

The CUTTING EDGE of dental instruments

Develop good sharpening skills and your instruments will reward you with a long, trouble-free working life, says **Alison Lowe***.

Instrument sharpening is a bit like marmite - you either love it or hate it - but as G. V. Black so famously said all those years ago: *'Nothing in the technical procedures of dental practice is more important than the care of the cutting edges. No man has ever yet become a good and efficient dentist until after he had learned to keep his cutting edge sharp'*.¹

This statement made in 1908 still holds true and is as relevant to the dental profession today as it was then. I am sure we are all aware of the importance of maintaining our instruments – after all keeping them sharp is a problem we all face on a daily basis. But just why is it so important?

Well, although powered devices (sonic and ultrasonic) are widely used today (because they are quicker and brilliant at dispersing the biofilm), scalers and curettes still command a prominent role in periodontal therapy. Traditionally such treatment consists of two phases:

1. The removal of plaque, calculus and diseased or necrotic cementum
2. The creation of the smoothest possible root surface as this inhibits the formation of further plaque deposits (although various studies have shown that few clinicians remove all deposits from the root surface).

The effectiveness of such treatment is influenced by many factors including:

- Pocket depth
- Type and tenacity of deposits
- Root anatomy

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INSTRUMENTS

- Operator skill
- And last but not least – **instrument sharpness.**

Indeed, efficient and thorough scaling, particularly on infected root surfaces, can only be optimally performed with sharp instruments – good scaling doesn't just depend on the operator's skill but also on the quality of the instrument in use.

There are of course many other advantages to using an instrument with sharp cutting edges:

- A sharp edge will grab or contact the deposit close to where it attaches and therefore less pressure is required to move the calculus
- Deposits break off in larger pieces and there is less chance of burnishing smaller pieces
- Fewer strokes are necessary which means reduced operating time, minimal patient discomfort and less fatigue for both your patient and you.

The good news about instrument sharpness is that it is a variable the clinician can control. The bad news is that it can be an exacting, time consuming and often frustrating procedure. The strange thing is that basic sharpening principles and techniques are much better understood in other walks of life. I'm sure we all know how to sharpen a carving knife and I bet we'd be horrified to think our hairdressers didn't take the time to sharpen their scissors, but still the uncertainty surrounding our relatively simple dental application seems fairly incongruous.

Sharpening objectives

The sharpening process has three major objectives:

1. To produce a functionally sharp edge
2. To maintain the contours required for the intended use of the instrument
3. Not to reduce too much blade material leading to a reduced 'working life'.

Unfortunately, these objectives are not always met. This is partly because sharpening

techniques are not easy to learn and require skill and practice to accomplish. However, once you get the hang of it you'll find that your instruments will reward you with a long trouble-free working life.

Manual sharpening

Instrument sharpening can be performed by hand using sharpening stones. It's well worth familiarising yourself with each instrument's individual characteristics for more instruments are worn out from incorrect sharpening than from overuse. Generally it's all about getting the correct angle of the instrument on the sharpening stone.² During sharpening there must be a sufficient source of light in the working area and good stability of the stone and the instrument. Table 1 is a comprehensive guide to all the bits and bobs you'll need.

You will also need a test stick (more on that later) and possibly a magnifying glass or loupes.³

Different sharpening techniques make it possible to obtain sharp cutting edges, but remember that not all methods completely preserve the original features of the instruments. Ideally re-sharpening should remove a minimum amount of material from the blade while establishing a perfectly sharp edge. It's well worth asking the manufacturer's advice on maintenance when you invest in new instruments.

Unfortunately, it is not possible to illustrate the various sharpening methods here but I would recommend *Experience is the best teacher: manual of dental hygiene* by Antonella Boticelli and *Periodontology: color atlas of dental hygiene* by H. R. Wolf and T. M. Hassel for their easy to learn chapters on sharpening. Alternatively, check out the web where there are several videos (mainly American) of hygienists demonstrating sharpening techniques.

Machine sharpening

Many clinicians have found that 'freehand' instrument sharpening is not always successful in producing perfectly shaped and sharp

hand instruments. Fortunately, there are now many devices on the market that are useful for sharpening sickles and currettes. Although their initial cost is usually quite high their mechanical structure does make it possible to sharpen instruments properly whilst still maintaining their original features. Your choice will probably be dictated by the brand of instruments you use, but here are a few of the options available:

Periostar

The biggest problem during free-hand sharpening is the difficulty of maintaining the angle of the stone to the instrument tip, and maintaining this angle during the whole sharpening procedure. It demands manual dexterity, knowledge of the individual instrument's characteristics and ... lots of practice.⁴ The primary goal of mechanical instrument sharpening includes not only simplification of the sharpening procedure but also elimination of the aforementioned problems – this is possible using the Periostar. An instruction DVD, test stick and a variety of stones are included in the package.

