

# **DENTAL CARRIES**

# What is Dental Caries??

*A multimicrobial & multifactorial disease of the calcified tissues of the teeth characterized by demineralization of the inorganic substance and destruction of the organic substance of the tooth.*

*Carious lesions occur under a mass of bacteria that produce an acidic environment & cause destruction of tooth structure. This gelatinous Bacterial mass is called Dental Plaque.*

*Plaque Bacteria + Sugars (From Diet)*



*Acids*

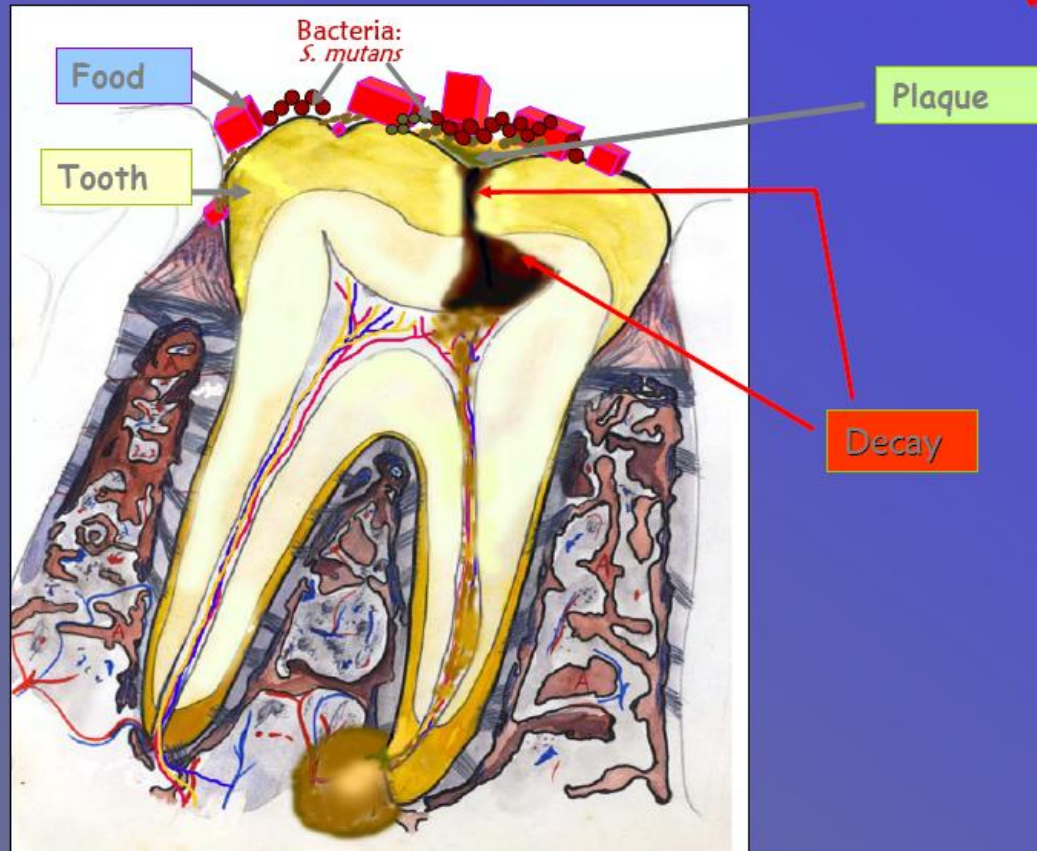


*Attack Tooth Surface*



*CARIES*

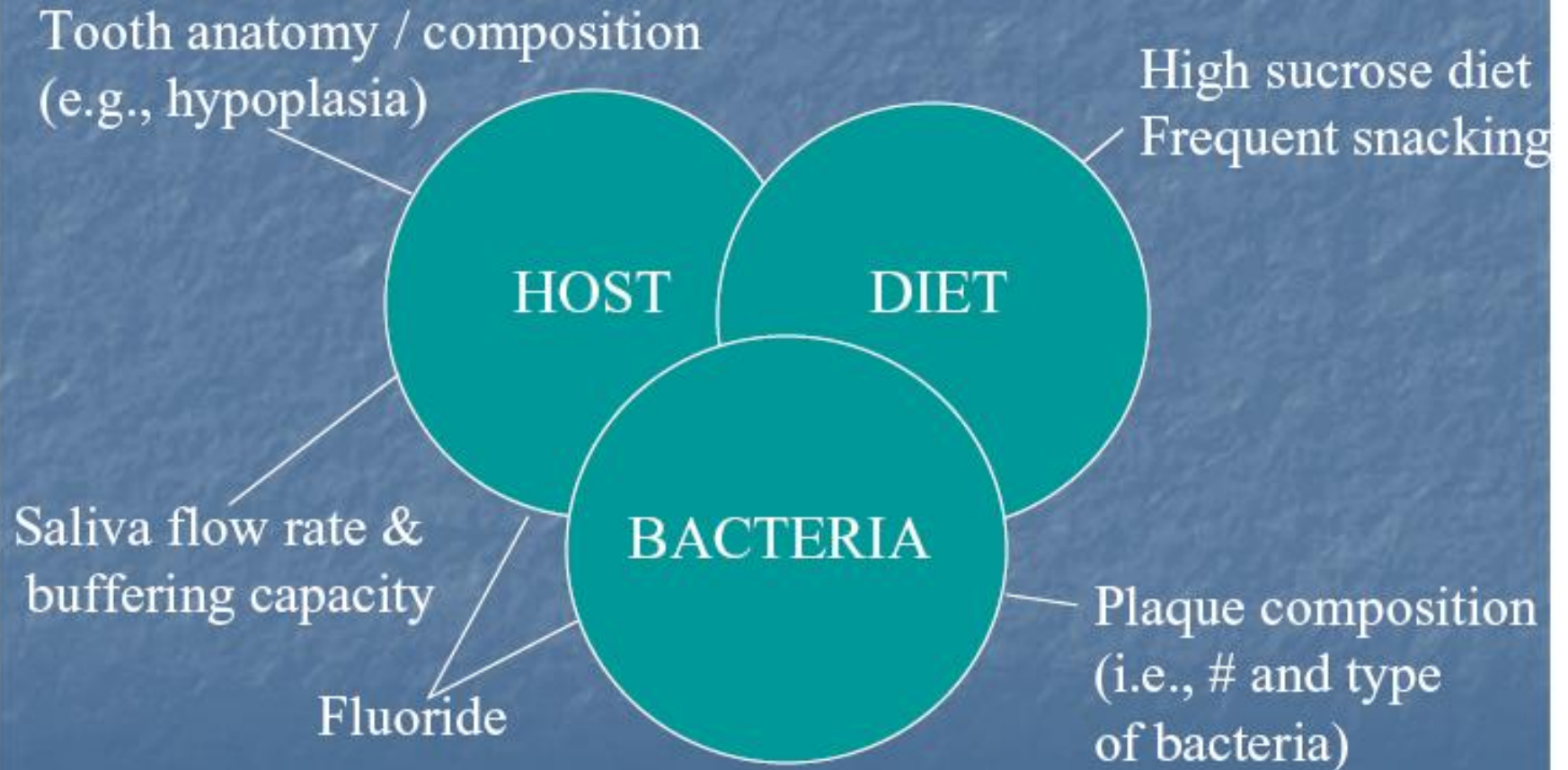
Plaque + Food + Tooth = Decay





**Plaque + Sugar**

# Factors that influence dental caries: *Multi-factorial !!!*



# The host-tooth

- **Composition-**

  - Surface enamel resistant

  - More mineral

  - Less carbonate & water



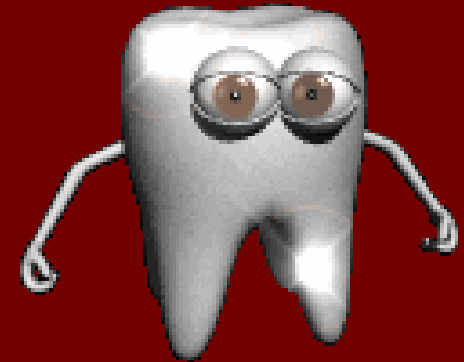
- **Morphology-**

  - Enamel hypoplasia

  - Deep fissures

- **Position-**

  - Alignment



