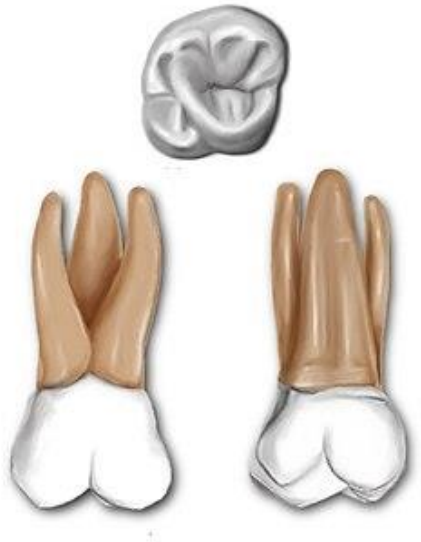
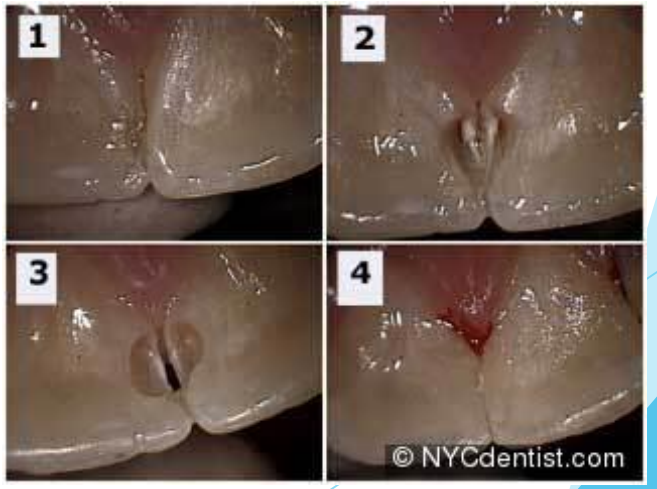
ODONTO-THERAPY IN YOUNG PERMANENT TEETH

Titular curs: Șef de Lucrări Dr. Mălina Popa

- immature enamel;
- dentine with wide open dentinal canals;
- the anatomic anatomical relief of the permanent molars;
- dental malposition of incisors;
- the untreated teeth of temporary teeth;
- fixed and mobile orthodontic appliances.



= extremely favorable ground for the installation and rapid evolution of the carious process.



- ***carious lesion on a permanently immature tooth*** = dental emergency, as its evolution endangers the dental pulp, endangering normal dental root edification.

- economy of hard tissues;

- maintaining pulp vitality;

- the preparation of the cavities is done according to *Black's principles* if we use classical filling materials or the principles of adhesive restorations when using modern materials of filling.

- the factors favoring early carious are linked to the presence of bacterial plaque, aggravated by a high nutrition in products with increased adherence.

- The most frequent affected tooth is first permanent molar, which is often confused with the temporary molar, being a tooth of completion.

- The next affected teeth are the incisors, around the age of 10-12 years, having a predominant location on the proximal face and sometimes palatal, in the cecum foramen area.

- Around the age of 13-14 years the caries appear at the level of the premolars, especially on the occlusal faces. Incisors and canines are more resistant to caries, but cavities can occur in children with an increased predisposition to this condition.

Diagnosis caries of young permanent teeth

Clinical exam: inspection and palpation

Inspection

- It is done after drying the tooth because there may demineralizations hidden by the salivary fluid
- Enamel color changes, enamel cavities or dentin ca be observed

Palpation

- It is done with the probe
- It has limited value for proximal caries

Rx exam

! To be radiologically visible, a caries must produce a demineralisation in enamel of at least 50%

Bite wing absolutely essential in the diagnosis of proximal caries because the surface contacts make difficult to observ the carious lesions.

