

Cariology and endodontics

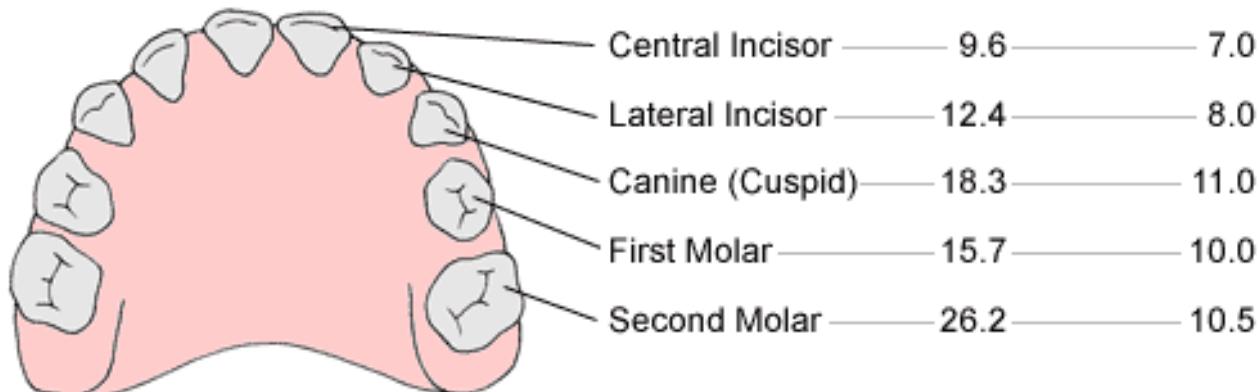
Dr. Zsuzsanna Tóth Ph.D.
head

Department of Conservative Dentistry
Faculty of Dentistry
Semmelweis University

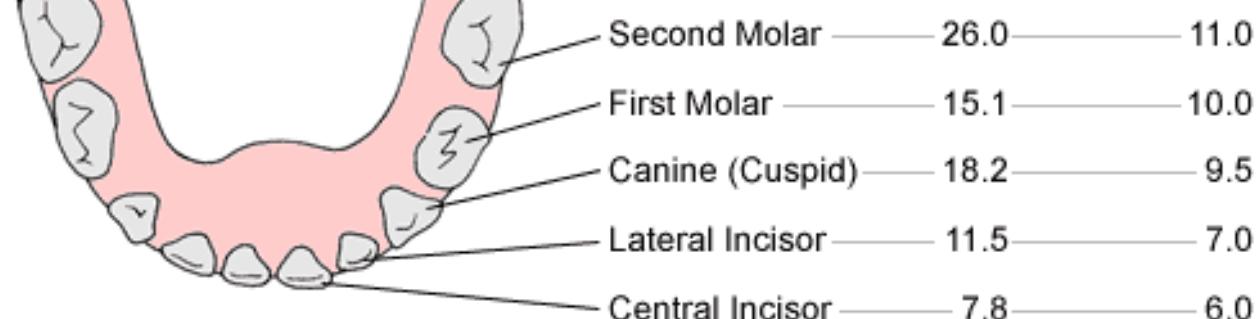


Deciduous teeth

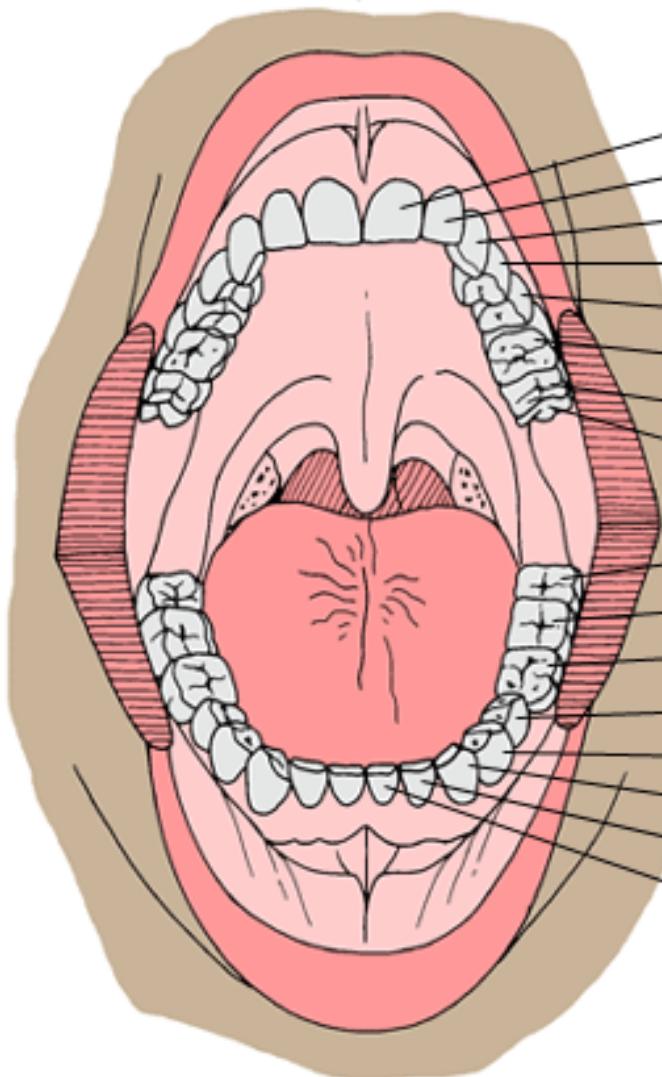
Upper Teeth



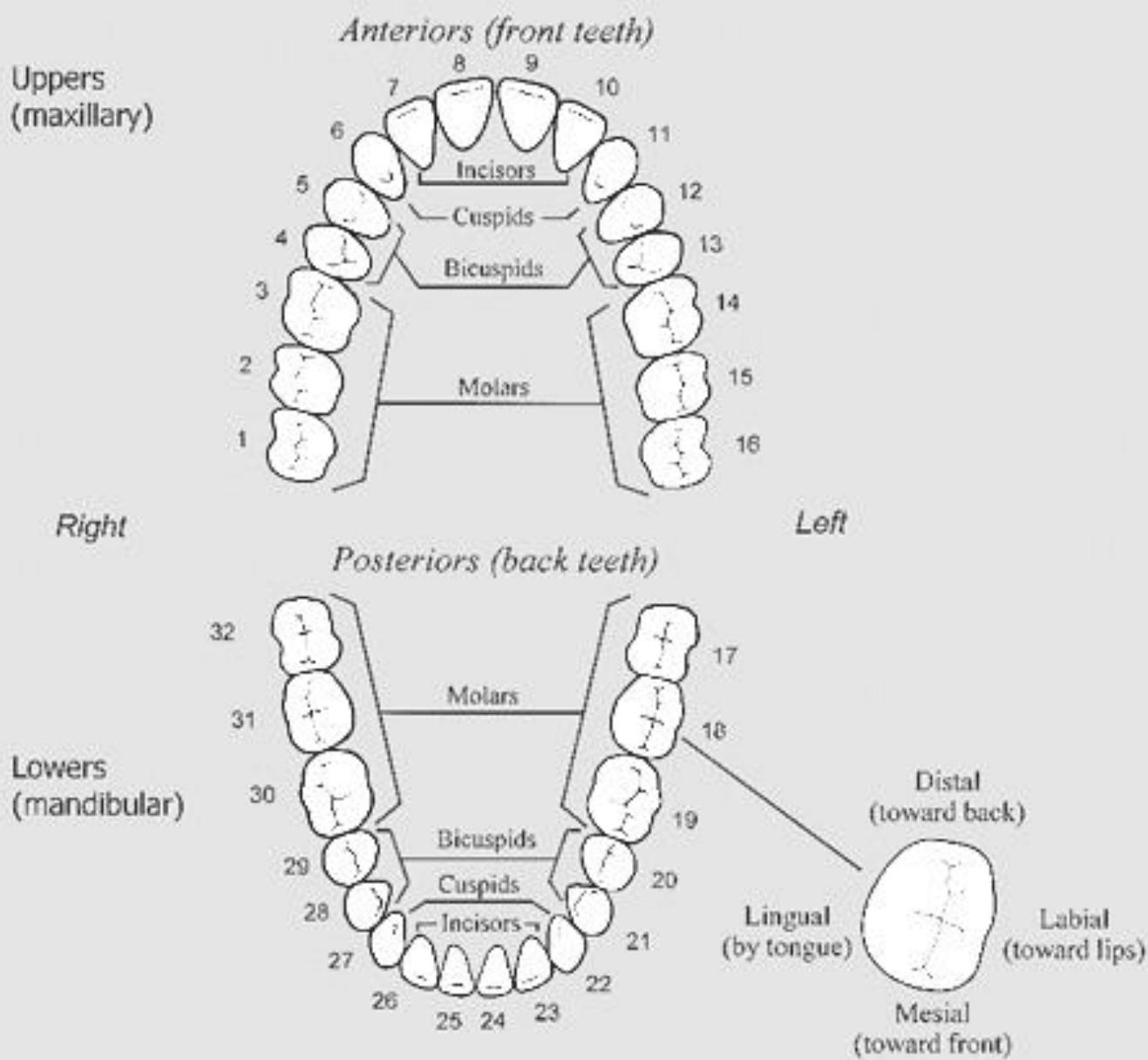
Lower Teeth



Permanent teeth



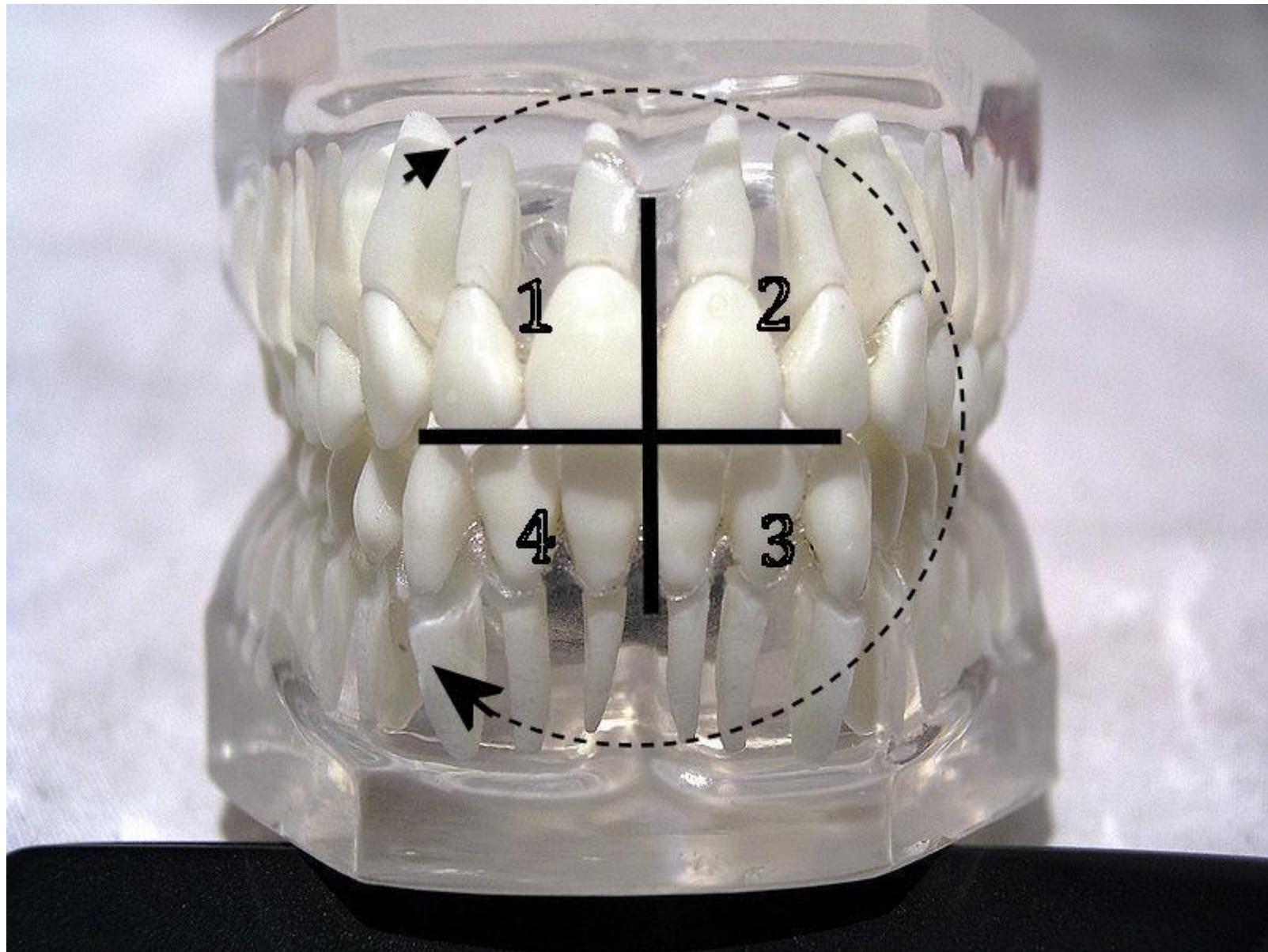
Age Tooth Comes In (years)
Central Incisor 7.35
Lateral Incisor 8.45
Canine (Cuspid) 11.35
First Premolar (Bicuspid) 10.20
Second Premolar (Bicuspid) 11.05
First Molar 6.30
Second Molar 12.25
Third Molar Variable 17 to 21
Third Molar
Second Molar 11.90
First Molar 6.05
Second Premolar (Bicuspid) 11.20
First Premolar (Bicuspid) 10.50
Canine (Cuspid) 10.35
Lateral Incisor 7.50
Central Incisor 6.40



Tooth notation



- Zsigmondy-Palmer, Chevron,
Set-Square system
- The FDI two-digit system
(international method)
- European, Scandinavian,
Haderup system
- American (universal) system



