CareQuest Institute for Oral Health®

Caries Management and Prevention: A Risk-Based Approach by CareQuest Institute

Session 10: Saliva in Disease: Cardiovascular Conditions and Caries Risk

SESSION DETAILS

Pedagogy:
Lecture: Interactive Presentation
In-Class Activity:
1. Multiple Choice Questions

Extended Learning Module **[add clickable link]**

Length: 60 mins

Description:
In this session, learners will explore how saliva, overall health, and disease risk are connected to systemic health. The goal is to help learners understand how the bacteria in saliva can be linked to stroke and heart disease. This presentation will discuss facts about strokes and heart disease, gaining insights, and discussing how dental diseases might be connected to inflammation in the body.

Learning Objectives:
- Discuss the connection of bacteria in saliva to stroke and heart disease.
- Examine the relationship between caries and stroke and heart disease.
- Evaluate the saliva and clinical case of a patient with congestive heart failure and assess how their oral findings correlate.

PRE-SESSION PREP CHECKLIST

Reading:
- *Essentials of Dental Caries*, Kidd *et al*., chapters 2.1 and 2.4

Asynchronous:
- CareQuest Self-Paced Course, "Managing Dental Caries: Evolving Strategies and Proven Techniques"

SYNCHRONOUS CLASS TIMING LESSON PLAN
• Opening and Framing [5 minutes] • Stroke and Oral Systemic Connection [10 minutes] • *S. mutans* and Stroke Risk [15 minutes] • Heart Disease and Caries [15 minutes] • Clinical Application [5 minutes] • Wrap Up [5 minutes]

LESSON OUTLINE	INSTRUCTIONAL PROMPTS
Opening and Framing [Lecture, 5 minutes]	**Slide 1:** Introduce the connection between saliva, bacteria, and systemic disease. **Slide 2:** Learning objectives (brief). **Slide 3:** Walk through each factor and reinforce that saliva is not static. **Slide 4:** Connect that the oral environment reflects systemic conditions.
Stroke and Oral Systemic Connection [Lecture, Multiple Choice Questions, 10 minutes]	**Slides 5–6:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slide 7:** Highlight the key numbers such as frequency and mortality. Emphasize that is a public health issue. **Slide 8:** Explain how inflammation is the linking pathway. **Slides 9–10:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slide 11:** Explain how bacteria enter the bloodstream and crosses the blood-brain barrier. Key takeaway: Oral bacteria can localize systemically.
***S. mutans* and Stroke Risk** [Lecture, Multiple Choice Questions, 15 minutes]	**Slide 12–13:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slide 14–15:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. Emphasize that certain serotypes have higher virulence and transition why this matters clinically. **Slide 16:** Certain strains of *Streptococcus mutans* are associated with an increased risk of hemorrhagic stroke. These bacteria can interfere

	with platelet function and weaken vascular integrity. **Slide 17:** Cnm-positive *Streptococcus mutans* can bind to collagen in blood vessels. This strain is associated with a higher incidence of cerebral microbleeds. This risk can be present even without visible dental caries. **Slide 18:** Salivary diagnostics can identify high-risk bacterial strains in patients. These bacteria have been linked to multiple types of strokes. This highlights the potential role of saliva in risk assessment and prevention. **Slide 19–20:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. Highlight the difference between hemorrhagic vs. ischemic. **Slide 21:** Bacteria associated with dental caries have been found in cerebral thrombi. This suggests oral bacteria may contribute to ischemic stroke.
Heart Disease and Caries [Lecture, Multiple Choice Questions, 20 minutes]	**Slides 22–23:** Shift focus from stroke to coronary heart disease. Similar inflammatory and bacterial pathways are involved. **Slide 24:** Atherosclerosis develops through plaque buildup and chronic inflammation. Over time, this narrows vessels and restricts blood flow. Plaque rupture can lead to acute cardiovascular events. **Slides 25–26:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slide 27:** Stroke and heart disease share similar geographic patterns. This suggests overlapping risk factors and population influences. **Slide 28:** There is an established relationship between dental caries and heart disease. **Slides 29–30:** Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slides 31–32:** Patients with more dental disease show higher rates of coronary heart disease.

	Slides 33–34: Read question. Have learners vote. Encourage quick participation. Confirm correct answer. **Slide 35–36:** Caries-associated bacteria were found more frequently than periodontal bacteria in cardiovascular tissues. This highlights the systemic relevance of cariogenic bacteria. **Slide 37:** Serotype c is less common in cardiovascular tissues, while serotypes e and k are more prevalent. This suggests certain strains of *S. mutans* may be more strongly associated with systemic disease risk.
Clinical Application [Lecture, 5 minutes]	**Slides 38–40:** Walk through patient case. Clinical findings show severe periodontal disease and active caries. This patient is high risk and requires comprehensive care.
Wrap Up [Lecture, 5 minutes]	**Slide 41 (final content slide):** Preventive care and early intervention can reduce oral and systemic risk. Dental professionals play a role in interprofessional healthcare.

EVALUATION METHOD

This session can be assessed through short-answer, essay, or multiple-choice questions to effectively evaluate comprehension. Below are sample questions to help guide the creation of the questions.

Question 1
How does aging affect salivary flow and composition?

A. Aging causes a consistent decline in salivary flow across all individuals.
B. Aging has minimal direct effect; changes are linked to medications and systemic conditions.
C. Aging leads to increased salivary acidity and reduced buffering capacity.
D. Aging results in permanent changes to saliva color and viscosity.

Question 2
A significant portion of annual strokes in the United States for individuals aged 35 and above are concentrated in the southeastern region.

A. True
B. False

Question 3
What event can result from the gradual increase of plaque in the arteries?

A. Enhanced blood flow
B. Improved artery flexibility

C. Reduced risk of heart attack
D. Thrombus formation or complete occlusion

Question 4
Which species of *Streptococcus* showed prevalence in dental plaques but was less likely to be found in diseased valves or plaques?

A. S. sobrinus
B. S. salivarius
C. S. oralis
D. S. mutans

Question 5
What contributes to the uniqueness of saliva composition among individuals?

A. Medications and systemic conditions
B. Genetics
C. Diet and lifestyle
D. All of the above