

# Gingivitis

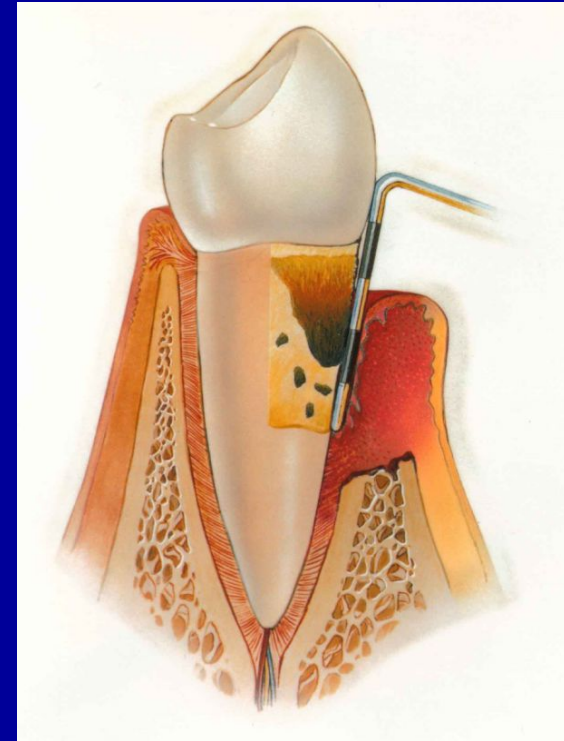
Red  
Swollen  
Bleed easily  
Plaque  
associated



Epithelium remains sealed around enamel/cementum line

# Periodontitis

- Inflammation of gingiva
- Loss of epithelial attachment
- Irreversible damage to
  - Cementum
  - Alveolar bone
  - Periodontal ligaments



