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January 21, 2006

I have written a lot on Dental Home Care over the years. Here I have put several different articles and hand-outs on the subject together in one package. There will be some redundancy, but repetition of important concepts is not all bad.

Note the date of this publication. As new products come on the market and new research becomes available, some of the specific information here may become stale.

I hope you find the information useful.

Sincerely,

Fraser A. Hale, DVM, FAVD, Dip AVDC

## WHAT HOME CARE IS NOT

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. You cannot wait until a pup has a touch of parvo to vaccinate against parvo. You do not wait for the early signs of rabies to vaccinate. You do not wait for the animal to develop rickets before recommending a balanced diet. All of these preventative things are done well before there is trouble.

It is very common for clients to report that they started brushing their pet's teeth a few months ago (or more) when instructed to do so because their veterinarian had noted some gingivitis starting. They have started trying to brush their pet's teeth without that 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 a few weeks ago for evaluation and treatment of a resorptive lesion. When I examined the cat, I actually found four resorptive lesions. As we have all seen, 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!

As my home care instruction sheet (available off my website) indicates, it is essential that the animal truly enjoy the home care experience. As it is a very unnatural behaviour to sit still while someone pokes a plastic stick into their mouth, 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!"

So, 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 until you have anesthetized, done a thorough oral examination and hygiene procedure and can be absolutely certain there are no sensitive areas in the mouth that would object to being brushed.

As with anything, home care only benefits the patient if it is done properly. Used improperly and it 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) in contact with and below the gingiva. While calculus (tartar) on the crowns of the teeth can 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.

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.

If the immature plaque is left undisturbed, it becomes 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 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.

Within as little as two days, undisturbed plaque can start to precipitate salivary minerals to form calculus. Calculus itself does not cause periodontal disease, but it does provide a very safe environment in which the periodontal pathogens can live. The rough porous surface provides a foothold for the bacteria that is not easily dislodged.

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 meats such as heart and diaphragm. Also, feral dogs live for about six years and feral cats last for two to three years. Their mouths 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.

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 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 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 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 appropriate 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 nine 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', 'and' or 'buts'.

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 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 products 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 a toothpaste is going to be used, now is the time to introduce it. Despite label claims, I view most veterinary tooth pastes as little more than flavouring. If the pet likes the flavour of the paste, it becomes part of the positive reinforcement. If the pet does not like the paste, it will have a negative impact on the program and should be left out. 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, use it. If the animal does not like the paste, try a different flavour or skip it 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 will 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.

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 sometime, 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

*How do you decipher claims and incorporate products into a total home-care program?*

*[first published September 2001]*

For animals predisposed to or afflicted with periodontal disease, professional treatment is only part of the plan. What the owner does at home on a daily basis for plaque control has as much or more impact on the long-term prognosis. To understand why homecare is so important, it is important to understand some things about plaque and calculus and the progression of periodontal disease.

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.

If the immature plaque is left undisturbed, it becomes 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 closer to the tooth surface. The mixed population of bacteria produce and secrete substances that act as a matrix, enhance adhesion and protect the residents of the biofilm from chemical and cellular antimicrobial agents. Mature plaque is 25% bacteria and 75% matrix.

Within as little as two days, undisturbed plaque can start to precipitate salivary minerals to form *calculus*. Calculus itself does not cause periodontal disease, but it does provide a very safe environment in which the periodontal pathogens can live. Its rough porous surface provides a foothold for the bacteria that is not easily dislodged.

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.

From the above, you can see that if the owners are not doing anything for plaque control at home on a daily basis, noticeable calculus and gingivitis may be back by the two-week recheck appointment. Homecare 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 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.

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.

For those animals blessed with excellent natural resistance, there may be little or no need to spend any time talking the owners into brushing.

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.

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 nine months.

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.

The remainder of this paper will discuss **some** home care products and how they work (according to manufacturer's claims or as confirmed by independent research). Inclusion here does not imply an endorsement and exclusion does not imply an indictment. There are far too many to cover them all in these pages, so you will have to apply the principles discussed to critically evaluate the claims of each product to see how it might fit into your dental program. Above all, remember that daily brushing is the most important part of the home care program. What, if anything, is put on the brush is secondary.

