Risk vs. Results: Periodontal Instrumentation for the Advanced Practitioner

COURSE DESCRIPTION

This course is based on current scientific literature providing the clinician with evidence based tools and strategies which include the use of periodontal risk assessment protocols, salivary diagnostics, incorporation of the dental exam and progressive treatment planning. Advantages of ultrasonic instrumentation will be examined as demonstrated in the current research for obtaining successful clinical outcomes while providing comprehensive patient care.

COURSE OBJECTIVES

Upon completion of this course, participants will be able to:

- Develop an understanding of the Evidence-based Decision Making (EBDM) process while providing a mechanism for staying current in practice by addressing gaps in knowledge so that the clinician can provide the best care possible.

- Understand the unique relationship between oral and systemic conditions utilizing the patient’s risk factors including current medical status, dental & periodontal considerations, and total patient history.

- Discuss the use salivary diagnostics for the presence of diabetes, C-reactive protein and other biomarkers which play a role in periodontal disease.

- Develop an understanding of the role ultrasonic instrumentation plays in the delivery of successful preventive and therapeutic debridement through an examination of the current evidence based research.
Pursuing Excellence in Periodontal Therapy: Achieving Positive Clinical Outcomes

Evidence Based Approach

Evidence Based Approach: A decision making process which integrates
- Best available scientific evidence
- Clinician’s experience & expertise
- Patient’s treatment needs and preferences
to make the best possible decision about appropriate care for specific clinical circumstances.

Ref: ADA Position Statement on Evidence Based Dentistry

Accessing, Utilizing and Interpreting the Research Results

Evidence Based Research
- Define the levels of evidence
  - Primary vs. Secondary Research
    - Clinical Trials
    - Systematic Reviews, Meta-Analysis
  - Elements of a Research Report
    - Questions to ask
    - Clinical vs Statistical Significance
- Where to Find the Research
  - Mobile Apps – search by name below
    - Ebsco
    - Pub Med
  - Mobile Site ADA – EBD http://mobile.ebd.ada.org/default.aspx
    - Systematic Reviews
    - Links to PubMed
    - Critical Summaries
- Interpreting Results
  - Questions to ask about study
    - Who published
    - Funding
    - Study structure
  - Clinical vs. Statistical significance
    - P value
    - Clinical application

The Assessment Process

Risk Based Approach
- Recognizes patients at higher risk for periodontal disease
  - Patients who are more likely to develop periodontal disease
    - Modifiable – ex. smoking
    - Non-modifiable - genetics
  - Patients with systemic conditions that can be significantly affected by oral inflammation
    - Diabetics
    - CVD
    - Pregnancy
- Biofilm and Host Response
  - Biofilm formation and Role
  - Inflammatory Response
- Salivary diagnostics
  - Chair Side Testing
    - Bacterial loads - http://www.oraldna.com/
    - Genetics - http://www.oraldna.com/
    - Future capabilities
• Progressive Treatment Planning
  o 4 Part Plan
    o Behavior Modification  http://www.ipadrhd.com/  Excellent resource for Ipad OHI
      • Smoking Cessation
    o Clinical Procedures
      • Concurrent restorative therapy
    o Lab Testing
      • CRP
    o Systemic Options
      • Antimicrobial or host modulation therapy
  o Documentation and Letter to Patient *(Attached at the end) -http://previser.com/
  o and http://www.youtube.com/watch?v=hlTNdnFejVk

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<th>Comprehensive Periodontal Therapy</th>
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Research published 1982-1991 initiated instrumentation paradigm shift from definitive root planing to periodontal debridement based on findings that:
- Endotoxins are loosely adherent to root surface
- Extensive cementum removal is unnecessary
- Cell-activating proteins which stimulate attachment are found within cementum

Periodontal Debridement
- creates a biologically-acceptable root surface that favors healing
- objective of instrumentation is to disrupt/remove biofilm, calculus, endotoxins from root surface & subgingival environment (vs. removing part of root surface itself)
- success of instrumentation is defined by positive tissue response (vs. smoothness of root surface)

Debridement Therapy
- Includes
  o Scaling: hard deposit removal
  o Root Debridement: biofilm and entotoxin removal
- Preventive or Therapeutic intervention
  o Preventive before perio destruction initiates
  o After initiation of periodontal destruction, it is a therapeutic intervention
    • Definitive or complete treatment
    • Preparatory or initial therapy prior to surgery

Successful Debridement ↔ Thoroughness of Instrumentation
Criteria for thorough instrumentation:
- Ability of instrument to make contact with involved root surface
- Ability of instrument to disrupt/remove deposits
- Ability of instrument to maintain integrity of root surface
- Accomplishment of the above in a manner that is comfortable to patient and ergonomic for clinician

Successful debridement can be accomplished by manual or ultrasonic instrumentation; however, ultrasonic instrumentation is superior to hand instrumentation in meeting most of this criteria
## Ultrasonic Instrumentation

