

Advanced Instrumentation for the General Practice Dental Hygienist



Course Author(s): Vickie Parrish Foster, RDH, MEd

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Disclaimer: Participants must always be aware of the hazards of using limited knowledge in integrating new techniques or procedures into their practice. Only sound evidence-based dentistry should be used in patient therapy.

Conflict of Interest Disclosure Statement

- The author reports no conflicts of interest associated with this course.

Introduction – Advanced Instrumentation

The purpose of Advanced Instrumentation for the General Practice Dental Hygienist is to broaden the horizons of the general practice dental hygienist in treating some of the special dental needs of patients by utilizing advanced instrumentation and/or instruments that are not typically in the general practice set up for initial or periodontal recall patient treatment.

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Overview

In many general dental practices, the dental hygienist relies on a standard set of instruments and typical scaling procedures with most patients. Some patients provide a challenge for treating certain areas of the mouth or accessing areas for appropriate instrumentation with this standard set up. The dental hygienist must apply knowledge of dental anatomy and instrument design for periodontal debridement. In addition, they must utilize the most appropriate instrument for the area to effectively and safely treat patients with both periodontal and special dental needs.

The purpose of this course is to broaden the horizons of the general practice dental hygienist in treating some of the special

needs of patients by utilizing advanced instrumentation and /or instruments that are not typically in the general practice set up for initial or periodontal recall patient treatment.

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Apply knowledge of instrument design to select the most appropriate instruments in periodontal debridement.
- Utilize knowledge of tooth morphology, fulcrum placement, instrument design, and patient/clinician positioning to safely and effectively treat periodontal and special dental needs of patients.

Introduction

Typically, there are standard dental hygiene instrument set-ups in the general-practice dental office. Yet, these instrument set-ups may not address specific instrumentation needs when debriding supra and subgingival surfaces of the teeth and periodontal pockets. In addition, these instrument set-ups may not be the most effective and efficient to utilize with every patient. This course serves to review different types of dental hygiene instruments, their design and application. Also, alternative fulcrums and patient and clinician positioning, which aids in better access to certain area of the mouth, will be discussed.

Periodontal Considerations and Tooth Morphology

There are several considerations when trying to effectively instrument in order to remove as much calculus, plaque/biofilm and retentive tooth morphology as reasonably achievable with hand instruments and aid in obtaining periodontal health. The patient's periodontal health is one of the main factors that must be assessed. This includes the following assessments: periodontal probing depths, bleeding on probing, gingival recession, clinical attachment levels, furcations and mobility present and calculus attachment. Assessing these parameters gives the clinician the ability to determine both the type and design of instruments needed in order to effectively scale or debride in the patient's periodontal pocket (if present). It also allows the clinician to determine

what type of periodontal debridement is necessary for the individual patient.

Calculus attachment mode can play a factor as to what type of instrument may be needed, as well as how it is utilized. Calculus is often attached to the tooth through the acquired pellicle (most common attachment means) and is usually easy to remove. It can also be attached on the root surfaces through irregularities in the tooth surface or through the inorganic matrix on the tooth surface. Both of these are more difficult to remove.

There are many factors that we can take into consideration when looking at tooth morphology and how both hard and soft deposits can attach to these areas. Each tooth has its own “design” and thus can present unique challenges when debriding each area of the mouth. It is necessary to be able to mentally visualize each tooth’s morphology during debridement of the area in order to effectively and efficiently aid in obtaining a periodontally healthy environment. Tables 1 and 2 review tooth root morphology by area.

Table 1. Maxillary Teeth.¹

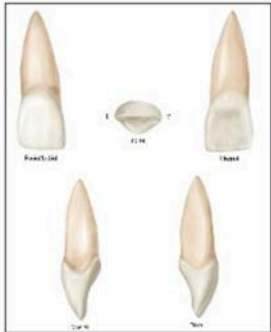
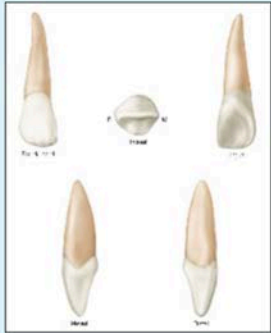
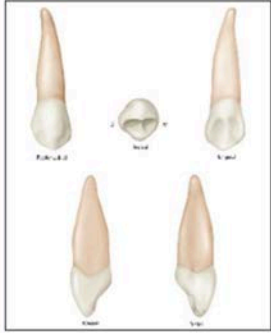
Tooth	Photo	Characteristics	Challenges
Central Incisor		One conical shaped root.	Very little, no prominent concavities, except possibly on the lingual of the tooth.
Lateral Incisor		One conical shaped root.	Can have a palato-gingival groove.
Canine		One long conical shaped root.	Can have prominent, proximal root concavities.

Table 1. Maxillary Teeth.¹ (continued)

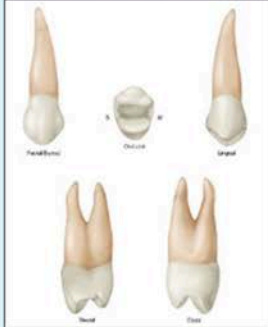
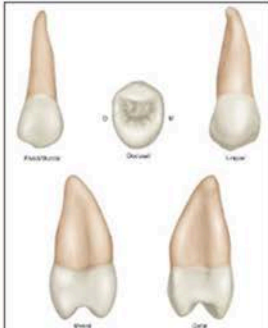
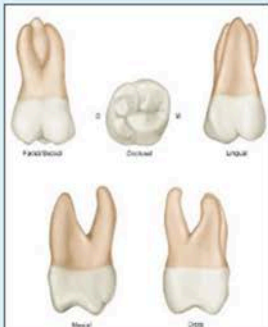

1st Premolar		<p>May have 1 or 2 roots (facial and lingual).</p> <p>Furcation occurs in the root third to half.</p> <p>There is a distinct mesial root concavity on the crown that extends apically from the mesial contact.</p>	<p>Determining where the furcation occurs and concavities on the crown above the contact can be a challenge.</p>
2nd Premolar		<p>Only one root. Concavities not as prominent as in the 1st premolar.</p>	<p>Relatively few challenges.</p>
1st Molar		<p>Three roots, mesiobuccal, distobuccal and palatal.</p> <p>The root concavities may be present on the mesiobuccal and palatal roots and also on furcal surfaces.</p> <p>Mesiobuccal root has a mesial concavity.</p> <p>Furcations are on the facial, mesial, and distal aspects. The mesial furcation is located more toward the lingual aspect.</p>	<p>Location of root concavities and furcations are a challenge.</p>
2nd Molar		<p>There are 3 roots: mesiobuccal, distobuccal and palatal.</p> <p>The root trunks are longer than the 1st molars.</p>	<p>Location and number of roots.</p>
3rd Molar		<p>The morphology varies.</p> <p>This tooth can have 3 roots.</p> <p>Also, the roots can be fused. Often accessory roots are found on these teeth.</p>	<p>Location and root morphology.</p>