## Pathogenesis of Periodontal Disease Biofilm



- Plaque
- Gingival redness/swelling
- Bleeding gums



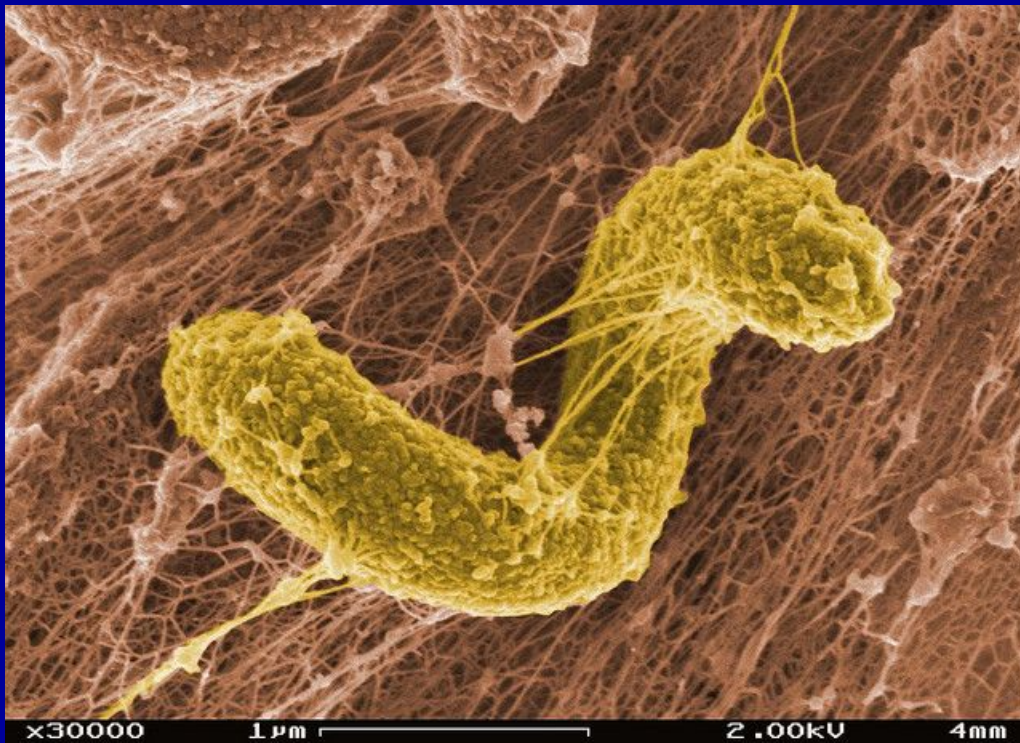
- Tartar
- Different oral bacteria

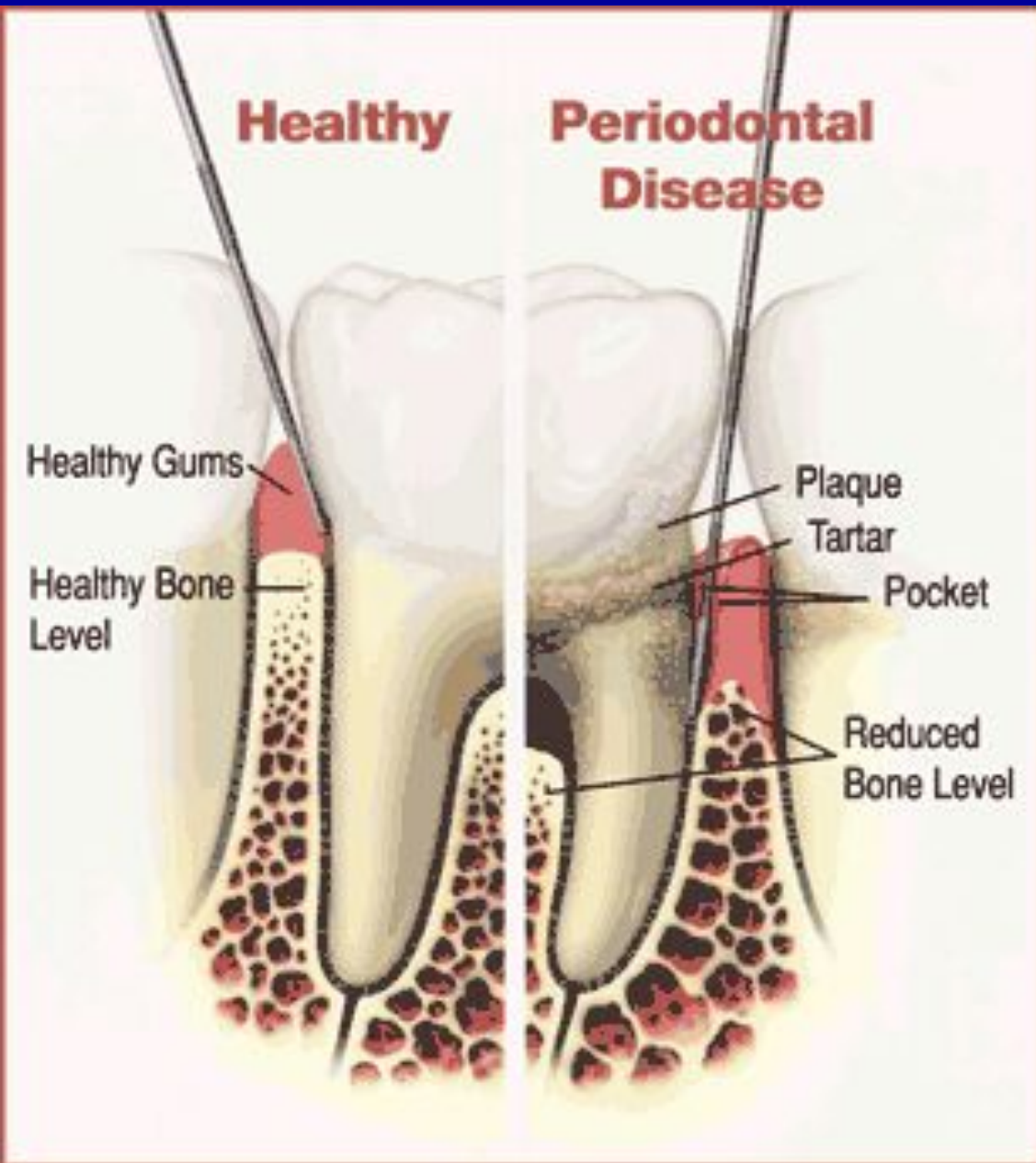
