Periodontal Treatment and Home Dental Care
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Introduction
The management of the periodontal tissues in dogs and cats (and humans) is very complex. Due to space restrictions, these notes are but a start. I encourage you to visit my website (www.toothvet.ca), in particular the Old CUSP Articles page, where you will find several educational articles relevant to periodontal disease and its management. I have also posted my book, Understanding Veterinary Dentistry on my site (www.toothvet.ca/book.html). It is yours for free.

Professional Dental Treatment
The treatment of periodontal disease is divided into three stages as follows.

Initial Treatment:
- client evaluation and education with respect to plaque control
- diet analysis and evaluation
- periodontal probing and charting
- intra-oral radiographs
- appropriate extractions and wound closure
- scaling and root planing
- reduction of pocket depth
  i) sub-gingival curettage
  ii) gingivectomy where indicated (only in cases of gingival hyperplasia)
  iii) periodontal flap procedures
  iv) osseous recontouring
  v) periodontal regenerative procedures

Home-care
- appropriate diet and chew treats
- daily tooth brushing
- chemical plaque control agents

Maintenance Periodontal Treatment
- re-evaluation every 3-12 months (probing, charting, radiographs)
- periodontal maintenance therapy

The COHAT
Prophy is short for prophylaxis which means prevention. The vast majority of our dental patients already have established dental disease at time of presentation and so in the majority of cases, the term "prophy" is inaccurate and inappropriate. Most of the time, we are performing detailed periodontal evaluations and treatment, often with advanced oral surgery (extractions, wound debridement and closure). For those rare cases that are truly getting preventative treatment, the term prophy would apply. I virtually never use the term myself. Rather I use the term COHAT which is an acronym for Comprehensive Oral Health Assessment and Treatment.

According to the American Veterinary Dental College, the purpose of a Dental Prophylaxis is as follows: a procedure to remove all hard and soft substances from the tooth surfaces. The primary objective is always a thorough and complete removal of the bacterial plaque, calculus and extrinsic stains. This must be accomplished by a procedure known as scaling and polishing. If calculus is present below the gingival margin, subgingival scaling, as well as supragingival scaling, is performed. Dental record keeping, thorough charting and client education are also necessary portions for the prevention of disease.

Each COHAT should start with a thorough examination of the patient. Do not go directly to the mouth, but rather, look at the whole animal first. Start with patient history and signalment as this may reveal information that will change your approach to the case.

Review past history for:
- previous dental treatment,
most recent illness, surgical history, gastrointestinal status, cardiovascular status, endocrine disturbances, allergies and drug sensitivities, bleeding disorders, present medication, diet, vices, current level of daily home plaque control

A physical examination should follow history taking. You may well find a problem that supersedes the dental concern and that should be treated before dental procedures are done.

After looking at the whole animal, look carefully at the head. Check for symmetry of the head and face. Observe any nasal or ocular discharges, as chronic dental infection will often communicate with other cranial structures. Note any swellings.

Next, look at the lips and muco-cutaneous junctions. Many immune-mediated diseases will be evident in this location.

Now you may start the oral examination. This involves the whole oral cavity, not just the teeth. The exam should be organized in an orderly fashion with a consistent routine to ensure no area is neglected. Look at the buccal mucosa, the tongue, the palates, oropharyngeal area and tonsils, the floor of the mouth, occlusion and finally the teeth.

The findings should be recorded accurately on a suitable dental chart to facilitate communication and assessment of progress at subsequent treatments.

Some of the things to look for are:
- colour, texture and form of gingiva
- exudate if present
- plaque and calculus deposition and distribution
- pocket depth in millimeters
- attachment loss in millimeters
- gingival recession in millimeters
- occlusal relationships
- traumatic occlusal factors
- wear patterns on teeth
- mobility of teeth
- migration of teeth
- food/fur impaction
- anatomic variations
- abnormal frenulae
- mucogingival line
- signs of oral vices
- anything else of interest

