Laura Smith
Lesson Plan Student Teaching #2
DNTH 660
SP21

Course: DHYG 150 Dental Hygiene Theory II

Topic: The Patient with Dental Implants

Audience: Adult Learners (First Year Dental Hygiene Students)

Instructional Objectives: Upon completion of the lecture, the student should be able to:

1. Describe concepts, technology, and terminology relevant to implant dentistry.
2. Comprehend patient selection factors and education essentials.
3. Understand theory and practice of dental implant maintenance in the clinical setting.
4. Recognize dental implant problems, complications, and failures.
5. Appreciate the value in lifelong learning to have current knowledge of new trends and technologies in implant dentistry.

Materials: PowerPoint and Zoom computer equipment
Video
Review Guide Handout

References:

Allocca, G., Pudylyk, D., Signorino, F., Grossi, B. G., & Maiorana, C. (2018). Effectiveness and compliance of an oscillating-rotating toothbrush in patients with dental implants: a randomized clinical trial. *International Journal of Implant Dentistry, 38*(4). Accessed March 10, 2021.

Kracher, C. M., (2018). Current concepts in dental implants: clinical assessment in the prevention of peri-implant mucositis, peri-implantitis, and implant failure. https://www.dentalcare.com/en-us/professional-education/ce-courses/ce514

Nield-Gehrig, J. S., Willmann, D. E., (2019) Foundations of periodontics for the dental hygienist, (5th ed.). Jones & Bartlett Learning. Burlington, MA.

Wilkins, E. M., (2019). Clinical practice of the dental hygienist, (12th ed.). Wolters Kluwer. Philadelphia, PA.

Zellmer, I. H., Couch, E. T., Berens, L., & Curtis, D. A. (2020). Dental hygienists' knowledge regarding dental implant maintenance care: a national survey. *Journal of Dental Hygiene, 94*(6), 6-15. Accessed April 1, 2021.

Personnel: None needed

Time: 50 minutes

TIME	LESSON CONTENT	NOTES
	I. INSTRUCTIONAL SET	
1 minute	A. Introduction Thank you for hosting me in your class for my student teaching in my master's degree program. I am excited to be teaching this very important topic, the patient with dental implants. Dental implants have become very popular with consumers, and is the most desired option in tooth replacement.	Slide #1 Introduction Slide
1 minute	B. Established Mood In the overall history of dentistry, dental implants are relatively new, but are now dominating the market for tooth replacement. As the dental implant technology and popularity increase, it is important for the dental hygienist to be knowledgeable about the process of implant placement, the maintenance of implants both during periodontal therapy visits, and home care recommendations for patients.	Slide #2 Q: How many years have dental implants been in dentistry? Or, when was the first dental implant placed? A: 40 years Slide #3 Image of a panoramic radiograph with a dental implant
1 minute	C. Gain Attention/Motivate Imagine yourself in our school clinic. You take a pan radiograph on your new patient, and notice a solid radiopaque cylinder where the root should be. What are you looking at? How would you modify treatment? What supplies would you need? What would you add to the patient's homecare instructions? We will learn all this in today's lecture.	Slide #4 Q: Ask audience about implant knowledge so far
1 minute	D. Established Rationale By gaining knowledge and staying current in the latest trends and technologies in implants, as a dental hygienist you will be equipped to work with a dental team to help provide patient's the knowledge, care, and ability to maintain their own implants.	A: Answers may vary. Perhaps some students may have been a dental assistant and helped with a procedure.
1 minute	E. Established Knowledge Base What have you learned so far about dental implants? Can someone share if they have had an experience with an implant, as a dental assistant,	

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	a patient, or family member with an implant?	
1 minute	<u>F. Instructional Objective</u> After today's lecture you should be able to describe the concepts and technology relevant to implant dentistry; comprehend selection factors and education essentials for dental implant patients; understand the theory and practice of dental implant maintenance in clinical settings; recognize problems when an implant is failing; and appreciate the value of lifelong learning in dental hygiene field, specifically implant dentistry.	Slide #5 Objectives
1 minute	**I. Bone Physiology** A. Cell Types i. Osteocytes ii. Osteoblasts iii. Osteoclasts B. Bone Classification i. Variations in density ii. Cortical bone iii. Trabecular bone C. Biomechanical Force i. Wolfff's Law: bone laid down in areas of greatest stress	Slide #6 Summary of Bone Classification& Cell Types Q: What's a monoenoic you can use to remember the difference? A: OsteoBlasts Build Bone Slide #7 Bone: "use it or lose it" Image of edentulous Pan x-ray with bone loss
2 minutes	D. Grafting and Regeneration i. Socket preservation ii. Ridge augmentation iii. Sinus lift iv. Graft types 1. Autograft 2. Allograft 3. Zenograft 4. Alloplast	Slide #8 Graphic illustration showing surgical steps of a sinus lift Slide #9 Table: definitions of types of grafts
2 minutes	**II. Osseointegration Implant interfaces** A. Implant/Bone Interface i. Osteointegration ii. Healing times B. Implant/Soft Tissue Interface i. Biologic seal ii. Connective fibers are either	Slide #10 Definition of Osteointegration NOTE: Very important to know the term osteointegration and understand the concept.