# Substrate (Diet):

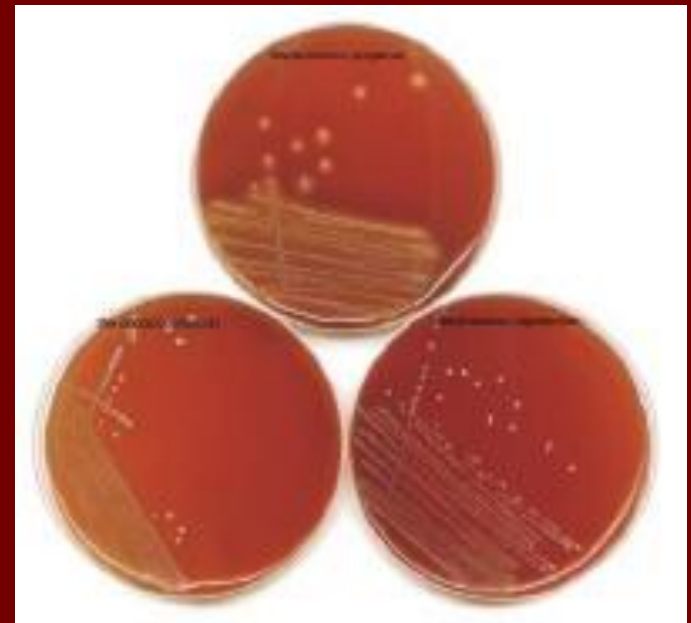
- Readily fermentable
- Sucrose (table sugar)- “Arch criminal”





# Microbiology of caries

- Caries- infectious disease
- Streptococcus mutans
- Streptococcus sobrinus
- Lactobacillus acidophilus
- Actinomyces- root caries



# **SPECIFIC BACTERIA ARE INVOLVED:**

**Initial Lesion : Mutans Streptococci  
(Caries Induction)**

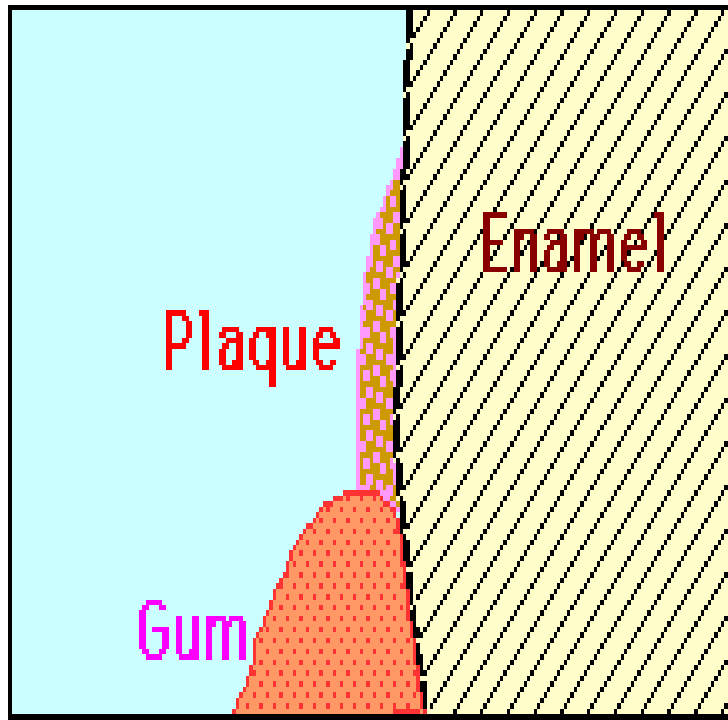
**Advanced Lesion : Lactobacilli  
(Caries Progression)**

