

# Honing Our Edge: Options for Maintaining Periodontal Hand Instruments

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## Abstract

As clinicians, the hand scaling instruments we use become part of our professional persona. Many hygienists refer to loving or hating certain instruments. It is an emotional attachment. More importantly, maintaining the working edge is a challenge, one that's a constant source of discussion in the dental hygiene profession.

Just visit the Hygienetown.com message boards to see how much discussion this hot topic creates. Bottom line: When we consider what's best for our patients, there's only one answer: a sharp, properly angled working edge. However, how to best maintain a consistent edge is a much more complicated matter.

## Educational objectives

- Understand FDA regulations of Class I devices
- Review clinical considerations of a sharp instrument
- Discuss the challenges of manually sharpening
- Identify the risks of using dull instruments
- Discuss manual and mechanical sharpening options



### Instrumental overview

The FDA considers a hand scaler or curette a Class I medical device. A Class I medical device as defined by the FDA: “An instrument ... which is: intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals, or intended to affect the structure or any function of the body of man or other animals, and which does not achieve its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes.”<sup>1</sup>

Hand scaling instruments enter the

body’s tissues, altering them for better (with calculus removal) or worse (with tissue trauma). If an incorrect edge or an incorrectly sharpened blade is activated, it’s likely that burnished calculus will remain embedded in the root surface.

Recent observations during dental perioscopy detected ulcerated tissue and calculus deposits adjacent to one another. The inflammation was more severe when both calculus and biofilm were present than areas of biofilm alone.<sup>2</sup> This reinforces the value of hand scaling with a quality working edge as an essential component of root debridement.

In addition to the clinical benefits of a precise edge during calculus removal, there are ergonomic benefits for the practitioner.

A lighter grasp and less pressure are needed when there is a sharp “bite” from the instrument. Lighter scaling strokes enable the practitioner to maintain proper positioning during treatment which help lessen fatigue in the hand, shoulder and neck.

Treatment is more efficient when it requires fewer strokes for complete calculus removal. Patient comfort also increases when there is lighter pressure and decreased working time.

### Fine points and sharpening stones

The purpose of sharpening an instrument is to restore its sharpness while preserving the original integrity, contour and angle of the instrument. There are a number of

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The author discloses that she has a financial interest in consulting dental professionals in the subject matter and has a financial interest with an instrument company that has a product or service mentioned in this course.

ways a clinician can attempt to sharpen periodontal instruments.

To maintain the effectiveness and quality of care, a periodontal instrument should be sharpened at the first sign of dullness. All metals are considered sharp at a certain angle, while any deviation from that angle results in the dulling of that instrument. The word

*sharper*, in this context, is a misnomer, because all edges are either sharp or dulling.

Instrument sharpening is often attempted by manual sharpening techniques. In a recent sharpening study, more than half of the participants used a manual technique for sharpening instruments.<sup>3</sup> In this technique an instrument is moved against a stone at the appropriate angle to re-create a sharp edge to the blade.

The choice of stone is typically operator preference. A fine stone, such as an Arkansas stone, is the most widely used and often preferred by novice clinicians. An India stone is medium in coarseness and is best used when only a small amount of sharpening is needed to restore a cutting edge, making it optimal for sharpening during patient treatment. Arkansas and India stones require oil for use during the sharpening procedure.

One caveat: The Canadian Health Services of Alberta has released a sharpening protocol banning chairside sharpening. Reasons cited include the introduction of metal shavings into patient tissues, lack of manufacturer sterilization protocol for stones, and the potential for clinician injury. Currently, there is no equivalent policy in the U.S.<sup>4</sup>