Hu-Friedy

The Side-Kick sharpener is a straightforward device that guides you and your scalars to sharp consistent results time after time.

LM Rondo

The LM Rondo Plus is a simple and reliable sharpening machine suitable for use with all hand instruments. It sharpens in just a few seconds while still preserving the original form.

Swallow

Whether you're 'skinted or minted' Swallow will have the sharpening solution for you. Although not strictly mechanical, the transformation stone is great for using during an appointment at the first sign of dullness and if you're used to sharpening by eye you'll love the 'Ultimate Edge' kit – it really does make your scalars feel like new. If your sharpening skills need honing it's well worth attending one of their workshops.



Table 1 Instrument sharpening tools and their use

Type	Abrasive texture	Use	Lubrication
Composition sharpening stone	Coarse	A synthetic sharpening stone used for extensive reshaping of working ends that have been improperly sharpened or have extremely dull, worn cutting edges. Use only on metal instruments.	Water
India stone	Medium	A synthetic stone used to sharpen dull cutting edges. Use only on metal instruments.	Water or oil
Arkansas stone	Fine	A natural stone used for routine sharpening of instruments. Use only on metal instruments.	Mineral oil
Ceramic stone	Fine	A synthetic stone used for routine sharpening of instruments. Use on metal instruments and certain plastic instruments; follow manufacturer's instructions for plastic instruments.	Water

NB: Tungsten carbide tips don't require sharpening.

Sharpening services

If sharpening really isn't your thing then why not get someone else to do it for you? Dentsply used to offer a marvellous service; sadly it's no longer in operation but you could try either of the following sharpening services:

- RS Dental; email rjtozer@googlemail.com or telephone 07973 938861.
- Rudge Instrument Sharpening - telephone 01752 216525.

Sharpness

Of course sharpness is a highly relative notion but you need to make sure your instruments actually need sharpening because over-sharpening reduces the life of scalers. You can examine the cutting edge under a bright light – a dull edge will have a wear facet (bevel) and reflect light. Alternatively, apply the cutting edge at the working angle to a test stick or a Bic pen (both are easy to use and much safer than a thumb nail, which may harbour bacteria). Stroke using light pressure – a dull edge will not 'grab' without more pressure.

Do sharpen any instruments that have become dull because however good your manual dexterity is, it's never going to compensate for a blunt instrument. Blunt instruments lack 'bite' and you're more likely to burnish the calculus than remove it.

With repeated sharpening or improper technique, the dimensions of our curettes and scalers can become very thin. These often become our favourite instruments

because they enter pockets with minimal tissue distension and little discomfort to the patient. Thin blades such as these are much more susceptible to breaking when force is applied to the root of a tooth. Losing the tip of a scaler is stressful for the operator and frightening for the patient as broken tips are often elusive and sometimes can only be located with a radiograph.

WARNING! Sharpening instruments eventually alters the shape and reduces the size of the blade. Instruments then become weak and may collapse in clinical use. All instruments should be replaced when the blade has been reduced by 50% from the original manufacturer's shape (usually after they have been sharpened 10-15 times).⁵

Time

Many of us resort to sharpening our instruments during our lunch hour, after work or when a patient fails to attend. However, if a job is worth doing it's worth doing well and if you sharpen when you're in a hurry or if you use the wrong sharpening stone then the shape and contour may be destroyed.

Frequency

Some say you should sharpen curettes during each session as they often become dull following contact with enamel or metal restorations. I guess it really depends on your usage but for most of us it should definitely be at least a weekly experience.

Cross infection

Always clean and autoclave instruments before sharpening and then re-autoclave them prior to treatment. The scrapes, scratches, fine dust and airborne debris capable of being generated when sharpening are extra dangerous when the serious risk of cross infection is added.

Care of instruments

There's little point in sharpening instruments if you're not looking after them in the interim:

- Remember that cutting edges become dull from contact with hard metal surfaces so try to keep blades from hooking, bumping or pressing against each other (this is where instrument cassettes score)
- Avoid overloading instruments in the ultrasonic bath and autoclave
- When scaling always try to hold the instruments at the correct angle to the tooth surface and avoid contact with metal restorations.

Conclusion

Well developed sharpening skills are essential for performing effective periodontal instrumentation. Once you get the hang of it you'll find that your instruments will reward you with a long, trouble-free working life.

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3. Daniel S J, Harfst S A. *Mosby's dental hygiene – concepts, cases and competencies*. Mosby, 2002.
4. Wolf H F, Hassell T M. *Periodontology: color atlas of dental hygiene*. Thieme, 2006.
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