## CHEMICAL PLAQUE CONTROL

Chemical plaque control agents come in many forms including toothpastes, gels, rinses, water treatments and bioadhesive patches. No chemical agent has been shown to be effective in plaque control by itself. Most will reduce or retard plaque accumulation to a degree, but they cannot stop it from forming. Once a plaque film has formed, it will be very resistant to chemical agents that are applied passively.

Pastes are meant to be used on the toothbrush and may have a number of functions. Most veterinary pastes are flavoured for the peculiar taste preferences of dogs and cats and so can improve compliance. If the animal likes the taste to the paste, it becomes part of the positive reinforcement so important to establishing this habit.

Pastes also often have some abrasive material such as ground walnut shells, to improve the mechanical cleaning action of the brush.

**Virbac™** markets a line of veterinary toothpastes under the brand **C. E. T™**. These pastes contain a “dual-enzyme system” consisting of *glucose oxidase*, *lactoperoxidase* and a substrate (not specified). These ingredients combine with water (from saliva) and oxygen to eventually form *hypothiocyanite* (OSCN). This ion is produced naturally in human and canine saliva (possibly in cat saliva as well), where it has been shown to have an antibacterial effect.

I have never disputed the value of the endogenous salivary lactoperoxidase enzyme system as part of the host defense system. What I have asked on several occasions over the years is, “Is there any research to show that adding more of this enzyme system in a toothpaste or other product has any beneficial effect?” I know that brushing a pet’s teeth with C. E. T.™ will be beneficial, but would we get the same benefit from brushing with a placebo paste that lacks the enzyme system? To date, this research has not been done. I am told by representatives of the company that just such a trial is planned within the next couple of years. For now, I tell clients that many pets like the taste of C.E.T.™ and so it can be useful in boosting compliance. If it also does have some antibacterial effect, I look on that as a bonus. At time of writing, I cannot support their antibacterial claim, as they have no scientific studies to back it up.

There are also a variety of gels and rinses available which act as oral antiseptics. The most common active ingredient in these products is *chlorhexidine*. Chlorhexidine is a non-specific antibacterial agent as well as having some effect on fungus and viruses. There is a large body of research on the efficacy of chlorhexidine as an antimicrobial agent. It acts by causing precipitation of the cytoplasmic contents of the bacterium – a mechanism against which resistance cannot develop. While chlorhexidine has been shown to reduce plaque and gingivitis, it paradoxically can increase the rate of mineralization of plaque (calculus formation). Chlorhexidine also causes a brown staining on the teeth when used as a rinse (can be polished off but looks terrible) and can cause a decrease in the sense of taste. Chlorhexidine is likely best used as a pre-operative oral rinse and at home for the healing period following professional treatment.

Chlorhexidine comes in two forms; acetate and gluconate. Of the two, gluconate is more soluble and has been studied more. Either form bonds ionically with oral hard and soft tissues to give a prolonged effect (12 hours) from a single rinse.

**Maxi/Guard™** is available as a gel and as a rinse. Both contain *zinc* and *ascorbic acid* (vitamin C) and *taurine*. Zinc is antibacterial and important for healthy epithelium. Vitamin C is important in the production of collagen, which is the main structural protein in gingiva. The taurine chelates volatile sulphur compounds produced by oral pathogens, which has an obvious effect of reducing halitosis and may reduce the damage to oral tissues that may be caused by these volatile sulphur compounds. The gel is tasteless and alcohol free and makes a nice oral anti-septic for the post-operative period. It has also found a use as a plaque retardant in cats that will tolerate no other forms of home-care. Maxi/Guard™ has a relatively low pH (4.6) and this may cause some cats to hypersalivate a bit.

*Sodium Hexametaphosphate* (HMP) is a sequestrant that binds salivary calcium, making it unavailable for precipitation as calculus. It has no direct effect on oral bacteria or plaque, but by reducing calculus accumulation, it would make plaque control easier. HMP is delivered as a coating on various treats and diets and may also be found in some toothpastes not currently available in Canada. **Iams™** recently launched an entire line of diets coated with HMP under the name **Dental Defence™**. [Medi-Cal/IVD now have canine and feline dental formula diets as well which utilize calcium sequestrants and may also offer some mechanical benefits, Jan, 2006.]