FDI

Fédération Dentaire Internationale

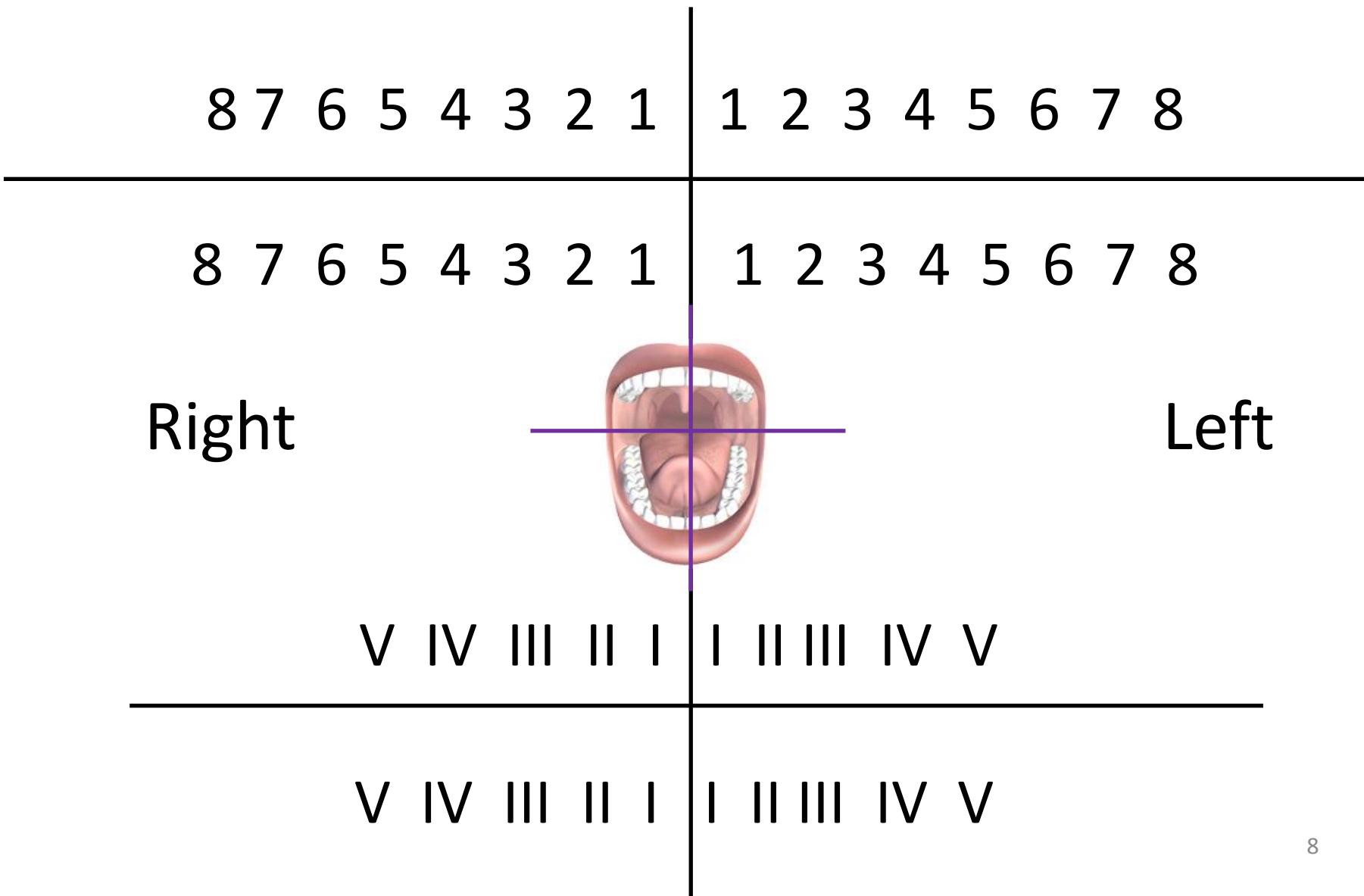
WHO

World Health Organization

IADR

**International Association for Dental
Research**

Zsigmondy-system



FDI

18 17 16 15 14 13 12 11

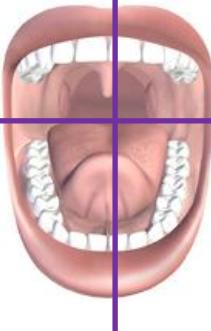
21 22 23 24 25 26 27 28

48 47 46 45 44 43 42 41

31 32 33 34 35 36 37 38

Right

Left



55 54 53 52 51

61 62 63 64 65

85 84 83 82 81

71 72 73 74 75

USA - universal

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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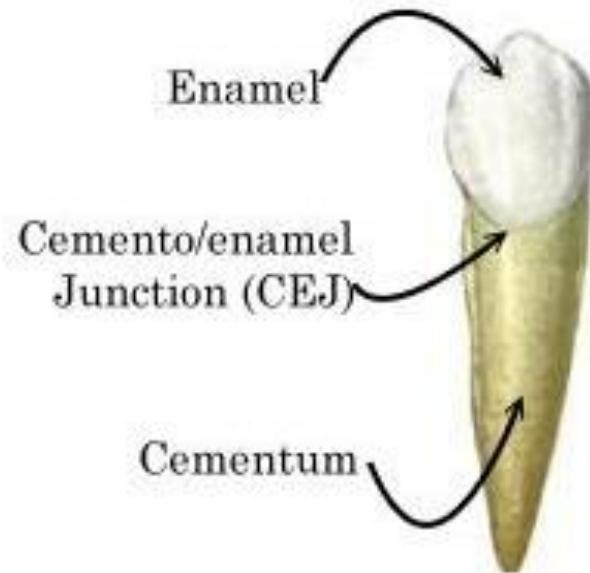
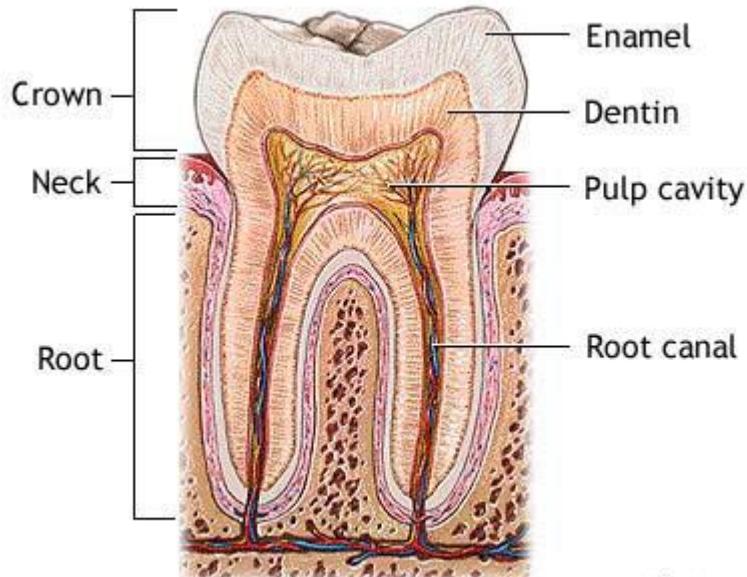
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
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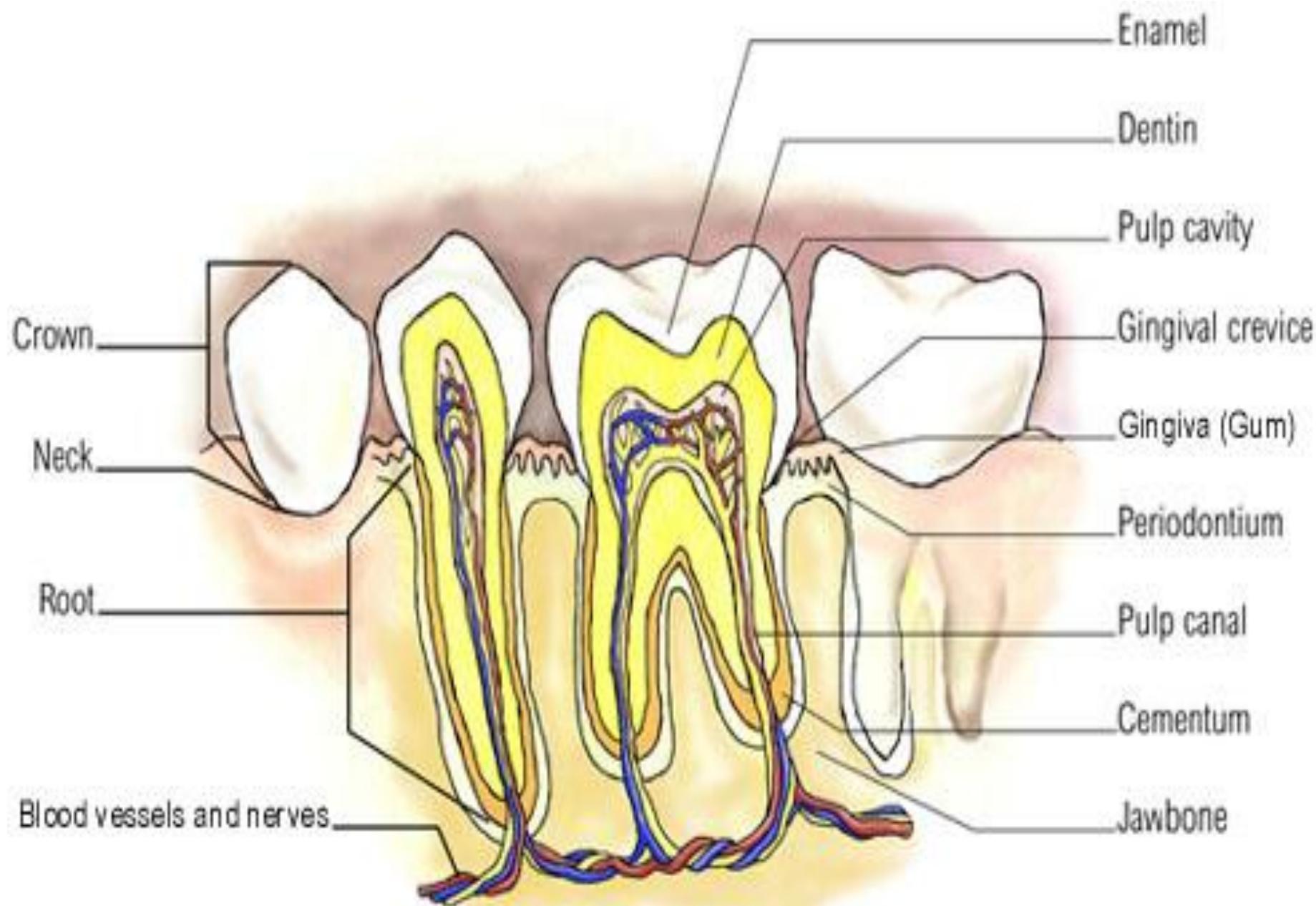
Right