### Ultrasonic Technology

<table>
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<tr>
<th>Mechanism</th>
<th>Description</th>
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<tr>
<td>Mechanical</td>
<td>• Rapid movement of tip mechanically removes deposits</td>
</tr>
<tr>
<td>Irrigation</td>
<td>• Lavage created by water flow facilitates removal of biofilm &amp; endotoxins</td>
</tr>
<tr>
<td>Cavitation</td>
<td>• Implosion of minute bubbles releases energy which has potential to disrupt cell wall of bacteria</td>
</tr>
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</table>
| Acoustic Microstreaming | • Forceful flow of cavitating fluid  
|                    | • Enhances debridement of root surface beyond area actually contacted by tip |
| Frequency          | • Number of cycles (one complete stroke path) per second  
|                    | • Frequency correlates to the active tip area  
|                    | • *Example:* 30kHz = 4.2mm of active tip area |
| Power              | • Length of the stroke path  
|                    | • As the power increases, the stroke becomes longer, increasing amplitude  
|                    | • Lowest *Effective Power* should be used |
| Piezoelectric technology | • Electrical energy activates piezo-ceramic disks in handpiece  
|                    | • 25,000 to 42,000 cps  
|                    | • Linear movement  
|                    | • Only lateral sides active |
| Magnetostrictive technology | • Electrical energy is applied to metal stack  
|                    | • 25,000 to 30,000 cps  
|                    | • Elliptical movement  
|                    | • All sides are active |
| Sonic Technology   | • Compressed air runs handpiece to activate tip  
|                    | • 2500 to 16,000 cps  
|                    | • 1 power level  
|                    | • Circular movement  
|                    | • All sides are active |
# Ultrasonic Instrumentation Guidelines

<table>
<thead>
<tr>
<th>Magnetostrictive Inserts</th>
<th>Standard Diameter</th>
<th>Slim Diameter</th>
<th>Perio Specialty Design</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Power – Low to High</td>
<td>Power – Low to Medium</td>
<td>Furcation - Furcation access</td>
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</table>

**Single bend (#10)**
- Gross removal of mod-hvy calculus & stain
- Supragingival or Subgingival use

**Straight**
- Light calculus and/or biofilm debridement in pockets **less than** 4mm
- Light calculus & biofilm debridement in anterior teeth with pockets **>** 4mm

**Double bend (#100)**
- Gross removal of mod-hvy calculus & stain
- Supragingival or Subgingival use

**Curved**
- Light calculus and/or biofilm debridement in pockets **greater than** 4mm

**Triple bend (#1000)**
- Gross removal of moderate to heavy tenacious calculus & stain
- Improves access to line angles and interproximal areas
- Supragingival use only

**Beavertail (#3)**
- Heavy supragingival calculus & stain

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<th>Dental Specialty Inserts</th>
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1. Endodontic – canal debridement, cleansing, irrigation; for dental use only
2. Diamond Coat – removal of tenacious calculus and soft tissue in surgical treatment settings; for surgical use only

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<tr>
<th>Piezoelectric Tips</th>
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- Subgingival Technique “Vertical Adaptation”
- Positioned like a probe
- Facilitates access of active area to depth of pocket
- Predominantly horizontal strokes on buccal/lingual surfaces
- Oblique strokes on interproximal surfaces

- Contact Area/Supragingival Technique “Oblique Adaptation”
- Positioned like a hand instrument
- Predominantly oblique strokes
- Vertical strokes thru contact area

- Calculus removal assessment
- Assess with probe, explorer, and/or inactivated tip

- Ultrasonic Lavage/Rinse
- Water
- Chlorhexidine
- Povidone-iodine
- Other

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**Clinical Application**

- Subgingival Technique “Vertical Adaptation”
- Positioned like a probe
- Facilitates access of active area to depth of pocket
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- Calculus removal assessment
- Assess with probe, explorer, and/or inactivated tip

- Ultrasonic Lavage/Rinse
- Water
- Chlorhexidine
- Povidone-iodine
- Other
• Deplaquing
  o Instrumentation in Healthy Sulci
    o Biofilm Removal
    o Less traumatic
  o Perio Maintenance
    o Biofilm Removal
    o Ultra Thin Insert

• Lasers in Soft Tissue Management
  o Uses and Contraindications
    o Disinfection
    o Tissue modification
  o Types of Lasers
    o Diode

• Pain Control
  o Perceived Pain
  o Non – injectable options

• Medical and Dental considerations
  o Medical –
    o Respiratory problems
    o Swallowing difficulties
    o Transmissible diseases
    o Pacemaker considerations
  o Dental
    o Exposed Dentin
    o Demineralization
    o Implants

• Ergonomic Considerations
  o Cord and insert–
    o Grasp
    o Research Evaluated

  o Water Control
    Suctioning Options/Techniques – Isolite/Isodry – Mr. Thirsty – Small or ½ length HVE – Blue Boa
To You, Our Valued Patient,

As you know, researchers continue to uncover medical conditions that are related to periodontal disease. In light of this fact, our intention is to work cooperatively with your physician to offer you the best care available when it comes to managing chronic diseases like periodontal disease, cardiovascular diseases and diabetes. In addition, many patients are unaware that they are at risk for the development of disease.

With that in mind, we are pleased to be able to provide you with four safe, convenient and affordable finger-nick blood tests:

- **Diabetes Risk Assessment** (instant glucose & HbA1c)
- **CRP or C-Reactive Protein** (tests for high levels of inflammation)
- **Metabolic Profile** (Total Cholesterol, LDL, Triglycerides, HDL, Glucose, CRP, HbA1c & Fasting Insulin)
- **Vitamin D test**

During your appointment today, your clinician will talk with you about your level of risk and answer any questions you may have about chair side blood testing.

With your good health in mind,

Dr. James Wright & Staff

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Burke FJT et al. Br Dent. J.


Centers for Disease Control and Prevention. Guidelines for Infection Control in Dental Health-Care Settings – 2003. MMWR 2003; 52[No. RR-17]:[inclusive page numbers].


Fundamentals of Periodontal Instrumentation and Advanced Root Instrumentation - 7th Edition by Jill S. Nield-Gehrig


Gorman, Park and Dell, Time Magazine, Feb 2004


