

**METHODS OF CARIES TREATMENT
CAVITY CLASSIFICATION
NOMENCLATURE
RULES OF CAVITY PREPARATION**

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METHODS OF CARIES TREATMENT

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graph TD; A[METHODS OF CARIES TREATMENT] --> B[PREVENTIVE treatment (secunder)]; A --> C[RESTORATIVE treatment]; B --> D[- incipient caries]; B --> E[reversible, not cavitated Lesion]; C --> F[-caries superficialis]; C --> G[-caries media]; C --> H[-caries profunda]; C --> I[irreversible, cavitated Lesion];
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■ PREVENTIVE

treatment

(secunder)

- incipient caries

reversible,

not cavitated Lesion

■ RESTORATIVE

treatment

-caries superficialis

-caries media

-caries profunda

irreversible,

cavitated Lesion

Preparing the tooth for filling are called
TOOTH (CAVITY) PREPARATION
-instrument, **rules**

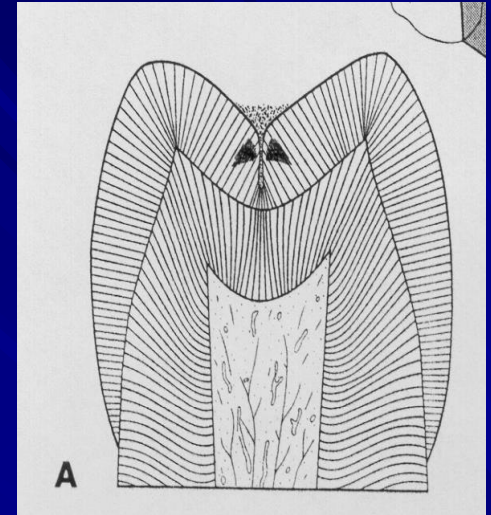
THE AIM OF MAKING FILLING

- Not only the removing of carious toothstructure, but
 - retention, resistance
 - form
 - function
 - esthetic



This aim requires:

- biological knowledge of the tooth, and parodontium
- knowledge of the enamel and dentin structure
- information about the filling material
- occlusion



Factors, affecting cavity preparation

- extension of the caries
- oral hygiene
- filling material

Classification of cavity G.V. BLACK (1914)

Base: „the predilection places of caries” on the anatomical crown.

I.-V. Classes

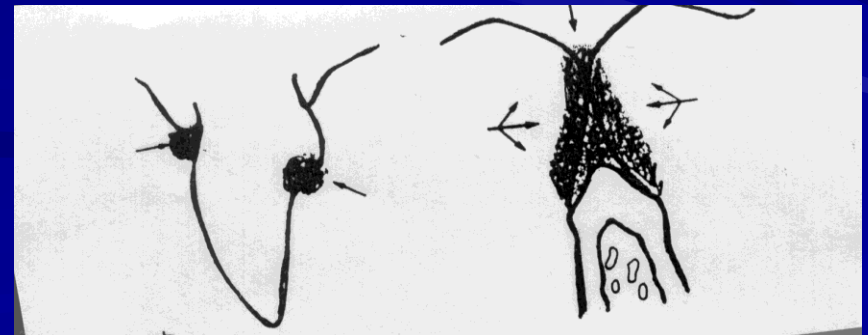
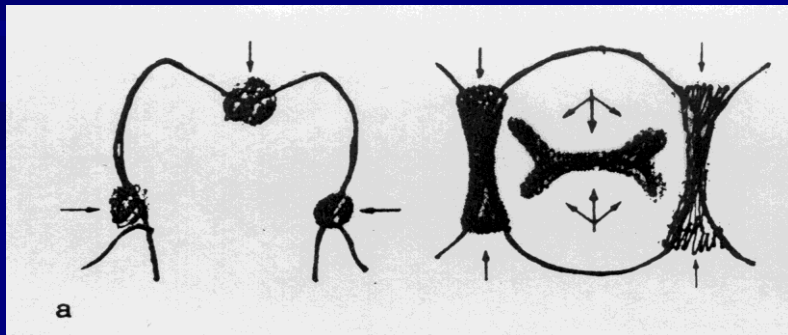
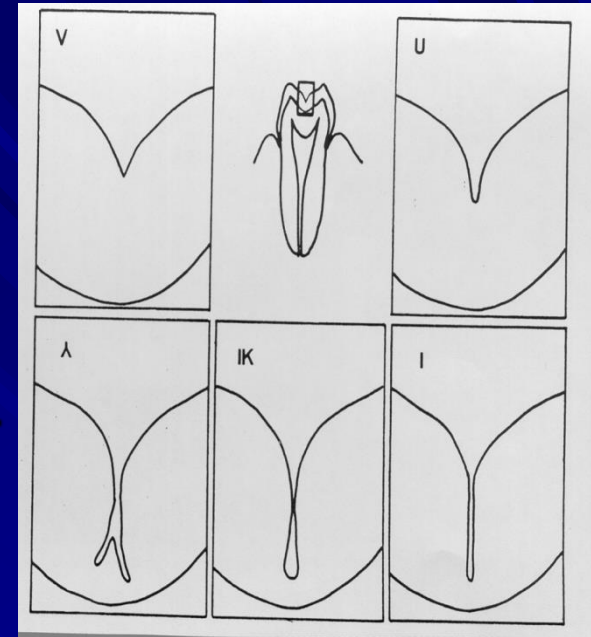
Later will be added

- Class VI. (not predilection place)
- root surface caries (not on the anatomical crown)

„The predilection places of caries” (on the anatomical crown)

- Predilection places are **retentionsplaces**.
These places have **no self-cleansing!**

