

LESSON 1: DENTAL DECAY

Purpose: To provide basic understanding of dental decay.

Overview: In this lesson, the trainee gains an understanding of the biological causes of dental decay, and learns the physical and psychosocial effects of dental decay in children.

Goals: The trainee will be able to describe the following:

- The process of tooth decay
- The bacteria associated with decay
- Where the bacteria are found in the mouth
- The relationship of diet and saliva to dental decay
- The direct and indirect physical and psychological effects of dental decay in children.

Activities: Trainees may be asked to introduce themselves and indicate what they hope to gain from this training.

The trainer writes the following formula on the board in big bold letters:

FOOD + PLAQUE + TOOTH = DECAY

Trainees will then be instructed to write down one way that the process of dental decay can be slowed down or eliminated. Trainees will then attach their responses around the impacted part of the formula.

EXAMPLES:

PART OF FORMULA

TRAINEE'S RESPONSE

FOOD

"Limit the number of times a day (frequency) of eating foods high in sugars."
"Choose healthy non-sticky foods for snacks."
"Chew sugarless gum."

PLAQUE

"Brush teeth at least twice a day."
"Floss teeth once a day."

TOOTH

"Drink fluoridated water."
"Use a fluoride toothpaste."
"Visit the dentist regularly."

Key Terms:

Bacteria/Bacterium
Carbohydrates
Cavity
Cleft
Decay
Decay Process

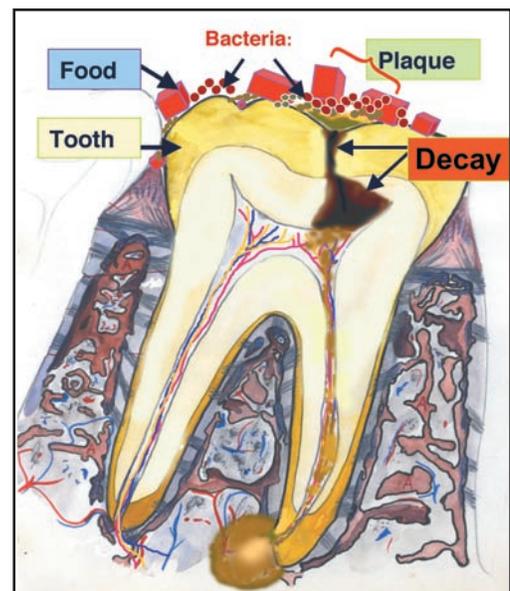
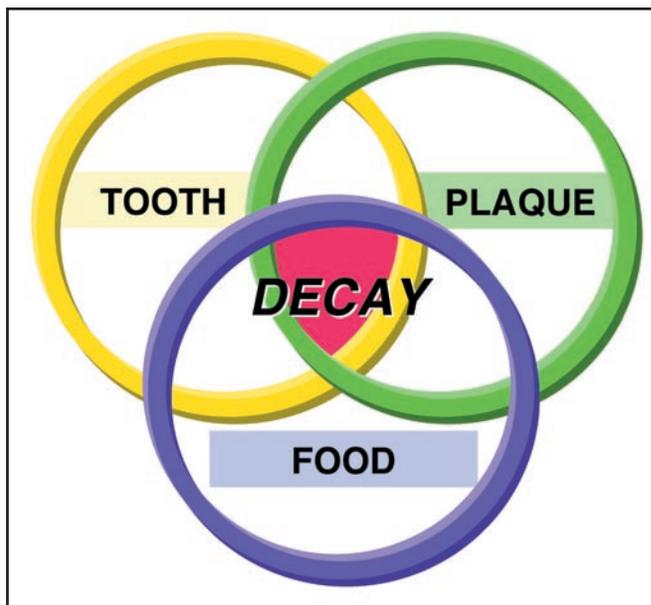
Enamel
Infection
Periodontal Disease
Decay Process
Saliva
Streptococcus mutans



DENTAL DECAY

❖ What is tooth decay?