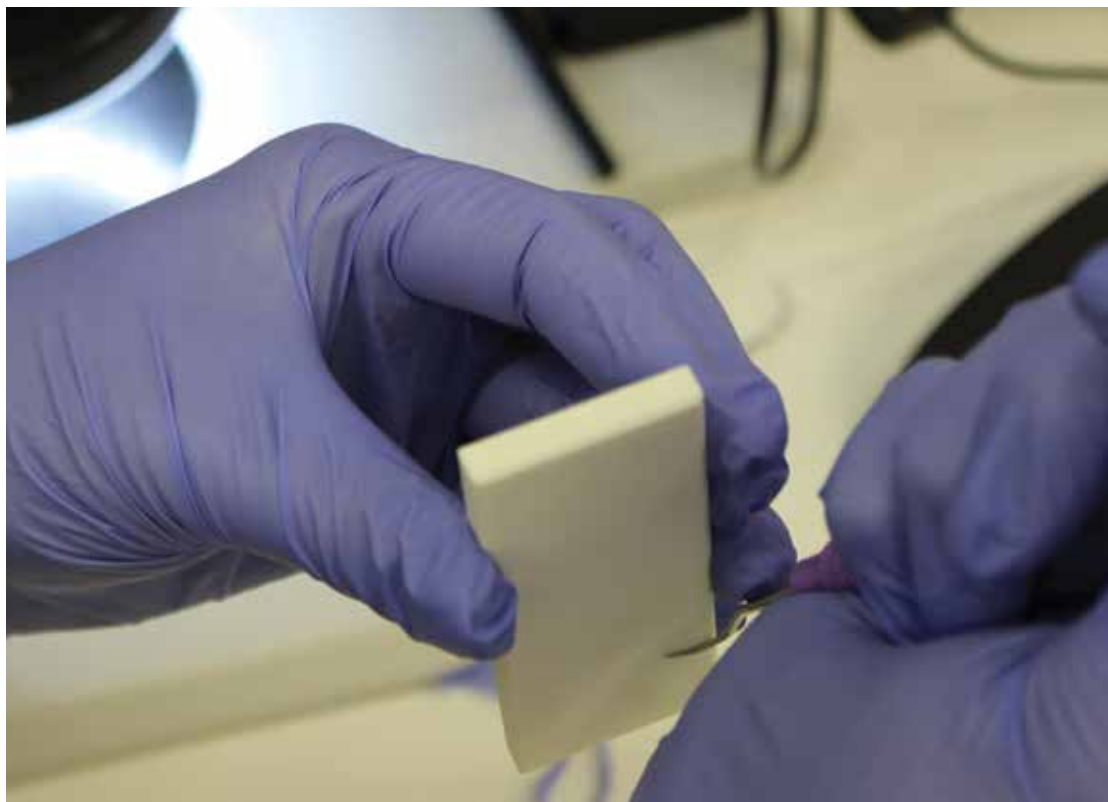
Ceramic stones are of fine to medium coarseness and lubricated with water rather than oil during sharpening. Some clinicians prefer to use a fine ceramic stone after an Arkansas or India stone to create a smoother edge. However, this two-stone technique removes more metal from the instrument and decreases its life.

Coarse stones remove a significant amount of metal and should be used only on instruments that require significant recontouring and reshaping. Fewer strokes and less pressure are needed with coarse stones during sharpening. A fine or ceramic stone must be used after a coarse stone to remove metal tags.

### **Manual and mechanical sharpening techniques**

To sharpen instruments with a manual technique, the clinician holds the stone in one hand at the edges.<sup>5</sup> The cutting edge of the instrument is held against the stone at a 110-degree angle to the face of the instrument. Either the stone





is moved across the cutting edge of the instrument or the instrument is moved against the stationary stone. The last sharpening stroke should be downward and away from the instrument face to ensure the removal of metal particles.<sup>2</sup>

Clinicians may choose to use a “guide” when attempting to perform manual sharpening. These guides help line the instrument up at the proper angle. One example is a Gleason Glide, which is held over the stone to assist in maintaining appropriate angulation. Another option is the Dental Instrument Sharpening Companion, which is an angulation guide with stones attached on each side. The clinician angles the instrument for sharpening at the area indicated on the device.

A number of manufacturers also offer mechanical sharpening devices. These are either rotary or laterally activated, and the stone moves against a stationary instrument. Once the instrument is positioned at the proper angle, the honing device does the sharpening. Rotary devices use a holding arm or mechanism for the instrument, and the clinician does not hold it during the sharpening process. A battery-operated device is also available in which the clinician holds the instrument on a guide and the stone is activated across the working edge.

In an April 2015 study, two participants used mechanical sharpening devices. Most likely because of an error in placement, neither participant was able to re-create the proper cutting-edge angle to maintain a sharp instrument. Of the 21 instruments returned in

the study, none had been sharpened correctly on both ends. Two participants were able to maintain the correct angle on the 11 side of the instrument, while none had been successful in creating that angle on the 12 side.<sup>3</sup>

While there are a number of methods and devices available for sharpening periodontal instruments, the reality remains that creating the optimal angle is not easily achieved. Whether because of time or skill constraints, hygienists have not demonstrated an ability to sharpen instruments effectively.

### Alternatives to sharpening in-office

Fortunately, there are several alternatives to sharpening in office. Sharpening is time-consuming and, as discussed, can have less-than-optimal outcomes. Which other options are available?

**Professional sharpening services.** A sharpening service employs professionals to evaluate working ends. They use professional sharpening wheels to re-create factory angulation and maintain original contour. Sending instruments out requires having additional sets on hand to allow for the others to be sent back to the office.

An important consideration: It’s likely that a less-than-optimally-sharp instrument will be used while waiting for the sharpened instruments to return, risking burnished calculus during instrumentation, lost efficiency, potential strain on the clinician, and patient discomfort.

While there are a number of methods periodontal instruments, the reality not easily achieved. Whether because not demonstrated an ability to sharpen



**Retipping.** At first glance retipping appears economical and eco-friendly, but let's consider how an original instrument is manufactured. Instrument manufacturers follow specific industry standards and use proprietary methods to produce hand instruments that have a tight fit between the working ends and handle.

