



# Cause related therapy: Professional mechanical plaque control

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*Special thanks to:  
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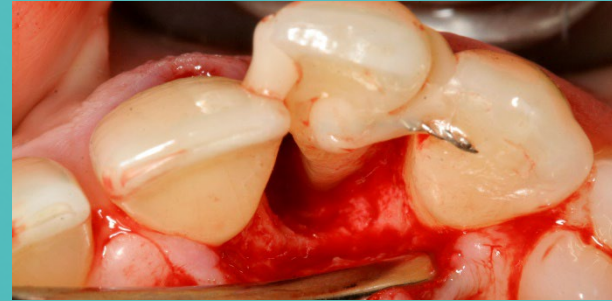
**What are the steps of the complex periodontal therapy?**

# What are the steps of the complex periodontal therapy?

INITIAL PHASE



CORRECTIVE PHASE



MAINTENANCE PHASE





# What are the steps of the complex periodontal therapy?

## INITIAL PHASE

- Instruction and motivation of the patient
- Supragingival and subgingival scaling and root planing (SRP)
- Elimination of other plaque retentive factors
- Treatment of the teeth with caries
- Extraction of the hopeless teeth
- Splinting
- Systemic and local antibiotic support

## CORRECTIVE PHASE

periodontal surgery and implant therapy (II), restorative, orthodontic, and/or prosthetic treatment (III)

## MAINTENANCE PHASE

Maintenance phase (care), that is supportive periodontal therapy (SPT)



# Initial phase = CAUSE RELATED THERAPY

- Main goal
  - To achieve of clean and infection-free condition
  - removal of all soft and hard deposits and their retentive factors
  - Furthermore, this phase should aim at motivating the patient to perform optimal plaque control



# Initial phase

- Base of treatment plan
- Phases I. (Initial phase) therapy or hygienic
  - Instruction and motivation of the patient
  - Supragingival and subgingival scaling and root planing (SRP)
  - Elimination of other plaque retentive factors
  - Treatment of the teeth with caries
  - Extraction of the hopeless teeth
  - Splinting
  - Systemic and local antibiotic support



# CAUSE RELATED THERAPY=

## Eliminating the etiological factors

### ◇ By whom?

◇ Dentist, dental hygienist

### ◇ And why?

- ◇ Biofilm, dental plaque - causal relationship with dental biofilms, a positive association between periodontal disease has been documented (Bergstrom 1989)

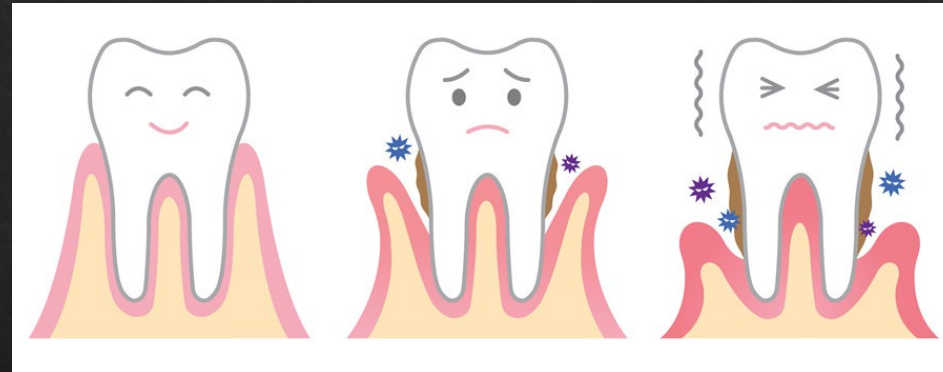
Primary and secondary prevention of periodontitis are based on the achievement of sufficient plaque removal.





◆ „Forty years of experimental research, clinical trials, and demonstration projects in different geographical and social settings have confirmed that **effective removal of dental plaque is essential to dental and periodontal health throughout life**”

European Workshop on Mechanical Plaque  
Control 1998



“Calculus does not in itself induce inflammation, but has a deleterious effect because of its ability to provide an ideal surface for microbial colonization.”

(Waerhaug 1952).

# Mechanical plaque control

- ◇ Base of treatment plan
- ◇ Phase I. Therapy
  - ◇ Instruction and motivation of the patient
  - ◇ **Supragingival and subgingival scaling and root planing**
  - ◇ Elimination of other plaque retentive factors
  - ◇ Treatment of the teeth with caries
  - ◇ Extraction of the hopeless teeth
  - ◇ Splinting
  - ◇ Systemic and local antibiotic support

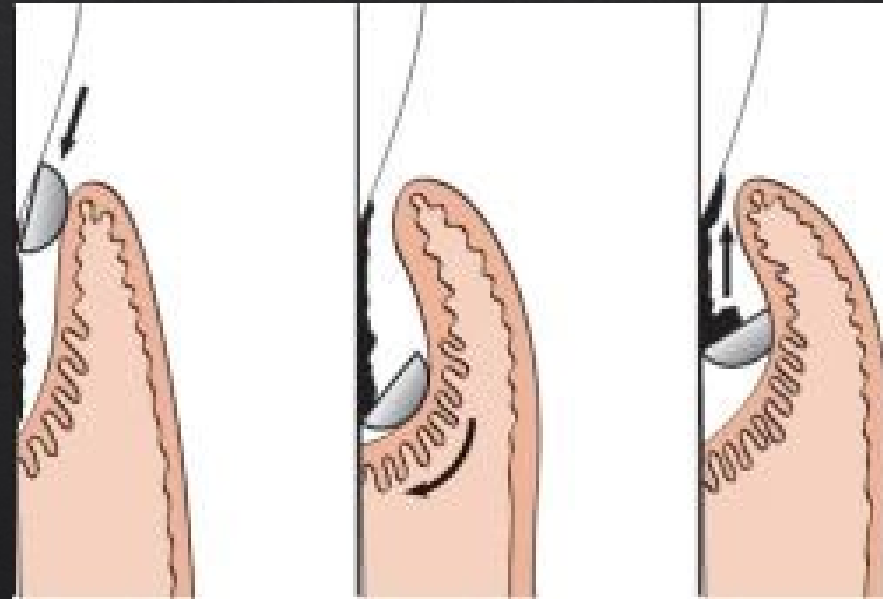
# Definitions

- ◆ **Scaling:**

- ◆ Mechanical removal of plaque and calculus

- ◆ **Root planing:**

- ◆ Cleaning the porous root surface, and removal of the infected cementlayer

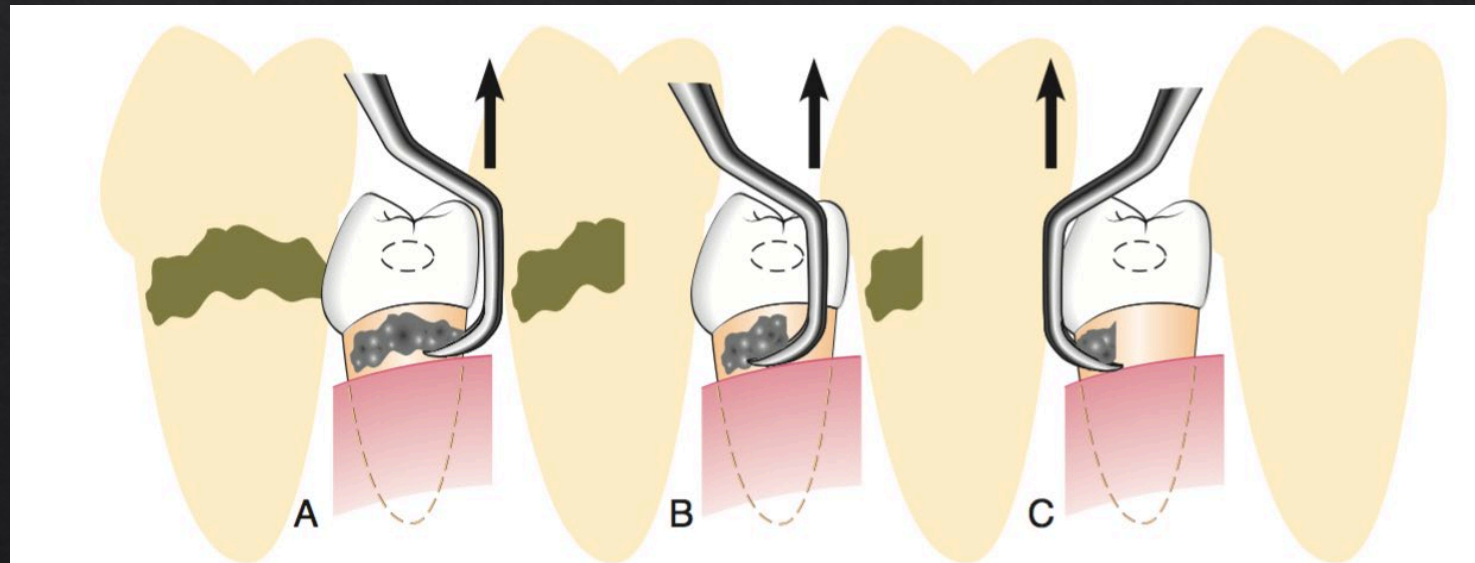




## Effects and goals of supra and subgingival scaling (nonsurgical therapy)

### Subgingival scaling and root planning are effective

- Reduces inflammation even in very deep pockets (?)
- Reduces pocket depth (?)
- Slows down the progression of attachment loss
- Sometimes provides clinical attachment gains



# Instrumentation

## Sonic and ultrasonic devices

- ◇ Ultrasonic
  - ◇ Magnetostrictive
  - ◇ Piezoelectrical
- ◇ Sonic
- ◇ Laser
- ◇ Air polishing devices
- ◇ Other
  - ◇ EVA system

## Hand instruments

- ◇ Scalers
  - ◇ Sickle
  - ◇ Hoe
- ◇ cures
  - ◇ Universal
  - ◇ Specific
    - ◇ Gracey
    - ◇ Mini
    - ◇ Langer
  - ◇ Periimplantal

# Ultrasonic instruments

- the removal of the plaque and calculus is accomplished by the vibration of the instruments' tip (cavitation: collapse of the air-bubbles)
- frequency: 24000-42000 Hz
- use for supra or subgingival scaling, removing of the plaque or the discoloration of the tooth
- always **with water- spraying !!!**
- contra-indication: **pacemaker**

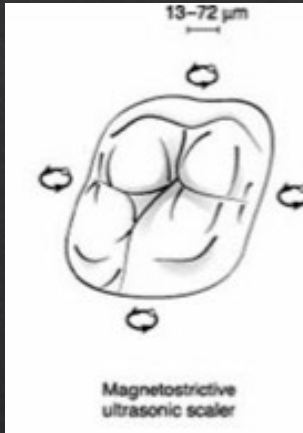




# Ultrasonic instruments

- 2 types: **magnetostrictive** and **piezoelectric**

Convert electrical current mechanical energy in the form of high-frequency vibrations at the instrument tip



The electrical current causes a dimensional change in the handpiece



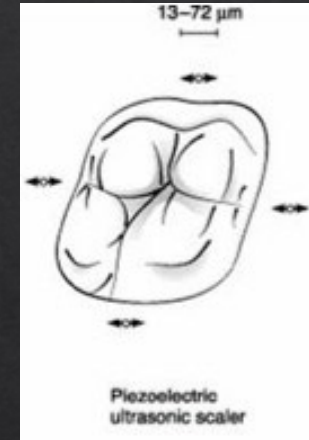
transmitted to working tip as vibration



The electrical current produces a magnetic field in the handpiece



The insert to expand and contract along its length and in turn causes the insert to vibrate