# Pathogenesis of Periodontal Disease

## Alter Bacteria

- Bacteria: *Porphyromonas gingivalis*

Gram negative anaerobic rod

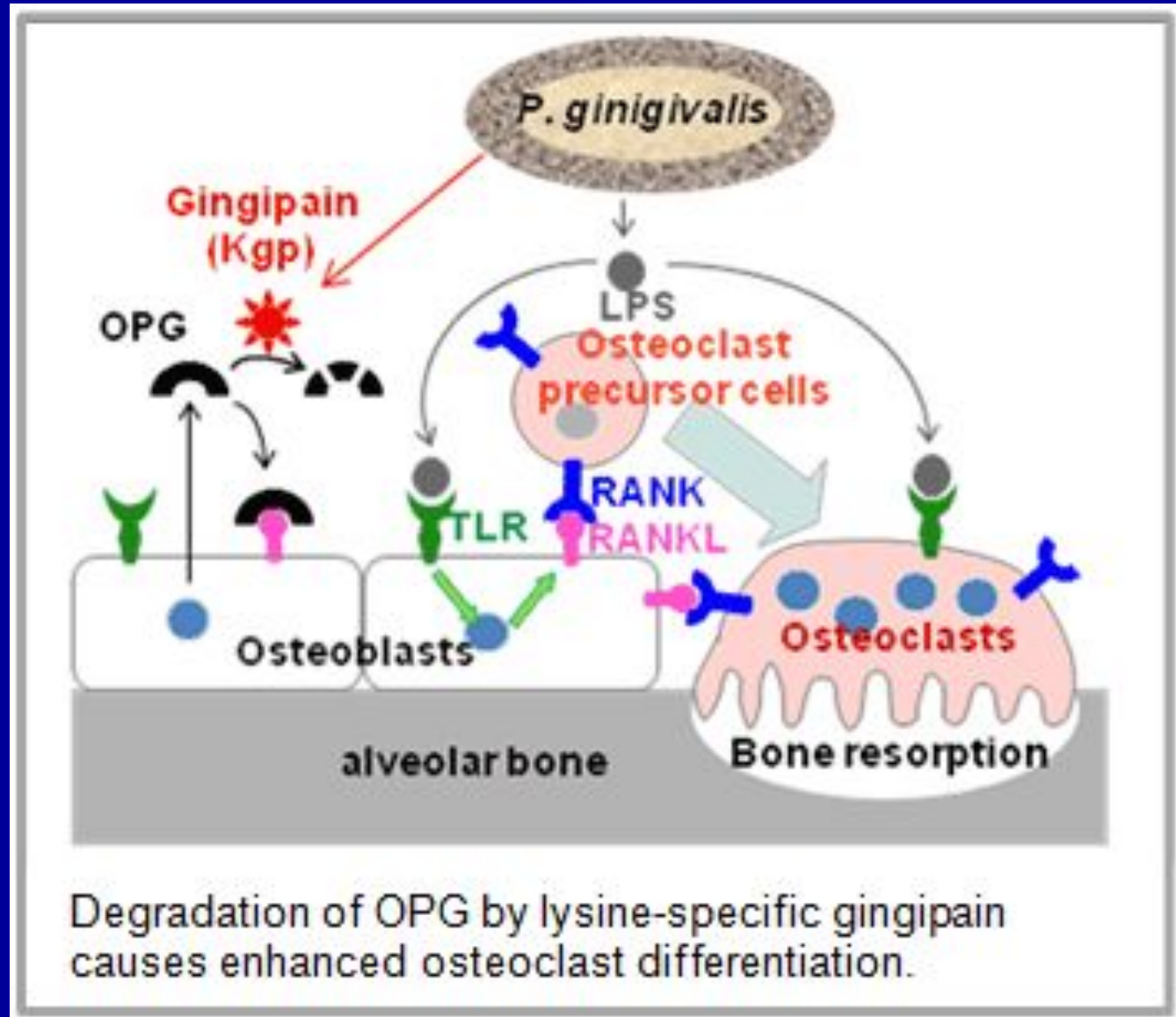




# Halitosis

- due to anaerobes (sulfite reducing bacteria)

