Fri 11 June 2010
Main session
4.00-4.25 PM

Rotorua GP CME 2010
General Practice Conference & Medical Exhibition

The Relevance of Oral Hygiene

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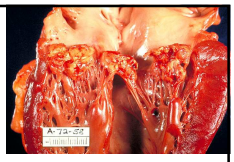
Reservoir of Organisms

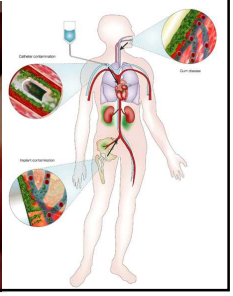
- Complex flora of > 700 bacteria and 20 fungi
- *Candida albicans*: 50% carriage in adults
  - Mucocutaneous infections
- *Helicobacter pylori* in normal adults
  - **saliva 54%, plaque in gingival crevice 48%**
  - Ascends from this reservoir to the middle ear and to the para-nasal sinuses directly or by reflux, resulting in otitis, sinusitis, pharyngitis, and laryngitis.
  - HP in dental plaque may be a risk factor for relapse of gastro-intestinal infection and relapse of gastric ulceration after antibiotic therapy.

Candidosis

Infective endocarditis:

More daily bacteraemia with gingivitis or periodontitis

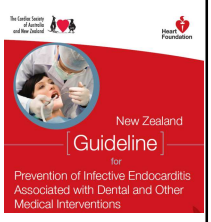




Infective endocarditis

- Significant numbers of disadvantaged New Zealanders, especially young Maori and Pacific people, have rheumatic valvular heart disease, and gingivitis and periodontal disease.
- Aspects:

1. Regular professional dental care
2. Use of appropriate products
3. Manual and powered toothbrushes
4. Floss/interdental cleaning
5. **Other plaque-control devices such as antibacterial mouthwashes**.



• Emphasis on improved oral health, **rather than a sole focus on dental procedures and ABT prophylaxis.**

Clinically significant reductions in interdental gingivitis vs control and baseline

- Regular fluoride toothpaste,
- plus **Listerine** mouthrinse (20 mL for 30 seconds twice daily for six months)

- **Colgate Total** toothpaste (brushed for 60 sec)
- plus a placebo rinse
- N=316 subjects, 6 months

Reduction in visual scoring for Gingivitis: 22.9% vs 20.8% (NS)

Reduction in Bleeding Index: 70% vs 58% (P<0.01)

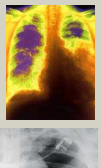
Reduction in Plaque Index: 56.1 vs. 22.1% (P<0.01)

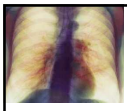
"Listerine, when used in conjunction with a fluoride dentifrice and usual oral hygiene, provided a greater benefit in reducing plaque. When considering an antiplaque/antigingivitis product to recommend to patients, clinicians should consider Listerine, in conjunction with usual oral hygiene, if more rigorous plaque control is desired"

Charles CH, Sharma NC, Galustians HJ, Qaqish J, McGuire JA, Vincent JW. Comparative efficacy of an antiseptic mouthrinse and an antiplaque/antigingivitis dentifrice. A six-month clinical trial. J Am Dent Assoc. 2001;132(5):670-5.

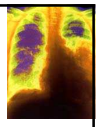
Table 1. Risk groups for respiratory infection from oral bacteria

Medical risk factors	Dental risk factors
Intellectual disability 60% oral	High plaque levels
Intubated patients	Irregular oral hygiene
Mechanically ventilated 90% oral	Untreated periodontitis
Intensive care	Dry mouth
After major surgery	Mouth breathing
Oesophagectomy 70% oral	
Stroke	
Coma	
Bedridden patients	
Frail elderly patients	
Pre-existing lung disease	
Immune suppression	





Mechanisms



- Aspiration of dental plaque and saliva, especially in infirm and elderly.
- Biofilm development
- Bacteria of oral/periodontal origin can be found in lungs of patients with COPD, pneumonia and VAP

- Once in the lung, periodontal bacteria:
  - Bind to lung epithelium
  - Allow colonization by pulmonary pathogens
  - Activate epithelial cells to produce inflammation, leading to fluid accumulation
  - Activate production of enzymes which break down lung connective tissues

Ventilator-associated pneumonia (VAP) in ICU patients

- 3X daily toothbrushing reduces the risk of VAP in stroke, neurological and medical ICU patients within one week
- 2 X daily use of **an effective anti-plaque rinse** (Chlorhexidine or Listerine) reduces the risk of nosocomial pneumonia in intubated patients, by a factor of more than 6 times, compared with the same daily standard oral care protocol **without** a mouthrinse.

- NB: CHX does not suppress gram-negative organisms causing VAP,
  - e.g. *Pseudomonas, Acinetobacter,* and *Enterobacter* species

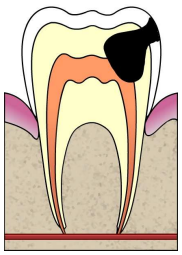
Patients with intellectual and developmental disabilities (IDD).

