



Last updated: February 25th, 2022

### Dental Science

***PLEASE NOTE THE FOLLOWING DIFFERENCES IN HOW THIS EVENT WILL BE RUN AT HOSA CANADA'S FALL LEADERSHIP CONFERENCE (FLC) AND SPRING LEADERSHIP CONFERENCE (SLC):***

1. Written test time shortened to 40 minutes (still 50 questions) for both FLC and SLC.
2. Written test will take place online and be open book for both FLC and SLC.
3. Only the written test will be evaluated at FLC.
4. Both Rounds One and Two will take place at SLC. The Round Two skill demonstration at SLC will be **virtual**.
  - a. \*If students participate over Zoom, they must have their cameras on for the entire duration of the event and show the judges their surroundings to help us minimize cheating as much as possible.\*
  - b. \*Students participating over Zoom have the option of demonstrating their skill on a friend/family member.\*
  - c. \*Competitors may verbalize their skill demonstration, especially if they have not purchased the materials required for their event (no points will be deducted).

# Dental Science

***New for 2021-2022***

New skills have been added and older skills modified with support from the Dental Assisting National Board. The test plan has been revised. Skills steps and point values have been revised.

**Event Summary**

Dental Science provides members with the opportunity to gain knowledge and skills required for dental careers. This competitive event consists of 2 rounds. Round One is a written, multiple-choice test and the top scoring competitors will advance to Round Two for the skills assessment. This event aims to inspire members to learn more about careers in the dental field.

**Dress Code** Competitors shall wear proper business attire or official HOSA uniform, or attire appropriate to the occupational area, during both rounds. Bonus points will be awarded for [proper dress](#).

- General Rules**
1. Competitors in this event must be active members of HOSA and in good standing
  2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
  3. Competitors must be familiar with and adhere to the [“General Rules and Regulations of the HOSA Competitive Events Program \(GRR\).”](#)
  4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s [photo ID](#) must be presented prior to ALL competition rounds.

**Official References**

5. All official references are used in the development of the written test and skill rating sheets.
  - [Boyd, Linda. Dental Instruments: A Pocket Guide. Saunders, latest edition.](#)
  - [Phinney & Halstead. Dental Assisting: A Comprehensive Approach. Cengage, latest edition.](#)

**Round One Test**

6. [Test Instructions](#): The written test will consist of 50 multiple choice items in a maximum of 60 minutes.
7. **Time Remaining Announcements**: There will be a verbal announcement when there are 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

8. **Written Test Plan**

The Dental Team, Dental Specialties, and History .....	12%
Oral Health and Nutrition .....	6%
General Anatomy and Physiology .....	4%
Head and Neck Anatomy .....	10%
Tooth Morphology .....	12%
Infection Control / Occupational Health and Safety .....	16%
Chairside Assisting/Instruments.....	16%
Radiology .....	8%
Medical Emergencies in the Dental Office.....	10%

Restorative and Laboratory Materials.....6%

**NOTE: Chartered associations** may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Chartered Association for the process you will be using.

9. The test score from Round One will be used to qualify the competitor for the Round Two.
10. **Sample Round One Test Questions**
1. What is the term for the area where two bones fused to form the mandible?
    - A. Condyles
    - B. Ramus
    - C. Coronoid notch
    - D. Symphysis**

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  2. Which instrument is best suited for examining the teeth for caries, calculus, furcations, or other abnormalities?
    - A. Dull chisels
    - B. Ball burnishers
    - C. Explorers**
    - D. Scalpels

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  3. In the dental unit, what does the rheostat control?
    - A. Air-water syringe.
    - B. Speed of the handpiece.**
    - C. Position of the head of the dental chair.
    - D. Overhead lights.