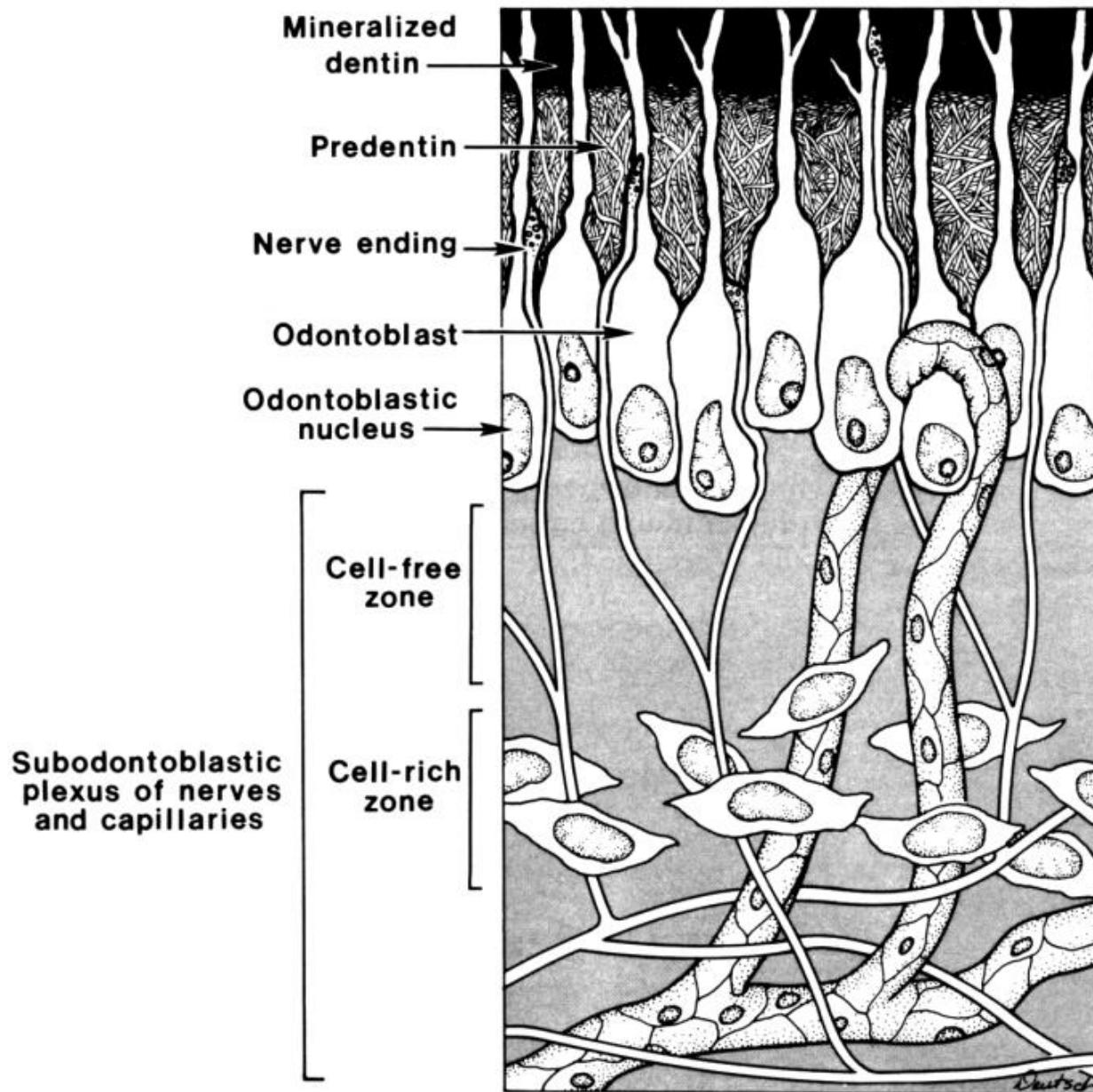
Left

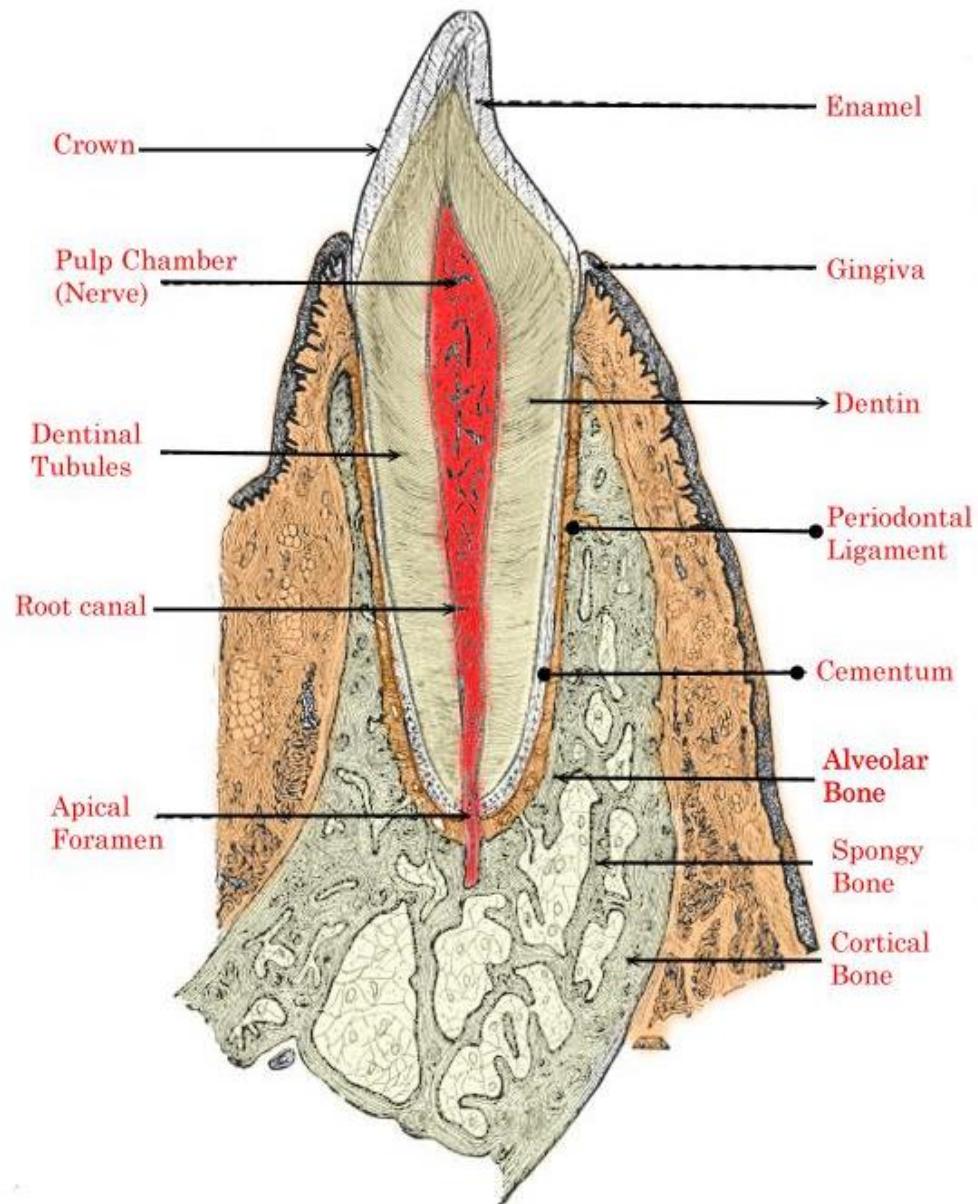
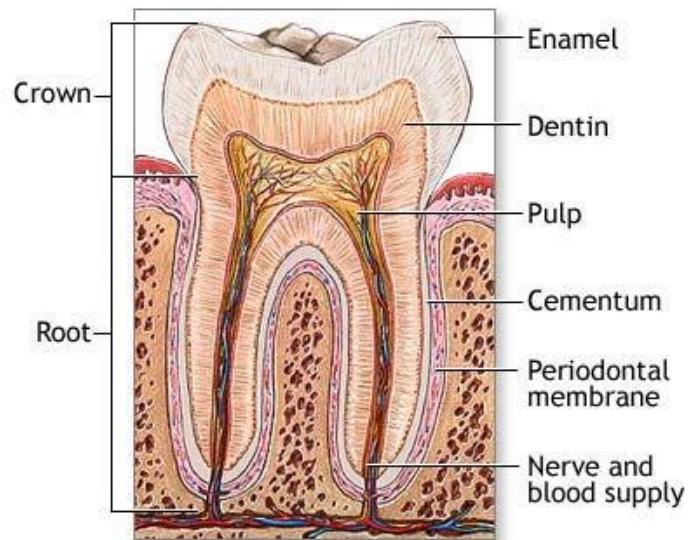
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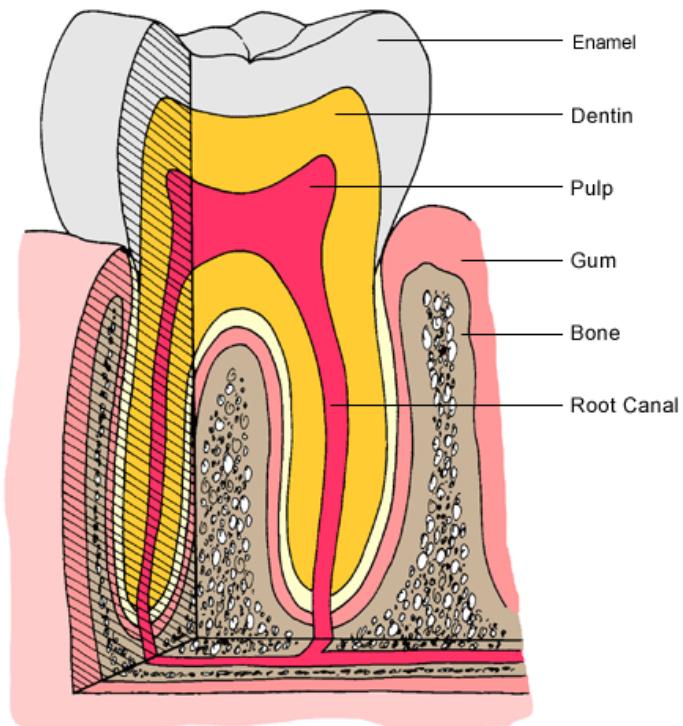
