

# Preclinical Dentistry

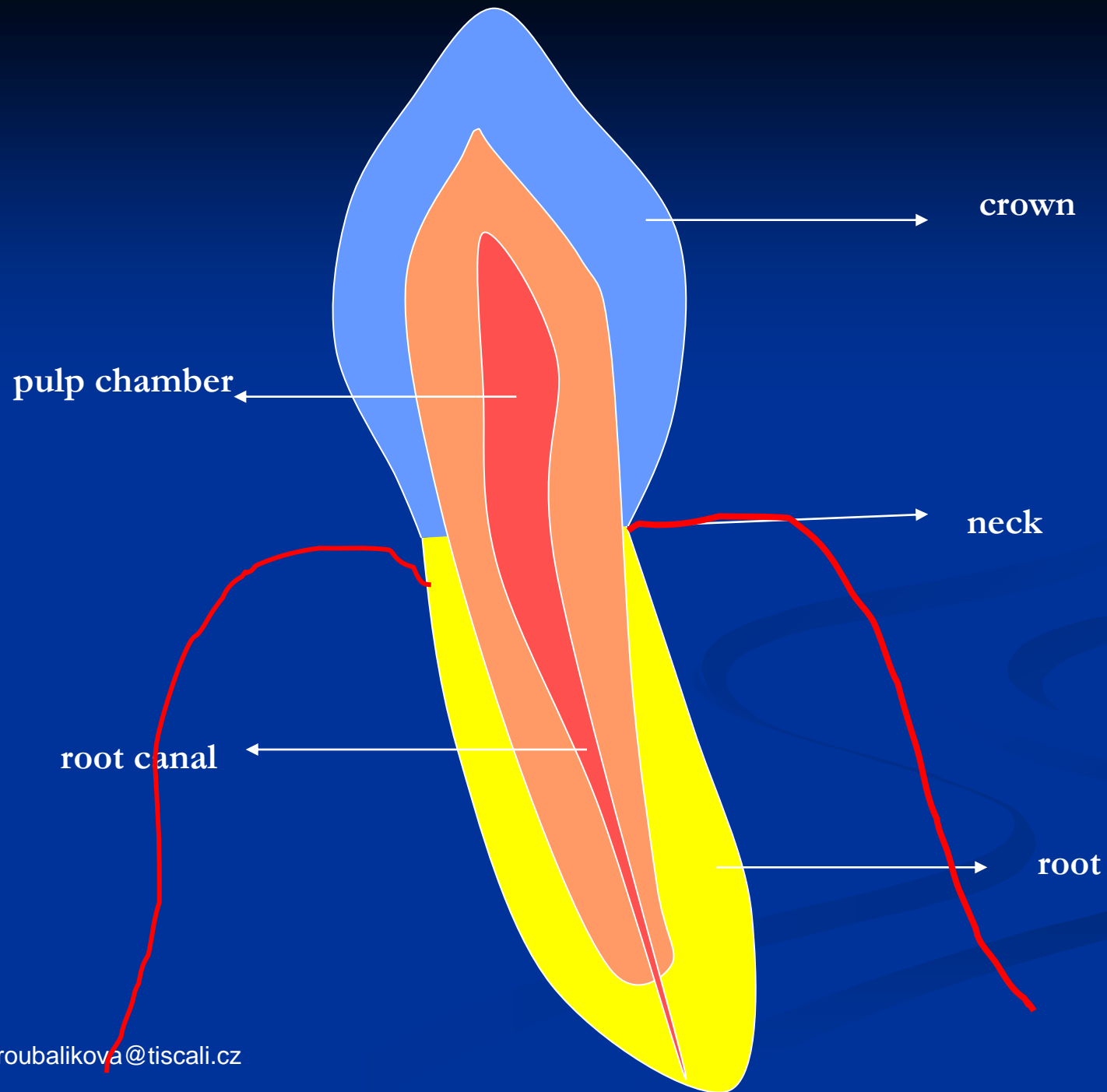
## I.

### Dental Caries

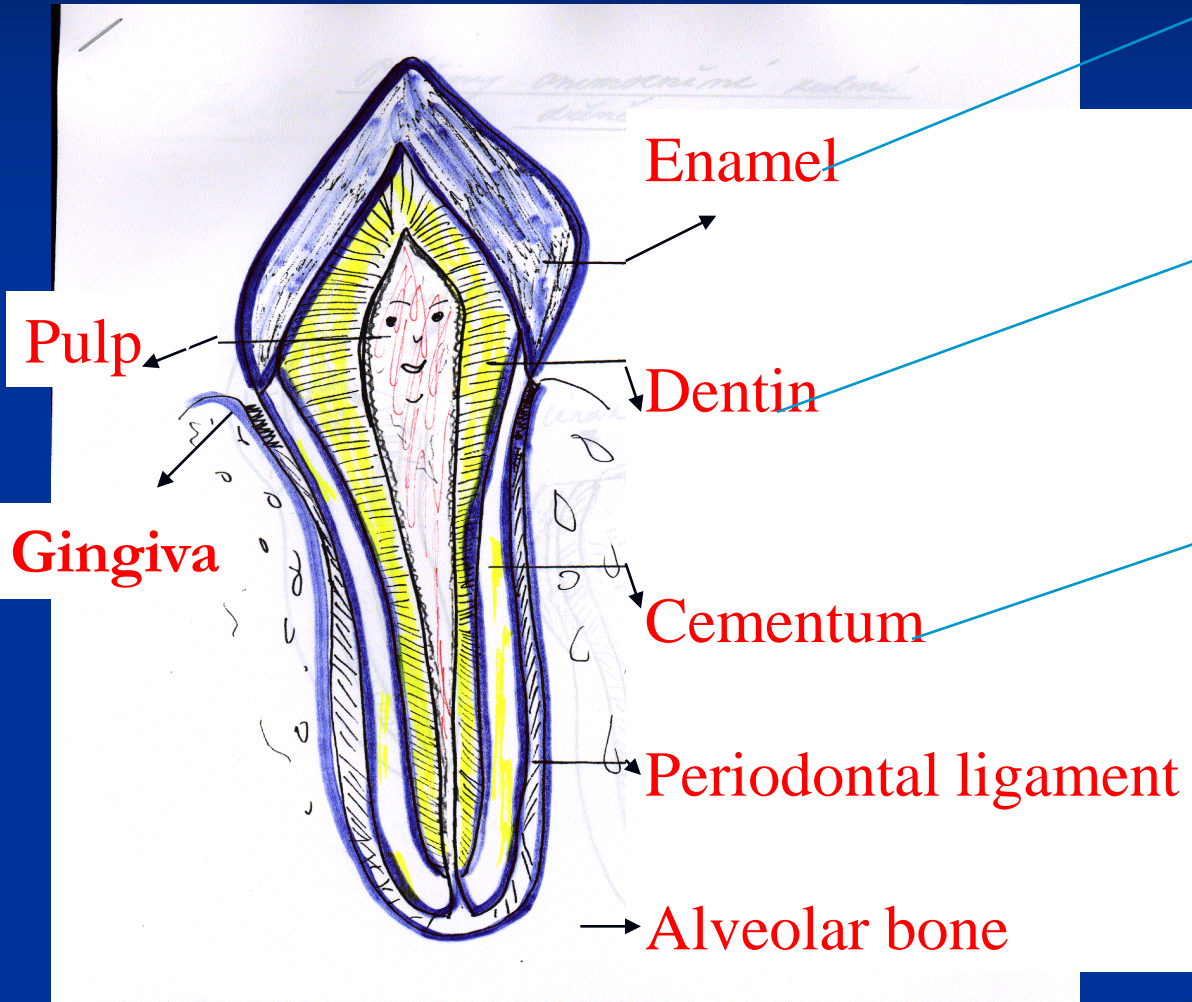
**Non carious lesions: trauma,  
erosion, abrasion, V. shaped  
defects**

