on time.  Delayed participation.  Failed to actively participate in discussion.
Response to others	<b>5-4 points</b>  Clearly identified one presentation strength.  Asked thought provoking questions. Demonstrated a deep connection to the materials.	<b>3-2 points</b>  Ambiguously identified one presentation strength.  Questions were vague. Demonstrated satisfactory connection to the materials.	<b>1-0 points</b>  Failed to identify a presentation strength.  No questions were asked. Discussion on classmate's thread was not related to the project discussion.
Reply to responses	<b>5-4 points</b>  Replied to classmates' questions thoughtfully. Correctly utilized citations to support responses when appropriate.	<b>3-2 point</b>  Adequately replied to classmates' questions. Utilized citations with minor errors.	<b>1-0 points</b>  Failed to reply to classmates. Failed to utilize citations. Plagiarized. <b>Plagiarism will result in a zero for the discussion portion of the project.</b>



# Exam Packet & Answer Key

## Student Evaluation

### Faculty Instructions:

- Record student's name in the upper left-hand corner of the form.
- In the columns below, please use a (+) to indicate whether a student was successful or (-) if the student was unsuccessful.
- Please record the total number of successes in the bottom right-hand corner of the checklist.
- Instructor feedback may be provided in the designated space below.

Faculty Feedback:

<b>Name:</b>		
Gracey 11/12		
<b>Correctly Identified:</b>	+	-
Tooth number		
Tooth surface (mesial)		
Tooth surface (root)		
<b>Demonstrated correct:</b>		
Seating position		
Typodont position		
Illumination		
<b>Instrument technique:</b>		
Adaptation		
Angulation		
Activation		
<b>Infection Control:</b>		
Hand hygiene (sanitizer)		
Donned gloves		
Doffed gloves		
<b>Total +:</b>	/12	



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## Student Evaluation

### Instructor Instructions:

- Record student's name in the upper left-hand corner of the form.
- Please review each FMX mount.
- Using the checklist, please place an X next to the description that best aligns with the student's performance.
- Please record the total points earned in the bottom right-hand corner of the checklist.
- Instructor feedback may be provided in the designated space below.
- Must achieve  $\geq 7.5$  / 10 points to successfully pass station.

Faculty Feedback:

Name:		
Mounted Radiographs		
Accurately Mounted:	X	Points
All 18 radiographs		8
16 radiographs		7
14-15 radiographs		6
11-13 radiographs		5
8-10 radiographs		4
<7 radiographs		3
18 images mounted (does not include accuracy)		2
Total points:		/10

## Student Evaluation

### Station Two: Blood Pressure

#### Faculty Directions

In the columns provided, please use an X to indicate whether the performance was adequately achieved.

1 point = achieved / 0 points = unachieved / Missed = -1 point

\*Must achieve 75% or higher to pass.

Additional Comments:	Achieved X	Unachieved X	Missed X
<b>Identified / Demonstrated Correct:</b>			
<b>BP-Cuff selection</b>			
<b>Placement of cuff</b>			
<b>Insertion of stethoscope in ears</b>			
<b>Closed pressure control valve</b>			
<b>Pumped to appropriate level</b>			
<b>Released pressure control valve at appropriate rate</b>			
<b>Identified systolic</b>			
<b>Identified diastolic</b>			
<b>Removed cuff appropriately</b>			
Total points:    / 10			



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# Station Example

Evaluate Student Learning & Program Success

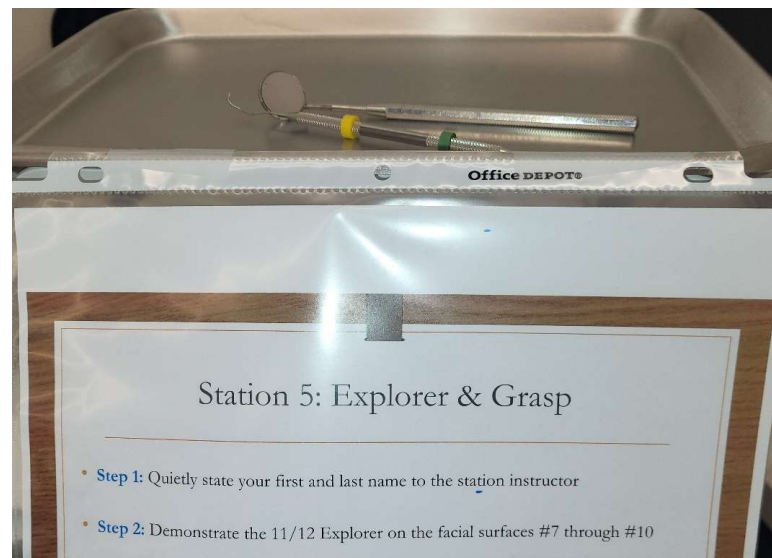
CODA Standard: 1-1 d&e



# Example: Station Topic & Criteria

Given an 11/12 explorer, mirror, typodont, and prompts, the student will successfully complete this station with a score of 80% or higher.