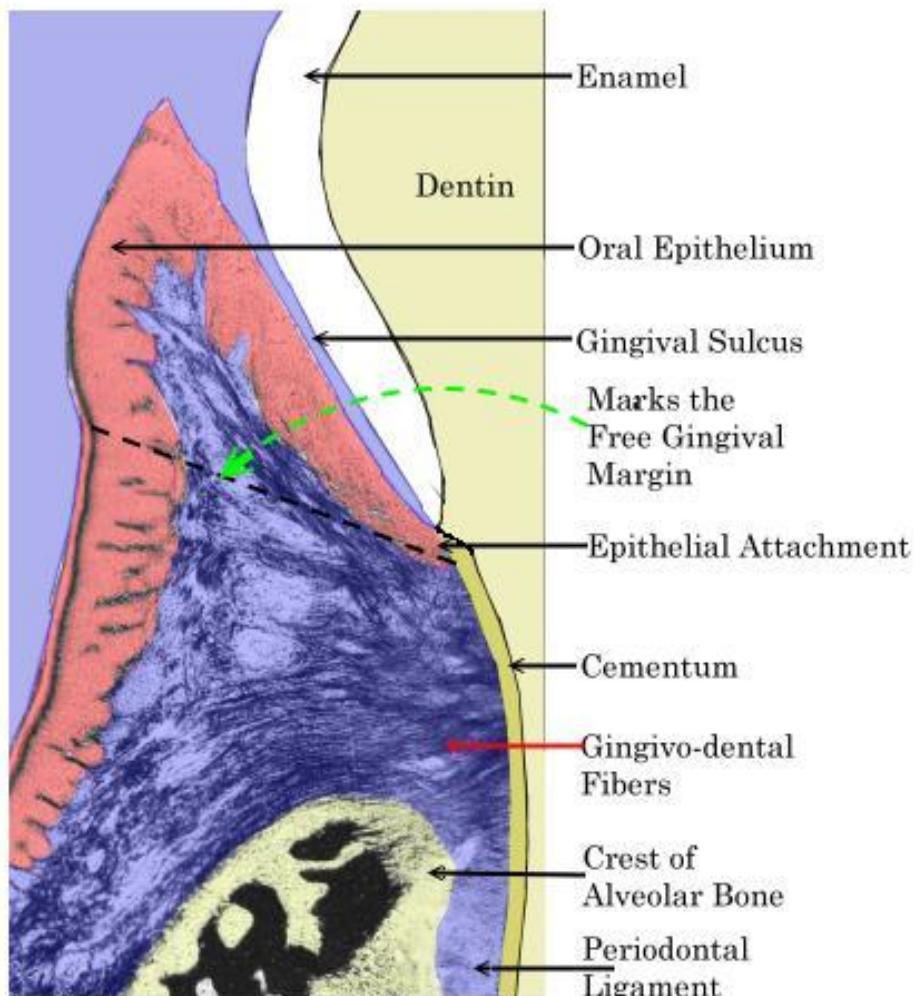
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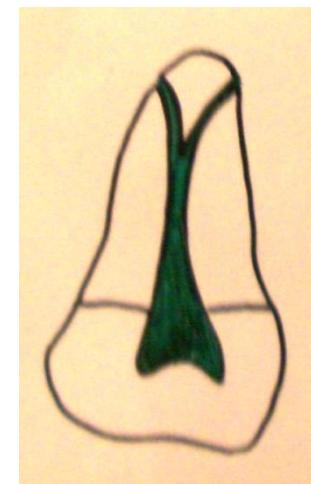
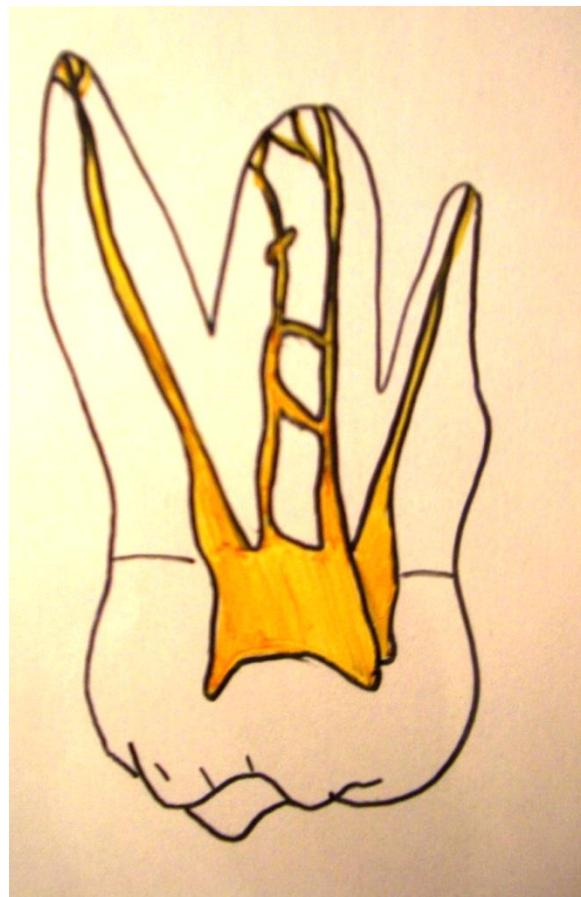
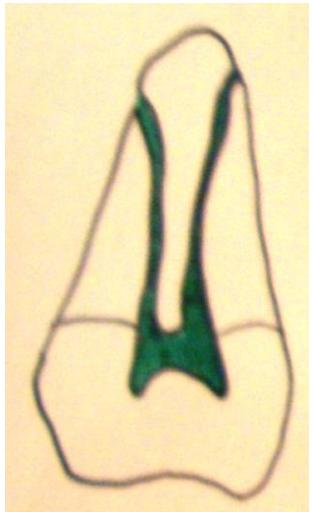










