# Instrument Sharpening



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Sharp instruments are used for scaling and root planing because they are more efficient at removing hard deposits such as calculus from the teeth. With the use of sharp instruments, scaling and root planing can be completed in less time, with less effort on the part of the operator and with less discomfort for the patient.

The cutting edge of a curette or scaler is formed by the junction of the face of the blade and the lateral surface. With sharp instruments, this junction is a fine line running the length of the cutting edge. Sharp edges are produced when the lateral sides of an instrument and its face intersect at approximately 70 degrees. The 70 degree angle is used because it allows for efficient scaling, as compared to, for instance, using an instrument with a 90 degree angle. Also, it minimizes the chance of gouging the root surfaces, which would happen if a more acute cutting edge were used.

Instrument sharpening is the process by which the side surface of a scaler or curette is ground with a hand-held abrasive stone or a rotary stone until a fine cutting edge is restored between the side of the instrument and its face.

When the cutting edge is sharp, it does not reflect any light.  When an instrument is dull, the junction between the side of the instrument and the face is not a line but a surface which reflects light back to the observer.  Sharpening aims to restore the fine line and thus the effectiveness of the instrument.  During the sharpening process, no distortion of the edges, bevels or angles of the instruments should occur. If the instrument is to continue to function effectively, the original shape and contours of the cutting edges must be preserved when sharpening.

Included in your instrument kit, you will find a rectangular or a wedge-shaped sharpening stone, a round sharpening stone, an acrylic test stick as well as the instruments to be sharpened.

Sharpening stones can be organic, such as Arkansas and India stones, or synthetic such as ceramic stones.  They are either fine or medium grit.  Organic stones are lubricated with oil and synthetic stones are lubricated with water. The stone is lubricated using sterile gauze.

Worn stones should not be used, as they can make sharpening more difficult and can cause distortion of the cutting edges.

Before beginning, it is important to become familiar with the design of the instrument, as the shape of the working end should not be lost or altered as a result of sharpening. The cutting edge may be straight or curved. To determine the type of design, hold the working end so that you can look down on the face of the instrument. The cutting edges of sickle scalers may be either curved or straight with a pointed tip. Universal curettes have a face that is perpendicular to the terminal shank with 2 parallel cutting edges and a rounded tip. Gracey curettes have the face oriented at a 70-degree angle to the terminal shank, with only one cutting edge and a rounded tip.

Good lighting is essential, as sharpening requires precise controlled movements of the stone against the very small dull surfaces of the instruments. Positioning is also very important. Each instrument is held differently depending on the angle of the instrument's face, which must remain parallel to the work surface with the tip either pointed toward or away from the operator. The instrument should be held firmly in the non-dominant hand with the elbow resting on a stable surface.  This stable position should be maintained throughout the sharpening procedure. If the instrument moves around, it is difficult to orient the stone properly against the edge to be sharpened. The stone is held in the dominant hand.

Once properly positioned, the basic sharpening procedure is similar for all instruments. In order to maintain a 70 degree angle between the face and the side of the instrument, the sharpening stone is held against the side of the instrument at its heel, first establishing a 90-degree angle between the face and the stone. Then, by slowly moving the lower part of the stone, the angle is closed to 70 to 80 degrees. Throughout sharpening, a light touch is used and the stone is moved in one direction, starting below the face of the instrument and moving upward towards the cutting edge, thereby re-shaping the side of the instrument, rather than its face.

The working end of each instrument is divided into 3 sections: the heel, the middle, and the rounded or pointed tip. The instrument is sharpened, starting with the heel and working toward the tip.

## Sickle Scaler:

In order to sharpen the sickle scaler, hold it in your non-dominant hand with the scaler face parallel to the work surface and the tip pointed towards you. Stabilize your arm on the table. The angle of the stone to the edge to be sharpened is 70 degrees. Pass the stone lightly 4 or 5 times in an upward direction on the heel, then 4 or 5 times on the middle, and then 4 or 5 times on the tip. In order to sharpen the other cutting edge, turn the scaler around, so that the tip faces away from you and lightly pass the stone upward over each third.

While sharpening, check frequently to ensure that the side of the instrument is not being distorted, that the 70 degree angle is being maintained and that no new bevels are created. Sharpness can be checked by looking at the cutting edge of the instrument under a good light source, to see if there is any light reflected back. The instrument is deemed to be sharp when the cutting edge reflects no light.