OPG(osteoprotegerin



# Pathogenesis of Periodontal Disease

## Support Destruction

- Alveolar bone loss
- Tooth mobility
- Tooth migration

### Normal Periodontitis



# Risk Factors for Periodontal Disease

- Smoking
  - 1/2 adults with PD are smokers
- Lack of fluoridated water
  - Fluorinated water supply decreases tooth decay
  - “Healthy People 2010” objective = 75% of population
  - Only 27 state meet objective (2010)



# Risk Factors for Periodontal Disease

- Systemic illnesses
- Genetics
- Anxiety, depression
- Obesity
- Medications (↓ saliva)
- Hormonal flux
- Elderly

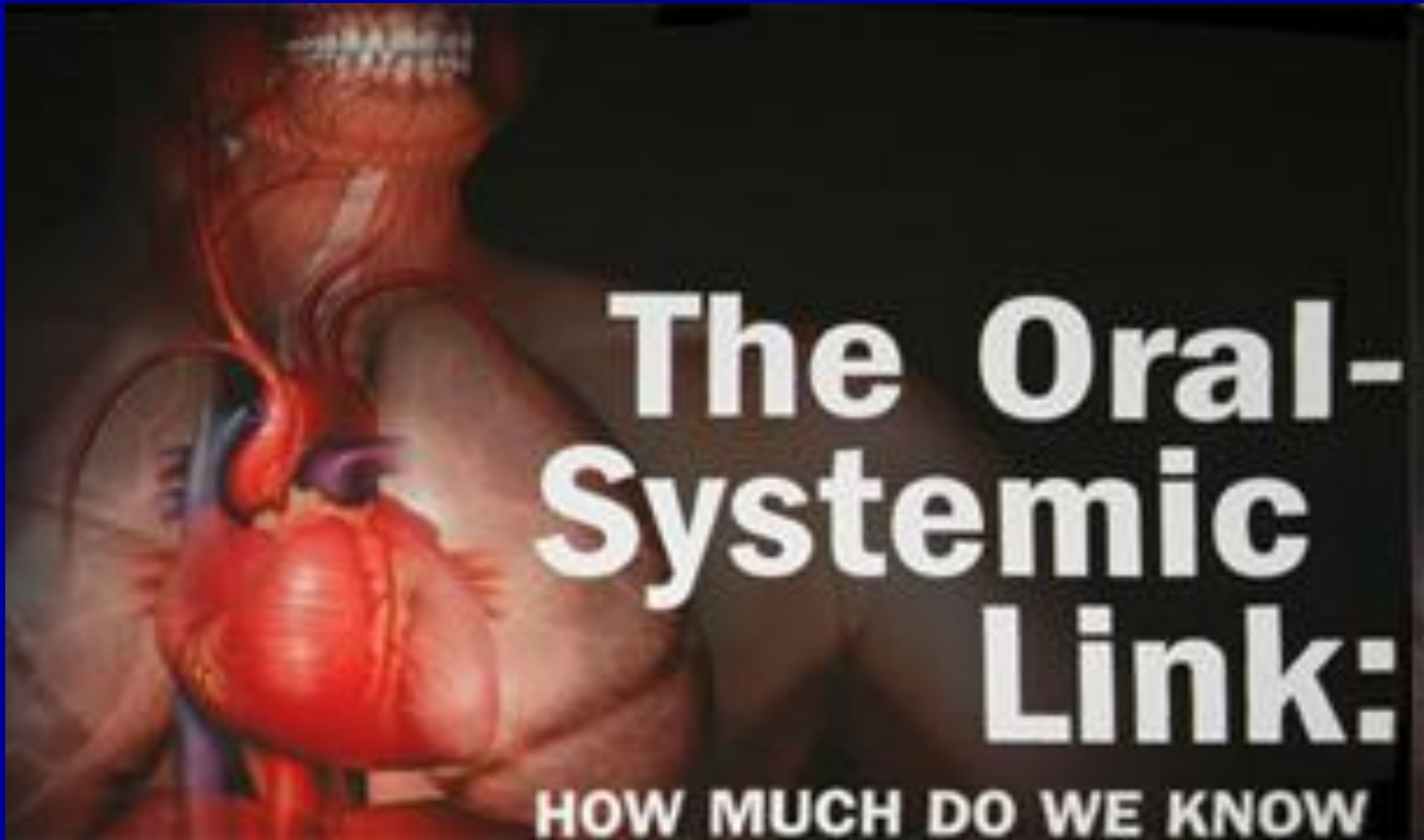
# Treatments for Periodontal Disease



- Brush & Floss
- Dental cleaning (scaling and root planing)
- Doxycycline (Periostat)
- Vaccine –in development
- Surgery