The advent of small, fine instruments has made it possible for operators to develop a delicate, tactile approach to the treatment of periodontal disease. Each instrument has been designed to do just so much work effectively, but when it is pushed beyond these limits, its efficiency drops proportionally. Some basic principles of hand instrumentation are as follows:
- work comfortably, seated on a stool (or better yet, a saddle chair) at the appropriate height
- follow an orderly and consistent sequence of instrumentation
- ensure maximum visibility with a good source of light (but do not open the mouth excessively as this will cause damage to the temperomandibular joint) and magnification
obtain good access with retractors and dental mirrors but avoid the use of mouth gags
- maintain control over the instruments
- maintain a clear field with frequent flushing
- use sharp instruments
- use a modified pen grasp
- be gentle and careful, do not rush yourself
- know the function and limitations of each instrument
- know the relation of the instrument to the tooth and periodontal structures before activating it
- check for completeness
- support hand on a tooth or structure in the same quadrant as you are working on.

Radiology in Periodontal Disease

When treating periodontal disease, the condition of each tooth must be accurately assessed in order to make the appropriate treatment decisions. While the use of a periodontal probe to measure gingival recession and periodontal bone loss is essential, it is only part of the picture. Intra-oral dental radiographs are absolutely essential for evaluating the degree and location of pathology (bone loss, root caries or resorption, endodontic disease). It just is not possible to accurately assess the periodontal status of affected teeth without radiographs. Failing to take dental radiographs will lead to misdiagnosis and mistreatment more often than not.

Scaling and Root Planing

Scaling refers to the removal of calculus from the crowns of the teeth. This can be achieved with mechanical scalers, hand scalers or a combination. Though the calculus on the crowns of the teeth is not the big problem (subgingival accumulations are much more significant), complete removal of all calculus is the goal. Mechanical scalers work by vibrating and so they do not tend to work well in tight quarters, such as between closely spaced teeth. That is when hand instruments must be used.

When wet, small accretions of calculus will be difficult to see, as they can be almost the same colour as the tooth. Blowing the tooth surface dry will reveal the dull, chalky calculus against the shiny enamel surface.

Root planing is the process of removing plaque, calculus and necrotic cementum from the root surfaces. Doing a thorough job of root planing is far more important than getting the crowns of the teeth clean, as it is the bacteria below the gum line that is causing the periodontal disease.

Root planing is accomplished with dental curettes (not scalers). Hand instruments used to be the only acceptable tool for root planing, but some mechanical scaling devices (ultra-sonic scalers) have been designed for use in root planing and have been shown to work well when used properly. Note: not all mechanical scalers can be used subgingivally - know your equipment!

For shallow defects, (less than 5 millimeters), closed root planing is often sufficient. This is root planing without reflecting a gingival flap for access and visualization of the root. If the pocket is over 5 millimeters deep then a gingival flap should be reflected to allow access to and visualization of the root (open root planing).

As study was done in which human periodontists did closed root planing on deep pockets until they felt the roots were good and clean. Then they reflected gingival flaps and consistently found that there was still calculus (and therefore, plaque) on the root surfaces. The conclusion was that even in the most skilled hands, deep pockets need open root planing.

Subgingival Curettage

As well as removing the plaque, calculus and necrotic cementum from the root surface, it is also important to remove infected and inflamed soft tissue from periodontal pockets. This procedure is known as subgingival curettage. In some cases, this tissue can be removed with the same curette that is used to plane the root surface, in other cases, specific periodontal incisions are made to remove the undesirable tissue.

When finished, the goal is to have a clean cementum surface on one side of the periodontal pocket and either fresh bleeding connective tissue or clean bone on the other side. Then healing can take place.
It is beyond the scope of this paper to go into great detail on these more advance periodontal procedures. The very important message that must be delivered is that, when dealing with the treatment of established periodontal disease, all subgingival pathology must be addressed if there is to be any hope of success. It makes no difference how clean the crowns are if there is plaque, calculus and inflamed soft tissue left in the pockets.

**Polishing**

Polishing at the end of the procedure serves two essential functions.

Firstly, scaling by hand or with power equipment will micro-etch the enamel and cementum. This leaves these surfaces rough and, therefore, more plaque retentive. Polishing helps to remove the microscopic grooves, leaving a smoother surface with less total surface area and fewer places for the plaque to hide.

