

IMPROVING YOUR DENTAL CHARTING, SCALING AND POLISHING IN DOGS

DR DAVID E CLARKE REGISTERED SPECIALIST, VETERINARY DENTISTRY AND ORAL SURGERY

PERIODONTAL DISEASE AFFECTS 85% OF ALL DOGS OVER 2 YEARS OF AGE. IT IS A MULTI-FACTORIAL DISEASE THAT REQUIRES THE PRESENCE OF A NUMBER OF FACTORS SIMULTANEOUSLY. IN THE PAST, MANY VETERINARIANS HAVE CONSIDERED PERIODONTAL DISEASE TO BE AN INFECTION, BUT IT IS NOT, AND SHOULD BE CONSIDERED AN INFLAMMATORY DISEASE.

Whilst the initiation of gingivitis commences with plaque, the progression to periodontitis requires a number of factors including the individual's subgingival microbiome, calculus deposits, breed, bite type, malocclusions, genetics, epigenetics, the individual's immune response and overall general health, age, home dental care regime, chewing behaviour, composition and adequacy of saliva, muzzle hair, periodontal health and any existing pocket depths. Therefore, we need to treat the inflammation, as well as deal with the other factors, to ensure the health of the periodontal tissues.

The majority of our canine patients will suffer from Adult Onset Periodontal Disease (AOPD) at some point in their lives, commencing with gingivitis and progressing to periodontitis. Early periodontitis in juvenile patients has a greater genetic component, whilst older animals have a higher 'other factor' component.

TREATMENT GOALS of AOPD are:

1. Observe pathology and record it on a dental chart, for both your immediate history and clinic records and for future reference to confirm treatment success.
2. Remove plaque and calculus from the tooth surface - crown (including the sulcus) and root (periodontal pocket).
3. Remove diseased cementum and endotoxins from root surfaces and debride epithelial wall within periodontal pocket.
4. Provide a smooth tooth and root surface that slows the rate of plaque re-attachment and encourages pocket epithelium reattachment to the cementum/dentin.
5. Provide medications to control pain and decrease inflammation.

The primary purpose of general anesthesia and teeth scaling is to reduce the quantity of pathogens to a level that decrease inflammation and provide an environment for the host's immune system to commence healing.

STEPS are:

1. Provide the operator with the correct equipment.
2. Detect plaque in order to improve scaling.
3. Perform a thorough dental examination including sulcus and pocket depth measurement.
4. Record your findings on a permanent dental chart.
5. Scale and polish the teeth.

Detecting Plaque

Plaque is a mixture of bacteria and glycoproteins, invisible to the human eye that must be stained to be detected. The ideal way in your clinic to detect plaque is to use fluorosein and a blue light. This can be performed in the consulting room and in the dental suite. Plaque can be observed in the consulting room using commercially available fluorosein or a fluorosein strip, like the one you use to detect cornea ulcers and a blue light. Hills, the pet food company supplied a blue light for Pet Dental Month last year, so you may already have one in the clinic. Fluoresein liquid stain is available from K9 Gums, www.k9gums.com.au.

Figure 1. Plaque enhanced using a blue light after fluorosein application.



The new Newtron ultra-sonic scaler, manufactured by Acteon and available from K9 Gums, contains a blue lighted handpiece that highlights plaque following placement of fluorosein. Fluoresein can be manually brushed onto the tooth or simply added into the water bottle, where the handpiece sprays the teeth with water impregnated with fluoresein prior to scaling. It is a brilliant technique to train your vets and nurse to ensure complete teeth cleaning and is not as messy as the red erythrosine dyes that stain white muzzled dogs 'pink'.

Video of manual placement of fluorosein with a brush can be viewed at: <https://vimeo.com/302622654>

Video of scaling using fluoresein enhanced by blue lighted Newtron handpiece can be viewed at: <https://vimeo.com/339266559>

Probing and Charting

A healthy tooth is surrounded by a sulcus, which is lined on one side by the tooth crown and the other by an epithelial wall. The bottom of the sulcus is an epithelial attachment to the tooth at the cemento-enamel junction. Periodontitis, an inflammation of the tissues surrounding the tooth, results in a loss of attachment and a deepening of the sulcus to form a pocket that exposes the tooth root and the deeper epithelial tissues. Periodontal probes are used to determine the position of epithelial attachment and thereby measure the depth of the gingival sulcus and periodontal pockets.