Lenka Roubalíková

# Understanding dental caries

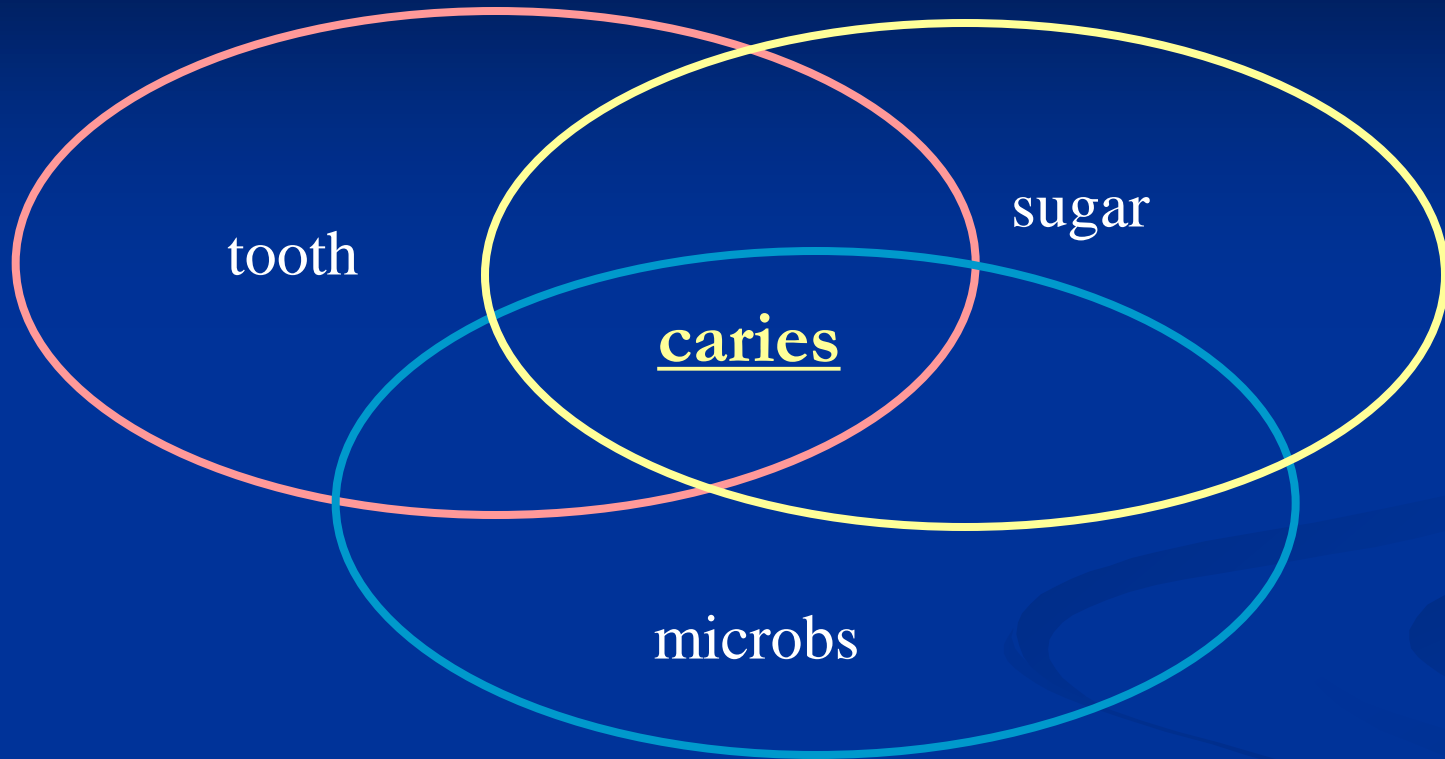


# Dental Tissues



Dental caries

# Dental caries



**time**

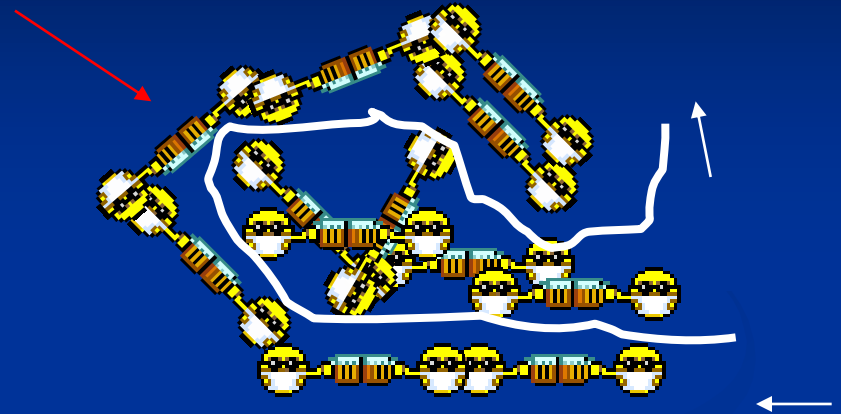
Factors that are necessary for origin of dental caries

# Dental Caries

Infectious microbiological disease of the teeth that results in localized dissolution and destruction of the calcified tissues.

# Biofilm – Dental Plaque

Complex community



Simple circulation



**Better conditions to survive**

# Dental Biofilm – Dental Plaque

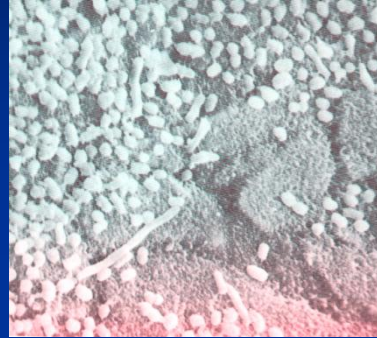
A gelatinous mass of bacteria adhering to the tooth surface.



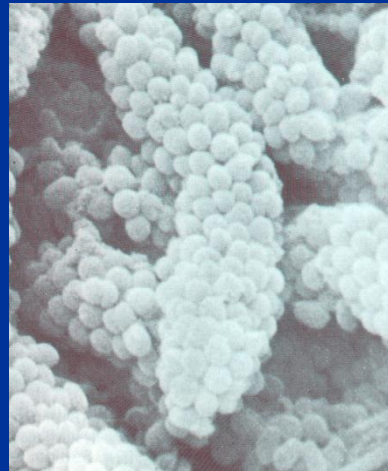


# Dental biofilm

- Adhesion



- Colonisation



- Maturation



# Sugar

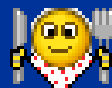
Fermentable (mono-, di- tri- sacharides)



Sucrose, glucose, lactose



Acids

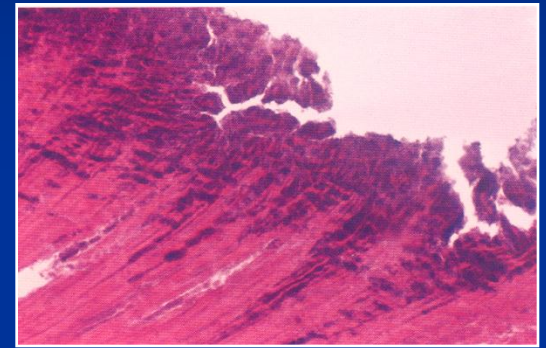
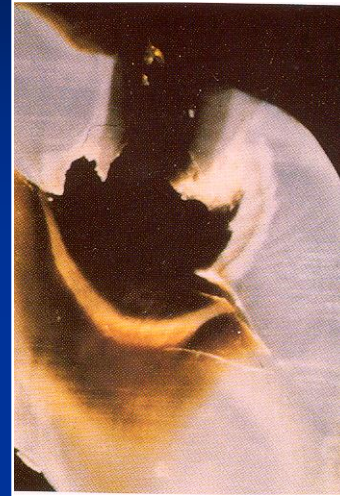
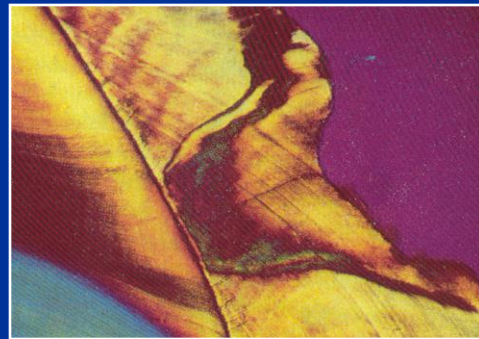


**Demineralization**

Cavitated lesion

Demineralization

Non cavitated lesion



Time

# Saliva

- Plaque formation
- Microbial source
- Mineral source
- Microbial clearance
- Buffer capacity