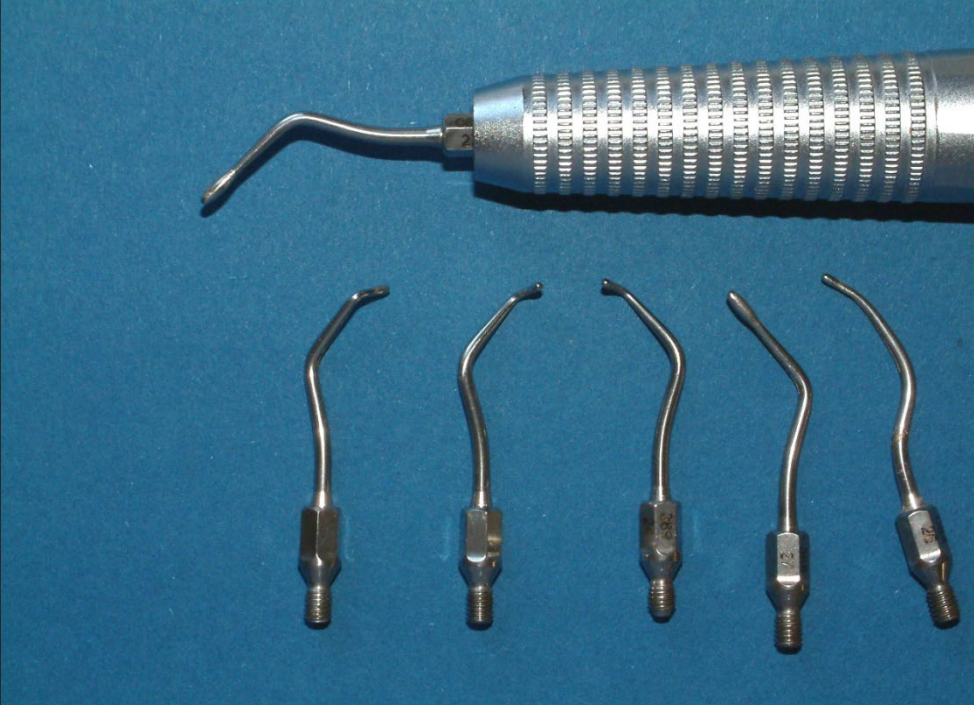


# Sonic instrument

- ◇ Use air-pressure to create mechanical vibration
- ◇ Less amplitude than ultrasonic (frequency: 4000-7000Hz )
- ◇ effective for calculus removal
- ◇ use with **water-spraying** (friction)
- ◇ has **no contra-indication**
- ◇ Air-driven instrument



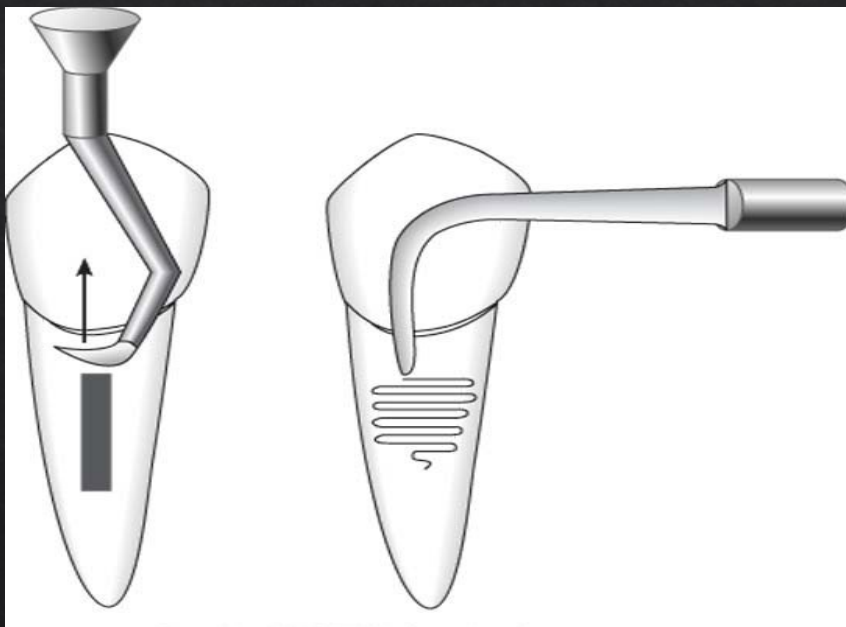




SONIC SCALER

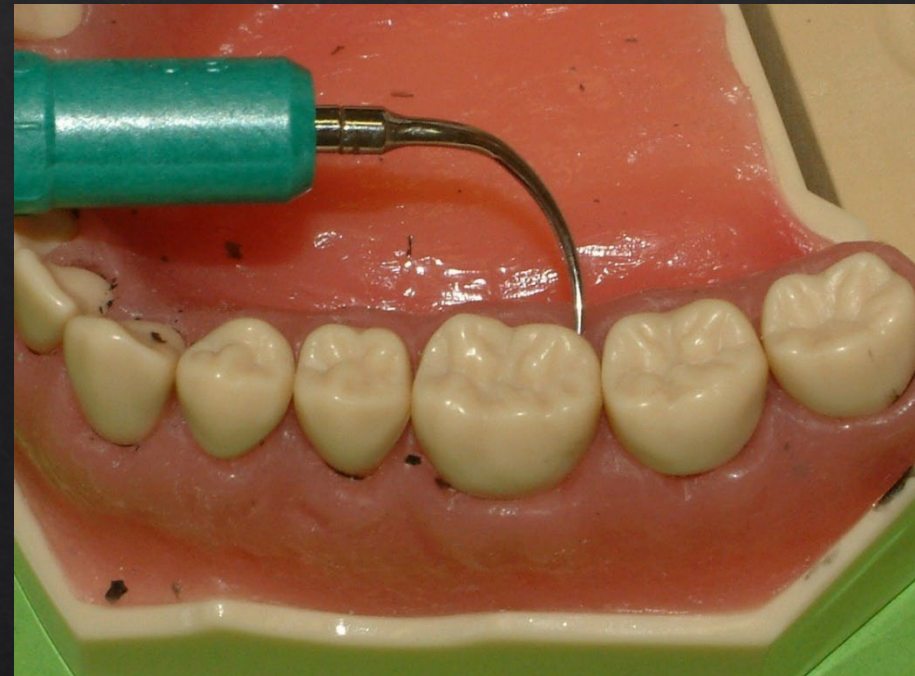
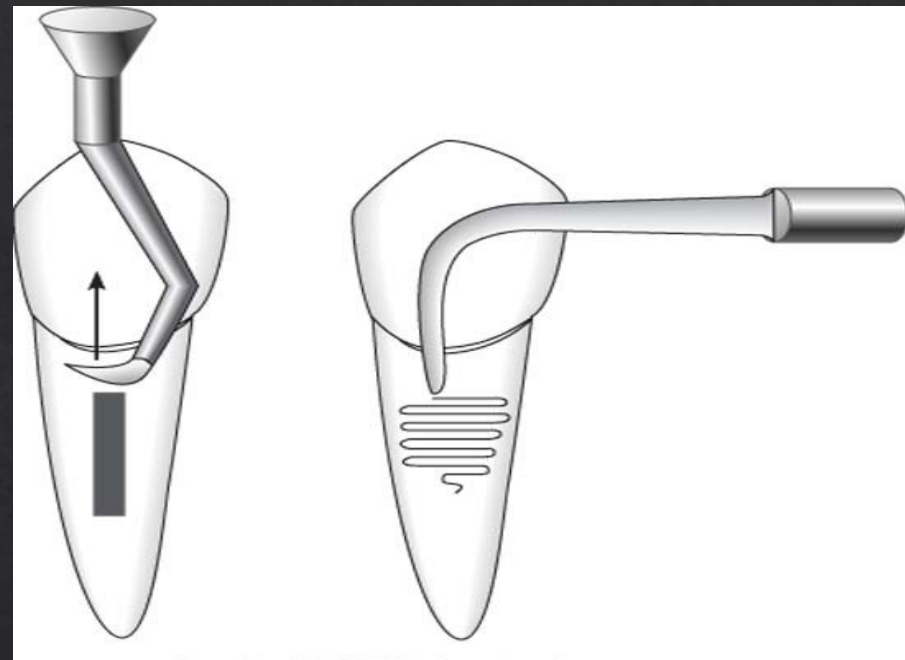








Strokes in horizontally  
direction!!!



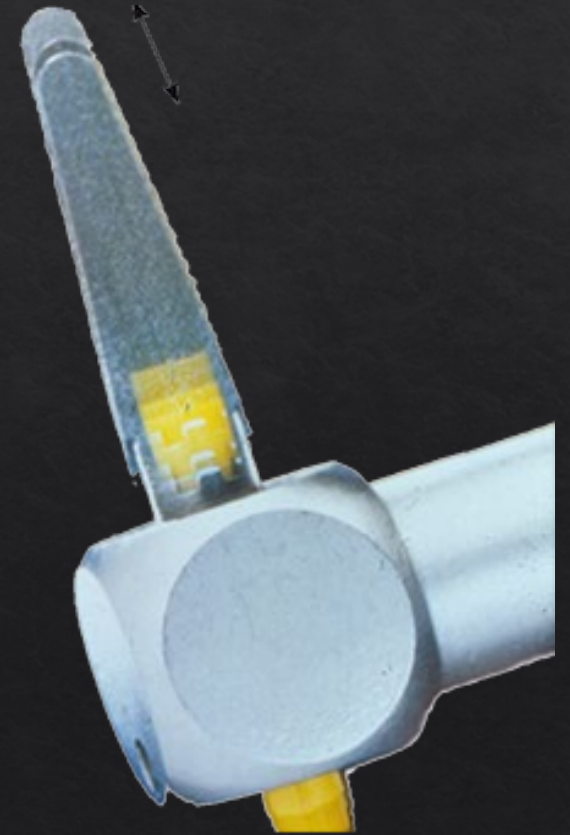
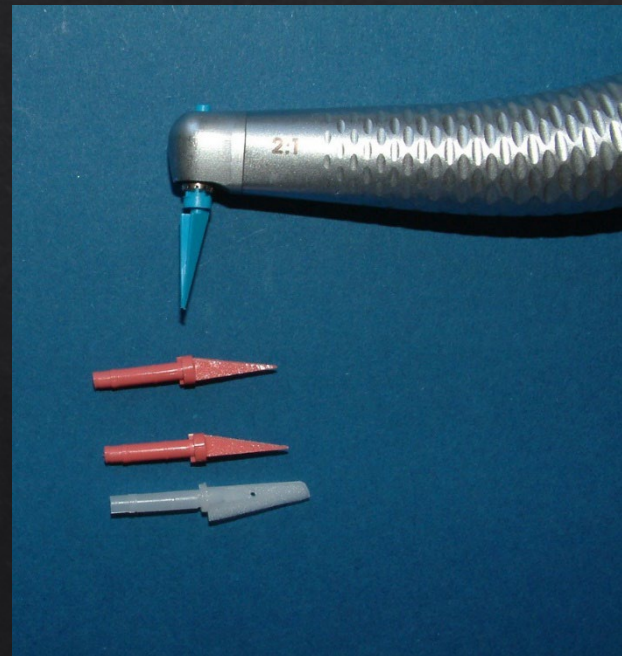
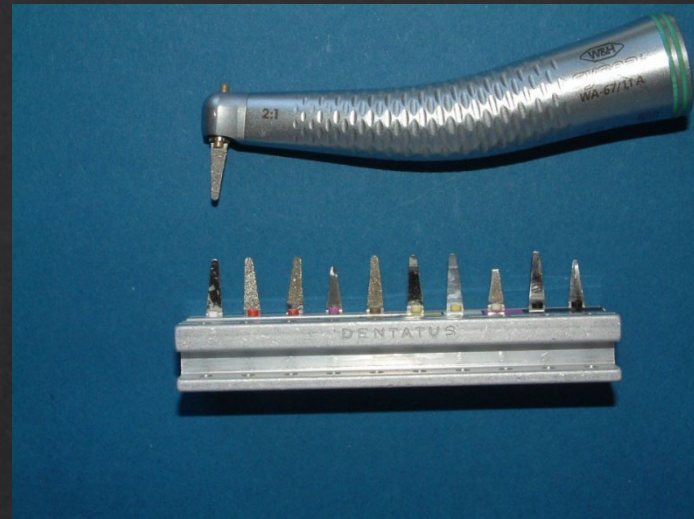
# Selection of instruments

- ◇ Hand, sonic, and ultra sonic instruments produce similar periodontal healing response with respect to PPD, bleeding on probing, and CAL (Badersten *et al.* 1981, 1984; Lindhe & Nyman 1985; Kalkwarf *et al.* 1989; Loos *et al.* 1987; Copulos *et al.* 1993; Obeid *et al.* 2004; Wennström *et al.* 2005; Christgau *et al.* 2006)
- ◇ the use of sonic and ultrasonic instruments may provide better access to deep pockets and furcation areas (Kocher *et al.* 1998; Beuchat *et al.* 2001)
- ◇ Reduce the risk of over-instrumentation!!!!



**EVA contra angle handpiece** for hard-to-reach intraoral areas.  
(oscillating instrument)

- Allowing reshaping of restorations
- Finishing, polishing and contouring of the dental surfaces
- To remove **overhangs**
- Tips: **one side is with diamond-coated, the other one is smooth**





# Air polishing devices

- ◆ for removal of soft deposits (plaque and debris)
- ◆ Reduced working time compared to other polishing procedures
- ◆ Possibility of using air-polishing in subgingival: erythritol and glycin powder



# WHAT IS GBT?

- ◇ Guided Biofilm Therapy is the systematic, predictable solution for dental biofilm management in professional prophylaxis using state of the art **AIRFLOW**<sup>®</sup>, **PERIOFLOW**<sup>®</sup> and **PIEZON**<sup>®</sup> technologies. It is proven by scientific evidence.