## **CHEW TOYS**

There are a variety of items on the market upon which dogs are meant to chew. Most of them will claim some dental benefit such as “Cleans Dog Teeth”. While many of these toys can legitimately claim to help keep a dog’s teeth clean, many are also a major cause of dental fracture. Examples would include all natural bone, whether processed or fresh from the butcher and dried cow hooves. Hard-pressed rawhide bones and nylon bones are also sufficiently resilient to cause dental fracture.

The criterion I use in practice is as follows. If you do not want me to hit you in the knee with a toy, then you should not give it to your dog to chew. If it is hard enough to hurt your knee, then it is hard enough to be a potential cause of dental fracture.

If you choose to sell these sorts of toys in your practice, then I feel you should pay for the treatment when the toy causes a dental fracture.

Tennis balls are a favourite toy for dogs, however, they can be quite damaging. The nylon fuzz itself is quite abrasive. Also, the fuzz will retain grit picked up from the ground. So chewing on a tennis ball will be like chewing in emery cloth. Dogs that chew tennis balls a lot can wear their teeth to the point of causing pulp exposure.

## **CHEW AIDS**

This category would include consumable items that are not considered to be a significant source of calories such as rawhide strips and bones, pig’s ears, and **Dental Ring™**. Any item that you give to a dog with the understanding that it is to be chewed into little bits and possibly swallowed, bears some risk of gastrointestinal upset or blockage. Consider each item and its relative risk and choose the safest one going.

Dental Ring™ is a ring of densely packed paperboard coated with ground bone, mint flavouring and colouring. As the dog chews on the ring, teeth are expected to be forced between the layers of paperboard, thereby “brushing” the teeth. The label claims that the ring cleans teeth and strengthens enamel. While use of this device may help remove

plaque and tartar, there is nothing in the ingredient panel that could be expected to strengthen enamel. In fact, chewing on the ground bone would be abrasive and would be more likely remove enamel. There is no indication on the label that there has been any research into the safety and efficacy of the product. Paper products are not digestible so if a dog swallows a chunk of the ring, gastro-intestinal blockage is a possibility.

Pig's ears are available at many pet stores and flea markets. They are basically just pigskin and cartilage, often dried and smoked to prevent decay. The skin-cartilage parfait has a mild abrasive effect on the tooth surfaces without great risk of being too abrasive. The thin and flexible nature of pig's ears makes them very unlikely to cause dental fractures. Some dogs tolerate these aids very well, while others may experience digestive upset. As the ears are sold from bulk bins generically, there is no assurance of quality control and there have been rumblings that they may harbour bacterial pathogens such as salmonella, so buyer-be-ware. If a large chunk of an ear is swallowed, it will likely be broken down by gastric juices and pass without incident. However, choking and esophageal blockage are possible. To my knowledge, no research has been published to determine the efficacy of pig's ears in the prevention of dental disease.

Rawhide strips are a consumable treat that many dogs really love, but as they provide non-digestible protein, they do not add greatly to the caloric intake. Therefore they are discussed here. **Friskies™** markets rawhide strips under the brand **Chew-eez™**. Each strip is approximately 3-4 cm wide, 10 cm long and 1-2 millimeter thick. I consider these to be among the safest chew aids you can recommend. There is still a risk of choking, but this is a very rare event. A brand name offers some quality assurance and the thinness of the strips makes it very unlikely that any teeth will be damaged. The abrasive action of chewing the rawhide does help reduce plaque, calculus and gingivitis.

Virbac™ markets raw hide strips similar to Chew-eez™, but they impregnate theirs with the C. E. T™. enzymes. Again, there is currently no research to support the notion that raw hide with C. E. T™ is any more beneficial than raw hide without. Given the dramatic price differential, I am recommending the Chew-eez™ currently.

## TREATS

Treats would include any consumable item that adds to the total calorie intake but that is not the main source of calories. No treat has ever been shown to be able to maintain clinically healthy gingiva, no matter how much of it is fed. Treats are only a part of the plaque control program and should be used as well as, not instead of brushing.