A graduated probe is placed along the tooth, under the gingival margin, until it reaches the resistance of the epithelial attachment. Gentle force should be used, as it is easy to penetrate through inflamed tissues. The depth is measured in millimetres from the gingival margin to the epithelial attachment and should be performed in two to three places on both the buccal and lingual/palatal surfaces of each tooth. The sulcus should measure 2mm or less, whilst the pocket demonstrates greater measurements. If the gingiva has receded, the measurement from the epithelial attachment to the cemento-enamel junction gives the loss of attachment. The depth of the pocket, as well as, gingival recession should be recorded on the dental chart.

Figure 2. A graduated periodontal probe.



Figure 3. Diagram of 'how to use a periodontal probe'.

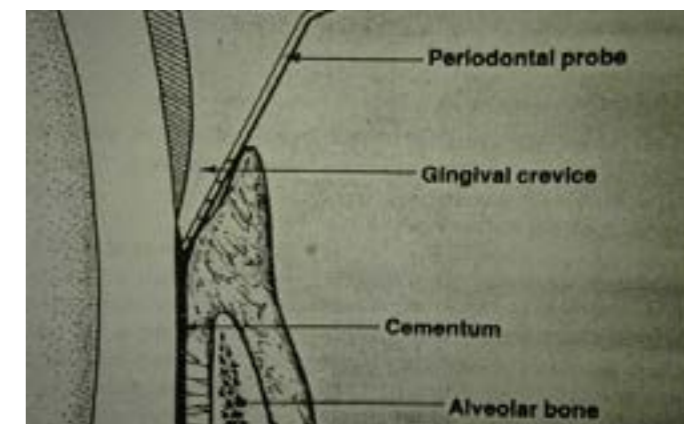


Figure 4. Using a periodontal probe to measure periodontal pocket depth of 10mm of the mandibular 3rd incisor tooth.



Video of periodontal probing can be viewed at: <https://vimeo.com/302620419>

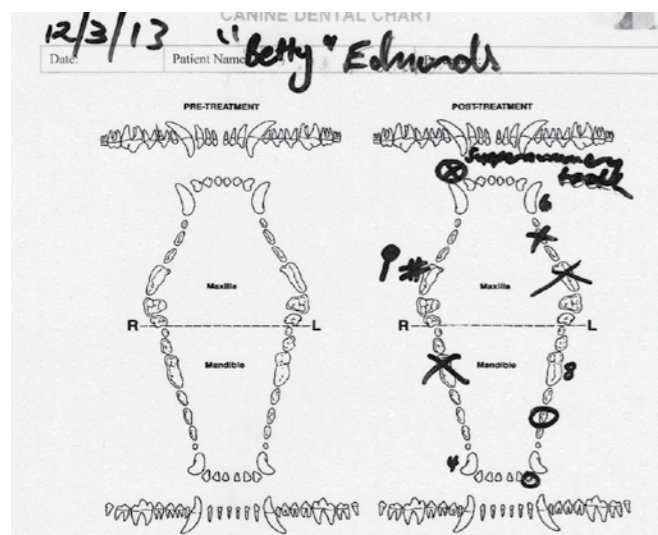
After measurement, each of the probing depths are recorded on the chart adjacent to the tooth, ie 6mm pocket on buccal surface of maxillary left canine tooth; 8mm pocket on buccal surface of mandibular left 1st molar tooth. All pathology should also be recorded on the dental chart.

This could include missing teeth, extra teeth, fractured teeth, gingival recession, gingival enlargement, furcation exposure, mobility, oral tumours.

