Special Considerations for the Dental Professional in Managing Patients with Diabetes

**Speaker:** Maria Emanuel Ryan, DDS, PhD

**Course Details:**

Diabetes Mellitus affects over 20 million Americans. This presentation will summarize the evidence relating periodontal disease to diabetes mellitus. Treatment strategies that can positively impact the periodontal condition in patients with diabetes and potentially improve on overall health will be discussed based on published studies and case presentations.

**Course Objectives:**

- Understand the bi-directional link between diabetes and periodontitis;
- Understand how periodontal therapy can improve diabetic control;
- Recognize the role of dental care providers as a member of the team of healthcare providers who provide optimal care to people with diabetes.

**CODA Standards Met:**

2-8 The curriculum must include content in the following four areas: general education, biomedical sciences, dental sciences and dental hygiene science. This content must be integrated and of sufficient depth, scope, sequence of instruction, quality and emphasis to ensure achievement of the curriculum's defined competencies. A curriculum document must be submitted for each course included in the dental hygiene program for all four content areas.

2-12 Graduates must be competent in providing dental hygiene care for the child, adolescent, adult and geriatric patient.

2-13 Graduates must be competent in providing the dental hygiene process of care which includes:

- comprehensive collection of patient data to identify the physical and oral health status;
- analysis of assessment findings and use of critical thinking in order to address the patient's dental hygiene treatment needs;
• establishment of a dental hygiene care plan that reflects the realistic goals and treatment strategies to facilitate optimal oral health;

• provision of patient-centered treatment and evidence-based care in a manner minimizing risk and optimizing oral health;

• measurement of the extent to which goals identified in the dental hygiene care plan are achieved;

• complete and accurate recording of all documentation relevant to patient care.

2-15 Graduates must be competent in communicating and collaborating with other members of the health care team to support comprehensive patient care.

2-18: Graduates must be competent in the application of the principles of ethical reasoning, ethical decision making and professional responsibility as they pertain to the academic environment, research, patient care and practice management.

2-23 Graduates must be competent in problem solving strategies related to comprehensive patient care and management of patients.

Canadian Competencies Met:

• A7. Evaluate clients’ health and oral health status using determinants of health and risk assessment to make appropriate referral(s) to other health care professionals.

• A10. Design and implement services tailored to the unique needs of individuals, families, organizations and communities based on best practices.

• B8. Share information with other professionals about the dental hygienists’ scope of practice while respecting their scope to promote interprofessional care.

• B12. Apply knowledge of common health risks to inform public policy, and educate practitioners and the public.

• C12. Critique literature findings to determine their potential value to dental hygiene practice.

• F4. Identify clients for whom the initiation or continuation of treatment is contra-indicated based on the interpretation of health history and clinical data.

• F7. Discuss findings with other health professionals when the appropriateness of dental hygiene services is in question.
Classroom Support Materials

Discussion questions:

1. Discuss treatment planning and treatment options for the patient with diabetes.

2. Define the HbA1c number and its significance related to periodontal treatment and maintenance.

3. Discuss the inflammatory process related to diabetes and oral health.

4. List and discuss systemic complications related to diabetes.

5. Investigate oral health products that will make the best treatment recommendations.

6. Discuss Maslow's Hierarchy of Needs related to patient care while identifying the level of disease prevention needed to ensure the overall health of the patient.

7. Further define oral health conditions that could compromise the health of the dentition, periodontium, oral mucosa, and lips. Examples, xerostomia, dentin hypersensitivity, enamel decalcification, etc.

Classroom activities:

1. Students can utilize texts and online resources to research the inflammatory process, signs and symptoms, systemic complications, treatment, and long term care.

