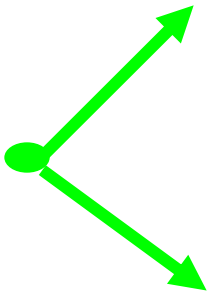
Primum non nocere !

Minimal intervention

=

Non invasive

Approach



Minimally invasive

Miniinvasive treatment

Preparation techniques

- Mechanical
- Chemo – mechanical
- Kinetic
- Hydrokinetic (Laser)

Peters MC, Mc Lean ME: Minimally invasive operative care II. Contemporary techniques and materials: An overwiev. J Adhes Dent 2001; 3:17-31.

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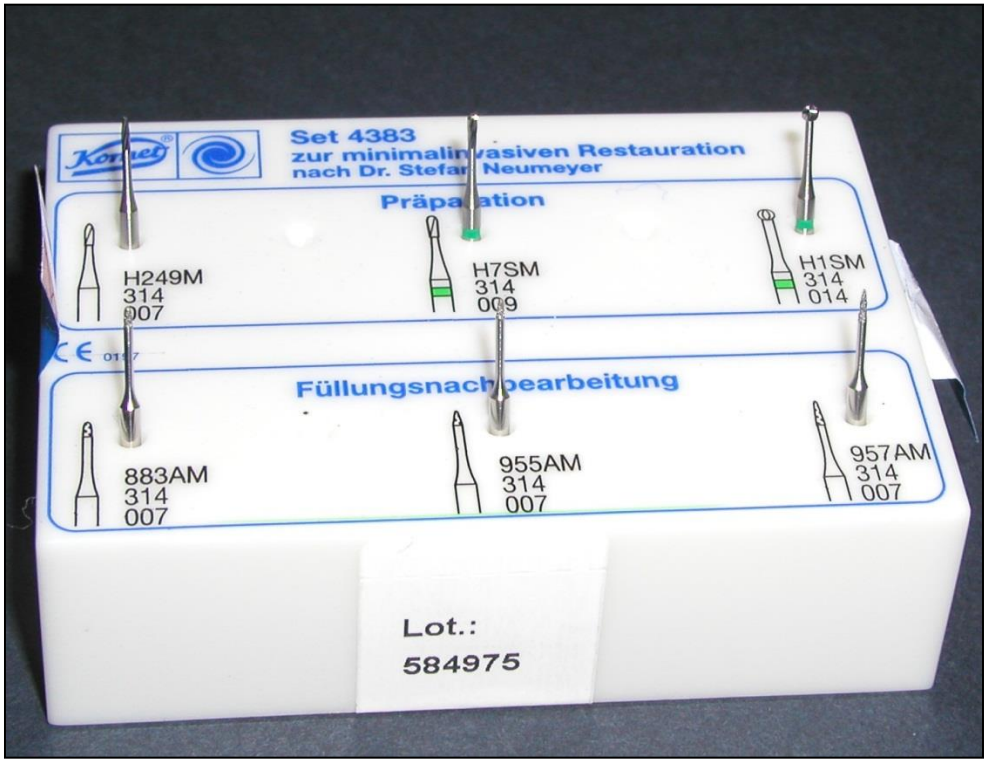
❑Mechanical preparation

- *Rotary*
- *Sonic and ultrasonic*
- *ART*

➢ Rotary – special burs and diamonds



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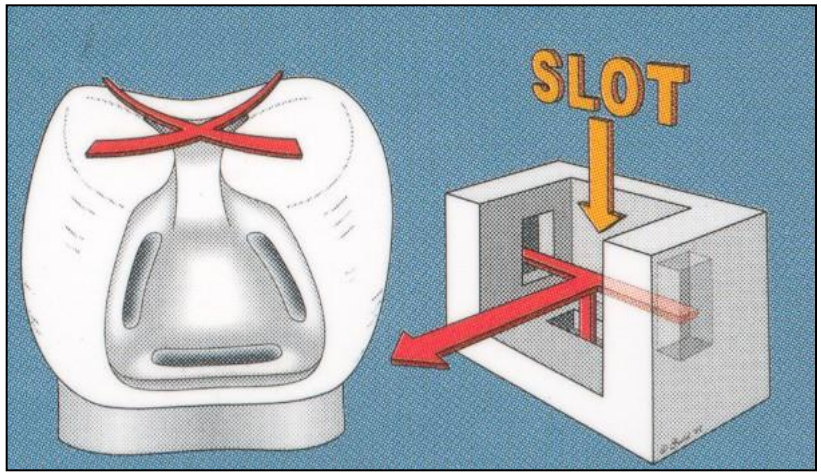
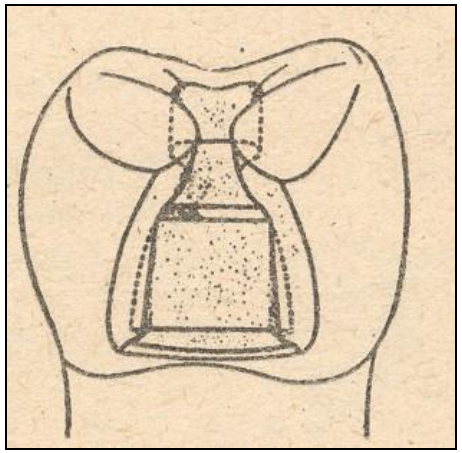
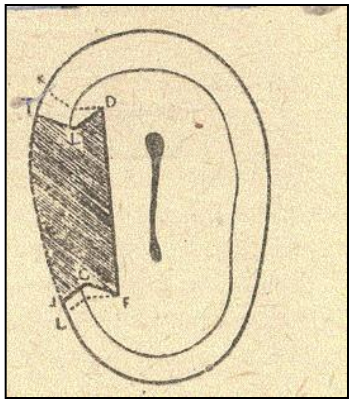
Slot peparation

