Evidence Based Concepts in Disease Management

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Our office

- Multi-specialty group practice
- Westborough, MA
- 13 operatories
- 14,500 patients of record
- Accept all insurances, including medicaid
- Prevention oriented
- Evidence-based protocols of care
- Minimally invasive dentistry
  - Emphasis on remineralization of caries
  - Non surgical management of periodontal disease
Todays Topics

• Philosophy and Science
• Surgical model of care vs. Wellness model of care
• CAMBRA basics
• Non Surgical Disease Management Protocols
• Patient engagement
• How to incorporate Disease Management into practice
The silent epidemic

“What amounts to a silent epidemic of oral diseases is affecting America’s most vulnerable citizens: poor children, the elderly, and many members of racial and ethnic minority groups.”

The Surgeon General 2000
Our CREDO

We will **partner** with our patients to reduce their risk of future disease by eliminating or reducing those risk factors that are responsible for creating new disease.
Re-Engineering Practice to Improve Care

Current Surgical Care Model

- Cavity
- Drill and Fill
- 6-Month Recall for Cleaning

Repeat as necessary
Re-Engineering Practice to Improve Care

DentaQuest Oral Health Center Disease Management Care Model
CAMBRA
• Caries Management By Risk Assessment

Pathological Factors
• Acid-producing bacteria
• Frequent eating/drinking of fermentable carbohydrates
• Sub-normal saliva flow and function

Protective Factors
• Saliva flow and components
• Fluoride – remineralization
• Antibacterials:
  – Chlorhexidine, xylitol

Caries
No Caries

Featherstone, Community Dentistry Oral Epidemiology, 1999
Caries Control Flowchart

Patient Refuses Prescription therapies

Refusal Codes captured in database

Caries Risk continues as Moderate, High or Extreme and patient continues to refuse preventive therapies (non-compliant)

Code NCOM (noncompliant) entered in database

Patient accepts disease management treatment plan, including Rx. therapies

Regular Service and diagnostic codes entered in database

Caries Risk continues as Moderate, High or Extreme and patient is compliant with preventive therapies

Re-assess caries risk
Prescription therapies for disease management
Apply fluoride varnish
Appropriate codes entered into database
Self-management support

Moderate, High, or Extreme Risk Caries Patients

Risk related Recommended prescription therapies:
- Chlorhexidine
- Clinpro 5000
- Xylitol 6-10 grams daily
- Fluoride varnish 1-3 applications initially
- Risk related recall scheduled

Three to Four month Caries Recall Monitoring Visit

DECREASED Caries Risk

Proceed to low risk preventive recall schedule based on patient preferences
Traditional Disease Management

We can control this disease by reducing S Mutans and Lactobacilli

In fact - it's not all about the bugs
Plaque hypothesis

Ecological Plaque Hypothesis

Extended Ecological Plaque Hypothesis

Figure 7. The Pattern of Biofilm Development. The stages of biofilm maturation are: attachment, initial colonization, secondary colonization, and mature biofilm.
BIOFILM

pH is KEY
## pH Examples

**DEMINERALIZATION BEGINS**

<table>
<thead>
<tr>
<th>pH</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Battery acid, pool acid</td>
</tr>
<tr>
<td>1</td>
<td>Hydrochloric acid secreted by stomach lining</td>
</tr>
<tr>
<td>2</td>
<td>Lemon Juice, Vinegar, Coca Cola, and Pepsi (2.3)</td>
</tr>
<tr>
<td>3</td>
<td>Grapefruit, Orange Juice, Soda, Powerade (2.7)</td>
</tr>
<tr>
<td></td>
<td>Diet Coke (3.0), Gatorade (3.1), Fruit Juice (3.5)</td>
</tr>
<tr>
<td>4</td>
<td>Tomato Juice, Sparkling Mineral Water (3.9), Beer and Wine (4)</td>
</tr>
<tr>
<td>5</td>
<td>Soft drinking water, black coffee, apricot yogurt (5.1)</td>
</tr>
</tbody>
</table>