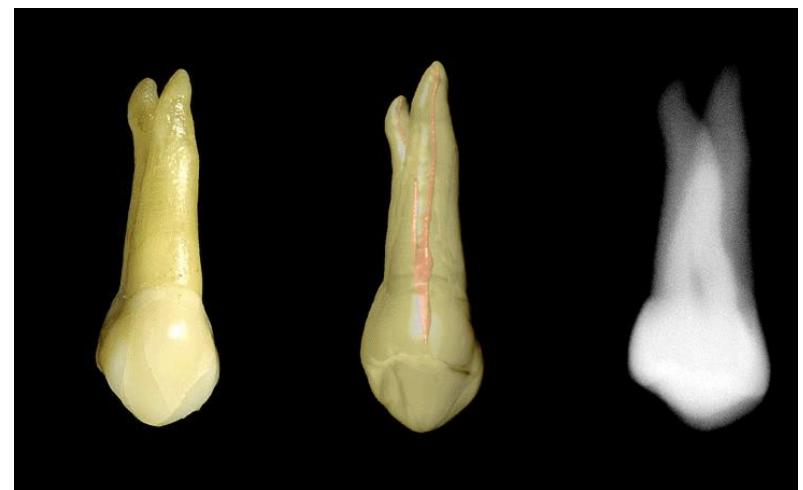
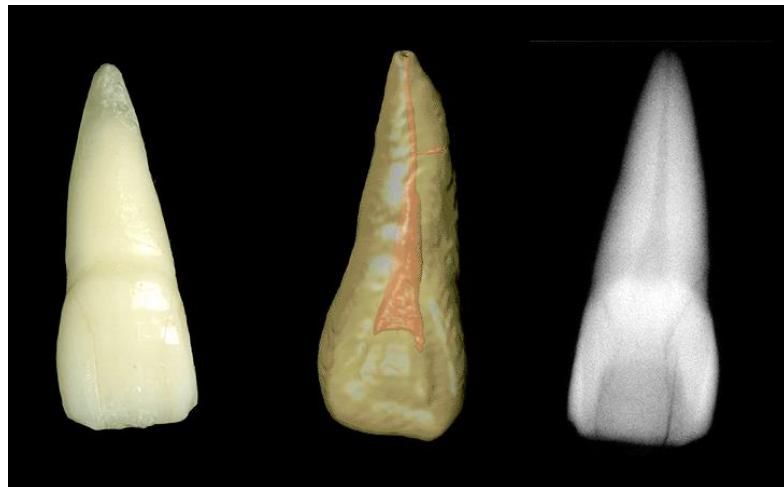




Brown & Herbranson



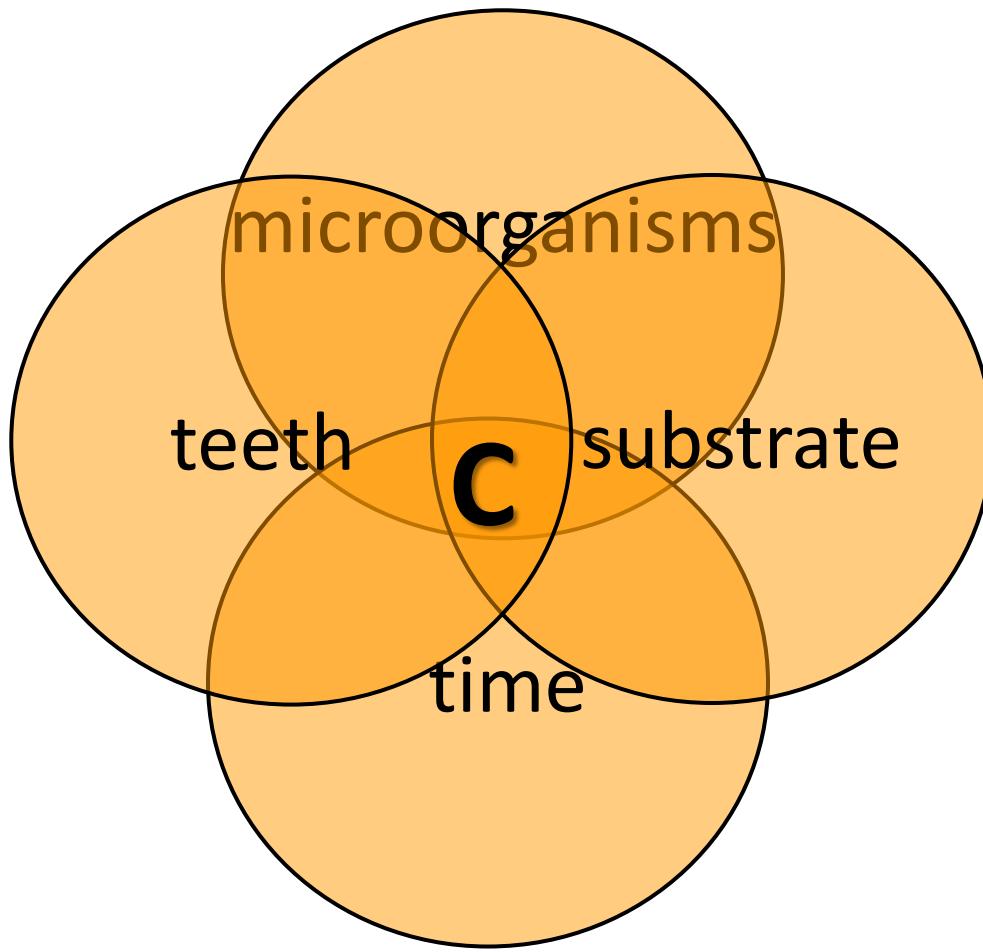
Dental Anatomy & Interactive 3-D Tooth ATLAS



www.toothatlas.com

DENTAL CARIES

- **Multifactorial**
- **Chronic**
- **Localized**
- **Irreparable destruction**
- **On erupted tooth surface**
- **Proceeding from surface to depth**