OPG

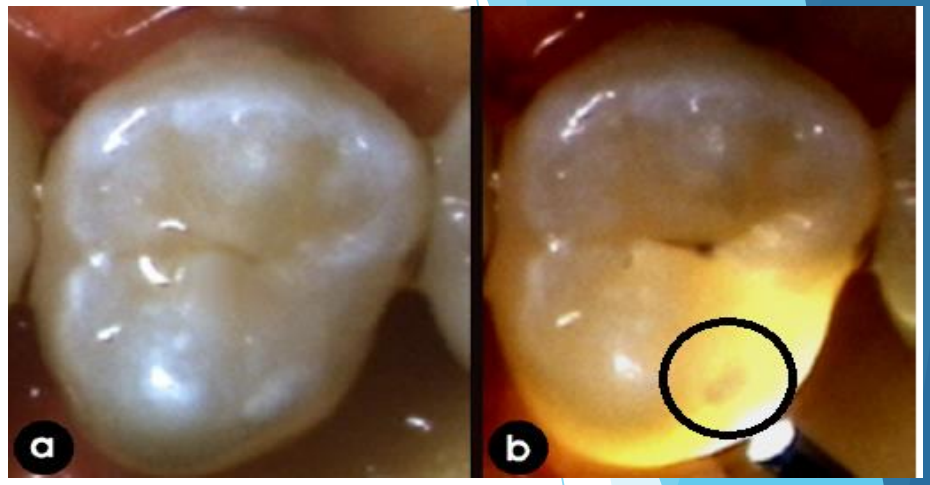
→ has the disadvantage of overlapping.

Radiografia retroalveolară →radiological incidence of detail on the temporary tooth and the underlying tooth.

Methods that use visible light

- **Transilumination** with optical fiber and digital

- **Fluorescence with visible light**
  - represents the passage of a strong luminous beam through dental tissues
  - helps us only in proximal cavities located at the frontal teeth that have a lower thickness



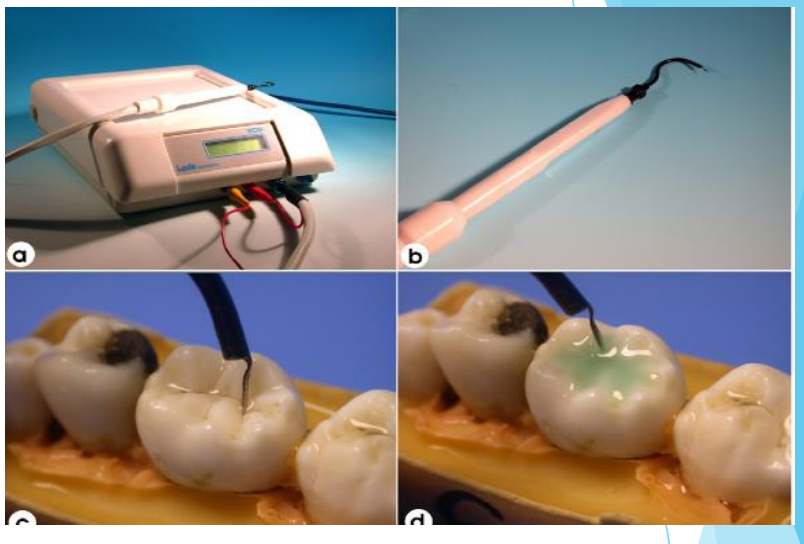
Laser: Diagnodent (laser-fluorescence)

- Use a laser probe that projects at the dental surface level. There is a signal that is specific to healthy tissues and another signal for tissues affected by dental caries