Table 2. Mandibular Teeth.²

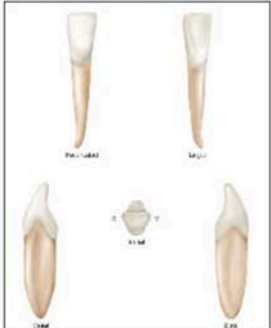
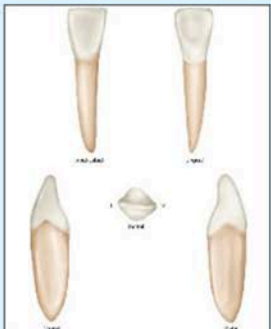
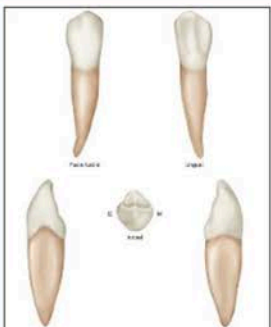




Tooth	Photo	Characteristics	Challenges
Central Incisor		<p>Very similar to mandibular lateral incisors.</p> <p>It has one cone shaped root.</p> <p>Sometimes there are shallow concavities on the proximal root surfaces.</p>	Small crown and root surfaces create a challenge for instrument adaptation.
Lateral Incisor		<p>Very similar to mandibular central incisors.</p> <p>It has one cone shaped root.</p> <p>Sometimes there are shallow concavities on the proximal root surfaces.</p>	Small crown and root surfaces again create instrument adaptation challenges.
Canine		<p>It has one cone-shaped root.</p> <p>The proximal root surfaces have concavities.</p> <p>Sometimes the apex of the root is bifurcated into facial and lingual portions.</p>	Small crown and root surfaces create adaptation challenges.
1st Premolar		<p>It has one cone-shaped root that may have root concavities on the distal surface.</p>	Relatively few challenges.

Table 2. Mandibular Teeth.² (continued)

2nd Premolar		One cone-shaped root with possible root concavities.	Relatively few challenges.
1st Molar		<p>It has a mesial and distal root.</p> <p>The distal root is somewhat narrower.</p> <p>There is a large interradiolar area. Mesial root has proximal and furcal concavities.</p> <p>The furcations are on the facial and lingual surface, and the facial concavity before the furcation, begins just apical to the cementoenamel junction (CEJ).</p>	Many concavities. The broadness of the root surfaces from facial to lingual create adaptation and angulation challenges.
2nd Molar		<p>They have 2 roots; mesial and distal.</p> <p>The roots are likely to be closer together.</p> <p>The mesial concavities are not as prominent as in first molar.</p>	Closeness of the roots create challenges if trying to access the furcal areas.
3rd Molar		<p>Root structure varies.</p> <p>They typically have two roots which can be shorter, fused or dilacerated.</p>	Location and root morphology again create adaption and angulation challenges.

Basic Instrument Design

One of the first considerations in instrument selection is to review the parts of the instrument and how they are incorporated into the design and utilization of the instrument (Figure 1). The handle, shank, functional end and working end (blade) are the parts that are all taken into consideration in the design of a specific instrument. These parts vary and can address how the instrument will function.

Handles

There are many types of handles that can be chosen when ordering dental instruments. The considerations when selecting handles for instruments should be their weight, balance, texture, diameter (size), shape, markings and whether they are single or double ended. Single or double ended instruments are certainly a personal preference, but doubled ended instruments are more efficient. Using

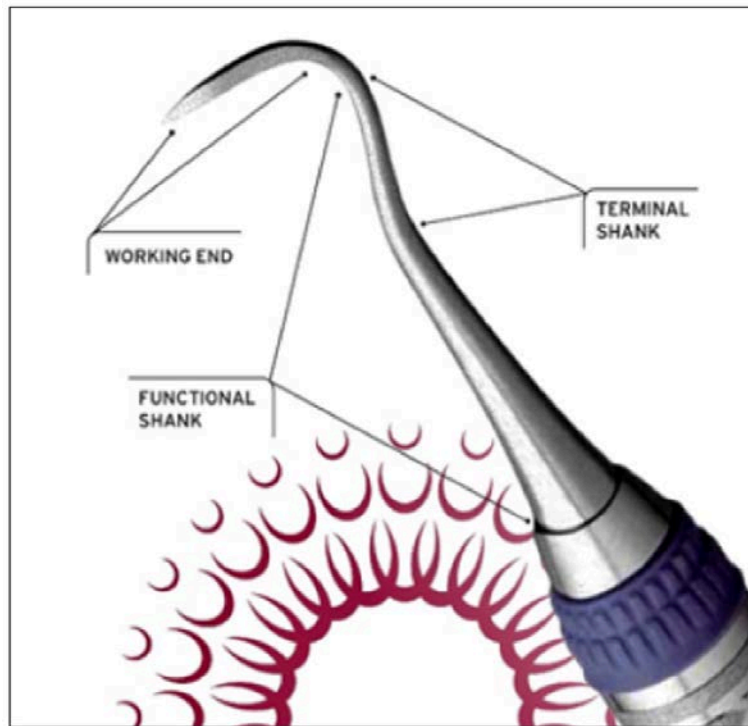


Figure 1. Basic Instrument Design.

double ended instruments allows the operator to flip the instrument, rather than picking up a different instrument, in order to access another surface of the mouth for treatment.

Although very lightweight, an instrument can have a significant toll on the stress of the hand. The instrument weight should be balanced between the ends, and significant enough that the instrument does not require the handle be pinched in order to activate a stroke. An instrument that is too light will cause as much hand stress as one that is too heavy.

Instrument handles can be smooth or textured as well as rounded or angled. Classic dental office ergonomics has defined rounded, textured surfaces to be easier to grasp rather than small and angled surfaces. In addition, the handles should have a larger diameter in order to allow the fingers to grasp without pinching.³

Some instruments are available with markings on the shank in order to distinguish the correct cutting edge. This is useful because the curvature of the blade and the shape of the shank may make it difficult to recognize the

correct cutting edge. Also, there are options for Gracey curettes with periodontal probing measurement lines on the terminal shank of the instrument. See Figure 2 below for a variety of scaler handles.

Shank/Flexibility

The considerations with the shank of the instrument include the functionality factors such as long vs. short, heavy vs. thin, curved vs. straight and universal vs. area specific. Each one of these factors will be discussed as the specific instruments are explored. In addition, the flexibility of the shank plays a role in the use of the instruments. Table 3 (Hu-Friedy) defines flexibility as it relates to use and instrument type.