Secondly, and perhaps more importantly, polishing removes plaque.

You will likely do a thorough job of removing calculus when you scale, but since plaque is less visible, considerable amounts can be left behind. The use of a plaque disclosing solution will reveal areas of retained plaque following scaling. This is a good way for you to run a self-assessment on your dental prophylaxis.

Since plaque will start to mineralize within a few days, to leave any behind is to do an incomplete job.

As with almost all beneficial treatments, polishing is not completely without risk. As the polishing cup will generate a lot of frictional heat, it can cause thermal damage to the pulp causing pain and possibly pulp necrosis. To avoid this:

- keep the prophy cup moving over the tooth surface constantly,
- leave the cup on any one tooth for a maximum of five seconds - if that tooth is not completely polished in that time then leave it to cool down and come back to it later,
- keep plenty of prophy paste in the cup,
- wet the teeth with water periodically to cool them - this also rinses away paste and blood allowing better visualization of the job site,
- use a light touch,
- potentially contrary to that last point, apply enough pressure so that the lip of the prophy cup flares out on the tooth surface to reach into the gingival sulcus. Remember that it is the plaque below the gum line that causes the most significant problems. If you do not get the enamel in the sulcus polished well, you have done little for the long term benefit of your patient,
- buy the softest available prophy cups to minimize the pressure required to cause the cup to flair,
- use a medium or fine grit prophy paste or flour grade pumice mixed with water,
- run the polisher at 2500 to 3000 rpm.

**Sulcar Lavage**

The prophy paste is a pumice mixture. Pumice is a foreign body, so flush the gingival sulcus thoroughly to remove all paste. This will also remove any loose calculus and cellular debris to establish a clean sulcus. You can flush the sulcus with a 20 or 60 cc syringe with a small intra-venous catheter. Gently introduce the cannula to the bottom of the sulcus and infuse your irrigant at low pressure.

**Fluoride Treatment**

Fluoride has a few desirable properties. It can bind to enamel and replace lost calcium to reverse incipient caries lesions (tooth decay). It desensitizes exposed dentin. It is antibacterial.

Fluoride is used extensively in human dentistry, mainly for its anticariogenic properties (it prevents tooth decay). However, cats do not get caries and only about 5% of dogs ever get them. Therefore, the wholesale use of fluoride seems unjustified in veterinary dentistry.

Dentin may be exposed by chip fractures and this will certainly cause sensitivity, but this can be more effectively treated by sealing the exposed dentin tubules with a dentin bonding agent (some of which do contain fluoride).

Fluoride is antibacterial but there are many other oral antiseptics to choose from and the effects of an in-office application are short-lived.
On the other hand, fluoride is a toxic substance. This is why fluoride-containing toothpastes are not to be used in children under three-years-of-age as they will swallow rather than rinsing and spitting. Dogs and cats also do not rinse and spit, but swallow what goes in their mouths.

If a patient has extensive gingival recession with exposure of root or has enamel hypocalcification, the use of fluoride might be justified. However, in the vast majority of veterinary dental patients, there is no confirmed benefit from providing fluoride as either an in-office procedure or in a home-care product.

Home Plaque Control

Stating the Obvious - You Cannot Treat Disease with Preventative Measures

Home care refers to everything the owners do at home on a regular (hopefully daily) basis to prevent gingivitis and periodontal disease and to maintain good oral hygiene. Note the italics. Homecare is PREVENTION. It is not treatment. In order to prevent a problem, you have to take action before the problem occurs.

It is very common for clients to report to me that they started trying to brushing their pet’s teeth when instructed to do so because their veterinarian had noted some gingivitis starting. They have started this without their pet having a thorough oral examination first and in an attempt to treat established disease and this is all wrong. It can actually be far worse than doing nothing.

