Clinical Periodontology

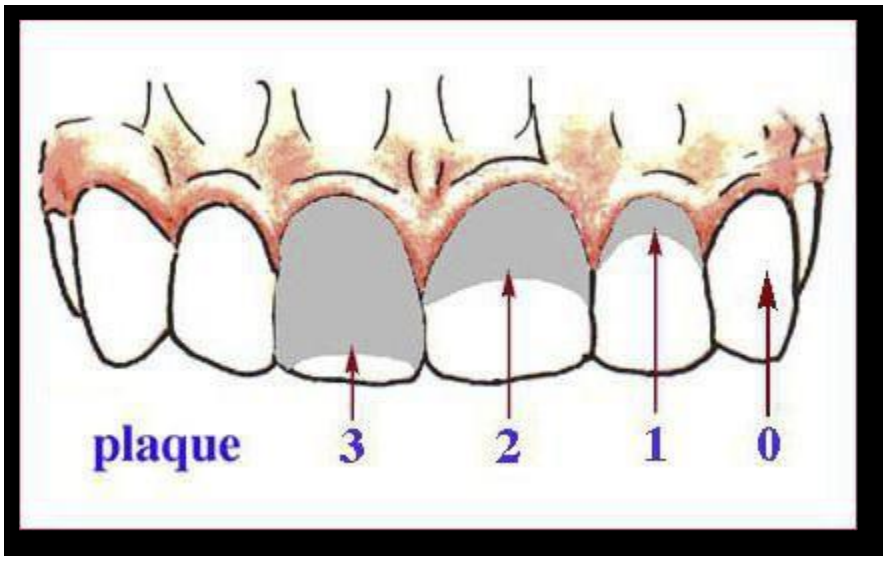
Fifth grade

Clinical periodontal examination

1-Plaque Index (PLI):

The assessment of dental plaque was made according to the PLI by ***(Sillness and Loe, 1964)***.The criteria for PLI include:

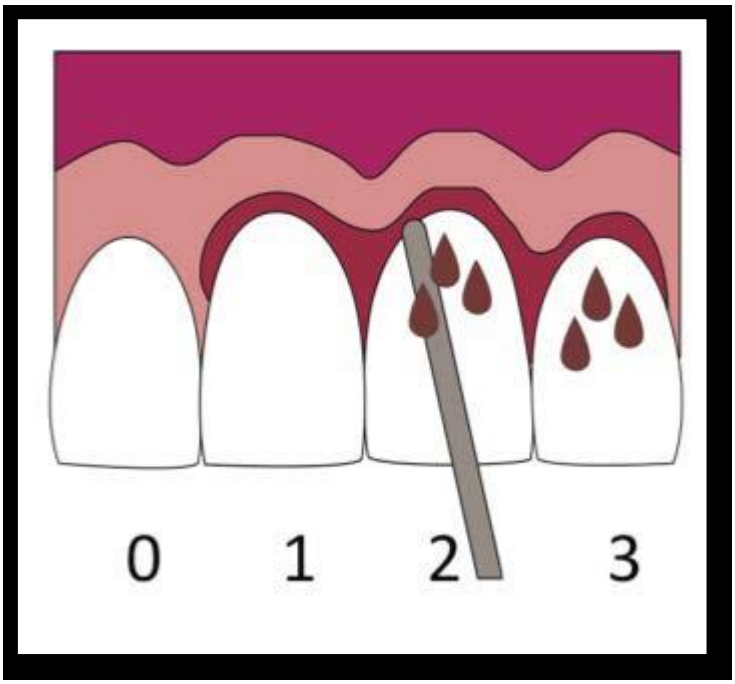
Score	***Criteria***
0	No plaque
1	A film of plaque adhering to the free gingival margin and adjacent area of the tooth surface, **which can not be seen with the naked eye. But only by using disclosing solution or by using probe.**
2	Moderate accumulation of deposits within the gingival pocket, on the gingival margin and/ or adjacent tooth surface, which can **be seen by the naked eye.**
3	Abundance of soft matter within the gingival pocket and/or on the gingival margin and adjacent tooth surface.



2-Gingival Index (GI):

The gingival condition was assessed by using the criteria of GI by ***(Löe, 1967).***The criteria for GI include:

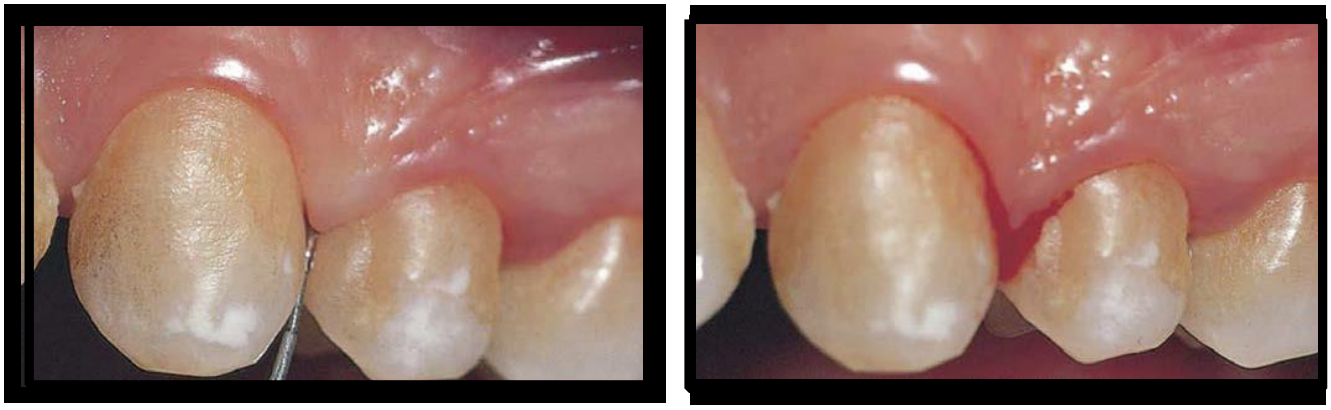
Score	***Criteria***
0	Normal gingiva.
1	Mild inflammation, slight change in color, slight edema, **no bleeding on probing.**
2	Moderate inflammation, moderate glazing, redness, **bleeding on probing.**
3	Severe inflammation, marked redness and edema, ulceration, tendency to **spontaneous bleeding.**



3-Bleeding on probing

Bleeding on probing is often an early sign of gingivitis and continues to be seen as the disease progresses to periodontitis. It is considered as a sign of active tissue destruction. If periodontal treatment is successful, bleeding on probing will cease.

