Overview of Periodontics for the General Practitioner
- Initial Therapy

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Reference Text

  - by Francis Serio and Charles Hawley
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  - Great narratives, clinical photographs, and online access

Many of the slides from this presentation are found in this source!
Overview of Presentation #2

1. Questions from Presentation #1
2. Initial Periodontal Therapy
   1. Scaling/Root Planing/ultrasonics vs. hand instruments
3. Occlusal Factors
4. Recall Maintenance
5. Systemic Disease and Periodontal Therapy
6. Medico-legal Considerations
Preferred Sequence of Periodontal Therapy

1. Emergency Phase

2. Etiotrophic Phase

3. Maintenance Phase

4. Surgical Phase - - - - - Restorative Phase
Initial Therapy

**Nonsurgical Therapy**

- Procedures not classified as surgical procedures.
  - Control of biofilm and etiology of disease
  - Scaling and root planing to disrupt and remove biofilm and calculus. Although this is a nonsurgical procedure, the gingival attachment to the tooth and underlying bone may be invaded.
  - Local antimicrobial delivery — systemic and local antibiotics
  - Occlusal therapy
  - Elimination of local plaque-retentive factors
  - Control of systemic factors (smoking, diabetes, stress) where possible
Pathway to periodontal disease

- **Presence of Bacteria**
  - *Actinobacillus actinomycetemcomitans*
  - *Porphyromonas gingivalis*
  - *Bacteroides forsythus*

- **Endotoxin: Lipopolysaccharide**
  - Released from gram (-) bacteria
  - Initiates host response
  - Acts with host factors > bone resorption
Periodontal Therapy

- **Treatment goals**
  - Resolve inflammation
  - Arrest disease progression
  - Maintain esthetics
  - Regenerate lost periodontium
  - Create an environment that deters recurrent disease
  - Maintain periodontal health
Scaling and Root Planing

- Scaling and root planing is the cornerstone of almost all initial therapy treatment plans for periodontitis.
- It may be the only mechanical therapy required for the management of mild (1-2 mm clinical attachment loss, pockets to 6 mm in depth) chronic periodontitis.
- While scaling and root planing procedures are utilized routinely, they remain among the most technically demanding procedures performed in periodontics.
- When performed with optimal access and skill, scaling and root planing will produce a decrease in gingival inflammation, a reduction in periodontal probing depths, and a gain in periodontal attachment.
Definitions

- **Scaling**: Mechanical removal of plaque, calculus and stains from crown and root surfaces

- **Root planing**: More definitive...time consuming scaling type procedure designed to remove cementum and/or dentin

  - Drisko, C., Periodontology 2000,
  - Dec. 1996
Before Scaling
Post scaling
What Is Endotoxin and Where Does It Come From?

Endotoxin is the lipopolysaccharide component of the outer membrane of Gram-negative cell walls.

Endotoxin will produce a severe local inflammatory reaction when injected experimentally in tissue.
Marginal Periodontitis

- Subgingival calculus deposits are firmly attached to and interlock with dentin and root surface irregularities.
Detecting Subgingival Calculus
Detecting Subgingival Calculus
## What instruments to use where

### SUGGESTED SCALING AND ROOT PLANING INSTRUMENTS AND APPLICATIONS

<table>
<thead>
<tr>
<th>Application</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supragingival calculus removal</td>
<td>Scalers – Jacquette 34/35, Taylor</td>
</tr>
<tr>
<td>Universal scaling and root planing</td>
<td>Columbia 4R/4L or 13/14, McCall's 17S/18S</td>
</tr>
<tr>
<td>Interproximal surfaces of anterior teeth</td>
<td>Gracey 1/2, 3/4</td>
</tr>
<tr>
<td>Interproximal surfaces of posterior teeth</td>
<td>Gracey 11/12 (mesial), Gracey 13/14 or 15/16 (distal)</td>
</tr>
</tbody>
</table>
Scaling and Root Planing
Initial Therapy

- Patient with plaque-induced gingivitis.
Initial Therapy

- Three weeks following compliance with excellent patient hygiene
Initial Therapy

- Gingival inflammation is a combination of acute and chronic changes.
Initial Therapy

- Root planing with curettes has largely resolved the inflammation.
Initial Therapy