Take the example of the cat presented for evaluation and treatment of a resorptive lesion. When I examined the cat, I actually found four resorptive lesions. These lesions can be intensely sensitive (jaws chatter when you probe the lesion in an anesthetized patient – ouch). This owner had been instructed to start brushing this cat’s teeth because it had some gingivitis as well as the resorptive lesion detected by the referring veterinarian. In effect, the veterinarian had instructed the client to inflict significant pain on their pet by poking at the painful resorptive lesions. What are the chances the animal is going to enjoy this experience? What are the chances the owner is going to enjoy this experience? If the animal’s early experience with a home care program is one of pain, they will not be willing and enthusiastic participants in the program. If the animal does not want to have its teeth brushed, it does not matter how much the owner wants to do it, it won’t happen!

It is essential that the animal truly enjoy the home care experience. It is an unnatural behaviour to sit still while someone pokes a plastic stick into their mouth and so training the animal to accept and enjoy the experience must be a gradual process of behaviour shaping. Every step must be pleasant and accompanied by positive reinforcement (affection, treats…). If the early experience is painful (due to trauma to teeth with resorptive lesions, fractured teeth, areas of significant inflammation…) the animal will be experiencing negative reinforcement and the program will fail! Once they get the idea established that the toothbrush is an instrument of torture, all future attempts at home care, even after the mouth has been made healthy, are very likely to fail. The animal will be saying “We tried this before, it hurt like heck, so you can just forget it!”

The same would go for feeding mechanincally-active plaque-retardant diets and chews such as those listed on the www.vohc.org website. These products work to remove plaque from the teeth doing the chewing. Asking a dog or cat with established dental disease to eat a large, dry kibble/treats that requires chewing is just mean. These diets/treats are to be fed to animals with clean, healthy mouths and the necessary chewing hardware to do the job. They should not be recommended for animals with disease. They will do no good and chewing them may be very uncomfortable for the pet. So the options for the pet are go hungry or chew through the pain.

If you have a young animal (6-months-old) that is in for spay/neuter, do a thorough oral examination to ensure everything is normal and healthy. If it is, now is the time to get the owners started on the slow and gradual process of training (tricking) their animal to enjoy having its teeth brushed.

If you are seeing a mature animal, do not recommend that the owners start a home care program (brushing and/or diet/chews) until you have performed a COHAT and can be absolutely certain there are no sensitive areas in the mouth that would preclude brushing or chewing.

As with anything, home care only benefits the patient if it is done properly. Done improperly it will do no good but can do harm.
Home Care

As in your own mouth, there are two main components of oral health care for dogs and cats. There is what we, as veterinarians and technicians do once a year or so (professional dental care) and there is what the client does at home every day between professional treatments (dental home care). While it is the client who administers the home care, it is the veterinary practice that must train and equip the client for this job. Therefore, the veterinary dental team must understand home care inside and out in order to guide and assist the clients in setting up a practical and effective program for their pet.

The purpose of home care is to maintain good oral hygiene to prevent the development or progression of periodontal disease and to maintain good gingival health.

Why is Home Care Essential?

The first thing to understand is that gingivitis and periodontal disease are caused by dental plaque (an invisible bacterial slime or biofilm) in contact with and below the gingiva. While calculus (tartar) on the crowns of the teeth will harbour plaque, it is not the coronal calculus that is the enemy or the target of home care—it is subgingival plaque and calculus that causes disease. To prevent subgingival plaque and calculus it is essential to prevent the accumulation of coronal plaque.

Think of it this way; the bacteria in the plaque film are the soldiers against which we are fighting. Calculus is the fortress that the soldiers build to live and hide in. The plaque is what causes disease; the calculus protects the plaque and makes it much harder to remove. If you prevent plaque accumulation/maturation, you will also prevent calculus formation. If your home-care strategy just prevents calculus formation without also targeting plaque, it will do little to prevent disease. I consider calculus prevention to be largely cosmetic rather than therapeutic.

Following a professional dental cleaning the tooth surface is considered clean. Within hours, a film of salivary glycoproteins, known as the acquired pellicle, starts to form on the exposed dental surfaces. In a few more hours, oral bacteria colonize this pellicle. This is the beginning of the development of dental plaque, which is a mixture of salivary glycoproteins, sloughed epithelial cells, white blood cells, food particles and bacteria. Immature plaque is a rather disorganized slime on the tooth surface. It is poorly attached, thin and aerobic and relatively easy to disrupt mechanically.