dental plaque



ecologic system

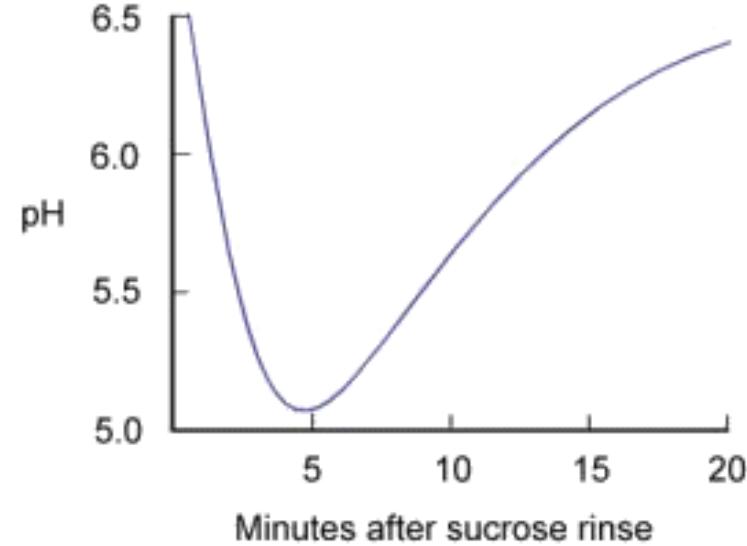
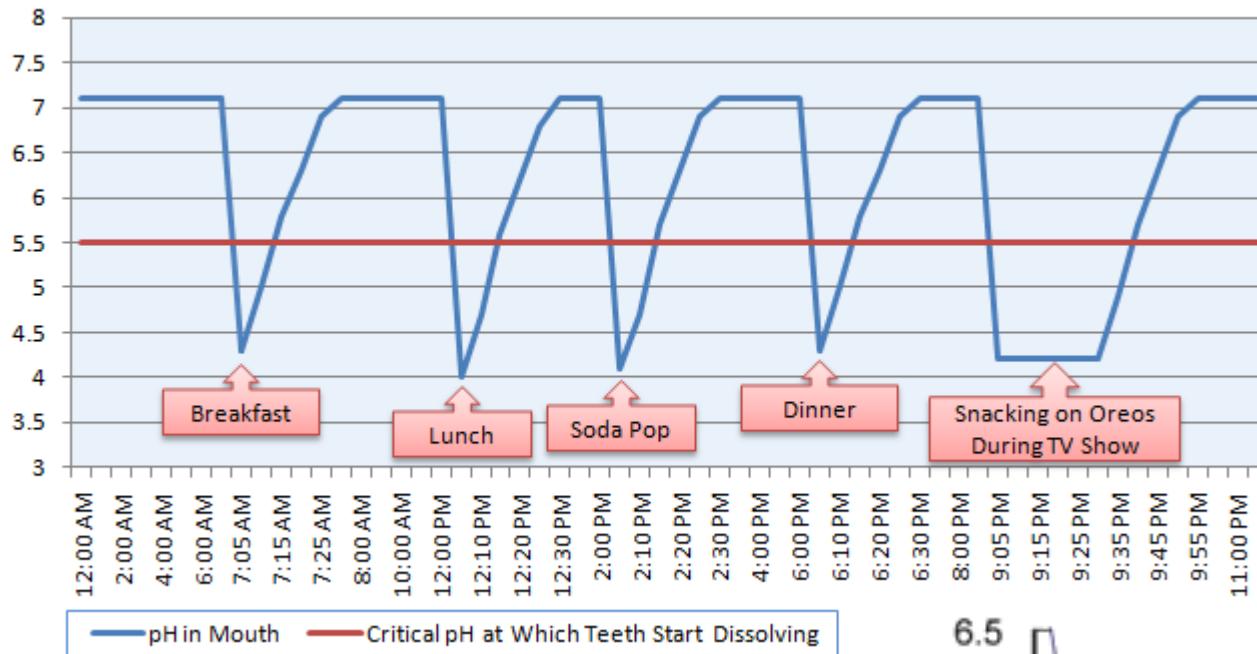