# Caries danger areas habitually (predictable) dirty areas

- Pits and fissures
- Proximal surfaces
- Cervical area

No self cleaning

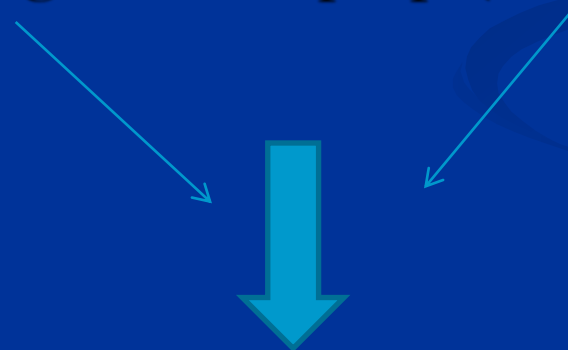
# Predictable (habitually) clean areas

- Cusps
- Proximal ridge, oblique, transverse ridge
- Incisal edge
- Buccal or oral surface upon the maximal convexity
- Proximal surface upon the contact point

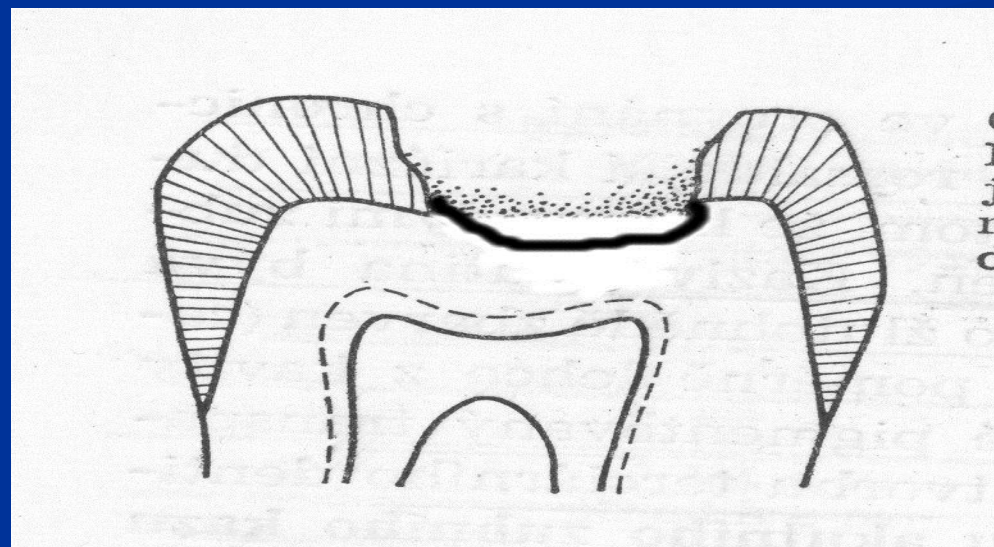
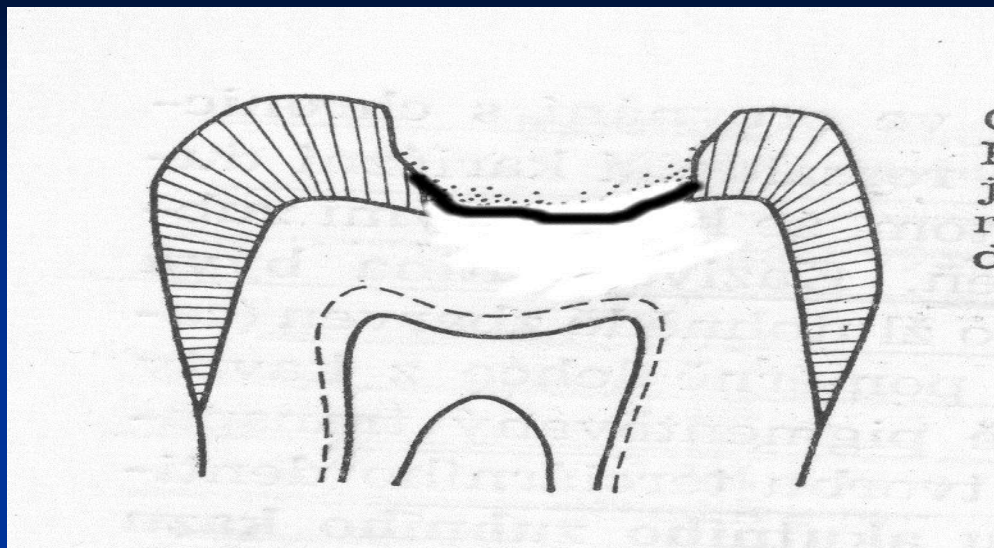
Self cleaning

# Caries - depth

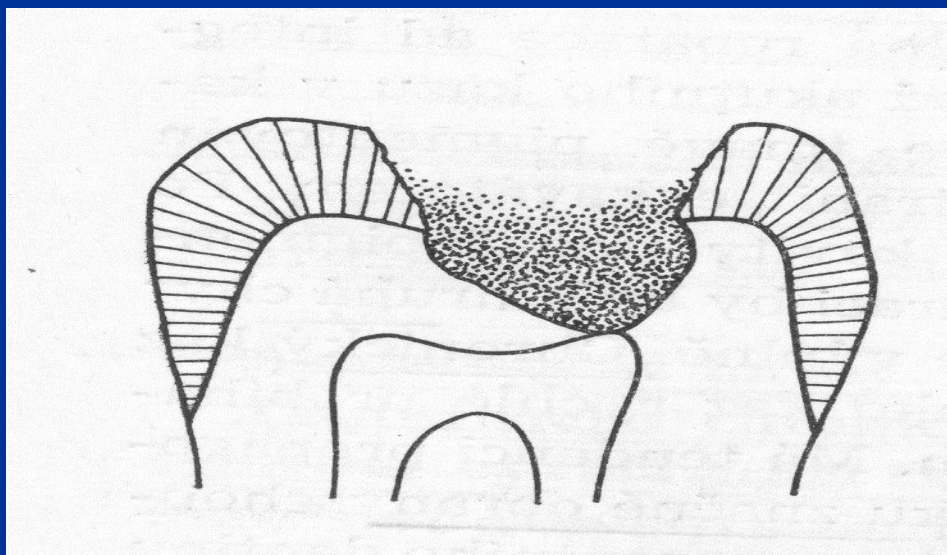
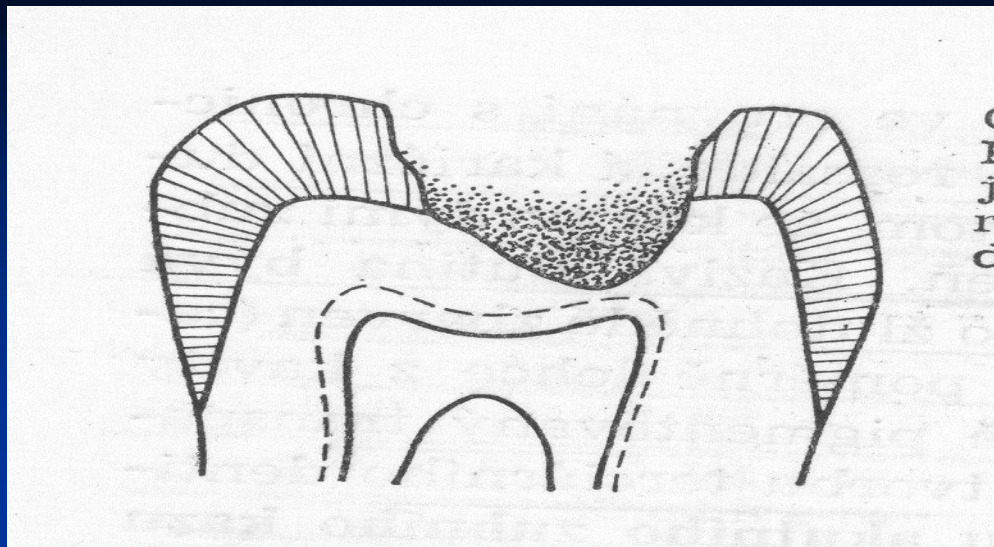
- Surface caries (*caries superficialis*)
- Middle caries (*caries media*)
- Caries close to pulp (*caries pulpae proxima*)
- Caries penetrating into the pulp (*caries ad pulpam penetrans*)