If the immature plaque is left undisturbed, it becomes thicker, more organized and more firmly attached to the tooth surface. It starts to evolve into a highly complex society of co-operative and synergistic bacteria and protozoa. Aerobic bacteria live on the outer surface of this biofilm with anaerobes living in the deeper layers closer to the tooth surface. The mixed population of bacteria produces and secretes substances that act as a matrix, enhance adhesion and protect the residents of the biofilm from chemical and cellular antimicrobial agents. Bacteria in a biofilm are considered to be as much as 1500 times more resistant to antiseptics and antibiotics than the same bacteria would be in a monoculture.

Mature plaque is 25% bacteria and 75% matrix. Using DNA probe techniques, it has been estimated that there may be 1400 (or even many more) different species of micro-organism living within the plaque film in a periodontal pocket. More than half of these organisms have never been cultured as they have such specific environmental requirements, they will only grow in the unique habitat of a periodontal pocket, not on a culture plate. Also, it has been found that organisms act physiologically very differently when part of a biofilm than they do when in culture media in the lab. These factors make culture and sensitivity testing of oral infections quite useless.

Within as little as two days, undisturbed plaque can start to precipitate salivary minerals to form calculus. Now the plaque film is building its fortress and is going to be much harder to remove.

The bacteria in plaque produce toxins, which cause inflammation of the gingiva. If left untreated, this gingivitis may progress to periodontitis (inflammation and destruction of the gingiva, periodontal ligament, alveolar bone and root cementum). To prevent gingivitis and periodontitis from developing and to maintain gingival health, plaque must be removed before it becomes organized and mineralized.

In the wild, plaque is controlled by chewing through the hides of prey, and by eating raw, fibrous tissues such as heart and diaphragm. Feral dogs live for about six to eight years and feral cats last for three or four years. Their
morts are designed to last this 'lifetime'. As our pet cats and dogs are living well into their teens and their diets offer little challenge to plaque, we must lend aid in the fight. Another factor in the high incidence of periodontal disease in pet dogs and cats is that many breeds (micro-breeds and all brachcephalics) have significant anatomic deformities that dramatically increase the risk of developing periodontal disease.

From the above, you can see that if the owners are not doing anything about plaque control at home on a daily basis, noticeable calculus and gingivitis may be back by the two-week recheck appointment. Home care refers to anything the owners are doing at home on a regular basis to control plaque and maintain periodontal health. In numerous studies, daily brushing of the teeth with a soft-bristled nylon toothbrush has been shown to be the most effective means of plaque control. It is the mechanical action of the bristles against the tooth surface that removes the plaque. Brushing also massages the gingiva, stimulating the gingival fibroblasts to produce more collagen thus firming and toning the gingiva.

The rewards of having clients involved with home care are great. First and foremost, your patient benefits from better oral health. Secondly, your clients will become more aware of dental concerns and will actually start requesting more dental treatment. They will notice small problems early, when they are easily treated, rather than leaving them as surprises for you to find at vaccine time.

**The Dangers of Home Care**

As with any treatment or intervention, home care can be harmful to the pet and the owner and can be counterproductive if not approached in the proper manner. To start, you should never recommend a home care program to a pet that has not had a recent, very thorough oral examination (under general anesthetic).

Home care (diet, chews, tooth brushing) can cause pain to the animal. If an owner tries to brush the teeth of a cat that has resorptive lesions, it will cause pain. If an owner tries to brush a tooth that has a crown fracture and exposed pulp, it will cause pain. If an owner tries to brush the teeth of an animal that has serious gingival inflammation, oral ulcerations, mobile teeth... it will cause pain. If an owner brushes too vigorously or roughly, it will cause pain. If the animal’s early experience with home care involves pain, it will be very difficult to ever get this animal (or owner) to accept and enjoy daily home care, even after the painful conditions have been resolved.