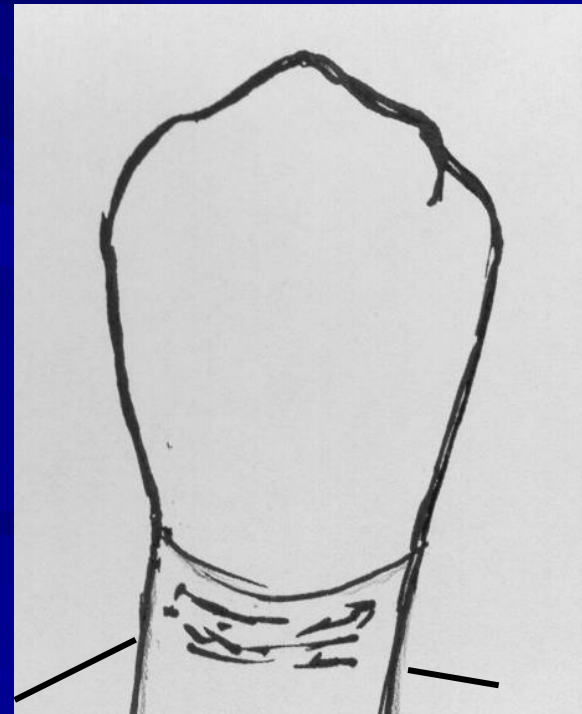
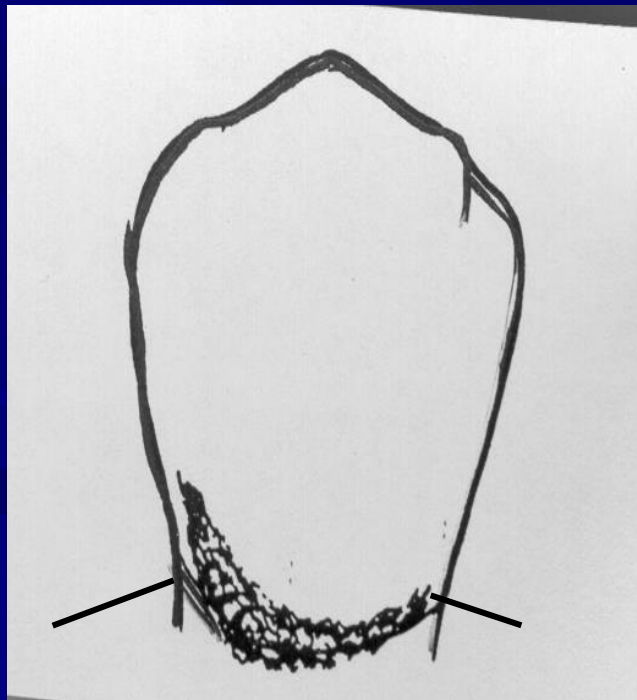
- Retentionplaces are:
 - fissure and pits
 - smooth surfaces between the aquator of the tooth and the gingiva



■ Anatomical crown:
covered with
enamel.

■ Clinical crown: can
be seen in the oral
cavity.

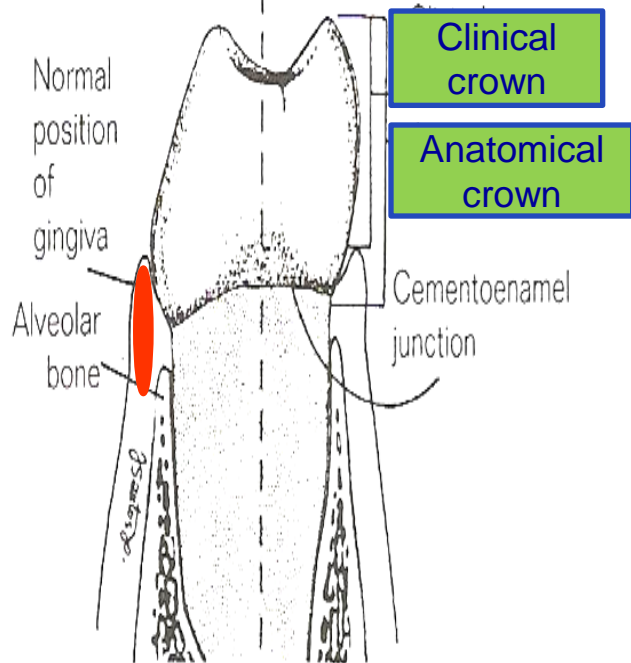
The clinical crown can be: shorter, longer or the
same, as the anatomical crown



Anatomical and clinical crown.