Working End

The working end of the instrument is also defined as the blade or cutting edge of the instrument. The considerations in the function and use of an instrument are whether the toe of the blade is rounded or pointed, whether it is single or double bladed, whether the blade is thick or thin, whether it is curved or straight and the length of the blade. In addition, the angle of the blade, or cutting edge, to the shank of

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#8 ResinEight



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#6 Satin Steel



#4 Round



#2 Octagonal



SINGLE END

#8 ResinEight



#7 Satin Steel Colours



#6 Satin Steel



#24 Round



#1 Octagonal



Figure 2.

Table 3. Shank Flexibility.

Shank Type	Uses	Examples
Flexible	Detection of subgingival calculus Removal of fine calculus Provides the best tactile sensation to the operator's fingers via the shank and handle	Gracey Curettes Explorers
Moderately-Flexible	Removal of light or moderate calculus Provides good level of tactile sensation, allowing detection and removal of moderate deposits	Universal Curettes
Rigid	Removal of heavy calculus deposits Limited tactile sensations	Rigid Curettes Sickle Scalars Periodontal Files Hoes
Extra-Rigid	Removal of very tenacious calculus deposits Limited tactile sensation	Extra Rigid Graceys

the instrument, can be a factor in being able to adapt the blade to the surface of the tooth at a correct working angle⁴ (Figures 3-4).

Advanced Instrument Choices

In most general dental practice offices, the typical set of instruments will contain data collection instruments such as explorers and probes, and debridement/scaling instruments such as scalars, universal curettes, and possibly, select Gracey curettes. Depending on the patient's oral health, these instruments may not totally meet the needs of the patient. Often instruments that have been modified from the original scaler and curette designs will better serve to effectively and efficiently debride the sulcus and/or periodontal pocket.

The instruments that will be reviewed in this course are:

- After Five, Mini Five and Micro Mini Gracey Curettes

- 15/16 and 17/18 Gracey Curettes
- Extra Rigid Gracey Curettes
- Vision Curvettes
- Langer Curettes
- Debridement Curettes
- Diamond Tipped Curettes
- Periodontal Files
- Hoes and Chisels
- SN 135 and SN 137
- Nevi Scalars
- Other Options: Shank and Tip Varieties

After Five, Mini Five and Micro Mini Gracey Curettes

Gracey is a family of curettes that are typically utilized in subgingival debridement. Depending on where in the mouth the instrumentation is occurring, the instrument selection may be a Gracey 1/2 for anterior areas or a Gracey 11/12 for mesial areas in the posterior (Figure 5). Also, the dental hygienist might use a Gracey 13/14 for posterior distal surfaces (Figure 5).

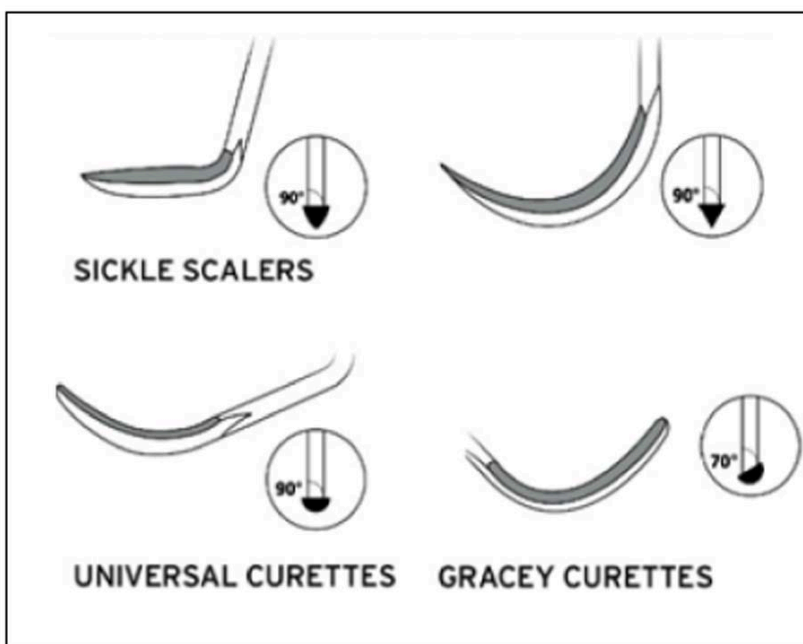


Figure 3.

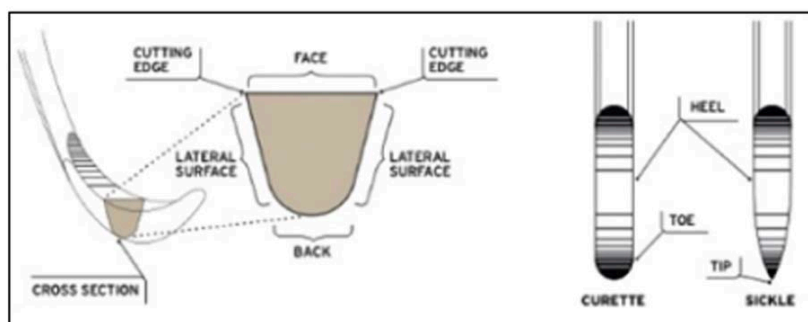


Figure 4.



Figure 5.

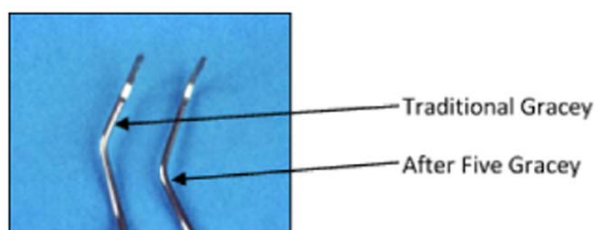
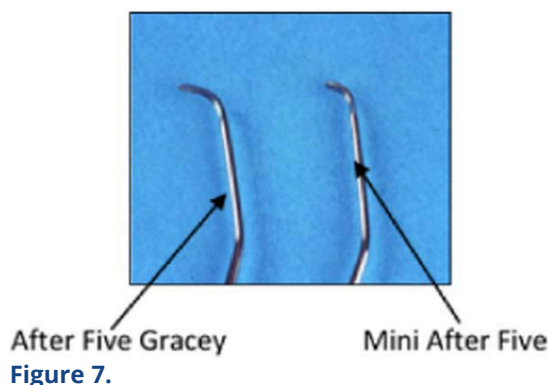


Figure 6.



Although, these may be the instruments that are typically selected, there are design alterations in the Graceys that can be utilized to better access difficult areas in the mouth. The following summarizes the comparison of varying designs of Gracey curettes (Figures 5-7):

After Five:

- 3mm elongated terminal shank = deeper insertion
- 10% thinner blade = easier insertion

Mini Five: (Figures 5-7)

- 3mm elongated terminal shank
- 50% shorter blade

Micro Mini: (Figure 10)

- 20% smaller and thinner than Mini Fives
- 3mm elongated terminal shank
- Easily adapts to tight spaces and concavities

Below compares using a Gracey 1/2 on a mandibular lateral incisor on the left vs using a Mini After Five Gracey 1/2 on the right (Figures 8-9). As shown in the photos, the Mini After Five allows for greater access to the periodontal pocket. Upon insertion, activation of the blade can be carried out in a more accurate fashion.