Airflow



Perioflow



Piezon



# WHAT IS **GBT**?

Guided Biofilm Therapy consists of treatment protocols based on individual patient diagnosis and risk assessment in order to achieve optimal results. The treatment is given in the least invasive way, with the highest level of comfort, safety and efficiency



Airflow



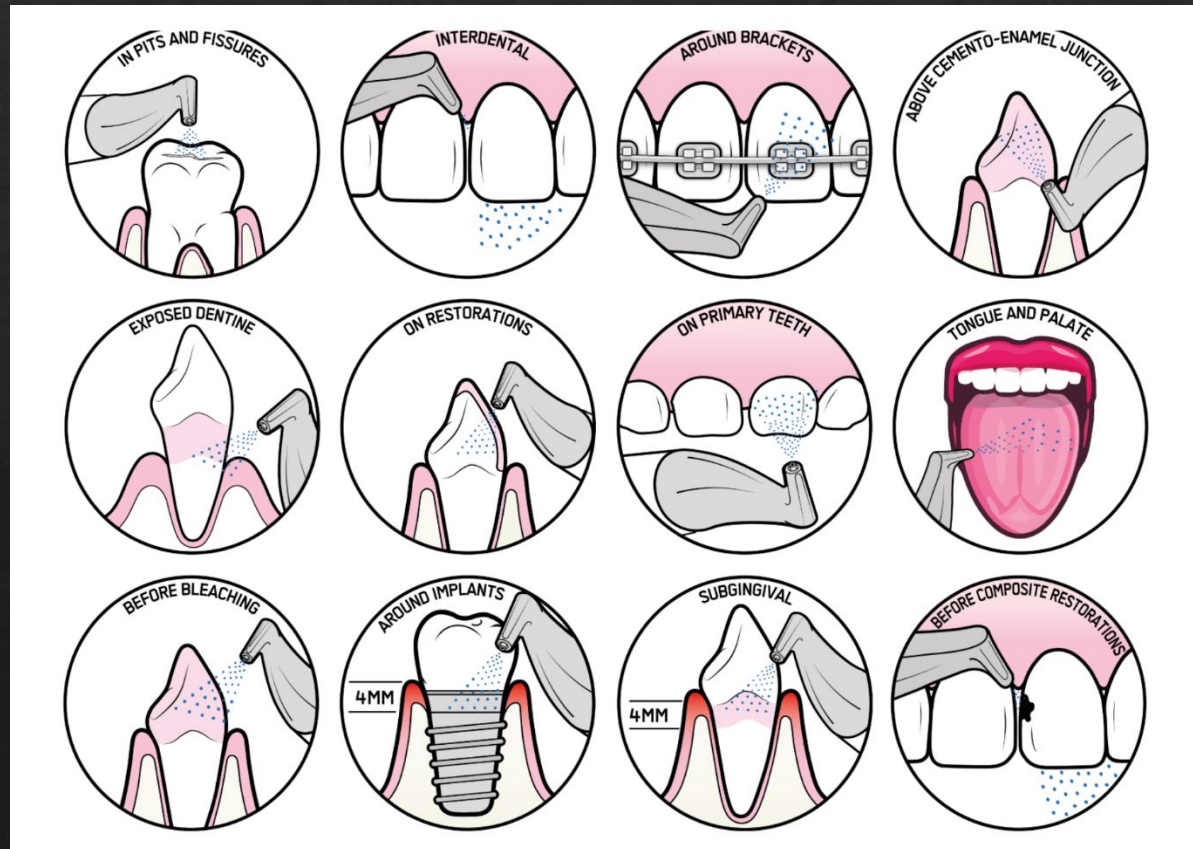
Perioflow



Piezon

# Airflow

- ◆ Removes biofilm, stains and young calculus on natural teeth, restorations and implants. Cleans and polishes in one single procedure.





# Airflow

## MINIMALLY INVASIVE PROPHYLAXIS ON ORTHODONTIC PATIENTS

### METAL BRACKETS



### CLEAR ALIGNERS





# Periflow

- ◆ Effective removal of biofilm down to the deepest periodontal pockets (pockets from 4mm – 9mm)



# WHAT IS GBT?

## 07 CHECK

### MAKE YOUR PATIENT SMILE

- Do a final check for remaining biofilm
- Ensure calculus is fully removed
- Accurately diagnose caries
- Protect with fluoride
- No polishing anymore

## 06 PIEZON® PS

### REMOVE REMAINING CALCULUS

- Use the minimally invasive EMS PIEZON® PS Instrument supra- and subgingivally up to 10 mm
- Clean > 10 mm pockets with mini curette
- Use EMS PIEZON® PI Instrument around implants up to 3 mm subgingivally and on restorations

## 05 PERIOFLOW®

### REMOVE BIOFILM IN >4 TO 9 MM POCKETS

- Use AIRFLOW® PLUS Powder on natural teeth in deep pockets and root furcations and on implants
- Use new and slimmer PERIOFLOW® Nozzle



## 02 DISCLOSE

### MAKE BIOFILM VISIBLE

- Highlight to patients the disclosed biofilm and their problematic areas with EMS Biofilm Discloser
- The color will guide biofilm removal
- Once biofilm is removed, calculus is easier to detect

## 03 MOTIVATE

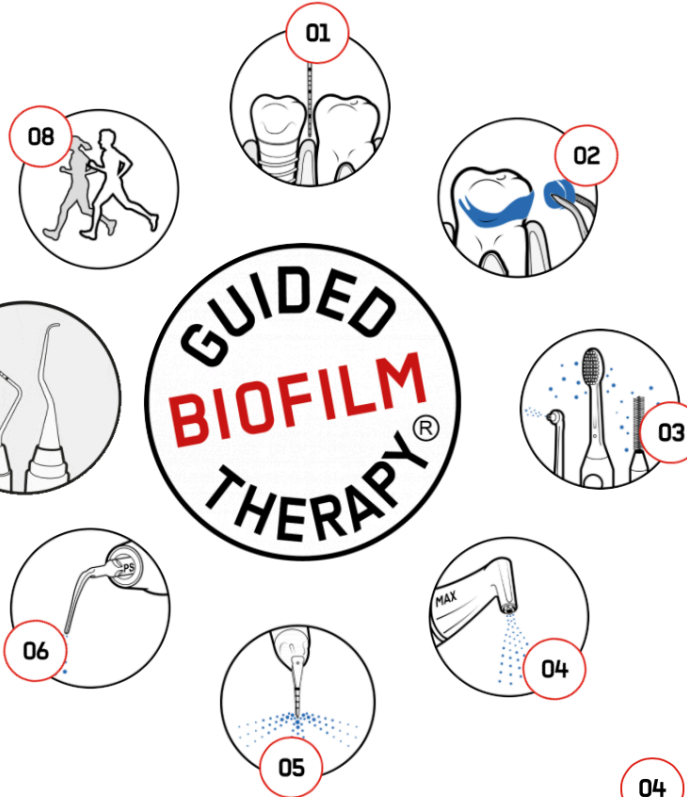
### RAISE AWARENESS AND TEACH

- Emphasize the importance of prevention
- Instruct your patients in oral hygiene
- EMS recommends interdental brushes or dental floss as well as electric or manual toothbrushes and AIRFLOW® erythritol toothpaste for daily home care

## 04 AIRFLOW® MAX

### REMOVE BIOFILM, STAINS AND EARLY CALCULUS

- Use AIRFLOW® for natural teeth, restorations and implants
- Remove biofilm supra- and subgingivally up to 4mm using AIRFLOW® PLUS 14 µm Powder
- Also remove biofilm from gingiva, tongue and palate
- Remove remaining stains on enamel using AIRFLOW® CLASSIC Comfort Powder





# Instrumentation

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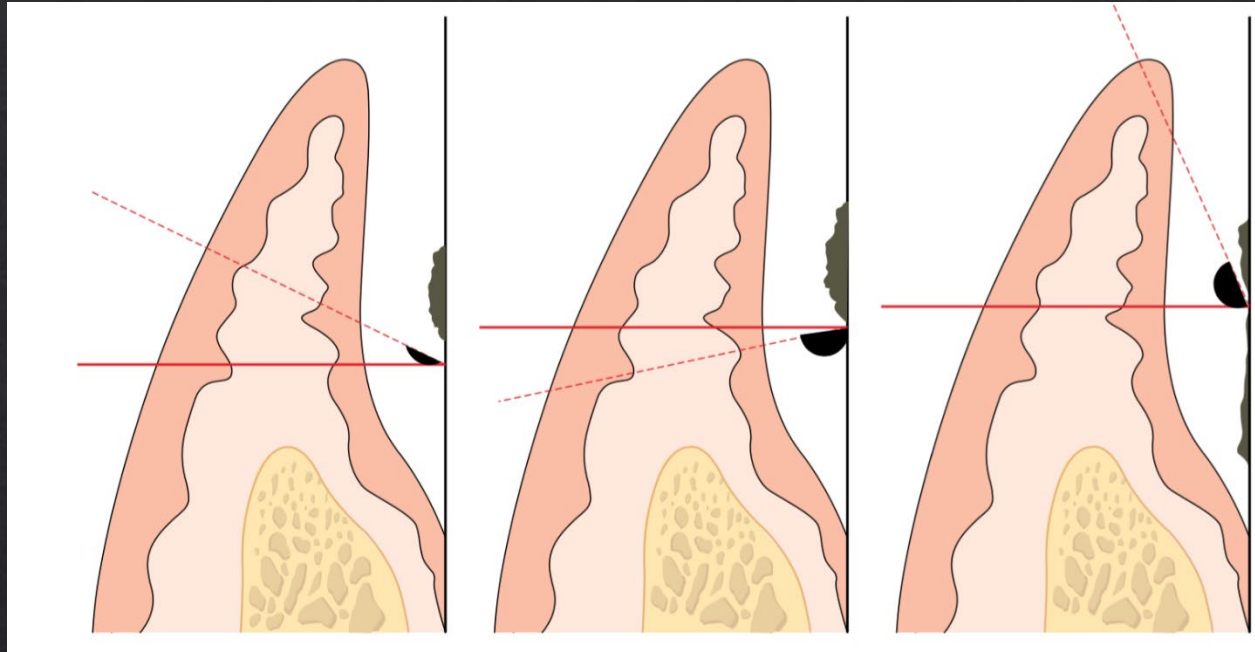


strokes from the  
apical to the coronal  
direction (terminal  
neck paralell with the  
axis of the teeth!!!)





