Canadian Dental Hygiene Educators
OSCE Development Workshop

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Valerie Nieto, RDH, MS

Education:

ASDH Grand Rapids Community College

BSDH University of Michigan, School of Dentistry

MSDH University of Michigan, Rackham Graduate School

Career:

University of Michigan, School of Dentistry

Clinical Lecturer – Clinic Coordinator

Other:

Colgate Dental Educators Network *OSCE Advisory Board*

Course Objectives

Recall the fundamental characteristics of an OSCE

Recognize various evaluation methodologies of OSCE

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

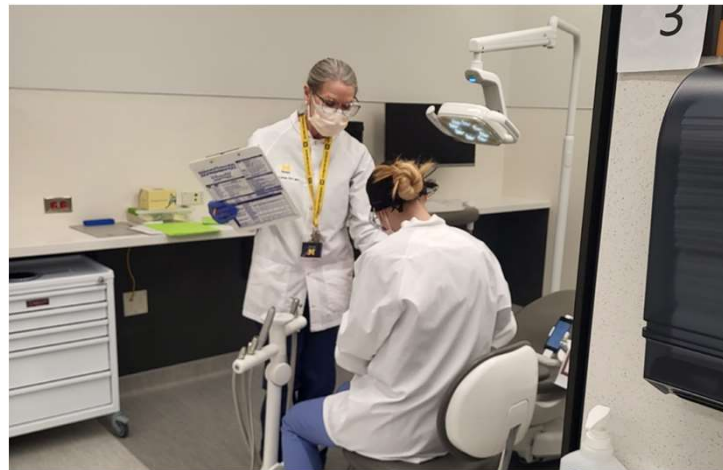**Develop** OSCE station-evaluations related to dental hygiene education

Why OSCEs?

Why OSCEs?

Didactic

Clinical

Why OSCEs?

- Diversity of faculty
  - Different DH training & education levels
  - Different clinical experience
  - Fulltime faculty – Adjunct faculty

- Lack of calibration
  - Subjective & unpredictable grading
  - Increased student & faculty stress