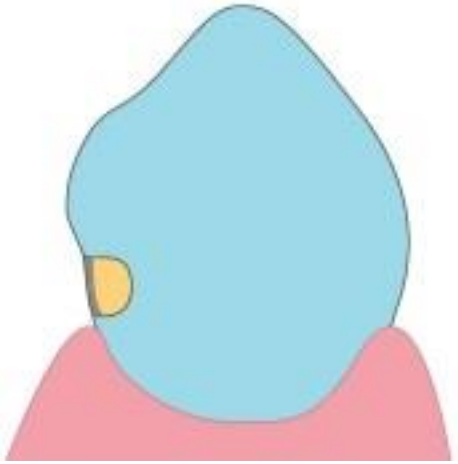


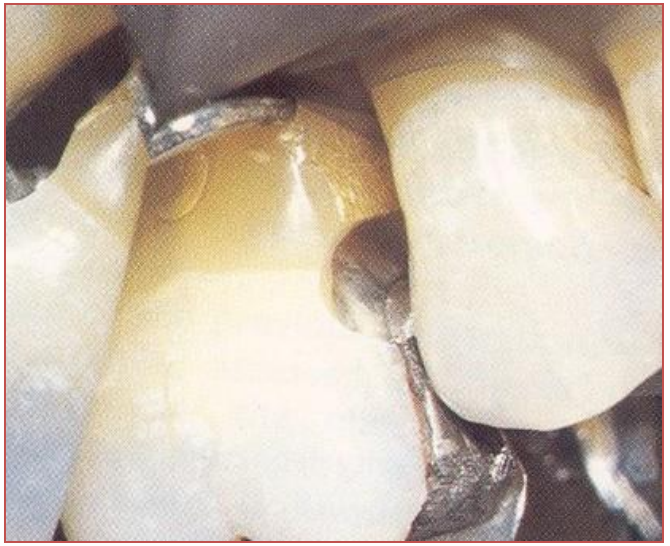




Sedelmayer, Bažant

Adhesive slot preparation





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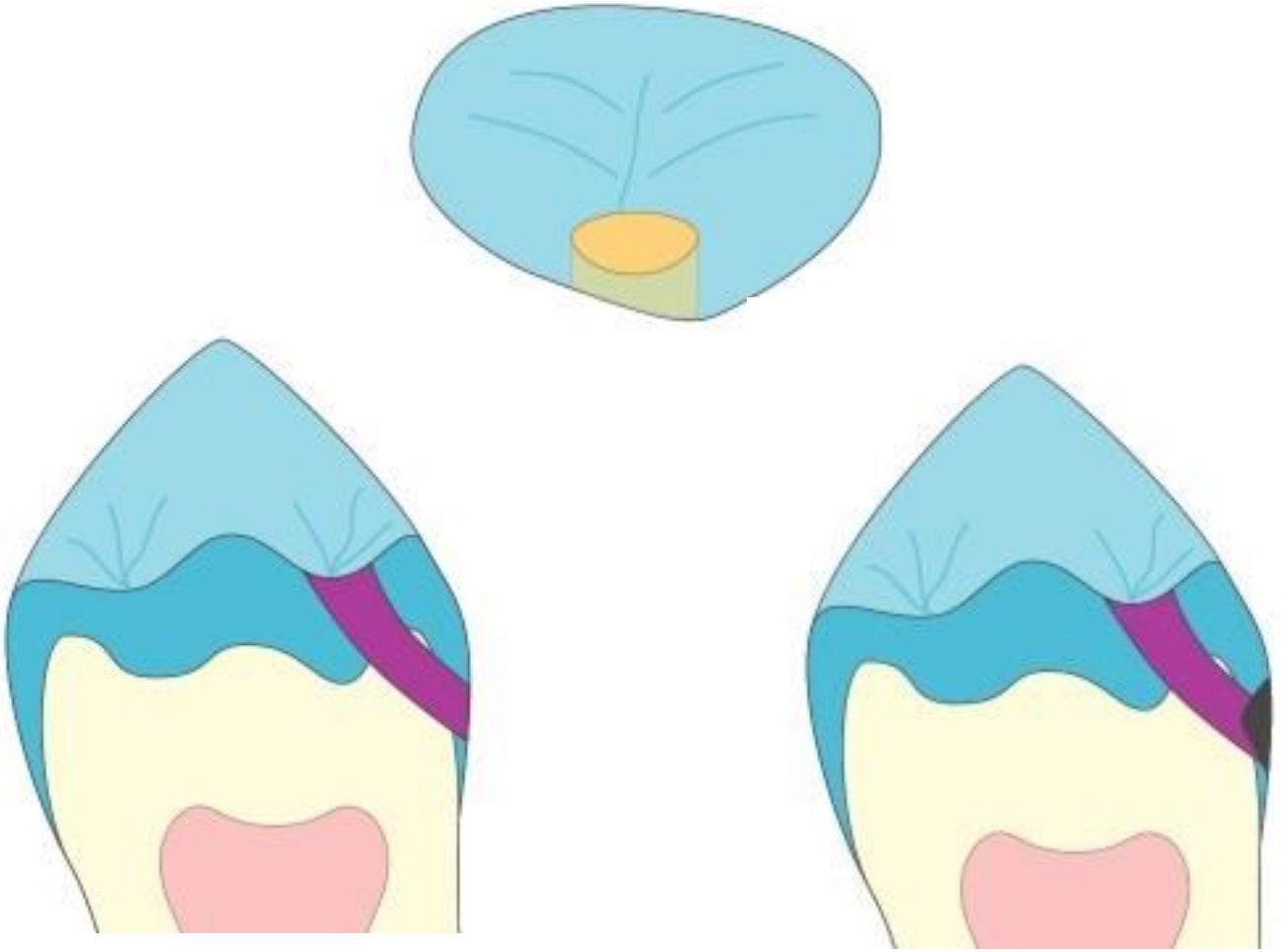
Tunnel preparation



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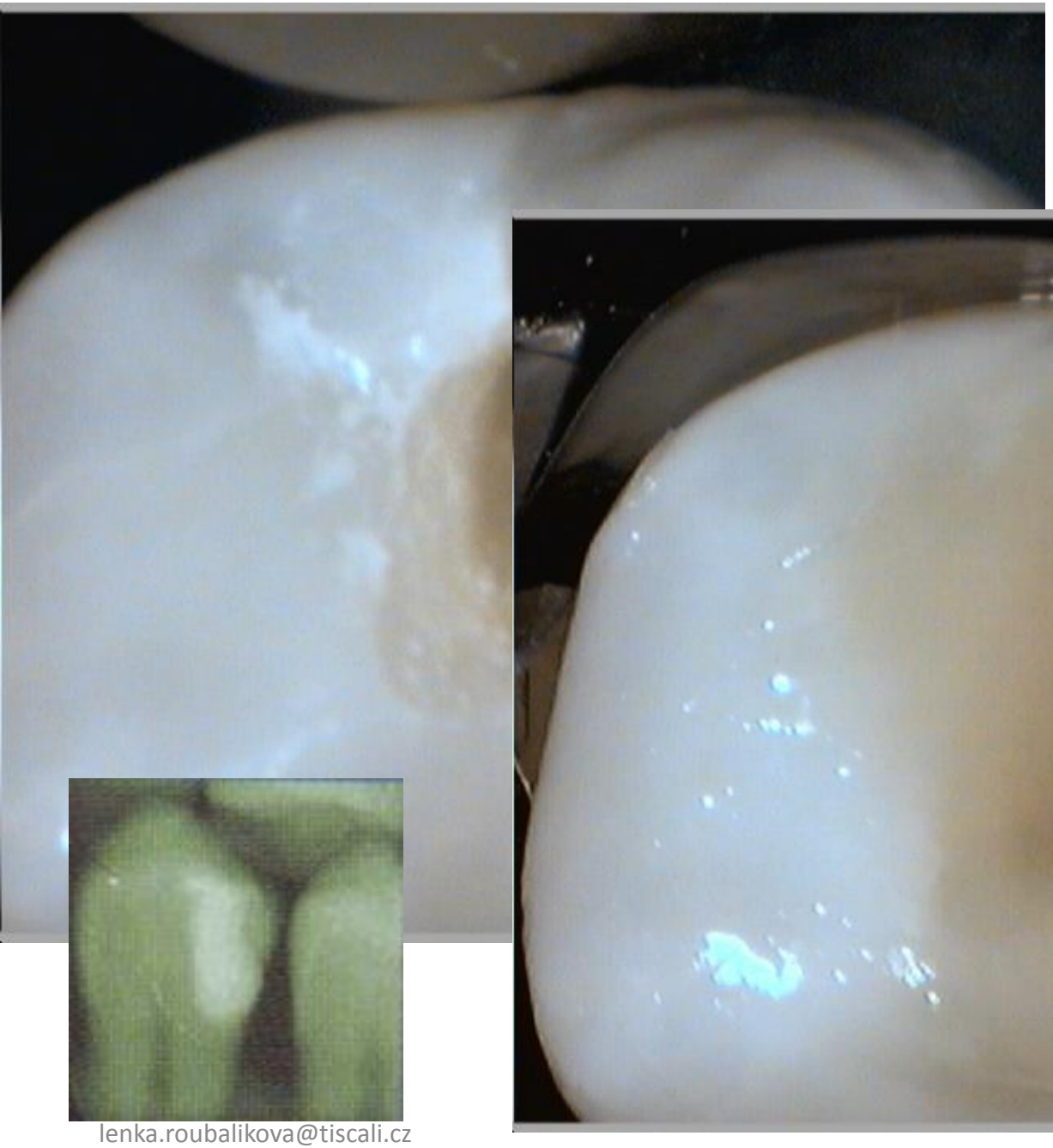

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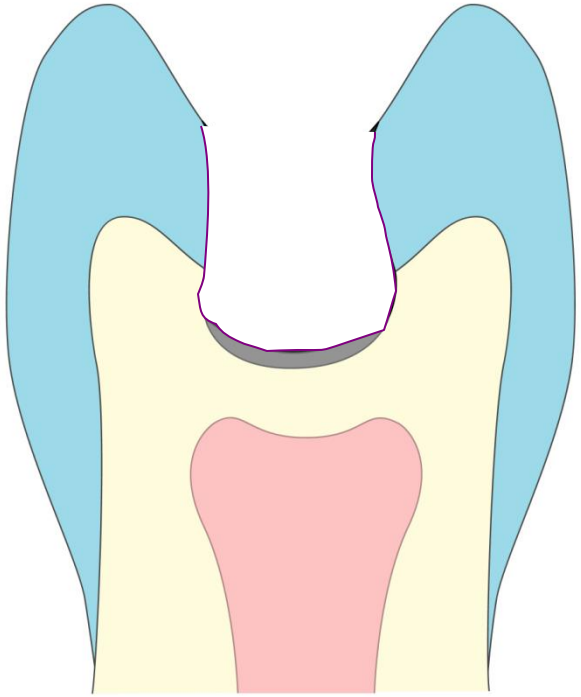
Success?