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**Round Two Skills**

11. Round Two is the performance of a selected skill(s). The Round Two skills approved for this event are:

Skill I: Dental Instrument Identification (15 minutes)  
 (Including name of instrument and purpose or use)  
 15 instruments or photos from the following list:

Amalgam Carrier	Burs	Elevators – Root-Tip	Periodontal Probe
Amalgam Carrier – Double Ended	Burs – Pear-Shaped	Elevators - Straight	Rongeurs
Amalgam Carrier – Single Ended	Burs – Inverted Cone	Endodontic Explorer	Sickle Scalars
Amalgam Condenser	Burs – Finishing	Evacuation Tip High-Volume Velocity	Scissors – Crown & Bridge
Amalgam Well	Burs - Diamond	Forceps- Mandibular Universal – Cryer 151	Scissors – Suture
Anesthetic Aspiring Syringe	Burs - Round	Forceps- Maxillary Universal – Cryer 150	Spoon Excavator
Articulating Paper Holder with paper	Carvers- Discoïd-Cleoid	Handpieces -Fiberoptic High-Speed	Tongue & Cheek Retractor
Bird Beak Pliers	Carvers - Hollenback	Handpieces – High-Speed	Universal Clamp
Bite-Wing Tabs	Composite Placement Instrument	Handpieces – Slow Speed with Contra Angle Attachment	Universal Clamps – Mandibular (Winged Clamp)
Bone File	Cotton Forceps (pliers)	Handpieces – Slow Speed with Prophy Angle Attachment	Universal Clamps – Mandibular (Wingless Clamp)
Burnisher – Ball	Curing Light	Hemostat	Universal Clamps – Maxillary (Winged Clamp)
Burnisher - Football	Dental Dam Forceps	Howe (or How) Pliers	Universal Clamps – Maxillary (Wingless Clamp)
Burnisher – T- Ball	Dental Dam Punch	Liner Applicator	Universal Matrix Band
Burnisher – Acorn	Elevators - Periosteal	Mouth Mirror	Woodson

- Skill II: Assembly and Disassembly of Local Anesthetic Syringe (7 minutes)
- Skill III: Seat, Prepare, and Dismiss Patient for Basic Dental Exam (10 minutes)
- Skill IV: Treatment Room Disinfecting and Cleaning (7 minutes)
- Skill V: Patient Education – Brushing and Flossing (7 minutes)
- Skill VI: Preparation, Manipulation, Delivery, & Handling of Alginate Impressions (7 minutes)
- Skill VII: Treatment of Contaminated Tray in the Sterilization Center (6 minutes)

12. The selected Skill(s) will be presented to competitors as a written scenario at the beginning of the round. The scenario will be the same for each competitor and will include a challenging component that will require the competitor to apply critical thinking skills. A sample scenario can be found [here](#).
13. Timing will begin when the scenario is presented to the team and competitors will be stopped at the end of the time allowed.
14. The scenario is a secret topic. Competitors MAY NOT discuss or reveal the secret topic until after the event has concluded or will face penalties per [the GRRs](#).
15. Judges will provide information to competitors as directed by the rating sheets. Competitors may ask questions of the judges while performing skills if the questions relate to patient physiology and will be included in the scenario.

### Final Scoring

16. The competitor must earn a score of 70% or higher on the combined skill(s) of the event (excluding the test and ID instruments) in order to be recognized as an award winner at the ILC.
17. Final rank is determined by adding the round one test score plus round two skill score. In case of a tie, the highest test score will be used to determine the rank.

**Competitors Must Provide:**

- Two #2 lead pencils with eraser
- Watch with second hand (optional-Round Two only)
- Disposable non-latex gloves, and utility gloves
- Disposable mask and gown
- Protective eyewear for the competitor
- A [photo ID](#)

# DENTAL SCIENCE

## SKILL I: DENTAL INSTRUMENT IDENTIFICATION

Time = 15 minutes

Competitor ID #: \_\_\_\_\_ Judge's Initials: \_\_\_\_\_ Total Points (45 possible) \_\_\_\_\_

	Name of Instrument	Points (1 each for name & spelling)	Purpose or Use	Points (1 point for correct purpose/use)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
<b>TOTAL: ID &amp; Spelling (30 poss.)</b>			<b>TOTAL: Purpose (15 poss.)</b>	