Dental charts are available on paper or cloud based electronically. A copy of our clinic's paper and electronic charts are used as examples. On the paper chart, ie the maxillary right 4th premolar tooth was fractured and required a root canal treatment to be performed – represented by a # symbol and filled in 'lollipop'; a supernumerary maxillary right 3rd incisor required extraction – represented by a cross in a circle; the maxillary left 2nd and 4th premolars and mandibular right 1st molar were extracted – represented by crosses over the tooth; the mandibular left 2nd incisor and 3rd premolar were missing – represented by a circle around the tooth. The other pathology symbols are in the Abbreviation key text box on the left side of the chart. Gingivitis, plaque and calculus may also be recorded on the chart. These can be designated an index from 0 to 4, which represents the degree of gingivitis and the surface coverage of plaque and calculus. The numbers are then recorded on the chart. The paper charts are available on the internet. The electronic charts are available from www.vetdentalcharts.com and allow the veterinary nurse to record using an Apple ipad or tablet with a stylus on the basic draw-on-chart or the advanced version using dental nomenclature. It is even possible to customize your own terms. The charts are available for a trial period before subscribing.

Video of completing an electronic chart can be viewed at: <https://vimeo.com/339313768>

Figure 5. 'Betty Edmunds' written paper dental chart showing pathology



Supra-gingival Scaling

Gross plaque and calculus deposits can be removed from the supra-gingival surfaces of the teeth with tartar removing forceps, hand-held scalers or power scalers. Tartar removing forceps are designed in a similar fashion to extraction forceps, with the difference being they have one curved beak and one straight beak rather than two straight beaks. The straight beak is placed against the cusp of the tooth, whilst the curved beak is placed at the gingival margin. The handles are squeezed together which results in the calculus being chipped/shaved off. The force from the beaks is parallel to the long axis of the tooth, compared to extraction forceps, where the force would be across the tooth. Using tartar removing forceps, decreases the chances of fracturing the cusp.

Hand scalers

Hand scalers have a handle connected to a blade, which has a double-sided cutting edge that converges to a sharp point. The blade is triangular in cross section. The sharp blade is used to remove plaque, calculus and other deposits from the supra-gingival tooth surface. They are held in a modified pen type grasp. The blade is placed on the tooth surface at the gingival margin and used in a pull stroke that moves the blade away from the gingival margin. The most common scalers are the Universal (or H6/H7), the Jacquette and the Morse. The Universal is the most common in Veterinary practices. The Universal has a long blade, the Jacquette has a medium sized blade and the Morse have small, almost miniature size blades.

VIDEO of hand scaling can be viewed at: <https://vimeo.com/299761600>

Figure 6. The blade of a curved scaler (A Universal – H 6/7).



Ultrasonic scalers

Ultra-sonic scalers may be used for removal of supra-gingival plaque and calculus. Ultrasonic scalers operate at >25kHz. The principle action of plaque and calculus removal is either

by a mechanical action or cavitation. The mechanical action is achieved by the vibrating tip contacting the calculus and breaking it off. Cavitation is the production of sound waves derived from physical vibrations of the tip energizing the water spray, which then clean the tooth. The cavitation effect can be dangerous to the operator. Cavitation produces a bacteria laden aerosol that when inspired by the operator may result in a respiratory infection.

The handle of the ultrasonic scaler is held in a pen-like grip. The tip is placed against the tooth surface at the gingival margin and in light contact with the calculus. The tip is moved using light strokes over the surface of the tooth. The operator should allow the vibrations to shatter the calculus. If the tip is used like a hand-held scaler, and force is placed against the calculus, the tip is likely to break.

The ultrasonic scaler can be safely used on any tooth surface that you can visualize, but the tip of most scalers can get quite hot without adequate water cooling, to the point where damage to the tooth and surrounding tissues occurs. The water spray should be directed at the end of the tip to dissipate heat. If used inappropriately or for excessive amounts of time on a single tooth or on young growing tissue, damage will result. To avoid excessive heating of an individual tooth and tissue damage, the tip should be continuously moved over the tooth surface and a single tooth should only be scaled for the shortest time possible. If the ultrasonic scaler does not remove the calculus from the developmental ridges and cusps, then a hand-held scaler should be employed.

Care must be used when using most ultrasonic scalers is the gingival sulcus, as they can easily overheat the epithelial tissues and the tooth. The NEW Newtron ultrasonic scaler produces minimal heat and can safely be used on the crown with no time limit as well as subgingivally without heating and damaging the delicate tooth root surface and pulp. The Newtron is also safe to use with the curette shaped tip in periodontal pockets.