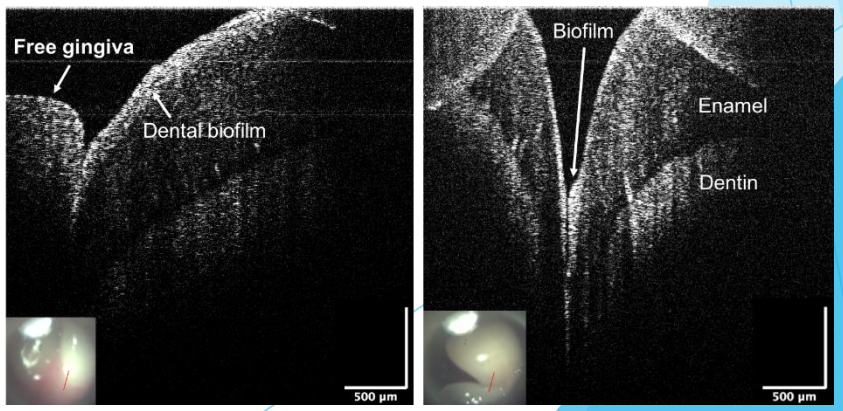
Methods that use electricity

- **Electrical conductivity measurement**

A gel that transmits the current is applied to the tooth. There is a probe placed on this gel. The healthy substance transmits another signal to the demineralised tissue, the transmission being diminished in the case of demineralisation. By recording the signal, different curves are formed.



Optical coherence tomography (OCT)



Clinical forms of caries of young permanent teeth

Depending on location:

- **Caries of pit and fissure;**
- **caries on smooth surfaces.**

Depending on the depth:

- **simple superficial caries;**
- **simple profound caries;**
- **complicated caries.**

Pit and fissure caries

- with predilection location at the level of the first permanent molars;
- starting like a point, but exploration with the probe reveals that the enamel is unsustainable on a large surface;
- easy to treat, and the risk of iatrogenic labor is relatively low;
- young permanent teeth exhibit some morphological features, such as an enlarged pulp chamber or close contacts with adjacent temporary teeth.

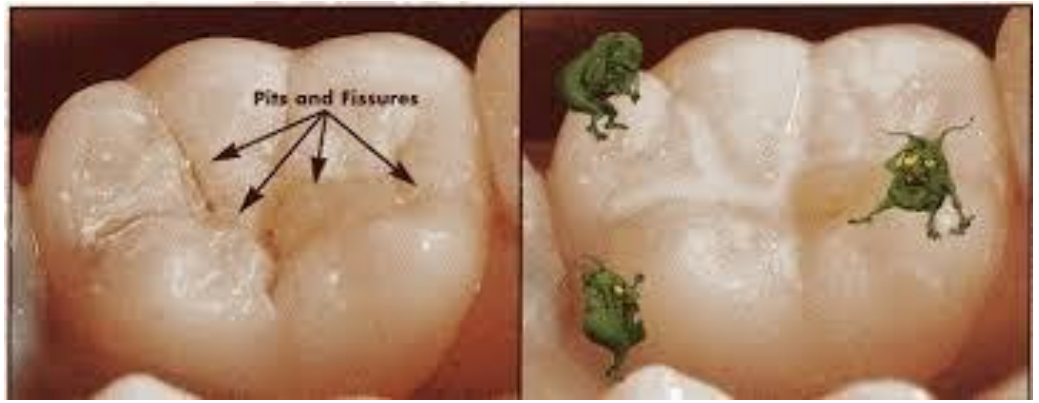
Caries on smooth surfaces

- its occurrence is usually due to an incorrect brushing that allows bacterial plaque retention;
- is preferentially located on vestibular faces of incisors and canines, vestibular cervical point of premolars and molars;
- initially the lesions are strictly of the surface, then progressing in depth, the enamel being destroyed at the center of the lesion, leaving the dentine uncovered.

- the edges of the lesion, poorly defined, are white spotted. This lesion is an additional retention for the bacterial plaque. Finally, the lesion extension is made across the vestibular surface, taking the appearance of an extended V-shaped cavity with less distinct integral enamel edges;

- injuries of this type are unfortunately often associated with insufficient brushing, often in fixed orthodontic treatments.

Treatment of caries of young permanent teeth



=> Pit and fissure sealing

- Initially, sealing materials were transparent to allow clinical control.
- Subsequently, it was concluded that it is difficult to highlight the presence of sealing, and different colored or white opaque materials were introduced.