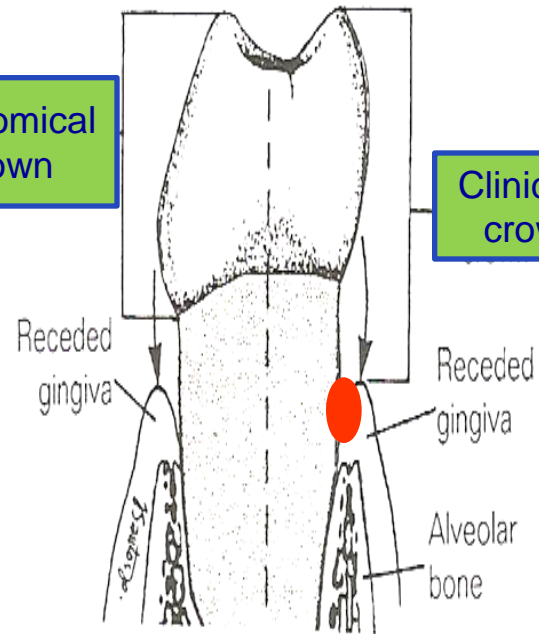
Clinical crown < anatomic crown

Long axis of tooth



Clinical crown > Anatomical crown

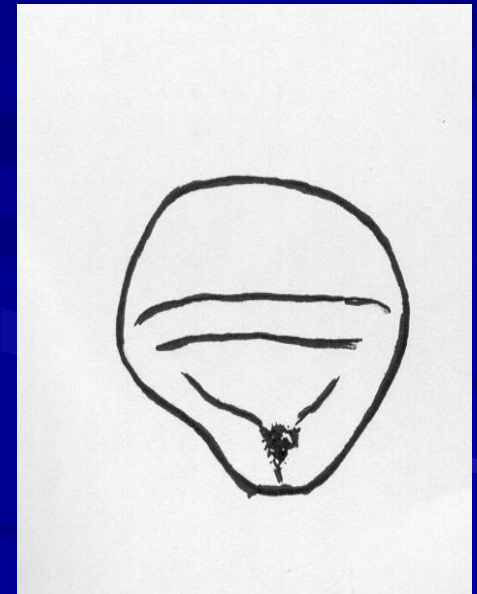
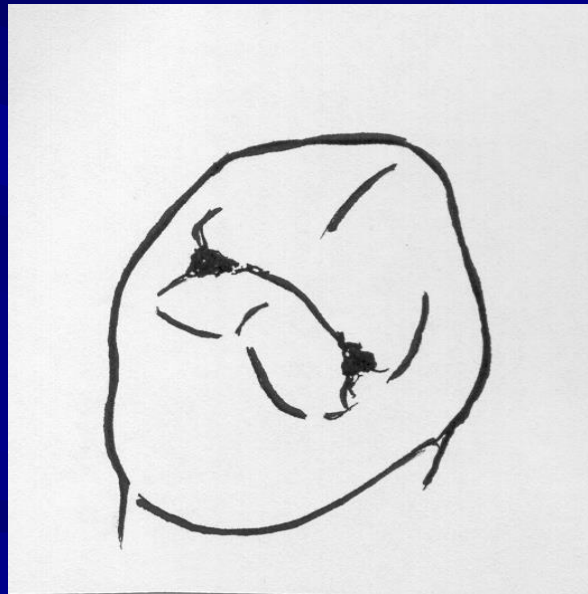
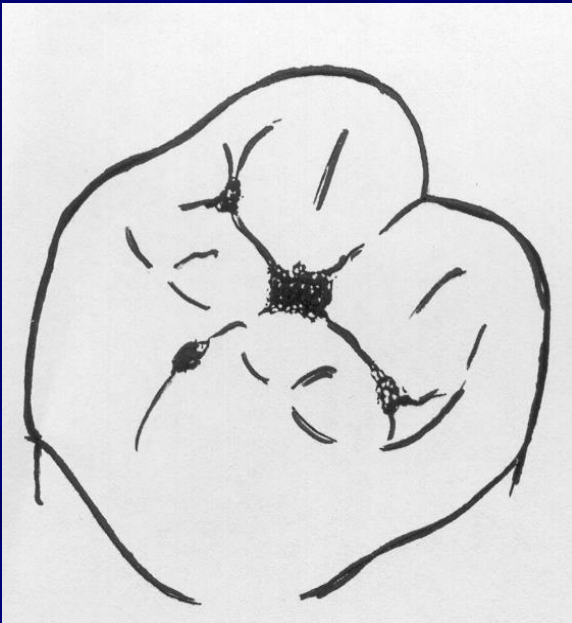
Anatomical crown



Class I.

- All pit and fissure cavities

Where are pits and fissures?

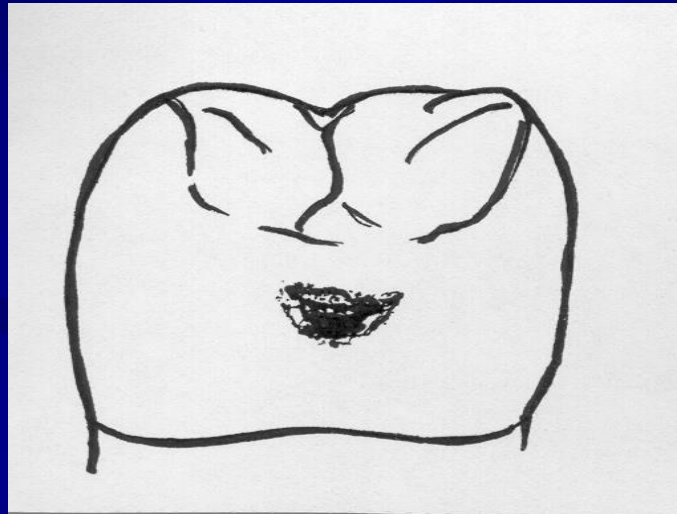




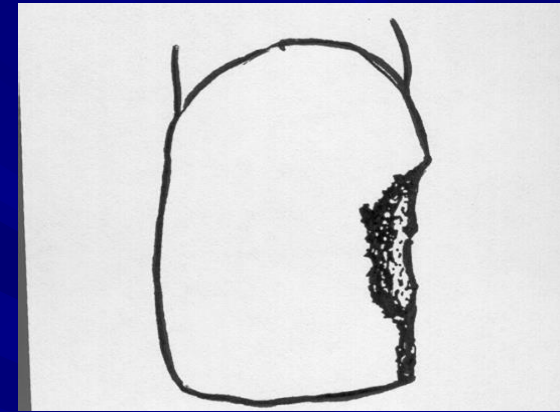
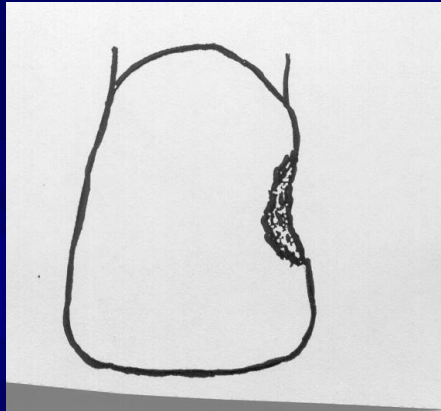
Class II.