Video of ultrasonic scaling can be viewed at: <https://vimeo.com/299769052>

Figure 7. Teeth prior to ultrasonic scaling



Figure 8. Teeth after ultrasonic scaling



Polishing

Polishing the tooth surface following scaling is performed to remove any microscopic plaque and calculus and to provide a smooth tooth surface that retards the re-attachment of plaque and calculus. Supra-gingival scaling and root planing, even when done correctly, will leave a roughened enamel surface that will encourage plaque reattachment. Polishing is performed by applying an abrasive paste in a cup to the tooth surface. Pressure on the cup will flare the edges, which can then be directed slightly under the gum, to polish sub-gingivally.

Generally speaking, there are two types of polishing actions. The traditional cup, which rotates continuously at 5,000 rpm and the newer type of cup with a reciprocating action, back and forward. The cups should not be applied to the tooth surface for greater than two seconds duration as the heat generated can cause an increase in dentine temperature and an irreversible pulpitis. Pastes are available in different flavours and grades. Bubblegum, Mint, Pina Colada and Banana are popular. Fine grades produce a smoother finish, whereas course grades will remove more enamel and produce a rougher surface. It is also possible to purchase paste in a multi-use jar or individual caplets. The same prophyl cup should not be repeatedly dipped into the multi-use jar during teeth polishing, as it will become contaminated. The paste can be placed into separate dappen dishes for each patient. A new cup should be used for each patient.

Video of polishing can be viewed at: <https://vimeo.com/299764076>

Figure 9. Polishing cup on slow speed motor



Figure 10. Prophyl paste in a multi-use jar.



Sulcular lavage is the term used to describe flushing the gingival sulcus and periodontal pockets with saline or water after the teeth have been polished to remove any free-floating debris and polish. VIDEO of sulcular lavage can be viewed at: <https://vimeo.com/299763377>

If you would like to watch a presentation on Improving your Periodontal Cleaning, it can be viewed here: <https://vimeo.com/270919552>

STUDENT ACCEPTS INTERNATIONAL EQUINE RESEARCH INTERNSHIP

Charles Sturt University (Charles Sturt) Bachelor of Equine Science student Adelaide Kovac has been accepted into the prestigious and highly competitive Kentucky Equine Research internship program.

The 12 month internship program is open to four people annually and is conducted in the Kentucky Equine Research (KER) headquarters in the United States. The centre is considered an industry leader in equine nutrition and exercise physiology research across a wide range of equestrian disciplines.

Ms Kovac said the internship is a highly sought after program and was surprised and thrilled to be accepted.

“To be considered for the internship I had to have already undertaken equine studies and at least five years working with horses,” Ms Kovac said.

Over the 12 months of the internship Ms Kovac said she will be involved in equine research and attending nutrition conferences in Kentucky and Florida as well as attending the Kentucky Derby and the Land Rover Kentucky Three Day Event.

Ms Kovac said the internship was an exciting opportunity to blend her passion for research and managing horses on the centre's farm.

“The internship program covers all aspects of equine nutrition and monitoring horse health and fitness but I will also be doing day-to-day applied management of the horses on the farm,” Ms Kovac said.

Charles Sturt associate Professor in Equine Science, Hayley Randle said Adelaide was a great ambassador for the Bachelor of Equine Science.

“Adelaide is passionate about horses and will be a strong ambassador for the Charles Sturt University Equine Science courses. As well as being a keen competitor in eventing, she is always keen to put the latest theory into practice and having the opportunity to work with KER is a perfect next step before coming back to us for the next step in her higher education studies,” said Associate Professor Randle.

“With only four internships offered each year, selecting an Australian shows the world respects what we are doing and that we are pulling our weight internationally in terms of research and industry relevance,” she added.

Kentucky Equine Research already employs several Charles Sturt graduates in Australia.

Ms Kovac will move to the United States at the end of June to commence the internship. Following the internship Ms Kovac said she will return to Charles Sturt to complete an Honours project.