1. Low caries risk
2. Cooperation of the patient
3. Intact proximal ridge
4. D2

Success?

1. Loupes or microscope
2. Mini instruments
3. Capsulated GIC
5. BW post op

ART



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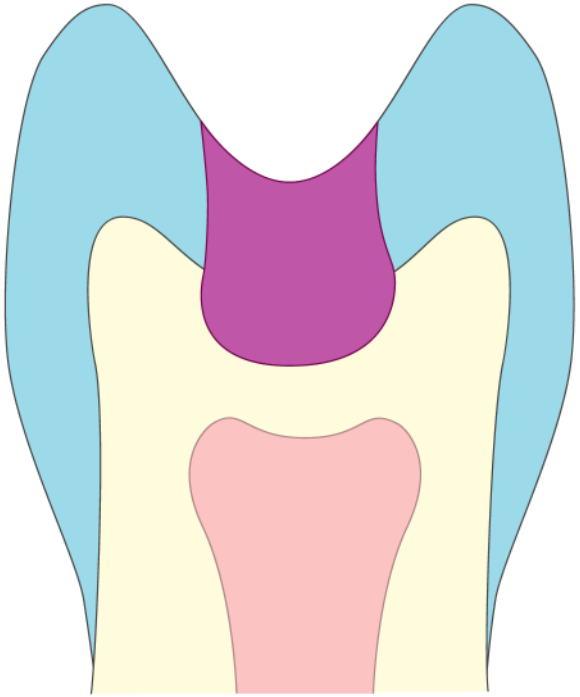
ART



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ART

Excavation of carious dentin

Clean borders

GIC

Recall

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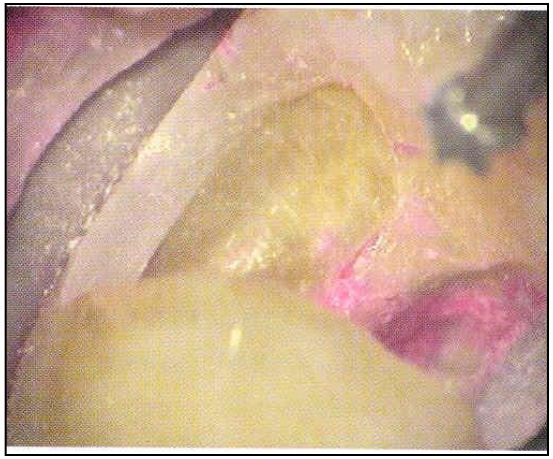
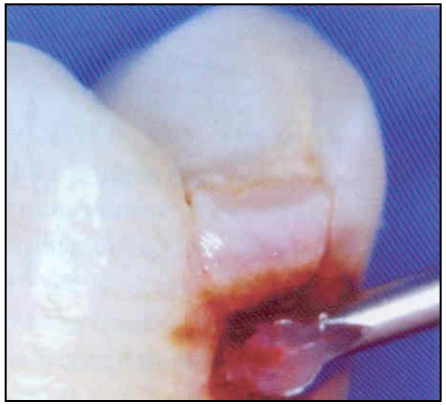
Caries detector

Can diferenciate carious dentin with destroyed and intact collagen network





Chemomechanical preparation

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Chemomechanical preparation

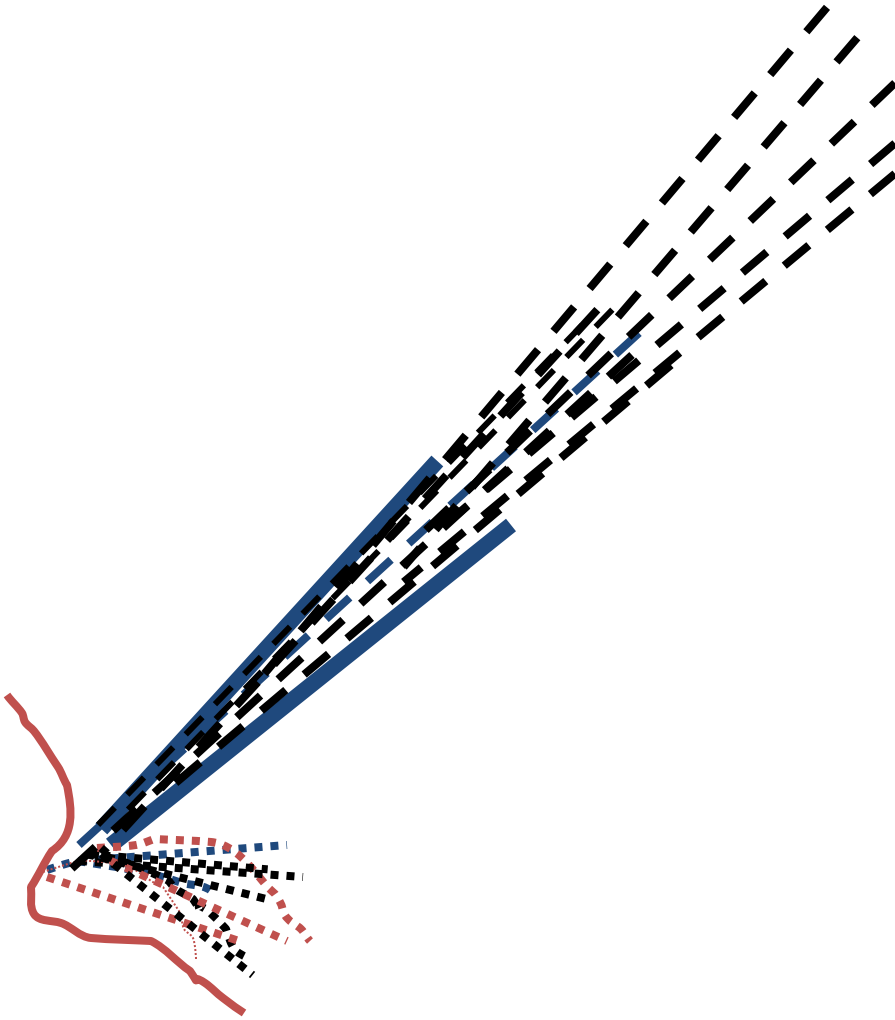
✓***Sodium hypochlorite + triaminoacids***

Removal of carious dentin, non active in enamel

GIC is the suitable material

Rafique S, Banerjee A, Fiske J.
Clinical trial of an air-abrasion/Carisolv gel regimen for restorative treatment for dentally anxious patients.
Caries Res 2002; 186 (Suppl.3)36:39.

➢ Kinetic preparation



Kinetic preparation

- Principally sandblasting
- Irregular cavosurface margin
- No excavation of carious dentin
- Suitable for composite materials

Ultrasound

Ultrasound in dentistry

- Piezoelektric generators
- 10 W/cm^2

Ultrasound in dentistry

- Oral hygiene - prophylaxis
- Subgingival treatment
- Preparation of cavities
- Endodontics
- Prosthetics
- Surgery

Ultrasound in dentistry

- Odstranění biofilmu a zubního kamene – profesionální hygiena

Robustní koncovky pracovní řady streamline.

