Small Animal Dental Prophylaxis: A Practitioner's Guide

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Introduction

Small animal dentistry is one of the most rapidly expanding specialties in veterinary medicine today. Though most practitioners examine the oral cavity for signs of disease, many lack the information and/or equipment required to provide their patients with a comprehensive plan of dental care. The purpose of this article is to introduce the basics of a small animal dental examination and to suggest a prophylactic plan for dogs and cats.

The Dental Examination

Good veterinary dental care begins in the examination room. A systematic oral examination should be performed every time an animal visits the clinic, regardless of the primary reason for the visit. Missing teeth, dental caries and other abnormalities should be recorded on a dental record sheet such as the one shown in Figure 1.

The dental examination should begin with a thorough history of the animal's health status. Age, breed, sex, health information on siblings and other animals in the house, vaccination history, and history of previous illnesses should be obtained, especially for animals which may have an inherited disease.[1] After the history is taken, a detailed and systematic physical examination should be performed. It is recommended that a practitioner formulate a standard examination protocol, follow this protocol and always record all variations and abnormalities.[2] By incorporating the dental examination into the standard examination routine, the practitioner will gain familiarity with normal oral anatomy and will become more adept at efficiently detecting pathological conditions.

The examination of the masticatory apparatus should begin with the head and neck. Check for any abnormal movements of the head while the patient walks and moves around, noting any head tilting or facial asymmetry of hair, lips, whiskers or facial moisture. Examine the eyes for discharges, ophthalmus, enopthalmus, exophthalmus, ptosis or photophobia. Using physical restraint or sedation if needed, palpate and percuss the sinus areas and check for any evidence of pain. Palpate the bony portion of the head, face and jaws for possible asymmetry, enlargement, atrophy, or signs of infection or neoplasia. Move the temporomandibular joint and feel for crepitus or obstruction and check for any tenderness or clicking or snapping sounds. Palpate the size and consistency of the thyroid gland and check for cervical lymph node enlargement.

The lips and breath should be examined next. Palpate the lips to check for cracking, fissuring, ulceration or soft tissue swelling. Examine the form, position, function, color and texture of the lips and note the condition of the skin around them. Pull the lips forward and invert them to examine the labial and buccal mucosa for normal color, texture and anatomy. Examine salivary glands, ducts and muscles. Check for foreign bodies, sialoliths or fibrous nodules, and measure the capillary refill time. Smell the patient's breath. Foul-smelling breath may be due to dietary causes, oral disorders such as periodontal disease or necrotizing gingivitis, respiratory disorders such as bronchiectasis or pulmonary abscesses, gastrointestinal upset or renal disease. Finally examine

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the alignment and articulation of the dentition for symmetry, trauma-induced injury, or malocclusions.

After the patient is placed under anesthesia, hold the mouth open with a speculum to look inside the oral cavity. Check the character (thin, watery, ropy, thick, syrupy) and coloration of the saliva, then examine the palate, rugae, oropharynx, tonsils and throat for normal anatomy, color and function. Use a dry sponge to grasp the tongue, and carefully manipulate it to examine all surfaces for symmetry, taste bud pattern, tumors, foreign bodies or traumatic lesions. Palpate both walls of the mandible for bony abnormalities or trauma-induced injuries, then carefully palpate the floor of the mouth.

Now examine the teeth. The normal dental formula for the dog and cat are as follows:[3]

DOG

Deciduous: 2 ($\frac{I3}{3}$ $\frac{C1}{1}$ $\frac{P3}{3}$) = 28 teeth
Complete eruption by: 8 weeks

Permanent: 2 ($\frac{I3}{3}$ $\frac{C1}{1}$ $\frac{P4}{4}$ $\frac{M2}{3}$) = 42 teeth
Complete eruption by: 7 months

CAT

Deciduous: 2 ($\frac{I3}{3}$ $\frac{C1}{1}$ $\frac{P3}{2}$) = 26 teeth
Complete eruption by: 4 weeks (except maxillary 3rd molar)