Deep caries







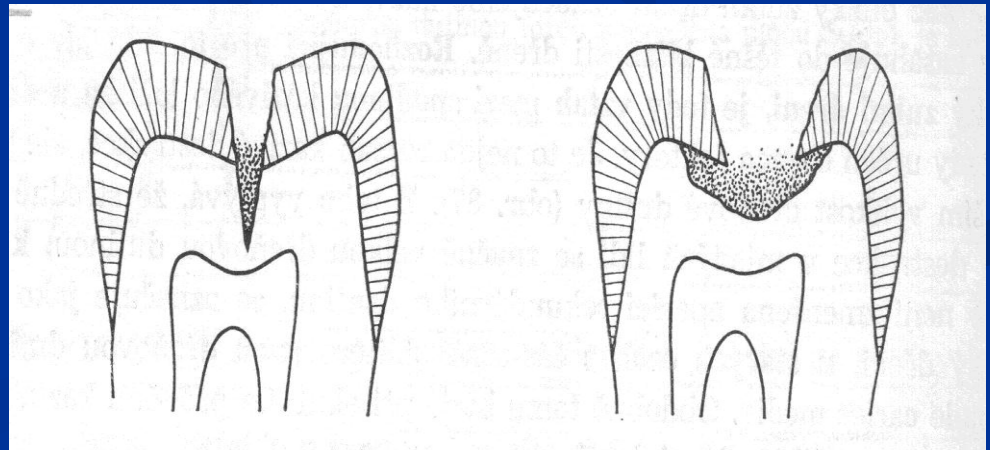
# Caries - Topography

- Coronal caries
- Root surface caries
  
- Enamel caries
- Dentin caries
- Cementum caries

# Caries

- Acute
  - Chronic
  - Arrested
- } Acc to its history

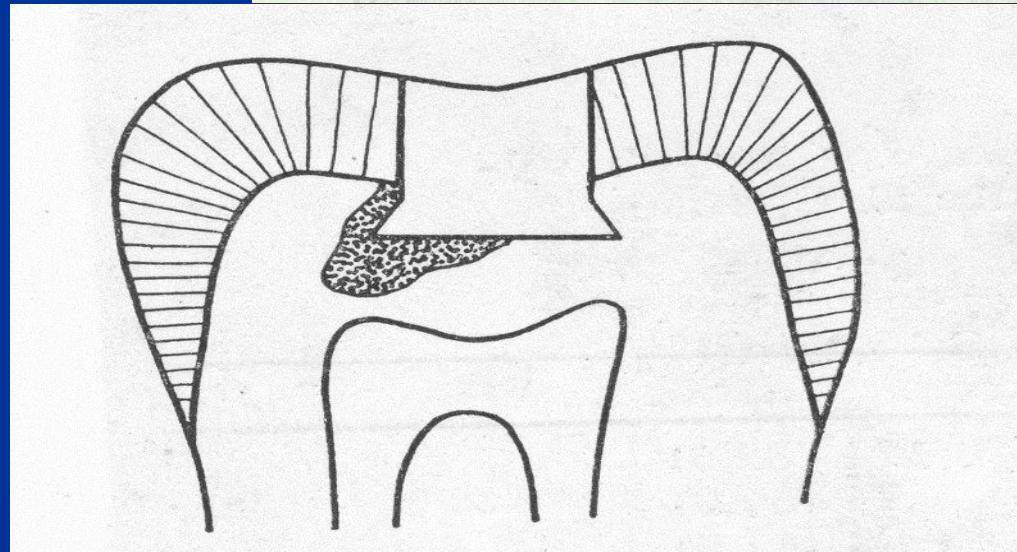
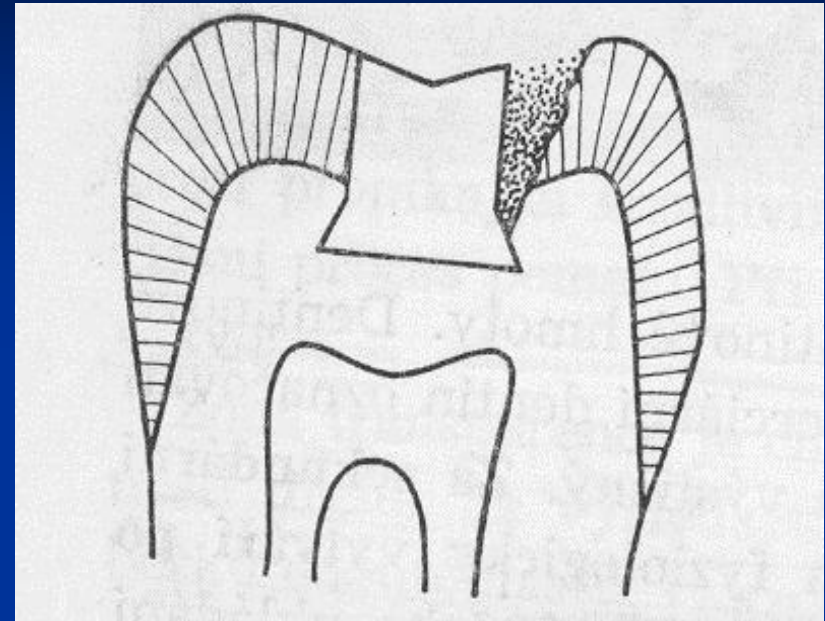
- Penetrating
- Undermining



Primary caries

Secondary caries

Recurrent caries



# Patient assessment

Clinical examination  
Diagnosis

# Diagnosis of dental caries

# Investigation

- **Mirror**
  - **Sharp Probe**
  - **Illimination**
  - **Magnification**
- Dark spot, hole, defect
- **X- ray, other methods i.e. transillumination, infrared laser fluorescency**





# Dental Caries - Treatment

## ■ Non cavitated lesion:

On molecular basis

- Dental hygiene
- Fluorides, Calcium, Phosphates
- Diet
- Antimicrobial agents

# Dental Caries - Treatment

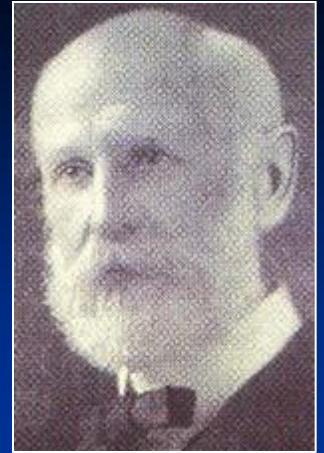
- Cavitated lesion:

Preparation

Filling

**Drill and fill**

# Preparation



Instrumental treatment

Remove caries

Leave the rest of the dental tissues

- to be restored
- to be resistant against the bite forces
- to be prevented against the recurrent caries

(Black 1914)

# Classification of cavities according to Black

# Class I.

Caries in fissures and pits – occlusal surfaces of premolars and molars

# Class II.

Proximal surfaces of molars and premolars

# Class III.

Proximal surfaces of incisors and canines  
without loss of the incisal edge

# Class IV

Proximal surfaces of incisors and canines  
with the loss of incisal edge



# Class V.

Cervical area

# Classification acc. to Black

- Class I.

Pit and fissure caries



# Classification acc. to Black

- Class II.

Proximal surfaces in premolars and molars



# Classification acc. to Black

- Class III.

Proximal surfaces of incisors and canines without lost an incisal ridge



# Classification acc. to Black

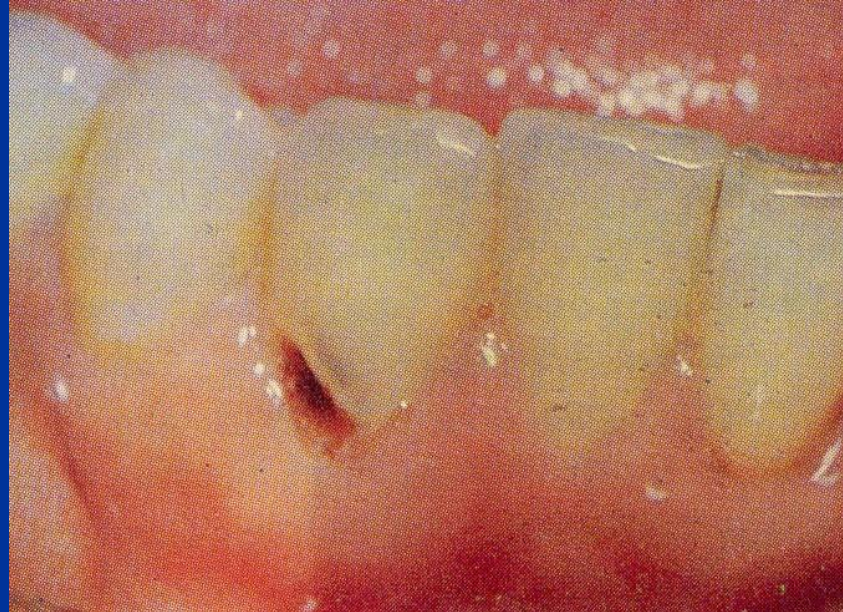
- Class IV.