# Effect of different angulations of the cutting edge of the curette to the tooth surface



Correct angle of application

Angulation too obtuse

Angulation too acute

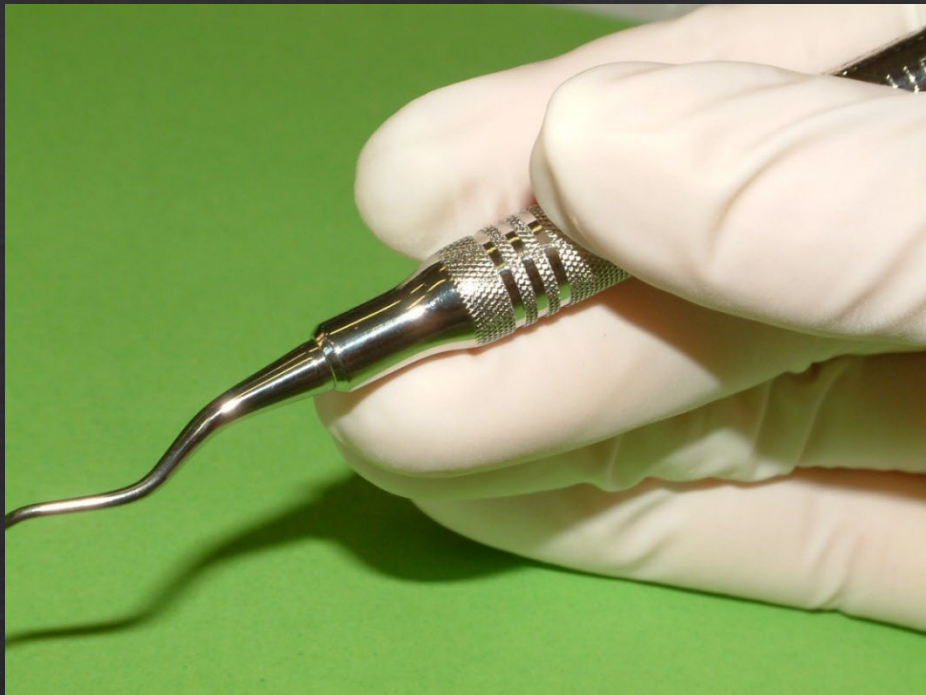


Ineffective and the possibility of cratering the surface

Ineffective and burnishing of the calculus deposits



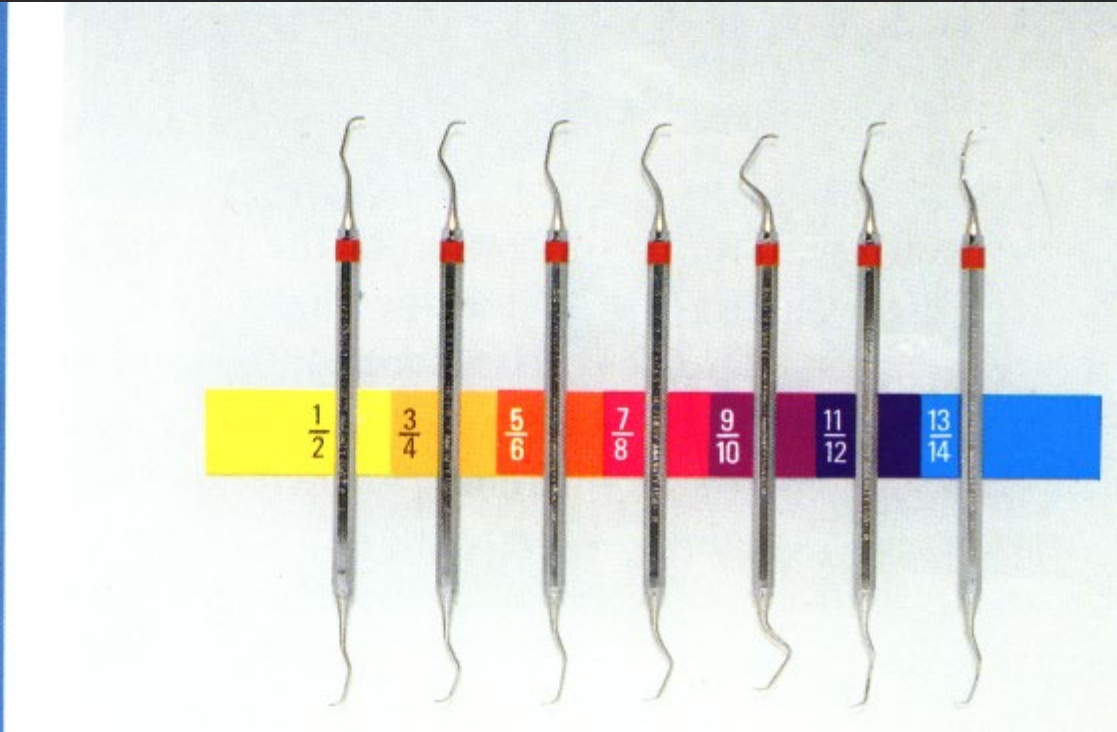
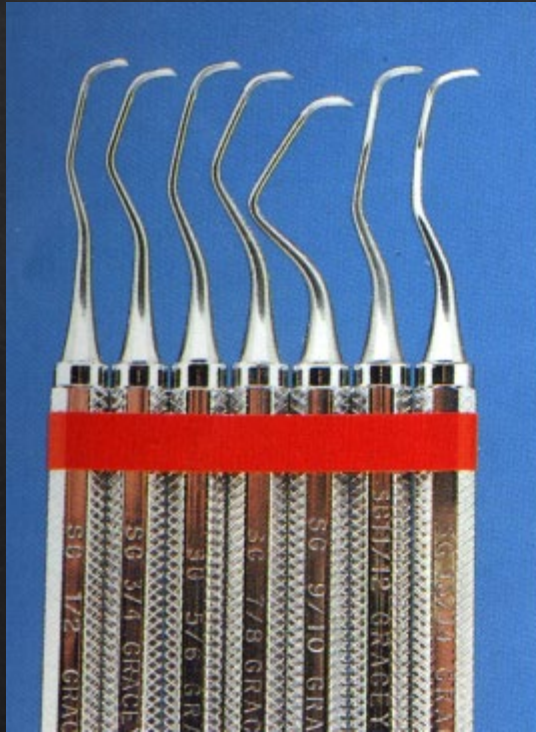
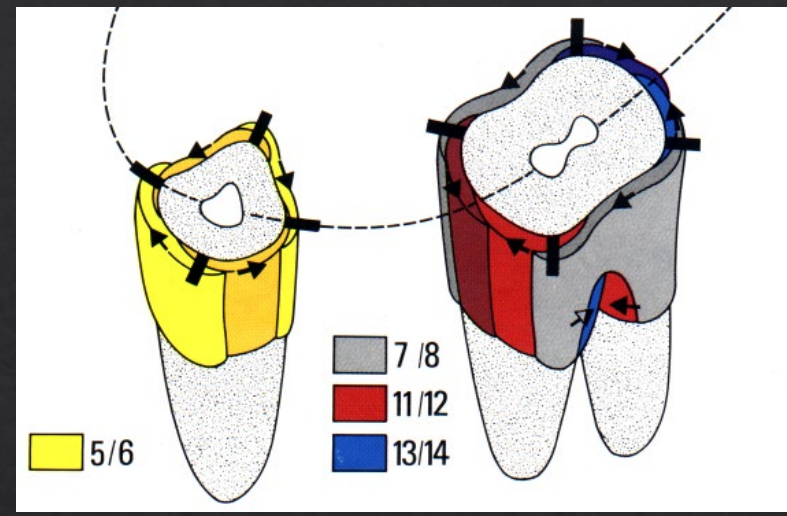




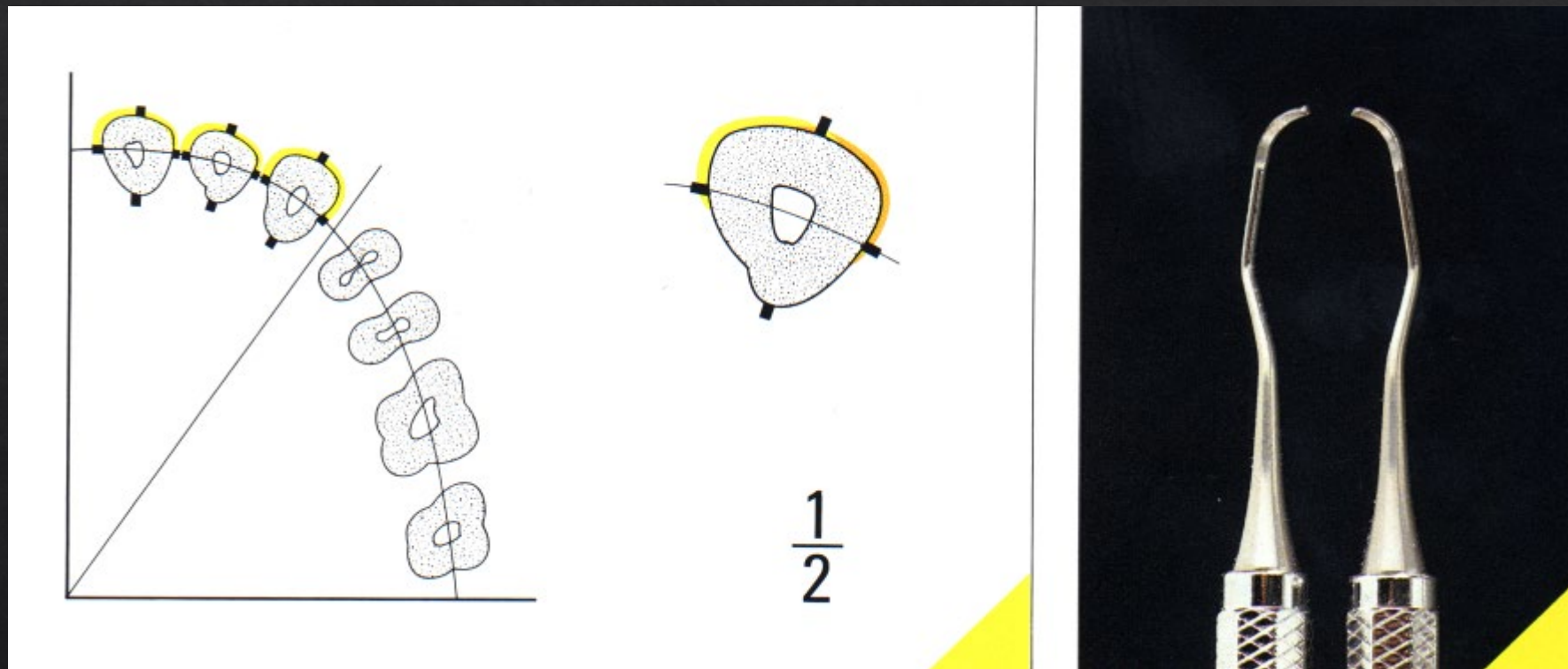
(terminal neck parallel  
with the axis of the  
teeth!!!)



