Periodontal (Gum) Disease in Small and Toy Breed Dogs

“Small dogs are NOT little big dogs”

Brook A. Niemiec, DVM
Diplomate, American Veterinary Dental College
Diplomate, American Veterinary Dental College
Fellow, Academy of Veterinary Dentistry
About the Author:

Dr. Brook Niemiec, DVM

Diplomate, American Veterinary Dental College
Diplomate, European Veterinary Dental College
Fellow, Academy of Veterinary Dentistry

Dr. Brook Niemiec is a 1994 graduate of the University of California, Davis School of Veterinary Medicine. He is a board-certified specialist in veterinary dentistry in both the American and European Veterinary Dental Colleges as well as a Fellow in the Academy of Veterinary Dentistry. He is one of about 10 veterinarians world-wide to hold all three of these certificates. He is past president of the AVD, as well as the AVDC delegate to the World Small Animal Veterinary Association. He is recognized internationally as one of the leading authorities in veterinary dentistry.

Dr. Niemiec is the Chief of Staff of Veterinary Dental Specialties & Oral Surgery, with practices throughout southern California as well as Fresno and Dublin, California. In addition, he has practices in Las Vegas, Nevada; New Orleans, Louisiana, and Pensacola, Florida.

An advocate for improved understanding, prevention and treatment of disease, Dr. Niemiec lectures extensively at local, national, and international meetings, and has presented in over 40 states and countries.

Dr. Niemiec is also the director of the San Diego Veterinary Dental Training Center. This state-of-the-art facility combines small class size with the latest technology for an excellent learning experience. Please visit www.vetdentaltraining.com for information on classes.

Dr. Niemiec has published numerous journal articles at the local, state, national, and international levels. He has authored and edited numerous books on subjects including: Endodontics, Orthodontics, Periodontology, Emergency Dentistry, Restorative Dentistry, Feline Dentistry, Oral Pathology, and Dental Radiology. Finally, he is Chair of the WSAVA dental guidelines committee.

Dr. Niemiec co-founded the premier veterinary dental telemedicine website (www.vetdentalrad.com) to assist veterinarians with dental radiographic interpretation, and through this company has produced instructional videos and educational posters.

For more information on Dr. Niemiec and veterinary dentistry in general, please visit his website www.dogbeachdentistry.com.
Introduction:

If you are reading this booklet, you are likely the owner of a “small” or “toy” breed dog (or other “at risk” breed), or you are a veterinarian interested in their best care. Any dog under 10 pounds is considered a small or toy breed dog. These dogs look and behave quite differently than larger dogs, thus they need to be treated differently in many ways, particularly their dental care.

Despite significant differences in the incidence and severity of periodontal (gum) disease, most clients and veterinarians still treat small dogs like their large breed relatives. This booklet will describe who is most susceptible, as well as why small breed dogs get more gum disease than their larger cousins. It will also discuss some of the severe consequences of gum disease, which are either unique to or more often seen in small and toy breed dogs. Unchecked gum disease also affects the health of the rest of the body; which organs it affects will be detailed. In addition, while there are anecdotal reports of differences in the safety of anesthesia for these breeds, the information on current anesthetic drugs and monitoring debunks the common myth of small dogs having significantly higher anesthetic risks. Finally, the unique challenges of extracting diseased or damaged teeth in small breed dogs is briefly discussed.

Periodontal (gum) disease in dogs: how common is it, who gets it, and why?

Periodontal (gum) disease is by far the number one medical problem in dogs. Current research shows that periodontal disease is present in 90% of dogs by just one year of age.
Small and toy breed dogs are particularly susceptible. The complete reasoning is unknown, but tooth crowding and rotation, less chewing for fun, longer lifespan, shorter tooth roots, and genetics likely all play a role. While there are many factors at play, gum disease is caused by plaque bacteria. **Plaque forms in just 24 hours, so reliable ways to remove plaque daily at home is critical.** If plaque is not removed, it quickly hardens into calculus (tartar).

Previously, it was mistakenly believed that tartar was the cause of gum disease, but now we know that the source of infection is plaque bacteria. The plaque and tartar on the area of the tooth you can see (the crown) is not the culprit - it is the plaque hidden under the gumline which causes the disease. Therefore, **therapy must remove all the plaque at and below the gumline to be effective.**

**When does periodontal disease begin in small dogs?**

Periodontal disease is typically seen in medium and large breeds when they are older, so starting professional therapy at 4-5 years of age has been an accepted practice. However, small dogs begin the process of periodontal infection and resulting dental bone loss very early in life. It has been reported that many dogs less than 10 pounds have bone loss at just 1 year of age. When combined with shorter roots, small breed dogs may need advanced periodontal therapy (including tooth extraction) much earlier in life.