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OSCE

History

Definition

Objective Structured Clinical Examinations

Designed – 1970's
- Replace
  - Traditional Clinical Exams
  - Subjective

Clinical Assessment
- Objective
- Structured
- Standardized

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

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OSCE Defined

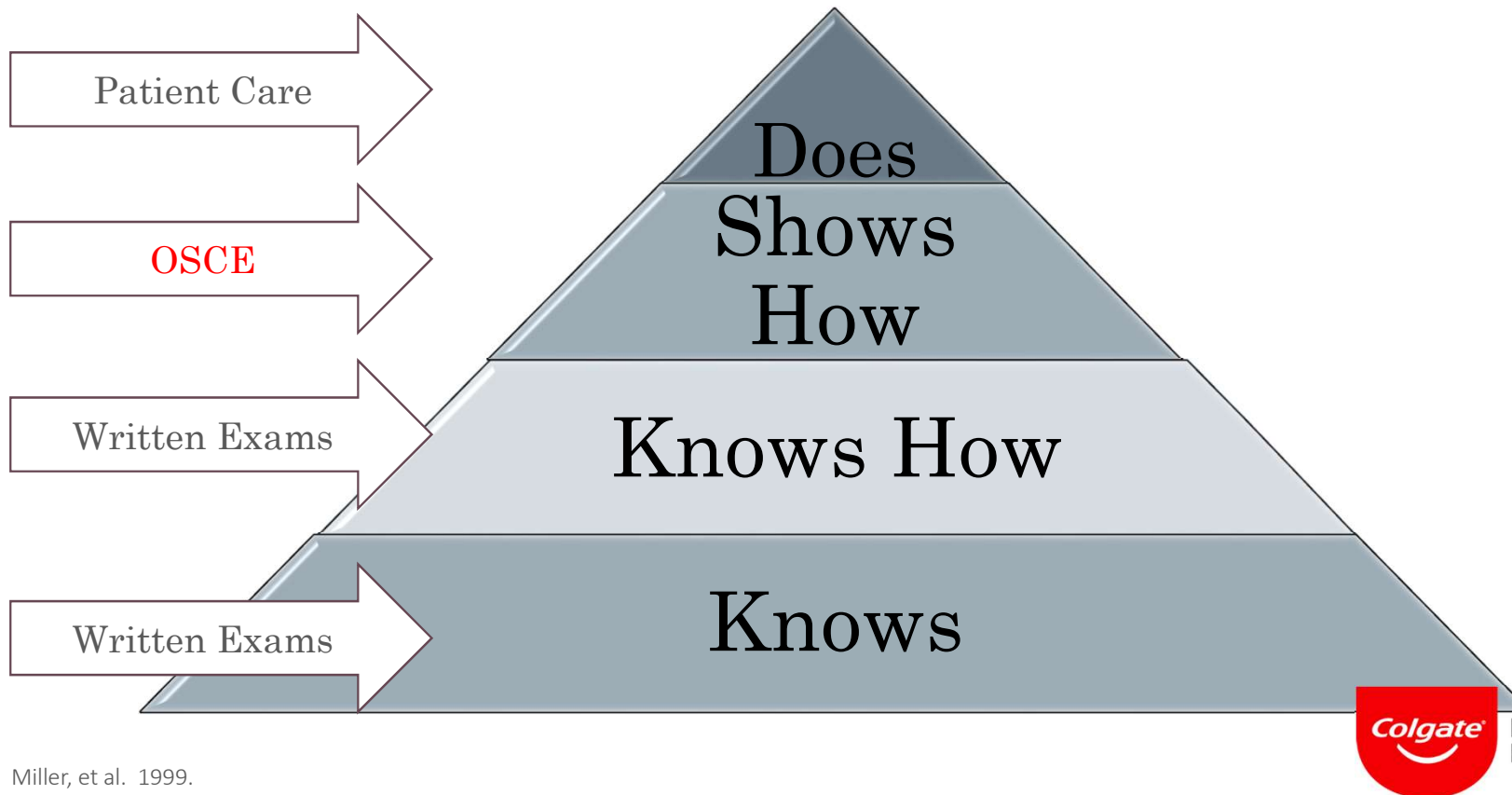| Observed | Performance based | Objective Assessment | Psychomotor Cognitive Affective | Structured & Standardized |

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

Miller Model

Patient Care →

OSCE →

Written Exams →

Written Exams →

Does
Shows How
Knows How
Knows

Miller, et al. 1999.

Fundamental Characteristics

Global View

Blueprint

Circuit Maps

Station Content

Planning an OSCE is like planning a wedding…
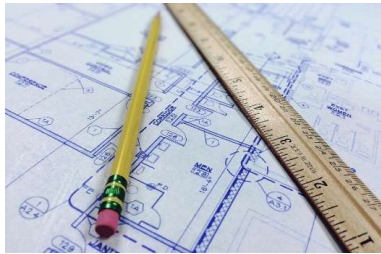
Decide:
Objectives being tested
Topics being tested
Number of stations
Station times
Number of faculty to help
Resources needed….

OSCE Characteristics

Circuit

Station One → Station Two → Station Three → Station Four

Objective

OSCE Characteristics

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

Structured
- Timed
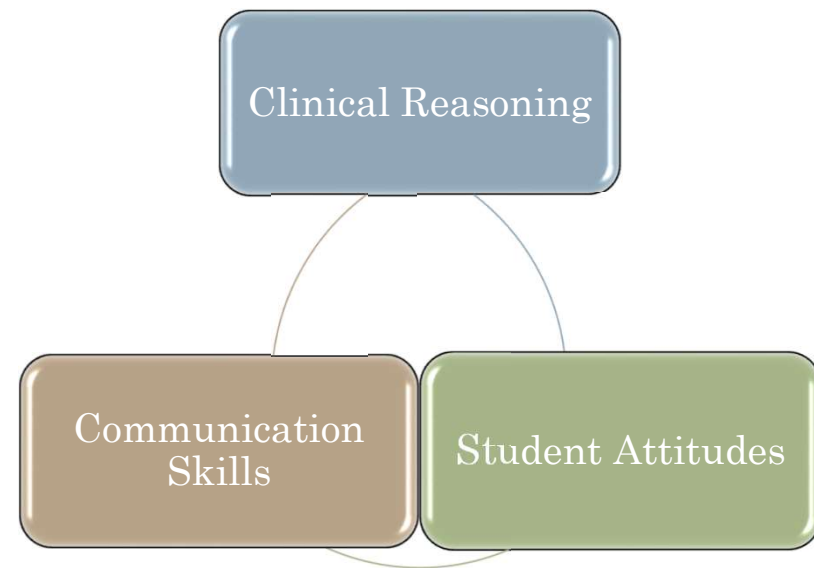- Station-based
- Blueprinted