# Gracey Currettes

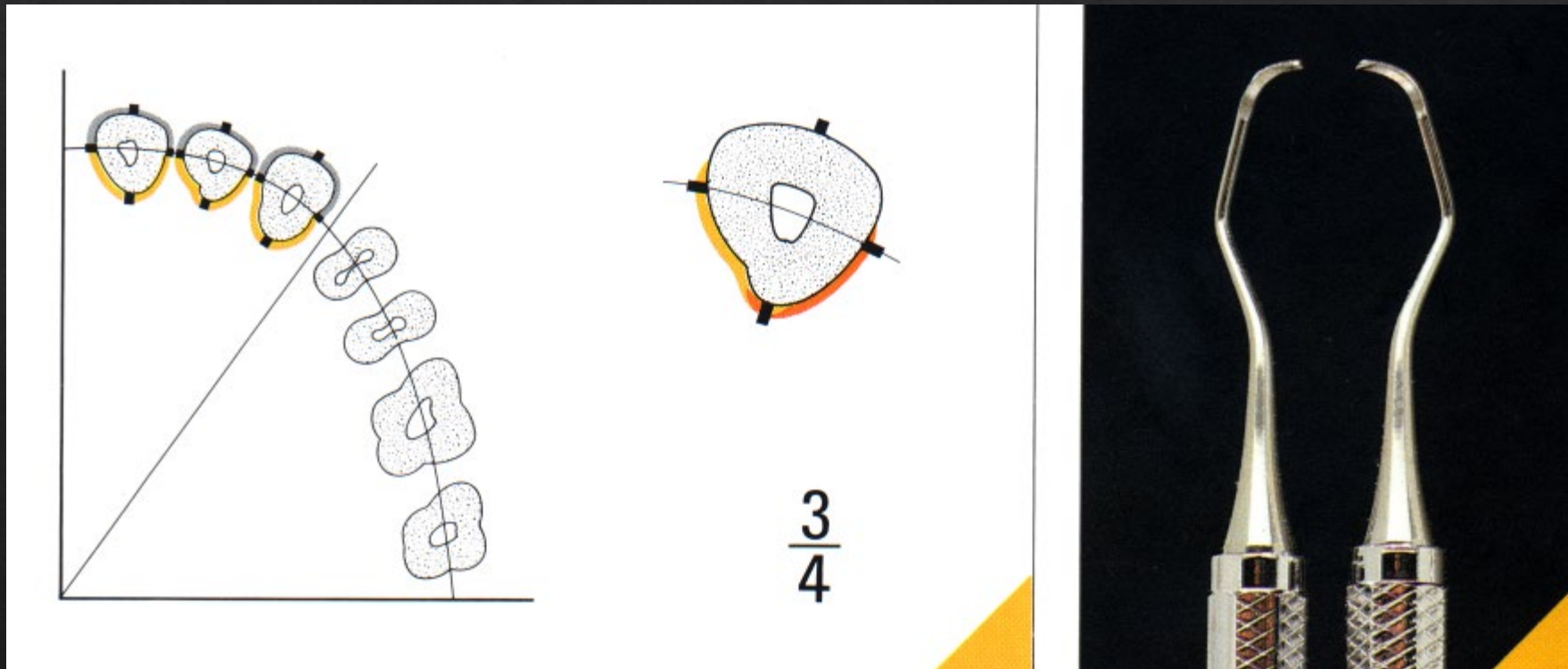


# Gracey 1-2

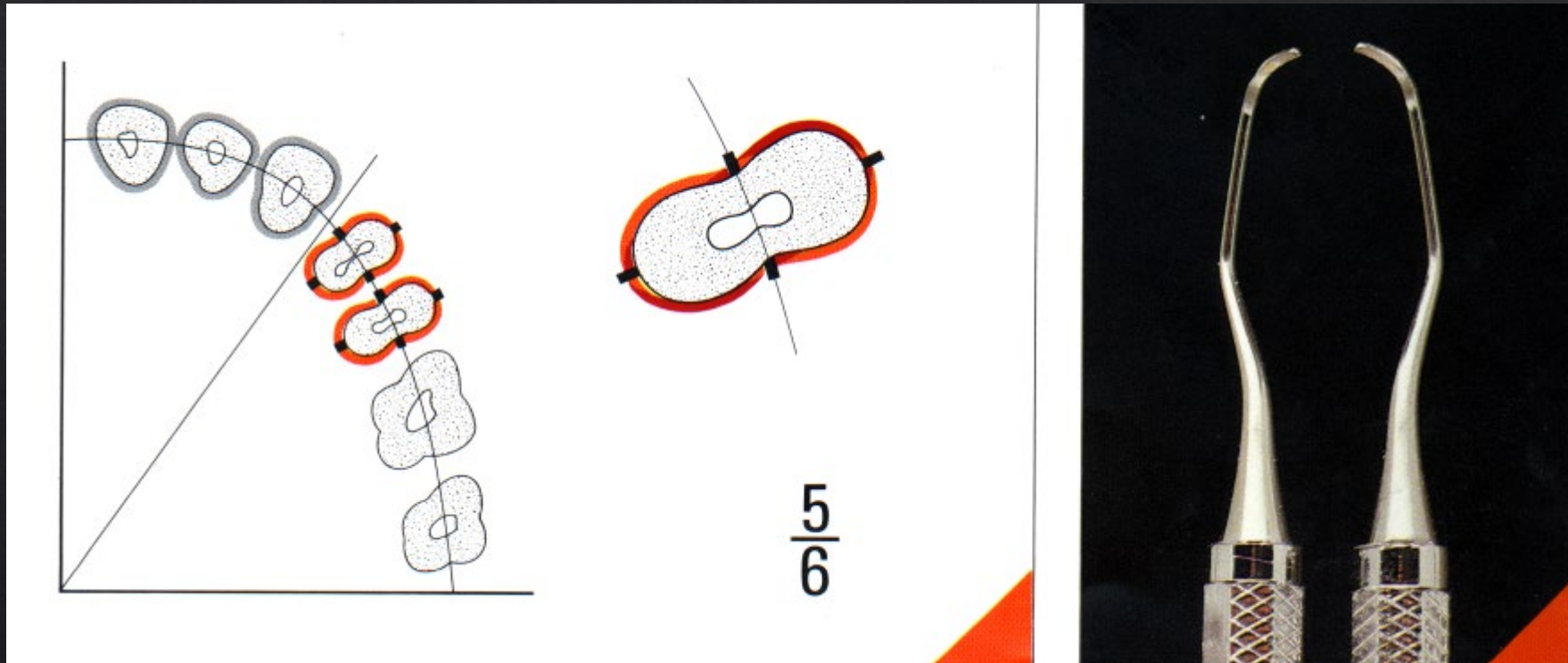




# Gracey 3-4

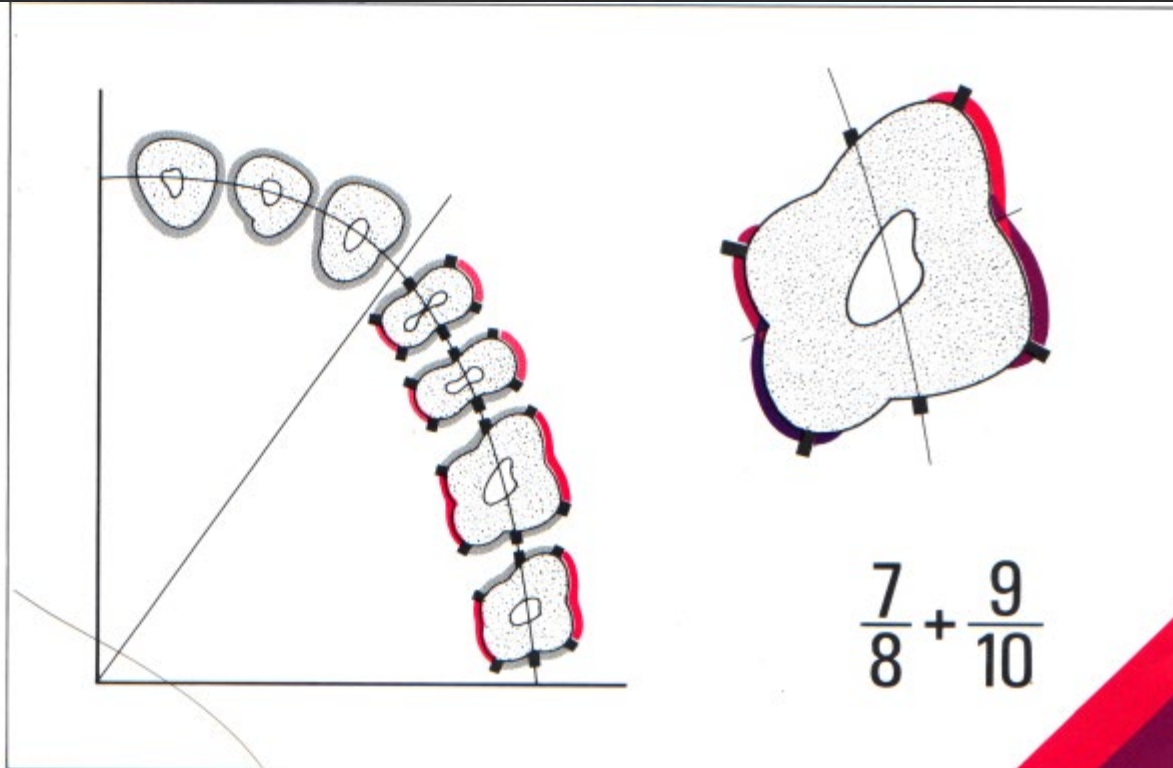
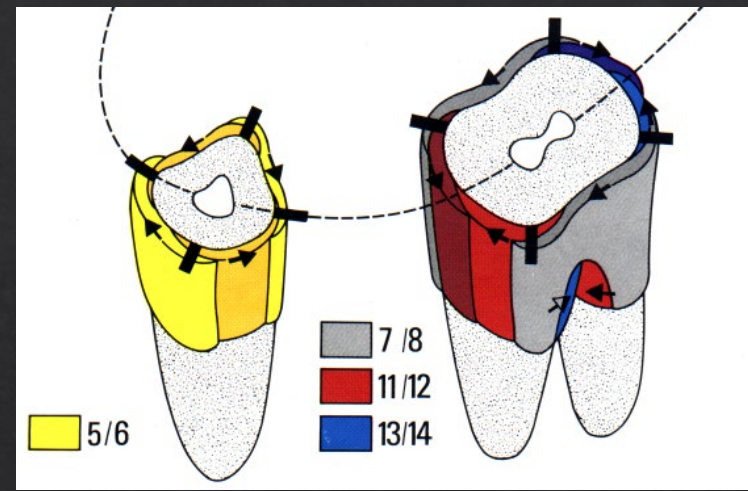


# Gracey 5-6

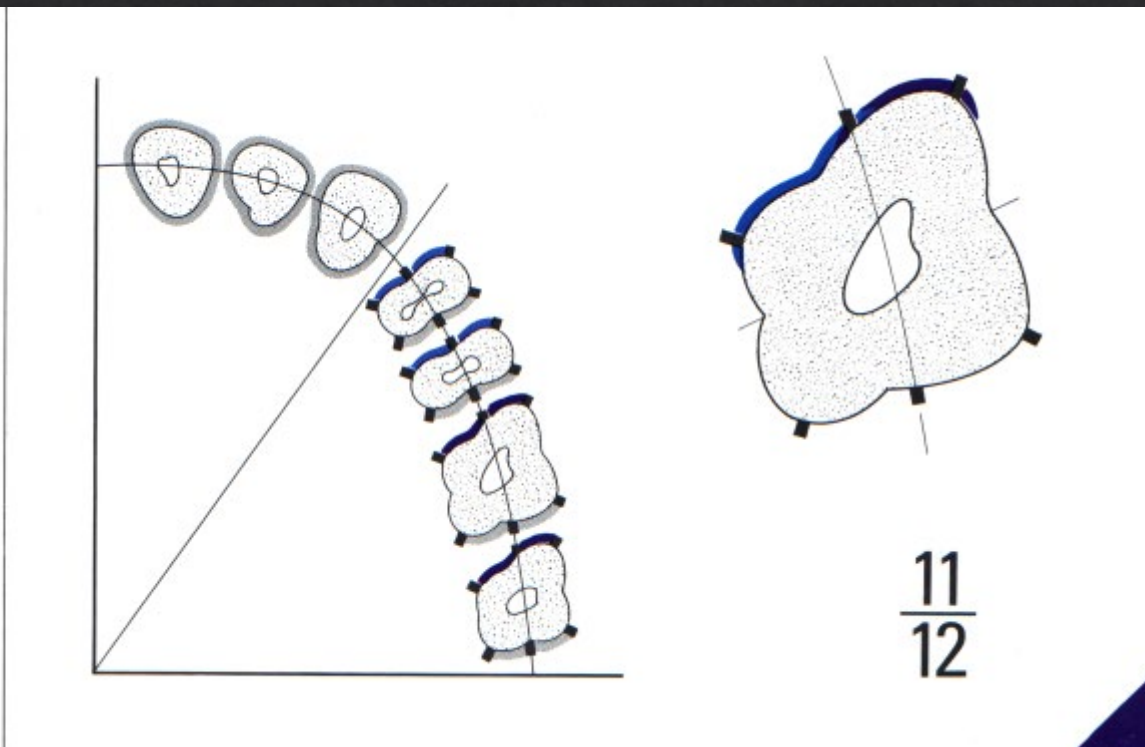
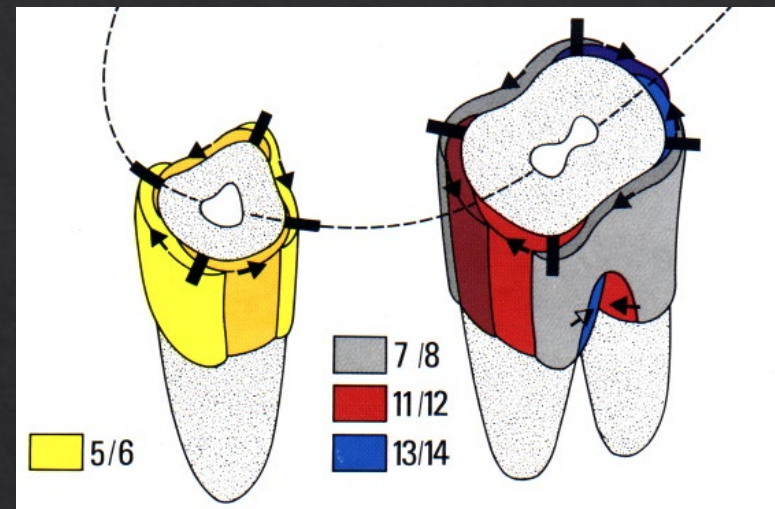