Figure 8. Gracey 1/2.

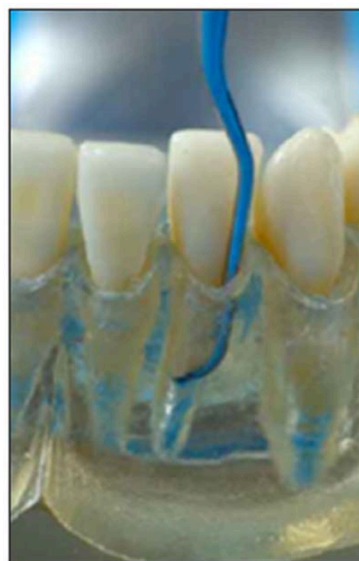


Figure 9. Mini After Five Gracey 1/2.

The Micro Mini Five Gracey curettes offer even more adaptability with a 20% thinner blade and an elongated, and more rigid, terminal shank than the Mini Fives (Figure 10).

15/16 and 17/18 Gracey Curettes

The 15/16 Gracey Curette was introduced in 1993. It is designed for increased access to molars where it can be difficult to position the 11/12 Gracey curette correctly. It is used on the mesial surfaces of the posterior teeth but has the shank design of a Gracey 13/14 (Figures 11-12).

In the clinical view of this region of the mouth, it is usually necessary to use an extraoral fulcrum to achieve a parallel shank angle with the 11/12 (Figure 13). With the increased angle



Figure 10.



Figure 11. 15/16 Gracey Curette.

of the 15/16, a superior adaptation is provided in this area and allows for the choice of an intraoral fulcrum position (Figure 14).

The 17/18 Gracey Curette is designed to improve access to the distal surfaces of



Figure 12. 13/14, 11/12, 15/16.



Figure 13. 11/12 Gracey Curette.



Figure 14. 15/16 Gracey Curette.

posterior teeth (Figure 15). The deep angle of the shank, along with multiple bends, provides crown clearance and prevents interference of the handle with the opposing arch and teeth. It also has a long terminal shank and reduced blade length in order to access deep

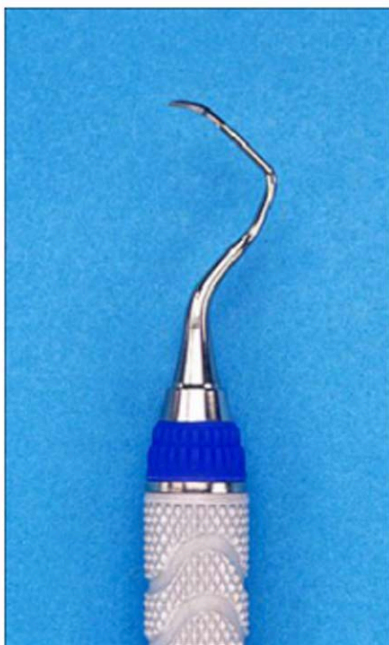


Figure 15. 17/18 Gracey Curette.

periodontal pockets on the distal areas. In addition, the shorter blade length allows better access to furcations and root concavities.

When comparing the terminal shank and blade of 13/14 After Five and 17/18 Gracey Curette, the terminal shank is almost as long as an After Five Gracey. This can increase access in periodontal pockets (Figures 16-17). The blade is 1mm shorter than standard Gracey blades which allows for adaption to more of the tooth surface by the blade (Figures 18-19).

Extra Rigid Gracey Curettes

Standard Gracey curettes are designed for light to moderate scaling and subgingival and root debridement. Often the flexibility of the shank of the Standard Gracey does not aid in scaling heavy calculus (when power scaling cannot be utilized). Rigid and Extra Rigid designs can accommodate these scaling needs (Figure 20).

The Rigid Gracey curette is designed for moderate calculus removal and root debridement as well as periodontal surgery. It has the same shank angulation and blade width as the standard Gracey, but the shank is wider and thus a little more rigid.

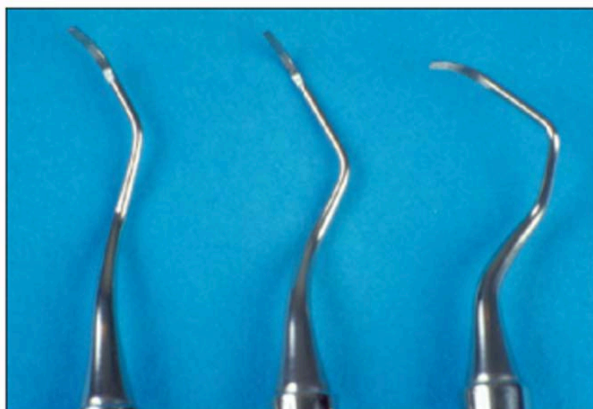


Figure 16. 13/14, 13/14 AF, 17/18.



Figure 17. 13/14, 17/18.

The Extra Rigid Gracey curette is designed

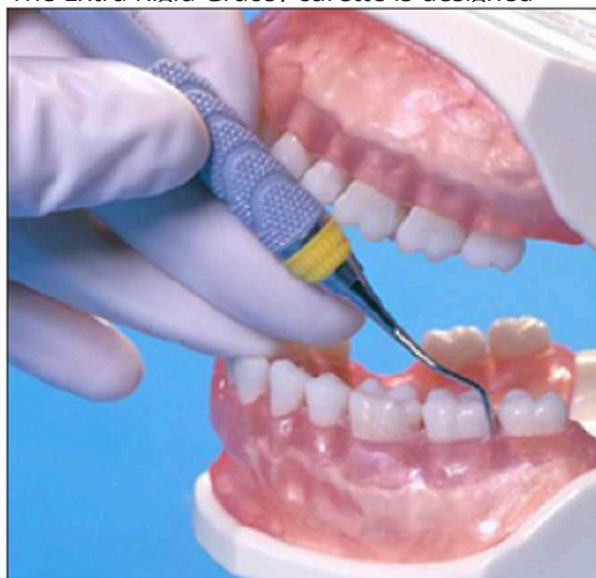


Figure 18. 13/14 Gracey.



Figure 19. 17/18 Gracey.



Figure 20. Standard, Rigid, Extra Rigid.

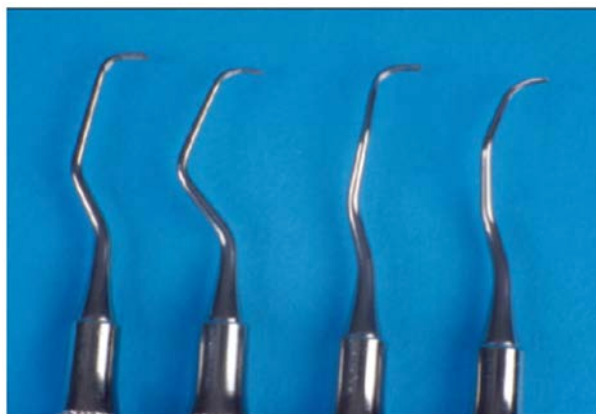


Figure 21. 5/6, 7/8, 11/12, 13/14.

for heavy calculus removal, gross scaling and debridement and periodontal surgery. It has the same shank width and blade as the Rigid Gracey, but the shank has unique angles and bends to aid in access to areas of the mouth (Figure 21).