A periodontal probe inserted to the bottom of the gingival pocket and is moved gently along the tooth surface. Sometimes bleeding appears immediately after removal of the probe; other times it may be delayed for a few seconds. Therefore the clinician should recheck for bleeding 30 to 60 seconds after probing and give a positive score or (1), and a negative score or (0) for the non-bleeding site.



A B

Bleeding on probing. A, Mild edematous gingivitis; a probe has been introduced to the bottom of the gingival sulcus. B, Bleeding appears after a few seconds.

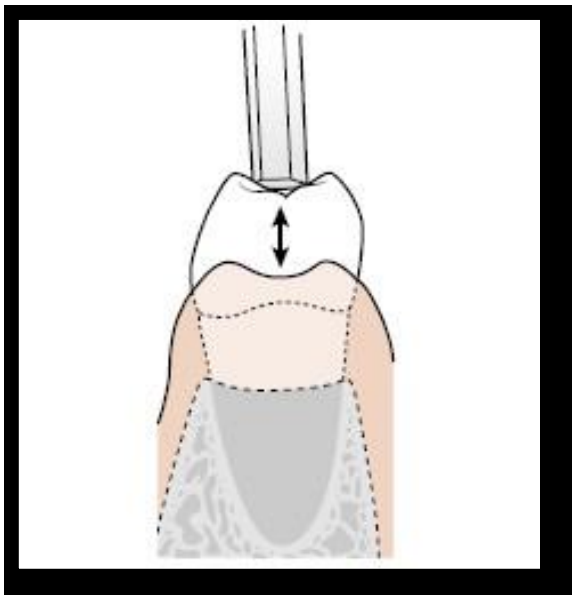
4-Classification of tooth mobility (T.M.):

T.M. is graded according to the following criteria:

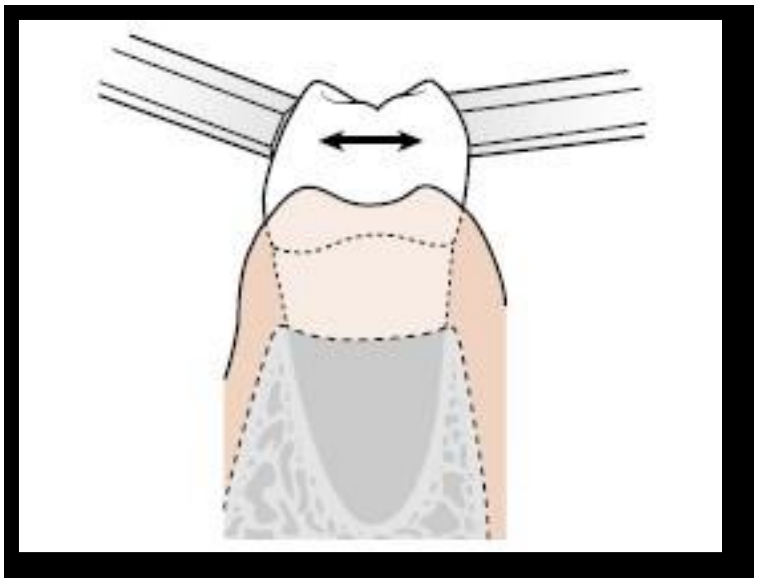
Grade I: is the mobility of the crown **0.2-1 mm in horizontal direction**.

Grade II: mobility of the crown of the tooth **exceeding 1mm in horizontal direction.**

Grade III: mobility of the crown of the tooth in **vertical direction** as well & the tooth becomes even depressed in its socket.



Assessing Vertical Tooth Mobility.
Using the end of an instrument handle to alternating
Exert pressure against the occlusal surface or incisal edge of the tooth.



Assessing Horizontal Tooth Mobility.
the ends of two handles, apply
pressure, first from the facial and then from the lingual aspects of the tooth.

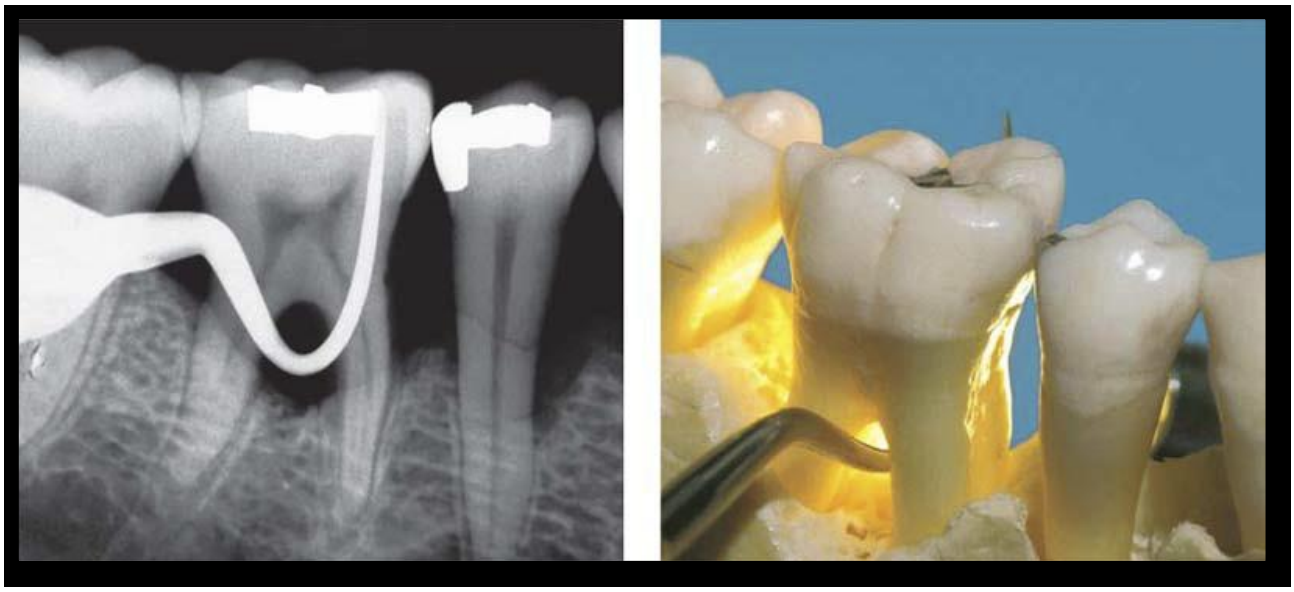
5-Classification of furcation involvement:

Furcation involvement may be classified into 3 degrees depending on the extention of the destruction within inter-radicular area. This classification was suggested by Hamp *et al*. (1975) which include the following criteria of the involved furcation:

- Class I (initial): denotes horizontal loss of periodontal tissue (PD) support **not exceeding 1/3 of the width of the tooth**.
- Class II (partial): denotes horizontal loss of PD tissue support **exceeding 1/3 of the width of the tooth but not encompassing the total width of the furcation area.**
- Class III (total) denotes horizontal **"through and through"** destruction of the PD tissues in the furcation area.
- Class IV when the **gingiva recedes apically** so that the furcation opening is seen clinically.

