

# Periodontal Instrumentation: Best Practices for Enhancing Clinical Outcomes

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### ABSTRACT

Periodontal instrumentation involves various tools essential for effective treatment of periodontal disease. Key instruments include scalers and curettes, designed for plaque and calculus removal, as well as ultrasonic devices that enhance efficiency. Hand instruments offer tactile feedback, while powered tools reduce operator fatigue and improve access to difficult areas. The choice of tools ultimately affects the quality of periodontal care and patient comfort, emphasizing the need for practitioners to be skilled in utilizing both hand and powered instruments to achieve optimal outcomes.

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### Introduction

Periodontal instruments are intended for explicit purposes, for example, eliminating math, planning root surfaces, curetting the gingiva, and eliminating unhealthy tissue. On first examination, the range of instruments accessible for comparable purposes seem confounding. With experience, notwithstanding, clinicians select a generally little set that satisfies all necessities [1].

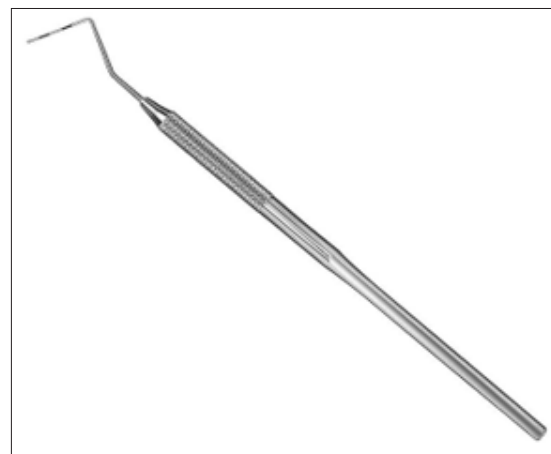
### Classification of Periodontal Instruments

1. Periodontal probes are used to locate, measure, and mark pockets, as well as determine their course on individual tooth surfaces.
2. Explorers are used to locate calculus deposits and caries.
3. Scaling, root-planing, and curettage instruments are used for removal of biofilm and calcified deposits from the crown and root of a tooth, removal of altered cementum from the subgingival root surface, and debridement of the soft tissue lining the pocket. Scaling and curettage instruments are classified as follows
  - Sickle scalers are heavy instruments used to remove supragingival calculus.
  - Curettes are fine instruments used for subgingival scaling, root planning, and removal of the soft tissue lining the pocket.
  - Hoe, chisel, and file scalers are used to remove tenacious subgingival calculus and altered cementum. Their use is limited compared with that of curettes.
  - Ultrasonic and sonic instruments are used for scaling and cleansing tooth surfaces and curetting the soft tissue wall of the periodontal pocket.
4. Periodontal endoscopes are used to visualize deeply into subgingival pockets and furcation's, allowing the detection of deposits.

5. Cleansing and polishing instruments, such as rubber cups, brushes, and dental tape, are used to clean and polish tooth surfaces. Also available are air-powder abrasive systems for tooth polishing [1].

### Periodontal Probes

Measurements of pocket depth and pocket configuration are made with periodontal probes. To produce a pressure that indicates the approximate depth of probing, probe tips with a diameter of 0.6 mm and a force of 0.20 grammes (50 N/cm<sup>2</sup>) is exerted on the bottom of the pocket [1].



### Explorer

An assessment tool with a flexible wire like working end is called an explorer. The condition of the periodontal tissues, the structure of the teeth, and the texture of the tooth surfaces are assessed using equipment such as periodontal probes and explorers. When the explorer is moved across abnormalities in the tooth surface [2].



### Scaling and Curettage Instruments

A sickle scaler is a dental tool utilized for eliminating calculus deposits from the tooth crowns. It is important to note that sickle scalers are specifically designed for supragingival use and should never be employed on

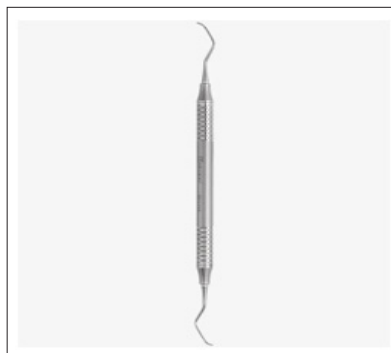


### Curette

The curette is the instrument of choice for removing deep subgingival calculus, root planning altered cementum, and removing the soft tissue lining the periodontal pocket. Each working end has a cutting edge on both sides of the blade and a rounded toe [2].

### Universal Curette

A universal curette is a dental tool utilized for the elimination of small to medium-sized calculus deposits from both the crowns and roots of the teeth. Typically, this instrument is designed with two working ends that are mirror images of each other [1].



### Gracey Curettes

Gracey curettes are specialized instruments tailored for specific anatomical areas of the dentition. These tools, along with their variations, are highly effective for subgingival scaling and root planing due to their unique design and angulation [1].



### Hoe Scalars

Hoe Scalars are utilized to scale ledges or rings of calculus. The blade has a 99-degree angle bend, and the cutting edge is created by the meeting point of the flattened terminal surface and the inner aspect of the blade. The cutting edge is beveled at a 45-degree angle. The blade is slightly curved to ensure contact at two points on a convex surface. The back of the blade is rounded, and its thickness has been minimized to allow access to the roots without any hindrance from surrounding tissues [2].



The Schwartz perioretrievers are a pair of highly magnetic, double-ended tools used to retrieve damaged instruments. tips from the periodontal pocket [2].