**Dentinal Caries : Gm +ve(Actinomyces) &  
Gm -ve(Fusobacterium)**

**Root Caries : Actinomyces**

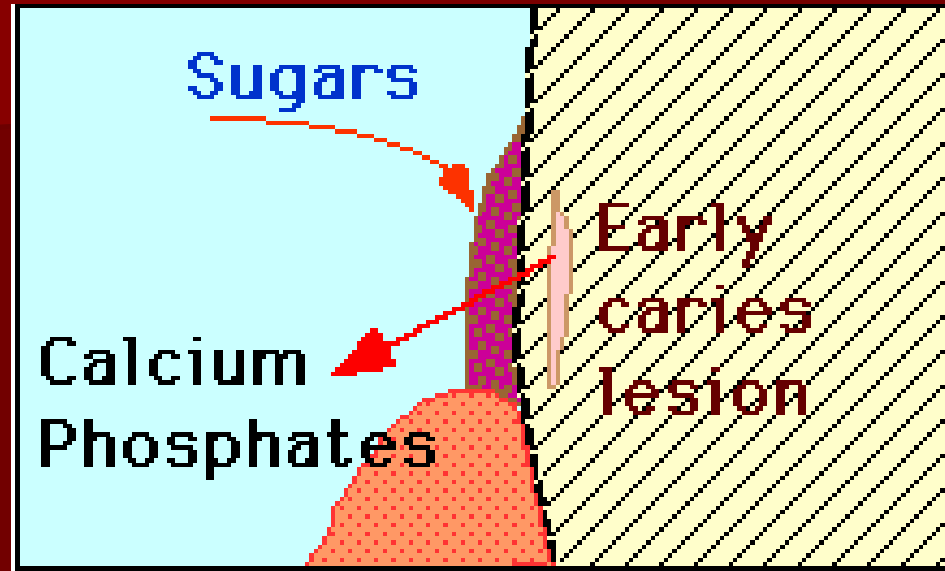
# **DEVELOPMENT OF A CARIOUS LESION :**

**The Process of  
Demineralization &  
Remineralization**



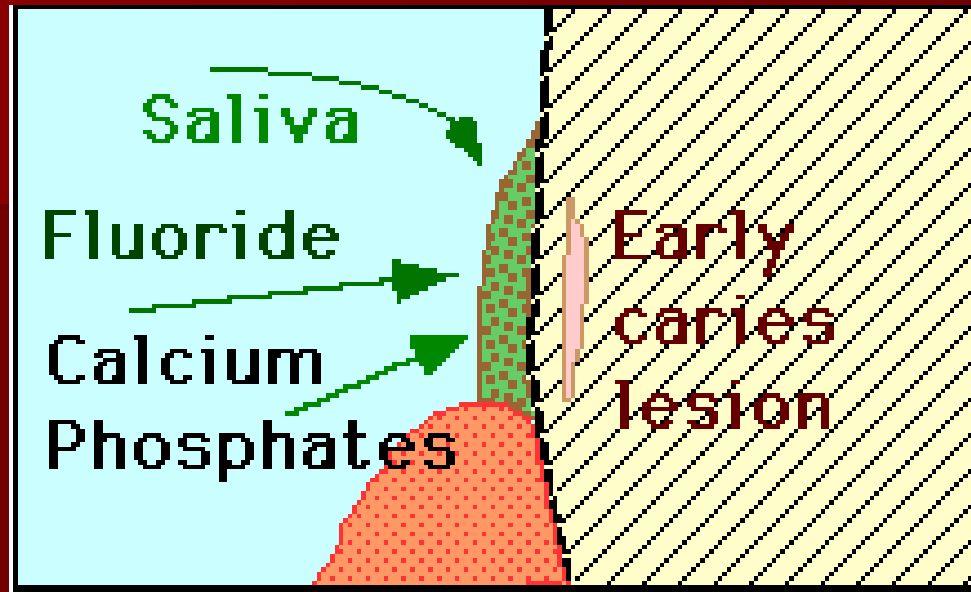
A detail of a tooth (to the right = enamel) covered by plaque, which consists mainly of bacteria.