**REMINERALIZATION BEGINS**

<table>
<thead>
<tr>
<th>pH</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Saliva, Milk (6.8)</td>
</tr>
<tr>
<td>7</td>
<td>“Pure” water</td>
</tr>
<tr>
<td>8</td>
<td>Sea water</td>
</tr>
<tr>
<td>9</td>
<td>Baking soda</td>
</tr>
<tr>
<td>10</td>
<td>Milk of magnesia</td>
</tr>
<tr>
<td>11</td>
<td>Ammonia solution</td>
</tr>
<tr>
<td>12</td>
<td>Soapy water</td>
</tr>
<tr>
<td>13</td>
<td>Bleaches, over cleaner</td>
</tr>
<tr>
<td>14</td>
<td>Liquid drain cleaner</td>
</tr>
</tbody>
</table>
The frequency of sugar consumption is important!

One sugar cube = One teaspoon

Kaplowitz, G. an Update on the Dangers of Soda Pop.
Dental CE Digest
Eleven years of Learning's Today’s Gems

• CAMBRA
• Non Surgical Disease Management
• Patient Engagement
• Creating a culture of Disease Management
CAMBRA

- Only validated Caries Risk Assessment form
- Readily adaptable for electronic records
- Relies on visual balance
- Well documented
- Clear protocols
- Evolving system
# Caries Risk Assessment Form — Children Age 6 and Over/Adults

<table>
<thead>
<tr>
<th>Disease Indicators (Any one “YES” signifies likely “High Risk” and to do a bacteria test**)</th>
<th>YES = CIRCLE</th>
<th>YES = CIRCLE</th>
<th>YES = CIRCLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible cavities or radiographic penetration of the dentin</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiographic approximal enamel lesions (not in dentin)</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White spots on smooth surfaces</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restorations last 3 years</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Factors (Biological predisposing factors)</th>
<th>YES = CIRCLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS and LB both medium or high (by culture**)</td>
<td>YES</td>
</tr>
<tr>
<td>Visible heavy plaque on teeth</td>
<td>YES</td>
</tr>
<tr>
<td>Frequent snack (&gt; 3x daily between meals)</td>
<td>YES</td>
</tr>
<tr>
<td>Deep pits and fissures</td>
<td>YES</td>
</tr>
<tr>
<td>Recreational drug use</td>
<td>YES</td>
</tr>
<tr>
<td>Inadequate saliva flow by observation or measurement (**If measured, note the flow rate below)</td>
<td>YES</td>
</tr>
<tr>
<td>Saliva reducing factors (medications/radiation/systemic)</td>
<td>YES</td>
</tr>
<tr>
<td>Exposed roots</td>
<td>YES</td>
</tr>
<tr>
<td>Orthodontic appliances</td>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protective Factors</th>
<th>YES = CIRCLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lives/work/school fluoridated community</td>
<td>YES</td>
</tr>
<tr>
<td>Fluoride toothpaste at least once daily</td>
<td>YES</td>
</tr>
<tr>
<td>Fluoride toothpaste at least 2x daily</td>
<td>YES</td>
</tr>
<tr>
<td>Fluoride mouthrinse (0.05% NaF) daily</td>
<td>YES</td>
</tr>
<tr>
<td>5,000 ppm F fluoride toothpaste daily</td>
<td>YES</td>
</tr>
<tr>
<td>Fluoride varnish in last 6 months</td>
<td>YES</td>
</tr>
<tr>
<td>Office F topical in last 6 months</td>
<td>YES</td>
</tr>
<tr>
<td>Chlorhexidine prescribed/used one week each of last 6 months</td>
<td>YES</td>
</tr>
<tr>
<td>Xylitol gum/lozenges 4x daily last 6 months</td>
<td>YES</td>
</tr>
<tr>
<td>Calcium and phosphate paste during last 6 months</td>
<td>YES</td>
</tr>
<tr>
<td>Adequate saliva flow (&gt; 1 ml/min stimulated)</td>
<td>YES</td>
</tr>
</tbody>
</table>

**Bacteria/Saliva Test Results: MS: LB: Flow Rate: ml/min. Date:

VISUALIZE CARIES BALANCE
(Use circled indicators/factors above)
(EXTREME RISK = HIGH RISK + SEVERE SALIVARY GLAND HYPOFUNCTION)
CARIES RISK ASSESSMENT (CIRCLE): EXTREME HIGH MODERATE LOW

