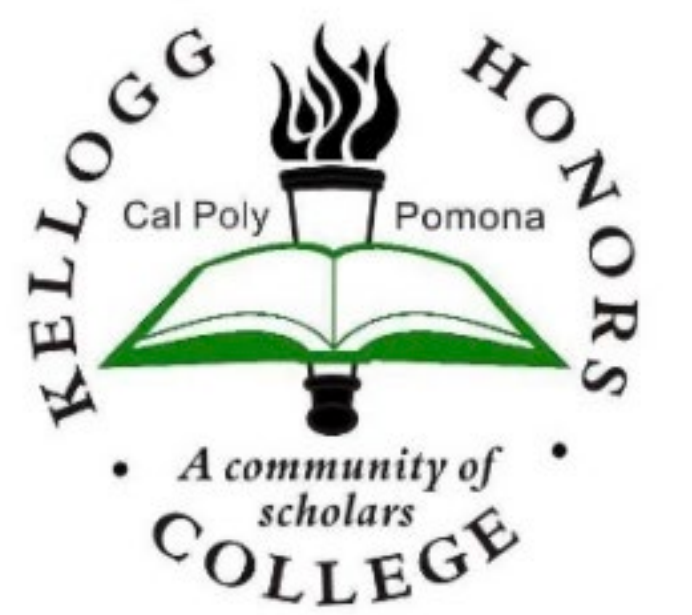


Dietary Evolution and Its Effects on Dental Health

Yvette Vartan, General Biology
Mentor: Dr. Claudia Garcia-Des Lauriers
Kellogg Honors College Capstone Project



Background:

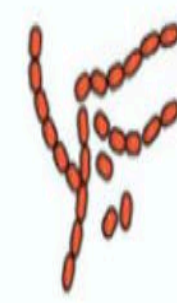
Even with the modernization and improved education about oral health, our ancestors had better oral health than we do today.

- The main reason for this is the difference in our diets!
 - Ours = high in carbohydrates which contributes to plaque build up
 - Their's = no carbohydrates (less cavities)

Early colonizers:
mainly health-associated streptococci
(e.g. *S. sanguinis* and *S. gordonii*)



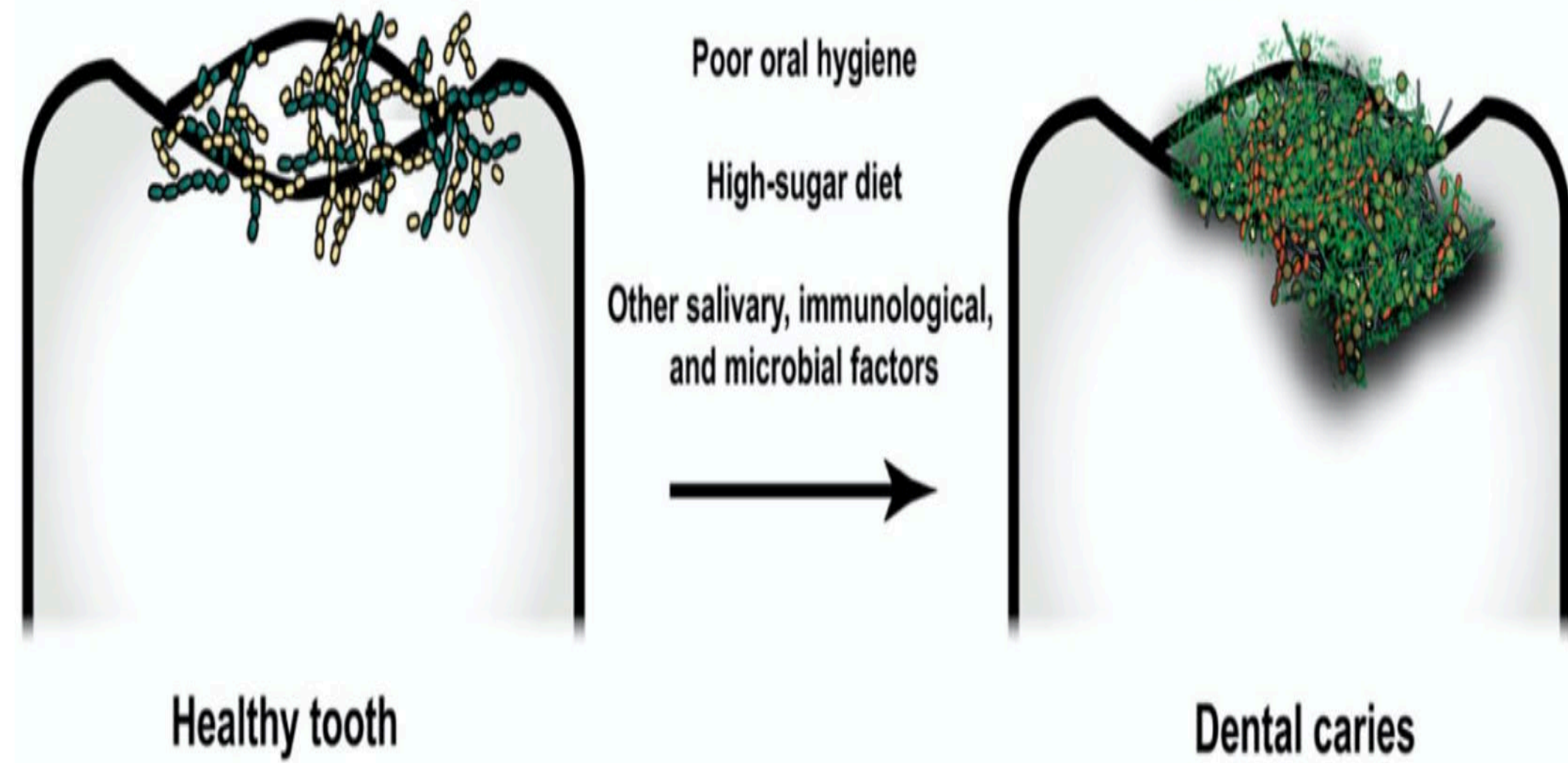
***S. mutans*:**
glucan production
robust biofilm formation
acid-tolerant
acid-producing