Proximal surfaces of incisors and canines with lost an incisal ridge



# Classification acc. to Black

- Class V. cervical lesions



# Charting and records

## the most important notation

- Caries /
- Filling P
- Tooth for extraction X
- Extracted tooth +
- Crown
- Pontic
- Tooth in removable denture 0

# Instruments for investigation – investigative instruments

Explorer (probe):

Sharp, straight or bow shaped:

Caries detection – light motion without any pressure: dental surfaces, fillings.

Periodontal explorer (probe): not sharp, calibrated, investigation of periodontal pockets



# Instruments for investigation – investigative instruments

- Mirror – flat or concave
- To see less available regions
- To illuminate
- To move off soft tissues (cheeks, tongue etc.)

# Instruments for investigation – investigative instruments

Tweezer

To grip various instruments and supplies.

# Cavity preparation

- Power driven

- Hand

# Instruments for cavity preparation

Hand instruments for cutting

Two main materials:

Stainless steel (loses keen edge)

Carbon steel (corrode)

Excavator

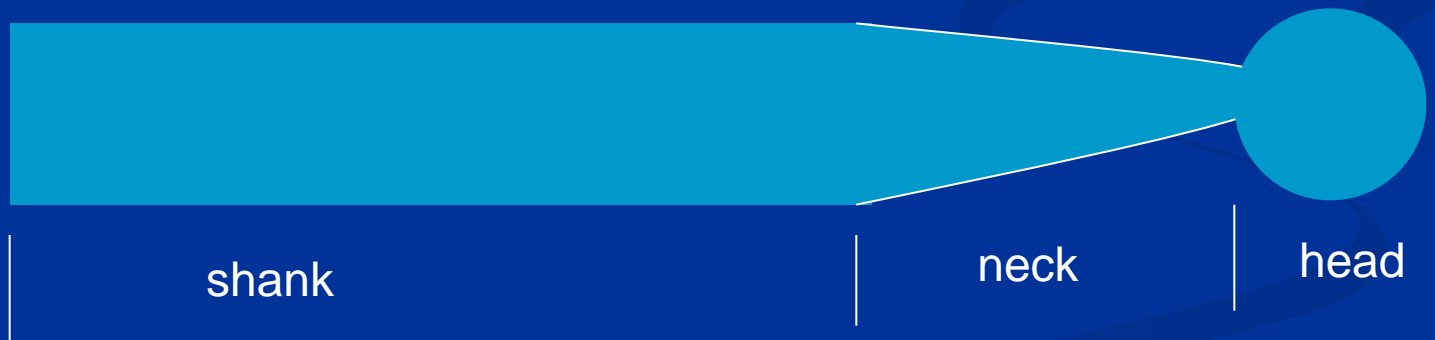
Chisel- cleaver

# Instruments for cavity preparation

Power driven instruments for cutting

Rotary instruments

Comon design characteristics



# Shank

- The part that fits into the handpiece
- Accepts the rotary motion from the
- handpiece
- Provides a bearing surface to control the
- alignment and concentricity of the
- instrument

# Straight handpiece shank

- Simple cylinder
- held in the handpiece in a metal chuck

# Latch angle handpiece shank

- Shorter length – access to posterior regions

Handpiece – contra angle, metal bur tube.

The end of the instrument fits into D-shaped socket at the bottom of the bur tube. The *instrument* retained by a retaining latch that slides into the groove found at the shank end of the instruments.



# Friction grip handpiece shank

Smaller design, simple cylinder.

Held in the handpiece by friction in plastic or metal chuck.

# Neck design

Intermediate portion of an instrument that connects the head to the shank  
Tapered, shorter or longer.

# Head design

Burs – cut of steel or tungsten carbid

Diamond (diamond burs)– covered with the diamond bort

# Head design

## Burs classification system

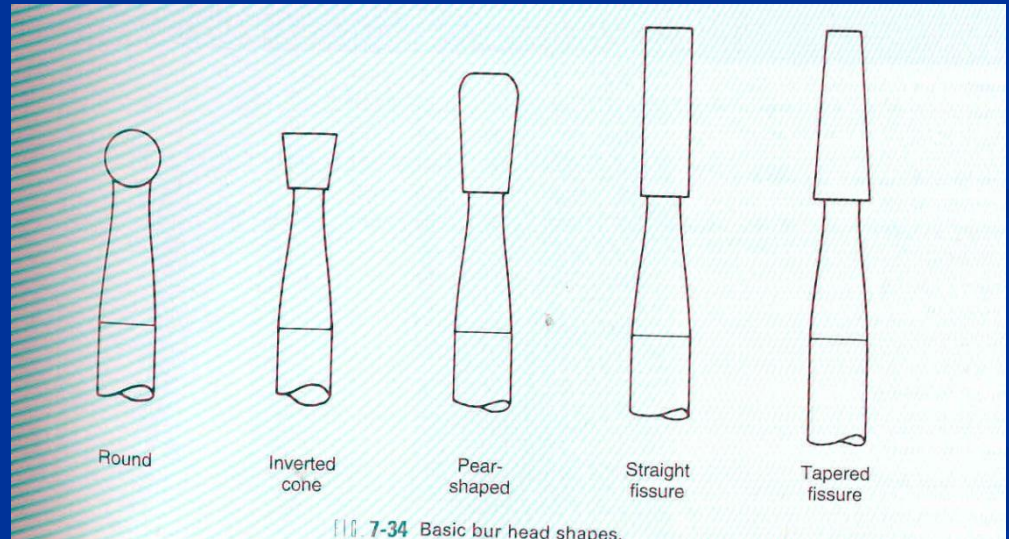
Round

Inverted cone

Pear shaped

Straight fissure

Tapered fissure



# Bur blade design

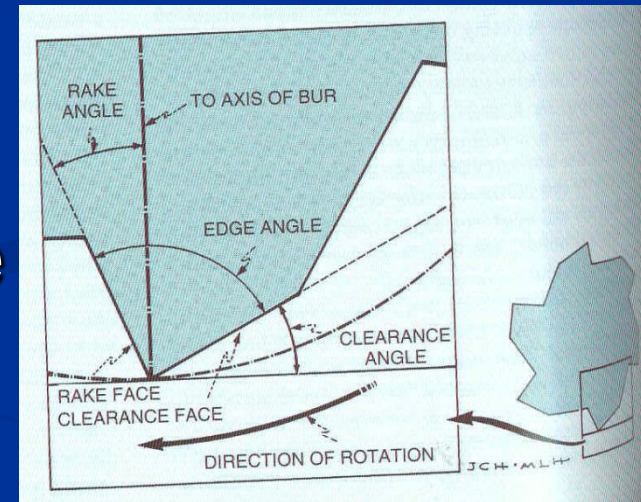
- Rake face (towards the direction of cutting)
- Clearance face

Rake angle – slightly negative

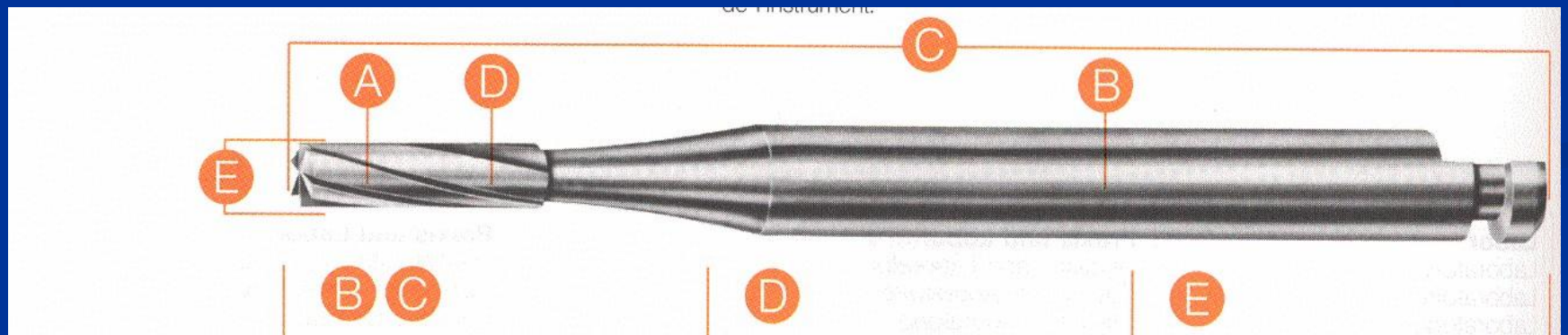
Edge angle – appr  $90^\circ$

Clearance angle

Clearance face rounded or two surfaces.