Home care can lead to a false sense of security. If an owner is brushing the crowns of the teeth daily, the crowns will remain clean and shiny. Therefore, at annual examination, you will see clean crowns and will be inclined to say that no further dental examination or treatment is required. However, there may well be problems brewing in an area that is not only hard for the owners to brush, but also hard for you to examine with the animal awake.

The problem could be a foreign-body induced periodontal pocket between the mandibular first and second molars, a caries lesion in the occlusal pit of the maxillary first molar, a previously formed periodontal pocket, a crown fracture, tooth resorption or any number of problems. If you are not regularly anesthetizing your patients to do a thorough oral examination, you are going to miss these hidden problems until they become very advanced and obvious.

One suggestion is to always do a thorough oral examination (examine each tooth above and below the gum line and take whole-mouth dental radiographs) anytime you have an animal anesthetized for any reason whatever. Never squander an opportunity to look for problems and you will be amazed at what you find.

So, home care is for pets with clean, healthy mouths and should never be used as a substitute for proper, professional care.

**What Home Care IS NOT**

*Home care is NOT a treatment for established disease.*

Home care is daily plaque control designed to maintain oral hygiene and prevent the development of gingivitis and periodontal disease. It does not remove calculus and it cannot reach into periodontal pockets. Therefore, home care should only be instituted AFTER appropriate professional treatment has established a clean and healthy mouth. Home care is then used in an attempt to maintain this healthy situation or to prevent the situation from deteriorating.
Home care is NOT a substitute for regular professional examinations and treatment.

Since home care only cleans the crowns of the teeth and maybe 1 to 2 millimeters subgingivally, it will have little or no effect on established periodontal pockets. Home care is also only effective for those teeth (or tooth surfaces) the owner is able to reach. Therefore, even with home care, the animal should have regular professional examinations and treatments. I brush my own teeth 2-3 times a day and floss daily and I still see my hygienist and dentist every six months. Never once have they told me that if I promise to brush every day that they don’t need to see me for a few years. At the end of each appointment they hand me a new brush, some floss and an appointment card for my next visit – no ‘ifs’, ‘ands’ or ‘butts’.

Home care is NOT an Over-the-Counter concept.

There is a dizzying array of home care products and aids available for your client to choose from. It can be confusing enough for us to figure out which products to use and when. Do not leave it up to your clients to decide for themselves which products to use or how to use them.

For those animals that need home care, take the time to discuss the situation with the owner and explain what they need to be doing. Listen to their thoughts and concerns, consider the animal involved and then customize a program based on the situation. And always keep each product’s limitations in mind – do not expect too much as there is no miracle product on the market and likely never will be.

Does Every Pet Require Home Care?

Here is some heresy. I have found that not all dogs and cats require homecare. I have seen mature, even geriatric dogs and cats that have never had any homecare, never had any professional dental treatment and yet still have no significant gingivitis or periodontitis. They may have broken or worn teeth from inappropriate chewing or other dental/oral disease, but nothing that would have been prevented by brushing.

In dogs and cats, as in humans, it seems that the single most important factor in determining the development of periodontal disease is genetics. Some pets have a great natural resistance to periodontal disease and some seem to have very little resistance. Certainly, factors such as diet, chewing habits, general health status, the physical architecture of the mouth and teeth all play a role as well. But they are secondary to the inborn ability of the animal to cope with oral bacteria.

For those animals blessed with excellent natural resistance, there may be little or no need to spend any time talking the owners into brushing. Pick your battles and spend your time and energy where it will do the most good.

How to Institute A Home Care Program

Some client-oriented information is available at http://www.toothvet.ca/dentalcare.html but some further detail is indicated.

Home care is not something we do TO animals; it must be something we do FOR them. It does not matter how motivated the owners are, if the animal is not a willing and enthusiastic participant, the program will fail. Therefore, we must train the animal to truly enjoy having its teeth brushed. If this is accomplished, the animal will request this attention and will give the owners grief if they try to skip a day.

Teaching a dog to fetch a stick or shake a paw is like teaching a fish to swim. They are basically natural behaviors that we encourage with positive feedback. Having someone poke a toothbrush in their mouths is a very unnatural behaviour and so we must start with something the animal is already doing, reward that and then gradually shape the behavior until it is what we want.