# Demineralisation



*Plaque bacteria utilise sugar and other fermentable carbohydrates to form acids which start to dissolve the enamel - an early caries lesion occurs due to loss of Calcium and Phosphates*

# Remineralisation



When sugar consumption has ceased, saliva can away wash sugars and buffer the acids. Calcium and Phosphates can again enter the tooth. The process is strongly facilitated by fluorides.

***A CAVITY results if  
Demineralisation “wins”  
over Remineralisation***



Saliva + Fluoride

Plaque + Sugar



# **CLASSIFICATION OF CARIOUS LESIONS**

# **According to Surface Involved**

- **Pit & Fissure Caries**
- **Smooth Surface Caries**
- **Root Caries**

# **According to Histological extent of Lesion**

- **Enamel Caries**
- **Dentinal Caries**
- **Cemental Caries**

# SMOOTH SURFACE CARRIES



Non-cavitated  
carious lesions  
(enamel)



Cavitated carious lesion

# PIT & FISSURE CARIES



Non-cavitated  
carious lesion (enamel)





Cavitated carious lesion

# ROOT CARIES



Early Carious  
Root Lesions



# ADVANCED ROOT CARRIES



Cavitated root carious  
lesions



# **PROGRESSION OF CARIOUS LESIONS**



- 1. A tooth surface without caries.*
- 2. The first signs of demineralization, a "white spot"*
- 3. Enamel surface has broken down. We have a "lesion"*
- 4. A filling has been made, but the lesion surrounds the filling. This is called "Secondary caries".*
- 5. The caries proceeds and undermines the tooth.*
- 6. The tooth has fractured - an effect of a process which could have been stopped at an early stage!*



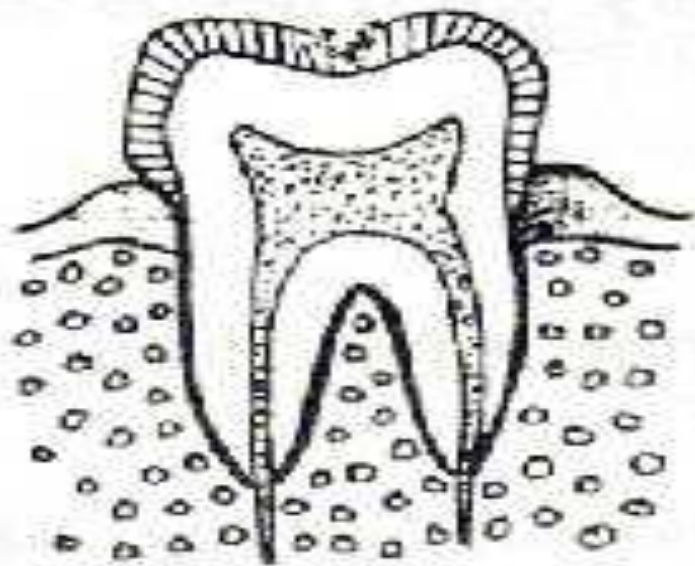
Beginning and advancement of Caries



Deeply destroyed, carious tooth with gangrenous pulp and acute apical periodontitis, submucosal phase.



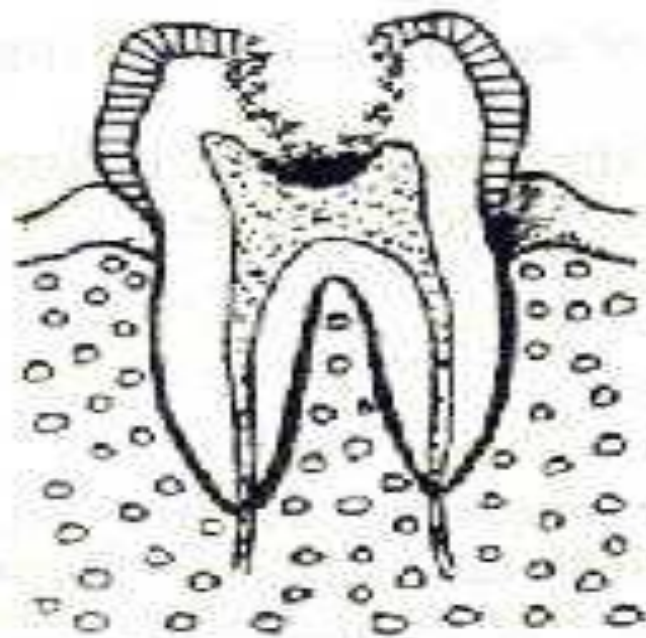
Deeply destroyed, carious tooth with gangrenous pulp and acute apical periodontitis, enossal phase.