- Tooth decay is a transmittable infectious disease that develops in the presence of teeth, sugars and **bacteria**.
- “**Plaque**” is a sticky collection of bacteria and food substances adhering to the teeth. The bacteria associated with dental decay found in plaque are commonly found in the mouth even when active dental decay is not present.
- Damage to the tooth begins when the bacterial plaque comes in contact with foods high in sugars and other **carbohydrates**. The bacteria ingest and break down the sugars, producing acids and other irritants. The acids attack the outermost hard surface of the tooth called “**enamel**” for about 20 minutes. After many acid attacks, tooth decay may occur. The hole in the tooth created by the acids is the “**cavity**.” What is commonly called “**tooth decay**” is actually an active process of tooth destruction resulting from the **interaction of the tooth, plaque and food**.
- If the decay is not stopped and the cavity not restored, the cavity continues to get larger, extending into the deeper hard structures of the tooth and ultimately into the living pulp tissues within the tooth. This bacterial **infection** can then be spread through the jawbones and through blood vessels to other parts of the face and body.



Note: Further information on the relationships of bacteria, diet, **saliva**, fluoride, risk behavior, oral hygiene and dental disease may be found in succeeding lessons.



❖ **What types of bacteria cause tooth decay?**

Many microorganisms coexist in the mouth, several of which can lead to disease. *Streptococcus mutans* (*S. mutans*) is the bacterium that is primarily implicated in the development of tooth decay. *S. mutans* is characterized by its ability to survive and even grow under conditions hostile to other bacteria.

❖ **Where is *S. mutans* found in the mouth?**

It is found primarily on the surfaces of teeth. One tooth may have a large number of these bacteria, while the tooth next to it may have very few. *S. mutans* is often not spread evenly on all teeth. The bacteria are present in highest concentrations in the crevices, pits and fissures found as part of the normal anatomy of teeth and surrounding structures.

❖ **What foods contain sugars that interact with *S. mutans*?**

All **carbohydrates**, particularly sugars, interact with *S. mutans*. Get in the habit of checking food labels; you'd be surprised how much sugar is in some foods.

- Most notorious is sucrose, the sugar contained in candies, cookies, soda, and the like.
- The naturally occurring sugars in fruit and fruit juice will create the same environment for the development of dental decay as soda, although fruit, of course, is much more nutritious.
- The sugars in milk (lactose) may also contribute to the dental decay process.
- Starches such as white bread, potato chips, pretzels and many other processed snacks all break down into sugars and may also be harmful to the teeth, particularly when they are snacked frequently during the day.

Of course, this does not mean avoid healthful foods such as juice, milk and bread, but emphasizes the importance of limiting snacking and exercising good oral hygiene habits (to be discussed further in succeeding lessons).

❖ **How widespread is dental decay in children?**

A 1997 survey of over 5,000 children found that active untreated dental decay was present in:

- 6 percent of 1 year olds
- 22 percent of 2 year olds
- 35 percent of 3 year olds, and
- 48 percent of 4 year olds

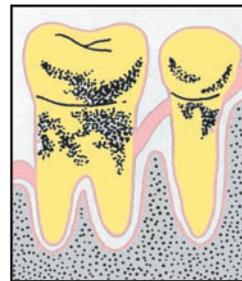


❖ **Do oral diseases and conditions pose potentially serious health concerns?**

- Dental decay, whether in infants, children or adults, is an infection that can spread and be extremely painful. This may lead to:
 - Destruction of teeth
 - Difficulty in eating resulting in nutritional impairment that, in turn, can lead to improper physical development
 - Speech problems
 - Emotional problems such as lack of self-esteem and impaired social interaction.
- It is incorrect to assume that dental decay will happen no matter what is done. “My whole family has *soft* teeth...” doesn’t mean decay cannot be prevented and reduced. Any effort to save teeth, including baby teeth, is worth it: to support development and nutrition, and to prevent or eliminate severe pain associated with dental decay.

- Serious concerns exist about the impact of dental decay and severe gum diseases (“**periodontal disease**”) on overall medical health and well-being. There is growing scientific evidence that dental decay and periodontal disease may play a significant role in:

- Preterm low birth weight and other adverse birth outcomes
- Cardiovascular conditions
- Cancer
- Diabetes.



Periodontal Disease

- Serious concerns about oral disease and conditions go beyond the teeth and gums:
 - **Injuries** to structures in and around the mouth are among the most common of all injuries in children and adolescents
 - **Cleft** lip/cleft palate is the fourth most common birth defect
 - Oral and pharyngeal **cancers** have one of the lowest 5-year survival rates of all cancers
 - Signs and symptoms in the mouth are often the first and may be important diagnostic clinical findings for many common (and not so common) medical diseases and disorders, such as measles.