An acrylic test stick can also be used to test sharpness. In the areas where light is still reflected by the cutting edge, several more light passes with the stone may be needed. Occasionally, a wire edge of metallic particles accumulates on the cutting edge. This can be removed by gently running the flat section of the wedge-shaped stone across the face of the instrument once or twice, in the direction of the cutting edge.

This procedure is similar if your dominant hand is your left hand. Hold the scaler in your right hand and ensure that the face is parallel to the work surface with the tip pointed towards you. Stabilize your arm on the table. Lightly pass the stone 4-5 times on each third, checking frequently to avoid over- sharpening or distortion of the blade. Turn the instrument to point the tip away from you and lightly pass the stone over each third. The scaler is sharp when the cutting edge does not reflect light. An acrylic stick can also be used to test sharpness.

## Universal Curette:

In order to sharpen the double edged universal curette hold it in a firm, stable grasp with the instrument face parallel to the work surface. The angle of the stone to the edge to be sharpened is 70 degrees. The sides of the instrument should be maintained parallel to one another, and the rounded tip of the curette should be preserved. It is important to remember that the sides of universal curettes are straight, not curved. Follow the straight line of the sides of the instrument precisely, sharpening the heel and the middle of each side, and then the tip separately, in order to preserve its rounded shape. Hold the instrument with the tip toward you while you sharpen one edge. Lightly sharpen the heel and the middle 4 to 5 times. Then turn the tip away from you, while you sharpen the heel and middle of the other edge. Finally, sharpen the rounded tip separately, rather than proceeding from side to tip to the other side in one continuous motion. The instrument is deemed to be sharp, when light no longer reflects off the cutting edge. Sharpness can also be tested with an acrylic test stick. If a wire edge of metallic particles has accumulated on the cutting edge, it can be removed by gently running the curved section of the wedge-shaped stone or a round stone across the face of the instrument once or twice, in the direction of the cutting edge.

This procedure is similar if your dominant hand is your left hand. Firmly hold the curette in your right hand with the face parallel to the working surface and the tip pointed towards you. Lightly pass the stone over the heel and middle 4 to 5 times. Turn the curette so the tip is facing away from you and lightly pass the stone over the heel and middle and then sharpen the tip separately. The instrument is sharp when light no longer reflects off the cutting edge. It can also be tested on an acrylic stick.

## Single edged curettes:

In the case of single-edged curettes, such as Gracey curettes, the cutting edge is located by holding the instrument with the tip facing the operator and the handle perpendicular to the work surface. The lower edge is the cutting edge. Gracey curettes are site-specific and thus come in pairs. During sharpening, they are held with the tip facing either towards or away from you, so that the cutting edge is always accessible with the dominant hand.

These instruments give the optical illusion that the cutting edge is curved. However, on close examination, it can be seen that the edge is straight. A common error is to treat the edge as curved, which can result in the distortion of the shape of the instrument during sharpening. As with all instruments, position the face of the instrument parallel to the work surface. Pass the stone lightly over the heel and middle 4 to 5 times, then sharpening the tip separately, moving the stone in an upward direction. Throughout the sharpening process, ensure that the face of the instrument remains intact and the tip rounded, rather than grinding it into a point.

The procedure is similar if your dominant hand is your left hand. Firmly hold the curette in your right hand with the face parallel to the work surface. The tip should face either towards or away from you, so that the cutting edge is accessible with the left hand. Pass the stone lightly over the heel and middle 4 to 5 times, then sharpening the tip separately. The instrument is sharp when light no longer reflects off the cutting edge. Sharpness can also be tested on an acrylic stick.

When all the instruments have been sharpened, remove all metal residues that have accumulated on the stone surface with a piece of wet gauze. Properly arrange all the instruments, acrylic test stick, and sharpening stones in the kit for sterilization.

The face of all instruments being sharpened is slightly reduced with each sharpening. However, if the cutting edges are not over-sharpened by using too much pressure, the wrong sharpening motion or coarse grit stones, they can be maintained sharp, so that they can be used repeatedly over long periods of time.

In conclusion, as sharp edge maintenance is much easier than complete edge re-shaping, it is important that instruments be examined before each use as well as during the scaling or root planing appointment, so that dull portions of their edges can be sharpened before the entire cutting edge becomes dull and must be completely re-established.

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