Late colonizers:
acid-tolerant
acid-producing
(e.g. *Lactobacillus* and *Veillonella* spp.)



glucans



Statistics of Dental Caries:

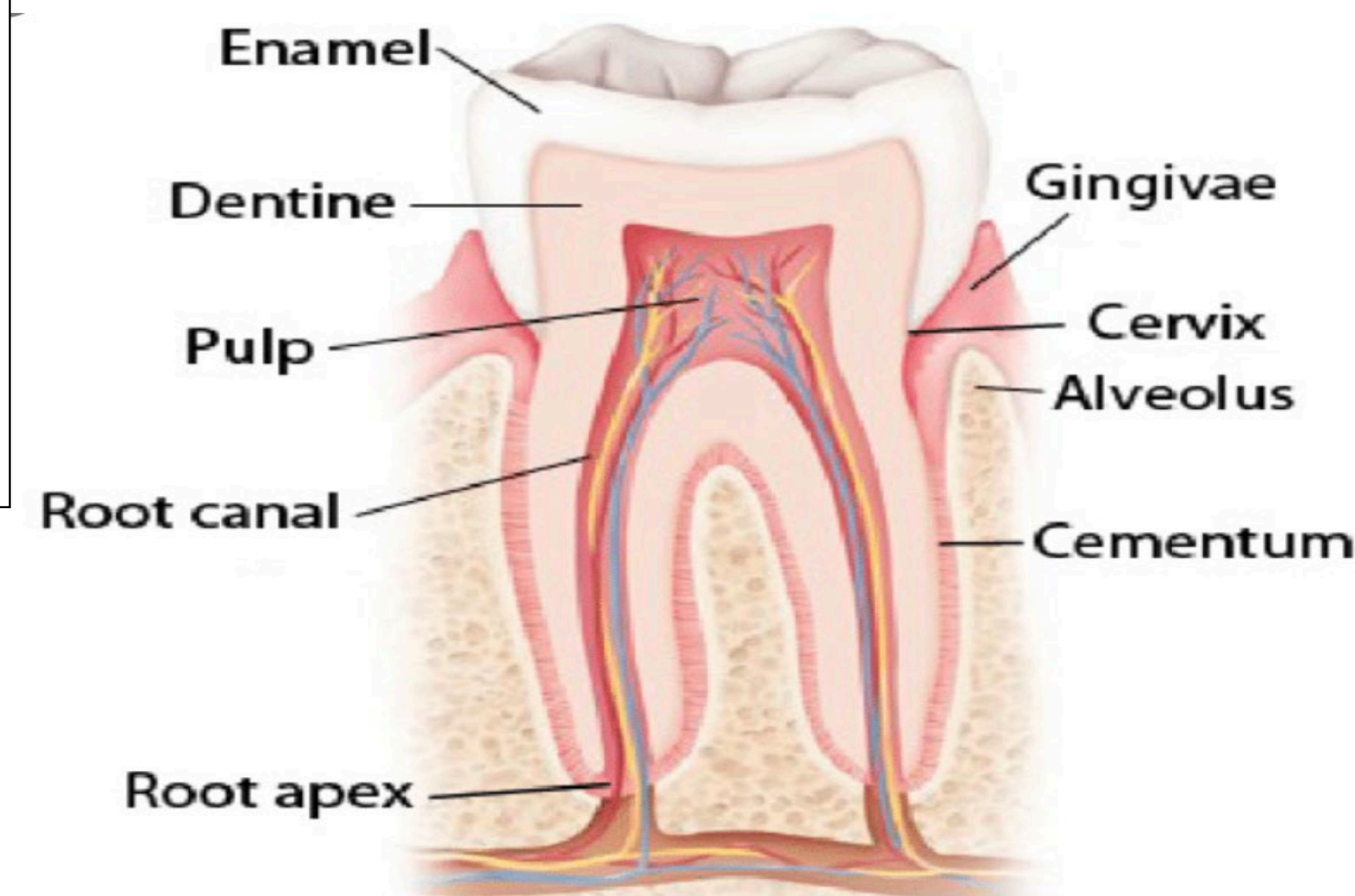
- Most common chronic disease in children and adolescents aged six to nineteen years old.
 - In adolescents, tooth decay is four times more common than asthma.
- Nine out of ten adults over twenty have some degree of tooth-root decay.
- Oral diseases come to affect nearly 3.5 billion people
- More than 530 million children suffer from dental caries