There are numerous reports of disease being so serious that multiple teeth were lost to extraction in pets just 1 year of age. In one case treated by this author, 19 extractions were performed in a 19-month-old Pug. Worse, without proper therapy and homecare, it is not unusual for small dogs younger than 4 to lose **all** their teeth to dental disease. Therefore, it is recommended that dogs under 10 pounds have their first dental procedure by 1 year of age.
What other breeds are at higher risk?

Cavalier King Charles Spaniels (CKCS) and Greyhounds, while not small, are also well known for significant periodontal (gum) disease. CKCS’s suffer from early onset, severe periodontal (gum) disease, with minimal tartar or visible gingivitis (gum infection). Greyhounds develop advanced gum recession very early in life, painfully exposing the tooth roots.

How would I know my pet has periodontal disease?

Normal gum tissue is pink, (where not pigmented), and has a smooth, regular texture (Figure 1). There should be no plaque (sticky white film) or calculus (tartar) on the teeth.

The first things one sees with gingivitis (gum infection) is red puffy gums and bad breath, (Figure 2) and occasionally bleeding with brushing or chewing (Figure 3). Gingivitis (infection) is typically associated with calculus (tartar), but is caused by plaque bacteria.

Figure 1: Normal gingival (gum) tissues

Figure 2: Early Gingivitis - the red line (blue arrows) at the gum margin is the first outward sign of infection

Figure 3: Bleeding on probing is the first sign of gingivitis. This pet does have infection, despite lack of tartar or inflammation
Tartar does not need to be present for the gums to be infected (Figure 4). Alternatively, one can see lots of calculus (tartar) with little to no gingivitis (Figure 5). Always remember, tartar itself is not the issue. Therefore, we must assess how much gingival inflammation/infection is present, not how much tartar. As gingivitis gets worse, it often progresses into periodontitis (deeper inflammation). Bone gets eaten away as the disease progresses.

![Figure 4: Significant gingival (gum) inflammation (blue arrows) with minimal tartar](image1)

![Figure 5: Severe dental tartar with no gingivitis](image2)

There are two patterns of bone loss: gingival (gum) recession (Figure 6) and periodontal pocket formation (Figure 7). When gum recession occurs, the roots become painfully exposed and may be seen easily. However, periodontal pockets require anesthesia to diagnose and treat.

![Figure 6: Significant gingival recession](image3)

![Figure 7: Deep periodontal pocket with normal appearing gums](image4)
What other issues does periodontal disease cause?

There are several well-established local consequences of periodontal disease. The most common is development of an oronasal fistula: a hole between the mouth and nose (Figure 8), common in Dachshunds. In addition, advanced periodontal disease can create abscessed teeth (Figure 9). Both of these conditions are seen much more often in small breed dogs.

Figure 8: Large oronasal fistula from the upper left canine

Figure 9: The periodontal infection started with infection on the back root (red arrows), killed the tooth and infected the front root (circle)

Another significant malady that affects small and toy breed dogs is a pathologic jaw fracture (Figure 10). These occur in small and toy breed dogs because they have proportionally much larger teeth than larger breeds do (See figure 12). The advanced periodontal disease weakens the jaw to the point where the jaw can break with minimal force, such as eating or playing.

Figure 10a: Severe bone loss on the lower molar (blue arrows), has created a very weak jaw with a high potential for fracture (yellow arrow)

Figure 10b: A pathologic jaw fracture from advanced periodontal disease on the front root of a lower first molar
Tragically, advanced dental disease in small dogs can also lead to serious and chronic eye infections, which can cause eye loss (Figures 11 a & b). Finally, chronic periodontal disease can result in a deep bone infection (known as osteomyelitis), and an increased risk of oral cancer.

![Figure 11a: Severe eye infection in a Pug from chronic gum disease](image)

![Figure 11b: Same Pug reveals root infection (red arrows) is just below the eye socket (green)](image)

How does periodontal (gum) disease contribute to disease in other places in the body?