## DENTAL SCIENCE

Competitor #: \_\_\_\_\_ Judge's Signature: \_\_\_\_\_

<b>Skill II: Assembly and Disassembly of Local Anesthetic Syringe (Time: 7 minutes)</b>		<b>Possible</b>		<b>Awarded</b>
1.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
2.	Donned protective clothing, surgical mask, protective eyewear, donned gloves.	2	0	
3.	Obtained disposable needle and the anesthetic specified by the scenario.	2	0	
4.	Removed aspirating syringe from autoclave bag and inspected.	1	0	
5.	Tightened the thumb bar or ring.	1	0	
6.	With nondominant hand used the thumb ring to fully retract the piston rod.	1	0	
7.	With piston retracted, placed the cartridge in the barrel of the syringe, rubber stopper end first and prevented contamination by not placing finger over the diaphragm.	1	0	
8.	Released the piston rod.	1	0	
9.	Used moderate pressure to push the piston rod into the rubber stopper until fully engaged.	1	0	
10.	Removed the protective plastic cap from the syringe end of the needle.	1	0	
11.	Screwed or pressed the needle onto the syringe based on type of needle hub making sure it is secure.	1	0	
12.	Removed the protective cover from the needle.	1	0	
13.	Held syringe upright and expelled a few drops to ensure syringe is working properly.	1	0	
14.	Replaced cap and placed on the tray for use. <i>Judge states, "procedure is completed."</i>	1	0	
15.	Donned utility gloves.	2	0	
16.	Retracted the piston to release the harpoon from the cartridge.	1	0	
17.	Removed the cartridge from the syringe by retracting the thumb ring enough to release the cartridge.	1	0	
18.	Turned the syringe until the cartridge is free.	1	0	
19.	Unscrewed the needle with the protective cap in place.	1	0	
20.	Disposed of sharps in a sharps container.	2	0	
21.	Removed PPE in correct order.	2	0	
22.	Washed hands or used alcohol-based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL II</b>		<b>29</b>		
<b>70% Mastery for Skill II = 20.3</b>				

## DENTAL SCIENCE

Competitor #: \_\_\_\_\_

Judge's Signature: \_\_\_\_\_

<b>Skill III: Seat, Prepare and Dismiss Patient for Basic Dental Exam (Time: 10 minutes)</b>		<b>Possible</b>		<b>Awarded</b>
1.	Entered reception area, establishing eye contact while greeting patient.	1	0	
2.	Introduced self to patient.	1	0	
3.	Escorted patient to treatment room.	1	0	
4.	Instructed patient to place personal articles in designated area that is within patient's view.	1	0	
5.	Instructed patient to be seated in the dental chair asking the patient to sit all the way back in the chair.	1	0	
6.	Offered pre-rinse, tissue and lubricant for lips to patient.	1	0	
7.	Placed disposable napkin on patient.	1	0	
8.	Provided patient safety glasses to wear during procedure.*	2	0	
9.	Reviewed changes in medical history from last visit.	2	0	
10.	Asked patient if there are any questions and provide a brief explanation of dental treatment to be completed.	2	0	
11.	Placed x-rays on viewbox or uploaded digital images on computer monitor.	1	0	
12.	Adjusted head rest until head is well supported and patient is comfortable.	1	0	
13.	Adjusted the dental light for the appropriate arch.	1	0	
14.	Positioned operator's stool and rheostat.	1	0	
15.	Positioned assistant's stool.	1	0	
16.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
17.	Donned protective clothing, surgical mask, protective eyewear, donned gloves.	2	0	
18.	Positioned tray set-up and inserted saliva ejector, evacuator tip, three-way syringe tip, and dental handpieces.	1	0	
19.	Reclined patient to supine position <i>Judge states, "treatment is completed".</i>	1	0	
20.	Positioned dental light out of the patient's way.	1	0	
21.	Returned patient to upright position and asked them to remain seated.	1	0	
22.	Removed any debris from the patient's face.	1	0	
23.	Removed napkin from patient and placed over the tray setup.	1	0	

<b>Items Evaluated</b>		<b>Possible</b>		<b>Awarded</b>
24.	Removed patient's safety glasses.	1	0	
25.	Removed evacuator tip, saliva ejector, and air water syringe tip and placed on tray.	2	0	
26.	Removed treatment PPE.	2	0	
27.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
28.	Documented in patient's chart or in computer (verbalized to judges).	2	0	
29.	Provided postoperative instructions to patient.	2	0	
30.	Returned patient's personal items and escorted to the reception area.	1	0	
31.	Appropriate verbal and nonverbal communication with patient and other personnel.	2	0	
<b>TOTAL POINTS - SKILL III</b>		<b>42</b>		
<b>70% Mastery for Skill III = 29.4</b>				