Clinical Examination
- Apply clinical skills
- Theoretical knowledge

OSCE Characteristics

Performance-based Assessment

- Clinical Reasoning
  - Critical Thinking
  - Decision Making
  - Practical Skills
- Communication Skills
  - Verbal
  - Listening
  - Writing
  - Speaking
- Attitudes
  - Professionalism
  - Ethical Behavior

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

Dental Hygiene Education Topics

Acquire Health History
Medical
Dental
Social

Practical Skills
Instrumentation
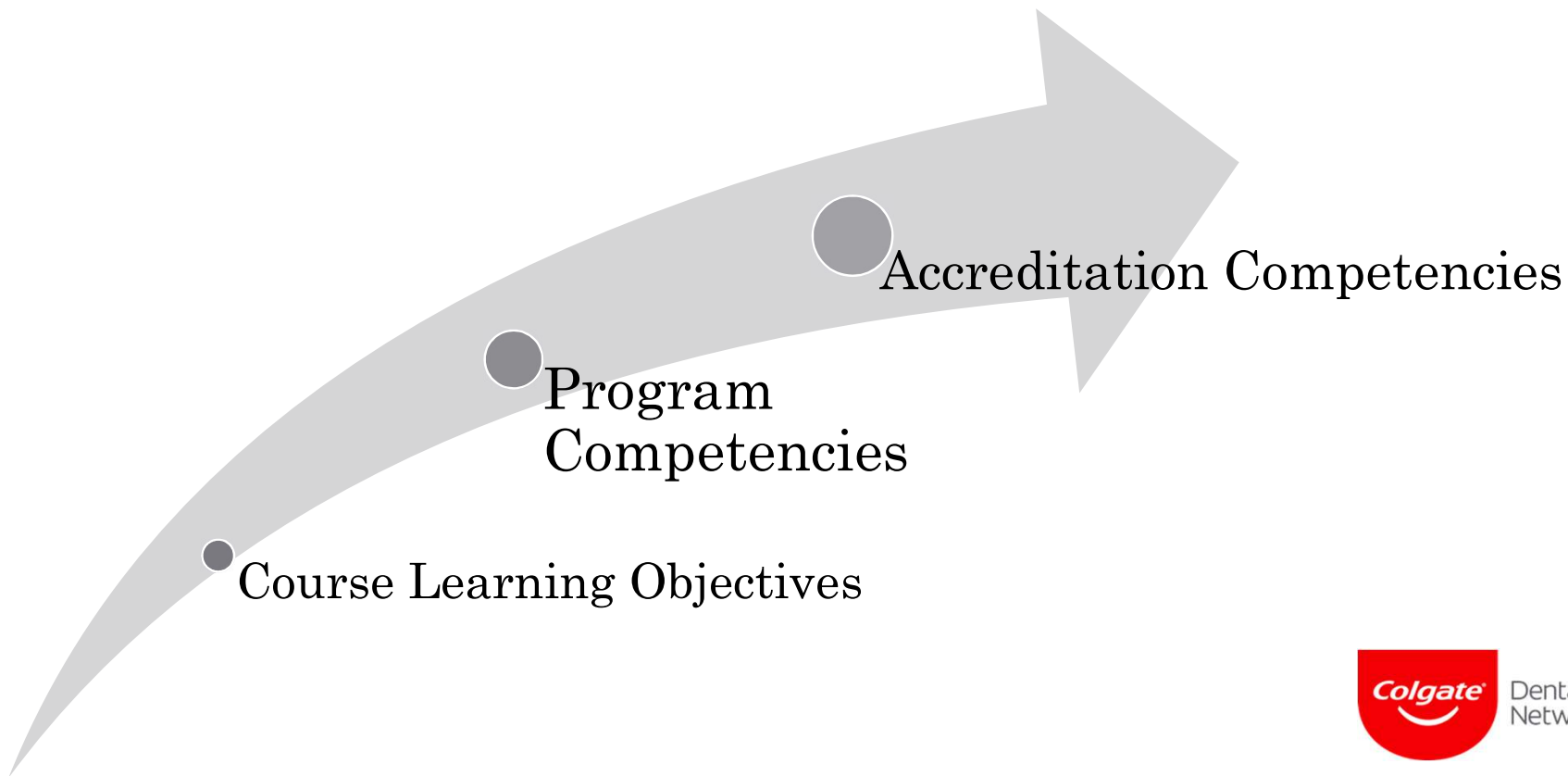Infection Control
Assemble LA Syringe