While the systemic effects of periodontal disease are not known to be increased in small and toy breed dogs, there are two concerning issues about periodontal disease in these breeds. First, they typically suffer from more severe disease much earlier in life, and over a longer lifespan. Second, the surface area of their big teeth in their tiny mouths is much bigger than in large breed dogs, leading to increased bacterial access to the body.

Periodontal disease has been linked to numerous systemic problems such as cardiovascular (heart), liver, and kidney insults as well as increased inflammatory markers in both veterinary and human studies. In addition, human research has revealed associations with heart disease, strokes, arthritis, diabetes, lung disease, adverse pregnancy affects, and anemia of chronic disease. Finally, periodontal disease has been shown to be a significant predictor of early death in humans. One report shows that severe periodontal disease is a higher risk factor for dying early than smoking.
What are the systemic benefits of periodontal therapy and a healthy mouth?

It is quite common for pet parents to want to avoid anesthesia. Likewise, many veterinarians are reluctant to anesthetize patients with systemic disease. The myths that anesthesia carries excessive risk, especially if pets are sick, or that danger increases with aging, or that the risks do not justify the potential gains from the procedure are exactly that - myths.

Age in and of itself has minimal effect on anesthetic risk (other than being associated with significant systemic disease which may increase anesthetic risk). Further, most problems (even heart disease) carry minimal additional anesthetic risk and the vast majority of pets can still undergo anesthesia, provided it is properly performed and monitored.

Sadie: Poor Sadie had some dental work done at her regular vet, and soon after developed a severe eye infection (a). We had the tooth “extracted” at our family vet, but things only got worse. Finally, she was referred to a veterinary dentist. Under anesthesia, a severe painful abscess around the eye was diagnosed (b). Dental X-rays showed a tooth root was left behind (c, red arrow). The specialist extracted the root and Sadie was finally herself again. Never have work done on your baby without dental X-rays. Despite her significant heart condition, she has done very well with anesthesia every time. We now see the dentist every year for routine care. Please do not let heart disease stop you from having your pet’s teeth taken care of. Even small breed dogs can be safe under general anesthesia in the right hands!
Recent studies have proven that treating periodontal disease in these patients will improve their overall health. Conditions shown to improve with periodontal care include diabetes, kidney, liver, and heart disease in humans. Systemic inflammation was also decreased following periodontal therapy in dogs and people. Most importantly, patients who receive regular dental cleanings lived longer than other pets. These studies demonstrate the value of periodontal care in patients with other sicknesses.

Therefore, dental care should be provided in cases of all but severe systemic disease. If you or your family veterinarian is concerned about anesthesia risk, ask for a referral to a veterinary dentist. Veterinary dentists have extra anesthesia training, can generally perform the procedure faster, are typically within a large referral clinic, and may have access to an anesthesiologist. To find a local qualified veterinary dentist, visit www.advc.org.

What therapy should my dog receive?

The treatment of gum disease is plaque control. Even with genetics contributing to how serious it gets, plaque is what initiates periodontal disease in any size dog. The major difference between “at risk” (small breed dogs, greyhounds, and CKCS) and other dogs is the frequency and age at initiation of periodontal care.

All canine patients should have homecare started at 6 months of age. It allows you to “get ahead” of the disease and focus on prevention, as well as train the dog to accept and enjoy homecare, which is easier in younger pets. However, it is more critical in “at risk” breeds to initiate homecare early. Like with people, the best time to start caring for a child’s oral health preventatively is as soon as their permanent (adult) teeth erupt through the gum.
What can I do at home?

There are two major types of homecare: active (brushing and rinses) and passive (diets and chews).

Things you can actively do:

*Active homecare* is considered the “gold standard” of home dental care. It is very effective at controlling gum disease; however, it is not possible for all clients or patients.

*Brushes:* The only piece of equipment necessary is a tooth brush. There are numerous veterinary brushes available, and a proper brush should be selected based on patient size. In addition to the veterinary products, human tooth brushes may be substituted. A soft bristled toothbrush is always recommended.

*Pastes:* There are several veterinary toothpastes available, which improve results of brushing and greatly increase the acceptance and enjoyment of the toothbrush by the dog. The most common brand recommended by veterinarians are the *Virbac* family of *C.E.T. Enzymatic Toothpastes*. Human toothpastes, and natural remedies such as baking soda, are not recommended as they contain detergents or fluoride which may cause stomach upset or fluorosis if swallowed.