# Gracey 7-8 9-10

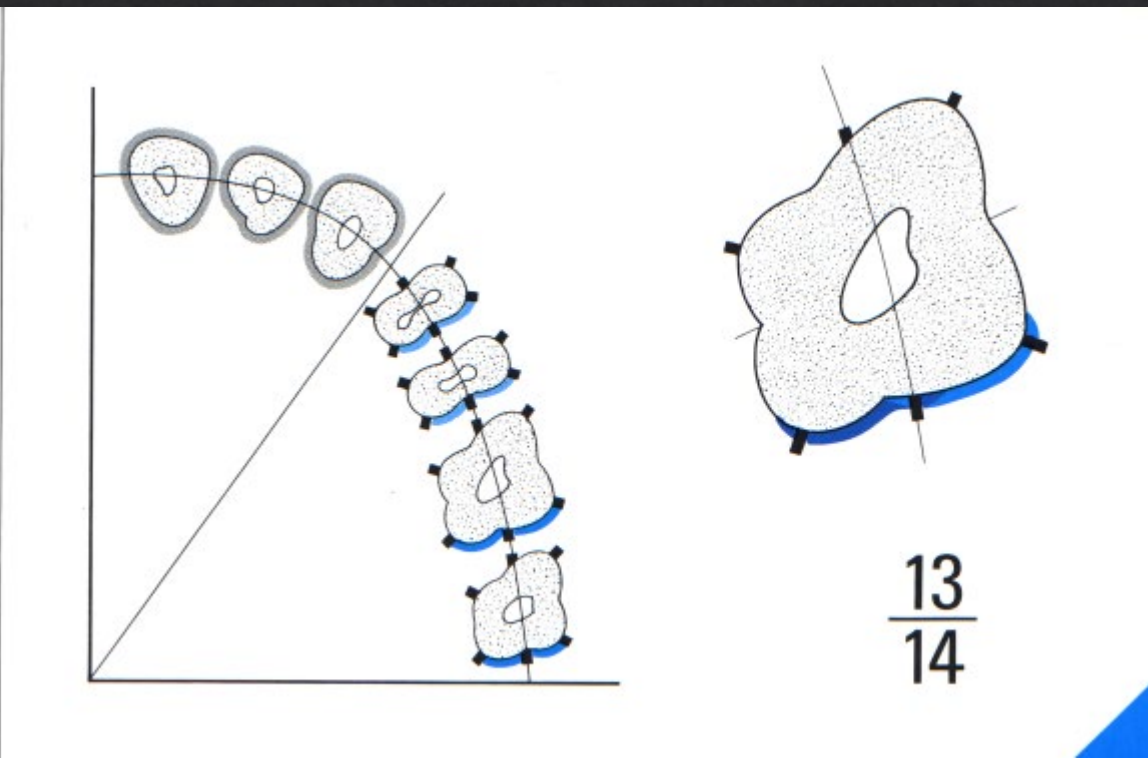
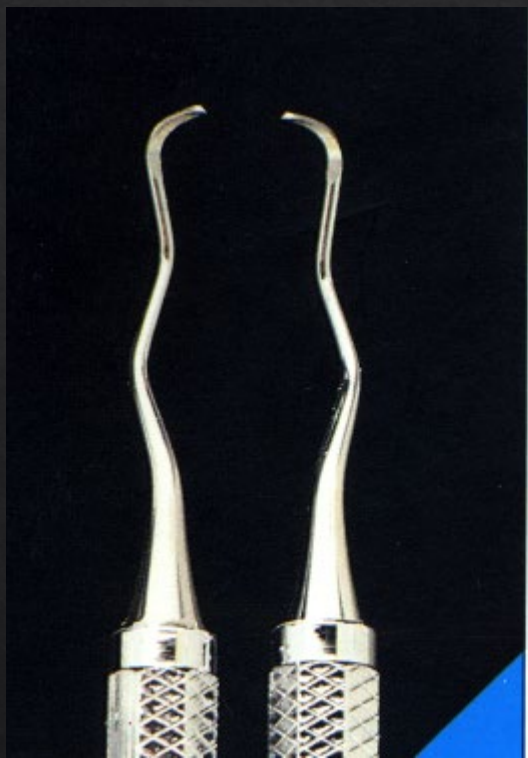
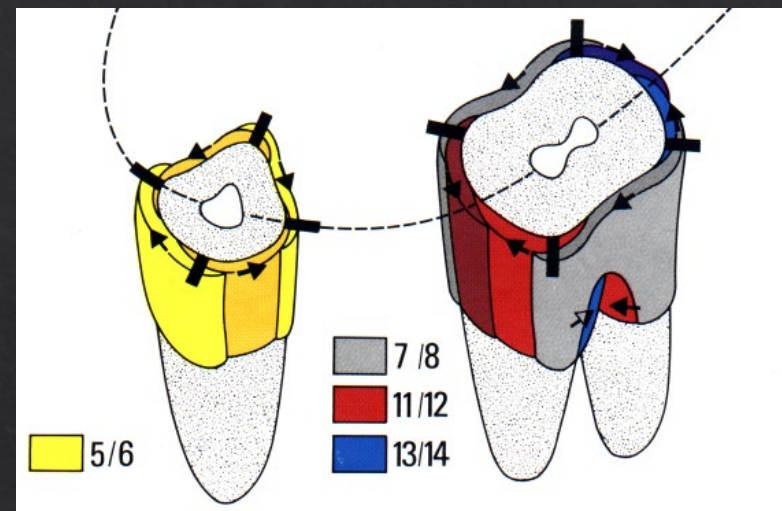


# Gracey 11-12

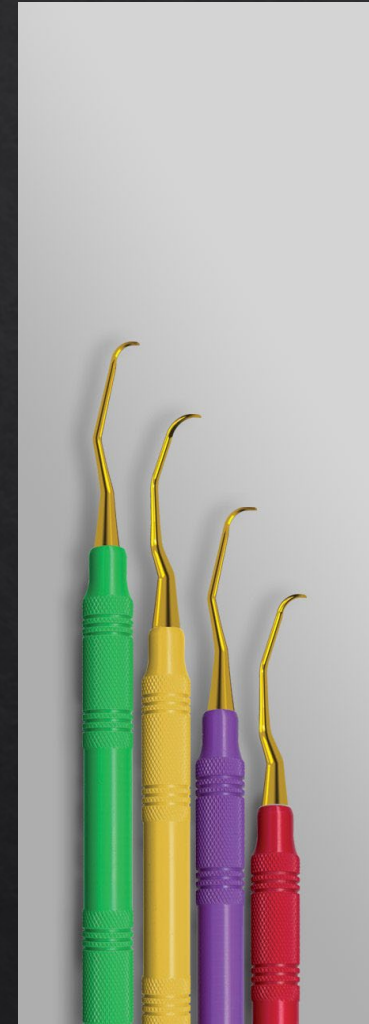
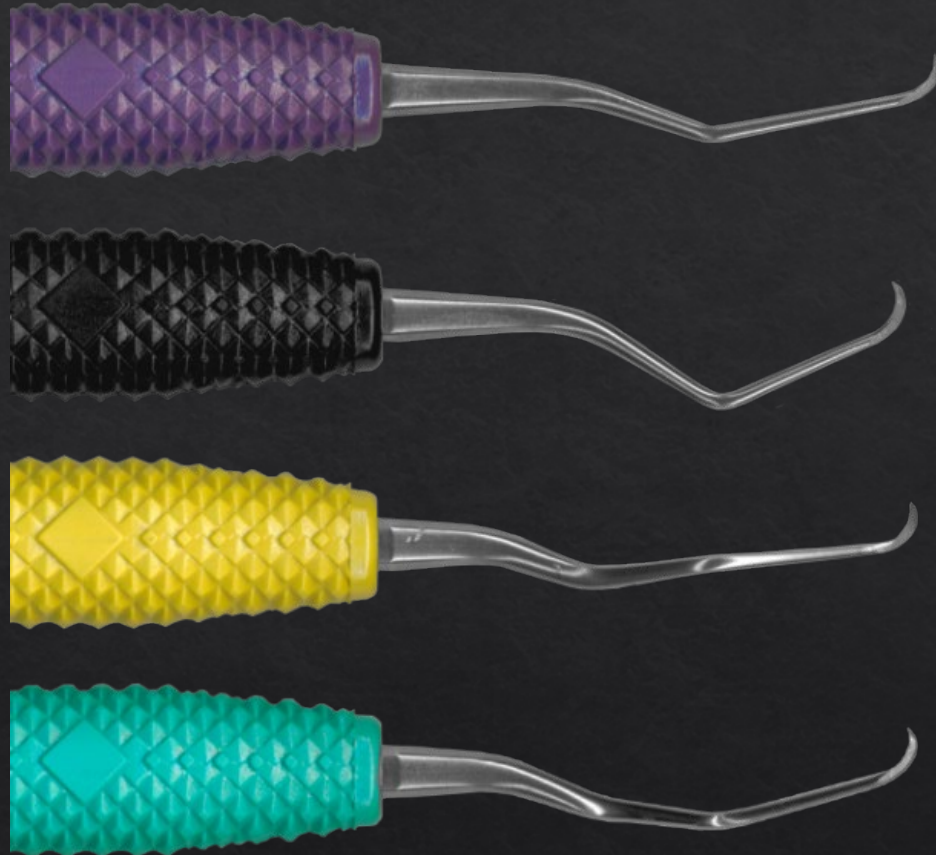




# Gracey 13-14



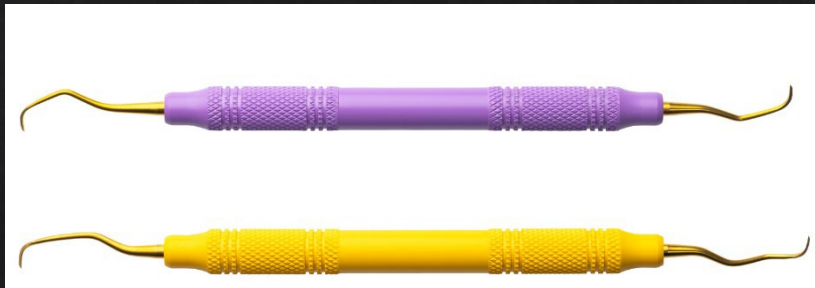
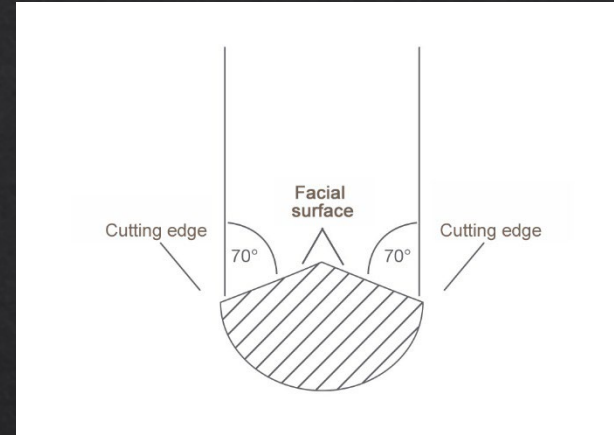
REDUCED GRACEY TRAY -  
daily praxis





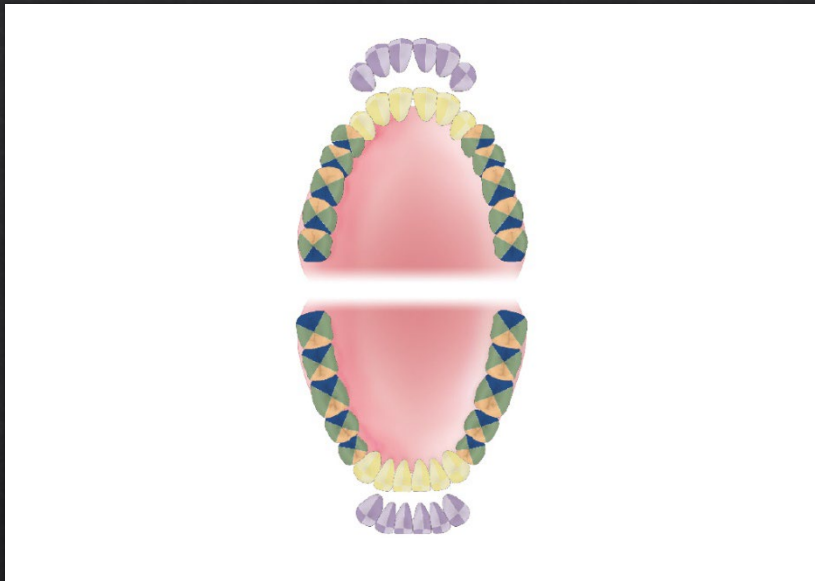
# Double gracey

- ◆ The Double Gracey™ has a rounded back and two cutting edges – combining two instruments in one. The cutting edge of the Double Gracey™ is raised to form gently sloping edges at an angle of approximately  $110^\circ$  measured from the lower shank.
- ◆ The angles of the facial surface and cutting edge allow the user to use the Double Gracey™ in the same way as conventional Gracey curettes with the working end parallel to the tooth axis.

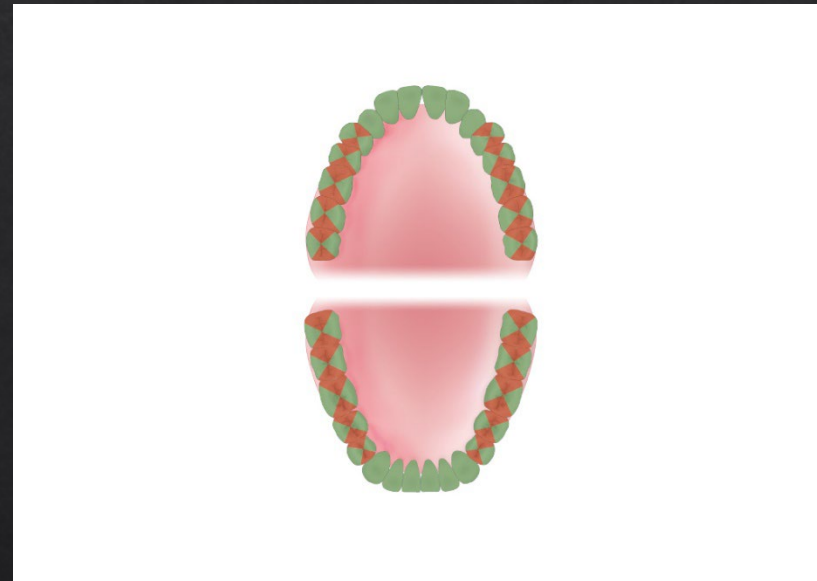


The advantage of using American Eagle Double Gracey™ is the ease of adjustment to mesial and distal as well as buccal and lingual surfaces, without changing or rotating the instrument.

# Double gracey



Usually, you need **4 standard Gracey curettes** for a complete treatment.