# Periodontal Disease & Systemic Illness



## The Oral-Systemic Link:

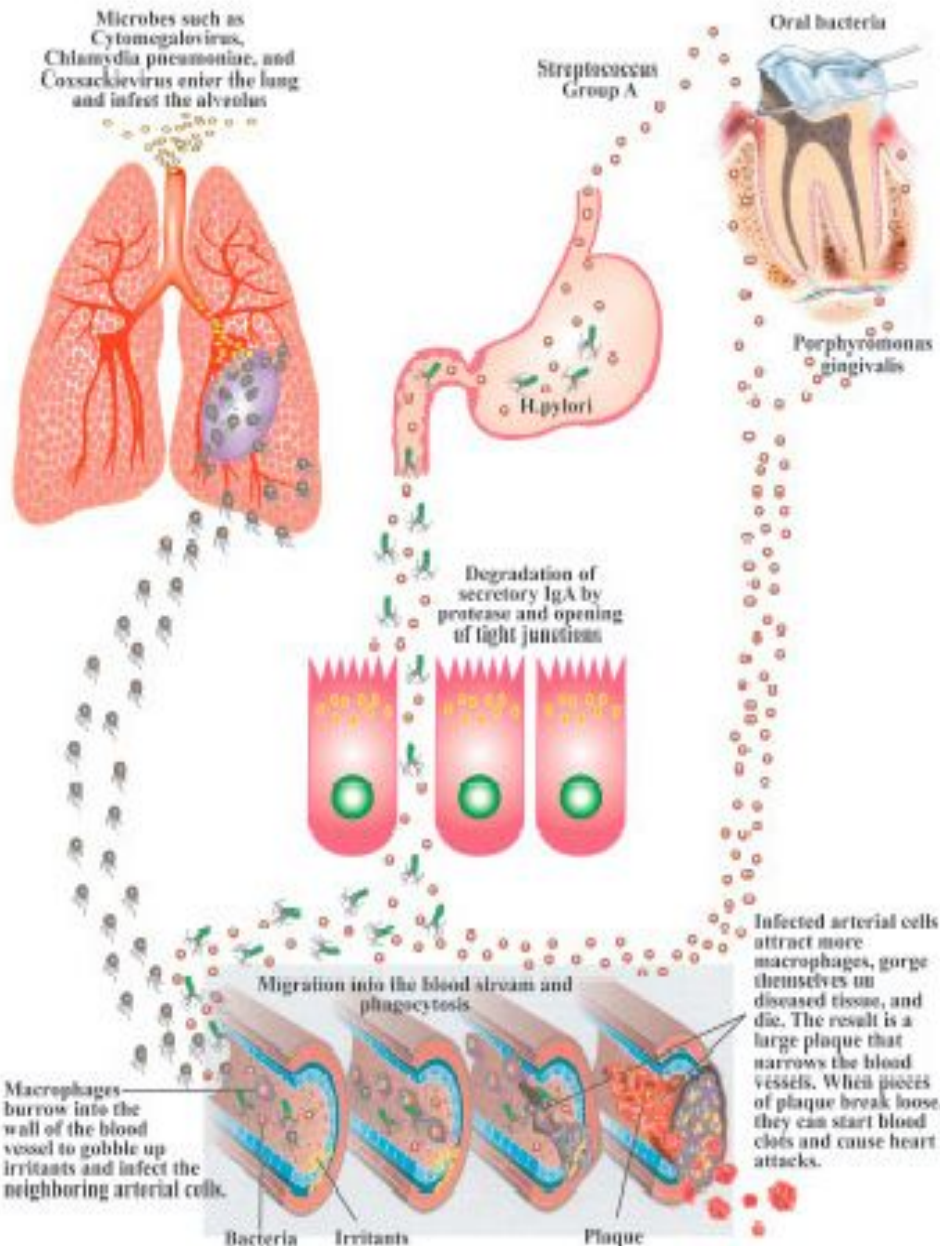
HOW MUCH DO WE KNOW

# Periodontal Disease & Systemic Illness

- Atherosclerosis, CVD
- Diabetes mellitus
- Preterm parturition
- Respiratory disease -COPD, pneumonia
- Osteoporosis
- Impaired mastication & nutrition
- Hypertension
- Arthritis
- Inflammatory bowel disease
- Psoriasis
- Erectile dysfunction

# Atherosclerosis: Risk Factors

- Ulcers
  - H. pylori
- Pneumonia
  - Chlamydia pneumoniae
- Periodontal Disease
  - Porphyromonas gingivalis