Antimicrobial products are also available. These products, like *C.E.T. Oral Hygiene Rinse* (*Virbac*), will improve plaque and gingivitis control beyond that of other pastes when used with brushing, and therefore should be considered instead of toothpaste in high-risk patients and in cases of established periodontal disease.
Another effective oral antiseptic is made of soluble zinc salts (MAXI/GUARD Oral Gel, Cleansing Wipes, & OraZn) (Addison’s Biologics). They decrease plaque mass to reduce overall gingivitis, and provide the additional advantage of being tasteless.

Frequency: Any of the above homecare techniques should ideally be performed daily, as this is required to stay ahead of plaque formation. Three days a week is considered the minimum to maintain good oral health. Finally, it should be noted that consistency with homecare is critical. If brushing is suspended for as little as a month, gingival inflammation will return to the same level as patients with no therapy.

Girl: Girl sure looks happy during her recheck (e). However, this was not the case when she first presented to Veterinary Dental Specialties & Oral Surgery. She had been bitten by another dog and it literally broke her jaw apart. When she arrived, it was just hanging open, as it hurt to hold it closed (a). A large piece of her front jawbone was missing, and the rest hanging by a thread (b). The true reason for the severe amount of damage was not really the bite however - it was advanced periodontal disease which infected the bone and created numerous weak spots which then fractured (c & d). We extracted almost all her teeth, cleaned up all the infection and fixed the fracture with wires (g & h). She was feeling much better just 2 weeks after surgery (e).
Things your dog can do for themselves:

*Passive Homecare* is an alternative method of plaque control using special diets, chews, and treats. Since passive homecare requires no work, it is more likely to be performed regularly. Long term consistency is key - don’t feel bad for thinking this might be easier … it just may be!!

Some of the effective products are detailed below. Pet parents should perform their own research, ask their veterinarian, and look for the Veterinary Oral Health Council (VOHC®) (www.vohc.org) seal of approval for plaque control.

*Diets for dental care:* It has long been thought that traditional dry dog food is good for oral health (compared to other options), however, most dry dog foods are not effective in improving oral health. Several diets have received the VOHC® seal as effective in calculus reduction. One important point is that even though these products may decrease calculus, plaque and gingivitis prevention are the main concern with periodontal disease. Of the available diets, only one, **Dental Care t/d** (*Hill’s Pet Nutrition*) has been clinically proven to decrease gingivitis in dogs.

This product’s effectiveness lies in the unique soft fiber arrangement within the kibble. This arrangement cleans the entire tooth right down to the gum line and potentially below, allowing for the removal of plaque bacteria and reduction of associated gingivitis (gum infection).
Concerns about urinary health may be present, especially in small dog breeds. Hill's Prescription Diet t/d has the S+OXSHIELD on all t/d canine formulas, including t/d canine Small Bites. The S+OXSHIELD seal indicates the food has the added benefit of being formulated to promote a urinary environment that reduces the risk of developing struvite and calcium oxalate crystals.

*Plaque and/or calculus control treats:*

Plain baked biscuit treats and chew toys (e.g. string and rope toys) have not shown to prevent periodontitis. There are numerous edible treats available for passive home care though, with varying efficacy, and the addition of chlorhexidine to rawhide chews can help reduce plaque formation as well. Of the available products, only a handful have been clinically proven to decrease gingivitis or have VOHC approval for plaque prevention. This author has had good results with the **Oravet Dental Hygiene Chews** (*Boehringer-Ingelheim*), **C.E.T. HEXTRA Premium Oral Hygiene Chews** and **Veggident FR3SH®** products (*Virbac*).

Please remember, many chew treats which claim to help control dental disease are very hard in texture. Chewing these products may in fact break your dog’s teeth! **If you cannot make an indentation into the product with your fingernail, it is too hard.** Also, just because a product is effective for dental disease, does not necessarily mean it is safe. Owners must be aware of the choking/obstructive possibilities of some treats.
What should I remember about home care options?

Homecare is a critical aspect of gum health and periodontal therapy, but it is often ignored. Early and consistent performance is key. There are numerous options available, but daily tooth brushing remains the gold standard. Of the numerous products available for passive homecare, only a few are truly effective, and the reader is urged to critically review the clinical studies when deciding which products to use or endorse.