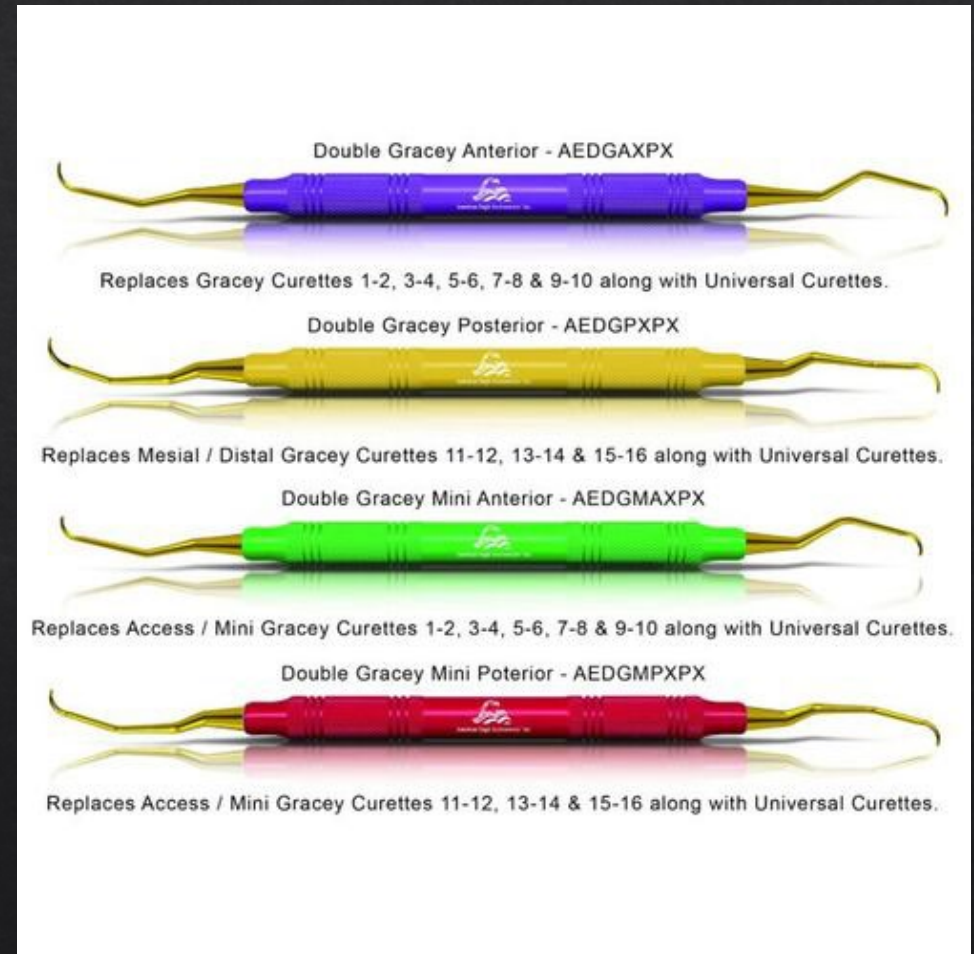


**Two instruments** replace a full set of standard Gracey curettes.

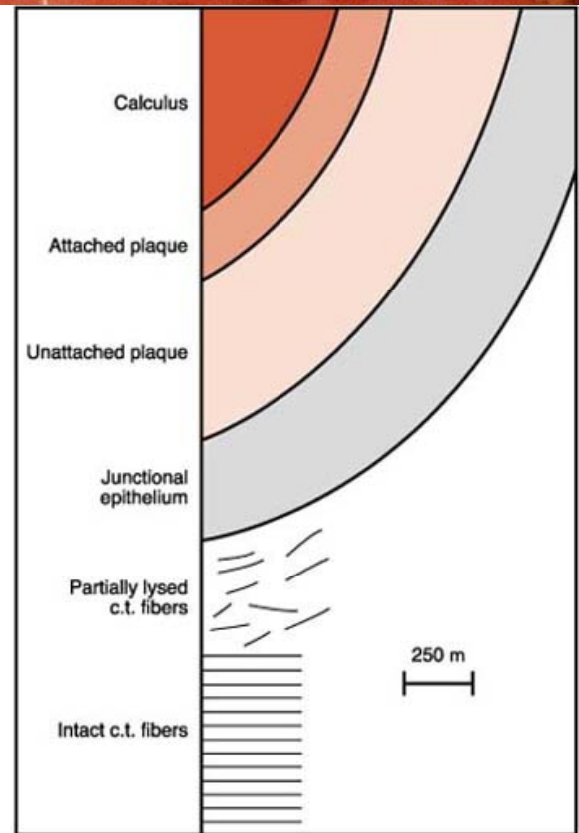
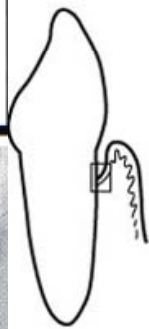
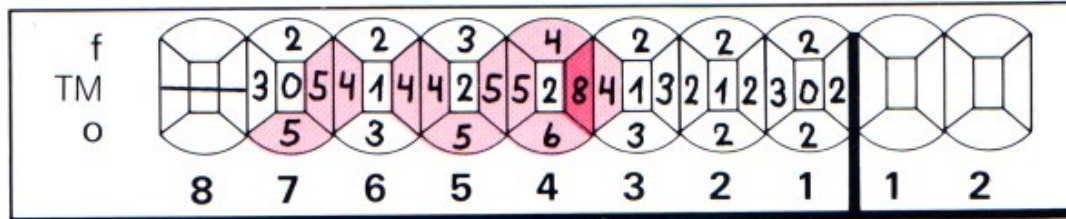
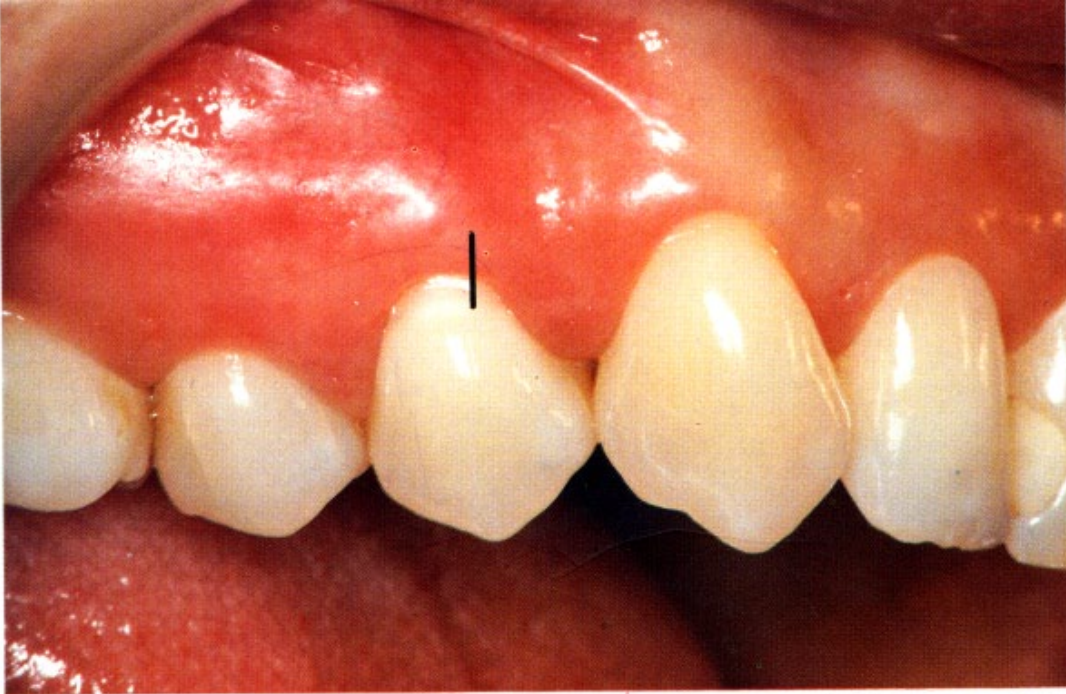


# Double gracey

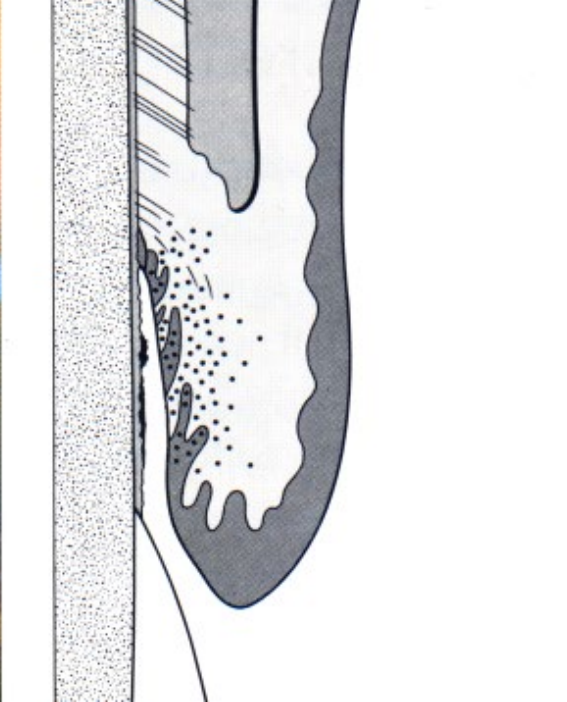
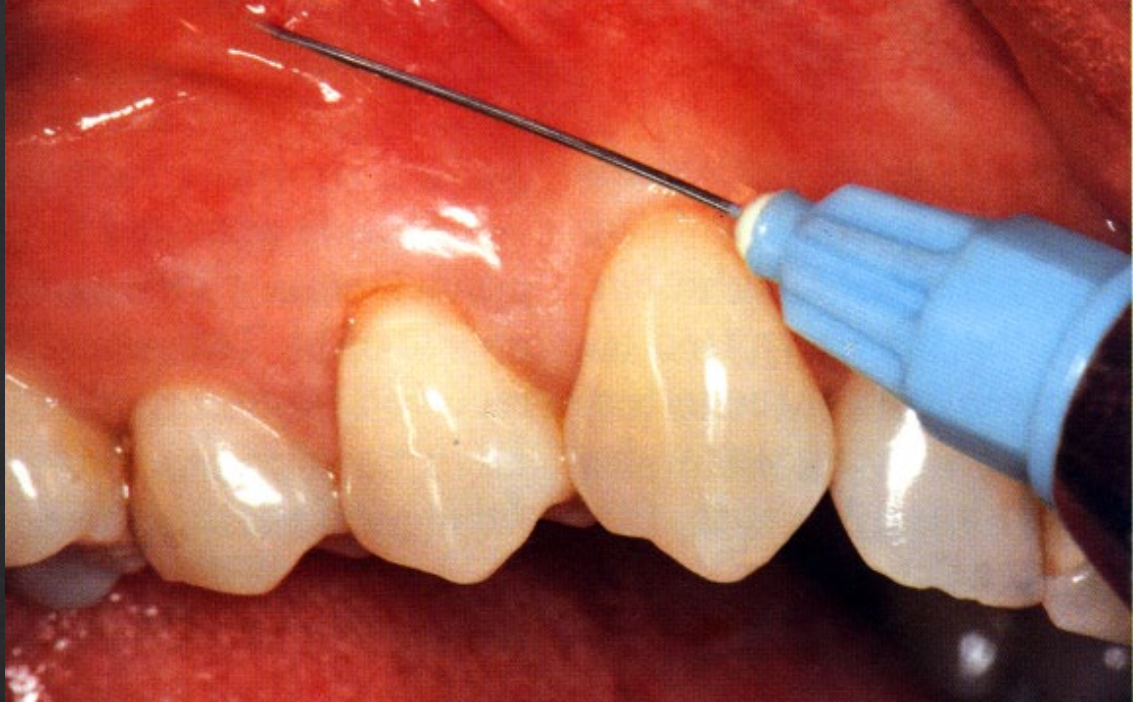
- ◆ The Mini versions of the dental cures provide easier access to deeper pockets, narrower interdental spaces and furcations. Thanks to the XP Technology® from American Eagle Instruments, all Double Graceys are maintenance-free (no sharpening necessary).
- ◆ Production of the Double Gracey™ instruments was only made possible by the development of the innovative XP Technology®.
- ◆ The specially manufactured working ends of the Double Gracey™ would quickly lose their original shape and effectiveness with regular sharpening. The special design of the cutting edges must be maintained throughout the entire useful life of the instrument.



