CARIES AS AN INFECTIOUS DISEASE
MODULE A: ETIOLOGY-CARIES RISK

REST 528A Operative  #2A
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READINGS: FUNDAMENTALS OF OPERATIVE, SUMMITT ET AL CHAPTER 4
Review of the Caries Process

- Bacterially based
- Plaque = bacterial biofilm that produces **acid** as a byproduct of its metabolism
- Acid $\rightarrow$ diffuses into the tooth
- Acid $\rightarrow$ dissolves the **hydroxyapatite**
Caries

- Host resistance
- Bacterial plaque
- Time
- Diet
Two most important groups of bacteria that predominantly produce lactic acid:

- *mutans streptococci*
- *lactobacilli*
THE CARIES BALANCE

Pathological Factors

BAD

Bad Bacteria
Absence of Saliva (Xerostomia)
Dietary Habits (Poor)

Caries

Protective Factors

SAFE

Saliva and Sealants
Antimicrobials
Fluoride
Effective Diet

Health

Figure 1
Primary caries
pathogenic bacteria

*Mutans*

*Streptococcus*
Lactobacillus acidophilus

Lactobacillus bulgaricus
DECISIONS FOR INTERVENTIONS BASED UPON RISK ASSESSMENT

High risk
Moderate risk
Low risk
TREATMENT PLANNING

Caries Risk Assessment
Periodontal Risk Assessment
Oral Cancer Risk Assessment
Management Strategy

- Dependent on an assessment of:
  - Current/predicted level of **caries risk**
    - Clinical evidence, Plaque control
    - Use of fluoride
    - Saliva
    - Medical, Dental, Dietary and Social history
  - Caries activity in lesions detected
    - Location,
    - rate of progression
    - appearance
Patient History

Medical history

- Conditions/medications affecting salivary flow
- Conditions affecting manual dexterity
- Conditions affecting host response
- Diet
Dental History
- High past caries experience
- Member of high DMF family
- Dental awareness and attendance history
- Symptoms present
- Fluoride exposure
- Oral hygiene regimen
- Diet
Clinical findings which indicate increased risk:

- Large amount of plaque
- High proportion cariogenic bacteria
- Diet rich in fermentable CHO
- High sugar frequency
- Reduced salivary flow
- Low salivary buffering capacity
- Number of restorations
Clinical findings which may indicate increased risk:

- Early signs of caries, eg, white spot lesions
- Newly erupted teeth (mostly 1st molars)
- Exposed root surfaces
- Crowded teeth, rotated teeth
- Deep fissures or other “natural” retentive sites
- Retentive sites due to dental Tx
- Presence of restorations
High Caries Risk:

- 2 or more lesions last 3 yrs
- High DMFS/large # exposed root surfaces
- Poor oral hygiene
- Irregular dental visits
- Elevated S.mutans levels
- Dietary risk factors
- Inadequate salivary flow rate
- Inadequate fluoride exposure
Moderate Caries Risk:

- 1 lesion in past 3 yrs
- Exposed roots
- Fair oral hygiene
- Irregular dental visits
- Incipient lesions
- Orthodontic or prosthetic treatment
Low Caries Risk:

- No caries in past 3 yrs
- Adequate restored surfaces
- Good oral hygiene
- Low sugar diet
- Regular dental visits
Caries as an infectious disease

- Specific Plaque Hypothesis
  - Only limited # of organisms in plaque cause caries
  - Treatment aims to specifically target these bacterial species
  - 2 primary groups of organisms involved
    - Mutans streptococci (caries initiation)
    - Lactobacilli species (caries progression)
Caries as an infectious disease

- Treatment aims to first remove sites for bacterial colonization and then to specifically target cariogenic organisms.
- This is done via restoration of all frank cavitation followed by the short term intensive use of antimicrobials.
Gathering diagnostic information

- Identifying caries risk
  - Low
  - Moderate
  - High
- Current use of fluoride containing dental products
- Saliva testing
- Bacteriologic testing (after all restorations completed)
- Recommendations for preventive treatment after assessment