# Periodontal Disease & Systemic Illness: Cardiovascular Disease

- Periodontal disease associated with:
  - ↑ Intimal thickening
  - ↑ C-reactive protein
  - ↑ fibrinogen
  - ↓ flow-mediated dilation

# Periodontal Disease & Systemic Illness: Cardiovascular Disease

Study to evaluate endothelial function  
with the treatment of periodontitis

- All patient with severe periodontal disease
- 1/2 normal cleaning ; 1/2 intensive root planing (after 6 months)
  - ↑ Flow mediated dilation
  - ↓ soluble E-selectin

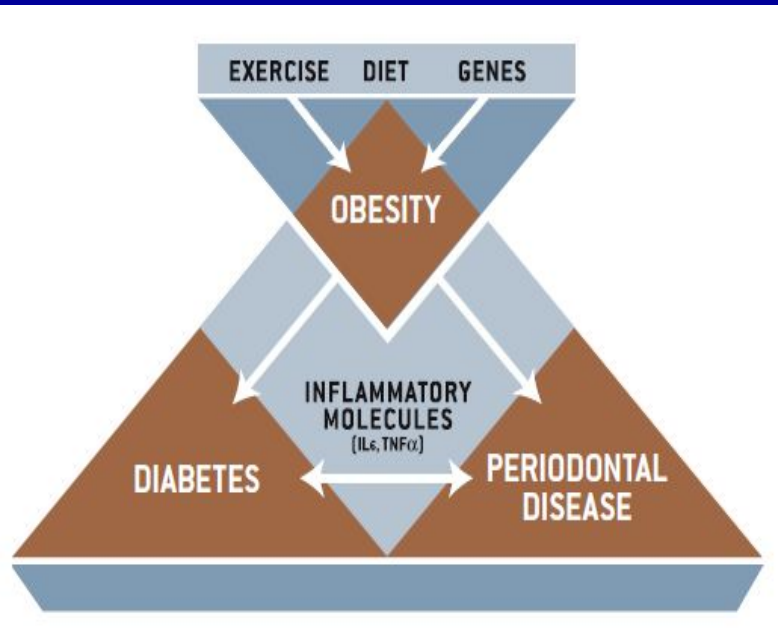
# Periodontal Disease & Systemic Illness: Obesity & Diabetes