Pit and fissure sealing

Steps: *1) Tooth preparation*

- oral cavity hygiene => brushing with dentifrice without ***Fluorine*** and fatty vehicle (interferes with acid demineralization)

- isolation of the tooth (rubber-dam)

- etching -> H3PO4 37% - 60 s permanent teeth / 120 s temporary teeth

- washing the acid (20s) + drying the etched surface (20s)

2) Seal preparation and application

3) Fotopolimerization 30 sec

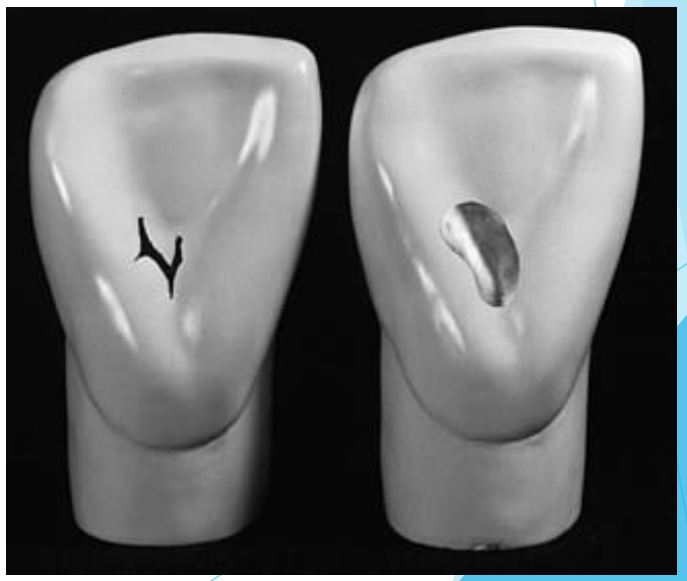
4) Sealing check

Treatment of permanent teeth caries through Class I cavities

➢***Final purpose*** = making of autoretaining cavities through the convergence of the walls to the free surfaces;

➢If the carious process is located only in the enamel, is enough to remove the infected tissues and widening the ditches, followed by applying composite matherials, through adhesive techniques →→ less sacrifice of dental hard tissues, compared to classical cavities, which are filled with amalgam.

Cavities of Class I => preparation of carious processes
From the level:
- M / PM occlusal faces,
- M1 vestibular fissures
- over-cingullum on incisors



Treatment of permanent teeth caries through class II cavities

- ***the principle of tough tissue economy*** must also lead us in the realization of these cavities;

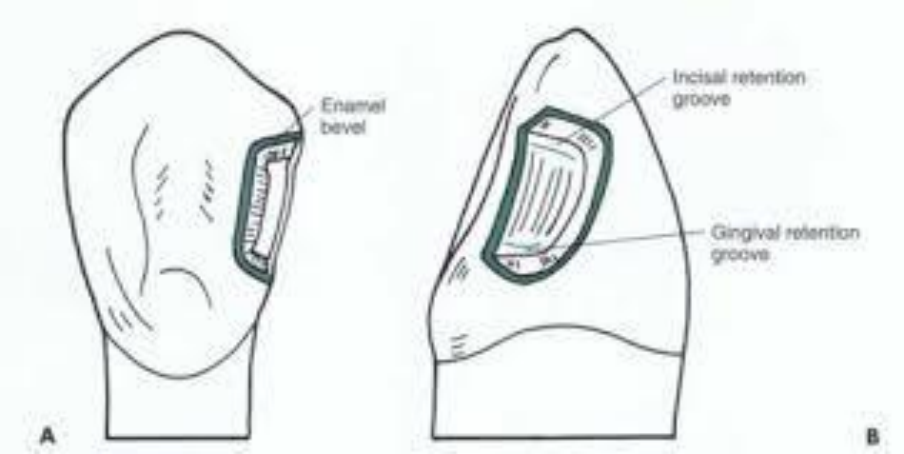
- the creation of autoretaining cavities, especially the proximal cavity must have a wide base, and the occlusal opening has to be limited;

- the area of the isthmus, which is generally the source of failures by frequent fracture of the obturation material at this level, presents difficulties for young permanent teeth due to the size of the pulp chamber;

- the isthmus must occupy the middle third of the vestibule-oral distance, and in depth it must not exceed the enamel-dentine junction.