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	parallel or encircling iii. Lack of PDL like a natural tooth iv. Lack of cementum	Slide #11 Image comparing periodontium of natural tooth and implant tooth. NOTE: This is why periodontal probing alone is not the best indicator of implant health. The measurements are not the same as a natural tooth.
2 minutes	**III. Types of Dental Implants** A. Subperiosteal B. Transosseous (Transosteal) C. Endosseous (Endosteal) Implant i. Most commonly used ii. Cylinder shape iii. Titanium material D. Parts of the dental implant i. Implant body ii. Abutment iii. Crown or prosthesis	Slide #12 Diagram of dental implant components
2 minutes	**IV. Patient Selection** A. Systemic Health B. Conditions that might interfere with healing: i. Pregnancy ii. Recent chemo or radiation iii. Uncontrolled D. M. iv. Substance Use v. Immunosuppression C. Tobacco Use i. Tobacco Cessation ii. Temporary cessation during procedure and healing D. Oral Examination i. Radiograph ii. 3D CBCT scan	Slide #13 Examples of medical conditions interfering with healing Q: Are all patients a dental implant candidate? Why or why not? A: No, not all. A patient must have a through medical history evaluation. Some health conditions that impair ability to heal may be a contraindication for a dental implant. Slide #14 Image of bone defect on xray and 3D scan NOTE: Remember that an x-ray is 2D, and our teeth and bones are 3D.
1 minutes	**V. Preparation and Placement** A. Dental implant team members: i. General Dentist ii. Surgeon 1. Periodontist 2. Oral Surgeon 3. General Dentist with expanded training	Slide #15 NOTE: Communication and teamwork play a major role in the coordination and success of a dental implant case.

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	4. Dental Assistant 5. Dental Hygienist 6. Treatment Coordinator for appointments and insurance or payment 7. Medical Doctor (if medically complex) 8. Dental Lab 9. Patient	Slide #16 Video clip of Laura interviewing her dentist Dr. Brown. Questions such as: What expectations should a patient have of an implant? What can a dental hygienist look for and what to report to a dentist at exam checkups?
1 minute	B. Information for the Patient i. Realistic expectations ii. Appointment sequence and length iii. Finances iv. Homecare instructions	Slide #17 Q: Does a facility like "Clear Choice" dental implants that airy TV commercials showing patients getting implants in one day set realistic expectations for patients? A: Yes, this could lead to unrealistic expectations. There are pros and cons. Pro: promote dental implants and dental care. Con: not every patient is a candidate, or would be able to get "immediate" implants. These require an extremely soft diet, and are not the final dental restorations.
5 minutes	C. Steps of an implant placement i. Extraction ii. Bone preservation or graft iii. Healing time iv. Implant placement with healing cap v. Healing time for osteointegration vi. Crown or prosthesis added	Slide#18 Video clip. Animation showing implant placement procedure.
1 minute	**VI. Implant Hygiene** A. Homecare Instructions i. Explain biofilm process ii. Base on patient individual needs	
1 minute	B. Importance of a night guard i. Reduce occlusal traumatic forces ii. How to clean night guard	Side #19 Image of lateral and occlusal forces on tooth
1 minute	C. Brushes i. Specialty for implants ii. Electric Brushes	Slide #20 Q: What toothbrush is best for an implant? A: Electric, specialty tapered slim.
1 minute	D. Interdental Cleansing i. Oral Irrigator (Water-Pik) 1. Special implant tip ii. Proxybrushes iii. Tufted Floss	NOTE: Tepe has a line specificly for implants

