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- **Drag-and-Drop Exercises**

The Drag-and-Drop Exercises test the student's skill at selecting the correct instrument and arranging them in the proper sequence for a tray setup. A selection of instruments is shown, and a type of dental procedure is specified. The student must select the correct instruments and put them in proper order of use on the tray.

- **Weblinks**

A variety of weblinks are provided so the student can pursue further study.

Second Edition



# Dental Instruments

## A Pocket Guide



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# Acknowledgments

I am extremely grateful to the several people who have assisted me in developing the second edition of this textbook. First and foremost, I want to thank all students. Their zest for learning has encouraged me in my efforts to make this text a great process for learning dental instruments. I truly appreciate all the dentists and their staff members who were willing to answer my questions, especially Timothy Farley, DDS. I would also like to thank all the dentists who gave me such great support and who allowed me to borrow instruments for photographs. A special

thanks to Kyle Van Brocklin, DDS, and his registered dental assistant, Nicole Campbell, who allowed me to take photographs of equipment in their offices.

I would like to thank Andy Hartzell and his excellent staff at G. Hartzell & Son for their graciousness in lending me most of the instruments used in the photographs; also Phyllis Martina for helping me obtain the photographs I needed from Hu-Friedy Instruments Co. I would like to thank Ken Cook for his dedication and artistry in taking the photographs for this textbook.

I owe boundless thanks to my colleagues, including periodontist Joyce M. Litch, RDH, DDS, MSD, whom I consulted for the chapters on hygiene instruments and periodontal instruments; she was so giving of her time. Cathy Clarke freely gave both time and endless encouragement in helping me research the sterilization aspects of this text. I am grateful to all my colleagues who were so encouraging and supportive during the phases of this second edition and to Jill Wilson for her constant assistance in whatever I needed to complete this text.

My thanks to my editor, Penny Rudolph, whose enthusiasm and vision of this book remain the same as mine, and to my developmental editor, Courtney Sprehe,

for all her encouragement and hard work in getting the text to production.

I could not have written this second edition without the love, support, and prayers of all my family and friends: my son Michael, my daughter-in-law, Rebecca, and my grandson, Christian, who gave me such joy when I needed some encouragement; my son Matthew, who was always there for me anytime of the day or night; my brother Ray, my sister Meri, and my cousin Elaine, who gave their constant support and love; and my very dear and best friend, John LaFountain, whose love and encouragement saw me through all the phases of this book.

**Linda R. Bartolomucci Boyd**



## Note to the Students

This text is designed to help you master the identification and function of instruments and equipment used in dental practices. The 17 chapters cover instruments required for clinical procedures in both general and specialty practices.

As you can see, the text is formatted in the flash card style. For the instrument pages, each instrument is given a

of the instrument are listed on the bottom page. Some instruments on the top page have numbered parts. In these cases, the bottom page identifies the parts matching the numbers on the instrument. As you master the name and function of an instrument, you can test yourself. Visit the Evolve web site (<http://www.evolve.com>) for additional resources. The Evolve web site provides additional resources for you to use in your learning. Visit the Evolve web site for more information.

Verify your answer by checking the bottom page. Keep in mind that it is important to be able to name the instrument, as well as describe its function. You can also test yourself on the Evolve web site (the URL is given on p. ii) by using the Assessment Questions from each chapter and the drag-and-drop exercises.

After mastering the individual instruments, you must be able to select and place instruments in order of use for specific dental procedures. At the end of most chapters there is an example of a tray setup that shows the instruments covered in that chapter. The array may include instruments from other chapters to portray a complete tray setup. For example,

some of the instruments from Chapter 1, such as the basic setup (i.e., mouth mirror, explorer, and cotton forceps), are included on all tray setups. Also, the tray setups in this text include only instruments and not the auxiliary items that would be used for dental procedures.

The design elements of flash card-style learning, comprehensive chapters for specific dental procedures, and examples of tray setups can help you master an important and intricate part of dental practice. I wish you all success in the field of dentistry. I know you will be a great asset to the dental profession.

Linda R. Bartolomucci Boyd

## About the Evolve Site

The Evolve web site for *Dental Instruments: A Pocket Guide* is a great addition to the text, and both faculty and students can benefit from it. To get started on the Evolve site, the student or instructor just logs on to and follows the instructions provided.

### For Students

The Evolve site for students has two main parts: assessment quizzes for each chapter and interactive drag-and-drop exercises (a new feature for the second edition). The assessments allow students

to test their knowledge by answering questions about each chapter. Students are able to see how many questions they answer correctly, and the correct answers are provided for any questions they miss. The drag-and-drop exercises can test the student's skill at selecting the correct instruments and arranging them in the proper sequence for a given setup. For these exercises, a number of instruments is shown, and the user of dental procedure is selected. The student must arrange the instruments and answer questions

order of use on the tray. The student is given feedback on whether or not their answer is correct. The Evolve site also features a downloadable test form and web links for further study.

### For Faculty

The Evolve site for faculty is a vital adjunct for instructors using this text. The web site can be used in a number of ways for teaching and as a source of different tools for measuring students' learning proficiency.

For example, pictures from all 17 chapters can be downloaded and used in a Power Point presentation. This is a great way to present each instrument and to discuss its use with students.

These pictures in Power Point can also be used to test students' recognition of the instrument, along with their knowledge of its function and special characteristics. To help with this process, I have developed a test sheet composed of a table with three columns, one for the name, one for the function, and one for the special characteristics. This test sheet can be downloaded and adapted to the instructor's specific needs.

The instructor site also provides a test bank of questions. The questions, which are all multiple choice, appear in Examview, a program that allows the instructor to customize quizzes and tests. In some cases I have provided different questions about the same instrument.



This gives the instructor a choice in the style of question, as well as a variety of ways to measure a student's proficiency.

In addition to these features, the faculty site also includes all the material that appears on the student site.

The Evolve site is a wonderful asset to *Dental Instruments: A Pocket Guide*. I have found it extremely useful both in

my presentations and for testing students. I hope that instructors find the web site an invaluable complement to their teaching efforts, and that students find it a helpful tool for measuring their progress in mastering dental instruments.

Linda R. Bartolomucci Boyd

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CHAPTER 1

Basic Dental Instruments



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## INSTRUMENT

# Mouth Mirror

**FUNCTION** To provide indirect vision  
To retract lips, cheeks, and tongue  
To reflect light into the mouth

**CHARACTERISTICS** Front surface mirrors—Accurate, distortion-free image  
Flat surface mirrors—Used in disposable models  
Concave mirrors—Magnify image  
Double-sided mirrors—Used to retract tongue or cheek and view intraoral cavity simultaneously  
Range of sizes  
Commonly used sizes: No. 4 and no. 5  
Single ended  
Different mirror handles available  
Used with most tray setups



## INSTRUMENT

# Explorers

**FUNCTION** To examine teeth for decay (caries), calculus, furcations, or other abnormalities

**CHARACTERISTICS** Pointed tips; sharp, thin, flexible  
Single or double ended

- Double-ended models—May have different styles of working ends; also may have explorer on one end and periodontal probe on the other

Used with most tray setups

Variety of sizes and types:

- ① Orban
- ② Pigtail
- ③ Shepherd's hook

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**INSTRUMENT**

## Cotton Forceps (Pliers)

**FUNCTION** To grasp material and/or transfer it into and out of the oral cavity

**CHARACTERISTICS** Plain or serrated tips  
Pointed or rounded tips  
Locking forceps (see Chapter 11)  
Range of sizes available  
Used with most tray setups



**INSTRUMENT**

## Instrument Handles

**FUNCTION** To hold (grasp) instrument

**CHARACTERISTICS**

- Single or double ended
- Removable working ends (replaceable and interchangeable)  
*Examples: Mouth mirror, scaler*
- Nonremovable working ends also available
- Larger diameter models—Help lighten grasp and maximize control
- Alternating diameter models—Lessen stress associated with carpal tunnel syndrome
- Lighter weight models—Minimize fatigue
- Variety of sizes, styles, and textures:
  - ① Small, round  $\frac{1}{4}$ -inch stainless steel
  - ② Standard,  $\frac{5}{16}$ -inch hollow stainless steel
  - ③ Lightweight,  $\frac{3}{8}$ -inch slip-resistant pattern
  - ④ Satin Steel model—Lightweight, ergonomically designed



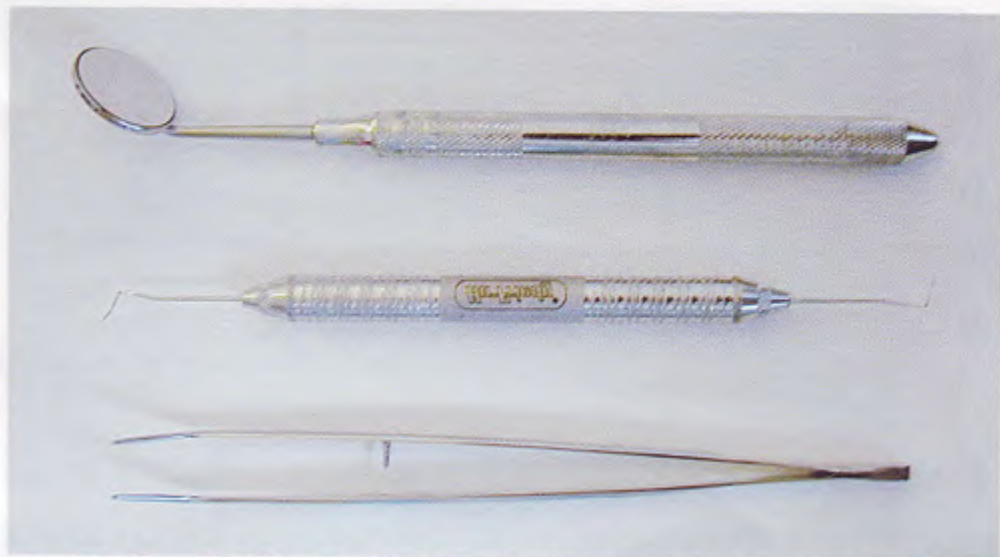
## INSTRUMENT

## Instrument Handles

**FUNCTION** To hold (grasp) instrument

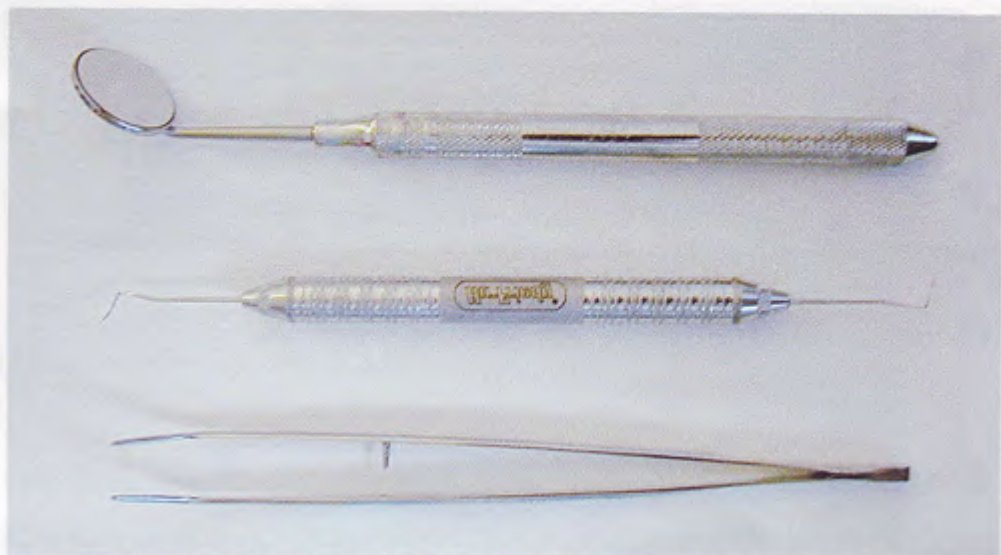
- CHARACTERISTICS**
- Single or double ended
  - Removable working ends (replaceable and interchangeable)
    - Examples:* Mouth mirror, scaler
  - Nonremovable working ends also available
  - Larger diameter models—Help lighten grasp and maximize control
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    - ④ Satin Steel model—Lightweight, ergonomically designed



**TRAY SETUP****Basic****FROM TOP TO BOTTOM**

Mouth mirror, explorer, cotton forceps

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**TRAY SETUP****Basic****FROM TOP TO BOTTOM**

Mouth mirror, explorer, cotton forceps

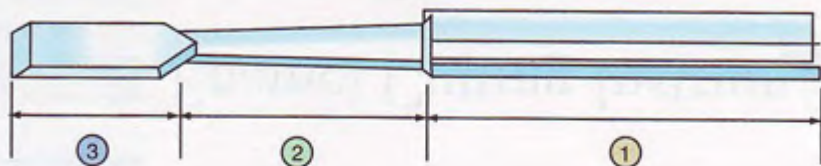
The image shows three dental instruments, likely enamel cutters, arranged vertically. Each instrument is shown in profile against a light blue rectangular background. The top instrument has a straight, slightly curved cutting edge. The middle instrument has a more pronounced curve. The bottom instrument has a distinct hook-like or curved cutting edge.