- through the development of posterior zone composites, it is possible and allowed to prepare cavities much lower than the classical ones, obtained by applying the principles of Black.

Treatment of permanent teeth caries through class III cavities



- Class III cavities located at the frontal teeth will ultimately be aimed at restoring the affected physiognomy;
- Depending on the location, the access should be made as far as possible on the palatinal face;
- infected dentine and pigmented hard dentine will be removed so as not to compromise the final result.

- if there are unsustained enamel prisms in the occlusal contact areas → will be removed with a tronconic hemispherical diamond bur;

- practicing the *bevel* in the vestibular wall of the cavity → removes the unaesthetic effects caused by the composite-enamel junction.

CLASS III RESTORATION

Treatment of permanent teeth caries through IV class cavities

- In the case of a newly fractured incisal angle without the carious process, it is sufficient to regulate the fracture surfaces with a diamond bur and prepare a bevel, which should not be larger than 1 mm.

- Pay attention to the use of *additional retention systems* due to the extension of the pulp chamber. Horizontal intradentinal screws can be inserted along the incisors edge at 2-2.5 mm from it.

- For class IV cavities resulting from carious processes → preparation is more complex → it is necessary *to remove enamel and colored dentin,* even if these tissues are well mineralized (except for the pulp wall). And in these cavities, we recommend beveling.

Treatment of permanent teeth caries through V-class cavities

- is less common in children and does not raise special problems.
- As far as possible, use the excavator or rounded burs.

Modern techniques of odontal restoration

Ultraconservative dentistry

The terms "ultraconservative dentistry" or "microdentistry" are increasingly used in current dentistry, referring to ***techniques that only remove dental damaged tissues with maximum dental structure economy.***

Ultraconservative dentistry recommends that, even taking into account the anatomical nature of the carious lesion, even unaffected areas should be carefully examined under the magnifying glass / microscope.

- the basic steps in cavity preparation by ultra-conservative technique include:

  - removal of altered enamel;
  - obtaining enamel access to altered dentin;
  - removal of dentine completely altered, highlighted with caries detector solutions;
  - removal of unsustained enamel;
  - avoid sharp edges / angles;
  - preparation of resistance / retention form is not required;
  - maintaining as much healthy dental tissue as possible.

Invisible cavity injury on the radiograph, but highlighted on the tooth section

Traditional bur 330 (right) and comparative bur of ultra-conservative intervention (left)

Preparation of the cavities with the use of laser

Light
Amplification by
Stimulated
Emission of
Radiation

Laser use in cavity preparation is becoming more widespread.

- the advantages of laser use in cavity preparation in children: lack of noise and pain, which has resulted in very good collaboration with the child patient.

- the only disadvantages being the cost of the necessary equipment and the smell generated during the preparation.

- superior preservation of caries-free structures;

Complete elimination of the risk of cracks and microfractures in enamel and dentin;

Sterilization of the tissues on which it was worked;

Higher adhesion and implicitly durable filling over time;