- Pima Indians – AZ
- Shift from desert survival to modern diet
- ↑fat intake: fr15%, to 40%
- Obesity
  - Diabetes Type 2
  - Periodontal Disease

Since 1960s Robert Genco (NIH)





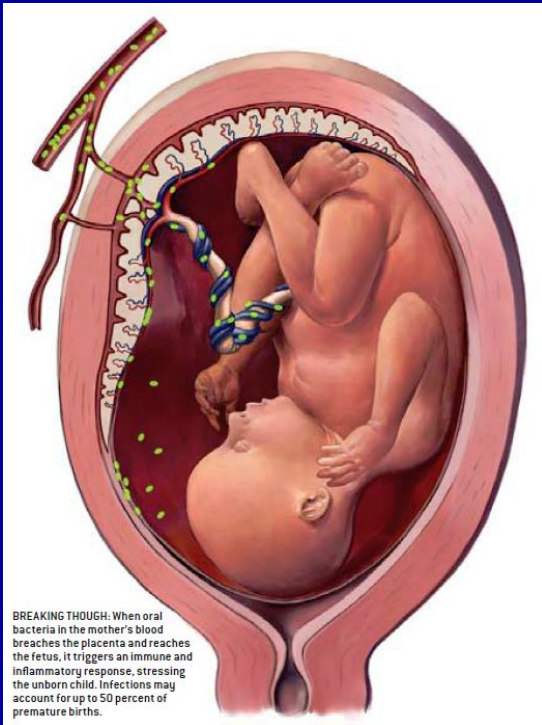


- Diabetes Type 2
- ↑ periodontal disease(3-4x)
  - ↑ Worse sugar control
  - Neuropathy, kidney disease
  - ↑ CVD
  - ↑  $TNF\alpha$ , IL-6
  - ↑ C-reactive protein

Simply treating periodontal disease improved blood sugar control

# Periodontal Disease & Systemic Illness: Pregnancy Complications

- Miscarriage
- Premature birth
- Low birth weight

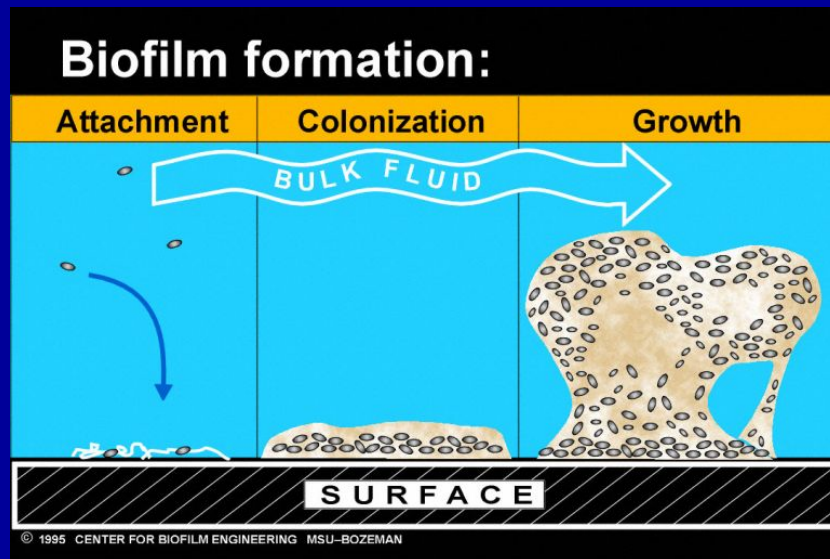


**Maternal oral bacteria found  
in amniotic fluid**

**Y.W. Han, 2006 Case Western  
Reserve**

# Periodontal Disease & Systemic Illness: Pregnancy Complications

Hormonal flux may increase  
bacterial biofilm & gum bleeding



- Oral contraceptives
  - Premenstrual
  - Pregnancy