- Subgingival calculus deposits and related inflammation.
Initial Therapy

- Four weeks after initial therapy
Initial Therapy

- Pocket reduction following scaling and root planing
Initial Therapy

- Gross amounts of plaque and calculus.
Initial Therapy

- Radiographs confirm a hopeless prognosis of the tooth.
Initial Therapy

- Removal of hopeless teeth
Initial Therapy

- Deep pockets seen on the distal of upper left first molar.
Initial Therapy

- Tooth #4 shows periodontal remodeling after extraction of #3.
- Pocket depth improvement noted on Distal of tooth #4.
Initial Therapy

- Caries removal and root canal therapy
Challenges to Hand Instrumentation

- Teeth with root concavities and grooves tend not do as well as flat surfaces post SRP with hand instruments.
New techniques

- Changing from Hand Scaling and Root Planing to Powered Ultrasonic Debridement
- Use powered Ultrasonic scalers for about 90% of the cleaning
Ultrasonic Technology

- 1943: originally designed for cavity preparation
- 1957: shift to tooth scaling use
Ultrasonics

- Correct use: gross calculus & stain
- Better time efficiency; less operator fatigue
- Hand planing follow-up is not always necessary
Instumentation: Furcations

- Better access into furcations (Oda 1989)
- No difference 16 months post treatment with hand vs. ultrasonics (Schrorer 1991)
- Superior to hand instruments (Takacs 1993)
Ultrasonics Reduce Bacteria

- Complete kill of motile rods after 60 seconds (Thilo, 1987)
- Sonics and ultrasonics reduced microflora by 88% (Baehni 1992)
- As effective as hand instruments (Oosterwaal 1987, Breninger 1987)
Cavitron

- Not as portable
- Elliptical motion
- Standard and slimline tips

Automatically maintains the scaler’s power and frequency settings as it comes in contact with the tooth.
Cavitron set-up

- The handpiece must be filled with water before the instrument is inserted
Patient Comfort

- Small, probe like tips: patients comfortable without anesthesia (Kawanami 1988)
- Temperature sensitivity can be controlled by reducing water flow (Chapple 1992)
Power Settings

- high power for initial debridement if heavy calculus
- Low power for fine debridement
- Thin tips may wear out prematurely if used for heavier calculus and stain
Adaptation

- The point of the tip should not be adapted at a 90° angle
- Light pressure should be used
- Only the last 1-2 mm of the tip does any work
Adaptation

- Curettes: specific cutting edge
- Ultrasonic and sonic tips can be activated with any side in contact with the tooth
- The length of the tip is held parallel to the tooth surface
- The point of the tip should not be adapted at a 90° angle
- The tip can build up heat rather quickly if held against soft tissue such as the lip or cheek.
Ultrasonic Technique

- Brush away calculus with sweeping cross strokes
- Largest metal mass possible at the lowest power possible for efficiency and comfort
Ultrasonic Technique
Ultrasonic Technique
Current Options

- **Micro-ultrasonic (thinline) tips**
  - Longer, thinner
  - Designed for fine debridement
Ultrasonics with Antimicrobials

- 0.12% chlorhexidine + ultrasonic
- Significant reduction in probing depth vs. scaling and irrigation with water
  - Reynolds 1992
**Curettes vs. Ultrasonics**

- **Distance from base of pocket**
  - Curette: 1.25 mm
  - P-10 Cavitron: 1.13 mm
  - Microultrasonic: 0.78 mm
  - Dragoo 1992
“Similar improvement occurred after use of hand and ultrasonic instruments. This agrees with results by Torfason et al. (1979), Badersten et al. (1981), Oosterwaal et al. (1987) and Boretti et al. (1995), and suggests that debridement of the contaminated root surfaces in deep pockets can be equally accomplished by ultrasonic and hand instruments.”

Curettes vs. Ultrasonics

Ultrasonics can:
- Achieve equal or better clinical results
- Be more efficient
- Be more comfortable for patients
- Provide better access for furcations
- Preserve more tooth structure
- Remove smear layer
Curettes vs. Ultrasonics

No difference in pocket depths between hand and ultrasonic instrumentation
Effect on Restorations

- Gold
- Porcelain
- Composite
- Implants
Premedication

- Patients with heart valve defects must be premedicated with antibiotics prior to periodontal probing, ultrasonic or hand instrumentation.
Summary

- Endotoxin causes inflammation, and can be removed.
- Tooth structure and gum tissue should not be traumatized.
- Use antimicrobials whenever possible.
- Powered instruments, not hand instruments, should be used for most of the cleaning.
Periodontal Maintenance

- Also known as . . .
  - Supportive Periodontal Therapy
  - Periodontal Recall
  - Maintenance Therapy
  - Phase III Therapy
Periodontal Maintenance

How Important Is Maintenance in Periodontal Therapy?