2. Students could work in groups to compare and contrast diabetes to other inflammatory diseases.

3. Students could research their own risk factors to develop a deeper relevance to the HbA1c number.
Exam Questions:

1. Multiple periodontal abscesses, red gingiva, and marginal proliferation of the gingiva are oral manifestations of:

   A. Type I diabetes  
   B. Type II diabetes  
   C. Uncontrolled diabetes  
   D. Controlled diabetes

**Answer:** C  
**Rationale:** Several soft tissue abnormalities have been reported to be associated with diabetes mellitus in the oral cavity. These complications include periodontal diseases (periodontitis and gingivitis);

2. The primary etiological factor in periodontal disease is

   A. bacteria  
   B. host response  
   C. bacteria and host response  
   D. poor oral hygiene

**Answer:** A  
**Rationale:** Bacteria is the primary etiological factor periodontal disease

3. Risk factors for Adult Periodontitis include:

   A. Diabetes  
   B. Smoking  
   C. Genetic susceptibility  
   D. All of the above

**Answer:** D  
**Rationale:** Diabetes, smoking, and genetic susceptibility are all risk factors related to periodontitis.
4. The long term complications of diabetes that best predict mortality are:

A. Macrovascular disease and nephropathy  
B. Neuropathy and retinopathy  
C. Altered wound healing and obesity  
D. Fibromyalgia and Alzheimer’s

Answer: A  
Rationale: Macrovascular complications and nephropathy are progressive and usually begin slowly, but over time result in further damage that is generally irreversible.

5. C-reactive protein:

A. Is produced by the liver  
B. Is produced in response to injury, inflammation or infection  
C. Is elevated in people with periodontitis  
D. All of the above

Answer: D  
Rationale: C-reactive protein provides additional information on vascular risk.

6. Studies indicate:

A. A bi-directional relationship between diabetes and periodontal disease.  
B. Treatment of periodontal disease may temporarily improve glycemic control  
C. Diabetes pre-disposes to periodontal disease  
D. All of the above

Answer: D  
Rationale: Supportive, evidence based research further defines the inflammatory relationship between glycemic control and periodontal disease.
7. The normal level of Glycated Hemoglobin (HbA1c) is:

A. 1-3%
B. 4-6%
C. 7-8%
D. 9-12%

Answer: B
Rationale: Normal ranges for hemoglobin A1c in people without diabetes is about 4% to 6%. People with diabetes with poor glucose control have hemoglobin A1c levels above 7%.

8. An individual begins to appear confused, dizzy, reports being hungry and shows “wet” signs. This individual is experiencing:

A. hypoglycemia
B. hyperglycemia.
C. low blood pressure
D. syncope.

Answer: A
Rationale: If glucose levels become too low, as occurs with hypoglycemia, it can cause “wet” signs; heart palpitations, fatigue, pale skin, shakiness, anxiety, sweating, hunger.

9. Hypoglycemia can be treated with the administration of:

A. glucose
B. 50% dextrose IV
C. glucagon IM
D. all of the above.

Answer: D
Rationale: Depending on the level of consciousness will determine the administration of the appropriate treatment.
Case Study Patient:

<table>
<thead>
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<th>Age</th>
<th>47</th>
<th>Scenario</th>
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<tbody>
<tr>
<td>Sex</td>
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<td>Clinically:</td>
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<td></td>
<td></td>
<td>Probing depths: 4-5mm</td>
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</tr>
<tr>
<td>BP</td>
<td>WNL</td>
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<tr>
<td>Chief complaint</td>
<td>Her gums are sore and bleed easily</td>
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<tr>
<td>Medical history</td>
<td>Diabetes</td>
<td></td>
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<tr>
<td>Current medications</td>
<td>Insulin</td>
<td></td>
</tr>
<tr>
<td>Social history</td>
<td>Patient has a tendency to take her insulin, but forgets to eat breakfast or lunch.</td>
<td></td>
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</tbody>
</table>

1. In uncontrolled Diabetes Mellitus Type I and Type II one is likely to observe multiple periodontal abscesses.

   A. True
   B. False

   **Answer:** A
2. The patient reports her fasting blood glucose is 45mg/dl. She starts to tremble, sweat and states she feels “light headed”. What type of condition does this patient mostly likely having?

A. Hyperglycemia  
B. Hypoglycemia  

Answer: B

3. Diabetes Mellitus is a systemic disease that primarily affects which metabolic processes?

A. Fat intolerance  
B. Protein metabolism  
C. Liver Malfunction  
D. Carbohydrate metabolism  

Answer: D

4. The “hallmark” of diabetes is hyperglycemia.

A. True  
B. False  

Answer: A