Orientace:

Magnetostrikční: Delší osa elipsy(osmičky) směřuje tangenciálně k povrchu zubu

Piezoelektrické: Dráha pohybu koncovky je tangenciální k povrchu zubu

Preparation

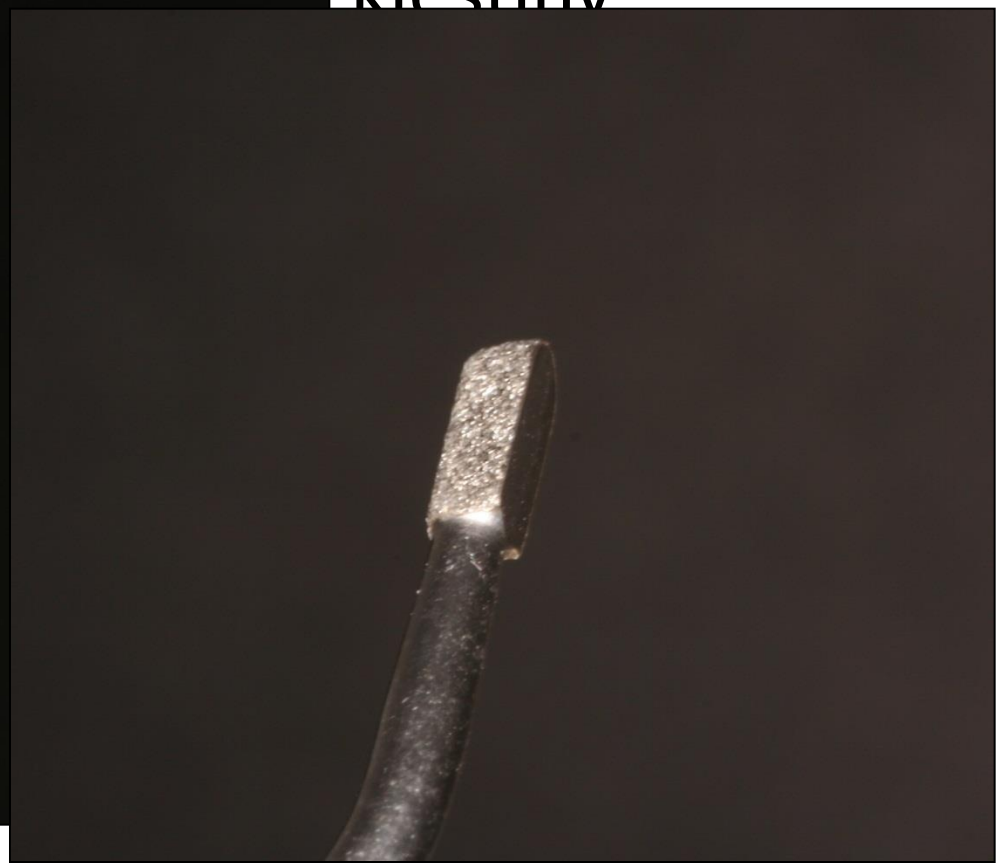
Oscillation of the instrument

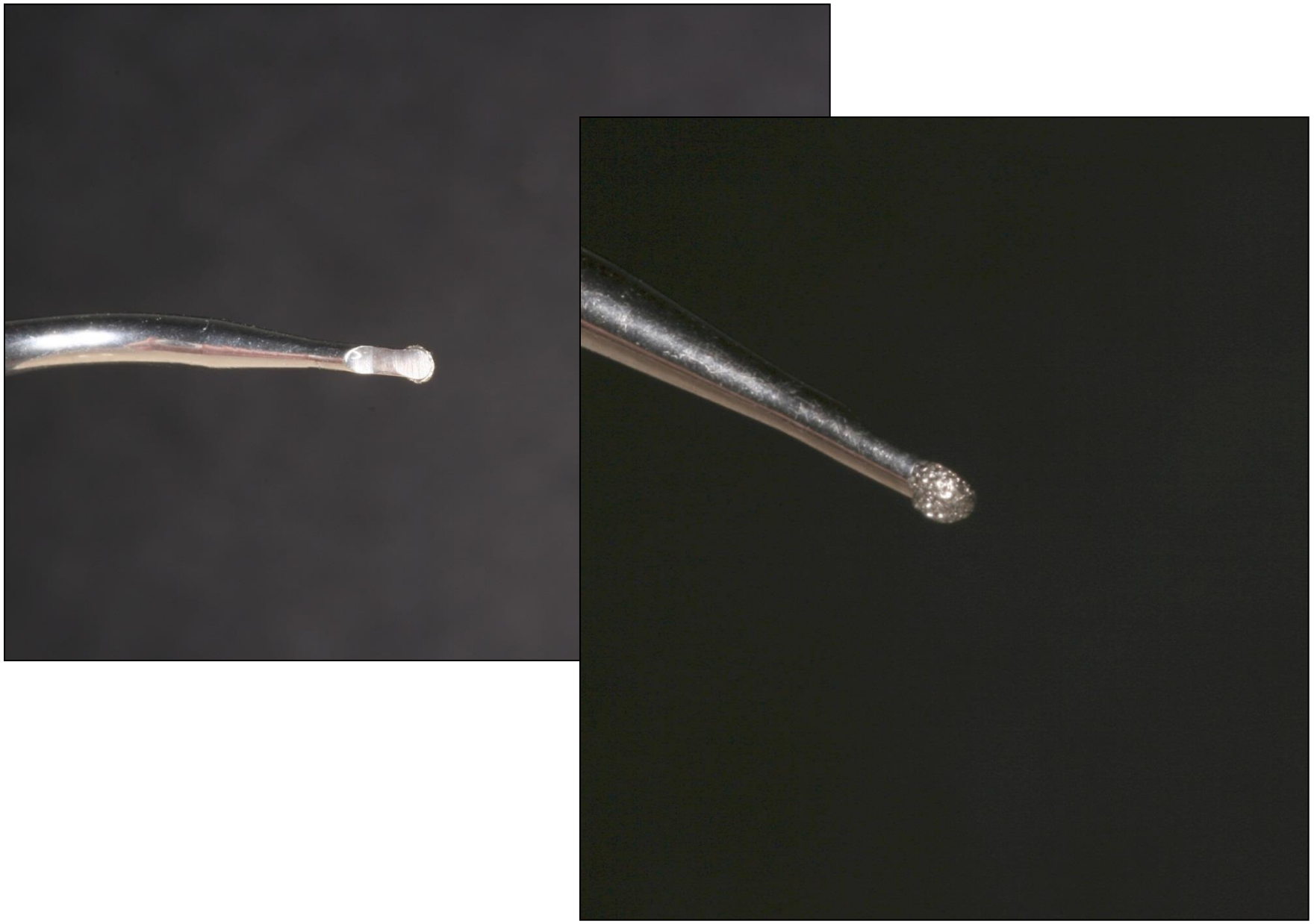
No risk of the damage of the neighborough tooth