Vision Curvettes

When a Gracey curette, no matter what the design, does not seem to access as well as you would like, another selection could be the Vision Curvette. Vision Curvettes provide excellent access to furcation areas and also help to improve access to deeper pockets in the anterior area. They provide very good adaption of the blade for narrow root surfaces and tight periodontal pockets (Figure 22). When comparing the Curvettes to a Gracey Curettes, the following design factors are noted:

Vision Curvettes have (Figures 23-25):

- 50% shorter blade
- increased blade curvature
- straighter shank
- x to identify the cutting edge
- 5-10mm markings
- longer shanks on posterior instruments (3mm)

Langer Curettes

The Langer Curettes were designed to take the shank designs of the Gracey Curettes and combine them with the universal blade, thus allowing utilization of the same instrument for both mesial and distal surfaces. Langer Curettes have the following characteristics:

- Universal blade
- Gracey shank design
- Set of 4 for the entire dentition
- Rigid design

In addition to these characteristics, the Langer Curettes have a slightly shorter and thicker terminal shank. Thus, this makes them a little less flexible and much more effective on larger, tenacious calculus deposits. Langer Curettes can be ordered in standard, After Five and Mini Five designs. Figures 26-29 show the types of Langer Curettes that are available.

The suggested areas of use are as follows:

1/2 Langer – Mandibular Posterior (both mesial and distal) (Figure 30)

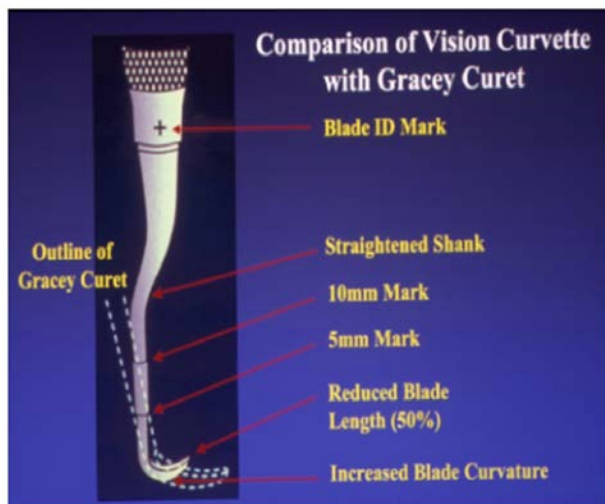


Figure 22.



Figure 23.



Figure 24.



Figure 25. Set of 4 Vision Curvettes: They are available in a modified Gracey set: Sub-0, 1/2, 11/12, and 13/14.



Figure 26. 1/2



Figure 27. 3/4



Figure 28. 5/6



Figure 29. 17/18



Figure 30. 1/2 Langer.



Figure 32. 5/6 Langer.

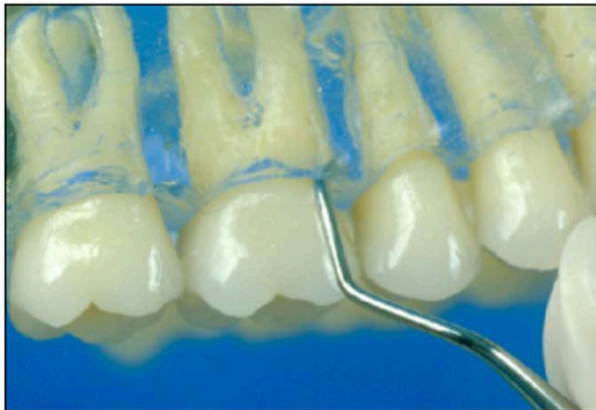


Figure 31. 3/4 Langer.



Figure 33. 17/18 Langer.

3/4 Langer – Maxillary Posterior (both mesial and distal) (Figure 31)

5/6 Langer – Anterior and Premolar teeth (Figure 32)

17/18 Langer – Posterior (Figure 33)

Debridement Curettes

Debridement curettes are often used after ultrasonic scaling and definitive hand scaling. These curettes are very small, have a rounded working end (blade) and effectively smooth root surfaces and remove small residual deposits (Figure 34). These small disc, shaped blades allow for adaptation to very deep pockets and can be used in any direction... vertical, horizontal, or oblique in a push pull (almost exploratory-like) stroke. It has a very long terminal shank (about 15mm).

- 1.5mm blade which encircles the entire rim
- push /pull stroke is utilized
- easily adapts to furcations, grooves and line angles

Uses for each of the Debridement Curettes are as follows:

- 1/2 Debridement Curette – for buccal and lingual surfaces of posterior teeth (Figures 35, 38).
- 3/4 Debridement Curette – for the mesial and distal surfaces of posterior teeth (Figures 35, 37).
- 5/6 Anterior Debridement Curette – mostly for anterior teeth but can be utilized in other areas (Figure 36).
- 7/8 Anterior Debridement Curette – mostly for anterior teeth but can be utilized in other areas. Has an extended shank for reach into deeper pockets (Figures 36, 39).

Diamond Tipped Coated File Scalers

Diamond tipped scalers are conical shaped and designed for furcation areas. They are made with a medical grade diamond coating all around the tip (360°). In order to safely use this instrument, there must be loose tissue or



Figure 34.



Figure 37. 3/4 O'Hehir Debridement Curette (Mesial/Distal).



Figure 35. O'Hehir Debridement Curettes. 1/2 O'Hehir and 3/4 O'Hehir.



Figure 38. 1/2 O'Hehir Debridement Curette (Buccal/Lingual).

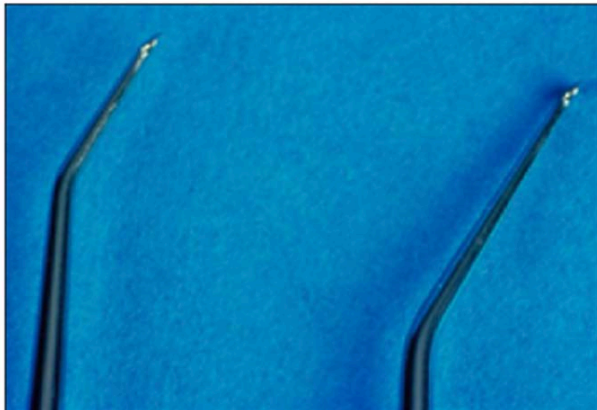


Figure 36. O'Hehir Debridement Curettes. 5/6 O'Hehir and 7/8 O'Hehir.