Perform Procedure
Clean Prosthesis
Acquire Impressions
Administer LA
Set up Nitrous Tanks

Interpretation
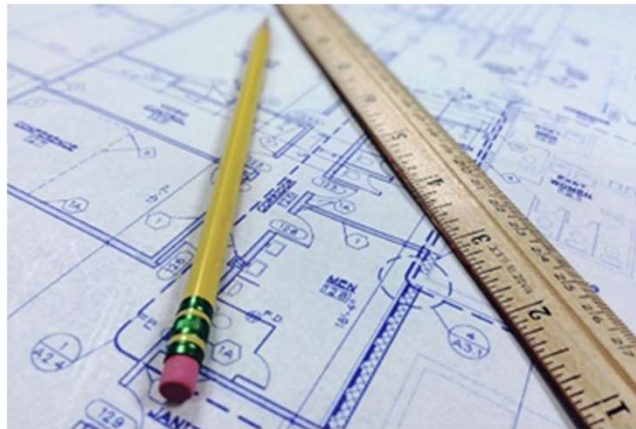Radiographs
Perio-chart
Re-evaluation

OSCEs in DH Education

Accreditation Competencies

Program
Competencies

Course Learning Objectives

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

Station Two: Radiograph Mounting
(8 points)

OSCE Objective & Performance Criteria:
- ✓ Organize radiographs and achieve a score of 80% or above

Procedural Skill: Psychomotor / Cognitive

Student Instructions: Written

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

Patient Type: None

List of Resources
- ✓ Instructions
- ✓ Empty FMX mount X8
- ✓ 18 FMX radiographs (loose) X8
- ✓ Drop box for completed mounts

Station Three: Document Oral Manifestation
(10 points)

OSCE Objective & Performance Criteria:
- ✓ Recognize abnormal anatomy of the oral cavity
- ✓ Accurately record soft tissue findings and achieve a score of 80% or above

Procedural Skill: Psychomotor / Cognitive / Affective

Student Instructions: Written

Faculty Instructions:
- ✓ Not faculty observed
- ✓ Graded after exam with scoring sheet (checklist)

Patent Type: None

List of Resources
- ✓ Instructions
- ✓ Medical History (diagnosis & drug list)
- ✓ Intraoral Images
- ✓ Student form
- ✓ Writing utensil
- ✓ Answer key

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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Bypass the Blueprint

Station	Supplies
1	Colored Pencils: pink X3
2	Typodont / Chair mount Magneto 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