Mini and microcavities, slots and tunnels, preparation of cavosurface margins

Preparation

kleštiny



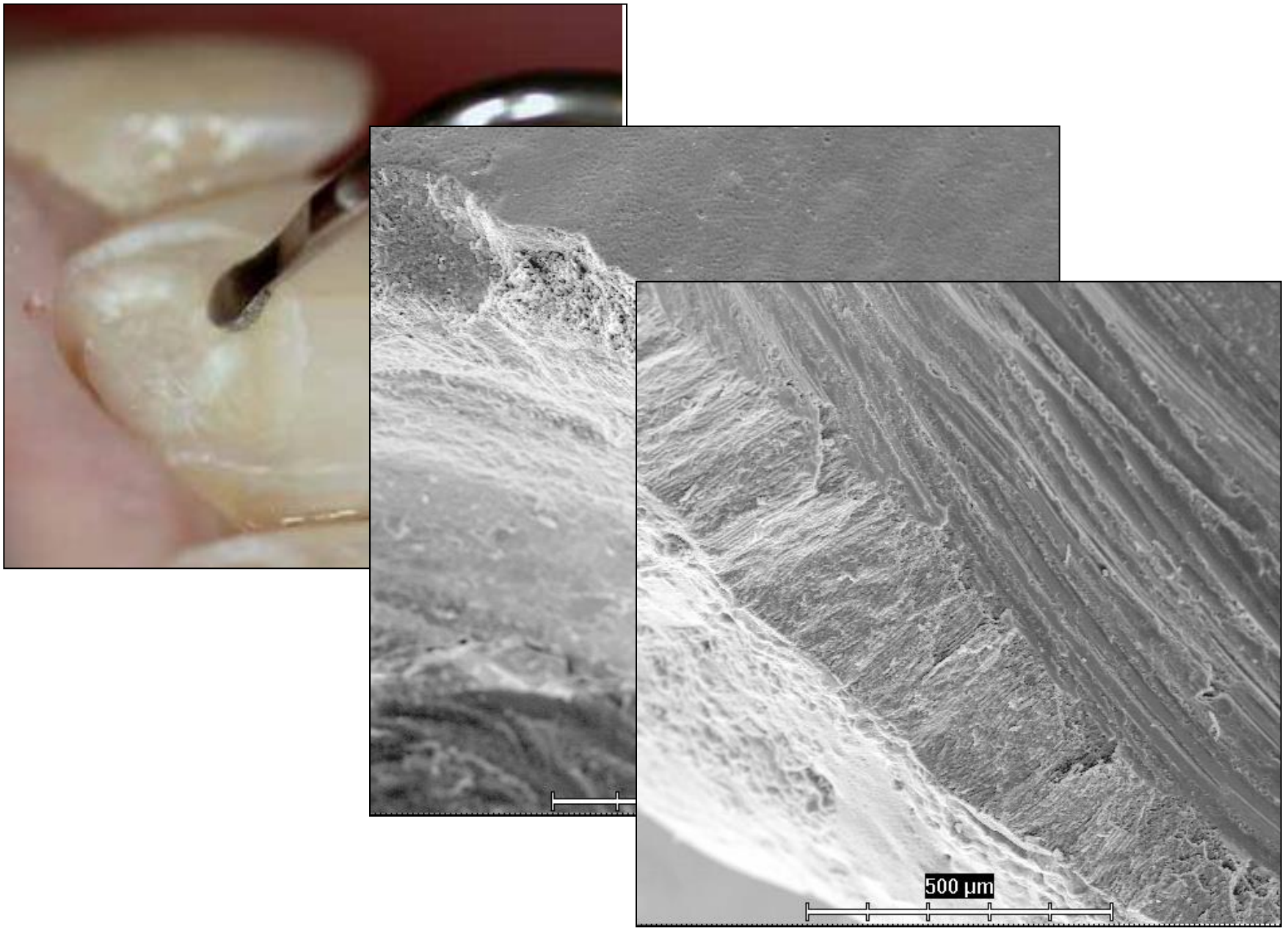


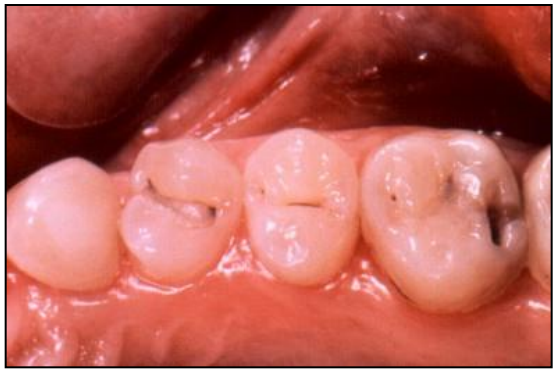
Preparation in enamel

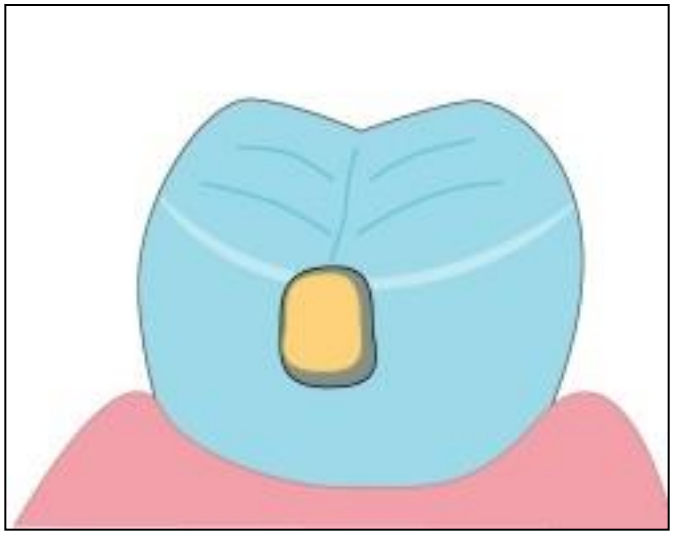
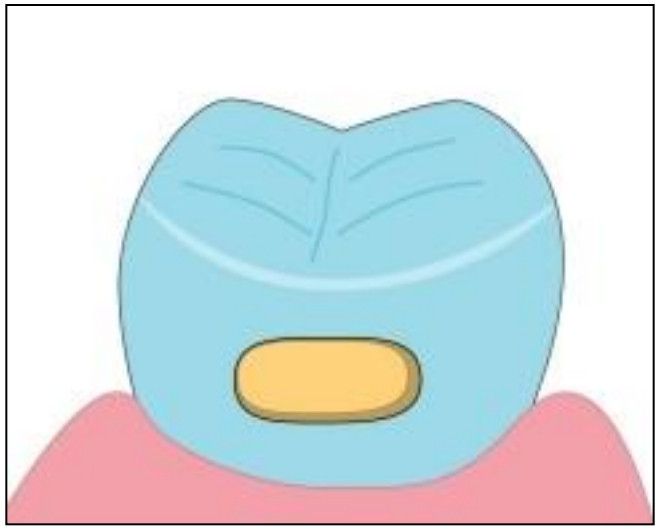
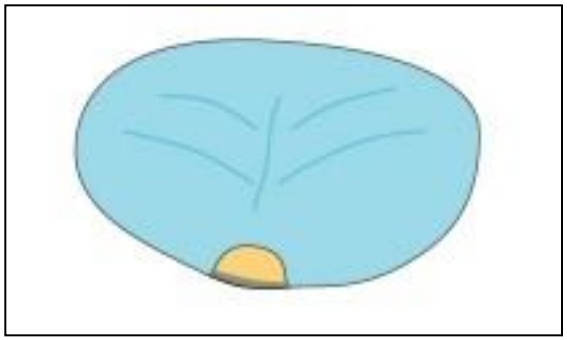
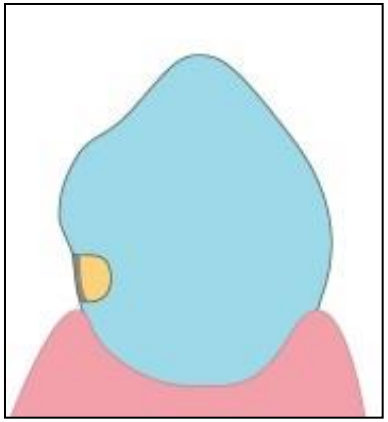
Excavation of carious dentin is unsufficient