CHAPTER 2

# Enamel Cutting Instruments

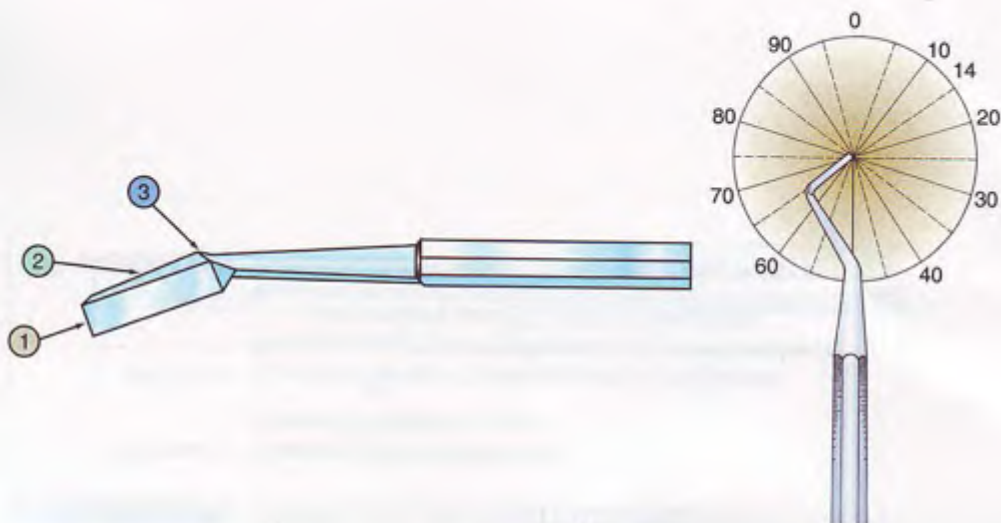


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## Parts of an Instrument

- ① **HANDLE** Grasping end of instrument  
Variety of sizes and styles
- ② **SHANK** Connects handle to working end of instrument  
May be straight or may have one or more angles to accommodate specific areas of the mouth
- ③ **WORKING END** May have cutting edge, bevel, point, nib, or beaks



## INSTRUMENT

### Three-Number Instrument\*

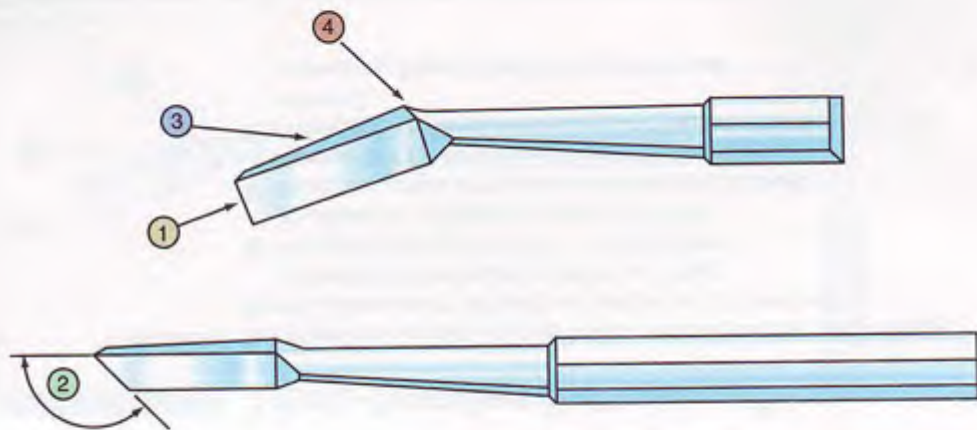
**FUNCTION** Numbers on handle indicate width, length, and angle of blade.

- ① Indicates width of blade in tenths of millimeters  
*Example:* 20 indicates a width of 2 mm
- ② Indicates length of blade in millimeters  
*Example:* 8 indicates a length of 8 mm
- ③ Indicates angle of blade from long axis of shaft  
*Example:* 12 indicates an angle of 12 degrees

The designation for the instrument described above would be 20-8-12.

*Examples:* Enamel hatchet, enamel hoe

\*The instrument number formula was designed by Dr. G.V. Black, Northwestern University.



**INSTRUMENT**

### Four-Number Instrument\*

**FUNCTION** Numbers on handle indicate width of blade, angle of cutting edge, length of blade, and angle of blade.

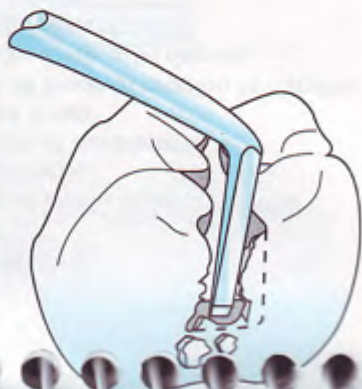
- ① Indicates width of blade in tenths of millimeters  
*Example:* 20 indicates a width of 2 mm
- ② Indicates angle of cutting edge of blade in relation to handle  
*Example:* 95 indicates a cutting edge angle of 95 degrees
- ③ Indicates length of blade in millimeters  
*Example:* 8 indicates a length of 8 mm
- ④ Indicates angle of blade from long axis of shaft  
*Example:* 12 indicates a blade angle of 12 degrees

The designation for the instrument described above would be 20-95-8-12.

*Examples:* Angle former, gingival margin trimmers

\*The instrument number formula was designed by Dr. G.V. Black, Northwestern University.



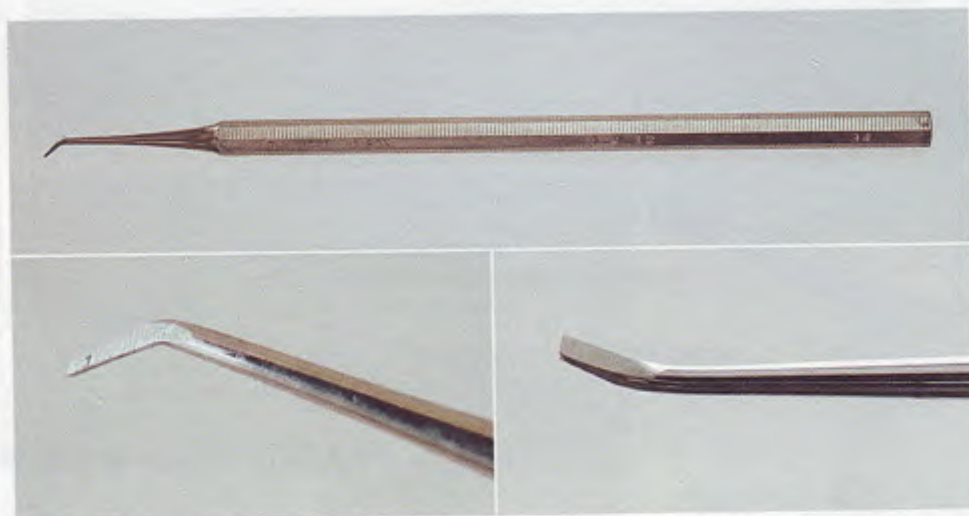


## INSTRUMENT

# Enamel Hatchet

**FUNCTION** To clean and smooth walls in cavity preparation  
To remove enamel not supported by dentin

**CHARACTERISTICS** Used with push motion  
Cutting edge on same plane as handle  
Single or double ended



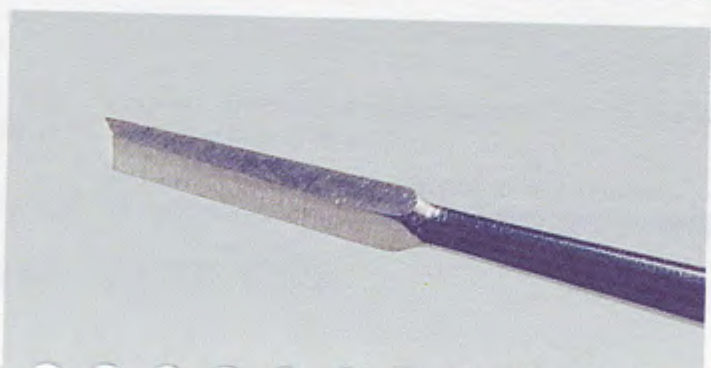
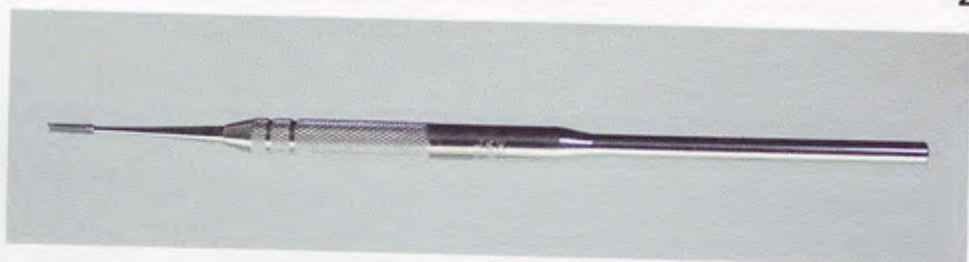
## INSTRUMENT

### Enamel Hoe

**FUNCTION** To clean and smooth floor and walls in cavity preparation  
To form or accentuate line angles in cavity preparation

**CHARACTERISTICS** Used with pulling motion  
Cutting edge or blade almost perpendicular to handle

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**INSTRUMENT**

## Straight Chisel

**FUNCTION** To plane and cleave enamel in cavity preparation

**CHARACTERISTICS** Used with push motion  
Single-bevel cutting edge  
Single or double ended





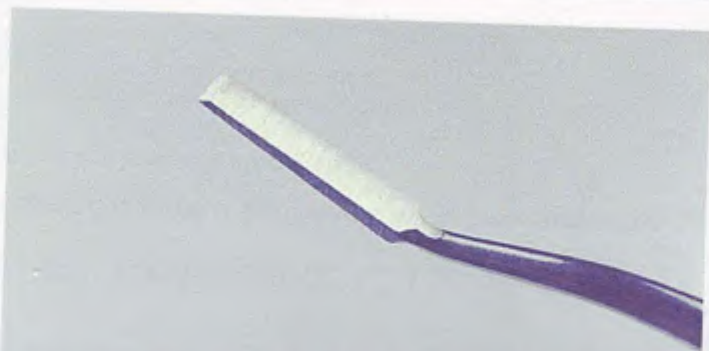
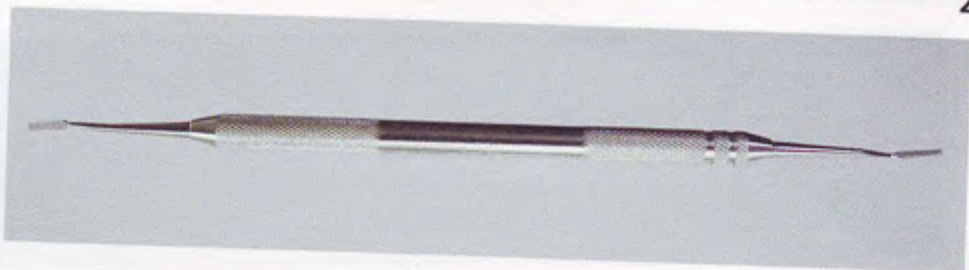
## INSTRUMENT

### Wedelstaedt Chisel

**FUNCTION** To plane and cleave enamel in cavity preparation

**CHARACTERISTICS** Used with push motion  
Curved blade  
Single-bevel cutting edge  
Single or double ended

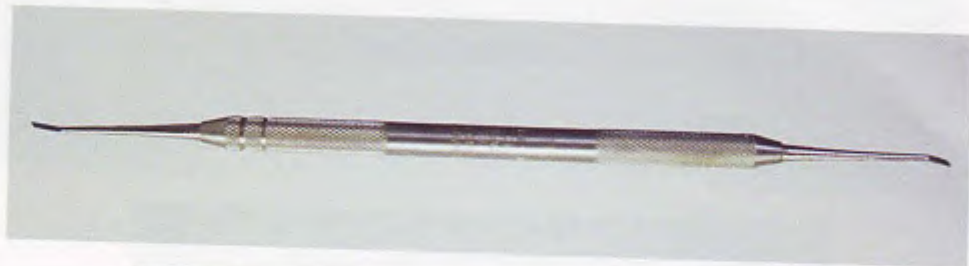
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**INSTRUMENT**