A Key component of periodontal therapy!

- 70% fewer lost teeth were observed comparing untreated patients to those who received treatment and followed through with regular maintenance.

- 50% improvement in tooth retention comparing treated patients without maintenance to treated patients who were both treated and well maintained.
Periodontal Maintenance

Components of the Recall Visit
- Update and review the medical/dental history
- Extraoral and intraoral soft tissue exams
- Dental examination
- Perio evaluation
- Radiographic review
- Removal of plaque and SRP where indicated
- Selective polishing/Topical Fluoride
- Final OHI and dispensing of personal hygiene implements
What determines the Interval?

Several Factors

- Initial level of disease
- Aggressiveness of attachment loss
- Patient’s response to therapy
- Patient’s ability to perform effective plaque control
- Post-treatment stability of inflammation and attachment levels
Periodontal Maintenance

- What Type of Biological Modulation May Be Used to Control Recurrent Periodontal Disease in the Maintenance Patient?

  - In situations where the attachment loss is localized, local delivery of antibiotics or antimicrobial agents such as doxycycline (Atridox™), minocycline (Arestin™), or chlorhexidine (PerioChip®) may be effective in maintaining attachment levels.
Subantimicrobial dose of doxycycline (SDD) has been advocated to help prevent attachment loss (PerioStat®).

- SDD stabilizes the activity of collagenase and other matrix metalloproteinases and, therefore, slows down the destructive inflammatory process.

- Initial clinical studies to receive U.S. Food and Drug Administration approval were of 9 months duration. There is minimal evidence of the effect of PerioStat® over longer time periods.
Recall Visit Compliance

■ How Compliant Is the Average Periodontal Patient?

■ One study suggests that only about 16% of patients receiving periodontal therapy comply with recommended maintenance intervals.
Recall Visit Compliance

Steps to improve patient compliance:

- Simplify behavioral change.
- Accommodate the patient.
- Remind patients of appointments.
- Keep compliance records.
- Inform the patient about the necessity for and consistency of keeping maintenance appointments.
- Provide positive reinforcement.
- Ensure the dentist's involvement.
Medico-Legal Considerations

What are some of the reasons dentists are sued by patients related to periodontal care?

Here are a few examples of real cases...
Medico-Legal Considerations

- failure to use bacteriological monitoring of dental unit water lines and evacuation systems to verify that chemical disinfectants have eliminated waterline biofilm buildup;

- performing periodontal screening examinations instead of comprehensive periodontal examinations before performing full-mouth restorative procedures;
Medico-legal Considerations

- performing prescription periodontal surgery for bridge abutment teeth while ignoring periodontitis elsewhere, including adjacent or opposing teeth;
- evaluating periodontal disease control by pocket measurements alone and not considering bleeding on probing as a component of periodontal disease diagnosis;
- diagnosing pulpal disease, but failing to consider periodontal-endodontic lesions or that successful endodontics may not salvage a tooth compromised with severe periodontitis;
Impact of Systemic Disease on Perio Diseases

- Diabetes Mellitus
- Smoking
- HIV Disease
- Heart Disease
Impact of Systemic Disease

- **Diabetes Mellitus**
  - Clear associations exist between severity of periodontal diseases and glycemic control.
  - Controlled diabetics may receive perio treatment without restrictions.
  - Uncontrolled diabetics, poorly controlled diabetics, or diabetics whose control is unknown should only receive emergency periodontal therapy, and that treatment should be performed with intraprocedural and/or postoperative antibiotic coverage.
Impact of Systemic Diseases

- **Smoking**
  - Length of time an individual has been smoking and the frequency of smoking contribute to severity of periodontal disease.
  - Greater accumulation of plaque and calculus
  - Less probing depth reduction following both SRP and surgical periodontal therapy in smokers vs. nonsmokers
  - Higher implant failure rates.
Impact of Systemic Diseases

HIV Disease

- Early studies described increased severity of periodontal diseases.
  - HIV-gingivitis (linear erythema)
  - HIV-periodontitis (necrotizing ulcerative periodontitis)

- Recently, reports of no increases in the prevalence or extent of periodontal diseases among HIV-positive individuals
Impact of Systemic Disease

- **Pregnancy**
  - Progesterone and estrogen levels increase to levels that are several orders of magnitude greater than those seen during a normal menstrual cycle.
  - Varying degrees of a reversible “pregnancy gingivitis” are common during pregnancy.