Circuit Map

Station One	Station Two	Station Three	Station Four

| Station 26: Community 2 points | Station 27: Oral Pathology 2 points | Station 28: Gerontology 2 points | Station 29: Blinded Instruments 2 points | Station 30: Re-Evaluation 3 points | Station 31: Comprehensive Care 3 points |

| Station 25: Cariology 2 points | Station 24: Treatment Note **5 points** | Station 23: Pharmacology 2 points | Station 22: Head & Neck Anatomy - Extraoral Exam 2 points |
| Station 18: Instrument Sequencing 3 points | Station 19: Odontogram 4 points | Station 20: Implant Instruments 3 points | Station 21: Gingival Description 2 points |

| Station 17: Risk Management 3 points | Station 16: Business of Dentistry 3 points | Station 15: Motivational Interviewing 3 points | Station 14: Magnetostrictive 3 points |
| Station 10: Extraoral Exam 3 points | Station 11: Implant Assessment 2 points | Station 12: SRP 3 points | Station 13: Risk Management 3 points |

| Station 9: Intraoral Exam 3 points | Station 8: Radio Interpretation 4 points | Station 7: Furcation 5 points | | Station 33: Ultrasonics 3 points | Station 32: Rest |

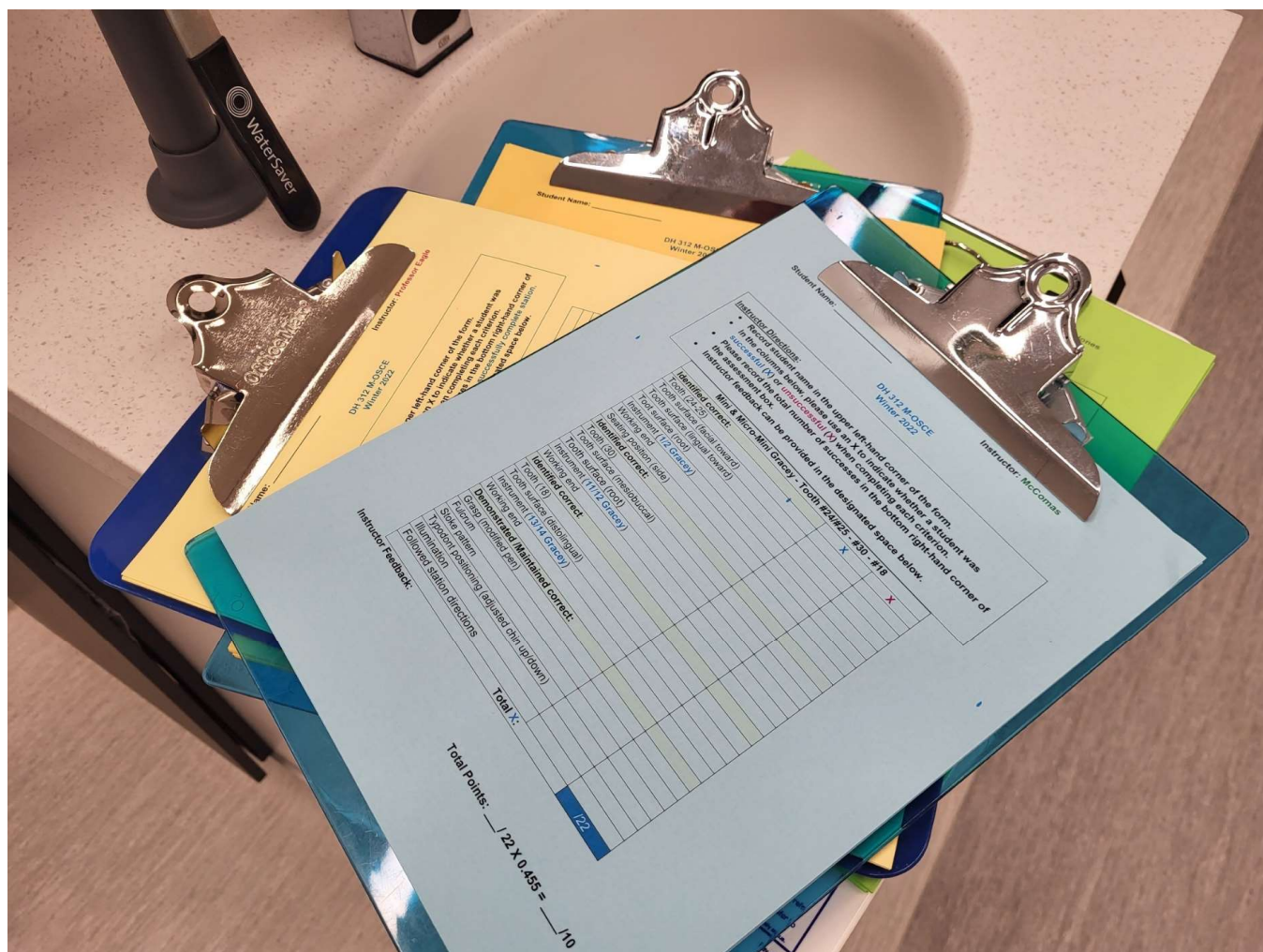# Evaluation Methods

Pre-determined Criteria

*Objective: Checklists – Rubrics – Rating Scales

*Exam packets with Answer Key

DH 312 M-OSCE
Winter 2022

Mini & Micro-Mini Gracey - Tooth #24/#25 - #30 - #18

Instructor Directions:
- Record student name in the upper left-hand corner of the form.
- Use the column below, please use an X to indicate whether a student was successful (✓) or unsuccessful (X) when completing each criterion.
- Please record the total number of successes in the bottom right-hand corner of the assessment box. Instructor feedback can be provided in the designated space below.

Student Name:

Instructor: McComas

Identified correct:
- Teeth (24-5)
- Tooth surface (facial toward)
- Tooth surface (root)
