Healing and Sealing Dental Caries: The Paradigm Has Shifted
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This Afternoon’s Topics

- Caries Management by Risk Assessment (CAMBRA)
- Remineralization with CPP/ACP
- Restoring carious lesions – some considerations
- Ultraconservative caries removal

Dental Caries Defined (from Hurlbutt & Young, 2014):

- Dental caries is a multifactorial, biofilm and pH mediated transmissible disease that affects people of all ages and disproportionally affects certain populations at epidemic proportions.
- Simply restoring cavitated teeth does nothing to resolve the disease.

Caries Management, c. 1976

- Diagnosis = DETECTION
  - the earlier, the better
  - visual, sharp explorer, radiograph
- Etiology
  - acid-producing bacteria
- Prevention
  - plaque removal and diet
- Treatment
  - RESTORE cavitated lesions
  - WATCH non-cavitatd lesions
Caries – Our Present Understanding

- Balance/Imbalance

![The Caries Balance / Imbalance diagram](image)

- Caries Detection vs. Diagnosis
  - di·ag·no·sis (dī-ig-ˈnə-səs) *n.* The art or act of identifying disease from its signs and symptoms
  - Tradition Caries Detection (visual, tactile, radiographic)

Caries Risk Assessment (CRA)

- “A formalized process that involves an analysis of the probability that the number, size, or activity of lesions will change over a specified period of time.” (Young, Fontana, & Wolff 2010)

CRA Systems

- California Dental Association (CDA) CRA
  - 24-item questionnaire – disease indicators, risk factors, protective factors
  - Good validity for ID of extreme- and high-risk adult patients (Domejean, et al. 2011)
  - Includes evidence-based clinical management guidelines based on caries risk levels
  - Adult and child versions

- American Dental Association (ADA) CRA
  - Fillable form downloadable from ADA website
  - Checklist of 19 factors associated with caries
  - Adult and child versions
  - No published studies on validity
  - No published ADA guidelines for caries management associated with ADA CRA
• American Association of pediatric Dentistry (AAPD) CRA
  o 14 factors to evaluate for low, moderate, or high risk classification in children
  o Also a CRA form for physicians and non-dentists for 0–3 years of age
  o Includes clinical guidelines that provide evidence-based preventive and treatment
    recommendations based on the risk level determined
  o Moderate predictive value (Yoon, et al. 2013)

• Cariogram
  o Software program developed at Malmö University in Sweden
  o calculates actual chance to avoid new cavities and offers some guidance in reducing the
    risk for developing new caries disease
  o Good validity for children and elderly adults per published studies (Campus, et al. 2012;
    Hansel Petersson et al. 2003)

Remineralization with CPP/ACP

• Enamel white spots – why they matter and what to do about them

Restoring Caries Lesions – The Role of Glass Ionomer

Sandwich Technique

• Use composite resin and glass ionomer *TOGETHER* in large posterior direct restorations to...
  - Eliminate post-op sensitivity caused by shrinkage and local gaps in dentin-resin interface
  - Improve seal at margins lacking enamel
  - Reduce restoration placement time

• Use composite resin and glass ionomer as *FUNCTIONALLY-COMPATIBLE ANALOGUES* for enamel
  and dentin
  - Replace DENTIN with GLASS IONOMER
  - No etching → no potential for incomplete resin seal
  - Eliminates technique sensitivity of resin-dentin bonding
  - Chemical bond to dentin → high affinity for dentin surface
  - No shrinkage stress on interface
  - Fluoride release
  - Resistance to microleakage on dentin BETTER than resin bonding
  - BULK PLACEMENT → eliminates time-consuming incremental layering in large cavities
  - Replace ENAMEL with COMPOSITE RESIN
  - Occlusal and proximal wear resistance
  - Translucency/esthetic
  - Best restorative seal on etched enamel
- Persistent occurrence of post-op sensitivity? “Closed Sandwich” technique
  - Cover all dentin surfaces with glass ionomer base/restorative
  - Leave as little as 1 mm depth available for composite
  - Etch/prime/bond, and place composite as usual

- No enamel on gingival margin? “Open Sandwich” technique
  - Cover all dentin surfaces with glass ionomer base/restorative, AND...
  - Use GLASS IONOMER for the gingival increment of the restoration
    - Place glass ionomer along matrix at gingival margin
    - Stop short of proximal contact area (reserve this area for composite)
  - Glass ionomer exhibits better resistance to microleakage on dentin margins than composite
Ultraconservative Caries Removal – A New Standard?

- “Partial caries removal is...preferable to complete caries removal in the deep lesion, in order to reduce the risk of carious exposure.”

- Frank caries was arrested in sealed restorations

- “There is substantial evidence that removing all vestiges of infected dentin from lesions approaching the pulp is not required for caries management.”

Caries Removal – A Paradigm Shift

- Remove all soft dentin
- STOP when firm/dry to avoid pulp exposure
- DON’T excavate to point of pink, “blushing”
- Seal in remaining bacteria with glass ionomer

References


Young DA, Featherstone JD. Caries management by risk assessment. Community Dent Oral Epidemiol. 2013 Feb;41(1)


- February and March, 2003
- October and November, 2007
- October and November, 2011