- **Oral Contraceptives (BCP)**
  - May see cyclic changes of pregnancy-like changes.
**Antibiotics in Periodontics**

- **What is Anti-infective Periodontal therapy?**
  - It is the use of local and systemic agents to control the bacterial etiology of the inflammatory periodontal diseases.
  - These agents include both locally and systemically delivered antibiotics and chemotherapeutic agents.
Antibiotics in Periodontics

- When are antibiotics indicated in periodontics?
  - Periodontal abscess
  - Aggressive periodontitis
  - Chronic periodontitis with severe gingival inflammation or as an adjunct to SRP
  - Refractory forms of the periodontal diseases
  - Prophylaxis for SBE
  - When surgery is contraindicated or not desired and inflammation persists after thorough root instrumentation
  - As a host modulation technique – subantimicrobial dose to stabilize collagenase
Antibiotics in Periodontics

What are some common ones to use?

- Amoxicillin (with or without clavulanic acid, Augmentin®)
- Metronidazole
- Ciprofloxacin
- Clindamycin
- Doxycycline
- Azithromycin
# AAP Antibiotic Suggestions

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Adult Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metronidazole</td>
<td>500 mg tid</td>
<td>8 days</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>300 mg tid</td>
<td>8 days</td>
</tr>
<tr>
<td>Doxycycline or minocycline</td>
<td>100-200 mg qd</td>
<td>21 days</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>500 mg bid</td>
<td>8 days</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>500 mg qd</td>
<td>4-7 days</td>
</tr>
</tbody>
</table>
What are some common Local Antibiotic and Antimicrobial Delivery Systems?

- **Arestin®** - Minocycline in a resorbable bead vehicle
- **Atridox®** - Doxycycline in a resorbable polylactide gel
- **PerioChip®** - Chlorhexidine in a resorbable gelatin wafer
Subantimicrobial Antibiotic Usage

- The use of subantimicrobial dose of doxycycline (SDD) has been shown to reduce the rate and amount of attachment loss associated with advancing periodontal disease.
- SDD is currently used as a 20 mg dose of doxycycline twice a day, available commercially under the name PerioStat®.
- Long-term studies have been for 9-month durations.
Indications for Locally Delivered Antibiotic and Antimicrobial Tx

- Local site(s) with signs of inflammation that have not responded to conventional mechanical therapy
- Local site that has recurrent signs of inflammation at a maintenance visit
- Buying time for a so-called hopeless tooth before extraction
- Resolving marginal inflammation when oral hygiene has reached maximum effectiveness
What therapeutic Mouth rinses are available to Reduce Plaque and Help Control Gingival Inflammation?

- Currently, only mouth rinses containing 0.12% chlorhexidine gluconate (Peridex) or the “essential oils” (phenolic compounds – thymol, menthol, eucalyptol, methyl salicylate) are able to reduce plaque and gingivitis.

- These mouth rinses are available to consumers through a variety of manufacturers and distributors, and must be used appropriately, usually a 30-second rinse twice daily to be effective.
Occlusal Therapy

What is Occlusal Traumatism?

- Signs and Symptoms of Occlusal Traumatism
  - Fractures, occlusal wear or inflammation of supporting structures (bone and pdl)

- Other signs and symptoms
  - Pain,
  - Mobility and fremitus
  - Radiographic widening of the pdl space.
Primary Occlusal Trauma

- Excessive forces along a healthy periodontium
- Crown root ratio is 1:2 and center of rotation is in the coronal 1/3 of the root.
Secondary Occlusal Trauma

- Normal occlusal forces on a reduced periodontium
Secondary Occlusal Trauma

- Posterior bite collapse
- Loss of VDO
Secondary Occlusal Trauma

- Radiographic evidence of occlusal trauma
Secondary Occlusal Trauma

- Clinical Occlusal Adjustment
Special Thanks

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Manual of Clinical Periodontics, 2nd Edition

by Francis Serio and Charles Hawley

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