Class I (initial).

Class II (partial)

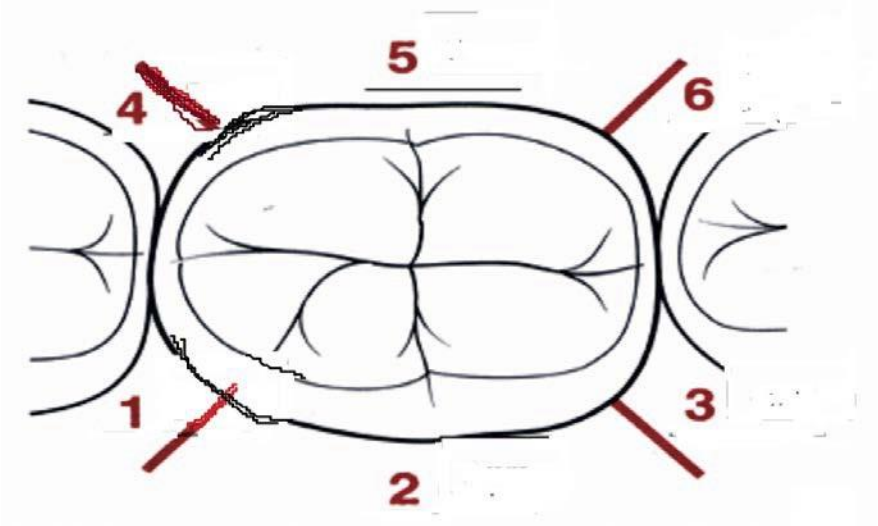


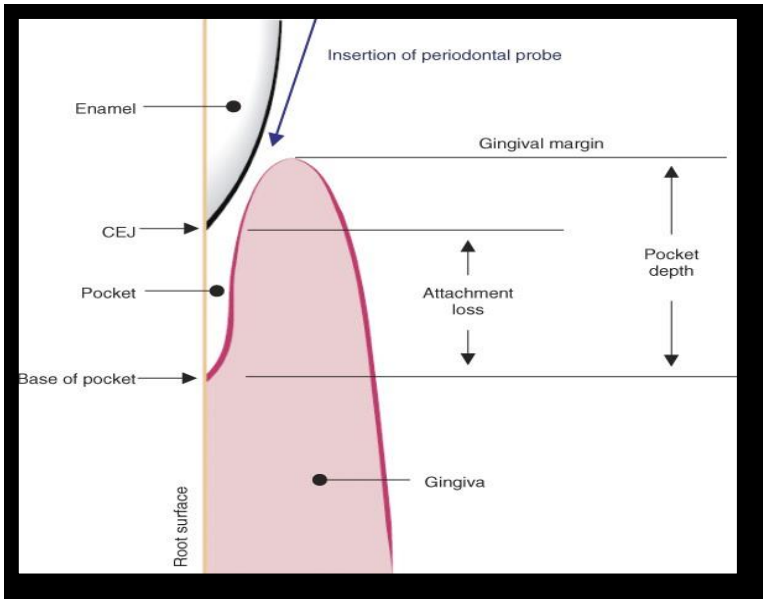
Class III (total)

Class IV

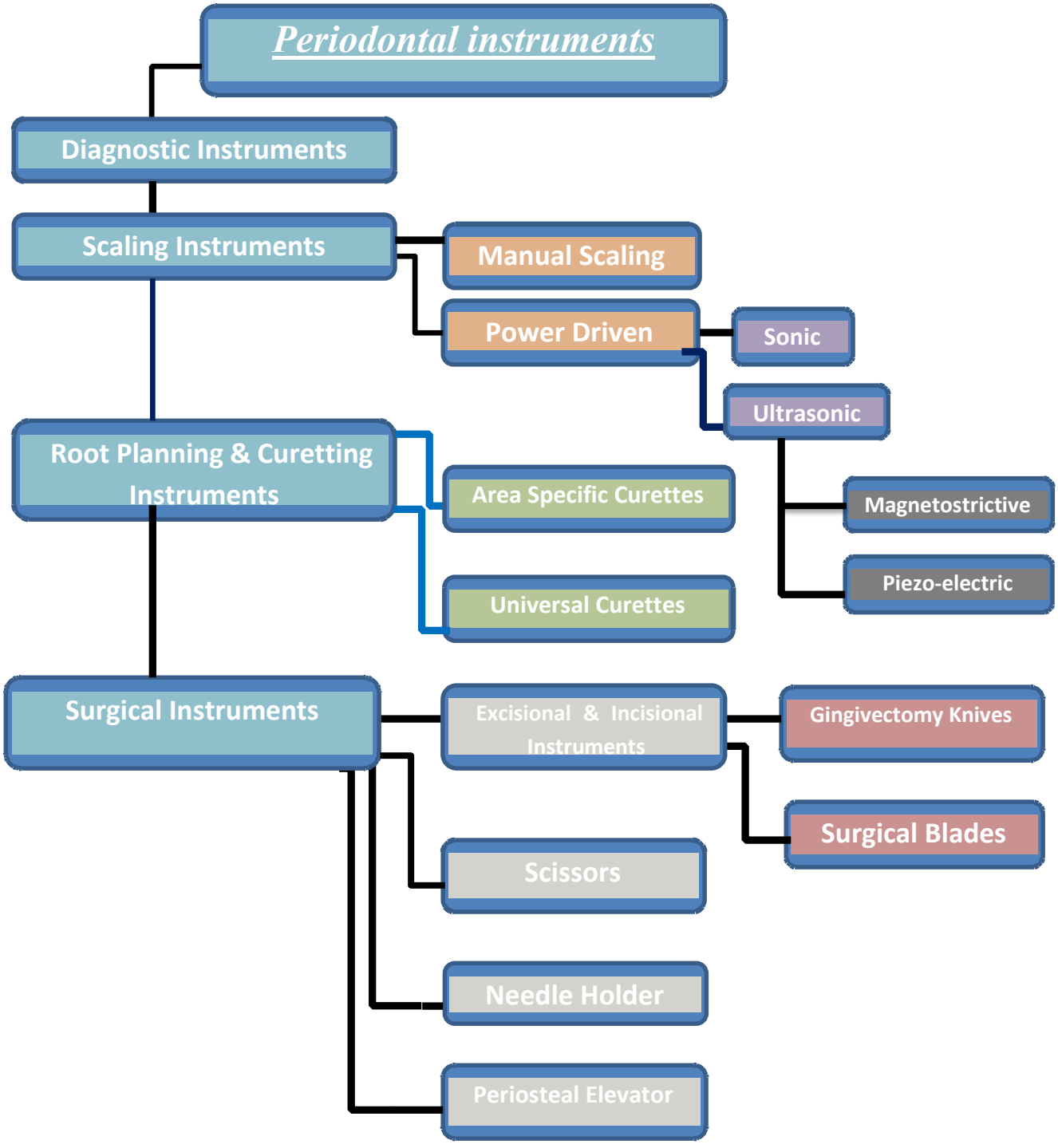
6-Probing Pocket Depth measurement (PPD):