## Binangle Chisel

**FUNCTION** To plane and cleave enamel in cavity preparation

**CHARACTERISTICS** Used with push motion  
Two angles for cutting edges  
Single or double ended



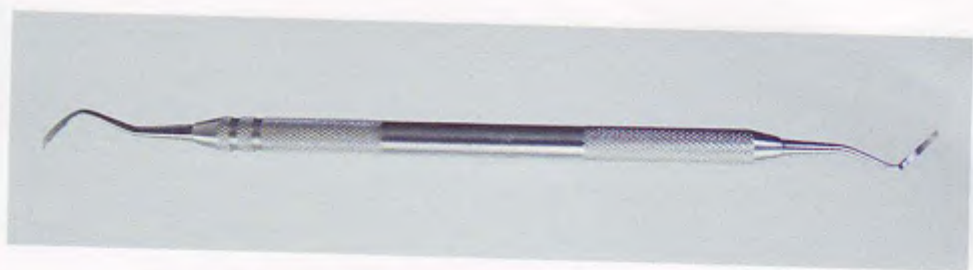
**INSTRUMENT**

## Angle Former

**FUNCTION** To accentuate line and point angles in internal outline and retention in cavity preparation

**CHARACTERISTICS** Cutting edge at an angle  
Single or double ended



**INSTRUMENT**

## Gingival Margin Trimmer—Mesial

**FUNCTION** To bevel cervical walls of mesial retention areas

**CHARACTERISTICS** Curved blade  
Cutting edge at angle to blade  
Double ended (one end curves to the right, the other to the left)

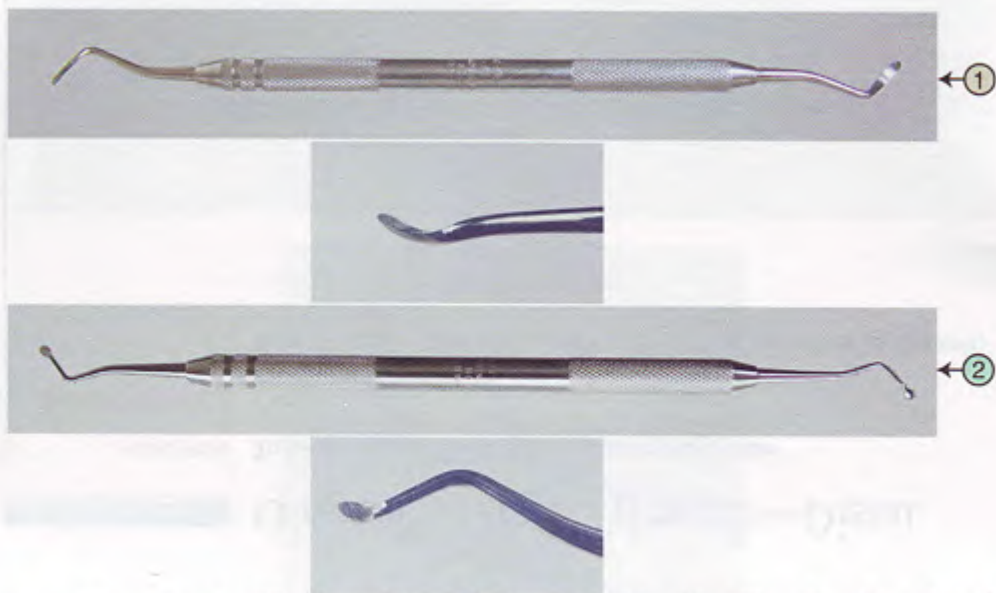


**INSTRUMENT**

## Gingival Margin Trimmer—Distal

**FUNCTION** To bevel cervical walls of distal retention areas

**CHARACTERISTICS** Curved blade  
Cutting edge at angle to blade  
Double ended (one end curves to the right, the other to the left)



## INSTRUMENT

# Spoon Excavators

### FUNCTION

To remove carious dentin  
Secondary functions:

- To remove temporary crowns
- To remove temporary cement in temporary restoration
- To remove permanent crown during try-in

### CHARACTERISTICS

Spoon-shaped with cutting edge  
Range of sizes:

- ① Large
- ② Small

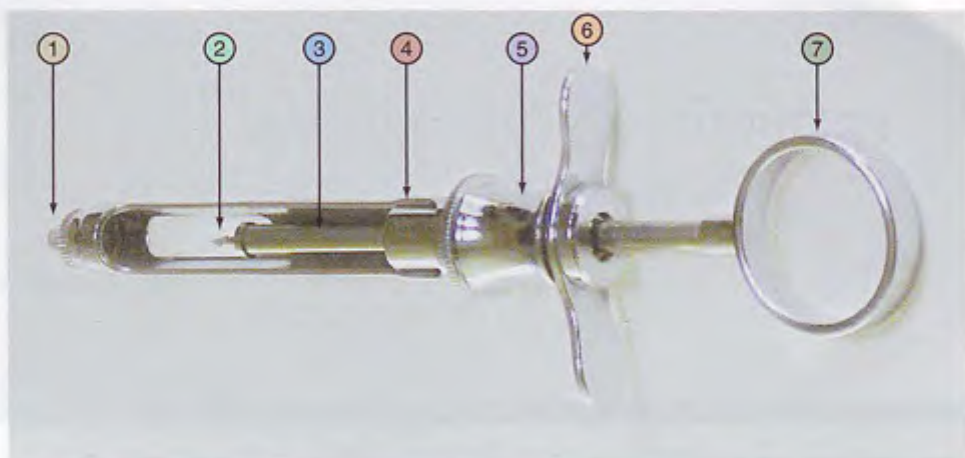
Single or double ended



## CHAPTER 3

# Local Anesthetic Syringe and Components





## INSTRUMENT

# Anesthetic Aspirating Syringe

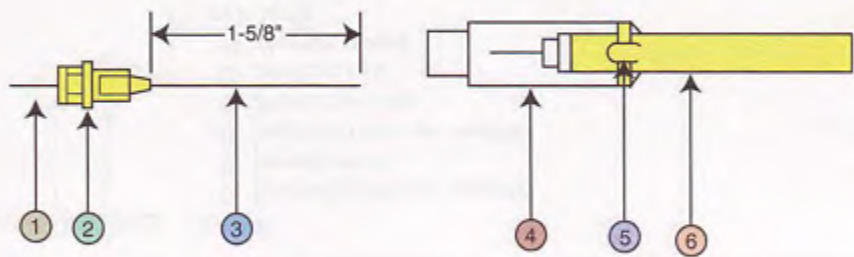
**FUNCTION** To administer a local anesthetic

**CHARACTERISTICS** Parts:

- ① Threaded tip
- ② Harpoon
- ③ Piston rod
- ④ Barrel of syringe
- ⑤ Finger grip
- ⑥ Finger bar
- ⑦ Thumb ring

### PRACTICE NOTES

1. Disposable syringes equipped with needles and preloaded with anesthetic are available.
2. Syringes with harpoons are considered aspirating syringes.



**INSTRUMENT**

## Long Needle

**FUNCTION** To administer anesthetic by block injection on mandibular arch

**CHARACTERISTICS** Parts:

- ① Cartridge end of needle
- ② Needle hub
- ③ Injection end of needle
- ④ Protective cap
- ⑤ Seal on cap
- ⑥ Needle guard

1<sup>5</sup>/<sub>8</sub> inches long

Variety of gauges

- Gauge number—Identifies diameter (thickness) of needle
- Larger gauge number—Indicates thinner needle (e.g., 30 gauge is thinner than 25 gauge)





## INSTRUMENT

# Anesthetic Cartridge

**FUNCTION** To hold liquid anesthetic for injection

- CHARACTERISTICS**
- Contains 1.8 ml of anesthetic solution
  - Rubber stopper—Inserts into harpoon of syringe
  - Aluminum cap with rubber diaphragm—Inserts into needle attached to syringe
  - Several types of anesthetic solution available
  - Color code of cartridge—Identifies type of anesthetic (type used depends on patient's health history and dental procedures performed)
1. When looking at the ratio of epinephrine, the lower the second number, the higher the percentage of vasoconstrictor.
  2. Longer lasting anesthetic has a higher percentage of vasoconstrictor.
  3. Anesthetic is available without a vasoconstrictor.

**INSTRUMENT****Needle Stick Protector—Jenker™**

- FUNCTION** To hold needle sheath for one-hand recapping after injection
- CHARACTERISTICS** Low center of gravity for stability in recapping  
Helps prevent needle stick accidents

**TRAY SETUP**

## Local Anesthetic Syringe

**FROM LEFT TO RIGHT**

Anesthetic aspirating syringe, anesthetic cartridges, long needle, short needle, needle stick protector, topical anesthetic, cotton swabs



CHAPTER 4

Evacuation Devices and  
Air/Water Syringe



**INSTRUMENT**

## High-Velocity (Volume) Evacuation (HVE) Tip

**FUNCTION** To evacuate large volumes of fluid and debris from the oral cavity

**CHARACTERISTICS** Straight or slightly angled at one or both ends  
Stainless steel, autoclavable plastic, or disposable plastic  
Attaches to high-velocity tubing on dental unit

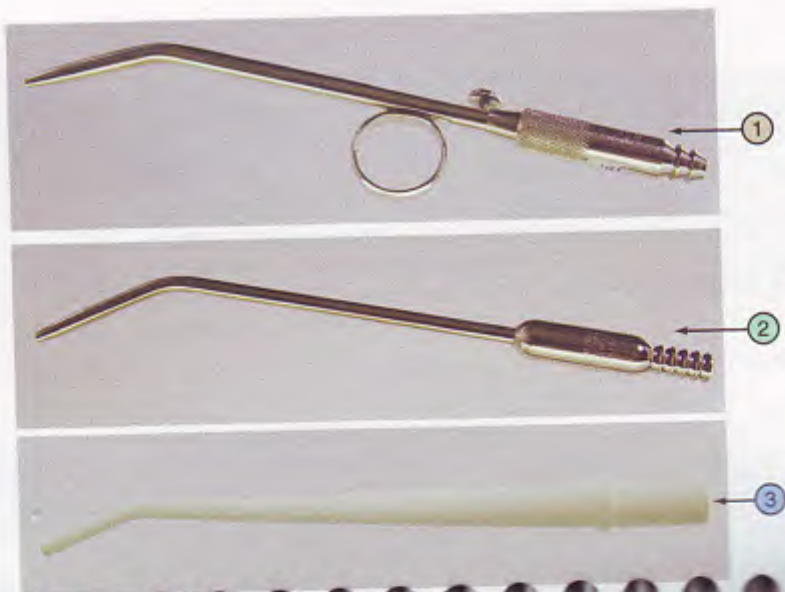
**INSTRUMENT**

## Low-Velocity (Volume) Evacuation Tip/Saliva Ejector

**FUNCTION** To evacuate smaller volumes of fluid from the oral cavity

**CHARACTERISTICS** Disposable plastic for single use  
Can be bent for placement under tongue and in other areas of mouth or can be used straight  
Attaches to low-velocity tubing on dental unit  
Variety of styles





## INSTRUMENT

# High-Velocity (Volume) Surgical Evacuation Tip

### FUNCTION

To evacuate fluid from oral cavity and surgical site

### CHARACTERISTICS

Stainless steel, autoclavable plastic, disposable plastic

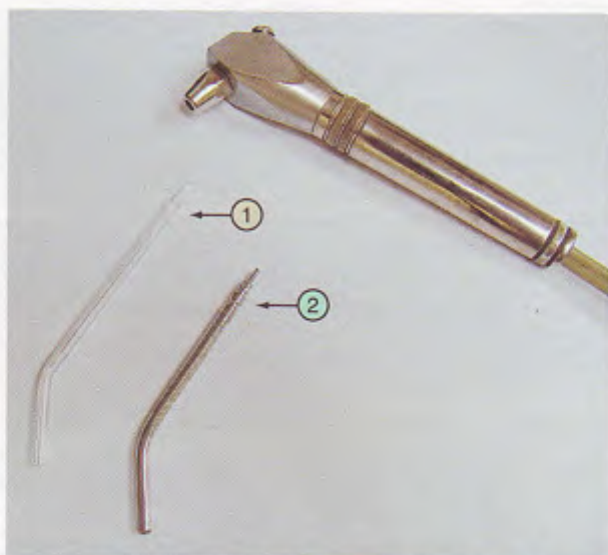
Narrowed tip (accommodates surgical site)

Attaches to high-velocity tubing on dental unit

May require connecting tube for adaptation to surgical evacuation tip

- Stainless steel surgical tips narrow at insertion of tubing; additional tubing is necessary to connect to high velocity on dental unit.
- ① and ② Autoclavable tips
  - ③ Disposable tip

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**INSTRUMENT**

## Air/Water Syringe with Removable Tip

**FUNCTION** To rinse and dry specific teeth or entire oral cavity

**CHARACTERISTICS** Three-way syringe—Air, water, or spray with water and air  
 Syringe tip—Attaches to air/water syringe on dental unit

- ① Disposable plastic syringe tip for single use
- ② Autoclavable metal syringe tip

CHAPTER 5

Dental Handpieces







## INSTRUMENT

# High-Speed Handpiece

**FUNCTION** To use with bur to cut tooth with decay or other dental anomalies

*Example:* Cavity preparation for restoration or crown

To use with bur for adjusting crowns and bridges for final fit

**CHARACTERISTICS** Handpiece is run by air pressure at a maximum speed of 450,000 rotations per minute.

On high-speed handpiece, bur generates extreme amount of heat.