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	iv. Flossing motion around neck of implant	Slide #21
	E. Antimicrobial Rinses & Dentrifices	Hygiene Edge: Video: How to floss around implant (demonstrating crisscrossing)
		NOTE: superfloss is available in
2 minutes	**VII. Continuing Care**	the HCC hygiene center
	A. Probing Dental Implants	
	i. Controversy when to probe	Slide #22
	ii. Plastic probe	Images of different types of probes
	iii. Sweeping motion instead of bobbing motion	NOTE: important to chart hard tissue charting as an implant
2 minutes	B. Basic Criteria for Implant Success	before perio charting
	i. No pain or discomfort by patient	
		Slide #23
	ii. No signs of inflammation (bleeding, suppuration)	Q: What is sign of an implant failure?
	iii. No mobility	A: bleeding, suppuration,
	iv. Radiograph shows healthy bone levels	mobility, bone loss
	v. Function	
	vi. Aesthetics	
1 minute	C. Frequency of Appointments	Slide #24
	i. Check one week after placement	Table showing many appointments from consult to treatment to follow up
	ii. During first year will have 1-2 month checks	
	D. The Continuing Care Appointment	Slide #25
1 minute	i. Radiographs	Q: Why would you take BW in vertical manner?
	1. Take BW in a vertical manner if needed to see bone	A: To see bone levels.
	2. PA periodically to assess	NOTE: important to note or indicate the "threads" of a dental implant where bone is. If more
2 minutes	ii. Scalers for dental implants	threads are seen in comparison
	1. Do not want to scratch metal	radiographs, that is a key indicator of bone loss.
	2. Plastic- older technology	
	3. Titanium- newer technology	Slide #26
	iii. Ultrasonic Scalers	Images of various implant scalers and ultrasonic tips made for implants
	1. Specialty plastic coated tips	
	iv. Airpolish/Prophy Jet	
	1. Glycine powder	

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	subgingival v. Coronal polishing with prophy paste not indicated vi. Acidulated fluoride treatments contraindicated	
2 minutes	**VIII. Implant Complications** A. Factors that contribute to implant failure i. Unknown medical conditions ii. Poor bone quality iii. Excessive occlusal forces iv. Traumatic insertion 1. Drill speed should be less than 2,000 rpm v. Break in sterile procedure leading to infection vi. Poor homecare leading to peri- implantitis	Slide #27 Q: What is a cause of implant failure? A: infection, perio recurrence, too much occlusal load, improper placement technique
	B. Peri-Implant Problems i. Initial stage: Peri-implant mucositis 1. Similar to gingivitis 2. Reversible ii. Secondary stage: Peri-implantitis 1. Similar to periodontitis 2. Involves bone loss 3. Swelling or exudate may be present C. Restorative/Prosthetic Hazards i. Residual cement	Slide #28 Text figure with stages of implant mucositis/implantitis
2 minutes	**IX. Classification of Peri-Implant Disease** A. Ailing Implant (Peri-implant Mucositis) i. Inflammation but no mobility ii. Review patient homecare iii. Irrigate with chlorhexidine iv. Locally applied antimicrobials (such as	Slide #29 Photo and radiograph of failed implant

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	Arestin) v. Re-evaluate in 2 weeks B. Failing Implant (Peri-implantitis without mobility) i. Inflation and exudate ii. No mobility iii. Bone loss present iv. Refer to surgeon who placed implant C. Failed Implant (Peri-implantitis with mobility i. Implant evaluated ii. Implant removed	
	X. Closure	
2 minutes	A. <u>Summary of Major Points - Relate Back to Objectives</u> I hope after this presentation you have built upon your knowledge of implant dentistry. You should feel confident and be able to describe what a dental implant is to a patient. You will know what to look for in your dental hygiene assessment of dental implants, and know what the proper instruments to use to debride an implant. You also now should have the knowledge of special homecare tools to educate your patient about.	Slide #30 List of Key points Questions?
	B. <u>Provide a Sense of Accomplishment</u> Congratulations, you have now learned about another topic in your dental hygiene education. You should be more comfortable with the procedures of implants, the maintenance, and homecare instruction. And remember, the learning never stops in school, it is lifelong!	
	C. <u>Assignment:</u> For a better understanding of our topic today you should: 1. Read the shared DentalCare.com Articles. (Feel free to complete for your CE certificate!) 2. When in clinic, practice in Dentrix how to chart an implant. 3. Add visuals of implants (and procedure process) and homecare product	Slide #31 Links for Extra Resources