It is defined as the distance between the base of the pocket and the gingival margin**.** The sites of measurements were mid- buccal/labial, mid-palatal/lingual, mesio-buccal and disto-buccal line angles, mesio-lingual and disto-lingual line angles. The probe was entered to the pocket gently without force.





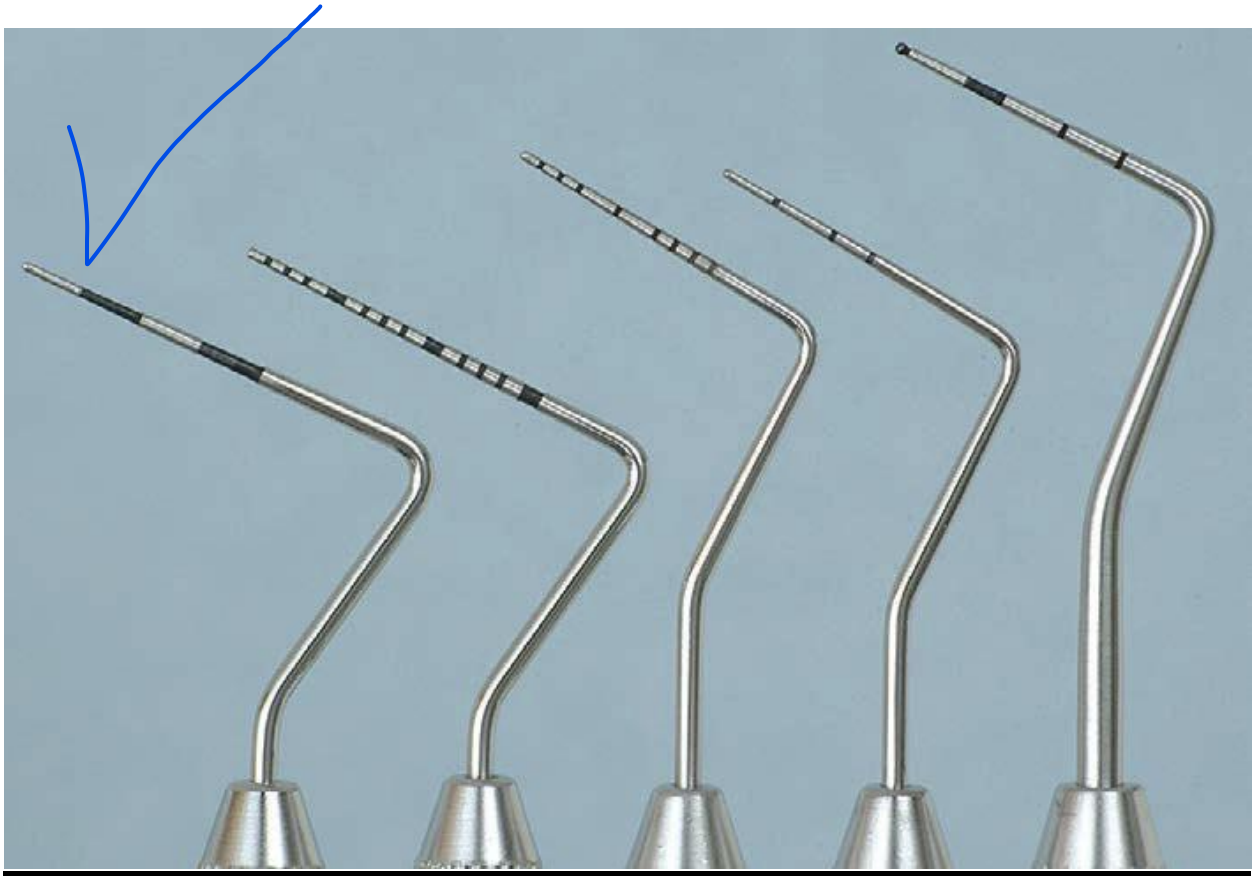
Probing pocket depth.


Periodontal instruments
Diagnostic Instruments
Scaling Instruments
Manual Scaling
Power Driven
Sonic
Ultrasonic
Magnetostrictive
Piezo-electric
Root Planning & Curetting Instruments
Area Specific Curettes
Universal Curettes
Surgical Instruments
Excisional & Incisional Instruments
Gingivectomy Knives
Surgical Blades
Scissors
Needle Holder
Periosteal Elevator

Periodontal instruments:

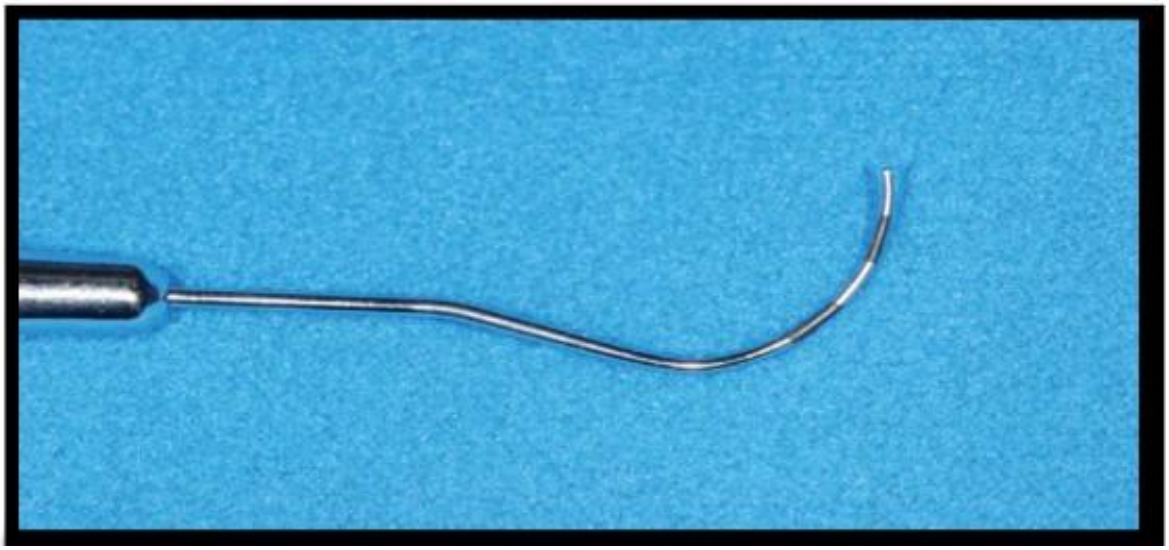
1- Periodontal probe:

is used to measure the depth of pockets and to determine their configuration. The typical probe is a tapered, rod like instrument calibrated in millimeters, with a blunt, rounded tip. When measuring a pocket, the probe is inserted with a firm, gentle pressure to the bottom of the pocket.

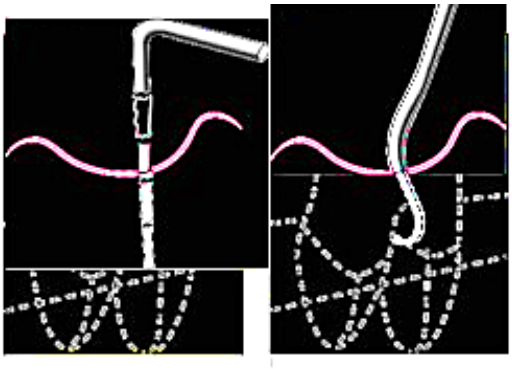


Types of periodontal probes. A, Marquis color-coded probe. Calibrations are in 3-mm sections. B, UNC-15 probe, a 15-mm long probe with millimeter markings at each millimeter and color coding at the fifth, tenth, and fifteenth millimeters. C, University of Michigan "O" probe, with Williams markings (at 1, 2, 3, 5, 7, 8, 9, and 10 mm). D, Michigan "O" probe with markings at 3, 6, and 8 mm. E, World Health Organization. (WHO) probe, which has a 0.5-mm ball at the tip and millimeter markings at 3.5, 8.5, and 11.5 mm and color coding from 3.5 to 5.5 mm.

2- Naber probe:



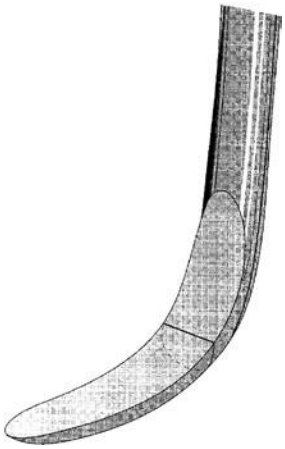
Naber probe: used to measure the furcation involvement.



Exploring with a periodontal probe (left) may not detect furcation involvement; specially designed instruments (Nabers probe) (right) can enter the furcation area.

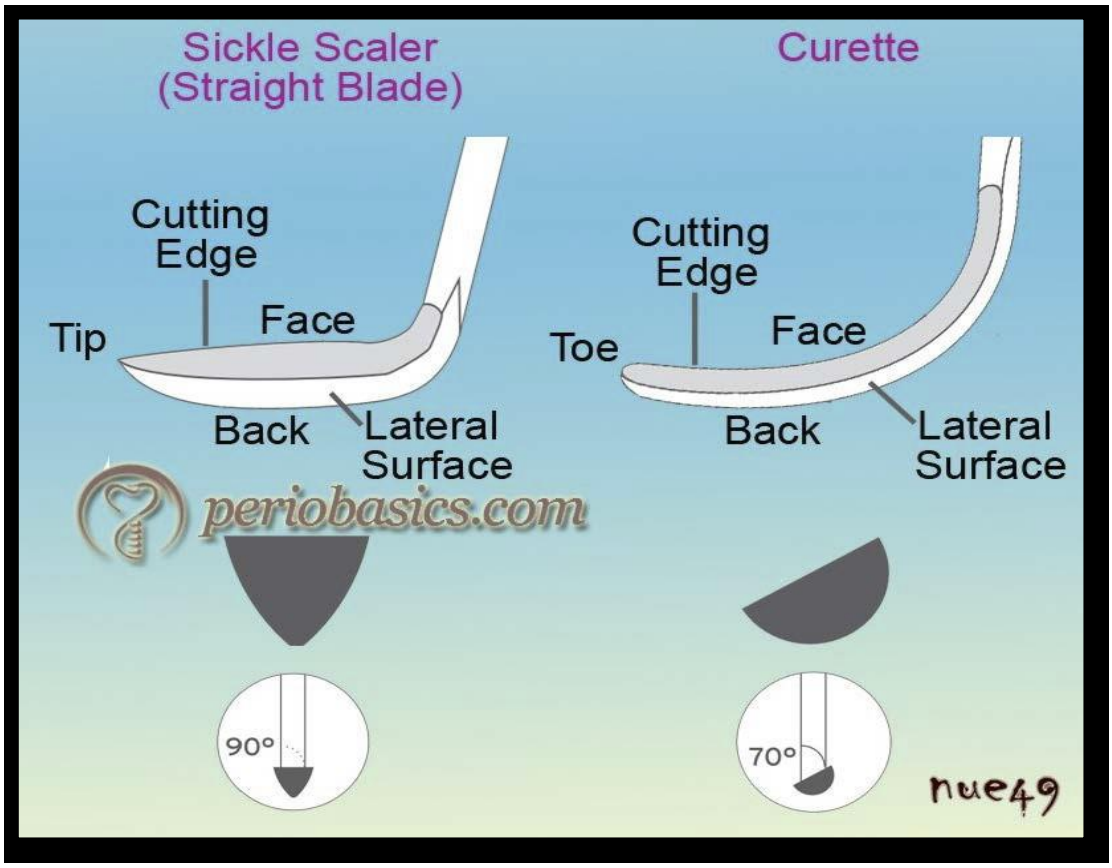
3-Curettes:

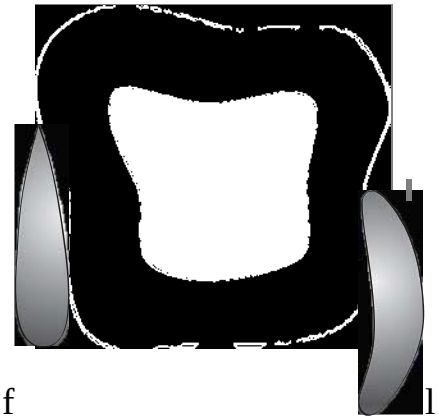
are fine instruments used for subgingival scaling, root planing, and removal of the soft tissue lining the pocket.