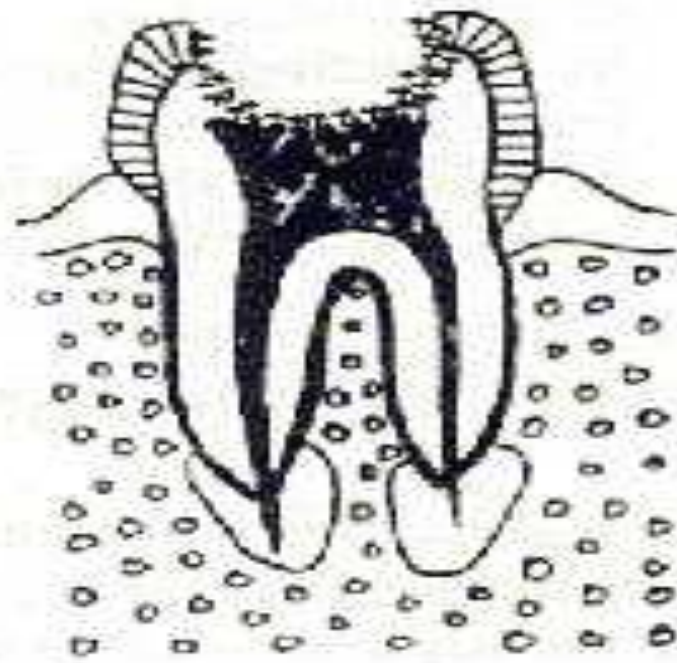
a. Enamel caries



b. Dentine caries



c. Pulp involved



d. Abscess

# **COMPLICATIONS OF DENTAL CARIES**

Caries



Pulpitis



Apical Periodontitis

(Periapical Abscess/ Granuloma/ Cyst)



Osteomyelitis



Cellulitis



# **PREVENTION & CONTROL OF DENTAL CARIES**

- **NUTRITIONAL MEASURES**
- **CHEMICAL MEASURES**
- **MECHANICAL MEASURES**



# NUTRITIONAL MEASURES

- Reduction in Sucrose consumption
- Use of Sugar substitutes
  - ex. Sorbitol, Xylitol, Aspartame
- Reduction in Frequency of In-between Meal Snacks
- Protective elements in Diet
  - Fluoridated Salt/ Milk/ Water
  - Phosphated Diets

# **CHEMICAL MEASURES**

<b>AGENTS</b>	<b>DESCRIPTION</b>
<b>ANIONS</b> Ex. Fluorides	Interfere with bacterial membrane function and glycolytic metabolism
<b>CATIONS</b> Ex. Chlorhexidine	Interfere with bacterial membrane functions and glucose uptake.
<b>NON-IONIC</b> Ex. Triclosan, Listerine	Inhibit membrane enzymes which leads to reduced glucose uptake.
<b>ENZYMES</b>	Interfere with bacterial adhesion and others to enhance the lysozyme activity

# FLUORIDES

## A. Community/ Self Application

- Water Fluoridation
- Fluoridated Milk
- Fluoridated Salt
- Fluoridated Toothpastes
- Fluoridated Mouthwashes

# **PROFESSIONAL APPLICATION**

- Topical Solutions**
- Varnishes**
- Gels**

# MECHANICAL MEASURES

- **Tooth brushing**
- **Oral Prophylaxis**
- **Mouth Rinses**
- **Dental Floss**
- **Oral Irrigators**
- **Pit & Fissure Sealants**



# TREATMENT OF CARIOUS LESIONS

**RESTORATIVE TREATMENT (Filling)**

**ENDODONTICS(Root Canal Treatment)**

**PROSTHODONTIC REPLACEMENT**

**( Crown & Bridge Work)**