Preparation in enamel

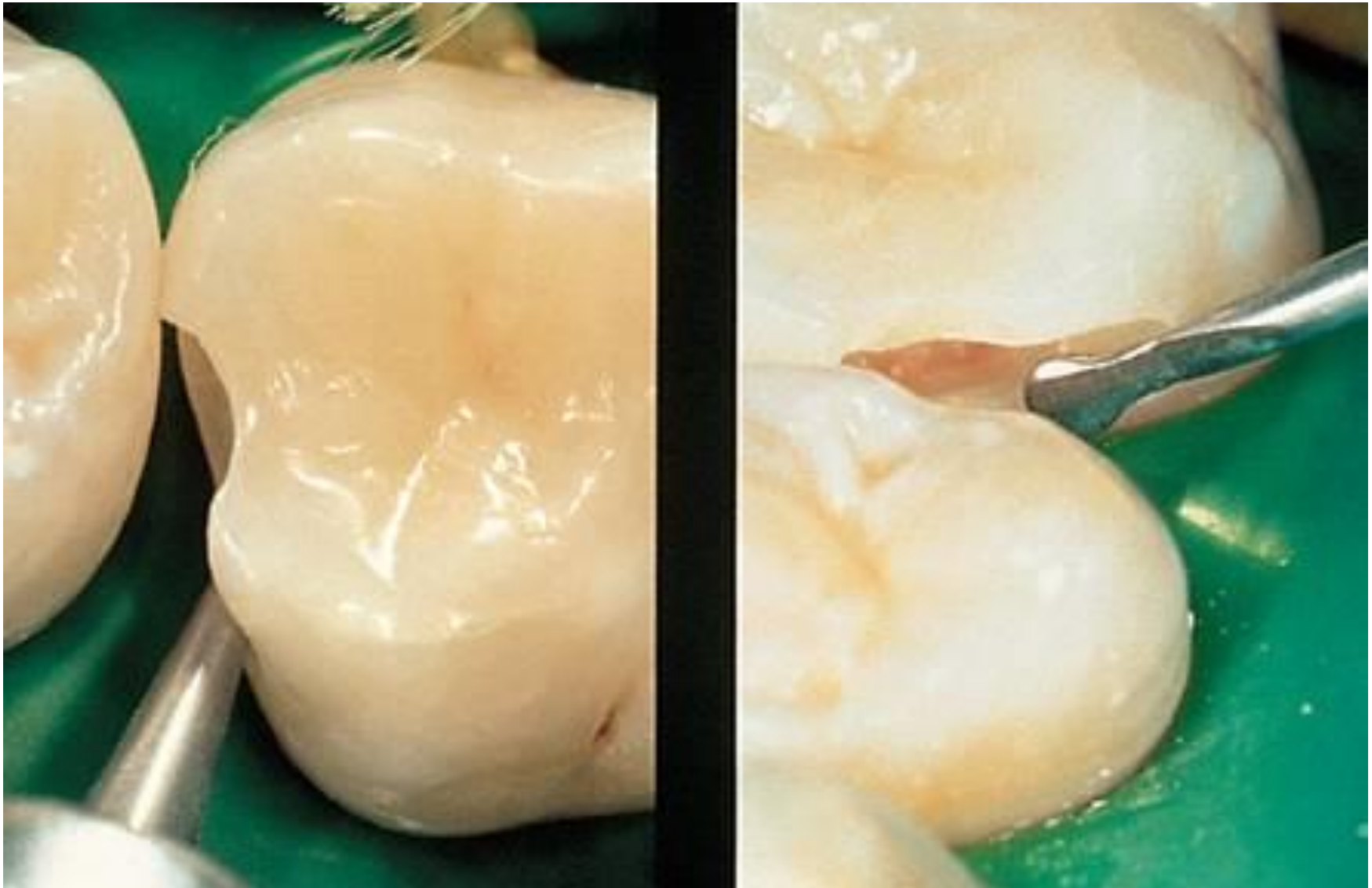
Preparation in dentin


500 µm



Proximal caries



LASER

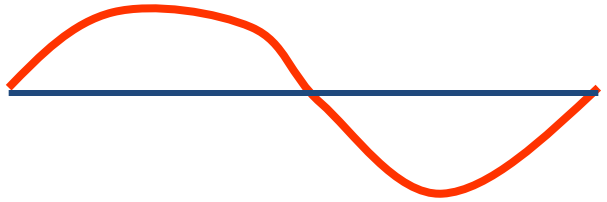
- **LIGTH AMPLIFICATION BY STIMULATED EMISSION OF RADIATION**

Maiman 1960

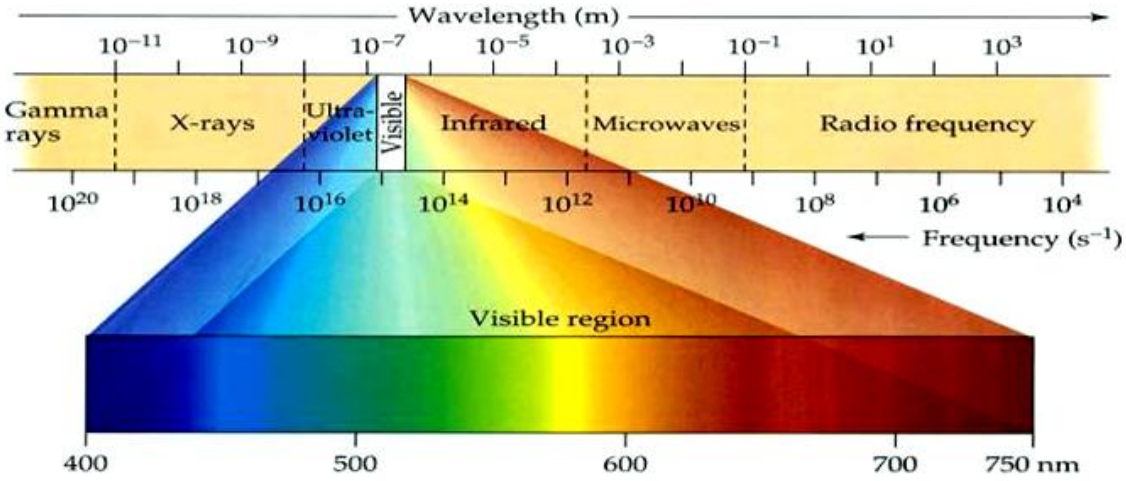
Basov, Prokhorov, Townes.