Instrument sprays water/air or air on bur for cooling purposes to prevent damage to pulp.

Handpiece attaches to tubing on dental unit.

Different styles of securing bur are available:

- ① Power level chuck
- ② Push-button chuck
- ③ Conventional chuck



## INSTRUMENT

# Fiberoptic High-Speed Handpiece

**FUNCTION** To illuminate tooth during preparation for restoration  
To provide light intraorally during use of handpiece

**CHARACTERISTICS** Light(s) at head of handpiece  
Lights working area while handpiece rotates  
Same characteristics as high-speed handpiece  
Attaches to tubing on dental unit



**INSTRUMENT**

## Slow-Speed Motor with Straight Handpiece Attachment

**FUNCTION** To use with slow-speed attachments  
To use straight attachment with long-shank straight bur

**CHARACTERISTICS** Maximum speed of 30,000 rotations per minute; used as adjunct to high-speed handpiece  
Contra-angle or prophy angle attachments—Designed for intraoral use  
Straight attachment—Usually used outside oral cavity  
Slow-speed handpiece, motor—Attaches to tubing on dental unit




**INSTRUMENT**

## Slow-Speed Motor with Contra-Angle Handpiece Attachment

**FUNCTION** To use with burs for intraoral and extraoral procedures:  
 To remove decay  
 To refine cavity preparation  
 To adjust occlusal restorations  
 To polish amalgam restorations  
 To adjust provisional and permanent crowns and bridges  
 To adjust partials and dentures

**CHARACTERISTICS** Attaches to straight handpiece  
 Slow-speed handpiece and motor—Attaches to tubing on unit  
 Types:  
 Latch type—Latch-type bur or latch-type prophylaxis polishing cup or brush  
 Friction grip—Friction-grip bur



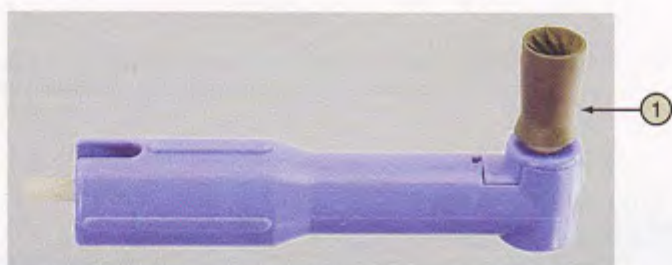
## INSTRUMENT

### Prophy Slow-Speed Handpiece\* with Disposable Prophy Angle Attachment

**FUNCTION** To polish teeth with prophy cup or brush attachment

**CHARACTERISTICS** Prophy angle attaches to motor  
Prophy handpiece and motor attaches to tubing on dental unit.  
Lightweight design to reduce hand and wrist fatigue.  
Ergonomic shape for natural hand positioning.

\*Referred to as *RDH* (registered dental hygienist) *prophy handpiece*.  
Pictured: MIDWEST® RDH® Hygiene Handpiece for Disposable Prophy Angles.


**INSTRUMENT**

## Disposable Prophy Angle Attachments for Slow-Speed Handpiece

**FUNCTION** To polish teeth with prophylaxis cup and brush

**CHARACTERISTICS** Attaches to straight or prophy handpiece

Types:

- ① Disposable prophy cup—For polishing all surfaces of teeth
- ② Disposable prophy brush—For polishing occlusal surfaces and deep grooves on lingual surfaces of anterior teeth





## INSTRUMENT

# Prophy Slow-Speed Handpiece\*

**FUNCTION** To polish teeth with prophy cup or brush

**CHARACTERISTICS** Prophy angle is one piece.  
 Disposable screw-type prophy cup or brush attaches to prophy angle slow-speed handpiece.  
 Lightweight design to reduce hand and wrist fatigue.  
 Ergonomic shape for natural hand positioning.

Attachments:

- ① Flat-end brush
- ② Tapered-end brush
- ③ Prophy cup

\*Referred to as RDH (registered dental hygienist) *prophy handpiece*.  
 Pictured: MIDWEST® RDH® Hygiene Handpiece with Prophy Right Angle.

**INSTRUMENT**

## Electric Handpiece Unit and Handpiece Attachments

**FUNCTION** To use with bur for intraoral cavity preparation  
To use with endodontic nickel-titanium rotary instruments  
To use with bur for trimming of provisional crowns  
To use with bur for adjusting permanent restorations, crowns, and bridges

**CHARACTERISTICS** Speed (i.e., rotations per minute [rpm]) can be set before procedure.



## INSTRUMENT

# Surgical Electrical Handpiece Unit and Implant Handpiece

**FUNCTION** To use with depth drills for implants  
To use with sterile water for cooling drilling system

**CHARACTERISTICS** Air driven  
Latch-type attachment on handpiece  
Maximum speed of 85,000 rotations per minute (rpm)  
Lower speed (e.g., 810 rpm) used for implant  
Attachment available for splitting impacted teeth

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## INSTRUMENT

# Air Abrasion Unit and Handpiece

**FUNCTION** To use for class I or class VI cavities instead of handpiece  
To use for preparation of occlusal surface for sealants

**CHARACTERISTICS** Handpiece uses high pressure of alpha-alumina particles through small device that removes decay and/or prepares pit and fissures for sealants or restoration.  
Minimal use of anesthesia is required.



## INSTRUMENT

# Laser Handpiece Unit and Laser Handpiece

**FUNCTION** To cut, vaporize, or cauterize soft tissue

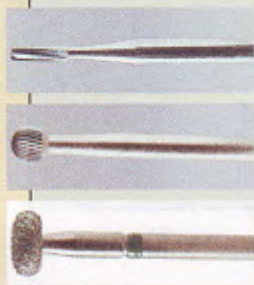
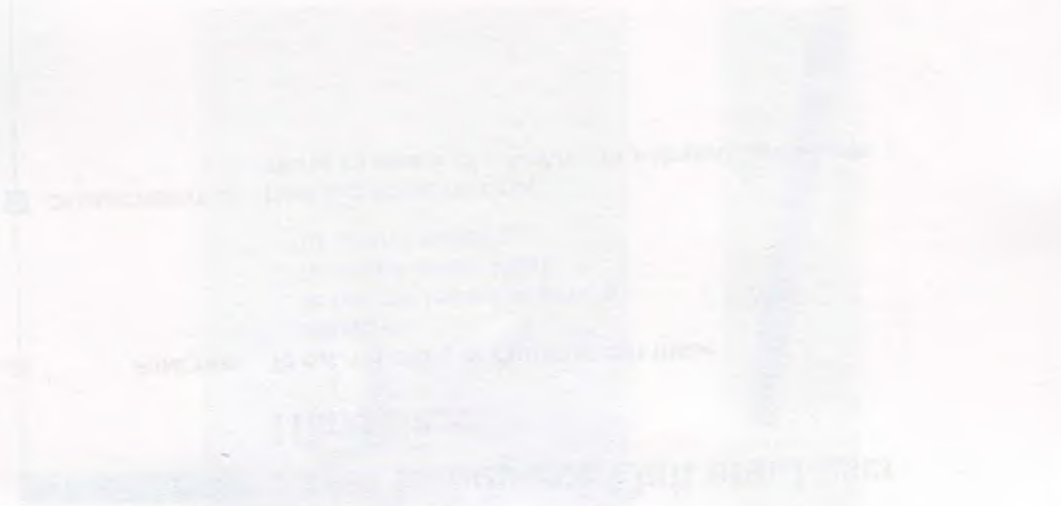
*Examples:*

To remove lesions or tumors

To reduce excess tissue

To control bleeding

**CHARACTERISTICS** New technological device  
Works by means of a highly concentrated light source



**CHAPTER 6**

**Burs for High-Speed  
and Low-Speed Handpieces**





**INSTRUMENT**

## Bur

**FUNCTION** To be used in high-speed or low-speed handpiece

**CHARACTERISTICS** **Parts**

① **Head:** Part of bur that cuts, polishes, or finishes  
Available in a variety of shapes and sizes

*Examples:*

Fit a variety of shanks

*Examples:*

- No. 2 round bur in friction grip shank
- No. 2 round bur in latch-type shank
- No. 2 round bur in straight shank

Pictured: MIDWEST Bur

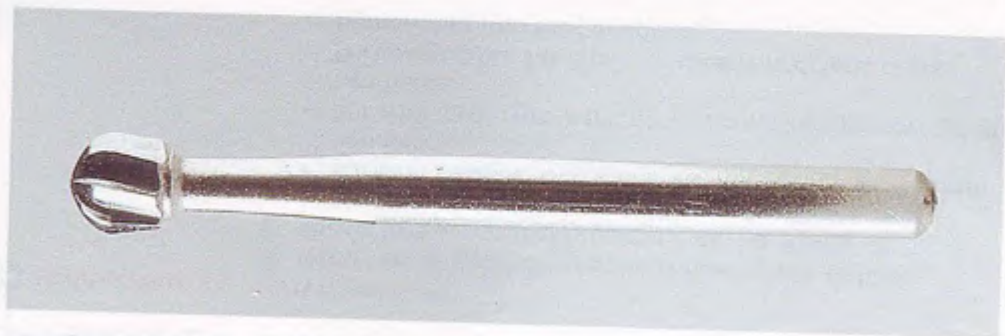
## INSTRUMENT

## Bur (continued)

## CHARACTERISTICS

## Parts (continued)

- ② **Neck:** Part of bur that tapers to connect shank to head
- ③ **Shank:** Part of bur that is inserted into handpiece
  - Length and style vary depending on handpiece used.
  - Bur with straight, long shank fits into straight slow-speed handpiece.
  - Bur with latch-type shank fits into contra-angle slow-speed handpiece.
  - Friction grip bur fits into high-speed handpiece; chuck tightens bur into the handpiece.