Permanent: 2 ($\frac{I3}{3}$ $\frac{C1}{1}$ $\frac{P3}{2}$ $\frac{M1}{1}$) = 30 teeth
Complete eruption by: 6 months

Taking the age of the patient into account, record any deviation from the normal formulas. Feel for sharp points, fractures, split or loose teeth or irregularities in the plane of occlusion. Carefully move the tongue out of the way and use a small dental mirror and an illuminator to evaluate tooth form, alignment, enamel covering, level of gingival attachment, gingival color, tooth color, dental caries, periodontal disease or abrasions. Use a periodontal probe to measure gingival pocket depth.

If disease is discovered or suspected during the oral examinations, a good-quality radiographic series should be taken.[3]

Periodontics

Periodontal disease is the leading cause of early tooth loss in dogs and cats.[4] Periodontology is the study, treatment, and maintenance of the supporting structures and tissues around the teeth.[3] This division of dentistry includes routine dental prophylaxis, home oral hygiene, and other procedures that aid in the early detection and prevention of periodontal disease. Regular dental prophylaxis and conscientious home dental care from the time a patient is young can minimize the animal's chance of developing excess plaque accumulation that can lead to periodontal pathology. Clients should be encouraged to request dental prophylaxis for their pets once a year, and more often if plaque accumulation is rapid and/or if early stages of periodontal disease have already been recognized.

Before the patient undergoes dental prophylaxis, he should receive a thorough physical examination to assess his fitness for anesthesia. Hematocrit and total serum protein should be measured, and if the animal is five years of age or older, BUN and ALT/SGPT should also be evaluated. During the initial oral examination, the stage of periodontal disease should be estimated as Class I, II or III based on the following criteria:[5]

Class I: No periodontal disease
Mild to moderate gingivitis

Class II: Mild to moderate periodontal disease
Gingivitis
Periodontal pockets 3-6 mm
Early gingival recession

Class III: Severe periodontal disease
Severe gingivitis
Periodontal pockets $\geq$ 6mm
Severe gingival recession

The prophylaxis protocol to be described is adequate for a Class I patient. A Class II or Class III patient may require additional procedures such as root planing, subgingival

curettage, and/or tooth extractions. If the animal is assessed as a Class II or Class III, systemic broad-spectrum antibiotics should be administered before the procedure to decrease the risk of complications resulting from the release of bacteria during cleaning.

The following equipment and materials are needed to perform a thorough prophylaxis:

Hand instruments
Dental probe and explorer Hoe scaler
Dental tartar remover
Gingival curette
Sickle scaler
Dental mirror
No. 15 Bard-Parker surgical blade for gingivectomy
Ultrasonic scaler
Air syringe
Rotary dental handpiece with dental prophylaxis attachment
Dental rubber prophylaxis cup
Dental pumice paste
Antiplaque agent (0.1%-0.2% chlorhexidine or 0.4% stannous fluoride)
Fluoride gel

The operator should wear a mask, gloves and protective eyewear throughout the cleaning procedure.[6]

After the animal is under anesthesia, explore the oral cavity thoroughly and record any newly discovered abnormalities or lesions. Then use a periodontal probe to measure the depth of the gingival sulcus around each tooth. The end of the probe is graded in millimeter increments. The probe should be held parallel to the long axis of the tooth, inserted into the sulcus until resistance is met, and swept through the entire facial and buccal aspects of the sulcus. A sulcus depth of 3 mm or less in a dog, or of 1 mm or less in a cat, is considered normal.[3,7] If the sulcus is deeper than normal, a gingivectomy may be warranted. In performing a gingivectomy, the clinician must be very careful not to remove too much gum tissue. One to two mm of attached gingivae must be preserved to provide adequate protection of dental structures deep to the mucogingival line.[3]