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	suggestions to your clinical reference binder to use in clinic for patient education.	
10 minutes	**CRITICAL THINKING ACTIVITY**	
	In-class debate. The class will split up into two groups, implant group, and bridge group. The students will together read the following case study, then pair into two groups. Within the groups, the students will consider pros and cons of their assignment treatment (implant or bridge) and prepare a chairside presentation of options to the patient. Groups will then present to the class, and a winner will be decided based on who presented the most logical and comprehensive proposal. Case Study Scenario: A 36-year-old Asian-American female presents to your dental hygiene school clinic. She had a retained primary tooth that is now loose. She reports her general dentist is recommending that she have it extracted, and replaced with a bridge. Your patient asks you about dental implants. She says she has seen Ads on buses and TV commercials about implants. She doesn't know what they are, and why her dentist did not recommend it for her. She states she does not have dental insurance. During your health history, she discloses she is a smoker, but thinking of quitting. After your dental hygiene assessments, you classify her moderate calculus, and stage II grade B periodontal classification. She has no dental restorations. Her PFS was 80% Factors to consider/Possible Answers: 1. Patient age: patient is young, will need a replacement option that has longevity.	Slide #32 Case Study and instructions

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	2. Medical History: patient is a smoker, but motivated to quit. If she continues to smoke, implants may not be a feasible option. Would the patient be motivated to quit to get a dental implant? 3. Patient compliance: Patient has a good PFS, but would need improvement to maintain the health of the dental implant or a bridge. Both require more advanced homecare techniques. OHI and shortened recare intervals could improve dental hygiene. 4. Cost: patient should be presented both options, regardless of insurance coverage. A bridge is more economical. 5. Enamel Preservation: the bridge would remove healthy enamel on opposing teeth. 6. Ethics: General dentist did not list all treatment options available to patient.	

Test Questions

1. **Objective #1:** Describe concepts, technology, and terminology relevant to implant dentistry.

   Test Item: Osteointegration is the direct attachment or connection of osseous tissue (bone) to the dental implant. Implant teeth contain periodontal ligament connective tissues.

   a. The first statement is true, the second statement is false

   b. The first statement is false, the second statement is true.

   c. Both statements are true.

   d. Both statements are false.

2. **Objective #2:** Comprehend patient selection factors and education essentials.

Test Item: What conditions would limit a patient's qualification as a candidate for a dental implant?

   a. Controlled Diabetes

   b. Latex allergy

   c. Current Smoker

   d. History of infective endocarditis

3. **Objective #3:** Understand theory and practice of dental implant maintenance in the clinical setting.

   Test Item: The following are acceptable tools to use to remove biofilm from a dental implant, **EXCEPT** one. Which is the **EXCEPTION**:

   a. Waterpik

   b. Stainless steel scaler

   c. Air polishing with glycine powder

   d. Titanium scaler

4. **Objective #4:** Recognize dental implant problems, complications, and failures.

Test Item: Short Answer. In a short paragraph, (3-4 sentences), describe why probing depths is not the best indicator of implant failure. Give one example of what would be an appropriate sign of implant failure.

5. **Objective #5:** Appreciate the value in lifelong learning to have current knowledge of new trends and technologies in implant dentistry.

Test Item: In a short paragraph (3-4 sentences), describe how you would respond to the following scenario.

Scenario: You are a new dental hygienist at a general dental practice. During your first week of employment, you realize the only implant specific instruments are Hu-Friedy plastic scalers. How do you approach this situation? Who would you mention this to, and what documentation and evidence would you present?

Correct Answers:

1. A: The definition of osteointegration is true. However, implant teeth do not contain a periodontal ligament that natural teeth have.

2. C: current smoker. A patient who is a smoker has compromised healing due to lack of blood flow and circulation. This would not be an ideal candidate for a dental implant. Although B(diabetes) may seem like an appropriate answer, this would only be indicated if the diabetes is uncontrolled. Note, a history of infective endocarditis would indicate the need for an antibiotic premedication before implant procedures and dental hygiene procedures.

3. B: stainless steel instruments are not indicated for biofilm removal of an implant tooth. Stainless steel could scratch and degrade the integrity of the titanium implant.

4. Since the sulcus of a dental implant is not anatomical identical to a natural tooth, a probing depth of greater than 3mm may not indicate disease. Instead, the probing measurement represents the length of the abutment and restoration. However, signs of implant failure may include: bleeding on probing, suppuration, mobility, radiographic bone loss.

5. The dental hygienist should propose a plan to the owner or person responsible for supply purchasing. This proposal would include investing in a titanium scaler kit to use during patient perio maintenance visits on implant teeth. Educate the team that the current standard of care is to use titanium scalers to remove biofilm on an implant. Plastic scalers, or stainless-steel scalers, can scratch and harm dental implants, which could lead to biofilm accumulation, and peri-implantitis, and potentially implant failure.