**INSTRUMENT****Round Bur**

**FUNCTION** To remove caries from tooth structure  
To open tooth for endodontic treatment

**CHARACTERISTICS** Range of sizes  
Commonly used sizes: No. 1/4 to no. 8

Pictured: MIDWEST Round Bur



**INSTRUMENT****Pear-Shaped Bur**

**FUNCTION** To open tooth for a restoration  
To remove caries

**CHARACTERISTICS** Frequently used in preparation of composite restorations  
Range of sizes  
Commonly used sizes: No. 330 to no. 333  
Bur head available in long  
*Example: No. 333L*

Pictured: MIDWEST Pear-Shaped Bur

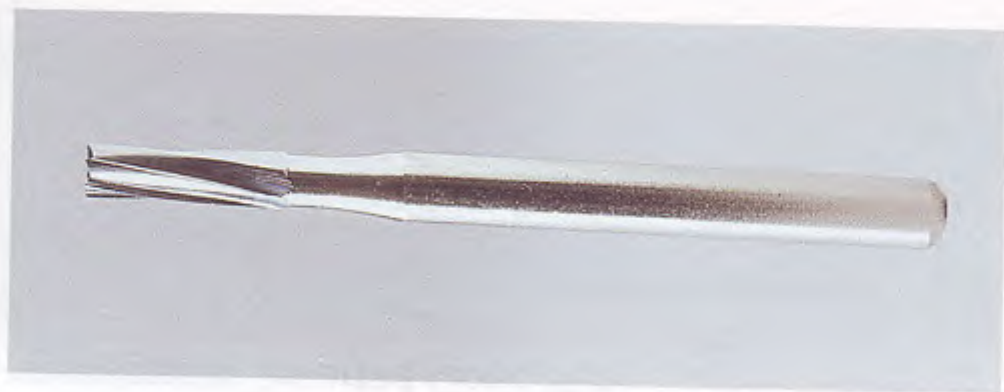

**INSTRUMENT**

## Inverted Cone Bur

**FUNCTION** To remove caries  
To establish retention in tooth for cavity preparation

**CHARACTERISTICS** Range of sizes  
Commonly used sizes: No. 33½ to no. 39

Pictured: MIDWEST Inverted Cone Bur



## INSTRUMENT

### Straight Fissure Bur—Plain Cut

**FUNCTION** To cut cavity preparation  
To form inner walls of cavity preparation  
To place retention grooves in walls of cavity preparation

**CHARACTERISTICS** Cutting part of bur—Has parallel sides  
Range of sizes  
Commonly used sizes: No. 56 to no. 58  
May have short or long shank for adaptation to a variety of cavity preparations; *S* at end of number indicates short shank, *L* indicates long shank  
*Examples:* No. 56S, no. 56L

Pictured: MIDWEST Straight Fissure Bur—Plain Cut





### INSTRUMENT

## Tapered Fissure Bur—Plain Cut

**FUNCTION** To cut cavity preparation  
To form angles in walls of cavity preparation  
To place retention grooves in walls of cavity preparation

**CHARACTERISTICS** Cutting part of bur—Has tapered sides  
Range of sizes  
Commonly used sizes: No. 168 to no. 171  
May have short or long shank for adaptation to a variety of cavity preparations; *S* at end of number indicates short shank, *L* indicates long shank  
*Example:* No. 168S, no. 171L

Pictured: MIDWEST Tapered Fissure Bur—Plain Cut

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#### INSTRUMENT

### Straight Fissure Bur—Crosscut

**FUNCTION** To cut cavity preparation  
To form walls of cavity preparation  
To place retention grooves in walls of cavity preparation

**CHARACTERISTICS** Cutting part of bur—Has parallel sides with horizontal cutting edges  
Range of sizes  
Commonly used sizes: No. 556 to no. 558  
May have long shank for adaptation to a variety of cavity preparations; *L* at end of number indicates long shank  
*Example:* No. 556L

Pictured: MIDWEST Straight Fissure Bur—Crosscut


**INSTRUMENT**

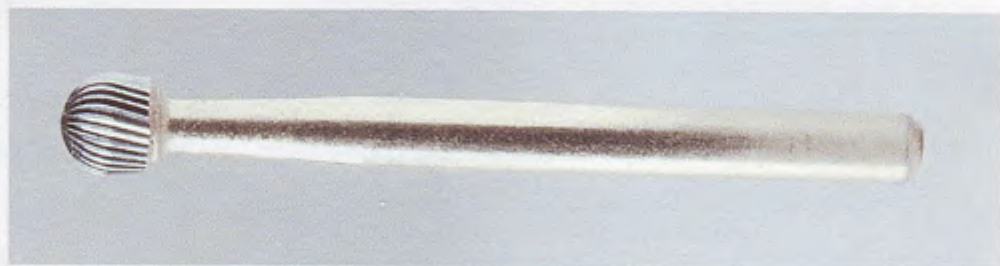
## Tapered Fissure Bur—Crosscut

**FUNCTION** To cut cavity preparation  
To form angles in walls of cavity preparation  
To place retention grooves in walls of cavity preparation

**CHARACTERISTICS** Cutting part of bur—Has tapered sides with horizontal cutting edges  
Range of sizes  
Commonly used sizes: No. 699 to no. 703  
May have long shank for adaptation to a variety of cavity preparations; *L* at end of number indicates long shank  
*Example:* No. 701L

Pictured: MIDWEST Tapered Fissure Bur—Crosscut



**INSTRUMENT**

## Finishing Bur

**FUNCTION** To finish composite restoration  
To finish restoration by restoring anatomy in tooth  
To equilibrate or adjust occlusion

**CHARACTERISTICS** Variety of shapes and sizes

Pictured: MIDWEST Finishing Bur

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#### INSTRUMENT

### Diamond Bur—Flat-End Taper

**FUNCTION** To reduce a tooth for crown preparation when a square shoulder is needed

**CHARACTERISTICS** Range of grits (coarse to superfine); grit designated by color band on shank of diamond bur or by letter after name of diamond bur  
Superfine diamond burs—Used for finishing restorations  
Variety of shapes and sizes

Pictured: MIDWEST Diamond Bur—Flat-End Taper

**INSTRUMENT****Diamond Bur—Flat-End Cylinder**

**FUNCTION** To reduce a tooth for crown preparation when parallel walls and flat floors are needed

**CHARACTERISTICS** Range of grits (coarse to superfine); grit designated by color band on shank of diamond bur or by letter after name of diamond bur  
Superfine diamond burs—Used for finishing restorations  
Variety of shapes and sizes

Pictured: MIDWEST Diamond Bur—Flat-End Cylinder




**INSTRUMENT**

## Diamond Bur—Flame

**FUNCTION** To reduce a tooth for crown preparation for subgingival margins

**CHARACTERISTICS** Range of grits (coarse to superfine); grit designated by color band on shank of diamond bur or by letter after name of diamond bur  
 Superfine diamond burs—Used for finishing restorations  
 Variety of shapes and sizes

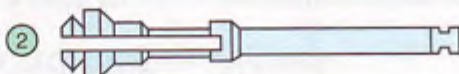
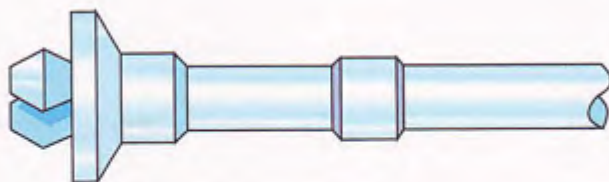
Pictured: MIDWEST Diamond Bur—Flame

**INSTRUMENT****Diamond Bur—Wheel**

**FUNCTION** To reduce a tooth for crown preparation on lingual aspect of anterior teeth and to reduce bulk of incisal edges

**CHARACTERISTICS** Range of grits (coarse to superfine); grit designated by color band on shank of diamond bur or by letter after name of diamond bur  
Superfine diamond burs—Used for finishing restorations  
Variety of shapes and sizes

Pictured: MIDWEST Diamond Bur—Wheel



**INSTRUMENT**

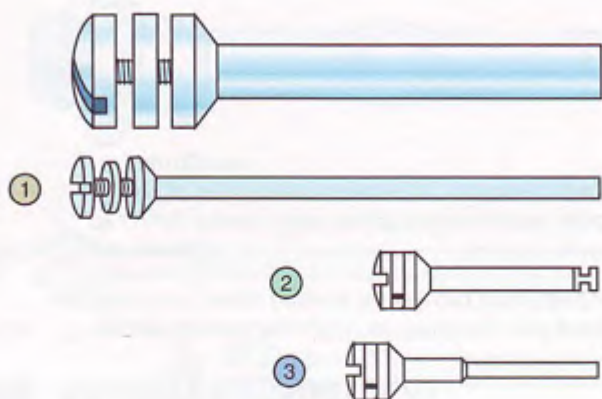
## Mandrel—Snap On

**FUNCTION** To attach discs to mandrel for finishing and polishing inside or outside oral cavity (device is inserted into handpiece)

**CHARACTERISTICS** Shank types:

- ① Long shank—For straight slow-speed handpiece
- ② Short latch-type shank—For contra-angle slow-speed handpiece



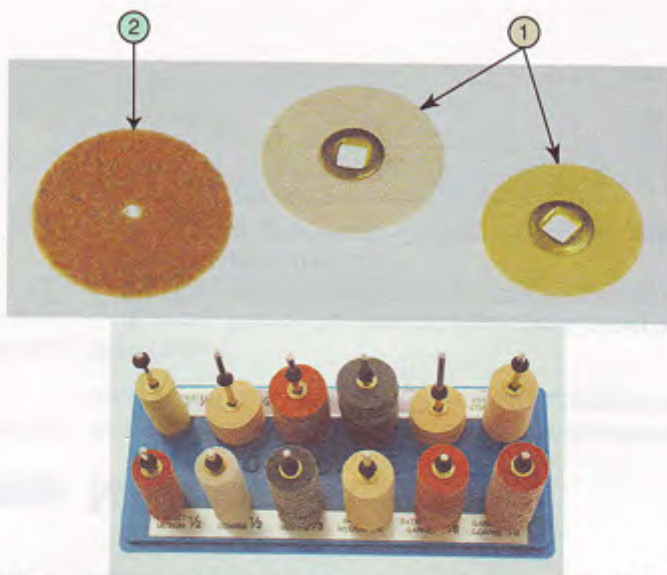

**INSTRUMENT**

## Mandrel—Screw On

**FUNCTION** To attach discs to mandrel for finishing and polishing inside or outside oral cavity (device is inserted into handpiece)

**CHARACTERISTICS** Shank types:

- ① Long shank—For straight slow-speed handpiece
- ② Short latch-type shank—For contra-angle or right-angle slow-speed handpiece
- ③ Friction grip shank—For high-speed handpiece



## INSTRUMENT

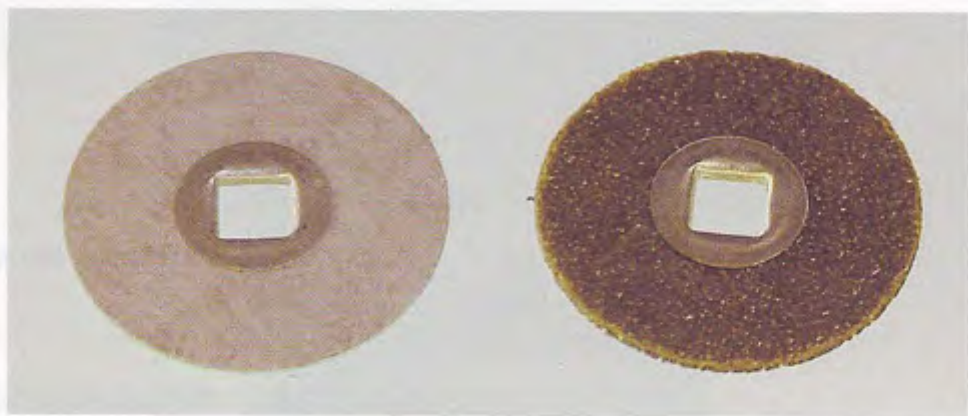
# Sandpaper Disc

**FUNCTION** To contour restorative material  
To polish restorative material (extra fine grit)

**CHARACTERISTICS** Range of grits (coarse to extra fine)  
Two types

- ① Snap on (metal center)
- ② Screw on

Sandpaper disc organizer has a range of sizes.