- Oral organisms in dental plaque and saliva cause over **60%** of respiratory infections (pneumonia and sinusitis) in IDD patients.
- IDD patients require meticulous comprehensive oral hygiene of the oral cavity to reduce their oropharyngeal microbial load and the attendant risks of respiratory infections.

- Binkley et al. Oral microbial and respiratory status of persons with mental retardation/intellectual and developmental disability: an observational cohort study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;108:722-31.

Oral cavity sources of distant infection

- Periapical infection
  - After dental caries, tooth fracture, and pulp exposure
- Gingival and periodontal infection
- Mucosal breaches
  - Ulcerations and lesions
  - Mucositis from chemotherapy or radiotherapy
  - Penetrating injuries and foreign bodies

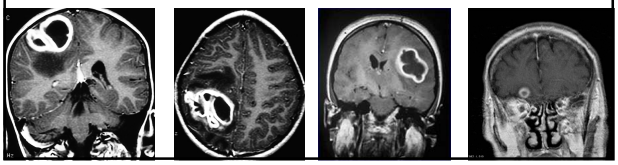


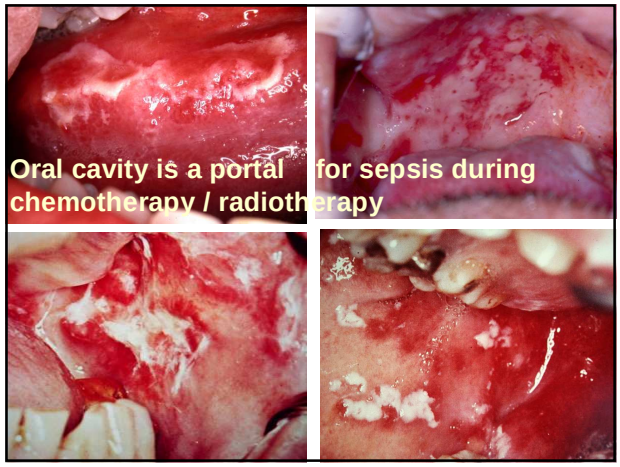
PUO in immune compromised patients:
e.g. Chronic periapical lesions reactivate when host resistance falls

Haematogenous spread of infection from the mouth to distant sites

- Immune compromised patients
- Pyrexias of unknown origin in oncology patients **30% dental origin**
- Systemic sepsis and intravascular coagulation

- Orbit
- Brain
- Liver
- Lung
- Spleen





Loss of epithelial integrity within periodontal pockets can represent an ulcerated surface area of up to 50-72 cm2 in contact with the dental plaque biofilm.

Systemic Exposure to Periodontal Pathogens

- Oral bacteria penetrate into periodontal and vascular tissues and invade intracellularly.
- **Organisms are found alive intra-cellularly within atheroma lesions:** *P. gingivalis* **38-40%** in carotid and coronary atheromas

Oral bugs in the pipes !

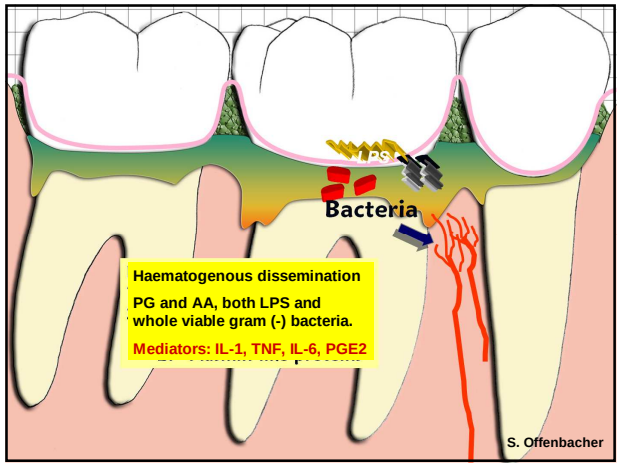
Periodontal Pathogens in Carotid Endarterectomy Specimens

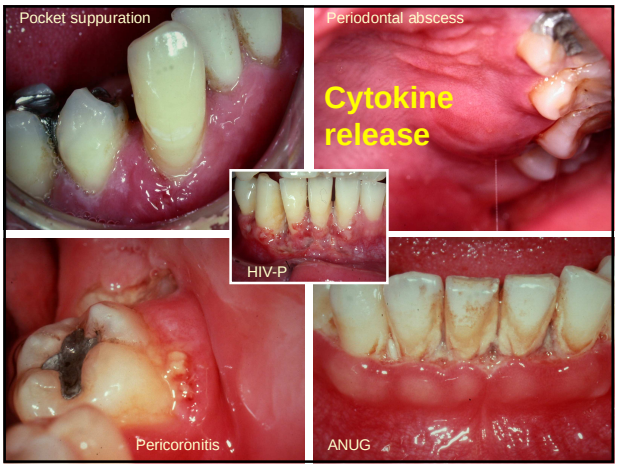
(by PCR)