Professional care:

The basis for periodontal therapy is professional dental cleaning. This is a medical procedure which must be performed meticulously to provide a medical benefit. Performed sloppily, incompletely, or without proper anesthesia, this can actually be detrimental to your pet’s health.

Sparkey: Chihuahuas are well known for severe complications of dental disease, and Sparkey had almost all of them (his mom lovingly describes him as “a very special type of overachiever”). This included a chronic eye infection and swelling around the eye socket (top), oronasal fistulas (middle) causing sneezing and discharge from his nose, and severe jaw bone degradation from the infection (bottom, red arrows) which created a “broken jaw waiting to happen” (bottom, white arrow). However, due to his age (a very young 15), his regular vet and his owner were both concerned about the safety of the anesthesia.

Thank goodness, they also realized he was hurting, and something needed to be done. He was referred to a veterinary dentist, and his infected mouth was treated properly. The painful diseased teeth were removed, and at his 2 week recheck we heard our favorite words: “He is acting like a puppy again – in fact, he is a whole new dog!”
But a dental cleaning is just scraping the teeth, right?

No! In fact, a professional dental cleaning involves a complex series of steps that involve sharp, surgical instruments to clean the cement-like tartar and plaque bacteria off the infected teeth, and more importantly, very carefully and cautiously from underneath the delicate, sensitive gum tissue.

A complete professional dental cleaning includes:
1. Pre-anesthesia exam and work-up
2. Proper anesthesia and monitoring by a trained veterinary professional
3. Antiseptic (chlorhexidine) rinse (to decrease bacterial load)
4. Supra-gingival scaling (cleaning the part of the tooth you can see)
5. Subgingival scaling (under the gumline cleaning - the most important step)
6. Thorough polishing
7. Sulcal lavage
8. Oral exam and charting
9. Dental radiographs
10. Treatment planning and any additional therapy
11. Application of a barrier sealant where appropriate

Does my pet need anesthesia for a cleaning?

YES, any professional periodontal therapy for our pets MUST be performed under general anesthesia. Only when the patient is properly anesthetized can a safe and effective cleaning and oral evaluation be performed.

A recent study demonstrated that patients who received anesthesia free (or non anaesthesia) dental procedures had more severe disease than those who did not.
Despite its unfortunate popularity, this type of substandard therapy provides no measurable medical benefit. Numerous professional organizations including the American Veterinary Dental College (the professional association for veterinary dental specialists) have strong statements to fight its practice. The World Small Animal Veterinary Association dental guidelines committee feels that anaesthesia-free dentistry is a significant animal welfare concern. This practice is outlawed by several state/province veterinary medical boards and is illegal in most states/provinces when performed outside of a vet practice.

**When should my dog have its first professional dental cleaning?**

For small and toy breed dogs, their first professional dental cleaning should be performed at 9-12 months of age, and then every 6-12 months. Early intervention is important not only to perform a cleaning before dental disease starts, but also to evaluate for other pathologies which are common in small dogs, such as impacted and/or retained deciduous (puppy) teeth, which can cause serious, painful disease later in life if left undiagnosed or treated.

Cosmo suffered with multiple draining facial abscesses for years (a). They would heal temporarily with antibiotics, but the infection would come right back. Finally, we were referred to a dental specialist who took dental radiographs which confirmed numerous infected teeth (b). Extraction of these teeth permanently cured the infection and gave him a new lease on life (c).
The recommendation for early intervention is counter to what has been the standard of care in veterinary dentistry. However, this is one of the most important parts of this booklet, which is to encourage proper preventative dental care for these at-risk breeds.

If, during the professional dental cleaning under anesthetic, there are no abnormal subgingival pockets (gaps under the gum where bacteria gather and fester), the gums haven’t started to recede yet, and no teeth are so diseased they have become wiggly or mobile, a professional dental cleaning and homecare are sufficient. However sadly, most small and toy breed dogs don’t get their first professional dental cleaning until advanced periodontal disease is present and serious irreversible damage has occurred.

**But what about the risk of anesthesia?!**

Veterinarians understand that owners are worried. But dozens of clinical studies have shown that for the vast majority of patients, well performed anesthesia is exceedingly safe. Even more interesting?? A new study showed that patients who received regular dental care under general anesthesia actually lived longer than those who didn’t!!