Evolution of *Streptococcus mutans*:

- Three factors have evolved to contribute to the increased virulence of the bacteria
- *S. mutans* came to evolve to be able to metabolize an increased amount of carbohydrates
- As humans came to evolve anthropologically, *S. mutans* also came to evolve biologically (coevolution)

What Causes Tooth Decay (Dental Prospective):

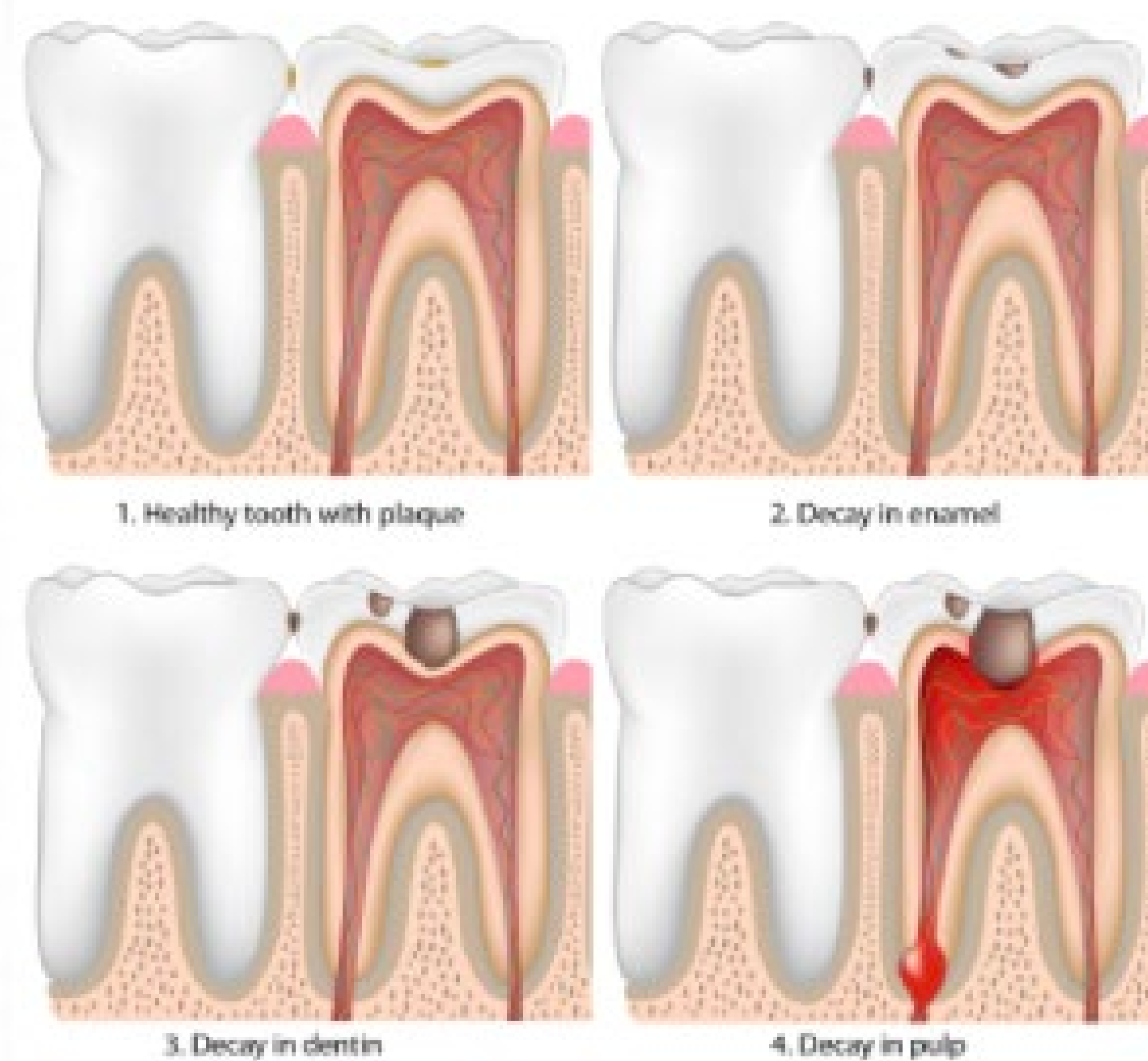
- Dental caries formally known as tooth decay are caused by the breakdown of tooth enamel.
- Enamel is broken down due to:
 - Bacteria in the mouth
 - Dietary habits
 - Poor dental hygiene
- Tooth decay breakdown:
 - Accumulation of dental plaque
 - Acid within plaque starts to minerals on outer enamel
 - Acid and bacteria move into pulp



Connection Between Anthropology and Teeth:

- Why do anthropologists come to study teeth?
 - Durability and longevity of teeth compared to bone
 - Tooth analysis is a non-destructive and cost-efficient
 - Modifications to teeth and dental work help with person identification
- What information can teeth provide anthropologists?
 - Morphological differences can come to reveal information about a person's past, customs, diet and general health
 - Linear enamel hypoplasia appearance of an individual's teeth
 - Indication of premature birth, trauma, viral and bacterial infection and malnutrition.
- Dental remains such as the plaque on teeth, allows for an alternative ethical approach that comes to respect the ancestor's body but also allows anthropologists to learn more about the remains.