Basic characteristics of a curette: spoon-shaped blade and rounded tip.

The curette is finer than the sickle scalers and does not have any sharp points or corners other than the cutting edges of the blade. Therefore curettes can be adapted and provide good access to deep pockets, with minimal soft tissue trauma.

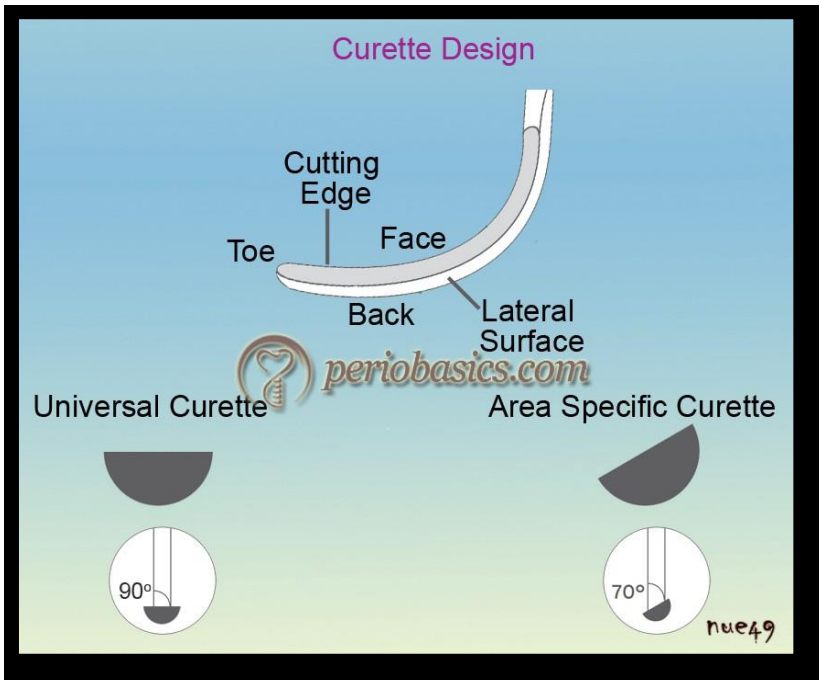




f l

Subgingival adaptation around the root is better with the curette than with the sickle; f, facial (sickle); l, lingual (curette). The curved blade and rounded toe of the curette allow the blade to adapt better to the root surface, unlike the straight design and pointed end of a sickle scaler, which can cause tissue laceration and trauma.

There are two basic types of curettes: universal and area specific.



Gracey Curettes Vs Universal Curettes

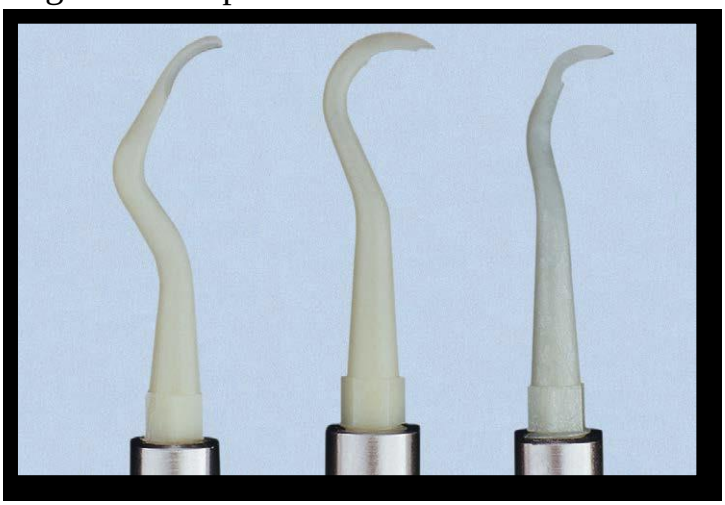
	gracey curettes	Universal curettes
Areas of use	Set of many curettes designed for specific areas and surfaces	One curettes designed for all areas and surfaces
Cutting edge		
uses	One cutting edge used: Work with outer edge only	Both cutting edge used: work with either outer or inner
curvature	Curved in two planes: blade curves up and to the side	Curved in one plane:curves up not to the side
Blade angle	Offset angle:face of blade beveled at 60 degree to shank	Blade not offset: face of blade beveled at 90 degree to shank

Double-ended Gracey curettes are paired in the following manner:
Gracey #1-2 and 3-4: Anterior teeth
Gracey #5-6: Anterior teeth and premolars
Gracey #7-8 and 9-10: Posterior teeth: facial and lingual
Gracey #11-12: Posterior teeth: mesial
Gracey #13-14: Posterior teeth: distal

***** Plastic and Titanium Instruments for Implants.***

It is important that plastic or titanium instruments be used to avoid scarring and permanent damage to the implants.

Plastic probe



3- Gingivectomy knives:

4-Blades:

5- Scalpel:

6-Curved scissor:

7-Needle holder:

Sonic and Ultrasonic Instrumentation

Mechanism of action of power scalers:

Various physical factors (frequency, stroke, and water flow) play a role in the mechanism of action of power scalers. The physiologic effects of water may play a contributing role in the efficacy of power instruments. These are acoustic streaming (unidirectional fluid flow caused by ultrasound waves), acoustic turbulence (created when the movement of the tip causes the coolant to accelerate, producing an intensified swirling effect), and cavitation (formation of bubbles in water caused by the high turbulence. The bubbles implode and produce shock waves in the liquid, creating further shock waves throughout the water). The combination of acoustic streaming, acoustic turbulence, and cavitation has been shown to disrupt microflora.

TYPES OF POWER INSTRUMENTS:

1-Sonic:

Units work at a frequency of (2000 to 6500) cycles per second. Sonic scaler tips are large in diameter and universal in design.

2- Ultrasonic devices:

Work in a frequency range of (18,000 to 50,000) cycles per second.