Light

- *Wavelenght*
- *Amplitude*
- *Photons*

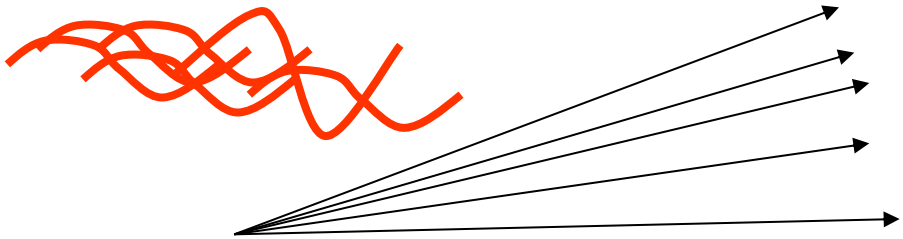


Natural light

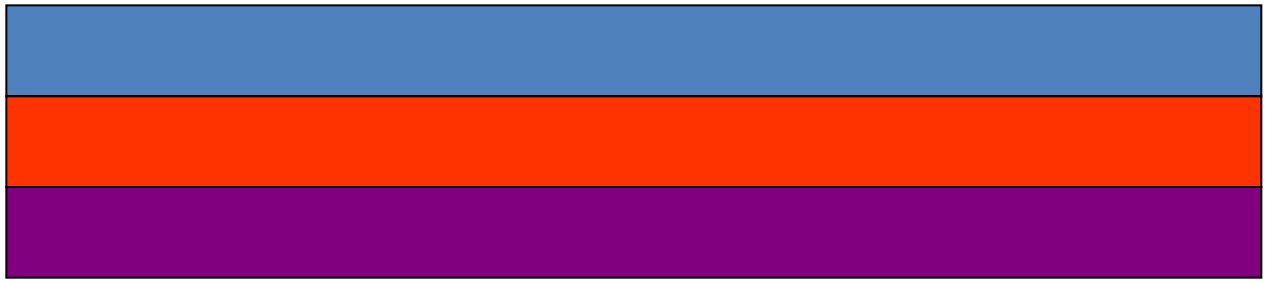


Hickel, 2004

- Polychromatic
- Divergent
- Incoherrent



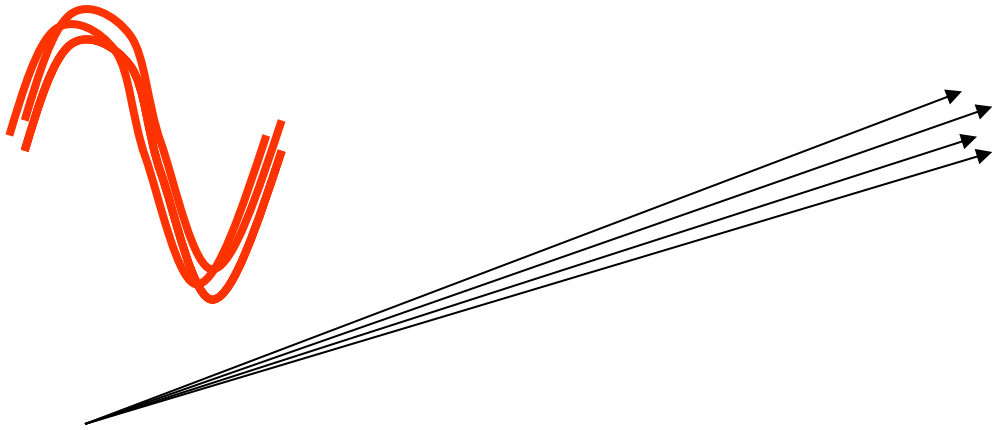
Laser light



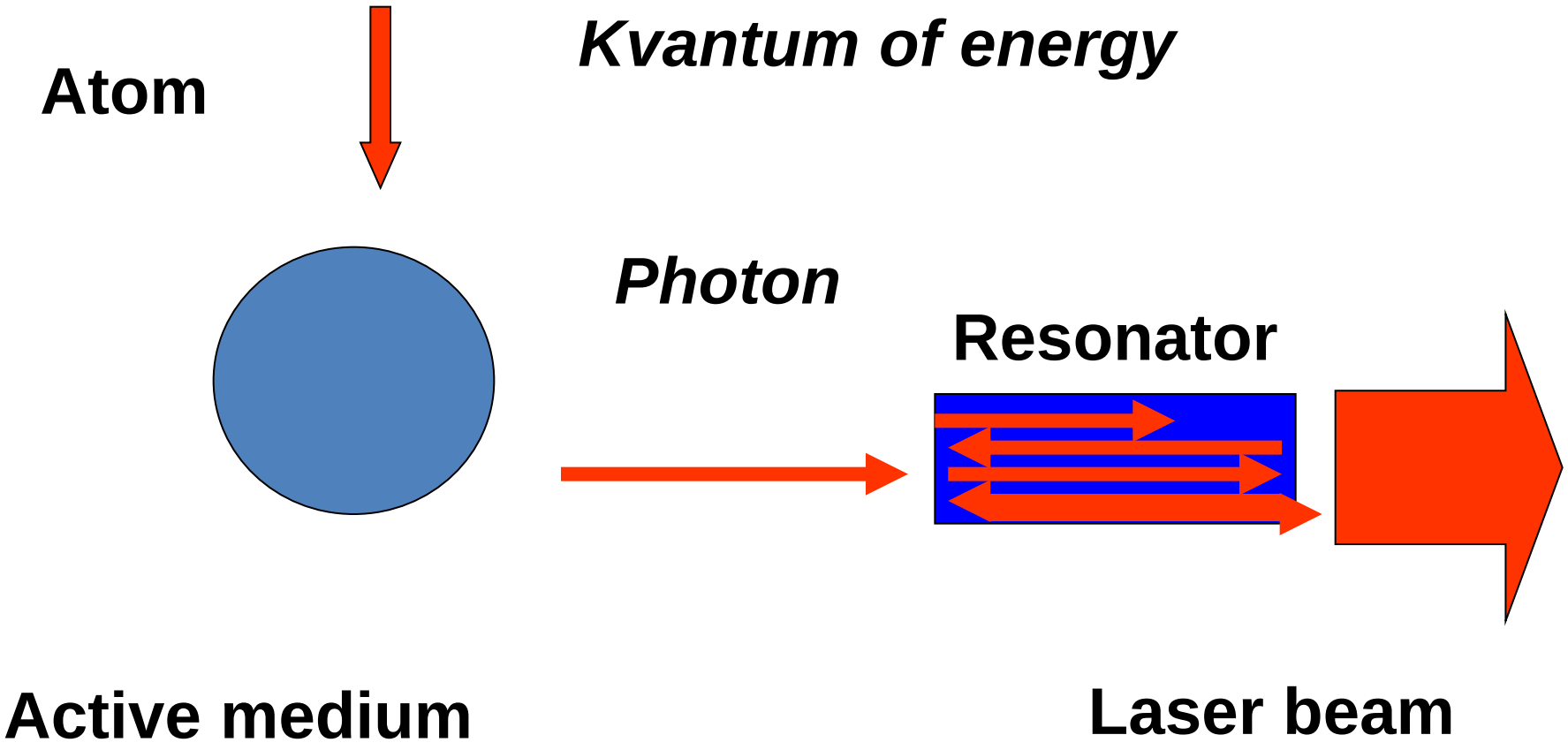
Monochromatic

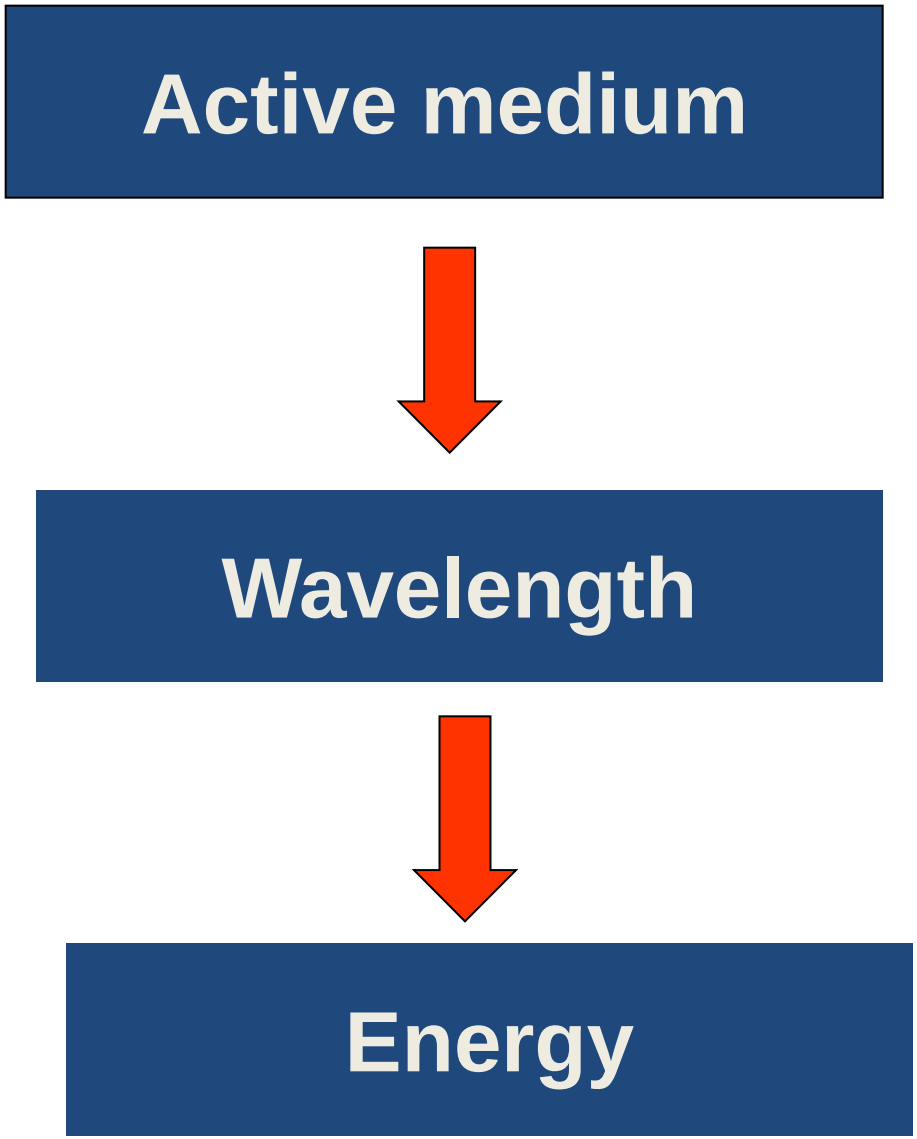
Coherrent

Colimated



Principle


Atom
Kvantum of energy
Photon
Resonator
Active medium
Laser beam


Active medium
Wavelength
Energy

Active medium

- Argon – Fluor UV
- Krypton- Fluor UV
- Helium – Kadmium UV, VIS
- Argon VIS
- Rubín VIS
- Nd:YAG VIS,IR
- Helium – Neon VIS, IR
- Diode lasers VIS, IR
- Erbium IR (Er:YAG, Er,Cr:YSGG)
- Oxid uhličitý IR