P. gingivalis	13/50	26%
B. forsythus	15/50	30%
P. intermedia	7/50	14%
A. a.	9/50	18%

44% positive for at least one periodontal pathogen

Haraszthy et al. *J Dent Res*, 1998

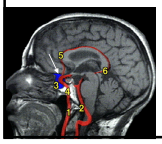




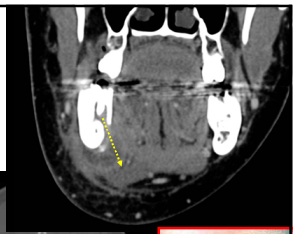
Periodontal treatment reduces the body's burden of infection

Spread of infections: Maxillary teeth

- Danger triangle: anterior teeth
  - Cavernous sinus thrombosis
- Canine teeth
  - Canine fossa and orbital involvement
- Molars
  - MX sinus involvement



Mandibular molars: Dental abscess extending into the submandibular space



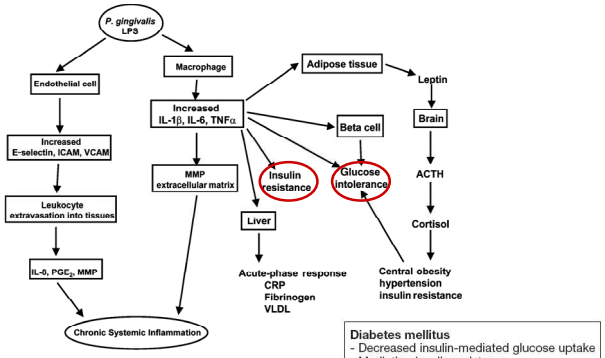
Ludwig's angina

- Life-threatening cellulitis of the floor of mouth
- Spreads to the sublingual space via the fascial planes
- Tongue is forced upward and backward, causing airway obstruction (strangulation).
  - Tracheostomy needed for airway support
  - High dose iv ABTs and surgical decompression
- **Mortality:** No ABT: 50%; ABT and surgical therapies: less than 5%

Associations between **periodontitis** and systemic disease

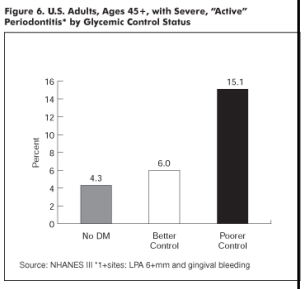
- **Diabetes – strongly (2 way)**
- **Pulmonary disease – yes: subgroups VAP, IDD**
- **Cardiovascular disease – possibly**
- **Adverse pregnancy outcomes – probably in certain ethnic groups**

Periodontal – systemic health interactions



Diabetes Mellitus

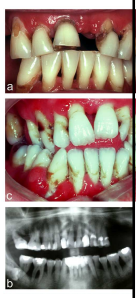
- Poor glycaemic control is associated with more severe periodontal diseases.
- **Untreated periodontitis impairs glycaemic control.**
- **Untreated diabetes accelerates periodontitis.**



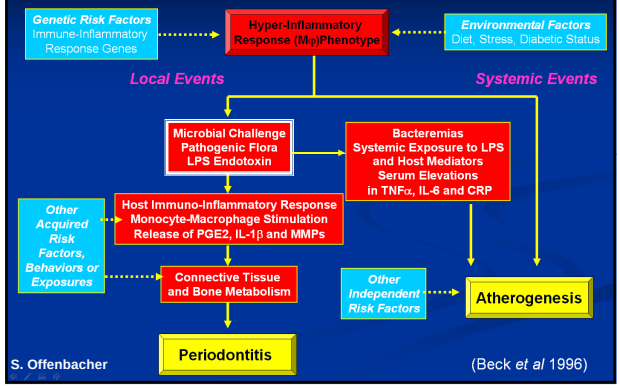
Diabetes Mellitus

Periodontitis is often considered the sixth complication of diabetes

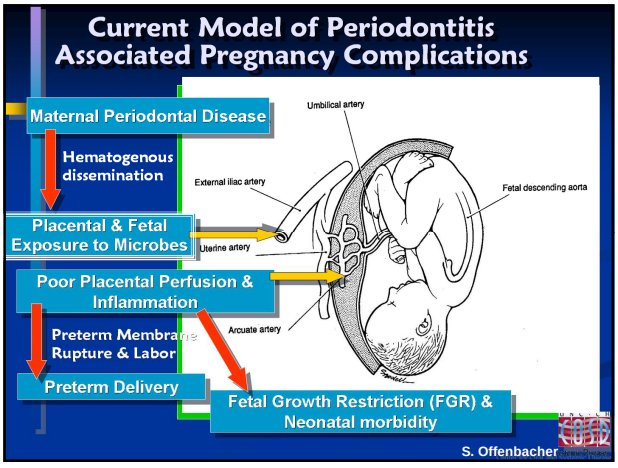
- Patients with diabetes require more rigorous follow-up and greater attention to prevention
- Patients with a history of *poor glycaemic control and oral infections*, require more frequent recall visits, AND urgent attention to acute oral infections.



Proposed Model of Periodontitis-Cardiovascular Disease Association



Current Model of Periodontitis Associated Pregnancy Complications



Dental plaque and distant infection:
Oral bacteria make bad tourists