## INSTRUMENT

### Composite Disc

**FUNCTION** To contour restorative material (coarse grit)  
To polish or smooth restorative material (extrafine grit)

**CHARACTERISTICS** Made from synthetic material to accommodate composite restorations  
Range of grits (coarse to extrafine)  
Variety of sizes  
Two types available  
    Snap on (pictured)  
    Screw on





## INSTRUMENT

# Rubber Points

**FUNCTION** To polish restorations, amalgam, composite, gold

**CHARACTERISTICS** Types of polishing grits:

Brown points (brownies)—Abrasive

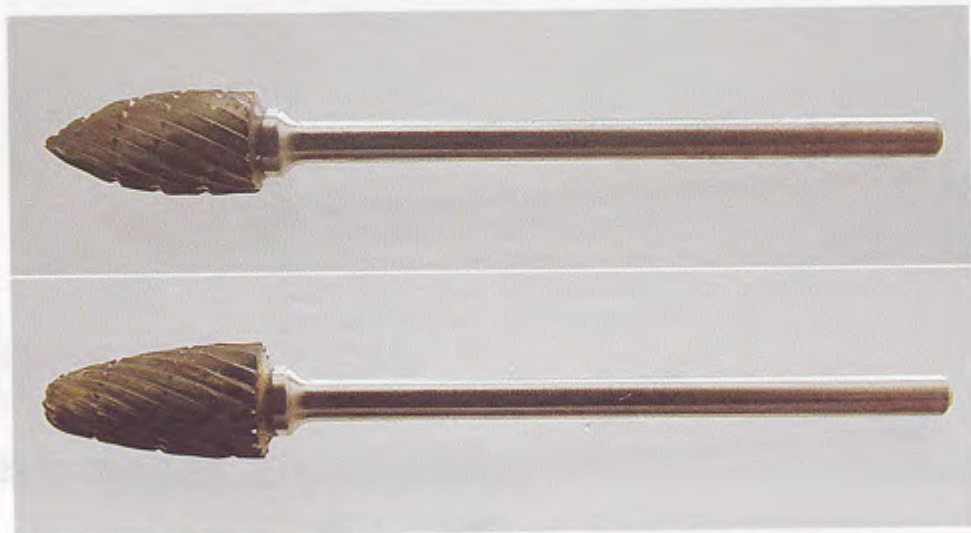
Green points (greenies)—Less abrasive than brownies

White points—Polishing point

Variety of shanks available for all types of rubber points

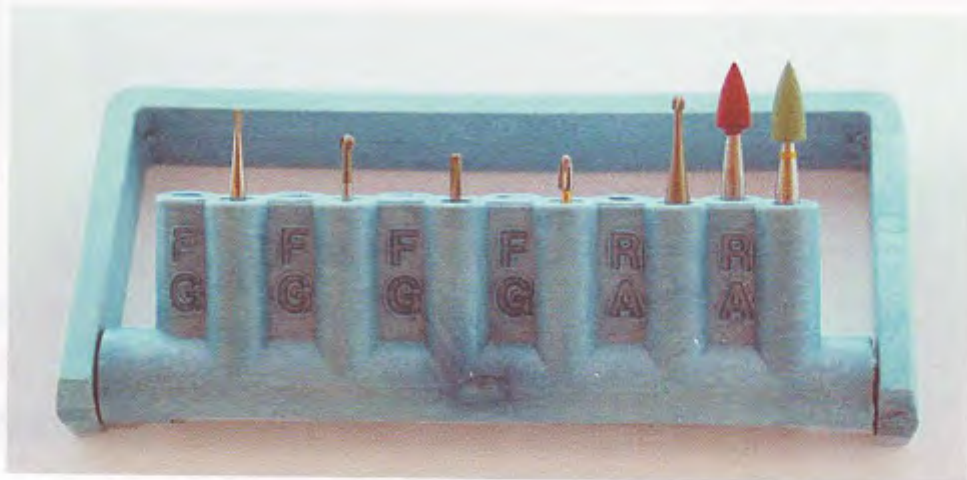
① Friction grip

② Latch type

**INSTRUMENT****Laboratory Bur—Acrylic Bur**

**FUNCTION** To cut models or trim acrylic in laboratory

**CHARACTERISTICS** Long shank—For attachment to straight handpiece  
Variety of sizes and shapes



**INSTRUMENT**

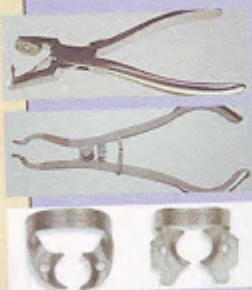
## Magnetic Bur Block with Burs

**FUNCTION** To be used on dental tray setups

**CHARACTERISTICS** Magnetic to hold burs in place  
Holds friction grip and latch-type burs  
Can be sterilized in autoclave  
Variety of shapes and sizes



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## CHAPTER 7

# Dental Dam Instruments

**INSTRUMENT****Dental Dam**

**FUNCTION** To isolate teeth for dental procedures

**CHARACTERISTICS** Sizes—4 × 4, 5 × 5, 6 × 6, or continuous roll  
Gauge or thickness—Thin, medium, heavy  
Colors—Gray, green, blue, pastels  
Latex free available


**INSTRUMENT**

## Dental Dam Punch

**FUNCTION** To punch holes in dental dam for each individual tooth

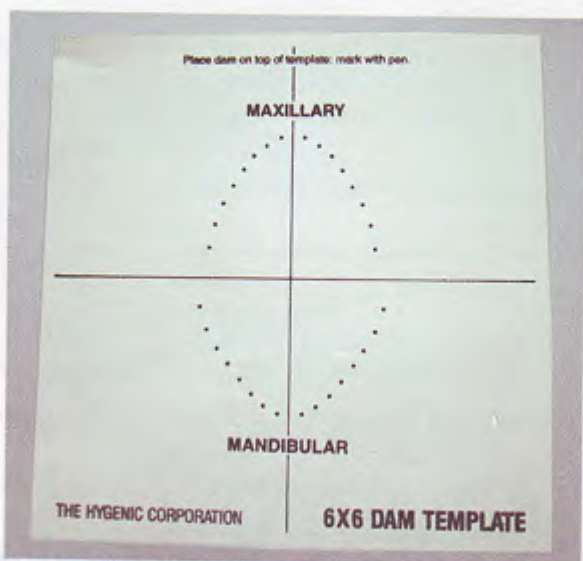
**CHARACTERISTICS** Designated hole size for each tooth:

- No. 5—Anchor tooth (largest)
- No. 4—Molars
- No. 3—Premolars
- No. 2—Maxillary and mandibular cuspids and maxillary central and laterals
- No. 1—Mandibular central and laterals (smallest)

**PRACTICE NOTES**

1. The oral cavity is examined before holes are punched to accommodate the patient's specific dentition.
2. A space of 3 to 3.5 mm is maintained between holes.





## INSTRUMENT

### Dental Dam Template

**FUNCTION** To use as a guide for marking and punching holes in correct position on dental dam

**CHARACTERISTICS** Made of durable plastic

#### PRACTICE NOTES

1. The oral cavity is examined before holes are marked and punched to adjust positioning to the patient's specific dentition.
2. The dental dam is placed on the template, and the points where holes should be punched are marked with a pen.



## INSTRUMENT

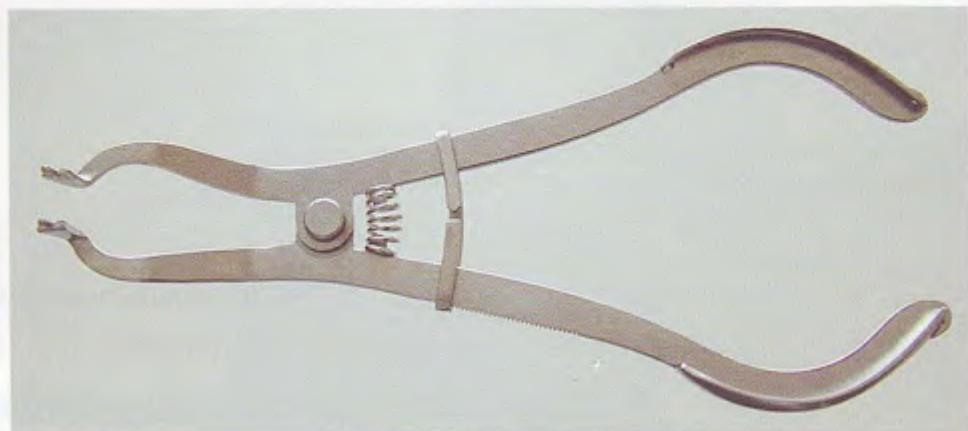
# Dental Dam Stamp

**FUNCTION** To mark holes on dental dam

**CHARACTERISTICS** Has 32 dots that represent the adult dentition  
Used as guide for punching holes in correct position

### PRACTICE NOTES

1. The oral cavity is examined before holes are marked and punched to adjust positioning to the patient's specific dentition.

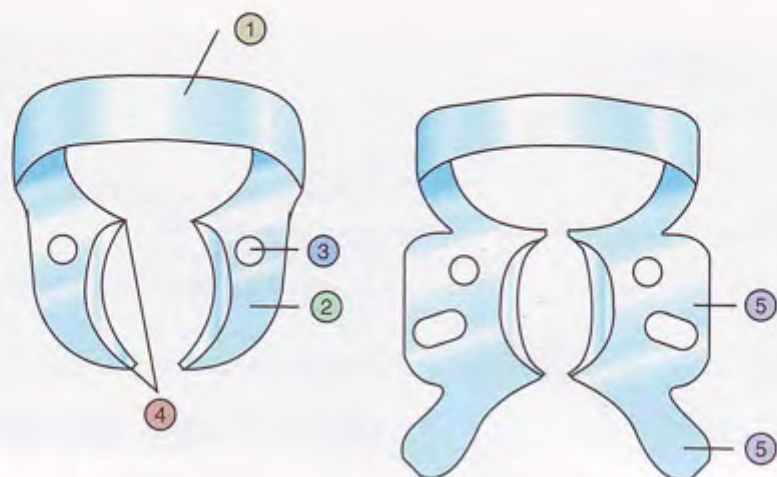
**INSTRUMENT**

## Dental Dam Forceps

**FUNCTION** To place dental dam clamp on tooth and to remove clamp after procedure

**CHARACTERISTICS** Beaks on forceps fit into dental dam clamp  
Forceps open with spring motion  
Bar between handle holds forceps in place while clamp is seated





## INSTRUMENT

### Dental Dam Clamp

**FUNCTION** To anchor and stabilize dental dam

#### CHARACTERISTICS

##### Parts

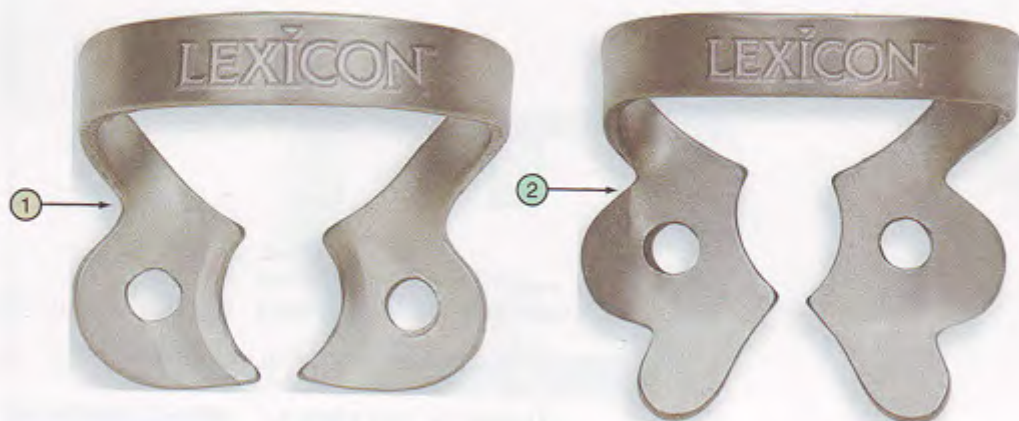
- ① **Bow:** Placed toward distal part of tooth
- ② **Jaws:** Have four prongs that secure clamp on tooth
- ③ **Holes:** On jaws; designated for beaks on forceps to place clamp on tooth
- ④ **Prongs:** Designed to secure clamp on cervical part of tooth, beyond the height of contour
- ⑤ **Winged clamps:** Have extension of metal on jaws to hold dental dam away for better visibility (wingless clamps do not have extra extension of metal)