- Instrument (side)
- Seating position
- Working end

Identified correct (12 Gracey):
- Tooth (30)
- Tooth surface (mesiobuccal)
- Working end
- Instrument (11/12 Gracey)

Identified correct:
- Tooth (8)
- Tooth surface (distolingual)
- Working end
- Instrument (13/14 Gracey)

Demonstrated (Maintained correct:
- Fulcrum
- Grasp (modified pen)
- Stroke pattern
- Tripodont positioning (adjusted chair up/down)
- Illumination
- Followed station directions

Total X:

Instructor Feedback:

Total Points: ___ /22 X 0.455 = ___/10

Examiner Type:
Observed

Nabers (N2) Probe Tooth #3		
Identified correct:	Yes	No
Instrument		
Tooth (3)		
Tooth Surface (buccal)		
Demonstrated correct:		
Typodont Position		
Illumination		
Grasp		
Working end		
Adaptation		
Activation (rotated into furcation)		
Total Yes:		/9
Comments:		

Nabers (N2) Probe Tooth #3		
Identified correct:	Yes	No
Instrument	x	
Tooth (3)	x	
Tooth Surface (buccal)		x
Demonstrated correct:		
Typodont Position	x	
Illumination		x
Grasp	x	
Working end	x	
Adaptation	x	
Activation (rotated into furcation)	x	
Total Yes: 7		/9
Comments: Attempted lingual surface		

Station Two: Blood Pressure

Faculty Directions

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
Identified / Demonstrated Correct:			
BP-Cuff selection			
Placement of cuff			
Insertion of stethoscope on arm			
Closed pressure control valve			
Pumped to appropriate level			
Released pressure control valve at appropriate rate			
Identified systolic			
Identified diastolic			
Removed cuff appropriately			
		Total points:	/ 10

Examiner Type:
None

- **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.**

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

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Exam Packet & Answer Key

The Value of OSCEs

Evaluation Tool

The Value of OSCEs

OSCEs influence student learning and program development.