When doing behaviour shaping or training of any sort, consistency is very important. The first step is to decide who in the family is going to be responsible for home care. Training should be done by one person. Once the program is up and running well, the job can be shared, but the training phase should be a one-person job. In a perfect world, it would be the person who is the most motivated or has the best relationship with the pet. However, sometimes the job defaults to the person who is consistently home every day.
The next decision is when the brushing will happen. Dogs and cats are creatures of habit and like things to happen the same time each day. For many, late evening or just before bedtime works well as the pets are in a quite mood and often looking for attention anyway.

The third decision is where brushing will happen. The owner should do this in the same place every day, not only for consistency but also to ensure that all materials, including the rewards, are all close at hand.

What follows are guidelines, not hard rules. Each program must be tailored to the home situation.

In many homes, the pet will seek the owner’s company and attention by climbing on their lap or nudging their hand looking to be petted. In this situation, the animal is coming to the owner looking for something. It is the animal’s idea; the animal is initiating the interaction and this is ideal. At this time, the owner should get down at eye level with the animal and give it the attention it is seeking.

The first step is to have the animal sit quietly while the owner strokes under the chin and mandibles, using lots of gentle praise. After ten seconds or so, the animal is given a reward (usually a food treat). It is important that the reward follows the behaviour within seconds for the animal to draw a connection between the two.

Each day, the owner tries to increase the amount of time the animal sits quietly having its lower jaw massaged before getting the reward.

When the animal is happy to sit for thirty seconds or so, the owner can start working on stroking and massaging the maxilla as well. They should go slowly, as animals are naturally very protective of their eyes.

Next step is to gently and casually start manipulating the lips, pushing the upper lip up, retracting the commissures of the lips caudally and the lower lip ventrally. This should be done without pulling on the whiskers or pinching the lips. After a few days of this, it should be possible to slip a finger (one without long nails) inside the mouth to start gently rubbing the teeth. Start with the anterior teeth (canines and incisors) and gradually work farther back in the mouth to massage the premolars and molars. It is not necessary to open the mouth or even lift the lips for this – it can all be done by feel.

When the pet is comfortable accepting a naked finger rubbing along the buccal surface of the upper teeth, the finger can be wrapped in a gauze square, a bit of pantyhose or some other mildly abrasive material. The covered finger is again used to massage the teeth and gums, starting with the anteriors and day-by-day moving to the back teeth.

If toothpaste is going to be used, now is the time to introduce it. Despite label claims, I view most veterinary tooth pastes as nothing more than flavouring. A study of human patients found that brushing without toothpaste was 96% as effective as brushing with paste. In other words, the mechanical action of the brush does 96% of the work.

If the pet likes the flavour of the paste, it becomes part of the positive reinforcement and it can be a useful motivator. However, many clients report that their pet is so busy trying to lick the paste off the brush, they will not sit still for brushing and so the paste actually makes it harder to brush, not easier. Dogs with furry faces are inclined to get paste stuck in their facial fur and then this needs to be cleaned/combed out and this often makes the paste more trouble than it is worth. Certainly, if the pet does not like the paste, it will have a negative impact on the program and should be left out.

To see if paste is going to help with the program or not, the owner should put some paste on the end of a finger and offer it to the animal. If the animal does not lick it off right away, the owner can dab a bit on the tip of the animal’s nose. The pet will lick it off and then will either want more or will turn away from it when the paste-laden finger is offered. If the animal likes the paste, then try using it. If the animal does not like the paste you can try a different flavour. If the pet really does not like the paste, or likes it too much and will not sit still or gets it all gummed up in their fur, I would suggest skipping the paste altogether.

The next step is to introduce the toothbrush. It should be a small, soft-bristled child’s or toddler’s brush. With the forefinger guarding the end of the brush, it is slipped into the buccal pouch under the upper lip and gently rubbed back and forth along the tooth at the gum line. Start with the anterior teeth and gradually work to the back of the mouth.
The bristles of the brush are held at 45 degrees to the long axis of the tooth at the gum line and the brush used to sweep the crown and marginal gingiva to remove plaque and stimulate gingival fibroblasts. Owners should be cautioned about brushing too hard. They can practice on a ripe tomato. They should brush hard enough to dent the skin but not hard enough to tear it.