### Chisel Scaler

Usually employed in the anterior region of the mouth, the chisel scaler is made for the proximal surfaces of teeth that are too tightly spaced to allow the use of other scalars. The instrument has two ends, one with a curved shank and the other straight. The blades have a 45-degree beveled straight cutting edge with a minor bend [1].



### Quétin Furcation Curettes

The Quétin furcation curettes are essentially hoes that fit into the furcation's floor or roof and have a shallow, half-moon radius. Additionally, the tip's curvature fits into the developmental depressions on the inside of the roots. There are two widths for the tips, and the shanks are somewhat bent for easier access (With a 0.9-mm blade width, the BL1 (buccal-lingual) and MD1 (mesial-distal) instruments are tiny and delicate. With a 1.3-mm blade width, the BL2 and MD2 instruments are bigger and more expansive. Even the mini-bladed curettes are frequently too big to reach some recessed sections of the furcation, and these tools remove burnished calculus from those locations [1].



### Diamond Coated Files

Special tools called diamond-coated files are used to polish root surfaces [2].



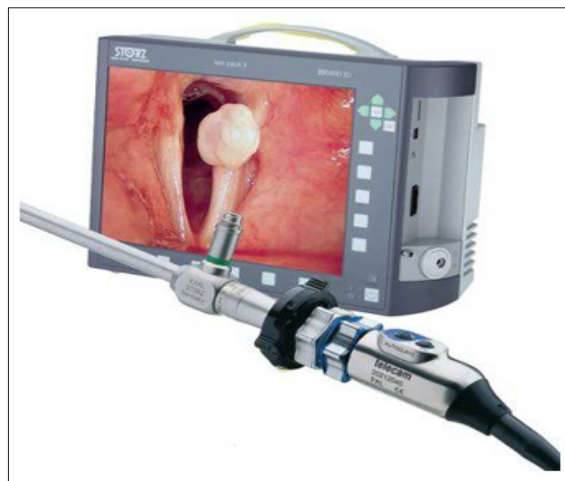
### Ultrasonic and Sonic Instruments

Plaque, scaling, curing, and stain removal are all possible with ultrasonic devices 39, 40, 8, 126. Magneto strictive and piezoelectric ultrasonic units are the two varieties. In both cases, oscillations in the handpiece's materials are caused by alternating electrical current, which vibrates the scaler tip. These ultrasonic vibrations at the tip of the instruments of both types vary from 20,000 to 45,000 cycles per second (ps; also known as Hertz [Hz]), depending on the manufacturer [1].

The elliptic vibration pattern of the tip in magneto strictive units indicates that all sides of the tip are active and will function when the unit is adjusted to the tooth. The linear, or back-and-forth, vibration pattern of the tip in piezoelectric devices indicates that its two sides are the most active. A handpiece that connects to a compressed air line and uses a range of tips with certain designs makes up a sonic unit. Compared to ultrasonic units, the sonic tip's vibrations range from 2000 to 6500 ps, which offers less power for calculus removal [2].

### Dental Endoscope

In order to diagnose and treat periodontal disease sub gingivally, a dental endoscope was recently launched. The Perioscopy system (Dental View, Irvine, CA) is made up of a sterile, disposable sheath that is placed over a reusable fiber optic endoscope with a diameter of 0.99 mm [2].



### EVA System

The motor-driven diamond files of the EVA prophylaxis instrument are perhaps the most effective and least traumatic tools for reducing overhanging of over contoured proximal alloy and resin restorations. These symmetric pairs of files are fashioned of aluminium in the form of a wedge that protrudes from a shaft; the wedge has a smooth surface on one side and a diamond coating on the other. The files can be installed on a specialized dental handpiece attachment that produces variable-frequency reciprocating strokes [1].



## Cleaning and Polishing Instruments

### Rubber Cups

Rubber cups are made composed of a hollow interior and a rubber exterior that may or may not be webbed. They have a unique prophylactic aspect when utilized in the handpiece. After every patient use, the handpiece, prophylactic angle, and rubber cup need to be sanitized; alternatively, a disposable plastic prophylactic angle and rubber cup can be used, then thrown away. It is best to use a fluoride-containing cleaning and polishing paste that is kept moist to reduce heat generated by friction while the cup rotates. Polishing pastes come in small, handy, single-use packages and are available in fine, medium, or coarse grits. The thin layer of cementum in the cervical area could be removed by vigorously using any kind of abrasive on the rubber cup [1].



### Bristle Brushes

There are wheel and cup-shaped bristle brushes. Using polishing paste, the brush is applied at the prophylactic angle. The brush should only be used on the crown due to its firm bristles in order to prevent damaging the gingiva and cementum [2].



### Dental Tape



For polishing proximal surfaces that are in reach of other polishing tools, dental tape combined with polishing paste is utilized. The tape is activated with a firm labiolingual gnath while it is passed interproximally and maintained at a straight angle to the tooth's long axis [2].

### Air Powder Polishing

Early in the 1980s, a specifically made handpiece was produced that could apply an air-powered slurry of warm water and sodium bicarbonate for polishing. The Prophy-fet is an extremely useful tool for removing soft deposits and extrinsic stains. Significant tooth material loss is possible, according to research on the abrasive effect of sodium bicarbonate-based air-powder polishing machines on cementum and dentin. The air-powder polishing tool is not recommended for use in patients with hemodialysis or a history of respiratory conditions [2].



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