- Cavities on the proximal surface of posterior (premolar and molar) teeth. Smooth surface caries M(O); (O)D; M(O)D; (toward or from the midline)



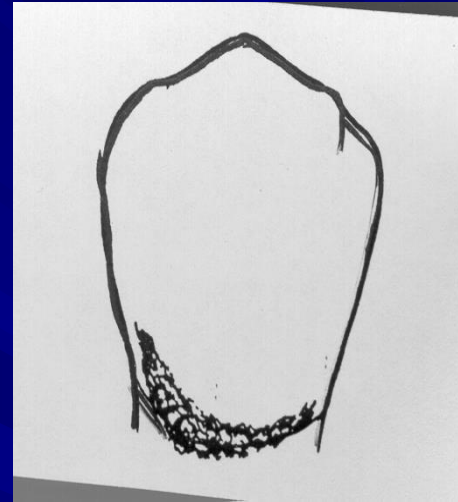
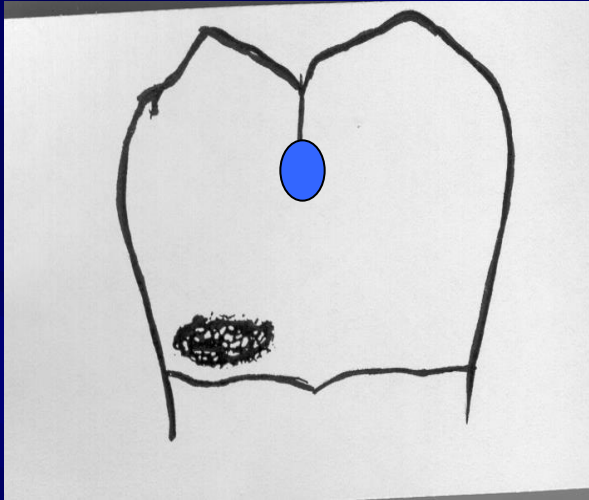
Class III. and IV.



- Cavities on the proximal surface of anterior teeth, that **don't involve** the incisal angle

- Cavities on the proximal surfaces of anterior teeth that **involves** the incisal angle

Class V.



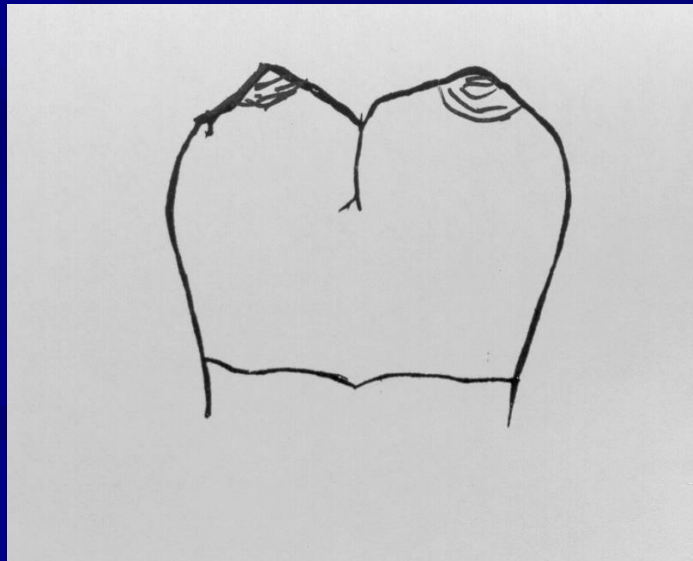
- Cavities on the gingival third of the anatomical crown. These can be on the facial or lingual surfaces of all teeth.

Not pit and fissure cavities!

Class VI.

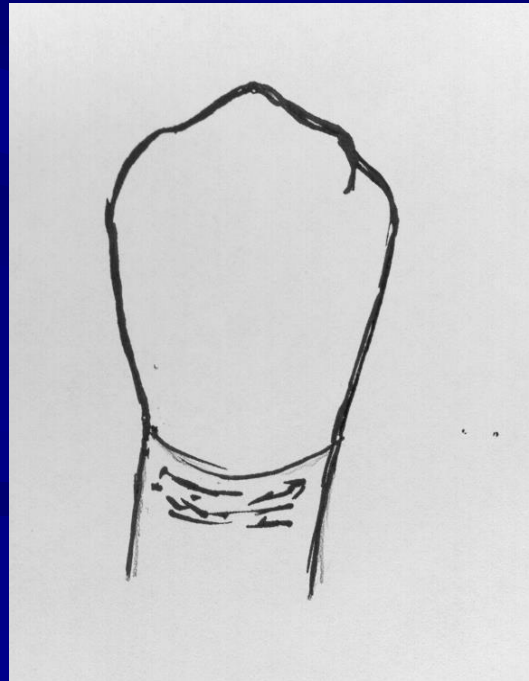
- Cavities on the incisal edge of anterior teeth, or on the occlusal cusp heights of posterior teeth.

Not predilection place!



Root surface caries

- Caries begins on the root surface (**not with enamel covered surface**)!
- **Predilection place!**



NOMENCLATURA

Surface: untouched

Wall: prepared surface

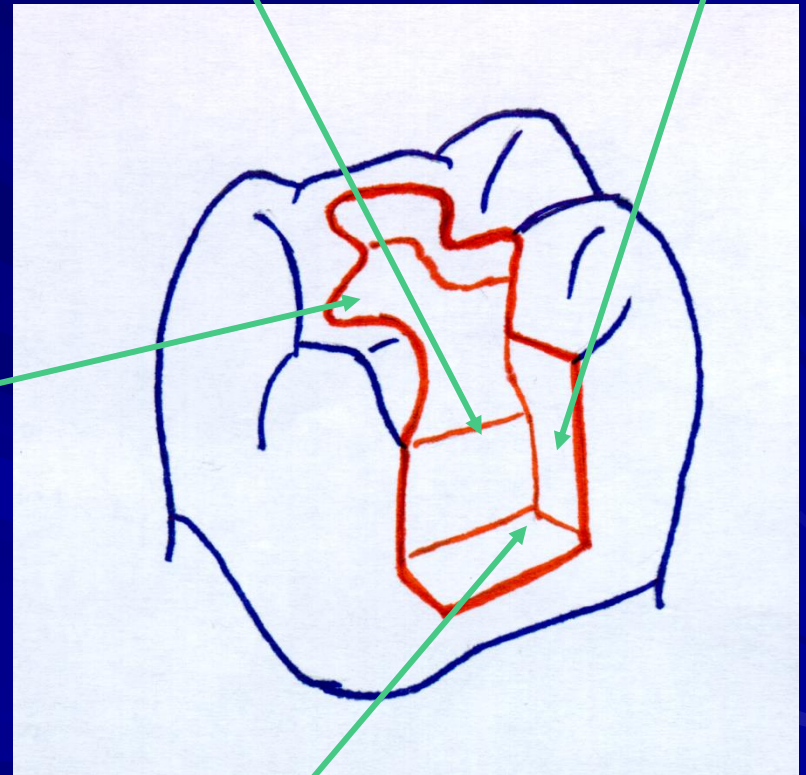
Line angle: the junction of two walls

Point angle: the junction of three walls

Cavosurface angle or cavosurface margin: the junction of prepared wall and the untouched tooth surface