Figure 39. 7/8 O'Hehir Debridement Curette (Lingual).



Figure 40.



Figure 41.



Figure 42.



Figure 43.



Figure 44. Mesial and Distal.



Figure 45.

exposed furcations. It easily removes calculus in the furcation area using a light back and forth stroke (Figures 40-41).

SDCN7 – Nabers Probe Style has paired ends (both right and left). It has a universal use. Its long shank and curvature allows good access to furcations (Figures 42-43).

SDCM/D7 – Mesial end is concave and the Distal end is convex. This instrument is made for the line angles and deep grooves (Figures 44-46).

Periodontal Files

Periodontal files are used for debridement in deep pockets. They are excellent for breaking



Figure 46.



Figure 47a.



Figure 47b.

up tenacious or large calculus deposits. The design has a series of parallel blades on a flat head that can crush the deposits (Figures 47a-b). There must be good access to the area in order to use this instrument effectively. Files are typically utilized with a pull stroke.

Hoes and Chisels

Hoes and chisels are often overlooked in the general practice. The hoe can be very useful to remove large ledges of calculus and stain from supra-gingival areas on the facial and lingual surfaces (Figure 48). The hoe is used with a pull



Figure 48. Hoe.



Figure 49. Chisel.

stroke. The blade is straight, and the toe has a 45° bevel. It can have a straight or angled shank. The straight shank is designed for use on anterior teeth and the angled shank is for posterior teeth.

Chisels are great for dislodging large bridges of calculus in the interproximal areas (Figure 49). It also has a straight blade and a toe that has a bevel. This instrument is utilized with a push stroke typically between teeth.

SN 135 and SN 137

This instrument offers two instruments on one handle. One end is a universal sickle scaler and the other end is a universal curette. This provides for increased efficiency in scaling. The SN135 is designed for the posterior areas and the SN137 is for anterior areas (Figure 50).

Nevi Scalars

The disc end of the Nevi 1 scaler can be used to remove heavy lingual deposits in the anterior areas using a pull stroke. This is similar to the hoe, but it has a curved blade. Due to the curved disk shape and cutting edge along the entire disk, it is more universal and can be used with horizontal, vertical and oblique strokes.

The other end is a sickle type scaler and is good for use on the lingual surface. The thin tip adapts easily and is strong enough to tackle interproximal deposits and line angle stain (Figures 51-55).

In use, the Nevi 2 scaler easily reaches under the contact points in posterior areas to remove calculus with minimal tissue trauma due to its very thin, contra-angle design. Often, sickle scalars are thicker and are difficult to navigate under the contact areas without traumatizing the tissue. In addition, sickle scalars typically have a straight design on the working end. This straight design makes it difficult to adapt to many of the posterior surfaces and maintain correct hand and instrument position. The contra angle design in the Nevi 2 scalars allows for a neutral wrist position while scaling and thus aids in ergonomic practice (Figures 56-57).

Nevi 3 and 4 are posterior scalars. The Nevi 3 (Figure 58) has dual cutting edges and a slim shank with a slight contra-angle to get into posterior areas. Nevi 4 (Figure 59) has a stronger shank and longer, tapered dual blades to get under heavier deposits in the posterior.

Other Options: Shank and Tip Varieties

In some cases, the dental hygienist can request, when ordering new instruments, that the tip be thinned on many of the scalars and curettes. This is something that can be discussed with the distributor to find out if this option is available.

In addition, many instrument companies will offer standard, After Five, Mini After Five and micro versions of their scalars and curettes. They also offer extended shanks in most of

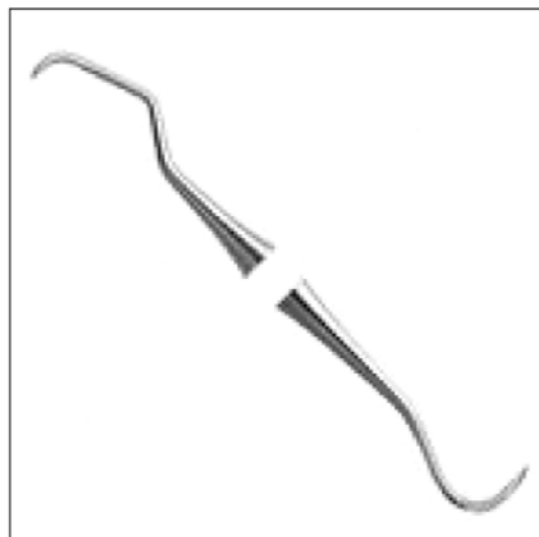


Figure 50. SN 135/137.



Figure 51. Nevi 1 Scaler.



Figure 52. Nevi 1 Scaler- Disc End.



Figure 53. Nevi 1 Scaler- Disc End.



Figure 54. Nevi 1 Scaler - Sickle End.

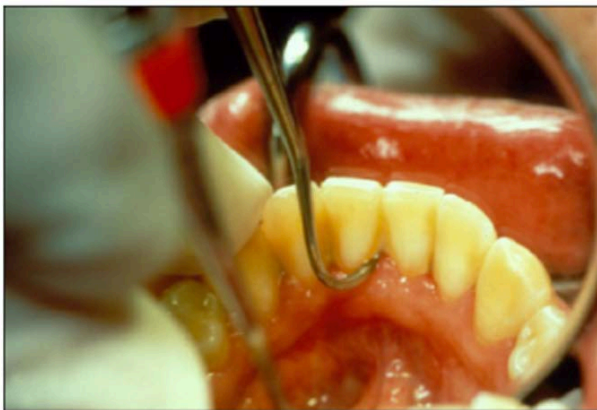


Figure 55. Nevi 1 Scaler - Sickle End.

these versions which feature the 3mm extended shanks and 10% thinner blades.

A new series of area specific curettes (Maintenance Curettes) (Figure 60) have also been developed. Often, after periodontal surgery, patients return for recall maintenance with tighter gingiva, but also may have residual

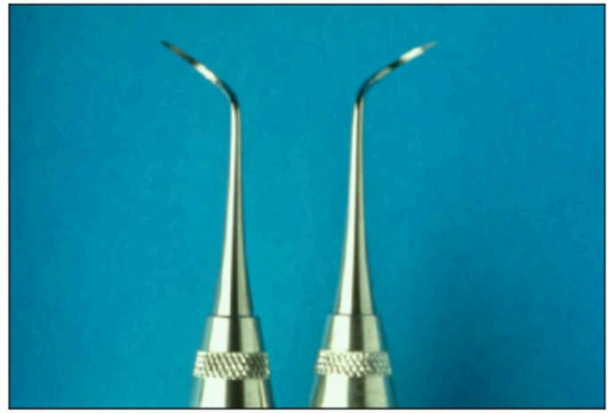


Figure 56. Nevi 2 Scaler.