Removing the working end becomes a violent process because of this tight fit, risking microcracks and warping. Retipping services use a wide variety of metals that are not the same as the original manufacturers', making duplication a challenging goal.

One researcher described the issues she encountered: Lack of balance, varied shank length, softer metals and microcracks in the handle were discovered, risking infection control breaches and, lastly, a difficulty positioning working ends to effectively remove calculus.<sup>6</sup>

The most compelling reason to avoid retipping is a warning from the FDA, stating that any retipped hand instrument must be labeled as such and, once altered, the original manufacturer is no longer liable for this Class I medical device.<sup>7</sup>

**Cone socket systems.** Cone socket systems offer a unique and eco-friendly alternative to retipping or replacing complete instruments. The working ends and handles arrive separately, and are assembled by the end user. Working ends can be replaced as they become dull, and the system becomes very economical. The Eco-dentistry Association lists cone socket instruments as an eco-friendly and FDA compliant option for practices looking to conserve resources.<sup>8</sup>

**Sharpen-free hand instruments.** These instruments are manufactured with a technology that creates a much harder metal and wears much more slowly than stainless steel. The lifespan of the working end is about as long as a stainless steel instrument, with one great advantage—no sharpening during that entire period.

and devices available for sharpening remains that creating the optimal angle is of time or skill constraints, hygienists have instruments effectively.

Sharpen-free instruments are harder than calculus, and because of that a modified scaling technique is employed that is similar to a magnetostriuctive scaler. The clinician holds the instrument with a light modified pen grasp, sustaining proper ergonomics while planing the calculus from the outside to the tooth surface. Sharpen-free technology maintains the original working edge angulation, a great advantage for complete calculus removal.

## Conclusion

There are several options available when attempting to maintain a sharp instrument edge. The choice often depends upon the skill level, time availability and preference of the clinician. A study has shown that RDHs are not efficient at maintaining a properly angled edge after just one sharpening attempt.

The best option appears to be using technology that does not require instrument sharpening. Whichever method is chosen, the FDA guidelines for Class I medical devices need to be kept in mind to ensure patients receive the best care available with the technology at hand. ■

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- 1) **The FDA has designated dental hand instruments as Class I medical devices. Class I medical devices are defined as:**
  - A) Instruments that mechanically enter the body tissue and have the ability to positively or negatively alter that tissue.
  - B) Instruments that mechanically enter the body tissue and chemically alter the tissue.
  - C) Instruments that do not alter body tissue in any way.
  - D) Instruments that only touch the mucosal tissue.
- 2) **The benefits of a sharp hand instrument working edge include complete calculus removal, instrumentation stability, efficiency and patient comfort. A sharp working edge does not benefit the clinician.**
  - A) Statement 1 is true, Statement 2 is true.
  - B) Statement 1 is true, Statement 2 is false.
  - C) Statement 1 is false, Statement 2 is true.
  - D) Statement 1 is false, Statement 2 is false.
- 3) **When sharpening an instrument, the goal is:**
  - A) A sharp edge
  - B) To achieve a good speed at which the edge can be sharpened
  - C) To use the coarsest stone available
  - D) To restore the working edge and to maintain angulation and contour of the original instrument
- 4) **When employing a manual sharpening technique, the face of the instrument and the stone should be at what degree of angulation?**
  - A) 90
  - B) 70
  - C) 110
  - D) 135
- 5) **An India stone and an Arkansas stone do not require lubrication during use. A ceramic stone requires oil during use.**
  - A) Statement 1 is true, Statement 2 is true.
  - B) Statement 1 is true, Statement 2 is false.
  - C) Statement 1 is false, Statement 2 is true.
  - D) Statement 1 is false, Statement 2 is false.
- 6) **Which of the following stones is available in medium coarseness?**
  - A) Arkansas stone
  - B) India stone
  - C) Ceramic stone
  - D) B and C
- 7) **A two-step sharpening technique can be used to smooth the edges of the working end. When used, this method:**
  - A) Removes more metal and decreases the useful life of the instrument
  - B) Adds metal burs that cannot be detected
  - C) Does not affect the width of the working end
  - D) Smooths the face of the working end.
- 8) **Retipping working ends of instruments is not recommended by the FDA because of the potential for:**
  - A) Breaches in infection control
  - B) Unbalanced working ends
  - C) Improperly shaped shanks
  - D) All of the above
- 9) **Which of the following are considered advantages of sharpen-free metallurgy?**
  - A) A harder metal that lasts about as long as stainless steel curettes without sharpening during that time frame
  - B) Ergonomically advantageous scaling technique
  - C) Patient comfort
  - D) All of the above
- 10) **The modified hand scaling technique utilized with sharpen-free metallurgy is similar to:**
  - A) Stainless steel instruments
  - B) Magnetostrictive scaling
  - C) A and B
  - D) None of the above

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