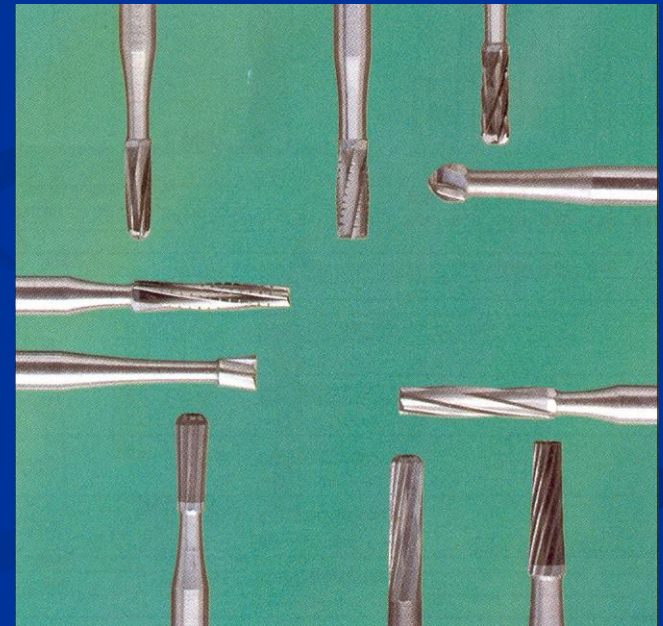
# Fissure bur



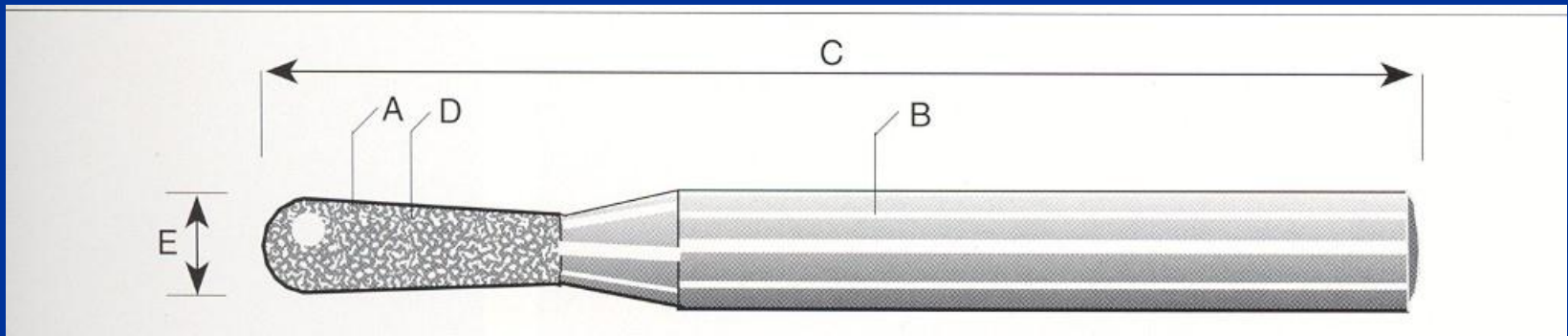
# Burs

Blades are cutting the material

Material is removing  
through spaces between blades



Diamonds – a bur covered with the diamond particles





# Diamond abrasive instruments

Diamond bort – small sharp particles in softer matrix. Cutting occurs at a large number of points (grinding).

Metal blank

Diamond powder

Metallic bonding material

# Preparation speed

- Low (slow) speeds – below 12.000 rpm
- Medium or intermediate speeds 12.000 – 200.000 rpm
- High or ultrahigh speeds above 200.000 rpm



**400.000 rpm**



Electromotors – maximum 40.000/min

Blue code – gear 1:1



Airmotors – maximum 20.000/min

Gearing to fast speed



1:5

Gearing to slow speed



2,7 :1 or 7,4 :1

Oscillation



# Red coded handpiece



**1:4 až 1:5 as far as 160.000 – 200.000 rpm**

# Green coded handpiece



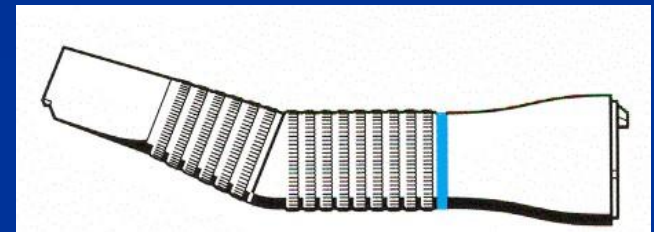
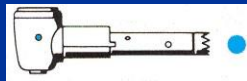
2,7:1