Homework! (The name of the walls, line angles, and point angles I-V. cavities)

orale (palatal) wall
Axio-pulpal line angle

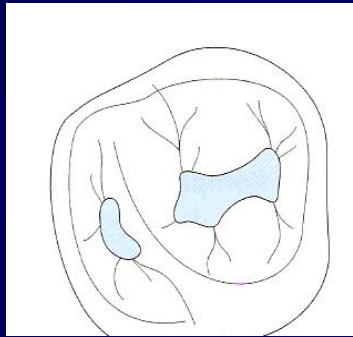


Axio-oro-gingival point angle

BASIC PREPARATION DESIGNE

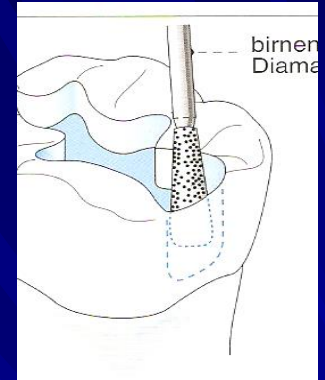
Depends on the fillingmaterial and the extension of caries

- **CONVENTIONAL:** for amalgam, inlay, rootsurface caries;
Macroretention
-Box-like cavity, special enamel margin, secondary retention are used very oft.
- **BEVELED CONVENTIONAL:** earlier amalgam was the fillingmaterial, and now komposit will be the fillingmaterial.
Makro- and mikroretention
- **MODIFIED, or ADHESIVE or MINIMAL-INVASIV:** No special walls, line angles and point angles! Only carious tooth structure will be removed, and cavosurface margin will be prepared beveling (komposit) **Mikroretention.**



GENERAL RULES OF CAVITY PREPARATION

G.V. BLACK (1889)

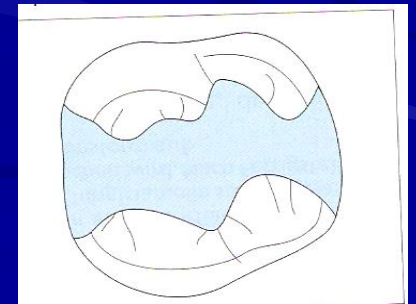
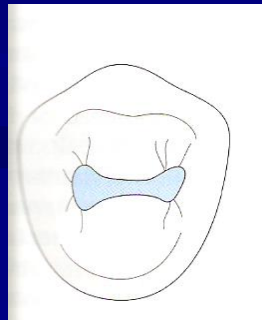
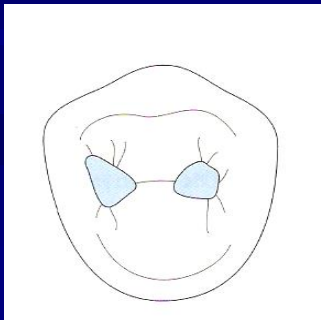


- During the years the rules are many times modified.

Reason:

- Prevention
- Filling material

„extension for prevention”



RULES OF CAVITY PREPARATION

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I. INITIAL STAGE

(primer steps)

- outline form, and initial depth**
- primary resistance form**
- primary retention form**
- convenience form**

II. FINAL STAGE

(secunder steps)

- removal of infected dentin and old filling**
- pulp protection**
- secondary resistance and retention form**
- finishing the prepared walls**
- cleaning, inspecting...**

Initial stage/primary preparation outline form, and initial depth

- Together are made!
- High speed, with cooling, diamond, or hardmetal bur. The shape of the bur depends on the caries!
- **Decision:** preparation is made with the principle of „extension for prevention” or **without** this principle.

Nowdays: this principle are used only as exeption!

„EXTENSION FOR PREVENTION”

- Aim: **was** to prevent the secunder caries
- The border of the cavity should be extended to areas that are normally **self-cleansing, or cleansable**, therefore **healty** tooth structure can be removed.
- **Nowdays**: this principle are **not used** routinly.
(It is used only in case of bed oral hygiene)

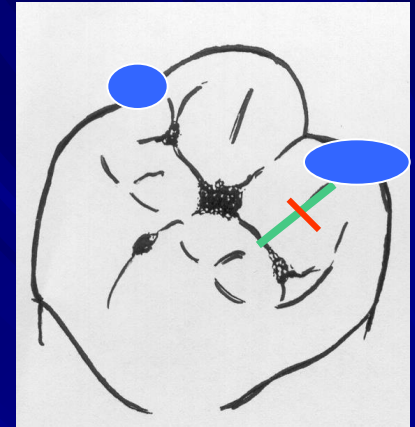
PRINCIPLES NOWDAYS

for the outline form

1. Healthy tooth structure should be preserved
2. All friable enamel should be removed
3. All faults should be include in cavity
4. Good finishable position into the enamel
5. The outline of the filling should be shortened

FACTORS, WHICH INFLUENCE THE OUTLINE FORM

- 1.The extension of carious lesion
- 2.Esthetic consideration
- 3.Occlusal relationship
4. Adjacent tooth contours
- 5.Cavosurface marginal configuration