Some owners with complain that they cannot brush the back teeth because the pet keeps chewing on the brush. That is not altogether a bad thing. While the owner goes back and forth, the chewing action is brushing up and down and getting the bristles in between the teeth, almost like flossing.

Once the animal is accepting of having the buccal surface of the upper teeth brushed, the owners can start to work on getting at the lower teeth and to the lingual and palatal aspects. This will involve opening the mouth. Approached gently, this is usually no particular challenge. If prior dental treatments have identified trouble areas, the owners should concentrate on these.

After each training or brushing session, the patient is given a reward of some sort. This might be food, play, cuddles… whatever the animal will be motivated by.

This is not a race or a competition. The animal sets the pace and determines how long is spent on each phase before moving to the next. If the owners try to progress too fast and evoke a negative response from the pet, that is what the pet remembers the next night and the game is lost. It is far better to go too slow than to go too fast.

If the owners have made earlier attempts at home care without going through a gradual process of behaviour shaping, chances are it did not go well and the owners gave up because the animal was non-compliant. These owners will have to be particularly patient and give the animal time to forget past negative experiences and learn new positive ones.

Similarly, if the animal has been living with dental pain for some time, the owners will have to proceed slowly to gain the animal’s trust and help them to learn that it no longer hurts to have their mouth handled.

If owners approach home care with enthusiasm, follow the steps and take it slowly with lots of praise, affection and rewards, many animals will come to truly enjoy home care. Many owners claim their pets will not let them skip a day as they do not want to miss the attention and treats.

**HOME CARE PRODUCTS: How they work**

There is a dizzying array of home care products and aids available for your client to choose from. It can be confusing to veterinarians which products to use when. Do not leave it up to your clients to decide for themselves which products to use or how to use them.

For those animals that need home care, take the time to discuss the situation with the owner and explain what they need to be doing. Listen to their thoughts and concerns, consider the animal involved and then customize a program based on the situation.

Of the many products on the market (through veterinarians, over the counter retail, on the internet) that claim to be beneficial, the majority have little or no credible research to back their claims and for many, I would say they are not worth the package they come in. I encourage you to use those products with VOHC acceptance for plaque control. If a sales rep. tries to tell you their product is “just as good”, ask them to prove it by showing you full details of any species-specific in vitro clinical trials using the entire product as it is currently being sold. (not just some of the ingredients and not trials in other species or on an agar plate...). If they cannot provide those studies, I would not recommend the product. Visit www.vohc.org to find a list of products accepted for helping to control plaque.

Note - due to space limitations, I am not going to discuss any specific products in these notes. Visit my website, in particular the Old CUSP Articles page. Also, because of my very high regard for the product line, I am a Product Advocate for HealthyMouth, LLC. I invite you to visit their website (www.healthymouth.com) and mine (www.toothvet.ca/hm1.html) for a lot of information about the company, the products and all of the clinical trials that have proven these products to be very valuable.
**Conclusion**

By the time you read this, there will likely be a few more products on the veterinary dental home care shelf. Whenever you are presented with a new (or old) product for consideration, consider this.

Look for the Veterinary Oral Health Councils seal of acceptance, especially for plaque control. More and more companies will be submitting their research for evaluation and so there will likely be more products bearing this stamp in the future.

Look carefully at the claims and demand to see the research, not just a list of references or some glossy diagrams of what is supposed to be happening when you use the product. You want species-specific, *in vivo* clinical trials on the entire, current formulation as the highest level of evidence.

Does the research show:

Safety

High compliance

Efficacy

- Reduced plaque, calculus and gingivitis scores (i.e. actual therapeutic benefit).

Also keep in mind that any product, no matter how good, will only work if it is used properly. Make sure you understand how to use the product and then make sure your clients understand.

By putting a little effort into the critical evaluation of product claims, you can increase the chances of developing a home care program that works, to everyone’s benefit.