7,4:1

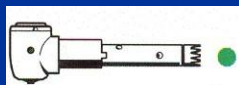
# Hanpieces combined



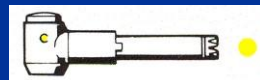
1:1



2:1



nerotuje





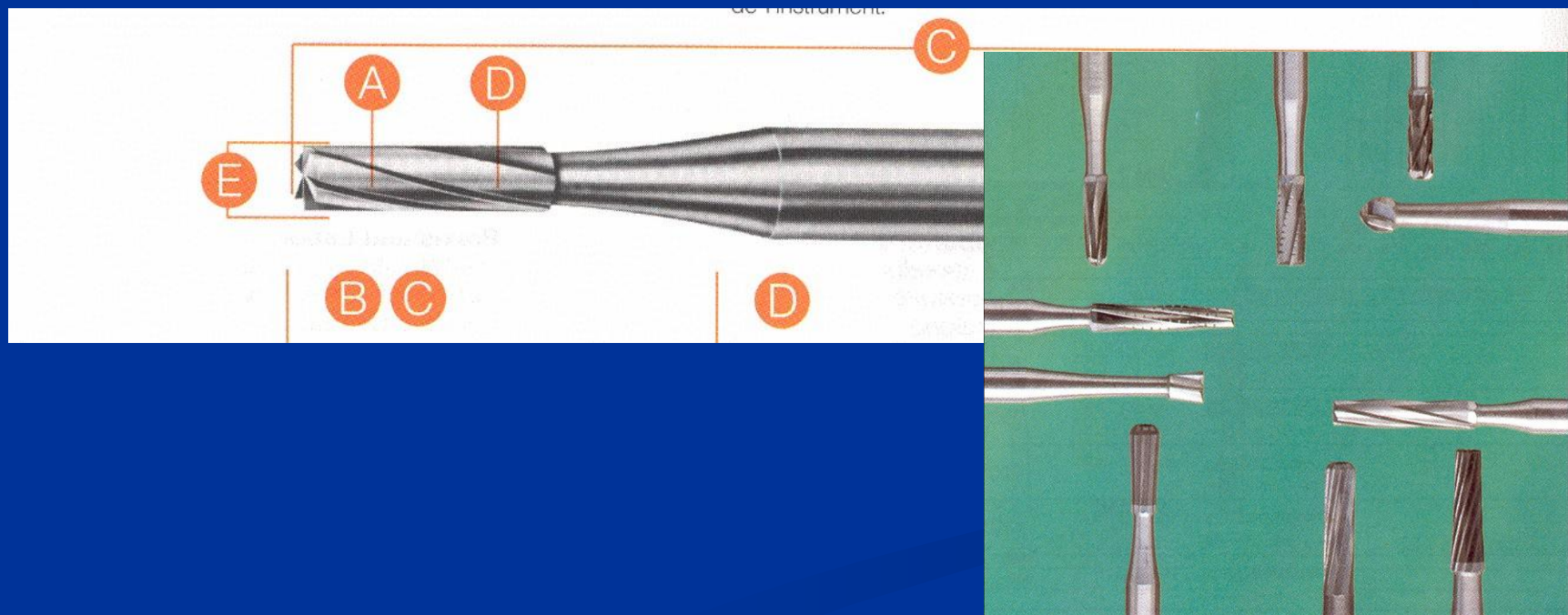


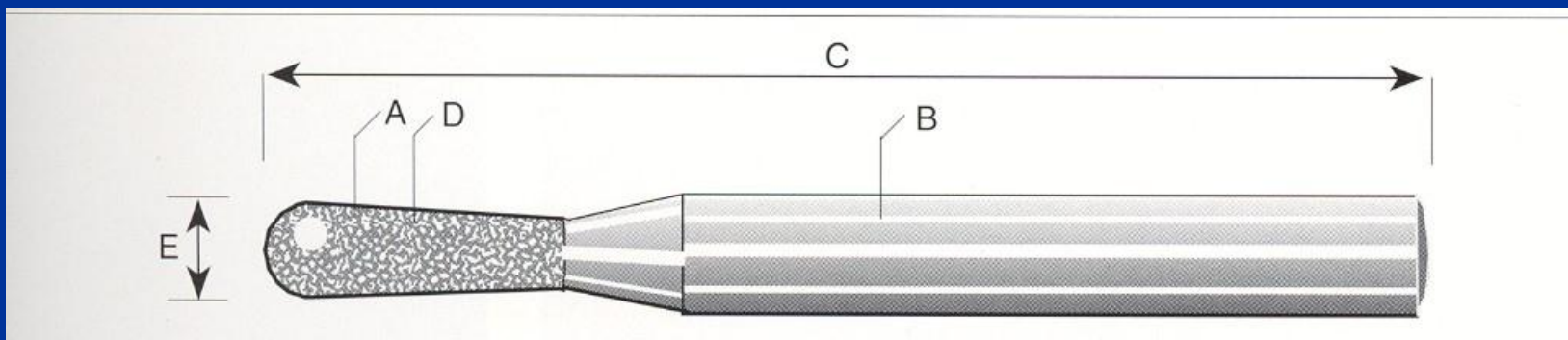
**1 : 1 as far as 40.000 rpm**

# Blue and green coded handpiece



# ISO 6360





# Filling materials

## Temporary

Zinkoxidsulphate cement

One component cements based on gypsum and organic lute

Zinoxidphosphate cement

Permanent

Amalgam

Composites

# Filling materials

Amalgam:

Mercury

Powder – metal alloy:

Silver

Tin

Copper

Zinc

# Chisel – for enamel Cleaver

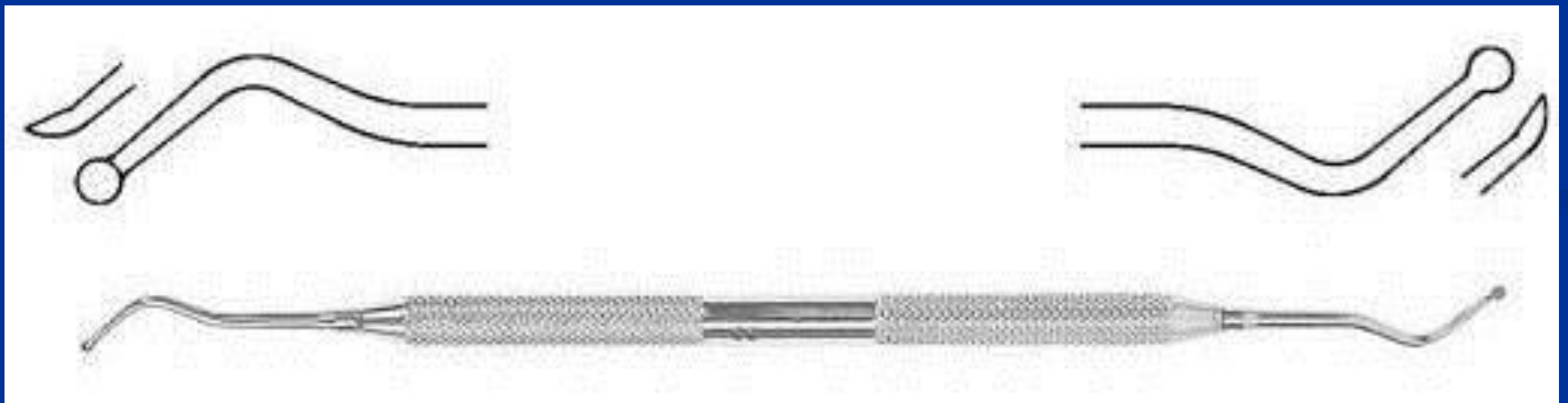


# Chisel for enamel





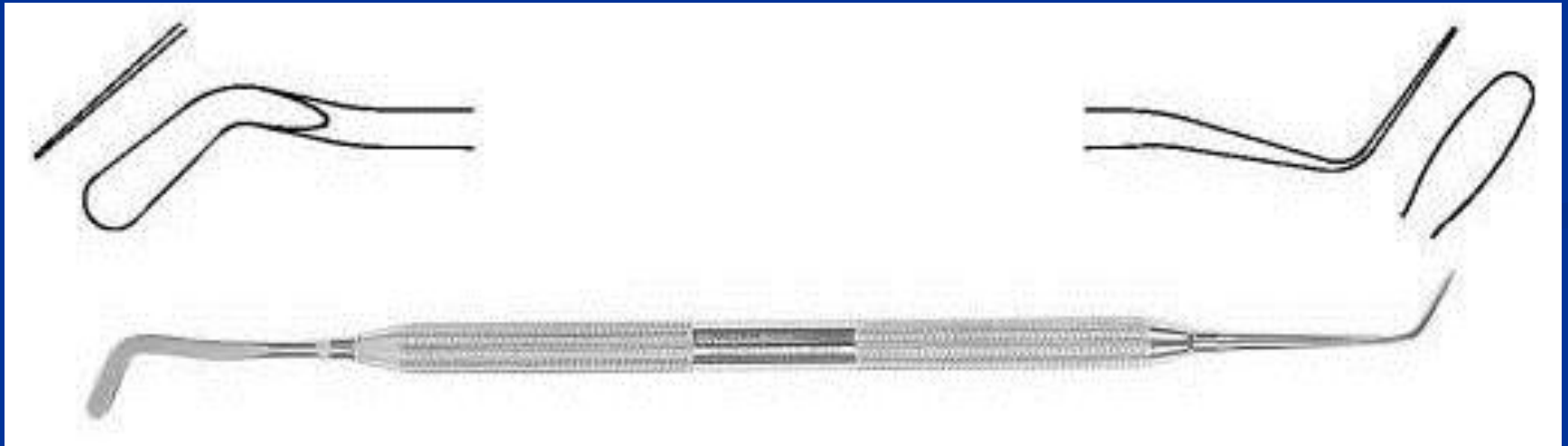
# Excavator



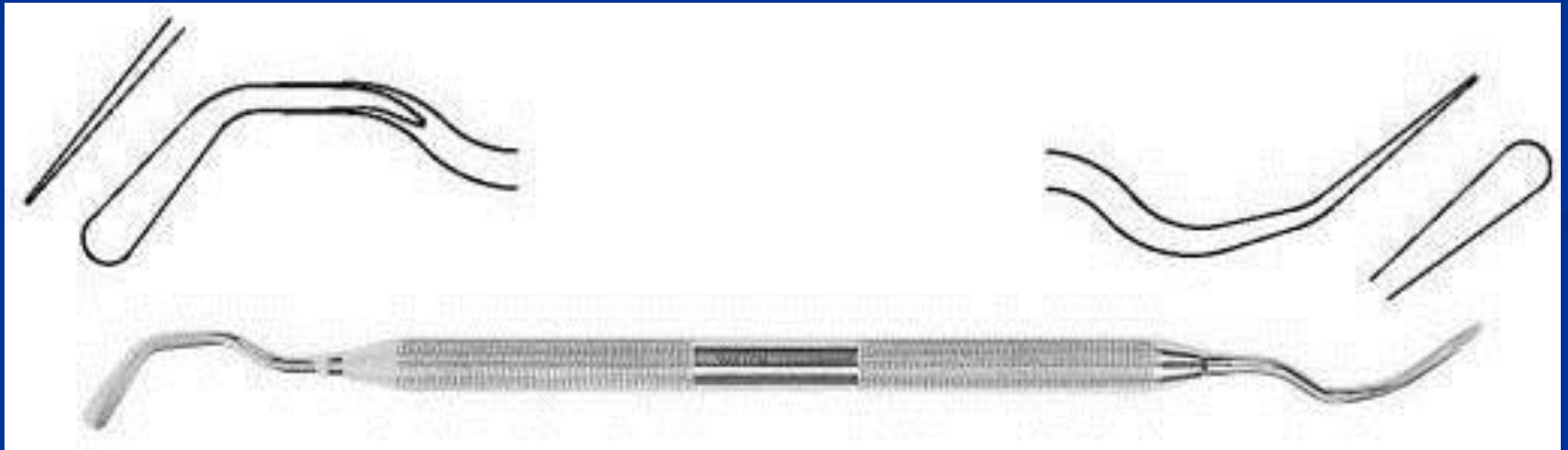
# Filling instruments

# Burnisher -plane

## Angular- trough edge trough face



# Burnisher – angular three face



# Condensor and burnisher combined



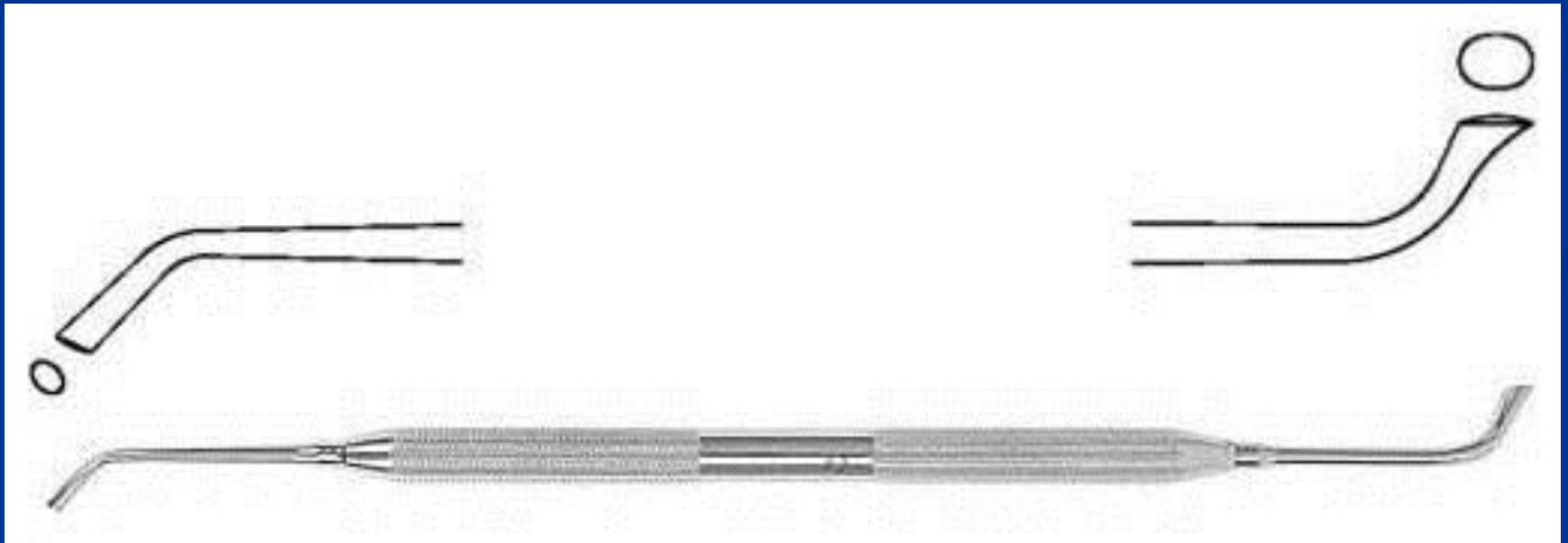
# Amalgam carrier



# Condensor for amalgam

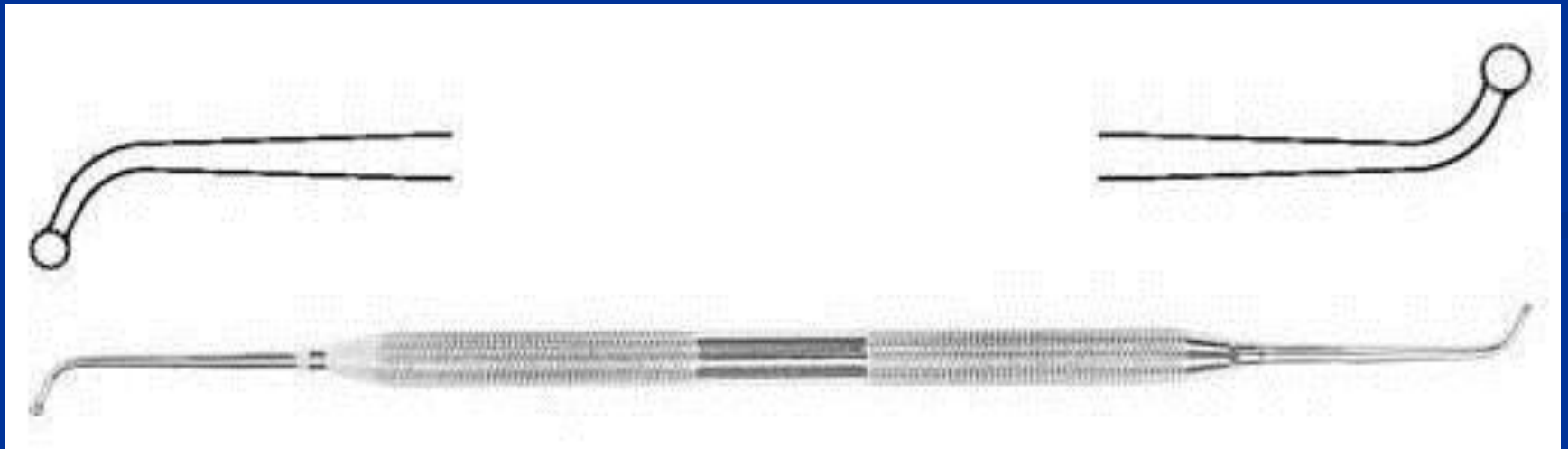


# Condensor for guttaprecha - hoof

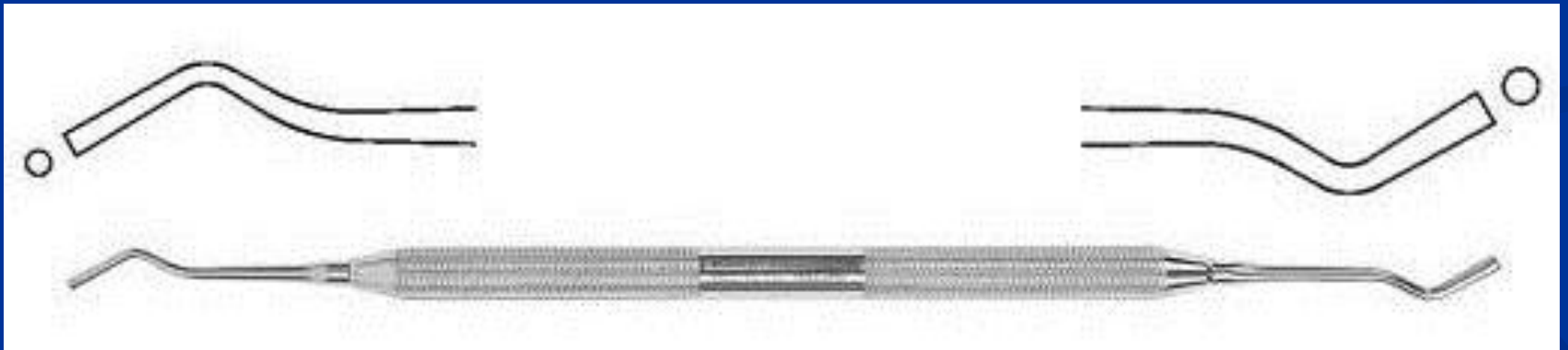




# Ball condensor



# Condensor with straight front



# Fosterflagg



# Frahm



# Carver: Discoid - Cleoid