Figure 57. Nevi 2 Scaler.

pocket depths or recession. These curettes have a terminal shank honed to a 60° angle instead of the traditional 70° Gracey curette angle. These instruments have shorter, thinner blades than the standard Gracey but also are longer than the mini Gracey. They also have a modified, rigid shank that is 2mm longer than the standard Gracey. They are made for ease of insertion in areas of tight tissue and attachment loss.⁵

Considerations for Selection of Instruments

The following are questions that the dental hygienist might ask herself/himself when determining the types of instruments needed in the practice.

1. **Type of patients in your practice:** The following questions will help to determine the extent and type of instruments that might be needed on a recurring basis.
 - Do you treat periodontally involved patients?



Figure 58. Nevi 3: Slim blade and slight contra-angled shape.



Figure 59. Nevi 4: Stronger shank and a longer blade.

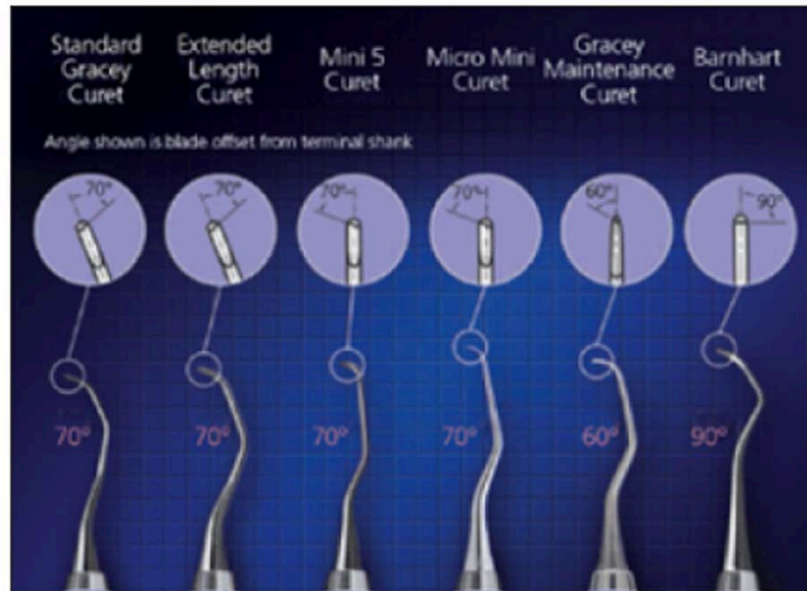


Figure 60.⁵

- Do you provide initial therapy for the periodontal patient?
- Do you utilize power instrumentation?
- Do you have patients that have dental implants?

2. **Anatomy of each of the teeth:**

- What is the anatomy of the teeth involved for any given patient?
The anatomy complexities of each tooth must be known in order to address challenges that may arise with instrumentation. In addition, understanding how to adapt the instruments to these complex root structures utilizing the instruments' unique designs is essential for effective and efficient debridement. Also, selection of the instruments should be predicated

on patient's individual tooth structure and their immediate oral health.

Some questions that you might ask in order to determine what instrument to select would be:

- What type of blade (shape, thickness, length) do I need to access the surface that needs to be debrided?
- What type of shank flexibility do I need in order to adapt the cutting edge to the surface?
- What type of strokes will I be using and can the blade accommodate me with those types of strokes (heavy, light, etc.)?
- Does the arch create challenges that can be addressed by a particular instrument (such as maxillary 3rd molar in a patient that cannot open widely)?

- Do you, as a clinician, have any special comfort needs (such as use of extra-oral fulcrums, comfort grip on the instrument handles, etc.)?

In addition, efficient and effective initial therapy or maintenance procedures cannot be provided unless the debridement instruments are sharp. The sharpness of the cutting edge of the instruments must also be maintained throughout the procedure. This often requires re-sharpening instruments during the therapy session. Instruments can be purchased that also provide blades that maintain sharpness for an extended period of time during use.

3. **Oral health of your patient:** After assessing the patient's oral health, it can be determined the type of instruments that might be needed beyond what normal set-up might contain. Hand instruments can be grouped by whether they are for supragingival scaling or subgingival scaling and debridement in < 4mm areas or subgingival scaling and debridement in > 4mm areas.
4. **Instrument modifications:** Instruments can also be grouped by the modifications that were outlined in the previous section on Basic Instrument Design. These included things such as:⁶
 - Blade design
 - Blade angulation
 - Blade thickness
 - Blade length
 - Shank length
 - Shank flexibility
 - Location of the blade on the shank

Alternatives of Use/Instrumentation

In dental hygiene school during skill development, traditional hand fulcruming positions were often taught with the fulcruming finger placed intraorally and securely on a tooth near the area in which the clinician was scaling. Traditional "patient/operator" positioning between 8 o'clock and 12 o'clock positions were also emphasized. This traditional positioning often required the clinician to work in uncomfortable and strained positions for hands, arms, back and neck.

Alternative Fulcrums

There are many auxiliary or alternative fulcrums that aid in scaling areas that have difficult accessibility. These include:

- **Cross arch:** The fulcrum finger is placed in the same arch on the teeth, but on the opposite quadrant in which you are working (Figure 61).
- **Opposite arch:** The fulcrum is placed in the opposite arch from which you are working (Figure 62).
- **Finger-on-finger:** The fulcrum is placed on a finger of the opposite hand which is resting on the same arch as you are working (Figure 63).
- **Reinforced fulcrum:** The fulcrum is placed on the same arch as you are working and close to the working area. The index finger from the opposite hand is pressed onto the shank of the instrument and gently applies pressure. This increases the lateral pressure when scaling (Figure 64).



Figure 61. Cross Arch.



Figure 62. Opposite arch.

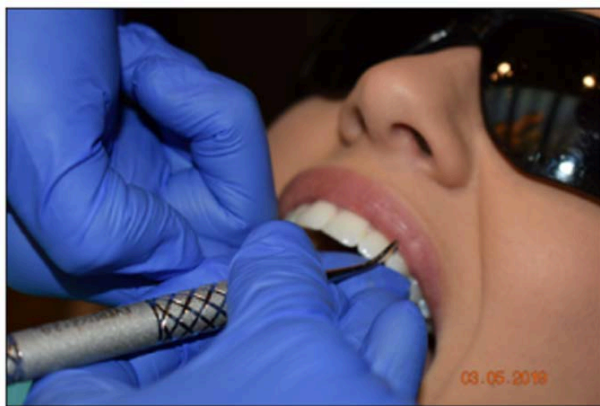


Figure 63. Finger-on-finger.