**DentaBone™** is a compressed tapioca-based treat that has been shown in numerous short-term and mid-term studies to reduce plaque, calculus and stain while improving gingival health when given daily. Personally, I have some misgivings about these very hard treats as a potential cause for dental fracture. I know of at least one case of this happening. I also have heard of dogs choking on chunk of these treats.

**C.E.T. Forte Chews™** are designed for cats as a mildly abrasive treat, intended to improve oral hygiene. They are available in fish and poultry flavour though freeze-dried fish is the main ingredient in both. These chews contain the same dual-enzyme system found in other C.E.T.™ products. Whether it is the coarse texture of the chew mechanically helping to remove plaque, the enzyme system or a combination, is not clear from the research. In any event a controlled study in client owned cats found a

statistically significant reduction in gingivitis when the cats received one chew a day compared to eating the same diet without the daily chew.

## **DIETS**

No diet has ever been shown to be able to maintain clinically healthy gingiva, no matter how much of it is fed. Diets are only a part of the plaque control program and should be used as well as, not instead of brushing.

It has long been felt that feeding a cat or a dog a dry kibble diet is better for the teeth than feeding them a processed, canned diet. The logic goes that dry food leaves less residue in the mouth for oral bacteria to feed on and so plaque would accumulate at a slower rate. Despite that, many animals fed on commercial dry diets still have heavy plaque and calculus accumulations and periodontal disease. This is because most dry pet foods are hard but brittle so that the kibble shatters without much resistance and so there is little or no abrasive effect from chewing.

There are currently four commercially available pet foods that have received recognition by the Veterinary Oral Health Council [visit [www.vohc.org](http://www.vohc.org) for up-to-date list of accepted products] as having a significant effect on plaque, calculus and gingivitis. These are **Hill's Prescription Diet t/d™**, **Hills Prescription Diet t/d small bites™**, **Hill's Prescription Diet t/d feline™** and **Friskies Dental Diet™** (feline).

The mechanism of action for these diets is based on the physical properties of the kibble. Each nugget is quite large and so must be chewed before swallowing. The nuggets are hard, but not brittle, and so the teeth sink deep into the nugget before it splits. As the tooth is penetrating the nugget, the fibers in the food gently abrade the tooth surface, thereby removing plaque.

These diets are high-fiber maintenance diets for average mature animals but would not be appropriate to support growth, gestation/lactation or a very athletic life-style. Each of them is intended to be fed as the main calorie source. Research by Hill's found that the best results were obtained in this manner, but that there was still a measurable (but declining) benefit when the t/d™ diets were fed as 75%, 50% and even 25% of the total calorie intake. Using t/d simply as a treat will not meet expectations for the product. It seems reasonable to extrapolate this observation to the Friskies Dental Diet™, though I have not seen research examining this issue for this product.

Iams™ has recently launched a line of diets under the name Dental Defence™. These diets have been coated with HMP to reduce calculus accumulation. Keep in mind that calculus does not cause gingivitis or periodontal disease, bacterial plaque does. Calculus just makes it easier for the plaque to adhere to the tooth surfaces. Reducing calculus accumulation alone will not prevent gingivitis and periodontal disease, but it may make the job easier.

[Medi-Cal/IVD and Purina also now has canine and feline dental formulas to offer. Time will tell on these latest entries. January 2006.]

## **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 approval. 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.
- 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.

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## D E N T A L   H O M E   C A R E

With your own teeth, what your dentist and hygienist do is only a small, though essential, part of your oral hygiene program. **You** are responsible for the daily brushing, rinsing and flossing that are required to slow the constant progression of periodontal disease. The same is true for your pet. You are responsible for every aspect of your pet's daily care and care of the teeth becomes more important as we expect our pets to live longer and longer.

Brushing your pet's teeth is the main component of home-care. The purpose is to remove plaque before it becomes tartar. Plaque is a slime comprised of bacteria, saliva and food particles which adheres to the teeth and fills the pocket between the tooth and gum. Left undisturbed, plaque rapidly collects minerals from the saliva to form the rock-like brown deposits known as tartar or calculus. By brushing daily, you remove plaque and so tartar builds up slower. As with all things, the results will depend on the effort you give it.

**The first step** is to have your veterinarian perform a thorough oral examination to determine if there is any dental disease which needs to be treated before you start your brushing program. It would be inadvisable to start brushing your pet's teeth if there was advanced gum disease as you could cause serious damage to the inflamed tissues as well as pain to your pet. Also, brushing will not remove tartar that has already developed.