## DENTAL SCIENCE

Competitor #: \_\_\_\_\_

Judge's Signature: \_\_\_\_\_

<b>Skill IV: Treatment Room Disinfecting &amp; Cleaning</b> <b>(Time: 7 minutes)</b>	<b>Possible</b>		<b>Awarded</b>
1. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
2. Donned PPE and utility gloves.	2	0	
3. Obtained the needed cleaning supplies which include disinfecting solutions, HVE solution, 4 x 4 gauze and towels.	1	0	
4. Laid out several pieces of 4 x 4 gauze on counter and sprayed with disinfectant.	2	0	
5. Wiped all possibly contaminated surface carefully with wiping cloth or towel.	2	0	
6. Sprayed disinfectant and verbalized leaving for the correct time for disinfection (usually 10 minutes).	2	0	
<i>Judge states, recommended time is completed.</i>	-		
7. Re-wiped each surface with wiping cloth or towel.	2	0	
6. Removed utility gloves.	2	0	
7. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
8. Donned exam gloves.	2	0	
9. Placed tray with packaged instruments and auxiliary items on work surface with patients' napkin and protective eyewear.	1	0	
10. Organized instruments, inserted saliva ejector, evacuator tip, three-way syringe tip, and dental handpieces.	1	0	
11. Placed barriers on all surfaces that can become contaminated (e.g., patient chair, dental unit handpieces, hoses, light switches, controls, work surfaces).	2	0	
12. Purged waterlines 20-30 seconds and ensured that handpieces and three-way syringe are working.	1	0	
13. Removed PPE.	2	0	
14. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL IV</b> <b>70% Mastery for Skill IV = 19.6</b>	<b>28</b>		

## DENTAL SCIENCE

Competitor #: \_\_\_\_\_

Judge's Signature: \_\_\_\_\_

<b>Skill V: Patient Education- Brushing and Flossing (Time: 7 minutes)</b>	<b>Possible</b>	<b>Awarded</b>
1. Assembled materials and typodont.	1 0	
2. Greeted patient and introduced self.	1 0	
3. Washed hands or used alcohol based hand-rub for hand hygiene.	2 0	
4. Donned protective clothing, surgical mask, protective eyewear, and donned gloves .	2 0	
5. Grasped toothbrush and placed bristles at a 45- degree angle, with tips of bristles directed straight into gingival sulcus of typodont.	1 0	
6. Using tips of bristles, vibrated back and forth with short, light strokes for a count of 10, allowing tips of bristle to enter sulcus and cover gingival margin.	1 0	
7. Lifted brush and continued into next area or group of teeth until all areas have been cleaned.	1 0	
8. Used toe bristles of brush to clean lingual (tongue) anterior area in arch.	1 0	
9. To clean tongue place the toothbrush as far back as is comfortable and then drew forward to the tip.	1 0	
10. Dispensed 18 inches of dental floss.	1 0	
11. Wrapped ends of floss around middle or ring fingers.	1 0	
12. Grasped floss between thumb and index finger of each hand, allowing ½ to 1" to remain between the two hands.	1 0	
13. Passed floss between typodont teeth using a sawing motion.	1 0	
14. Curved floss around tooth in a C-shape while pressing floss firmly against side of one tooth until meeting resistance indicating bottom of gingival sulcus has been reached and sliding floss up and down on side of tooth; slightly lifting floss over papilla to adjacent tooth.	1 0	
15. Rotate the floss on the fingers to allow for a fresh section to be used each time.	1 0	
16. Repeated these steps on each side of all teeth in all four quadrants in the same manner.	4 0	
17. Adapted instructions based on patients' needs, if indicated	2 0	
18. Removed gloves, protective eyewear, protective clothing and surgical mask.	2 0	
19. Washed hands or used alcohol based hand-rub for hand hygiene.	2 0	
20. Dismissed patient.	1 0	
<b>TOTAL POINTS - SKILL V</b>	<b>28</b>	
<b>70% Mastery for Skill V = 19.6</b>		