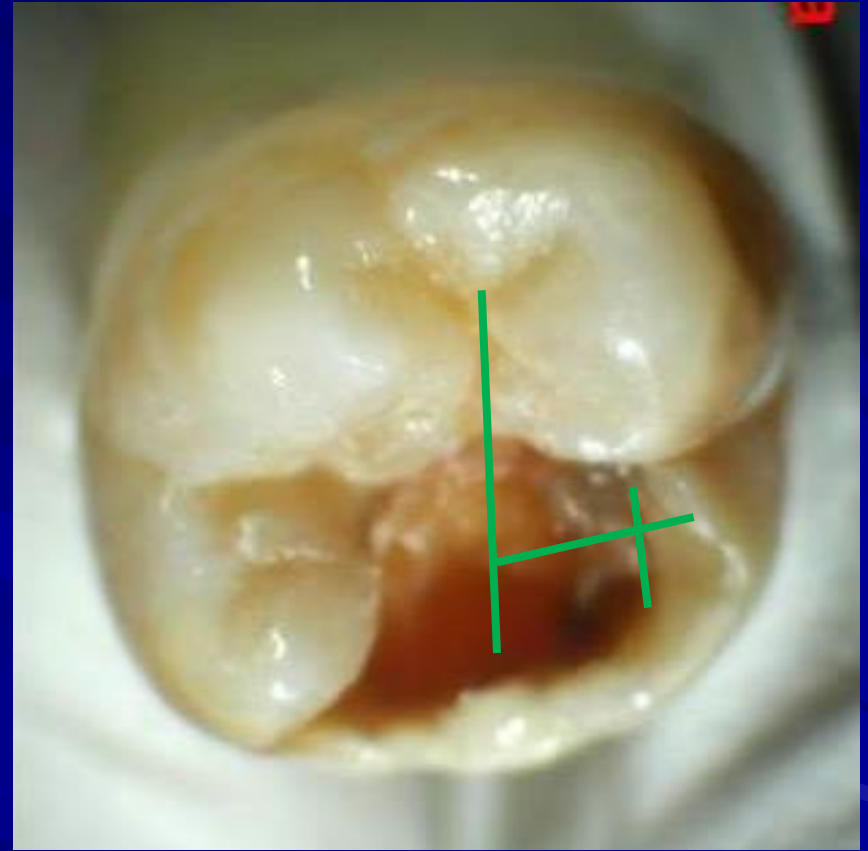
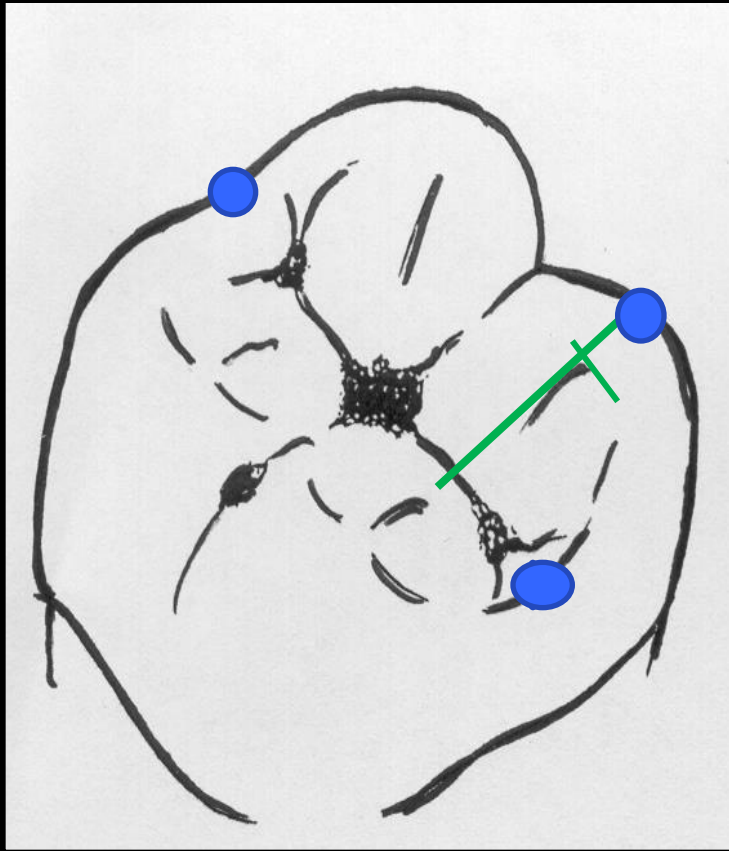
IMPORTANT IN CASE OF OUTLINE FORM

Preserve the strength of **marginal ridge** and the **strength of the cusps**.

Decision: about keeping, or reduction of the cusps.

- 1.**Keeping:** extension of caries is less, than half of the distance (50 %) between the primer fissure and the height of the cusp .
- 2.**Considerable:** if the distance is between 50% and 75%
- 3.**Reduction:** extension of caries is bigger, than 2/3 (75%) of the distance.

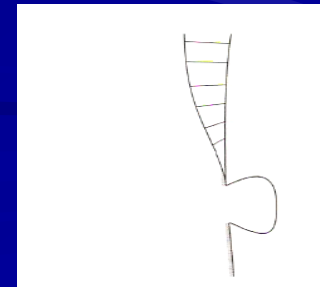
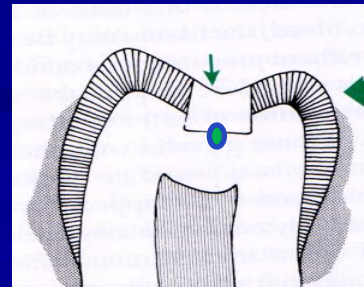
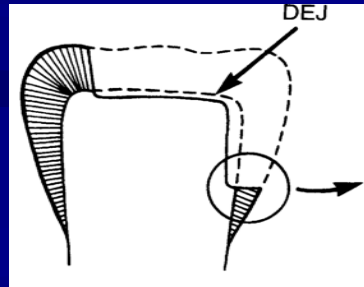
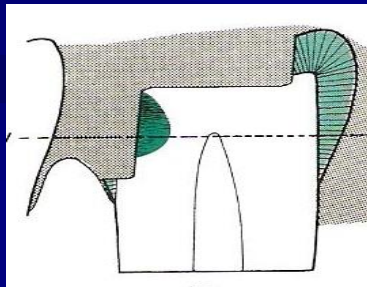
Marginal ridge and cusp