Once the examination has been completed, your veterinarian will outline the treatment plan. If there is dental disease the plan will include a thorough cleaning of all teeth, both above and below the gum line. Any teeth that have extensive disease beyond the point of being salvageable will have to be extracted. There may well be some

seriously diseased teeth which might be saved through more extensive procedures and you will need to discuss with your veterinarian what your expectations and desires are

regarding the various treatment options.

**MANY PETS REALLY  
ENJOY HAVING  
THEIR TEETH  
BRUSHED**

The only way to properly carry out dental procedures on pets is with them anesthetized. Fortunately, the drugs available today make the anesthetic risk lower than the risk of dental neglect.

Now that we have the teeth clean and healthy, it is up to you to keep them that way. As mentioned before, this is done by brushing your pet's teeth daily. A program is outlined below which will help you get started with this highly rewarding habit.

Bear in mind that these are guidelines, not hard rules. Each animal is

different and so the program may need to be modified to your pet's needs. Some owners can start brushing their pet's teeth on the first day whereas with others, it may take weeks of gradual effort to build up to brushing. Be patient because if you try to progress too rapidly, you might make your pet mouth-shy making it very difficult to proceed.

If handled properly, many animals come to truly enjoy their home-care and the extra time you spend each day with your pet will increase the bond between you.

## Guidelines For Dental Home-Care

1. When to start? **As soon as possible.** Eight to 12 weeks old is best. Pets don't need maintenance this young, but by brushing once or twice weekly they will become familiar with the routine when the permanent teeth erupt. It is a good idea to stop brushing while your pet is losing its baby teeth as the mouth will be a bit sore and your poking around with the brush will cause more pain. Once all the permanent teeth are in you can pick up where you left off.
2. The first step is to work with your pet's mouth. With a little patience your pet will soon accept your attention. **Make it fun** for both of you. Use a lot of love and especially praise to gain their confidence. Try to have your practice sessions at the same time each day so your pet gets into a routine. Late in the evening often works well, as everyone involved is generally in a quiet mood then. If your pet is highly motivated by food, try just before dinner with the meal acting as a reward for co-operating.
3. Start by handling the muzzle and tickling the lips and soon you will be able to rub the teeth and gums with your finger. Put a few drops of water, flavored with garlic or garlic salt for dogs and tuna juice for cats, in the mouth daily. They will soon look forward to this treat.
4. Next, use a washcloth or piece of pantyhose, wrapped around the end of your finger and flavored as above, to gently rub the teeth.
5. Finally, use a soft toothbrush to brush the teeth. There are several veterinary brushes available and many human brushes are well suited to animal use as well. Hold the brush at a 45 degree angle to the tooth and brush back and forth or from gum to tip. Brushing the tongue side of the teeth is less critical. Use the garlic water or tuna juice. **Make it a game.**
6. There is an ever growing selection of veterinary tooth washes, pastes and gels. Your veterinarian can help you select the one best suited to your situation. These products all increase the effectiveness of your home-care program but remember, **it's the brushing which does most of the cleaning.** Brushing at least three times weekly is recommended (daily is much better). Human tooth paste is to be avoided as it will cause stomach upset if swallowed. Baking soda, with its very high sodium content can be dangerous to older patients. Hydrogen peroxide can be too harsh for the gums and must not be swallowed.
7. It helps to give abrasive foods and toys such as dry kibble, raw hide strips and dense rubber chew toys. Hill's® Prescription Diet® t/d® and Friskies® Feline Dental Diet® are dry kibble maintenance foods for dogs and cats that has been proven to reduce plaque accumulation. **Avoid natural bones, dried cow hooves and hard nylon toys as these are hard enough to fracture teeth.**
8. By following a consistent program of home-care, you will greatly improve your pet's dental health. This will mean fewer professional cleanings, less tooth loss and a happier, healthier pet. However, please remember that there is no substitute for professional veterinary care. We must work as a team to ensure a long and happy life for your pet.

THANK YOU FOR LETTING US HELP MAINTAIN YOUR PET'S DENTAL HEALTH.