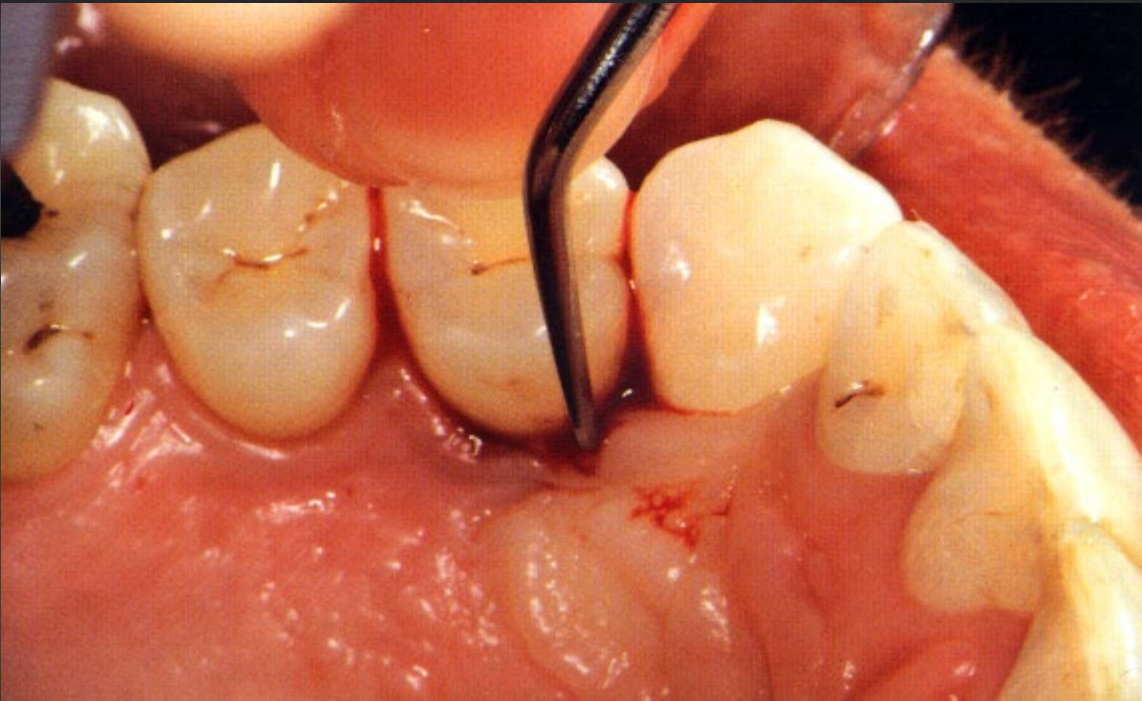
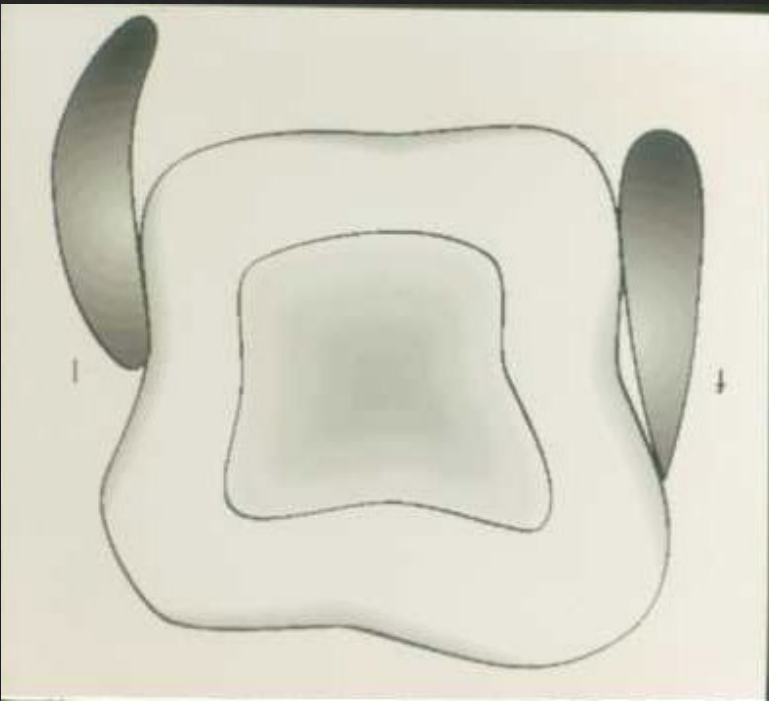
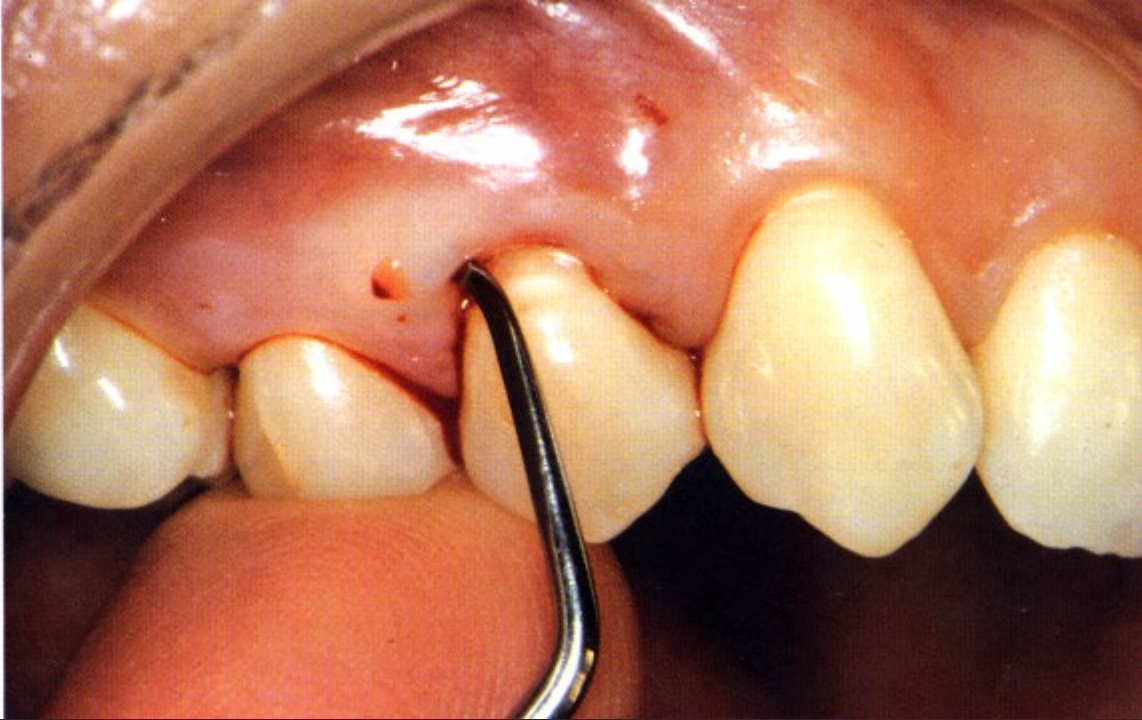
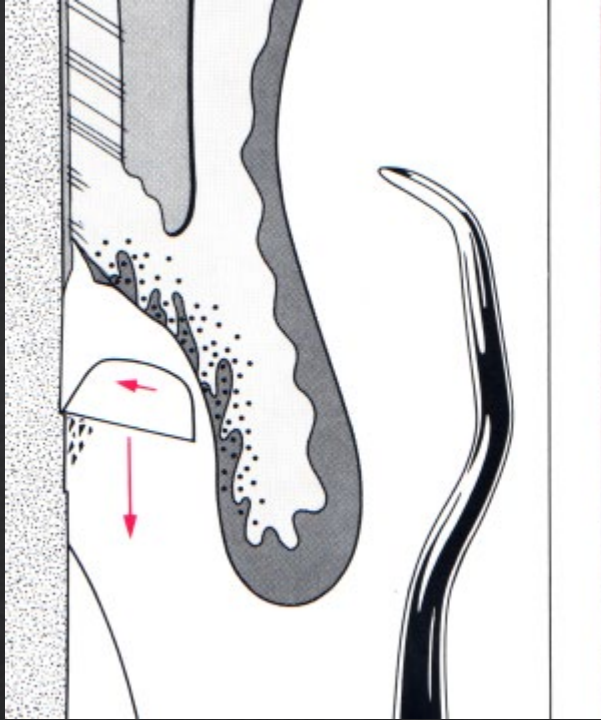










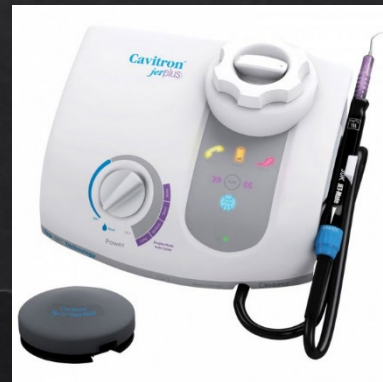




# Mechanized instruments compared with manual instruments

## Advantages

- Increased efficiency (**time!**)
- Multiple surfaces of tip are capable of removing deposits
- **No need to sharpen**
- Less chance for repetitive stress injuries
- Handpieces size large
- Reduced lateral pressure
- **Less tissue distention**
- Water
- Lavage
- irrigation



## Disadvantages

- More precautions and limitations
- Patient comfort (Water spraying)
- Aerosol production
- Temporary hearing shifts
- Noise (ear plug, noise protection)
- Less tactile sensation
- Reduced visibility
- **Over-treatment could lead to increased loss of substance**

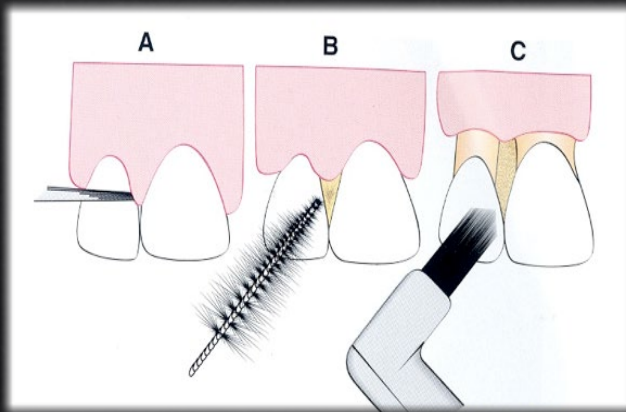


HOW DO WE INSTRUATE OUR PATIENTS?



# First instruction and motivation

- ◇ 1st appointment
- ◇ Modell
- ◇ Clear and understandable (50-50%)
- ◇ Patient's trust



# Make a biofilm visible!!

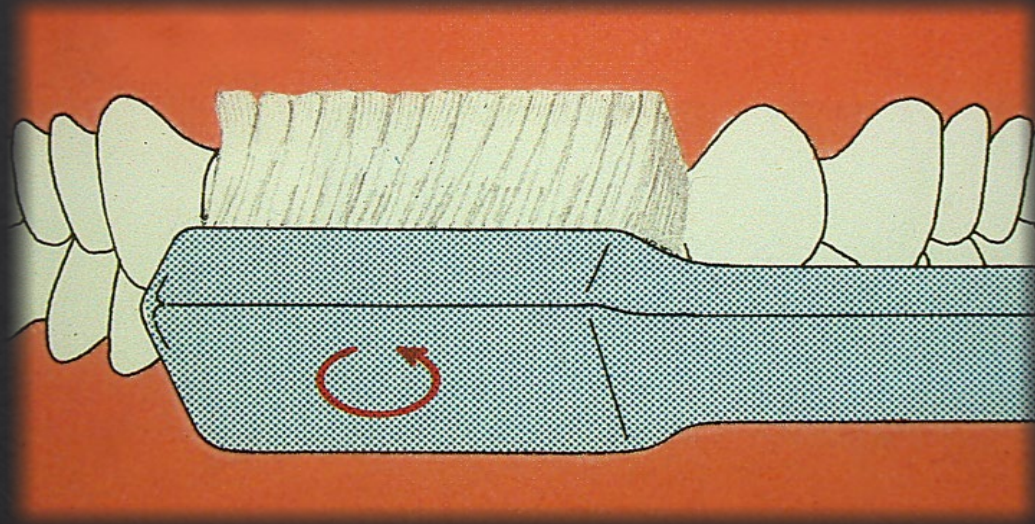


- When biofilm is made visible, it can be removed much faster and more precisely
- Disclosed biofilm on teeth motivates the patient to improve home prevention (home care)
- The disclosed biofilm guides the practitioner through the treatment
- Targeted biofilm removal leads to significantly better results



# Individually Trained Oral Prophylaxis (iTOP)

- Easy to learn
- Easy to maintain
  
- Not specific to any instrument
- Specific for the patient's mouth



## Modified BASS

The ideal brushing technique is the one that allows for complete plaque removal in the least possible time, without causing any damage to tissues (Hansen & Gjeremo 1971)

**Modified Bass technique:**  
cleaning the tooth tissue  
adjacent to the gingival tissue,  
the gingival margins and the  
sulcus





AND WHAT CAN WE ACHIEVE W CAUSE  
RELATED THERAPY?

## Initial therapy effects

- ◇ In perio patients, mechanical nonsurgical therapy **reduces inflammation, pocket depth, and increases clinical attachment level**
- ◇ The magnitude of pocket depth reduction correlates with greater pocket depth before the treatment
- ◇ Nonsurgical mechanical debridement may cause loss of attachment in shallow pockets ( **$\leq 3$  mm**)