2/3 rule

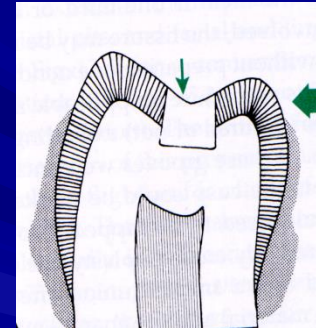
Initial depth in conventional (amalgam) preparation

- **Pits and fissures:** has to be 0,2 mm into the dentin. This means 1,5 mm depth into the central fissure.
- **Smooth surfaces:** in case of the axial walls 0,2 and 0,8 mm into the dentin. Deeper (0,8 mm) preparation is used, where there is no enamel. (on the root-surface)



Primary retention form

- **Definition:** Preparation resists displacement or removal of the restoration from tipping or lifting forces.
- **Retention is influenced** by the contact between the **restorative material** and tooth.
 - mechanic contact:
 - macromechanic: amalgam
 - micromechanik: komposit
 - chemical: rare glassionomer
 - electrical:weak



Differences according to the restoration

- inlay(indirect rest.) metal, esthetics
- filling (direct rest.) amalgam, komposit

Primary resistance form

- **Definition:** Both the tooth and restoration can withstand **without fracture** the masticatory forces.
- **Preparation:** primary retention and resistance form are prepared together.
- **Principle:**
 - box shape, flat floor, slightly rounded line angles,
 - thickness of restorative material
 - walls: parallel, divergent or convergent

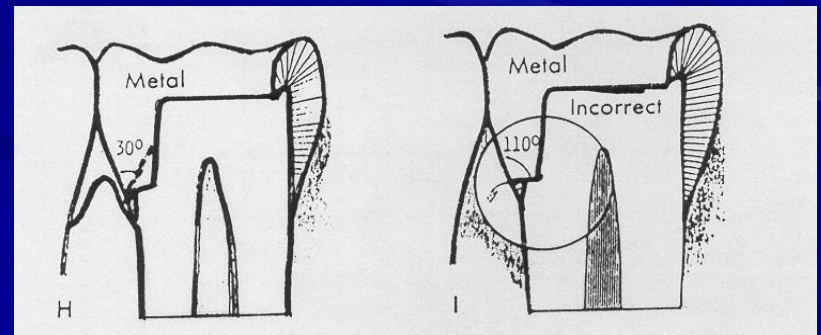
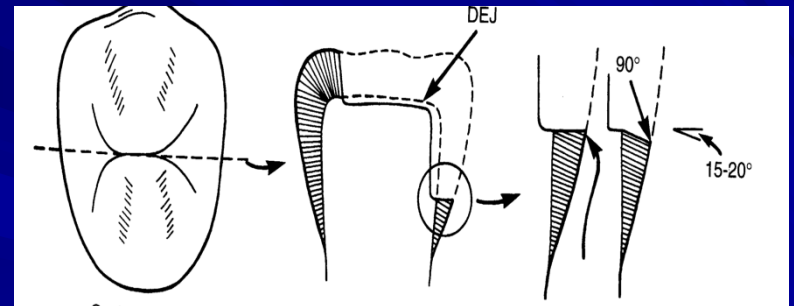
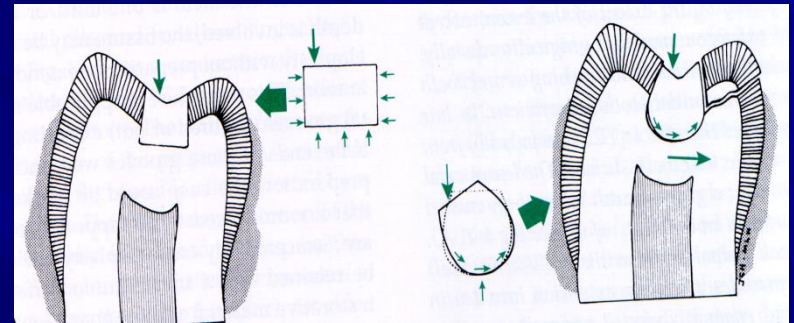
■ CONVINIENCE FORM

Primary retention and resistance form

box shape, flat floor, slightly rounded line angles, -thickness of restorative material

-walls: parallel, divergent or convergent

Marginal ridge!



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- finishing the prepared walls**
- cleaning, inspecting...**