Doctor signature/#: ___________________________ Date: ___________________________
CAMBRA Disease Indicators

- Visible cavities
- Radiographic approximal enamel lesions
- White spots on smooth surfaces
- Restoration in the last 3 years (due to caries)
CAMBRA Risk Factors (biological predisposing factors)

- Visible heavy plaque on teeth
- Frequent snacking (>3x daily between meals)
- Deep pits and fissures
- Recreational drug use
- Inadequate saliva flow by observation or measurement
- Saliva reducing factors (medications/radiation/systemic)
- Exposed roots
- Orthodontic appliances
CAMBRA Protective Factors

- Lives/works/school in fluoridated community
- Fluoride toothpaste at least once daily
- Fluoride toothpaste at least twice daily
- Fluoride Mouthrinse (0.05% NaF) daily OTC
- 5,000 ppm F fluoride toothpaste daily (Rx)
- Fluoride varnish in last 6 months
- Office F topical in last 6 months
- Chlorhexidine prescribed/used 1 week each of last 6 months
- Xylitol gum/lozenges 4x daily last 6 months
- Calcium and phosphate paste during last 6 months
- Adequate saliva flow (>1ml/min stimulated)
CAMBRA Risk Assessment for Children Age 0-5

Includes a Parent/Caregiver Interview

• Caries Risk Indicators-Parent Interview
• Caries Risk Factors- (Biological) Parent Interview
• Protective Factors (Non-Biological) Parent Interview
• Protective Factors (Biological) Parent Interview
• Caries Risk Indicators/Factors – Clinical Examination of the Child
CAMBRA

SOME CASE STUDIES
• Can your practice incorporate CAMBRA?
• Small digestible steps
• Motivate your staff
• Engage your patients
Non Surgical Disease Management

_informed consent for remineralization_

- Benefits of monitoring status of lesions
- Risks of monitoring status of lesions
- Consequences of no treatment
- Engaging patients for better compliance
Non Surgical Disease Management

So I’m at risk, what now?

Detailed, take home patient instructions

Low Risk

Moderate Risk

High Risk

Extreme Risk
Non Surgical Disease Management

Why Chlorhexidine is important!

- Antimicrobial oral rinse
- Reduces both aerobic and anaerobic bacteria
- *Neutralizes* decay causing acids
- Intended for initial and maintenance therapy
Non Surgical Disease Management

Why Clinpro 5000 is important!

• Clinpro 5000 is a prescription-strength toothpaste that contains 5000 ppm fluoride with tri-calcium phosphate.

• Treatment of “white spot lesions” with fluoride can stop the progression of tooth decay and reverse the decay process through remineralization.

• *Neutralizes* the acids that damage the enamel.
Non Surgical Disease Management

Why Xylitol is important!

• Helps reduce the development of dental cavities
• Aids in reducing plaque formation
• Stimulates saliva flow
• Promotes *neutral* pH
• Xylitol also inhibits the growth of bacteria associated with cavities
Non Surgical Disease Management

Why fluoride varnish is important!

• Fluoride varnish adds additional protection for those at increased risk of tooth decay by strengthening the tooth enamel
• Fluoride works by stopping and even reversing the decay process.
• When the enamel of a tooth is partially demineralized, fluoride can help remineralize the tooth enamel.
• Remineralized enamel contains more fluoride and is more resistant to decay.
Non Surgical Disease Management

Why Sealants are Important!

• Recommended for molars or premolars that have deep pits and fissures

• Sealants can save time, money, and the discomfort sometimes associated with dental fillings.

• When a child or adult is at high risk, it is recommended to seal a child/or adult’s premolars, as well as molars.

  Consider using glass ionomer sealant material, it continually releases fluoride
Non Surgical Periodontal Therapy

- PSR score of 3 or 4 triggers our non-surgical perio protocol
- Quadrant scaling and root planing
- Systemic antibiotics
- Chlorhexidine rinses
Non Surgical Periodontal Therapy

- Follow up
- Non responsive sites
- Success!
Success Story One!