## DENTAL SCIENCE

Competitor #: \_\_\_\_\_

Judge's Signature: \_\_\_\_\_

<b>Skill VI: Preparation, Manipulation, Delivery and Handling of Alginate Impressions (Time: 7 minutes)</b>		<b>Possible</b>		<b>Awarded</b>
1.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
2.	Donned protective clothing, surgical mask, protective eyewear, and donned gloves.	2	0	
3.	Assembled materials.	1	0	
4.	Measured water for impression.	1	0	
5.	Poured water into flexible mixing bowl.	1	0	
6.	Fluffed powder prior to opening canister.	1	0	
7.	Filled measuring scoop with powder by overfilling and leveling off with spatula.	1	0	
8.	Dispensed powder scoops into a second flexible mixing bowl.	1	0	
9.	Incorporated powder into water.	1	0	
10.	Mixed water and powder with stirring motion using spatula.	1	0	
11.	Continued mixing while holding bowl in one hand, rotating bowl occasionally, and using flat side of spatula to incorporate material through pressure against side of bowl until mixture is homogeneous and creamy according to manufacturer's instructions.	1	0	
12.	Loaded mixture into impression trays using flat side of spatula blade to condense material firmly into tray.	1	0	
13.	Smoothed surface of mixture with a moistened gloved hand.	1	0	
14.	Verbalized handing trays to dentist to take impressions <i>*Judge will simulate or take impression on typodont, and pass impression back to competitor</i>	1	0	
15.	Rinsed impression gently under tap water to remove any debris.	1	0	
16.	Sprayed impression with disinfectant.	2	0	
17.	Wrapped impression in moist paper towel.	1	0	
18.	Placed impression into plastic bag labeled with patient's name.	1	0	
19.	Remove gloves, disinfect hands, and put on fresh gloves OR put on overgloves.	2	0	
20.	Cleaned and disinfected armamentarium wearing utility gloves	2	0	
21.	Washed and dried utility gloves and removed them.	2	0	
22.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL VI</b>		<b>29</b>		
<b>70% Mastery for Skill VI = 20.3</b>				

# DENTAL SCIENCE

Competitor #: \_\_\_\_\_

Judge's Signature: \_\_\_\_\_

<b>Skill VII Treatment of Contaminated Tray in the Sterilization Center (Time: 6 minutes)</b>	<b>Possible</b>		<b>Awarded</b>
1. Placed the treatment tray in the contaminated area of the sterilization center immediately following dental treatment.	2	0	
2. Donned utility gloves, protective eyewear and mask.	2	0	
3. Safely disposed of sharps in the sharps container.	2	0	
4. Discarded all disposable items (if bio-hazard waste. Placed in appropriately labeled waste container).	2	0	
5. Placed instruments in the ultrasonic cleaner ( <i>can be simulated</i> )			
a. Instruments placed directly in the ultrasonic basket with items such as burs, dental dam clamps, and other small items secured in a small strainer.	2	0	
b. Competitor verbalized that cleaning is completed in three to ten minutes. <b>Judge will state, "cleaning is completed".</b>	2	0	
c. Rinsed the items thoroughly and towel dried.	2	0	
d. Separated according to the sterilizing technique.	2	0	
e. Placed the instruments for immersion into the cold disinfectant/sterilant solution, and noted the time.	2	0	
f. Instruments for heat sterilization are bagged and placed in the appropriate sterilizer.	2	0	
g. Verbalized sealed the door and activated the unit.	2	0	
6. Prepared the dental high-speed handpiece:			
a. Rinsed or wiped of the dental high-speed hand-piece with isopropyl alcohol.	2	0	
b. Lubricated.	1	0	
c. Bagged in an instrument pouch with indicator tape and placed in sterilizer.	2	0	
7. Sprayed, wiped, and sprayed tray again and left for 10 minutes. <b>Judge states, "10 minutes has elapsed".</b>	2	0	
8. Wiped tray again.	2	0	
9. Cleaned all contaminated areas.	2	0	
10. Washed and dried utility gloves, removed them and additional PPE and washed and dried hands. <b>Judge states, "Sterilizer indicated time has elapsed".</b>	2	0	
11. Removed instruments from sterilizer with forceps. <b>Judge states, "Time has elapsed for the cold disinfectant/sterilant".</b>	2	0	
12. Instruments are rinsed off, dried, and put away	2	0	
13. Washed hands or used alcohol-based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL VII</b> <b>70% Mastery for Skill VII = 28.7</b>	<b>41</b>		