caries

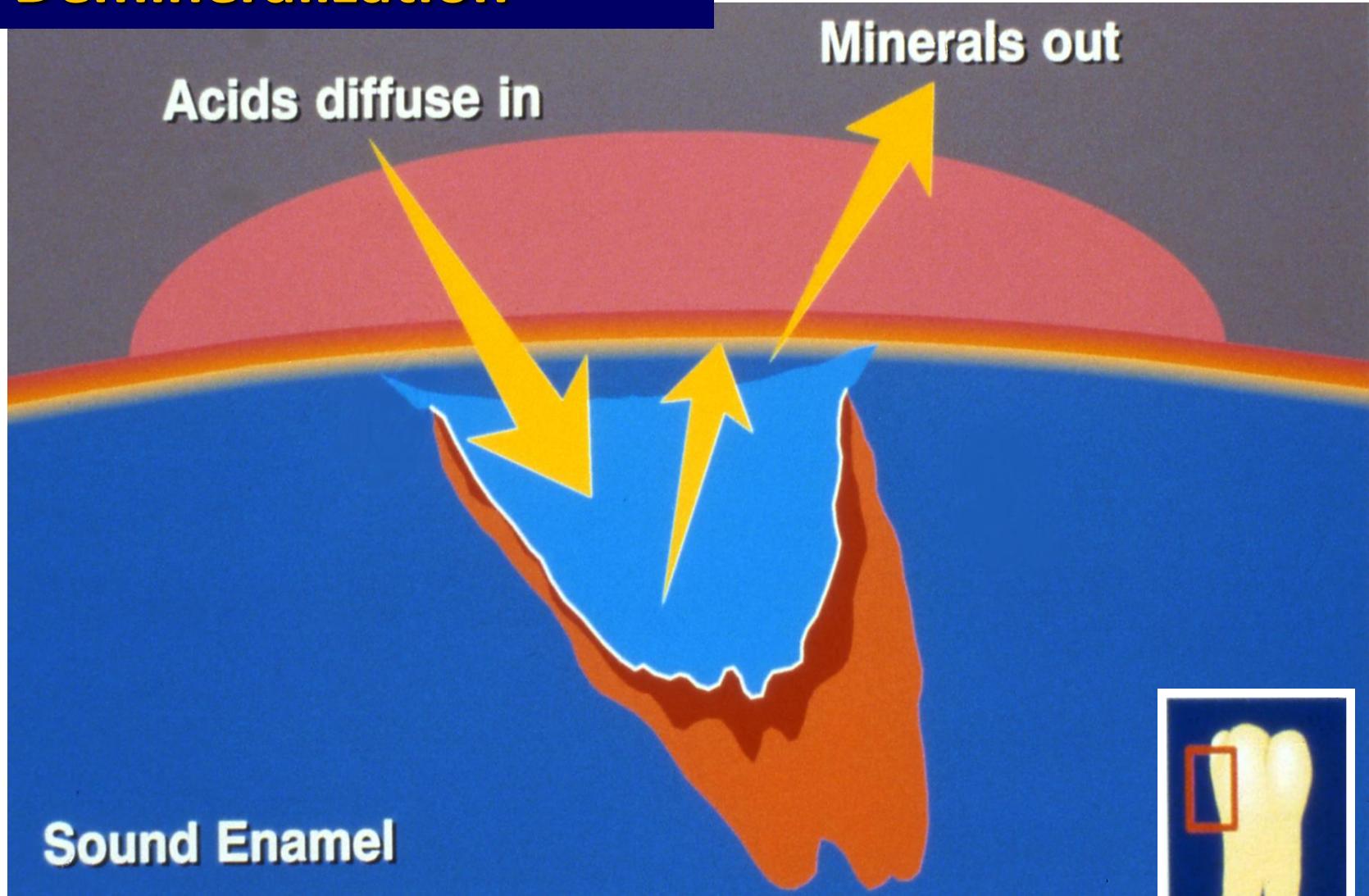


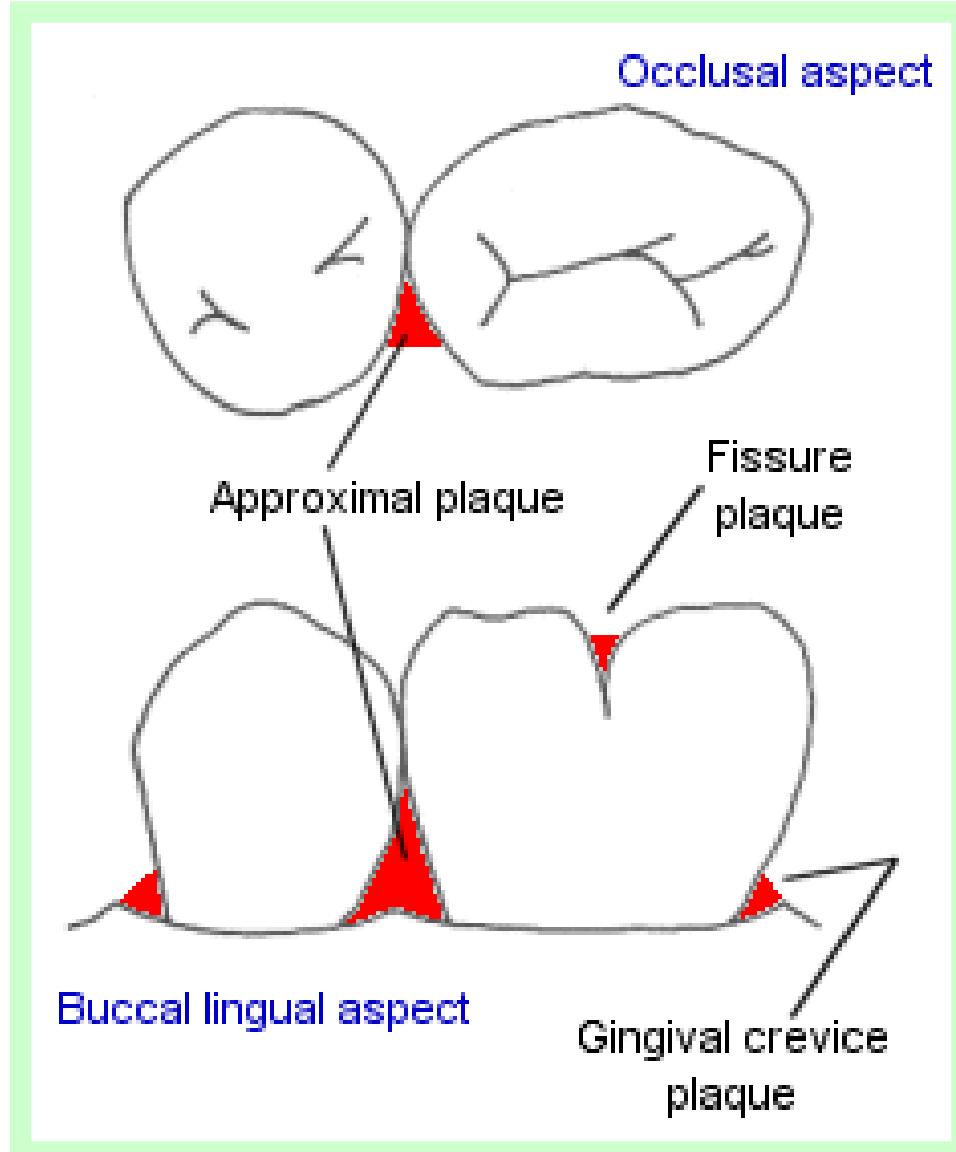
periodontal disease

What Happens In Your Mouth When You Eat or Drink



Demineralization





Classification of dental caries

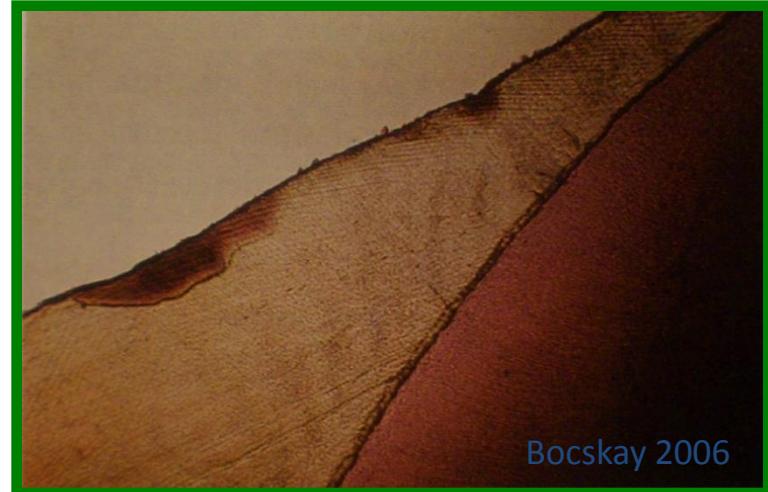
Extension

- **Caries incipient (initial)**
- **Caries superficial**
- **Caries media**
- **Caries profunda**
- **Caries penetrans**

Caries incipient

- ✓ slightly demineralized surface layer
- ✓ body of the lesion
- ✓ dark zone
- ✓ translucent zone

NO FILLING!!



REMINERALIZATION!!

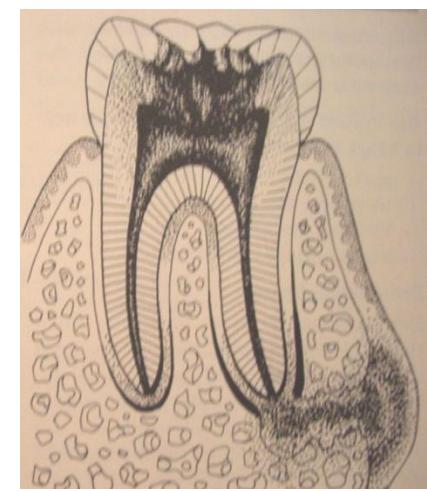
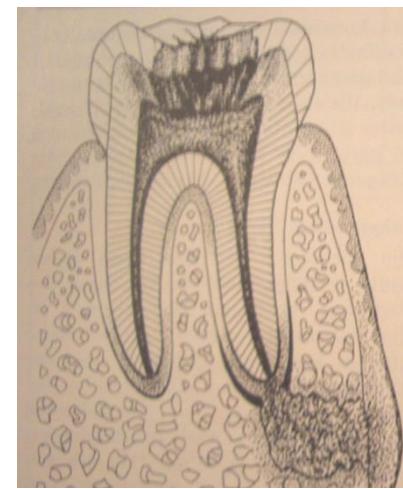
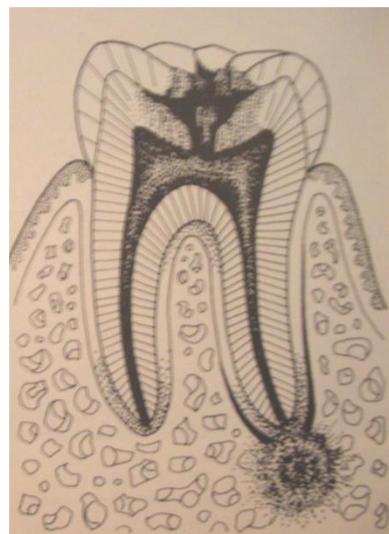
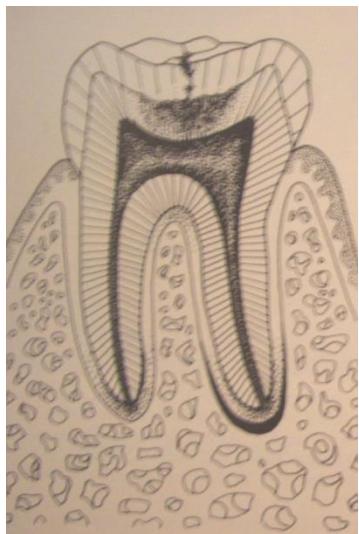
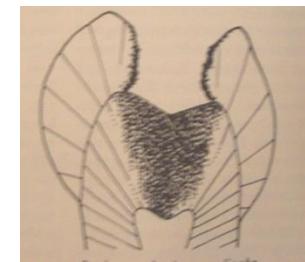
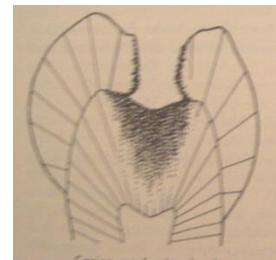
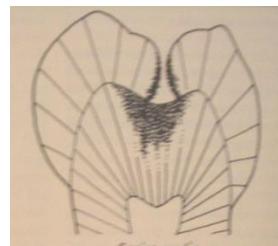
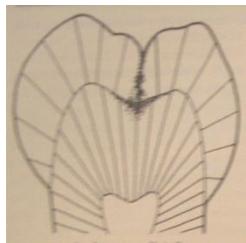
Therapy