Failure to do so will result in the required remediation of the station.



# Example: Student Directions

**Prompt 1:** Quietly state your first and last name to the station instructor

**Prompt 2:** Demonstrate the 11/12 Explorer on the facial surfaces #7 - #10



# Example: Evaluation Tool

**Prompt 1:** Quietly state your first and last name to the station instructor

**Prompt 2:** Demonstrate the 11/12 Explorer on the facial surfaces #7 - #10

<b>Station Five: Explorer</b> <u>Faculty Directions</u> In the columns provided, please use an X to indicate whether the student was successful. 1 point = achieved / 0 points = unachieved		
Identified / demonstrated correct:	Achieved X	Unachieved X
Tooth numbers		
Tooth surfaces		
Working end		
Started - midline		
Started – handle parallel to long axis of tooth		
Exploratory strokes		
Rolled – interproximal surfaces		
Maintained tip-third adaptation		
Flipped instrument (mesial / distal surface)		
Followed station directions		
Total Achieved:	/ 10	



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# Example: Student Performance “Sally”

**Prompt 1:** Quietly state your first and last name to the station instructor

**Prompt 2:** Demonstrate the 11/12 Explorer on the facial surfaces #7 - #10

<b>Station One:</b> Explorer <u>Faculty Directions</u> In the columns provided, please use an X to indicate whether the student was successful. 1 point = achieved / 0 points = unachieved		
Identified / demonstrated correct:	Achieved X	Unachieved X
Tooth numbers		X
Tooth surfaces	X	
Working end		X
Started - midline	X	
Started – handle parallel to long axis of tooth	X	
Exploratory strokes	X	
Rolled – interproximal surfaces	X	
Maintained tip-third adaptation		X
Flipped instrument (mesial / distal surface)	X	
Followed station directions	X	
Total Achieved:	7 / 10	

6-11

70%

Required  
Remediation



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# Example: Student Performance “Johnny”

**Prompt 1:** Quietly state your first and last name to the station instructor

**Prompt 2:** Demonstrate the 11/12 Explorer on the facial surfaces #7 - #10

## **Station One:** Explorer

### Faculty Directions

In the columns provided, please use an X to indicate whether the student was successful.

1 point = achieved / 0 points = unachieved

Identified / demonstrated correct:	Achieved X	Unachieved X
Tooth numbers	X	
Tooth surfaces	X	
Working end		X
Started - midline	X	
Started – handle parallel to long axis of tooth		X
Exploratory strokes	X	
Rolled – interproximal surfaces	X	X
Maintained tip-third adaptation		
Flipped instrument (mesial / distal surface)	X	
Followed station directions	X	
Total Achieved:	7 / 10	

70%

Required  
Remediation



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# Reporting Class Performance

By Station

\*\*\*Strategies to report data



# Example: Class Performance

Given an 11/12 explorer, mirror, typodont, and prompts, 100% of the class will successfully complete station one with a score of **80%** or higher. Failure to do so will result in ....

<b>Station One:</b> Explorer <u>Faculty Directions</u> In the columns provided, please use an X to indicate whether the student was successful. 1 point = achieved / 0 points = unachieved		
Identified / demonstrated correct:	Achieved X	Unachieved X
Tooth numbers	68%	32%
Tooth surfaces	92%	8%
Working end	64%	36%
Started - midline	95%	5%
Started – handle parallel to long axis of tooth	87%	13%
Exploratory strokes	94%	6%
Rolled – interproximal surfaces	97%	3%
Maintained tip-third adaptation	45%	55%
Flipped instrument (mesial / distal surface)	79%	21%
Followed station directions	99%	1%



## OSCE: Class Performance

Station	Average	Average %	Total Pass	Total Failures	Total Remediations
Gracey 11/12	/10	%			
Radiographs	/18	%			
Explorer	/10	%			
Blood Pressure	/10	%			
Implant Mobility	/10	%			
Gold Crown	/5	%			
Oral Hygiene Instruction	/5	%			
Obstructive Sleep Apnea	/8	%			
OSCE Results:	/66				
Faculty Feedback: Faculty Initials: ____					



# Program Evaluation



# Program Evaluation

- Station Averages (list)
- Frequent missed criterion (by station)
- Stations requiring remediation
- Course content taught
- Observed strengths
- Observed weaknesses
- Plans to modify course/program based on OSCE results



# Thoughts???

Student Evaluation

Course Evaluation

Program Evaluation



# Additional Station Examples

Blueprint & Resources

Student Instructions

Faculty Instructions

Evaluation Tool



# Example One

Patient with Special Needs

CODA Standards: 2-8d, 2-12

# Station Blueprint

- **Station 10:** Care of Patients with Special Needs (6 points)
- **CODA Standards:** 2-8d & 2-12
- **Program Competency / Course Objective:** Competency 3.4 – Objective 6
- **Performance Criterion:** Must achieve a  $\geq 4/6$  points to pass (failure to do so = remediation)
- **Procedural Skill:** Cognitive / Affective (Communication skills / Establishment of facts)
- **Student Instructions:** Written
- **Faculty Instructions:**
  - ✓ Faculty observed
  - ✓ Evaluation tool (checklist) w/ directions
- **Patient Type:** Standardized Patient
- **List of Resources:**
  - ✓ Student & Faculty Instructions
  - ✓ Fictional Health History Form
  - ✓ Checklist
  - ✓ Standardized Patient
  - ✓ Writing Utensil

# Student Instructions

## Prompt 1

- Review the patient's health history form located on the countertop.