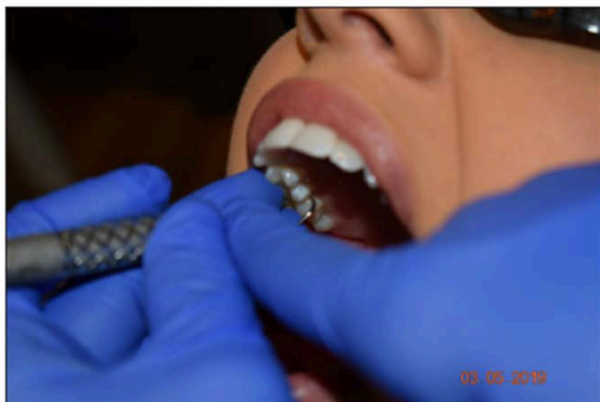


Figure 64. Reinforced Fulcrum.

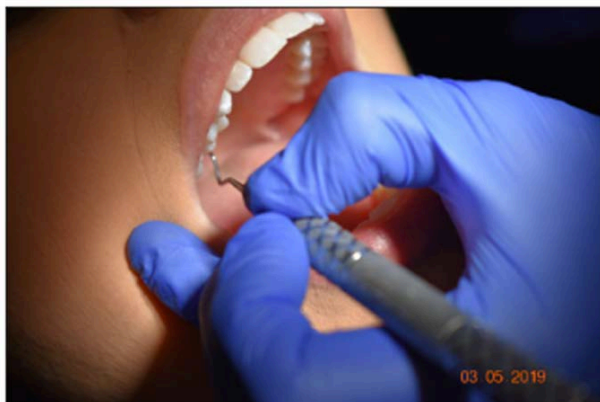


Figure 65. Extraoral Fulcrum.

- **Extraoral fulcrums:** The back of the hand or a finger is placed extra-orally to stabilize and obtain the most correct instrument angulation for activation and stroke (Figure 65).

Alternative fulcrums provide enhanced access to the working area, increase the likelihood of proper instrument angulation and activation and also help to provide increased power in the stroke. But they can also increase the risk of patient or operator injury and instability in the working area.⁷

Alternative Patient and Clinician Positioning

Alternative patient and clinician positions can include utilizing the 1:00 and 3:00 positions, in addition to traditional operator/clinician positioning. It also may require that the patient is placed in a semi upright position instead of the traditional supine position. No matter what patient or clinician position is needed to achieve the desired access to the working area, basic ergonomic principles require three things:

- Maintaining a neutral spine position
- Facing the working area
- Relaxing the shoulder area⁷

Summary

Utilizing the same instruments in the general dental practice for scaling and debridement, no matter what the patient's unique needs happen to be, can be a frustration. It can lead to incomplete scaling and debridement and, ultimately, the patient's periodontal disease progression. Exploring the use of "non-traditional scaling instruments" can allow for a more effective treatment for a patient's periodontal condition and promote a more efficient and ergonomically sound dental hygiene practice.

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: www.dentalcare.ca/en-ca/professional-education/ce-courses/ce569/test

- 1. The blade on the working end of the instrument is also known as _____.**
 - A. cutting edge
 - B. honing edge
 - C. cross-section
 - D. back side

- 2. Which of the following things have to be considered when working on a maxillary first premolar?**
 - A. Number of roots present.
 - B. The furcation in the roots occurs in the last ¼ of the root.
 - C. Mesial root concavity, on the crown from the contact, extending apically.
 - D. All of the above.
 - E. A and C only

- 3. Considerations when selecting a handle option for new instruments include which of the following?**
 - A. Weight
 - B. Size
 - C. Balance
 - D. Texture
 - E. All of the above.

- 4. Which of the following instruments will aid in accessing the distal of the mandibular 2nd molar and allow for traditional fulcruming in the area with less interference from the opposing arch?**
 - A. Gracey 13/14
 - B. SN 137
 - C. Gracey 17/18
 - D. After-Five Gracey 13/14

- 5. Which of the following instruments will effectively aid in the removal of posterior areas of heavy calculus under contact areas?**
 - A. Gracey 11/12
 - B. Nevi 3
 - C. Nevi 4
 - D. Mini five Gracey 13/14

- 6. The Extra-Rigid Graceys are designed for which of the following situations?**
 - A. Heavy calculus
 - B. Gross scaling and root debridement
 - C. Surgery
 - D. A and B only
 - E. A, B, and C

- 7. Diamond tipped curettes can only be used with loose tissue and exposed furcations.**
 - A. True
 - B. False

8. Which of the following instruments is designed with a series of parallel blades that are used in deep pockets to break up large, tenacious calculus deposits?
- A. Periodontal file
 - B. Diamond tipped file
 - C. Gracey 13/14
 - D. Hoe
9. Which from the following instruments, would you select for scaling in a very narrow periodontal pocket on the lingual of #24?
- A. Gracey 1/2
 - B. Vision Curvette 1/2
 - C. Vision Curvette Sub-0
 - D. Langer 3/4
 - E. B or C
10. Which of the following instruments has a small, disc shaped working end and used to remove small, residual calculus deposits?
- A. Debridement curettes
 - B. Langer curettes
 - C. Gracey curettes
 - D. Nevi scalers
11. Which if the following alternative fulcrums is demonstrated by placing the fulcrum on a finger placed on the same arch on which you are working.
- A. Reinforced
 - B. Finger-on-finger
 - C. Cross arch
 - D. Extraoral
12. Which of the following is a series of curettes that are designed with a 60° honed terminal shank instead of the typical 70°?
- A. Maintenance Curettes
 - B. Langer Curettes
 - C. Vision Curvettes
 - D. All of the above.
13. The hoe is used with a push stroke. The chisel is used with a push or pull stroke.
- A. The first statement is true and the second statement is false.
 - B. The first statement is false and the second statement is true.
 - C. Both statements are true.
 - D. Both statements are false.
14. Which of the following instruments has 2 different instruments in one: a sickle on one end and a curette on the other?
- A. Nevi 2
 - B. Extra Rigid Gracey
 - C. Hoe
 - D. SN135/SN137

- 15. Which of the following instruments has a universal blade with a Gracey design and a more rigid shank?**
- A. Langer Currettes
 - B. Vision Curvettes
 - C. Micro mini Currettes
 - D. Chisels

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About the Author

Vickie Parrish Foster, RDH, MEd



Vickie previously served as the Director of the Undergraduate Dental Hygiene program and as an associate professor in the Department of Dental Ecology at the UNC School of Dentistry in Chapel Hill for 32 years. On January 1, 2015, she retired after 40 years in the dental hygiene profession. She received her AAS in dental hygiene from Guilford Technical Community College in Greensboro, NC, her BS in dental auxiliary teacher education at UNC-Chapel Hill in 1981 and a master's degree in adult and higher education at UNC-Chapel Hill in 1983. While at UNC her teaching responsibilities included clinical dental radiology, dental materials, clinical dental hygiene and community dental health. She has presented continuing education courses at the local, state, national and international levels for many years and co-authored a radiology textbook in 1993. Previously, she served on the editorial board for the Journal of Dental Hygiene. She also authored the website review column in the International Journal of Dental Hygiene for many years.

Email: vickie_overman@unc.edu

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