 - Modification of current methods or introduction of new methods that are more mindful of a person's cultural beliefs.
 - Establishes a balance between science and cultural sensitivity

The stages of tooth decay



What Causes Tooth Decay (Microbiology Perspective):

- There are about three hundred different species of bacteria living inside a person's mouth.
- Bacteria come to thrive on the sugar left behind on teeth.
 - Produce toxic products which leads to gingivitis
- *Streptococcus mutans* is the main cause of dental decay.
- *Lactobacilli* affects the progression of lesion

Changes in Tooth Decay:

- Tooth decay only started to become a problem in about ten thousand years around the same time as the rise in agriculture
- The frequency of dental caries among hunter-gatherers is between 1 and 5 percent
 - Nowadays, dental caries are present in
 - 42% of children
 - 59% of adolescences
 - 92% of adults
 - 93% of seniors
- The frequency of cavities in societies reliant on agriculture is between 10 and 85 percent



Difference in Diets (Hunter-gatherer v. American):

- Hunter-gatherer diet contained:
 - Meats, nuts, and wild plants, berries and seasonal vegetables
 - Their diet were composed of whatever was most efficient to hunt and gather around them and what was seasonally available.
- Modern diet contains:
 - Meats, nuts, vegetables, but also carbohydrates and processed sugar
 - Acidic, sticky and starchy food
 - Wider range of food variety available year round

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