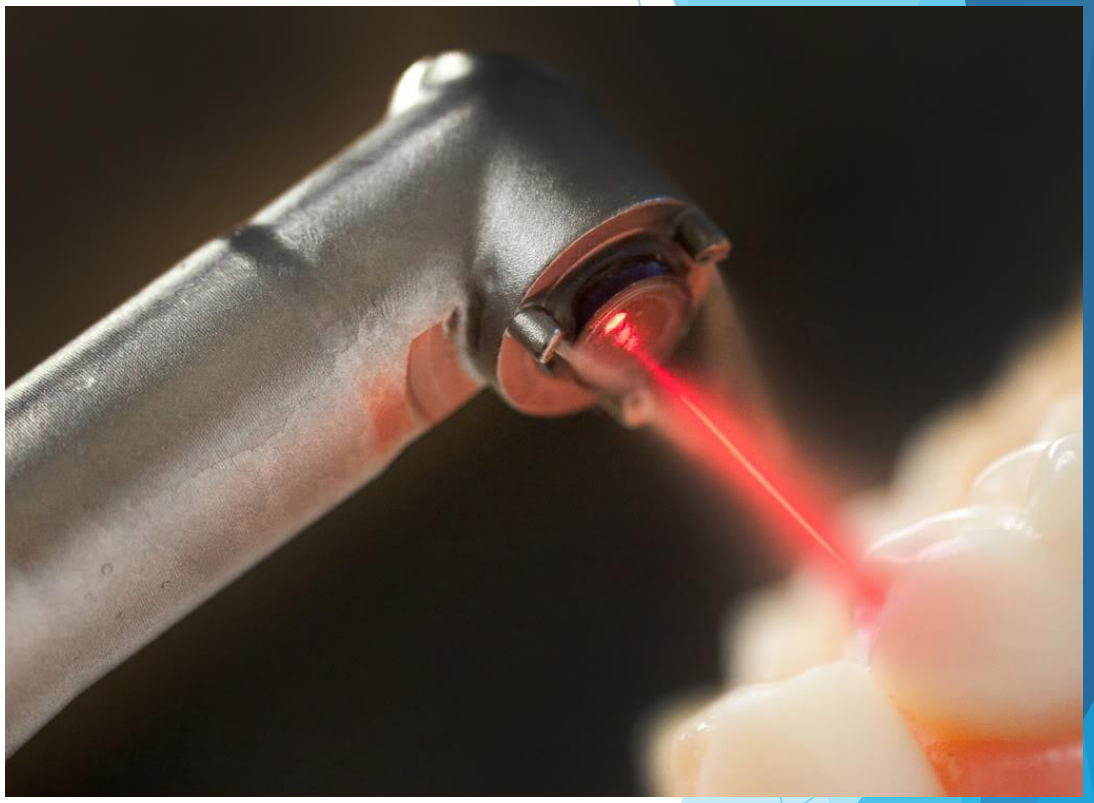
Lack of sensitivity and pain;

Oral surgery treatments (including dental implantology) without side effects such as bleeding, pain and edema;

Very well tolerated by children;

Without the risk of injury to the tongue, cheeks or lips;

Psychological comfort.



https://www.laserdentistry.org/uploads/files/education/LaserEdu_IntroToLasers.pdf

Mechanism of action:

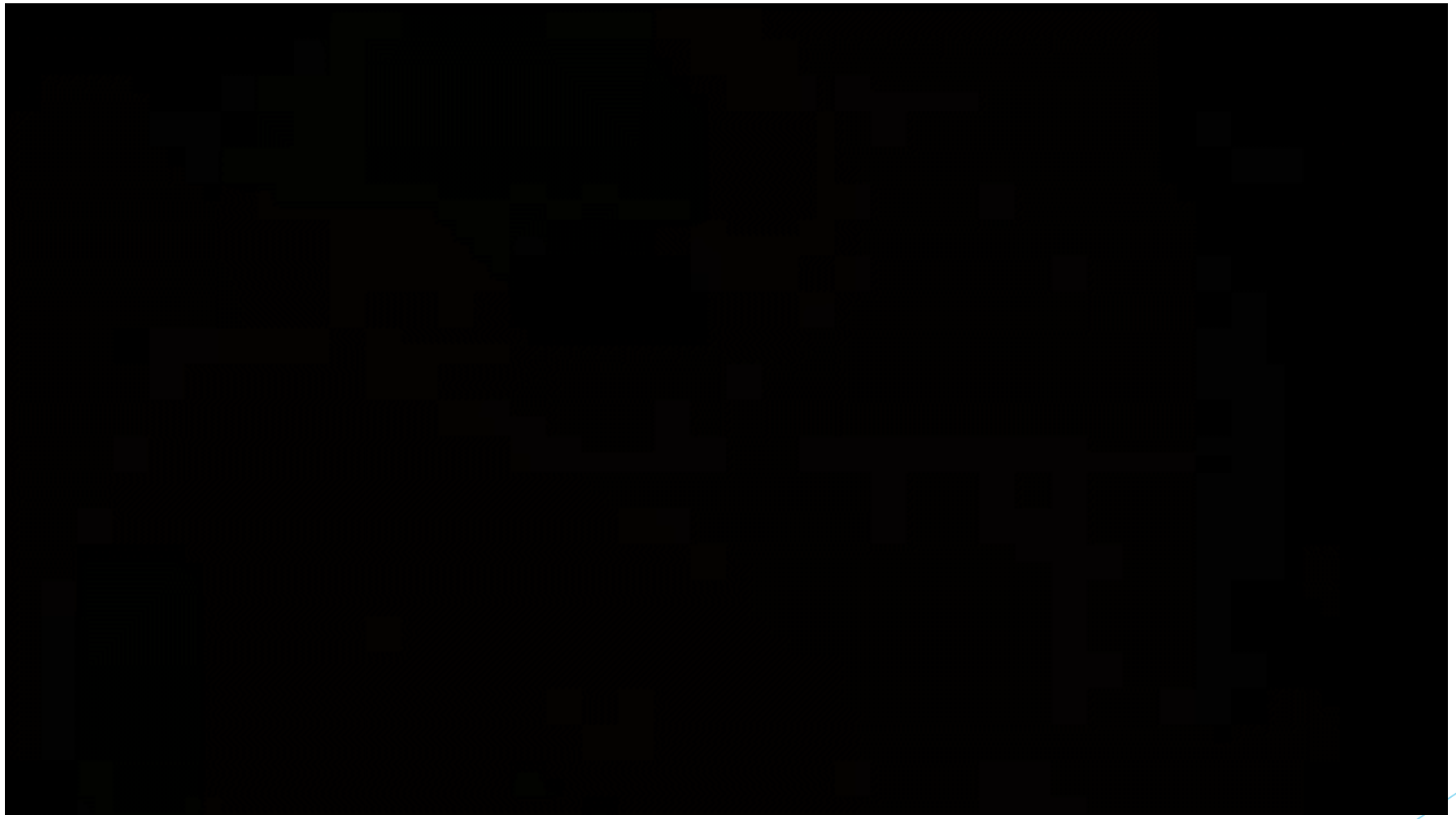
- we can selectively remove tissues → the laser works only in diseased tissues containing water and remains inactive in healthy tissues

↓↓↓↓↓↓

the risk of opening the pulp chamber is much lower

Dentistry:

- removal of infected hard dental tissues (enamel, dentin, cement);
- preparation of cavities for direct restoration;
- sealing pits and fissures.



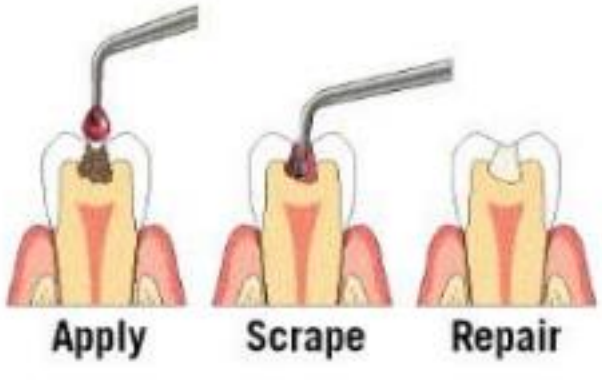
Chemical-mechanical method(CARISOLV®, BRIX 3000)

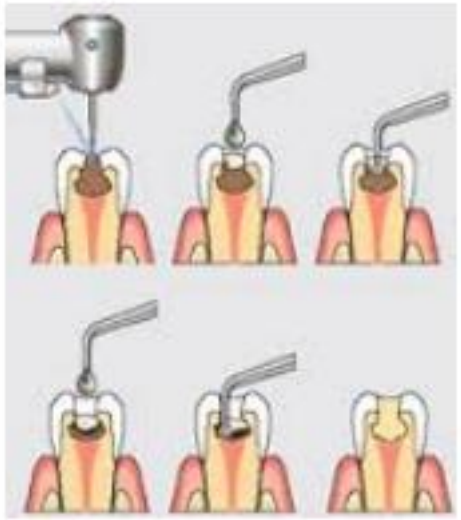
In order to eliminate the disadvantages of using rotary tools and to introduce a less traumatic method of cavity preparation, Carisolv®, a product of MediTeam Dental, appeared.