Caries

— pulp **vital** → **restoration**

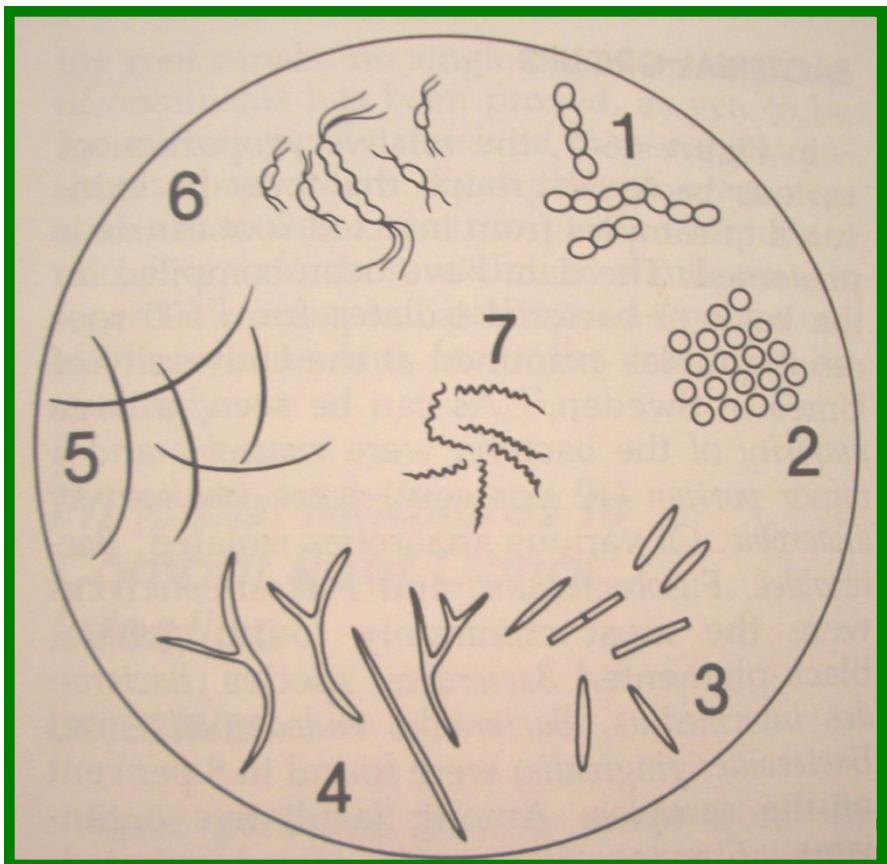
— pulp **inflamed or non-vital**

root canal treatment **or** **extraction**

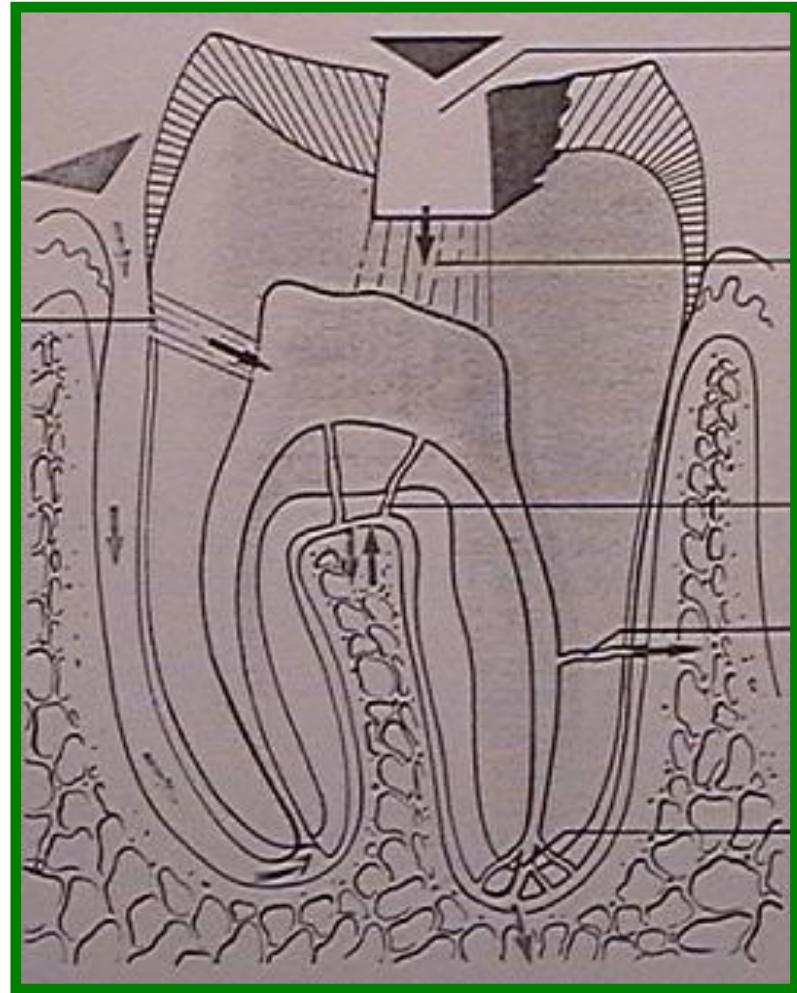
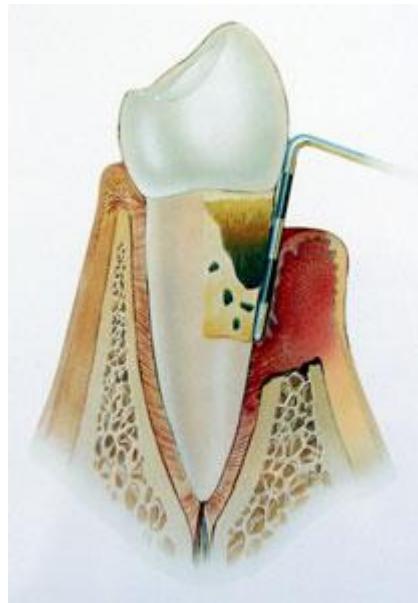


Endodontic Microbiology

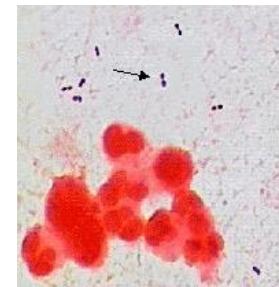
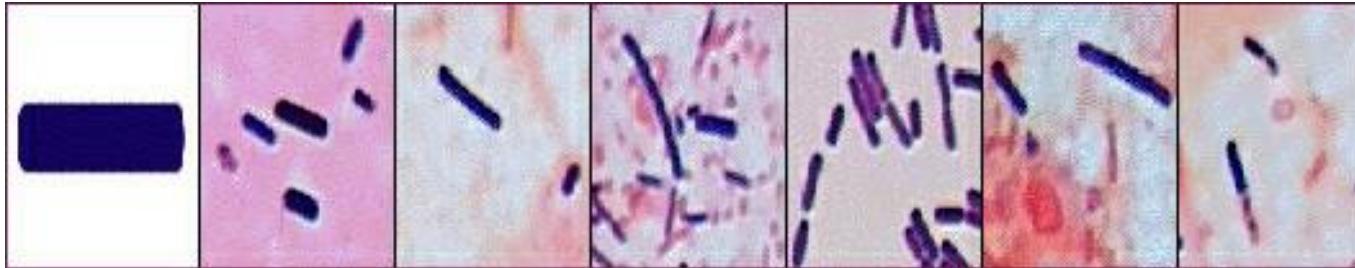
- Leeuwenhoek 1697
 - "living beings" in the pulp
- Miller 1894
 - pulp tissue pathoses and periodontal disease are connected with microorganisms



Forms of bacteria found in infected root canals. 1, *Streptococci*, e.g., gram-positive *S. sanguis*, *S. mutans*, and anaerobic peptostreptococci. 2, Clusters of cocci, e.g., anaerobic gram-negative *Veillonella* and gram-positive *Peptococcus* species. 3, Small rod forms, e.g., gram-negative *Eikenella* species, gram-positive anaerobic *Lactobacillus* species, and anaerobic gram-negative *Bacteroides*. 4, Branched gram-positive rods, e.g., anaerobic gram-positive *Actinomyces* and *Arachnia*, and unbranched gram-positive filamentous *Bifidobacterium* species. 5, Fusiform rods, e.g., anaerobic gram-negative *Fusobacterium* species. 6, Curved motile rods, e.g., anaerobic gram-negative vibrio forms, e.g., *Selenomonas* and *Campylobacter* species (showing flagella). 7, Spirochetal forms.



Diplococci

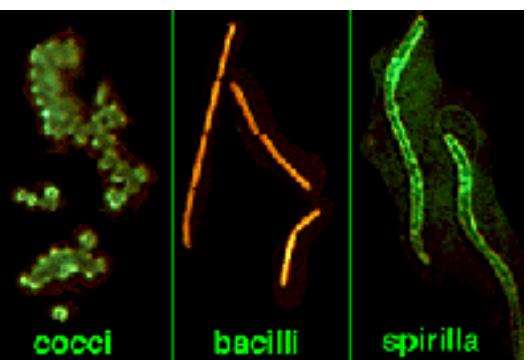


Gram-pos. rods

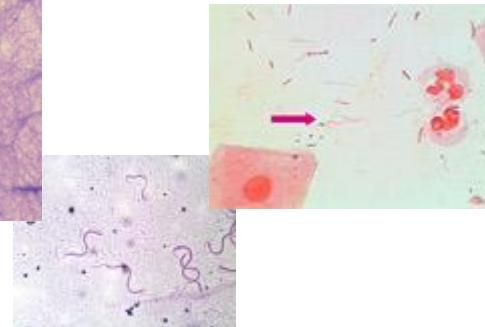
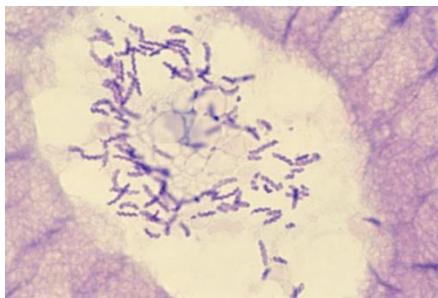


Clusters

Gram-pos. chain



Spirochetal form



Therapy of root canal infection

root canal treatment or extraction

Aseptic conditions + sterile instruments

- 1.** Debridement: cleaning and shaping:
chemomechanical preparation
- 2.** Antimicrobial irrigating
with tissue dissolution /NaOCl/ and
antimicrobial dressing /Ca(OH)₂/
- 3.** Complete obturation

The use of antibiotics

yes ?

no ?

in which case ?

The use of antibiotics

!! Antibiotics cannot substitute for a thorough diagnosis and proficient endodontic therapy !!

Systemic antimicrobial treatment is generally indicated when symptoms of endodontic infections are present that suggest marked progression or systemic involvement.

Fever, malaise, cellulitis, unexplained trismus...

Daily monitoring !

Antibiotic prophylaxis of high-risk patient

Always

- Heart valves damaged by rheumatic fever
- Bacterial endocarditis
- Congenital cardiac malformations
- Surgically constructed systemic - pulmonary shunt
- Idiopathic hypertrophic subaortic stenosis
- Mitral valve prolapse with insufficiency

Antibiotic prophylaxis of high-risk patient

After consultation their physician

- Immunosuppressive therapy
- Therapy on cytotoxic drugs
- Receiving irradiation for cancer
- Prosthetic joint implants or systemic infection

Careful history ----- consultation

The use of antibiotics

Before treatments with **bacteriaemia**

- Scaling
- Extraction, sculpture
- Rootcanal treatment + additional surgery
(curettage, resectio)
- Intraligamental injection
- Treatments with bleeding of the gingiva (surgery)

(Magyar Belorv. Arch. 1995.)

The use of antibiotics

Non penicillin-allergic patient:

1 h before treatment 2 g Amoxicillin p.o.
 50 mg/kg Amoxicillin p.o.

Penicillin-allergic patient:

1 h before treatment 600 mg Dalacin p.o.
 (Clindamycin)
 20 mg/kg Dalacin p.o.

Root canal treatment and obturation

- preparation of an aseptic root canal
- sealing of the root canal system to prevent microbial leakage
 - apical
 - lateral
 - coronal sealing
- chemomechanical root canal preparation, disinfection
- hermetically sealed root canal system and preventing re-infection by microorganisms via the root canal orifice and apical foramen