The Value of OSCEs

- **Value**: <u>Student Learning</u>
  - Summative & formative assessment
  - Assess learner progress
  - Predict future performance
  - Pathway for remediation
  - Improve learning & outcomes

The Value of OSCEs

- **Value**: <u>Program</u>
  - Reinforce course learning objectives
  - Reinforce program competencies
  - Align with accreditation competencies/standards
  - Evaluate teachers - course delivery
  - Course - curriculum content
  - Approaches to teaching & learning

Station Example

Evaluate Student Learning & Program Success

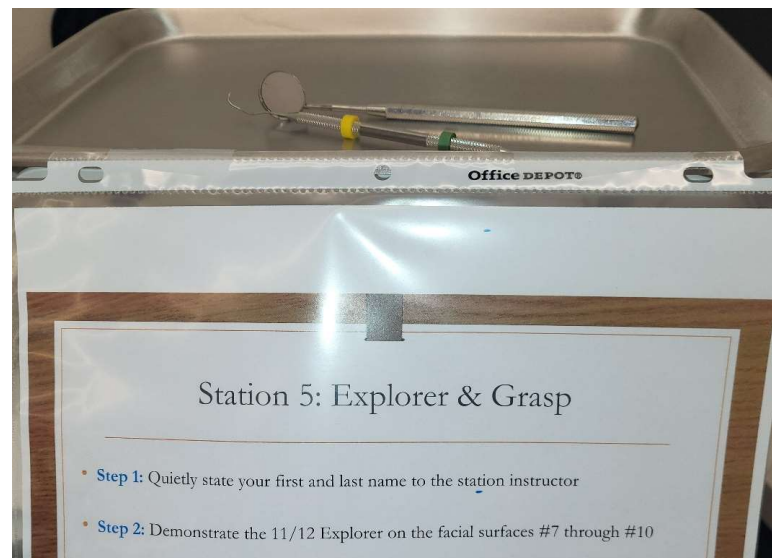Colgate Dental Educators Network FOR Professional Education AND Development

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

Station Five: 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		
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	

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

Station One: 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

OSCE

***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 ….

Station One: 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%

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OSCE: Class Performance

Station	Average	Average %	Total Pass	Total Failures	Total Remediations
Gracey 11/12	/12	%			
Radiographs	/18	%			
Explorer	/10	%			
Blood Pressure	/10	%			
Implant Mobility	/10	%			
Gold Crown	/5	%			
Oral Hygiene Instruction	/5	%			
Obstructive Sleep Apnea	/8	%			
OSCE Results:	/68				
Faculty Feedback: Faculty Initials: ___					

Program Evaluation

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Program Evaluation

- Station Averages (list)

- Frequent missed criterion (by station)

- Stations requiring remediation

- Couse content taught

- Observed strengths

- Observed weaknesses

- Plans to modify course/program based on OSCE results

Develop a Station

Examples

Blueprint & Resources

Student Instructions

Faculty Instructions

Evaluation Tool

Example One

Station Blueprint

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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Student Instructions

- **Prompt 1**: Assume your patient has subgingival calculus in a 7mm perio-pocket on the mesial surface of #15.

- **Prompt 2**: From the available instruments on the countertop, choose the *most* appropriate instrument to remove the calculus described above.

- **Prompt 3**: Use the selected instrument to scale the root surface on the typodont provided.

Faculty Instructions & Evaluation Tool

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:

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

Example Two

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 80% or above
Clinical Skill Level ~ Pre-Clinic
Psychomotor / Cognitive

Student Instructions

Prompt 1: Please <u>select </u>the appropriate blood pressure cuff .

Prompt 2: <u>Identify</u> the manual blood pressure reading.

Faculty Instructions & Evaluation Tool

Station Two: **Blood Pressure**

Faculty Directions

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
Identified / Demonstrated Correct:			
BP-Cuff selection			
Placement of cuff			
Insertion of stethoscope on arm			
Closed pressure control valve			
Pumped to appropriate level			
Released pressure control valve at appropriate rate			
Identified systolic			
Identified diastolic			
Removed cuff appropriately			
		Total points:	/ 10

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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.

How can I help your OSCE???

The End...

References

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2. Park SE, Kim A, Kristiansen J, Karimbux NY. The influence of examiner type on dental students' OSCE scores. J Dent Educ. 2015 Jan 1;79(1):89–94.

3. 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.*

4. Miller GE. The assessment of clinical skills/competence/performance. Acad Med J Assoc Am Med Coll. 1990 Sep;65(9 Suppl):S63–7.

Thank you

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