= minimally invasive, chemically and mechanically combined method.

Carisolv is a gel that, when applied to the dental tissue affected by caries for 30 seconds, dissolves it and allows it to be removed with minimal effort by hand tools.

Following is the normal restoration of the cavity thus created.





- the use of Carisolv is a less painful alternative and less dependent on local anesthesia, which can be accepted by most patients.

- the disadvantages of the method consist of prolonged working time and the need to associate in some cases with rotary tools.

BRIX 3000


REVOLUTION
HF-S90
FOR MUSIC
FOR CARIES
BRIX3000®
THE NEW ENZYMATIC TECHNOLOGY FOR
ATRAUMATIC CARIES REMOVAL.
EBE
EBE TECHNOLOGY

WHAT IS IT?

1. A revolutionary product of non-invasive tooth decay removal

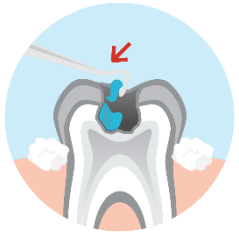
2. An enzymatic gel with papain extract

ADVANTAGES:

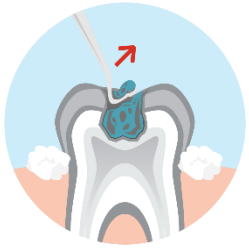
- innovative;
- Enzymatic action;
- React only with affected dentin;
- Natural and 100% non-toxic;
- Absence of pain;
- Excellent for anxious patients.

Working Technique:

1. Prepare and isolate the tooth as usual and, if necessary, increase the diameter of the cavity with manual or rotary instruments.
In case of large lesions, you can apply BRIX3000® directly.



2. Apply BRIX3000® with a narrow instrument, allowing the product to run for a while about 2-3 minutes.
Avoid contamination with water or saliva because the gel can be subdued and the process can be prolonged.



3. Remove the material with a non-pressure, pendullum movement, using an excavator.
If necessary, repeat the procedure until healthy dentine is obtained. Use the probe and caries revealer.

4. Apply the filling material as a normal procedure. You can apply Brix 3000 simultaneously on multiple teeth, saving you time.








BRIX3000®
PAPAINA E.B.E. TECHNOLOGY
30000 U/mg 10% - EXCIPIENTE C.S.
GEL PARA REMOCION ATRAUMATICA DE LESIONES CARIOSAS
CONT. NETO 3ml
Venta Exclusiva Profesionales
BRIX3000®
PAPAINA E.B.E. TECHNOLOGY
30000 U/mg 10% - EXCIPIENTE C.S.
GEL PARA REMOÇÃO ATRAUMÁTICA DE LESÕES CARIOSAS
Venda Exclusiva
Profissionais e Instituições de Saúde
BRIX
Bianaga Ecológica
3ml Tunidad
INDUSTRIA ARGENTINA

Air abrasion

Indications:
-children;
-Anxious patients;
-Patients who can not benefit from local anesthesia.

= parallel stream of concentrated narrow beam of aluminum oxide with a size of 27 microns (Air Pressure + Aluminum Oxides)

- the particles move in accordance with the laws of physics;
Abraze without releasing heat, vibration or noise;
Preserves tooth structure and maintains integrity its structural

disadvantages:

-resulting cavities with walls and edges poorly defined;
-lasts longer than conventional techniques;
dust removal is difficult.

Contraindications:

-asthma;
-allergy to dust;
-periodontal disease;
-recent extractions.