**But don’t small breed dogs have more anesthesia risk?**

No! This is a myth. There is an odd but common misconception that small breed dogs are at a significantly higher risk for anesthetic complications.
In general, this is untrue. They can be harder to catheterize and intubate, and your veterinarian needs to pay special attention to drug dose calculation, as these pets have a smaller body size. However, with care, all of these worries can be easily avoided.

One risk factor that small and toy breed dogs are more susceptible to is hypothermia (getting too cold when asleep). This is due to their frame size to body weight ratio being much higher than large breed dogs, which means they can get colder faster than larger breed dogs.

**So, what do vets do to adjust for this?**

This issue can be avoided in most cases if the clinic has appropriate patient warming devices and monitors temperature regularly. This is one reason sedation only dentistry is concerning - temperature regulation under sedation can be very difficult for the dog’s body.

*Brachycephalic (breeds with very short noses)*: The major concern with anesthesia for brachycephalic breeds is related to the breathing restrictions which are part of the “brachycephalic syndrome”. For owners, brachycephalic syndrome is the most common reason that dogs with short noses snore, make a lot of noise breathing when they exercise, or snuffle and snort regularly.

The hardest thing for our short-nosed dogs, is that during intubation (inserting the breathing tube for oxygen and anesthesia to be administered) and recovery (when they wake up), sometimes that short nose and extra skin inside their mouth can get in the way of easy breathing. Extra care needs to be taken to ensure our short-nosed breeds are checked regularly during these times for good oxygen levels in their blood, and proper breathing rates.

Luckily, once the short-nosed patient has a breathing tube inserted, their ability to breathe is usually better as the
obstructions from extra tissue are bypassed. Because of this, these patients are generally stable under anesthesia. One other concern is that short nosed dogs can occasionally suffer more tummy related issues under anesthesia, but this can be avoided with some very safe medications.

Properly performed general anesthesia in veterinary patients (even small and brachycephalic dogs) is very safe nowadays. Make sure to ask your vet about their anesthesia and monitoring protocol.

**Why do my baby’s teeth need to be removed?? Won’t he have troubles eating afterward? I don’t want that!**

When veterinarians must remove teeth in a small or toy breed dog, it’s done because they are in pain and/or infected. Judgement is always given to saving teeth whenever possible – they just have to be healthy and non-painful!

It is best to provide regular dental care for your pet, to avoid the need for extractions. Healthy teeth belong in a dog’s mouth, unhealthy teeth do not. Therefore, the goal must always be to do everything possible to keep every tooth healthy, so your dog can keep it for its entire life. However, keeping unhealthy teeth in the mouth serves no helpful purpose to our pets – it simply forces them to deal with pain and infection daily for the cosmetic purpose of having teeth. If they aren’t pain free and useful, teeth should be removed as soon as possible to help our patients.

Extractions, or removing painful and/or infected teeth, must be undertaken with great care in small and toy breed dogs for several reasons.
First, their jaws are much more fragile than larger breeds. Next, their teeth are proportionally larger, especially the mandibular (lower jaw) first molar (Figure 12). Furthermore, mandibular canines (fangs) makeup approximately 60-70% of the mandible’s space - and therefore contribute hugely to lower jaw bone strength (Figure 13). Thus, when these teeth require extraction, there is a high risk of fracture. Small dog patients also tend to have weaker bone, due to advanced periodontal disease (infection), thus increasing the risk the lower jaw might break (see Figure 10). The tips of the teeth in the lower jaw also commonly have curves, which are not commonly seen in large breed dogs (See figure 12).

![Figure 12: The front root of this lower first molar is curved (yellow arrow) and has minimal remaining bone (red arrow)](image1)

![Figure 13: Lower first molar area in a large breed dog has significant bone below the roots (blue arrows)](image2)

**Overall Conclusions:**

Small and toy breed dogs require a completely different level of care for gum disease. Periodontal disease has an earlier onset as well as quicker progression, and they are more at risk for the dangerous and potentially life threatening local and systemic effects of periodontal disease. We must initiate therapy early (before a year) and be much more consistent. Finally, when properly performed, anesthesia is exceptionally safe, even in small and brachycephalic breeds.
This booklet has been adapted from the textbook “Hereditary Dental Disease in Dogs” - available in 2020 from Wiley Blackwell. Some of the verbiage as well as most of the pictures are used with permission. For more detailed information on the contents of this booklet, consult that text. Additional information on dentistry in dogs and cats can be found in Dr. Niemiec’s previous titles below. These titles (and more) are available at www.dogbeachvet.com.