II. FINAL STAGE

Removal of any remaining
infected dentin and/or old restorative material

← **Carious dentin: why now, and how?**

Difference between carious and healthy dentin in practice

Carious dentin

- infected has to be removed
- affected

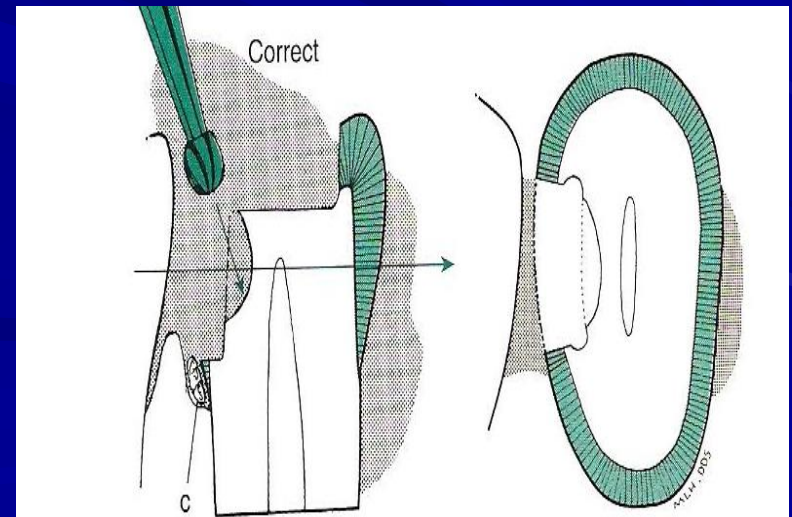
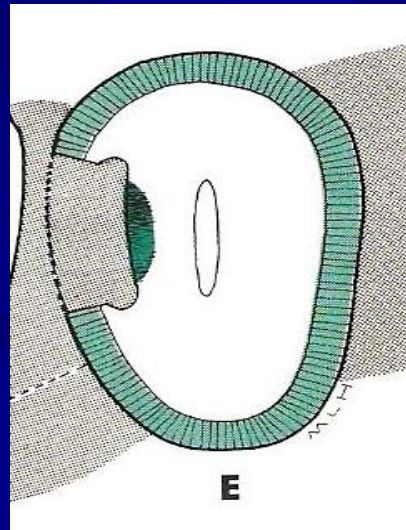
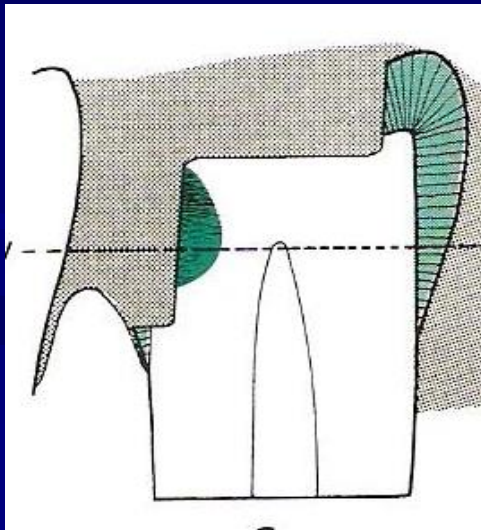
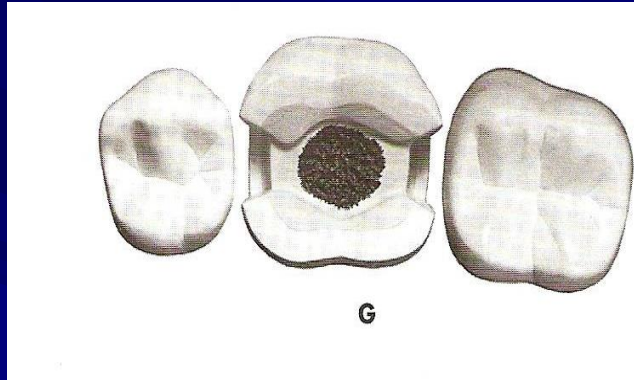
Difference: in color and hardness

- Caries indicator, sharp excavator, steel/hardmetall round bur

→ **Old restoration** should be removed, if

- negatively affect the new one
- compromise in retention
- caries is under the filling
- the pulp was symptomatic preoperatively
- the periphery of remaining filling is not intact

Removal of any remaining infected dentin /Pulp protection/



Secondary resistance and retention forms

■ Two types are:

- 1. Mechanical features: all require additional removal of tooth structure
 - retention lock, grooves, coves, skirts, pins, slots
 - beveled enamel margins This is oft done into the next step, depending on the filling material!

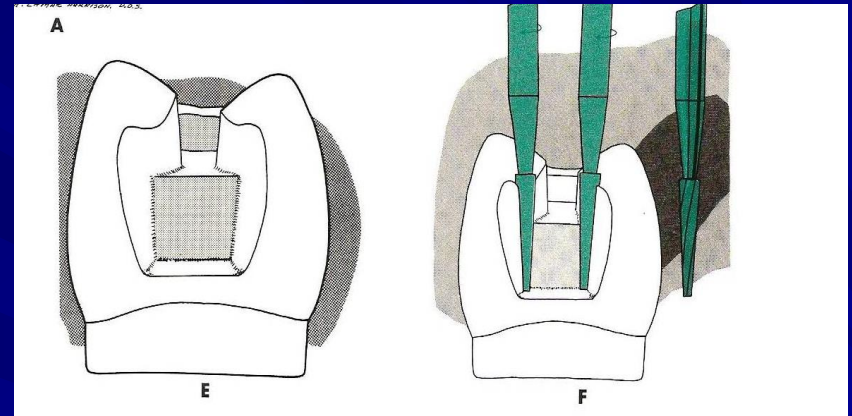
- 2. Treatments of the prepared walls: etching, priming, and bonding.

This is not really considered as a part of the tooth preparation

Secondary resistance and retention elements

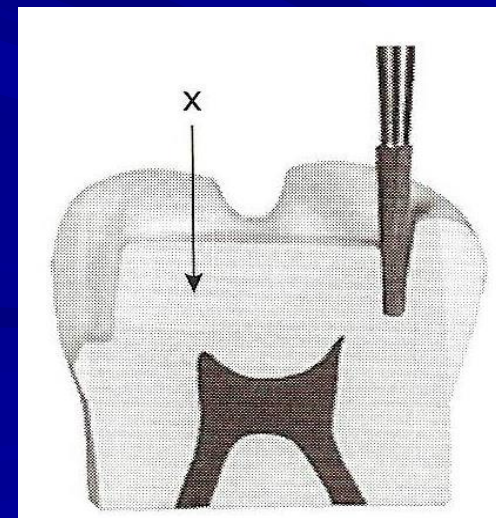
„Proximal grooves”.

For improving the retention, we can prepare in dentin parallel with the axio-pulpal wall, between this wall and the facial/lingual walls.



Slot Preparation (MO or OD)

is in Dentin (between the the Pulpa and Enamel-Dentin junction.



Finishing the prepared walls

- **The aim of finishing:** is to create the best marginal seal between the the restorative material and tooth.
 - afford a smooth marginal junction
 - provide maximum strength of both the tooth and filling near the margin.
- Fine grit diamond or finishing metal bur!

Cleaning, Inspecting,

- Cleaning: not with alcohol!
(Chlorhexidin gluconat)
- Inspecting or control of cavity:
 - is there any opacity?
 - is the pulp chamber closed?

BASIC PREPARATION DESIGNE

Depends on the fillingmaterial and the extension of caries

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