**INSTRUMENT**

## Anterior Clamp

**FUNCTION** To anchor and stabilize dental dam

**CHARACTERISTICS** Used only on anterior teeth  
*Example:* Wingless clamp  
Range of sizes



**INSTRUMENT**

## Premolar Clamp

**FUNCTION** To anchor and stabilize dental dam

**CHARACTERISTICS** Clamp used determined by tooth size

Range of sizes

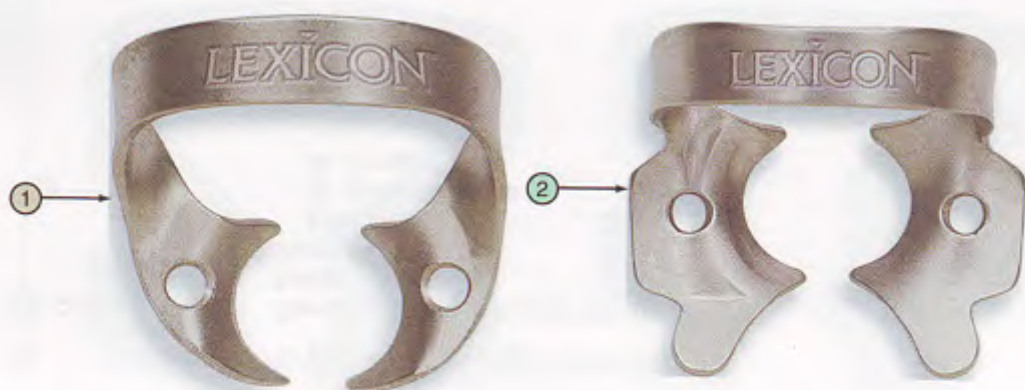
Variety of styles

*Examples:*

① Wingless clamp

② Winged clamp





## INSTRUMENT

### Universal Clamp—Maxillary

**FUNCTION** To anchor and stabilize dental dam

**CHARACTERISTICS** Used on right or left posterior molars

Range of sizes

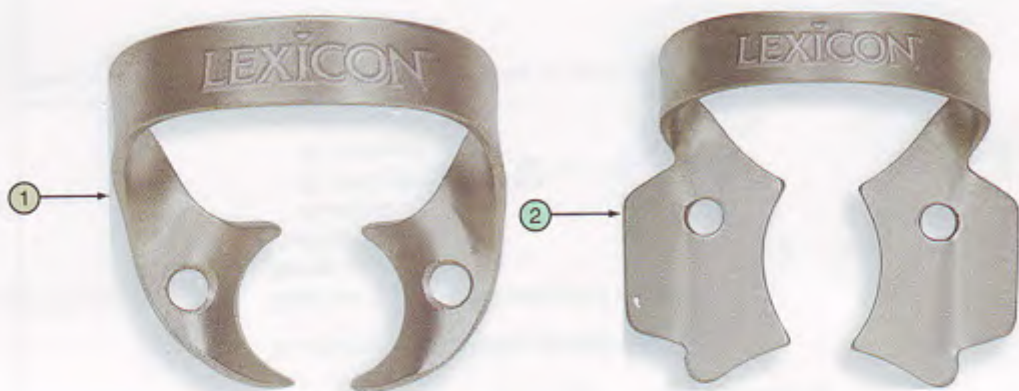
Variety of styles

*Examples:*

① Wingless clamp\*

② Winged clamp

\*Manufacturer suggests that wingless universal clamp may be used for both maxillary and mandibular.


**INSTRUMENT**

## Universal Clamp—Mandibular

**FUNCTION** To anchor and stabilize dental dam

**CHARACTERISTICS** Used on right or left posterior molars

Range of sizes

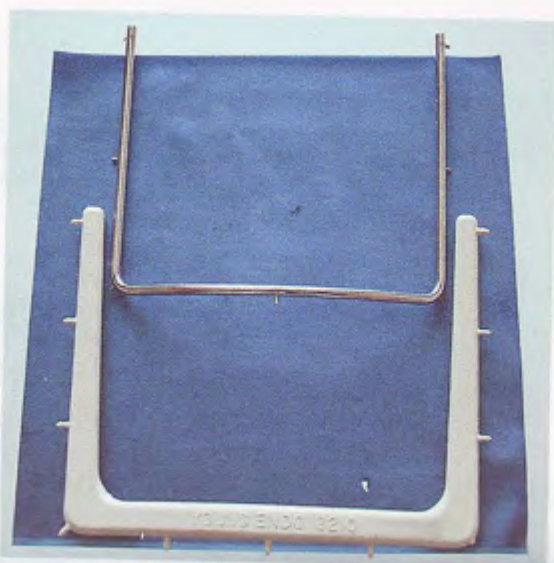
Variety of styles

*Examples:*

① Wingless clamp\*

② Winged clamp

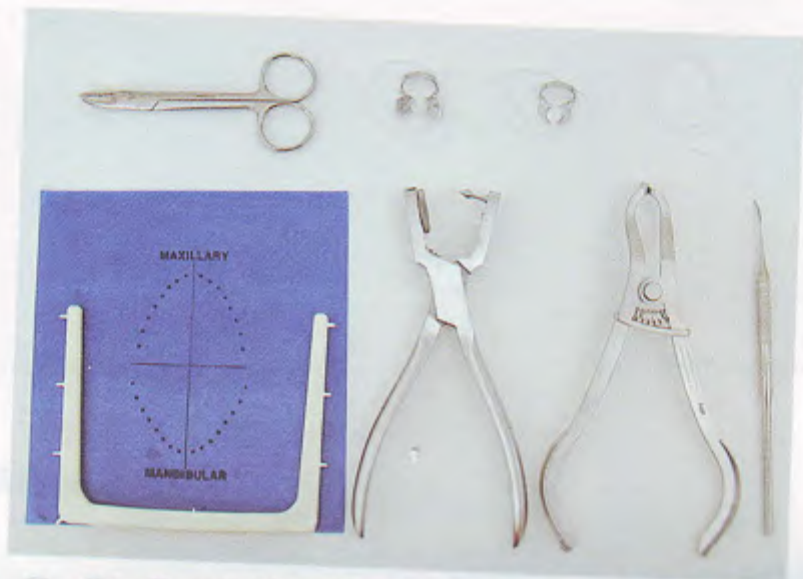
\*Manufacturer suggests that wingless universal clamp may be used for both maxillary and mandibular.

**INSTRUMENT****Dental Dam Frame**

**FUNCTION** To hold dental dam away from teeth

**CHARACTERISTICS** Metal or plastic  
Plastic frame—May be left on during radiographic exposures





## TRAY SETUP

### Dental Dam

#### TOP (LEFT TO RIGHT)

Crown and bridge scissors, dental dam clamps with ligature ties, stabilizing ligatures

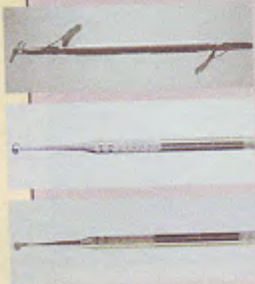
#### BOTTOM (LEFT TO RIGHT)

Stamped dental dam, plastic dental dam frame, dental dam punch, dental dam forceps, beavertail burnisher

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CHAPTER 8

Amalgam Instruments



**INSTRUMENT**

## Amalgam Carrier

**FUNCTION** To carry and dispense amalgam for cavity preparation

**CHARACTERISTICS** Single or double ended

- Double ended—One small end, one large end

**PRACTICE NOTES**

1. Amalgam is placed in hollow tubes and then transferred to the cavity preparation (the inside of the hollow tubes is coated with metal or Teflon).
2. Amalgam sticks in the carrier if it is not released immediately after the tubes are filled.



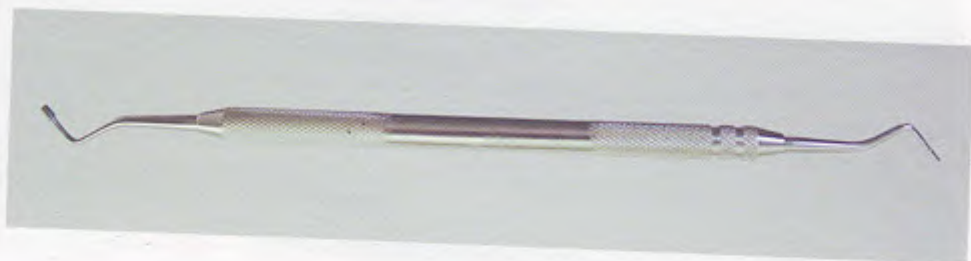
**INSTRUMENT****Amalgam Carrier—Plunger Style**

**FUNCTION** To carry and dispense amalgam for cavity preparation

**CHARACTERISTICS** Single ended

**PRACTICE NOTES**

1. Amalgam is placed in hollow tubes and then transferred to the cavity preparation (the inside of the hollow tubes is coated with metal or Teflon).
2. Amalgam sticks in the carrier if it is not released immediately after the tubes are filled.

**INSTRUMENT**

## Smooth Condenser (Plugger)

**FUNCTION** To pack and condense amalgam into cavity preparation (also condenses other restorative materials)

**CHARACTERISTICS**

Smooth ends

Round, flat, or diamond shaped

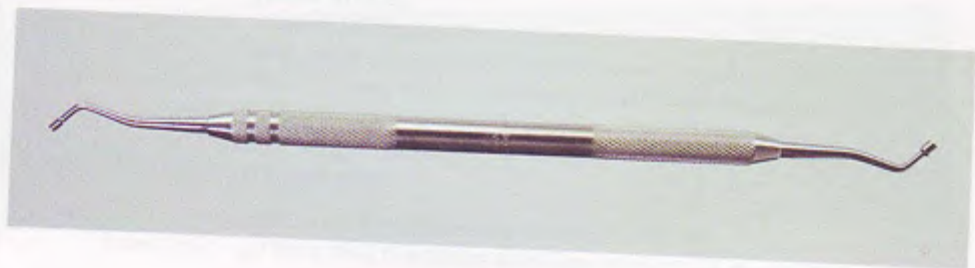
Single or double ended

- Double ended—One small end, one large end

Back action condenser with right-angle working ends—

Accommodates difficult areas

Range of sizes



## INSTRUMENT

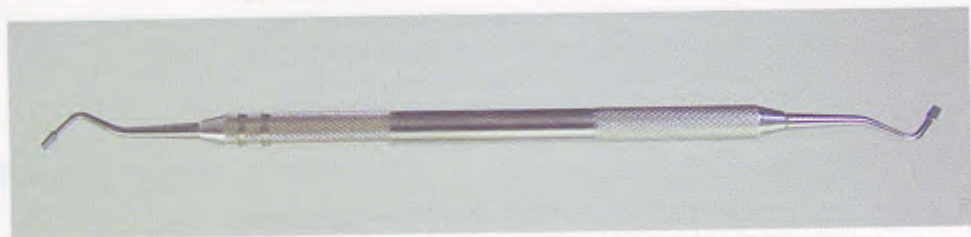
### Serrated Condenser (Plugger)

**FUNCTION** To pack and condense amalgam into cavity preparation (also condenses other restorative materials)

**CHARACTERISTICS**

- Serrated ends
- Round, flat, or diamond shaped
- Single or double ended
  - Double ended—One small end, one large end
- Back action condenser with right-angle working ends—
- Accommodates difficult areas
- Range of sizes

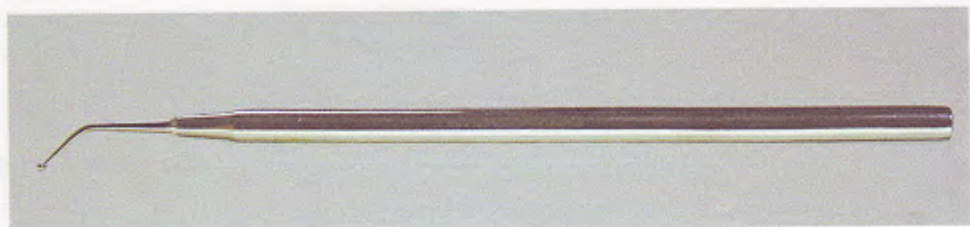


**INSTRUMENT**

## Interproximal Condenser

**FUNCTION** To pack and condense amalgam into interproximal areas of cavity preparation (also condenses other restorative materials)

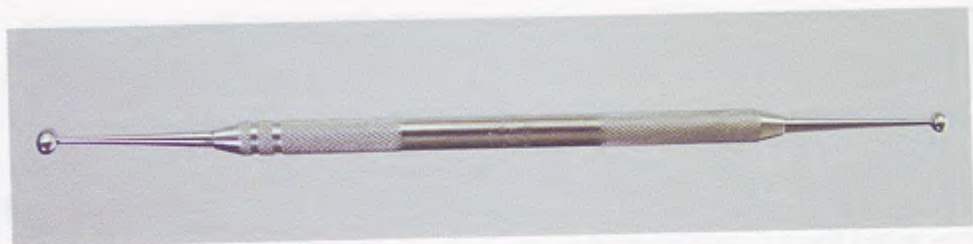
**CHARACTERISTICS** Ends shaped to fit mesial or distal areas of cavity preparation  
Smooth or serrated ends  
Range of sizes

**INSTRUMENT****Liner Applicator**

**FUNCTION** To place calcium hydroxide or glass ionomer in cavity preparation

**CHARACTERISTICS** Short or long handle  
Single or double ended

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## INSTRUMENT Football Burnisher

**FUNCTION** To smooth amalgam after condensing  
To contour matrix band before placement  
To perform initial carving of amalgam  
(Also burnishes other restorative materials)

