

CareQuest Cariology Curriculum Instructor Guide

Session 3: Caries as a Disease: Etiology, Risk Factors, and Protective Factors

SESSION DETAILS

Pedagogy:

Lecture: Interactive Presentation

In-Class Activity:

1. Pre-Class Case Review Discussion
2. Clinical Case Discussion

Length: 60 mins

Extended Learning Module: Managing Dental Caries: Evolving Strategies and Proven Techniques

Short Self-Paced Course (approximately 30 minutes)

<https://learning.carequest.org/#/online-courses/dfd88b92-a307-45d5-865a-57ac90591c5b>

Description:

Learners will understand if caries is a transmissible or infectious disease and how disease can be transmitted between humans. Learners will understand how to coach humans on how to decrease the transmission of pathogenic bacteria that can lead to decay.

Learning Objectives:

- Discuss the evidence on vertical and horizontal transmission of cariogenic bacteria associated with dental caries.
- Interpret a case review of saliva data from two families with similar saliva and disease presentations.
- Select strategies for families to reduce their risk for dental caries.

PRE-SESSION PREP CHECKLIST

Reading:

- Kort *et al.*, 2014 [add a clickable link]
- Manchanda *et al.*, 2021 [add a clickable link]
- Case Study: “Will You Marry Me?” [add a clickable link]

Asynchronous:

- Smiles for Life Curricula: “Early Childhood Caries,” <https://www.smilesforlifeoralhealth.org/lessons/early-childhood-caries/>
- CareQuest Self-Paced Course, [“Updating Your Knowledge of Dental Caries: Causes, Concerns, and Considerations”](#)

SYNCHRONOUS CLASS TIMING LESSON PLAN

- Opening and Framework [5 minutes]
- Pre-Class Case Discussion [10 minutes]
- Early Transmission and Mechanisms [10 minutes]
- Transmission Types [10 minutes]
- Microbiome and Disease Process [10 minutes]
- Clinical Application [15 minutes]
- Goal Setting [5 minutes]
- Wrap Up [5 minutes]

LESSON OUTLINE	INSTRUCTIONAL PROMPTS
<p>Opening and Framework [Lecture, 5 minutes]</p>	<p>Slide 1: Welcome and why this topic matters. Slide 2: Learning objectives (brief). Slide 3: Use this analogy to introduce the idea that oral health patterns are often seen within families. Ask the learners what patterns they have noticed clinically among family members and allow a couple of responses to encourage engagement. Slide 4: Provide a high-level overview of the model without going into too much detail. Emphasize that oral health is influenced by multiple factors, including the child, family, and community, and that the microbiome is only one part of the bigger picture.</p>
<p>Pre-Class Case Discussion [Discussion, 10 minutes]</p>	<p>Slide 5: Ask learners to discuss the questions in pairs or small groups.</p> <ul style="list-style-type: none"> • After discussion, have 2–3 groups share an answer to the questions. • Guide the conversation toward access to care, cultural beliefs, and environmental factors.

	<p>Slide 6: Learners can remain in the same pair or small group.</p> <ul style="list-style-type: none"> • After discussion, have 2–3 groups share an answer to the questions. • Emphasize that caries management should include both clinical treatment and behavior modification strategies. <p>Slide 7: Choose a few learners to share their answer to the class.</p> <ul style="list-style-type: none"> • Reinforce the importance of key bacteria and the protective role of saliva in buffering, remineralization, and carbohydrate clearance.
<p>Early Transmission and Mechanisms [Lecture, 10 minutes]</p>	<p>Slides 8: Introduce the mother-child transmission relationship.</p> <ul style="list-style-type: none"> • Explain that bacterial transmission begins very early, including during pregnancy, birth, and infancy. <p>Slides 9–10: Address slide notes. Discuss common everyday behaviors that allow transmission, such as sharing utensils or kissing.</p> <p>Slides 11–12: Reinforce that caregivers play a major role in transmission.</p> <ul style="list-style-type: none"> • Explain that higher levels of cariogenic bacteria in a caregiver increase the likelihood of transmission to the child. • Emphasize that transmission is common and largely influenced by behavior.
<p>Transmission Types [Lecture, 10 minutes]</p>	<p>Slides 13: Provide a brief overview of the research.</p> <p>Slides 14–15: Address slide notes. Explain that there is a critical period when children are more susceptible to bacterial colonization</p> <p>Slides 16–17: Expand the discussion beyond caregivers to include siblings, peers, and daycare environments. Ask learners who they think has the greatest influence on their pediatric patients’ oral health.</p> <p>Slides 18–19: Explain that research shows family patterns of caries persist even when other variables are considered.</p>

<p>Microbiome and Disease Process [Lecture, 10 minutes]</p>	<p>Slides 20–22: Walk through the caries process step-by-step, explaining how frequent sugar exposure leads to acid production, a drop in pH, and a shift toward acid-tolerant bacteria.</p> <ul style="list-style-type: none"> • Ask learners where they think intervention is possible within this cycle. • Emphasize that caries is a dynamic process and is largely driven by environmental conditions. <p>Slides 23–25: Provide an overview of the studies. Key takeaway:</p> <ul style="list-style-type: none"> • The oral microbiome is dynamic, shaped over time by both early influences and ongoing environmental exposures, with frequent contact contributing to bacterial similarity. <p>Slide 26: Bring the discussion back to the big picture by connecting transmission, environment, and behavior.</p>
<p>Clinical Application [Discussion, 15 minutes]</p>	<p>Slide 27: Introduce the case and ask learners to predict what patterns they expect to see among siblings.</p> <p>Slides 28–30: Walk through each case and compare findings across siblings. Highlight that all children share the same environment, but disease severity increases with age and exposure.</p> <p>Slide 31: Explain that this clinical case will show how patterns continue into adolescence and young adulthood.</p> <p>Slides 32–34: Review each case and highlight lifestyle factors such as diet, schedules, and compliance challenges. Ask learners what barriers they see to behavior change in these patients.</p>
<p>Goal Setting [Lecture, 5 minutes]</p>	<p>Slide 35: Introduce goal setting</p> <p>Slides 36–38: Walk through shared goals, individual roles, and environmental changes.</p> <ul style="list-style-type: none"> • Ask learners to create one realistic family goal and one child-specific goal. • Emphasize that goals should be realistic, achievable, and family-centered.

Wrap Up

[Lecture, 5 minutes]

Slide 38 (final content slide):

Reinforce two key:

- Bacteria can be shared, but disease also depends on environment and behavior.
- Effective prevention and management must be family centered, addressing shared habits, exposures, and routines, not just the individual patient.