## Prompt 2

- Given the information provided, conduct a customized health history patient-interview that specifically addresses the sensory disability indicated on the health history form.

# Health History Form

**Name:** Sean Smith

**Gender identity:** Male

**Age:** 54

**Vitals:** BP 123/76 PR: 62 bpm RR: 13/min

**Chief complaint:** none

**Medical History:**

- Viral induced gastroparesis
- Hard of hearing
- Osteoarthritis – hands

**Social/Dental History:** No significant findings



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# Faculty Instructions & Evaluation

## **Station 10:** Care of Patients with Special Needs

**Faculty Instructions:** Use an **X** to indicate whether the student successfully / unsuccessfully achieved the criteria below. Students must earn  $\geq 4/6$  points to pass station.  $< 4/6$  points = failure & required remediation of OSCE station with course director.

<b>Criteria:</b>	<b>Successful</b>	<b>Unsuccessful</b>
Introduced self to patient		
Expressed understanding / Demonstrated empathy		
*Correctly identified sensory disability		
Inquired about extent of hearing loss		
Identified which ear / ears are involved		
Identified the patient's preferred method of communication / assisted measures of communication (interpreter, assistive headset, hearing aids, text telephone device reader, etc.)		
<b>Total Achieved:</b>		
<b>Comments:</b>		
*If unsuccessful – automatic failure. Required remediation of OSCE station with course director.		



# Example Two

Blood Pressure



# Station Blueprint

## **Station Two:** Blood Pressure

10 points

- ✓ Examiner observed
- ✓ Standardized patient
- ✓ Stethoscope ~ BP Cuff (X3)
- ✓ Cavi Wipes
- ✓ PPE
- ✓ Evaluation sheet – faculty directions
- ✓ Student directions – written
- ✓ Time: 5 minutes

CODA Standard: 2.13

Program Objective:

- ✓ Collect patient data & determine health status

OSCE Objective & Performance Criteria:

- ✓ Perform manual blood pressure and achieve a score of 75% or above

Clinical Skill Level ~ Pre-Clinic

Psychomotor / Cognitive

# Student Instructions

**Prompt 1:** Perform a manual blood pressure.

# Faculty Instructions & Evaluation Tool

<b>Station Two: Blood Pressure</b> <u>Faculty Directions</u> In the columns provided, please use an X to indicate whether the student was achieved. 1 point = achieved / 0 points = unachieved / Missed = -1 point *Must achieve 75% or higher to pass.			
Additional Comments:	Achieved X	Unachieved X	Missed X
<b>Identified / Demonstrated Correct:</b>			
<b>BP-Cuff selection</b>			
<b>Placement of cuff</b>			
<b>Insertion of stethoscope on arm</b>			
<b>Closed pressure control valve</b>			
<b>Pumped to appropriate level</b>			
<b>Released pressure control valve at appropriate rate</b>			
<b>Identified systolic</b>			
<b>Identified diastolic</b>			
<b>Removed cuff appropriately</b>			
Total points: / 10			



# Recap

# Recap

- **Purpose:** Provide an objective clinical assessment that is valid, reliable, and reproducible.
- **Defined:** An OSCE is an observed, performance-based exam, designed to provide an objective assessment of psychomotor, cognitive, and affective skills in manner that is structured and standardized. OSCE stations are timed and assess multiple students on the same materials at the same time.
- **OSCEs:**
  - Assess student performance
  - Assess class performance
  - Station remediation
  - Evaluate course outcomes & learning objectives
  - Align with accreditation competencies/standards
  - Evaluate teachers - course delivery
  - Course - curriculum content
  - Program evaluation

Harden R, et al. Br Med J. 1975.  
Park SE, et al. J Dent Educ. 2015.  
Nieto, et al. J Dent Hyg. 2020.



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# The End...



# References

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4. Nieto V, Eagle I, Mishler S, Rulli D. Utilization of Objective Structured Clinical Examinations (OSCE) as an assessment for clinical competency and licensure: a survey of dental hygiene director's knowledge and attitudes. *J Dent Hyg*, 2020 Dec; 94 (6) 65-71.
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# Thank you

Valerie Nieto, RDH, MS

[vkarnes@umich.edu](mailto:vkarnes@umich.edu)