**CHARACTERISTICS** Single or double ended



**INSTRUMENT****T-Ball Burnisher**

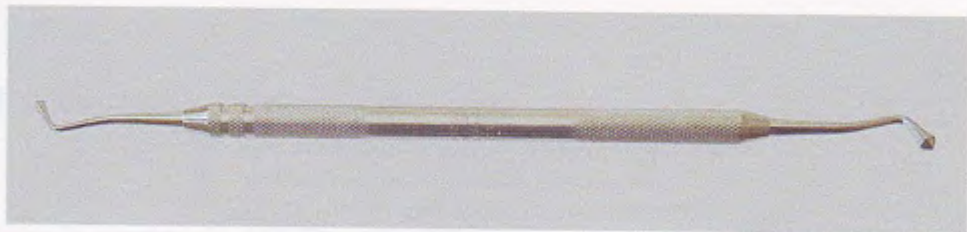
**FUNCTION** To smooth amalgam after condensing  
To contour matrix band before placement  
To begin carving of amalgam  
(Also burnishes other restorative materials)

**CHARACTERISTICS** Single ended

**INSTRUMENT****Ball Burnisher**

**FUNCTION** To smooth amalgam after condensing  
To contour matrix band before placement  
To perform initial carving of amalgam  
(Also burnishes other restorative materials)

**CHARACTERISTICS** Single or double ended

**INSTRUMENT****Acorn Burnisher**

**FUNCTION** To smooth amalgam after condensing  
To perform initial carving of amalgam  
(Also burnishes other restorative materials)

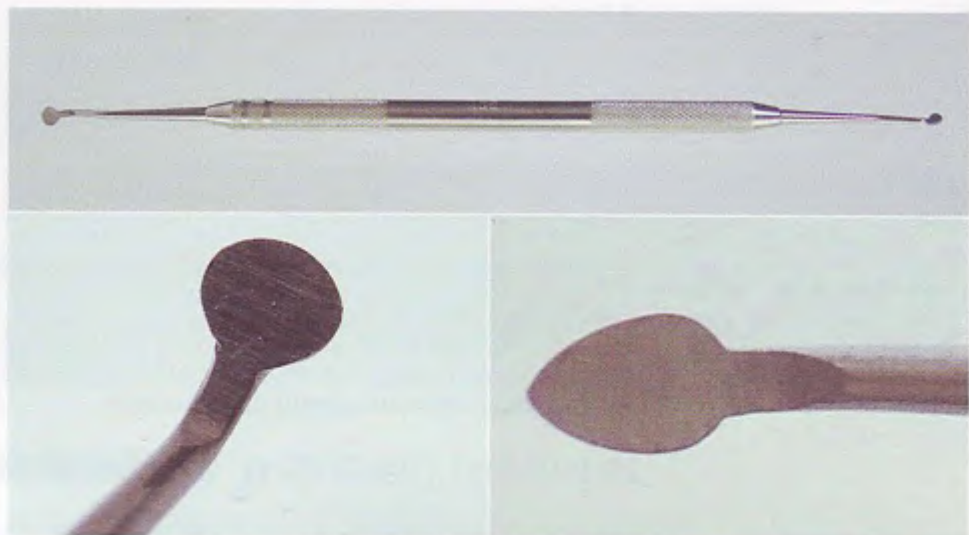
**CHARACTERISTICS** Single or double ended



**INSTRUMENT****Beavertail Burnisher**

**FUNCTION** To smooth amalgam after condensing  
To perform initial carving of amalgam  
To invert dental dam  
(Also burnishes other restorative materials)

**CHARACTERISTICS** Single or double ended

**INSTRUMENT**

## Tanner Carver

**FUNCTION** To carve occlusal anatomy into amalgam restorations  
(Also carves other restorative materials)

**CHARACTERISTICS** Double ended—Two ends shaped differently  
Ends shaped differently from those of discoid-cleoid carver

**INSTRUMENT****Discoid-Cleoid Carver**

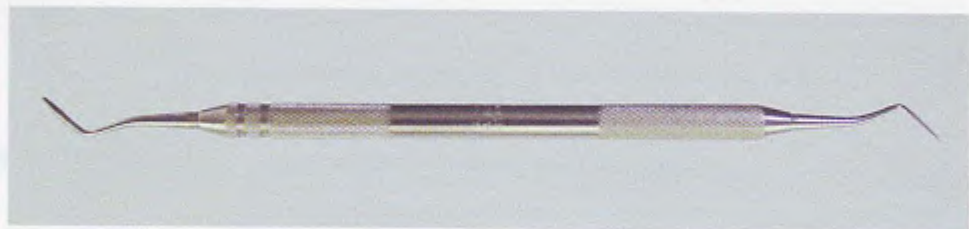
**FUNCTION** To carve occlusal anatomy into amalgam restorations  
(Also carves other restorative materials)

**CHARACTERISTICS** Double ended—Two ends shaped differently:

- Discoid end—Disc shaped
- Cleoid end—Pointed

Ends shaped differently from those of Tanner carver



**INSTRUMENT**

## Hollenback Carver

**FUNCTION** To contour and carve occlusal and interproximal anatomy in amalgam restorations  
(Also carves other restorative materials)

**CHARACTERISTICS** Double ended—Ends protrude at different angles

**INSTRUMENT**

## Half-Hollenback Carver

**FUNCTION** To contour and carve occlusal and interproximal anatomy in amalgam restorations  
(Also carves other restorative materials)

**CHARACTERISTICS** Half the size of Hollenback carver  
Double ended—Ends protrude at different angles

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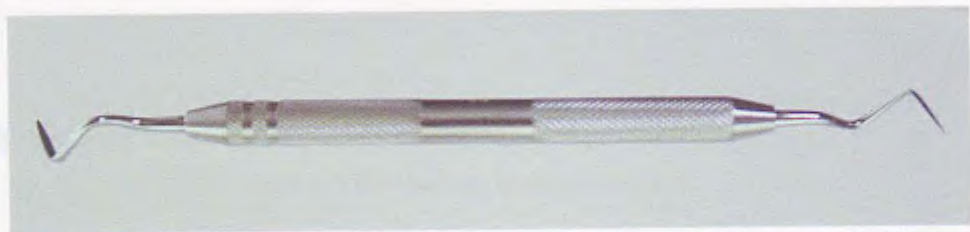
**INSTRUMENT**

## Gold Carving Knife

**FUNCTION** To trim interproximal amalgam restoration, recreating contour of proximal wall  
(Also carves other restorative materials)

**CHARACTERISTICS** Single or double ended  
Removes flash composite material from interproximal areas  
Variety of designs

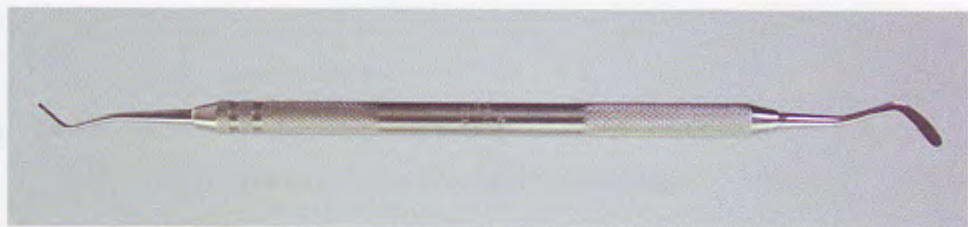


**INSTRUMENT**

## Interproximal Carving Knife

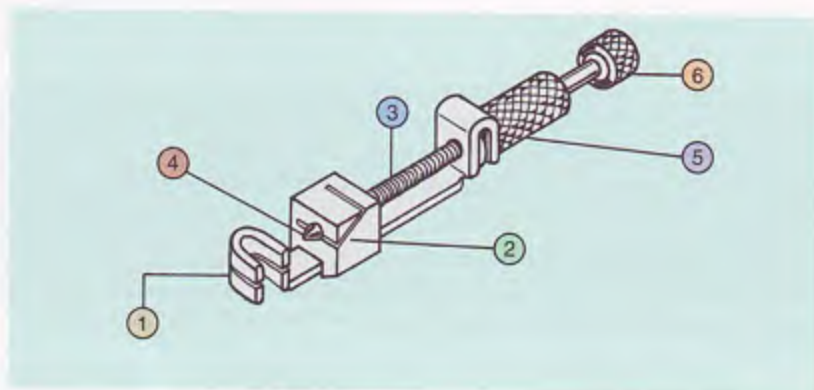
**FUNCTION** To trim interproximal amalgam restoration, recreating contour of proximal wall  
(Also carves other restorative materials)

**CHARACTERISTICS** Single or double ended  
Removes flash composite material from interproximal areas  
Variety of designs

**INSTRUMENT****Woodson**

**FUNCTION** To carry and place temporary restorative material for cavity preparation (paddle end)  
To condense restorative material (plugger end)

**CHARACTERISTICS** Double ended  
Range of sizes  
Plugger end available in variety of sizes  
Paddle end available in different angles, sizes



## INSTRUMENT

# Tofflemire/Matrix Band Retainer

**FUNCTION** To maintain stability of matrix band during condensation of restorative material for class II preparation (used with amalgam, composite, and build-up materials)

## CHARACTERISTICS

### Parts

- ① **Guide slots:** Straight slot; right and left slots for right or left quadrant
- ② **Diagonal slot:** Slides up and down on spindle; matrix band is placed in slot and spindle secures band in place; open slots are placed toward gingiva
- ③ **Spindle:** Holds matrix band in retainer
- ④ **Spindle pin:** Stabilizes band in holder
- ⑤ **Inner knob:** Adjusts size or loop of matrix band to fit around tooth and loosens band for removal
- ⑥ **Outer knob:** Positioned at end of spindle that tightens or loosens matrix band in retainer




**INSTRUMENT**

## Matrix Bands

**FUNCTION** To replace missing proximal wall or walls of cavity preparation for condensation of restorative material (for class II preparations)

**CHARACTERISTICS** Variety of sizes, shapes, and thicknesses  
Bands designed for specific teeth:

- ① Universal band—For all posterior teeth except larger teeth
- ② Premolar band—For premolars
- ③ Molar band—For larger molars

Pediatric band available for primary teeth



## INSTRUMENT

# AutoMatrix System

**FUNCTION** To replace missing proximal wall or walls of cavity preparation for condensation of restorative material (for class II preparations)

**CHARACTERISTICS** Alternative matrix band system

Variety of sizes and shapes

Bands designed for specific teeth:

- Universal band—For all posterior teeth except larger teeth
- Molar band—For larger molars
- Premolar band—For premolars
- Clear bands—For composite restorations
- Pediatric band—For primary teeth

### PRACTICE NOTES

1. Bands are placed on the tooth and tightened with a tightening wrench.
2. Tightening wrench is also used to loosen bands.
3. Removing pliers are used to remove bands.

**INSTRUMENT**

## Wooden Wedges

**FUNCTION** To hold matrix band in place along gingival margin of class II preparation

**CHARACTERISTICS** Wood or plastic  
Triangular, round, or anatomical shapes  
Placed in gingival embrasure area  
Variety of sizes and shapes available to accommodate embrasure area





## INSTRUMENT

# Amalgamator

**FUNCTION** To mix alloy and mercury into amalgam and other restorative materials  
To mix cements

**CHARACTERISTICS** Preloaded capsules contain alloy, mercury, and pestle to aid mixing.

- Various types of capsules are available; they are activated manually by twisting or pushing or using the activator. Thin membrane separates materials until mixing occurs.

### PRACTICE NOTES

1. The process of mixing is called *amalgamation* or *trituration*.
2. The mixing time recommended by the manufacturer should be used.

**INSTRUMENT****Amalgam Well**

**FUNCTION** To hold amalgam before it is placed in preparation  
To hold amalgam while loading amalgam carrier

**CHARACTERISTICS** Metal, plastic, or glass

<http://dentalbooks-drbassam.blogspot.com>



**INSTRUMENT**

## Articulating Paper Holder

**FUNCTION** To hold articulating paper in place  
To check centric and lateral occlusion

**CHARACTERISTICS** Articulating paper is blue or red.  
Paper varies from thin to thick.





## TRAY SETUP

### Amalgam

#### TOP ROW (FROM LEFT TO RIGHT)

Tofflemire/matrix band retainer, air/water syringe tip, liner applicator, molar matrix band, universal matrix band, wedges, burs in bur block, dental floss, amalgam well

#### BOTTOM ROW (FROM LEFT TO RIGHT)

Mouth mirror, explorer, cotton forceps (pliers), small spoon excavator, large spoon excavator, enamel hatchet, mesial gingival margin trimmer, distal gingival margin trimmer, small condenser, large condenser, acorn burnisher, Tanner carver, half-Hollenback carver, gold carving knife, interproximal carving knife, amalgam carrier, articulating paper holder and articulating paper, high-velocity (volume) evacuation tip (HVE)