• We assisted a special needs patient in remineralizing white spot lesions on the facial aspect of teeth #8 and #9.

• Over a period of 12 -18 months these lesions remineralized to sound enamel.

• This patient also participated in our self management support program, set his own goals to eliminate soda thereby helping to neutralize the salivary pH and facilitate remineralization.
Success Story Two!

- A student came to the DentaQuest Oral Health Center for a second opinion, she had been diagnosed as needing six fillings.
- She has complied with our Disease Management program including:
  - fluoride varnish applications, Clinpro 5000 toothpaste, Xylitol 6-10 grams daily, and Chlorhexidine rinses.
- As our patient of record for over 10 years these six incipient lesions have not progressed or needed restoration.
- Patient continues to develop healthy goals through self management support counseling!
Why drill when you can heal!
Success Story Three!

- A middle age patient benefits from enhanced disease management protocols of care.

- Recent evidence based findings have shed light on the role of biofilm and pH in caries.

- With a clear understanding of the impact of pH on the biofilm our patient has made healthier choices!

  Caries are inactive, smiles are back!
Patient Engagement **Before** Appointment

- Web site informs of our unique approach to care.
- Welcome package mailed to patient prior to 1\textsuperscript{st} visit with information on how this appointment may feel different.
- Reception area has extensive information on the principles of evidence based dentistry and our philosophy of care
Patient Engagement During Appointment

- Risk assessment and discussion of risk factors
- Appropriate prescription therapies prescribed and take home instruction sheet provided
- Customized and sequenced treatment plan designed to eliminate greatest risk factor (existing disease)
- Self Management Support visits scheduled to begin goal setting for optimal oral health
Patient Engagement After Appointment

• Within 1 week of visit follow up letters sent to patient summarizing our risk based findings and recommendations
• Electronic communication used to remind patients of appointments and encourage compliance.
• Using our patient centered registry we monitor completion of initial caries control (elimination of cavitated lesions)
• At re care appointments we reassess risk factors and partner with patients to reach a low risk level
Now what did they tell me?

*Patient take home information:*

- Instruction sheet for all prescription therapies
- Home care protocols customized by risk level
- FAQ’s on prescription therapies
- Informed consent for remineralization
Patient Engagement

What is Self-management support?

“Self-management support is the care and encouragement provided to people with chronic conditions … to help them understand their central role in managing their illness, make informed decisions about care, and engage in healthy behaviors”.

Self Management Support

*Smart goals*

Excessive soda consumption
Patient engaged in establishing goals and a timeline to reduce this risk factor

*Healthy action plans*
Patient Engagement

_We will partner with our patients’ to reduce their risk of future disease_

- Perception of a different kind of care
- Contracts for wellness
- Promise to always perform the most minimally invasive procedure
Creating a Culture of Disease Management

- Engaging staff through education and empowerment
- Introduce concepts gradually
- Envision gradual change over many months
Creating a Culture of Disease Management

Loose those explorers

- More damage
- Cross contamination
Yes—an explorer is a time-tested tool for caries detection

No—use of an explorer can lead to misdiagnosis and disrupt remineralization

POINT

The results of several studies indicated that use of the dental explorer was of limited value for the detection of occlusal caries.

COUNTERPOINT
Creating a Culture of Disease Management

- Calibrating providers
- Diagnostic coding
- Building a disease management registry
Creating a Culture of Disease Management

• Create champions
• Empower providers
• Cultural change takes time and patience
• Speak as one voice
Patient Centered
Contact Us

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and

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Research Hygienist, Team Leader
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References

• Caries Management by Risk Assessment (CAMBRA)  
  http://www.cdafoundation.org/who_we_are/publications#journal

• American Dental Association  
  http://www.ada.org/prof/resources/topics/caries.asp#additional

• International Caries Detection and Assessment System (ICDAS)  
  http://www.ICDAS.org

• 3 M ESPE Dental Products, 800-634-2249,  
  www.3MESPE.com/preventive care

• Oral Biotech, 800-503-0625, info@carifree.com

• ADA Evidence Based Guidelines and information on risk assessment, ebd.ada.org