Er:YAG laser

Active medium: Erbium Yttrium - Aluminium - Garnet

Wavelength: 2940 nm

Er,Cr:YSGG laser

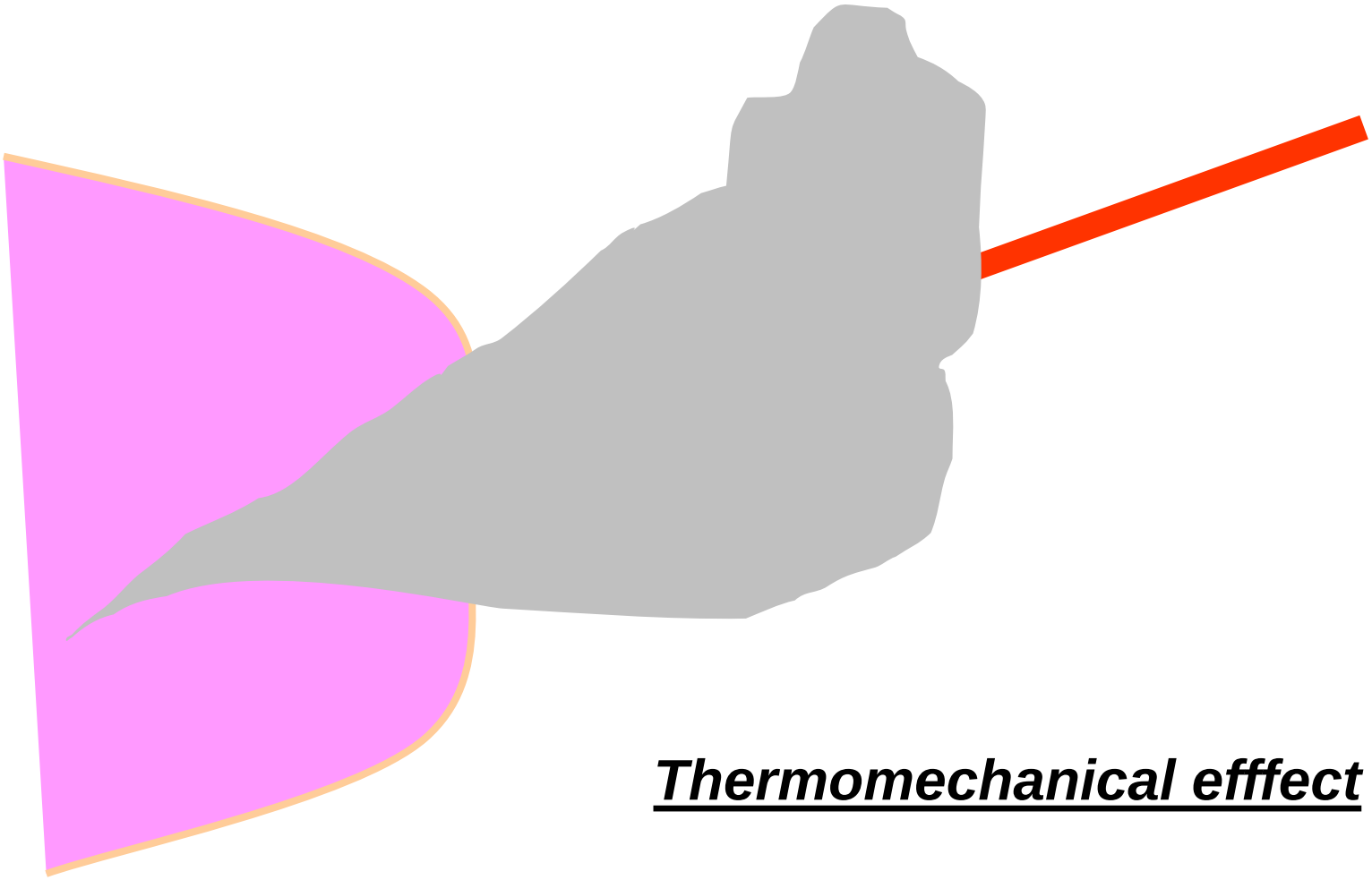
Active medium: Erbium a Chromium Yttrium - Scandium - Gallium - Garnet

Wavelength: 2780 nm

Er,Cr:YSGG Laser System

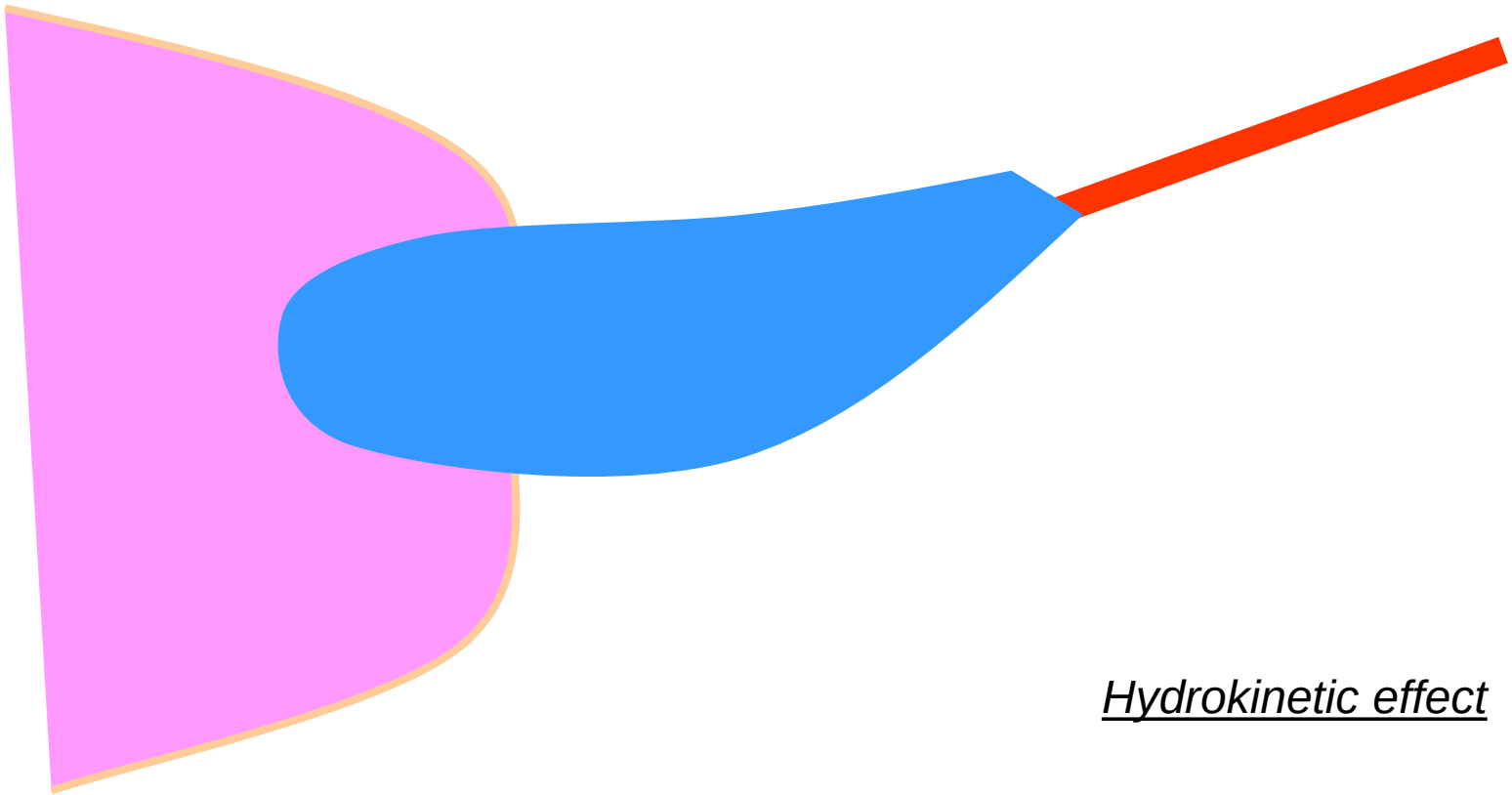
Waterlase (Biolase,USA)

Principle of action



Thermomechanical efffect

Principle of action



Hydrokinetic effect

Indications

- Preparation
- Mucogingival surgery
- Endodontics
- Analgezia, biostimulation

Laser - benefits

- Minimally invasive treatment
- No anaesthesia
- No smear layer
- Dentine tubules are open
- Antimicrobial effect