Magnetostrictive ultrasonic devices:

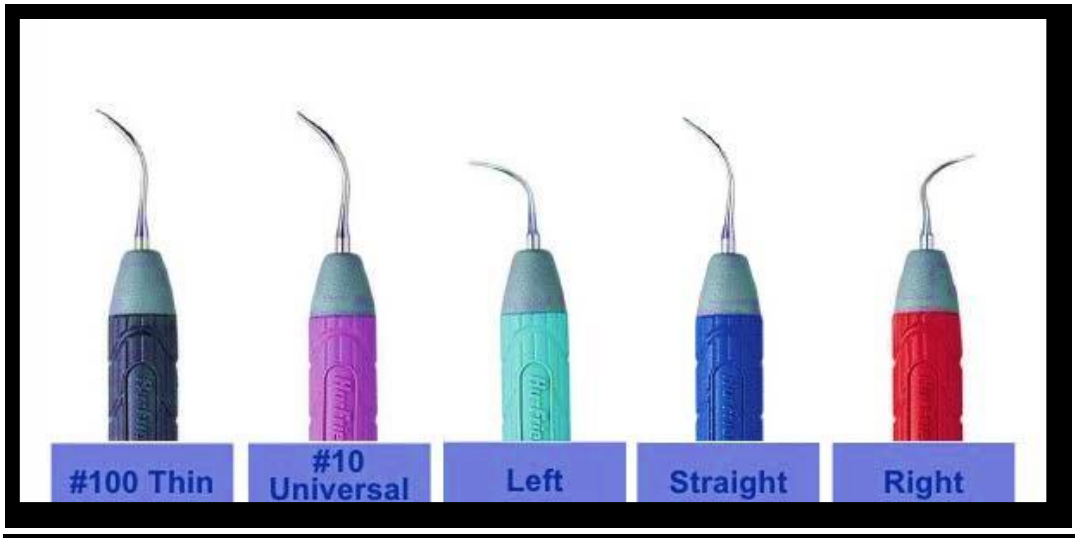
Tips move in an elliptical or orbital stroke pattern. This allows the tip four active working surfaces.

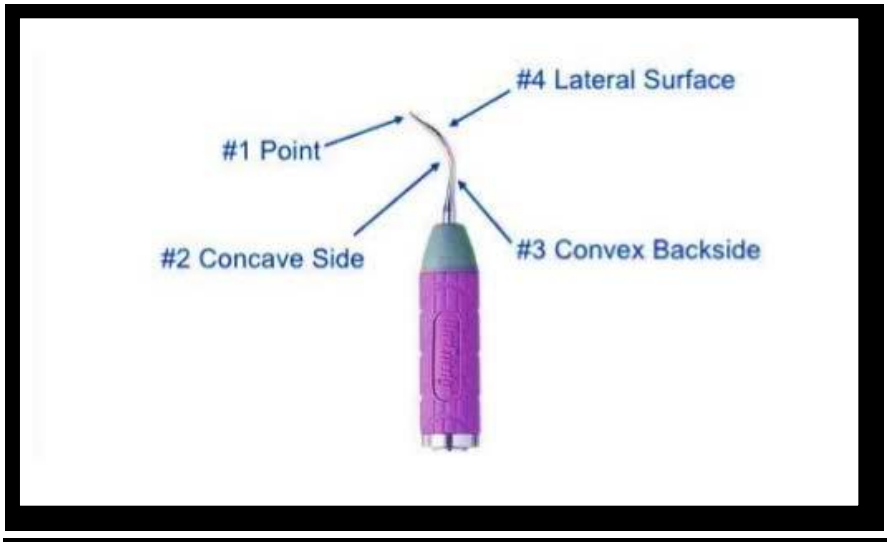
Piezoelectric ultrasonic units:

Piezoelectric tips move in a linear pattern, giving the tip two active surfaces.

Tip Designs

1- Large diameter tips: are created in a universal design and are indicated for the removal of large, tenacious deposits. A high power setting is generally recommended.
2- Thinner diameter tips: may be site specific in design.
3- The straight tip design: is ideal for use in treating patients with gingivitis and deplaquing maintenance patients.
4- Right and left Contra-angled tips allow for greater access and adaptation to root morphology. A low power setting is recommended.

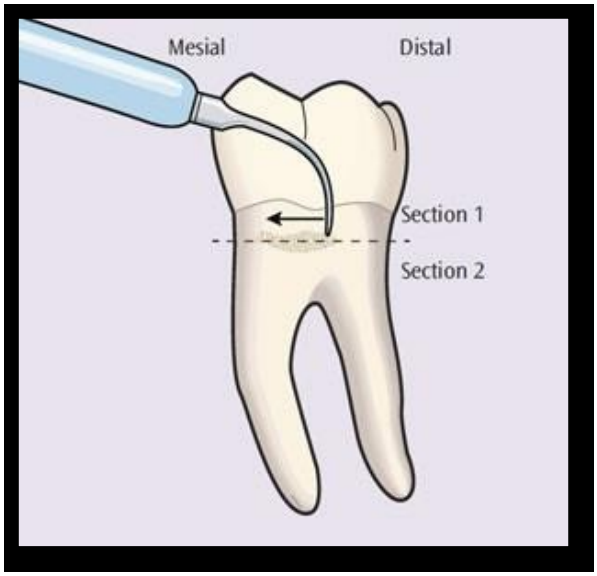

#100 Thin
#10 Universal
Left
Straight
Right


#4 Lateral Surface
#1 Point
#2 Concave Side
#3 Convex Backside

Parts of tip.

PRINCIPLES OF INSTRUMENTATION WITH ULTRASONIC DEVICE:

1- Wipe the ultrasonic unit with a disinfectant. Flush the waterlines and handpiece for 2 minutes to decrease the number of microorganisms in the lines.
2- Direct the patient to rinse for 1 minute with an antimicrobial oral rinse such as 0.12 % chlorhexidine to reduce the contaminated aerosol.
3- The clinician should wear protective eyewear and mask and use high speed evacuation to minimize inhalation of the contaminated aerosol.
4- Adjust the water control knob to produce a light mist of water at the working tip.
5- A modified pen or light pen grasp is used with an ultrasonic scaler along with an extraoral fulcrum (alternate fulcrums of cross arch or opposite arch). It allows the operator to maintain a light grasp (featherlike touch) and easier access physically and visually to the oral cavity.
6- Light pressure is needed with a power instrument. Increased clinician pressure on the tip causes decreased clinical efficacy.
7- The working end should be kept in constant motion, and the tip should be kept parallel to the tooth surface to avoid etching or grooving the tooth surface.
8- The instrument should be switched off periodically to allow for aspiration of water, and the tooth surface should be examined frequently with an explorer.



The tip is parallel to the tooth surface.

Light pen grasp, light mist of water.

The tip is parallel to the tooth surface.

Advantage of ultrasonic over hand Ins:

1- Less effort, pressure, trauma and time. 2-
Simple manipulation.
3- Water sprays clean debris.

Disadvantage of sonic & ultrasonic instrumentations:

1- Lack of tactile sensation because of light pressure during manipulation. 2-
Heat generation, required coolant system.
3- Impair of visibility because of water spray. 4-
Aerosol contamination.
5- Damage restorative materials (porcelain, amalgam, gold, composite) & Titanium implant abutments.

Contraindication of ultrasonic device:

1- Infectious diseases.
2- Cardiac pacemaker & hearing aids. 3-
Gag reflex
4- young children
5- pain.

Protection & precaution:

1- Protective eye glass, mask, gloves & protective gloves. 2- High speed evacuation.
3- Preprocedure rinsing with chlorehexidine. 4- Sterile water source.
5- Disinfection of environmental surfaces.
6- Adequate ventilation and air filtration units.

Root planing:

Root planing is defined as "a treatment procedure designed to remove cementum or surface dentin that is rough, impregnated with calculus, or contaminated with toxins or microorganisms."

Principles of root planning:

1- The curette is held with a modified pen grasp, and a stable finger rest is established.
2- Determine the correct cutting edge by visually inspecting the blade.

Correct ***Incorrect***

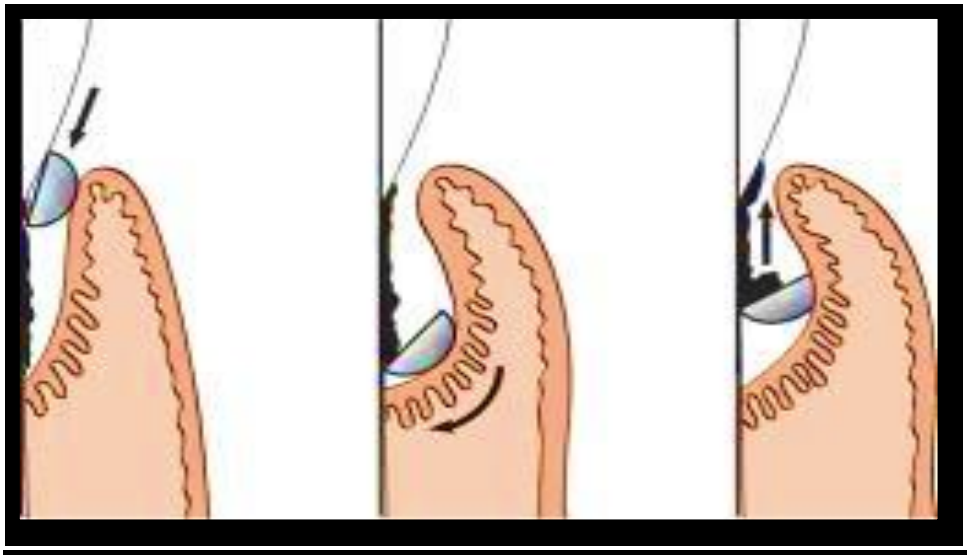
Cutting edge of a Gracey curette adapted to the tooth.

3- The correct cutting edge is slightly adapted to the tooth.

4- The blade is inserted under the gingiva and advanced to the base of the pocket.

5- Make sure the lower shank is parallel to the surface to be instrumented. The lower shank of Gracy curette is that portion of the shank between the blade and the first bend in the shank.

6- When a cutting edge reaches the base of the pocket, a working angulation of between 45-90 degrees is established, and pressure is applied laterally against the root surface.



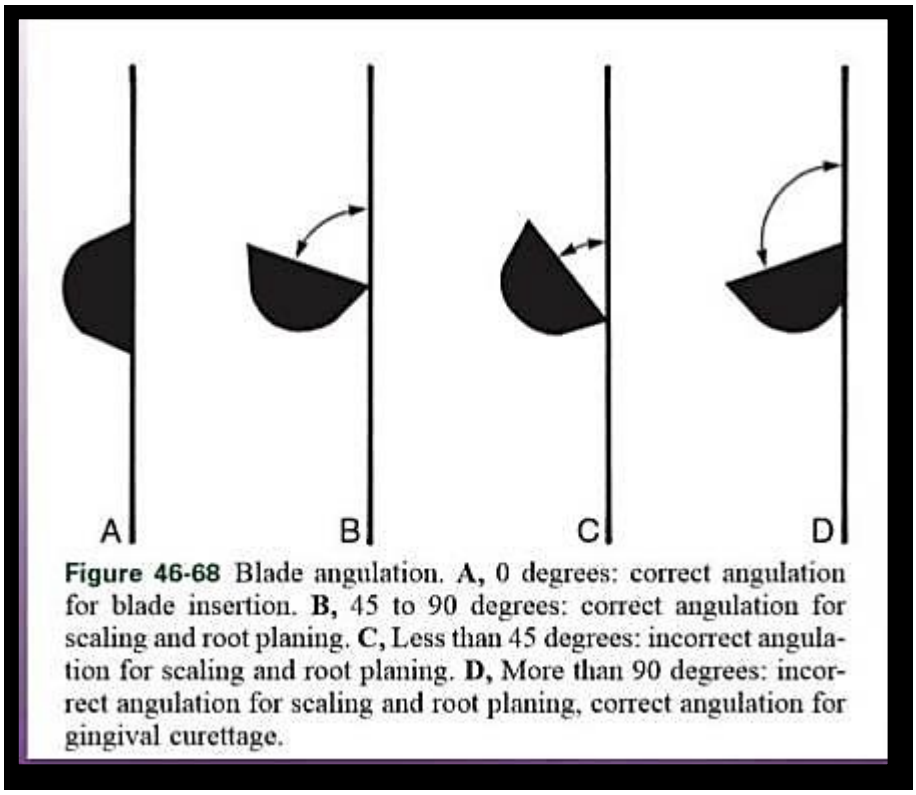


Figure 46-68 Blade angulation. **A,** 0 degrees: correct angulation for blade insertion. **B,** 45 to 90 degrees: correct angulation for scaling and root planing. **C,** Less than 45 degrees: incorrect angulation for scaling and root planing. **D,** More than 90 degrees: incorrect angulation for scaling and root planing, correct angulation for gingival curettage.

7- Calculus is removed by a series of controlled, overlapping, short powerful strokes. As calculus is removed, longer lighter strokes are

then activated with less lateral pressure until the root surface is completely smooth and hard.

** If heavy lateral pressure is continued after calculus has been removed, root surface roughened by numerous nicks and gouges, and excessive root surface removal.

8- Allow the wrist and forearm to carry the burden of the stroke, rather than flexing the fingers.

Reference:

Michael G. Newman, Henry H. Takei, Perry R. Klokkevold , Carranza A. Fermin. Carranza's Clinical Periodontology. 10th edition.

Good Luck