The next step is the removal of plaque and calculus from the supragingival and subgingival surfaces of the teeth. Much of the large accumulations of calculus on the supragingival surface can often be carefully chipped off using a dental tartar remover. The removal of the remaining calculus is accomplished using scalers, curettes, hoes and files. These intruments must be kept sharp, and the clinician must practice proper handling technique to ensure safe and rapid removal of tartar. A modified pen grasp is the recommended method of holding a hand instrument.[8] The thumb and forefinger should be placed at the junction of the handle and shank of the instrument, and the pad of the index finger should be placed at the junction of the shank and the working end. The third finger should serve as a fulcrum during scaling. Supragingival scaling should be performed with a hand scaler held between 45 degrees and 90 degrees to the surface of the tooth.[9] The hand and wrist should move in short pull strokes directed away from the gingival sulcus. Subgingival scaling is best performed using a curette held and operated in the same manner as the hand scaler. Ultrasonic scaling may be used in lieu of, or as a follow-up procedure to hand scaling of the tooth surfaces. The ultrasonic tip should be kept parallel to the gingival margin as it is moved lightly back and forth across the tooth surface. Do not scale any one tooth ultrasonically for longer than 15 seconds at a time or thermal damage to the tooth and gingivae may result.[8] Following scaling, the clinician may wish to check his handiwork using a disclosing agent.

Next, all tooth surfaces are polished using a rotary dental handpiece with a dental rubber prophylaxis cup attachment. The rubber cup is dipped into mildly abrasive pumice paste, then the rotating cup is applied with firm pressure to the tooth surface. Polishing should be performed to the level of the cementoenamel junction. Move quickly across the tooth surface during polishing, and do not polish any one tooth for longer than a few seconds or thermal damage to tissues may result.[3] Periodically apply more pumice to the rubber cup as needed.

When polishing has been completed, the mouth should be rinsed with water and a blunt needle and syringe should be used to gently flush the gingival sulci with an antiplaque agent (0.1%-0.2% chlorhexidine, 0.4% stannous flouride, or dilute povidone iodine).[6,8] Finally, a topical fluoride gel should be applied to all tooth surfaces to strengthen the enamel and to help desensitize the teeth.

Counseling the Owner on Home Care

When discharging an animal after dental prophylaxis has been performed, take time to explain to the owner what therapy has been provided. Use diagrams showing normal tooth anatomy and showing the progression of pathological changes that can occur if periodontal disease goes untreated. Send the owner home with a collection of products (e.g., doggy toothbrush or gauze pads, meat flavored paste, oral rinses) and with written instructions describing what dental care should be given to maintain optimal oral health of the pet between visits (Figure 3). For normal animals in good overall health, recommend a follow-up examination one month from the time of the cleaning to assess the effectiveness of the home care program and to adjust the program if needed.[10] Subsequent examination should be scheduled every six months thereafter, or more often if the animal's dental condition warrants more attention.

Home dental care programs for pets have the greatest chance of success if they are begun early in the animal's life. The owner's first goal should be to accustom the puppy or kitten to increasingly longer periods of handling and to couple these periods with positive reinforcement.[10] Encourage the owner to schedule brief oral handling periods daily and to pet and quietly praise the animal only when he submits to the handling. The owner should gradually work up to the point where the animal will submit to oral manipulation for several minutes and will hold its mouth open long enough to allow a brief examination of the oral cavity. After this is accomplished, dental instruments can be introduced. The buccal surfaces of the teeth should be gently stroked with a gauze pad or a dry soft toothbrush for increasingly longer periods. Cleaning the lingual surfaces is not usually done, since this involves more risk of bite injuries to the owner and of instrument-induced trauma to the animal. Once the animal will tolerate both oral handling and instrument use, the owner can try using oral products such as anti-plaque oral flushes, pastes flavored with meat or malt extracts, or human pastes. Pastes containing baking soda or salt are contraindicated in cardiac patients and other animals on sodium-restricted diets.

Summary

A successful small animal dental prophylaxis program requires careful monitoring of the pet's oral health by the veterinarian, thorough professional cleanings at regular intervals, and conscientious home dental care by the owner. Good comunication and cooperation between veterinarian and client will ensure that the pet receives adequate and timely dental treatment to help prevent or slow the progression of periodontal disease.

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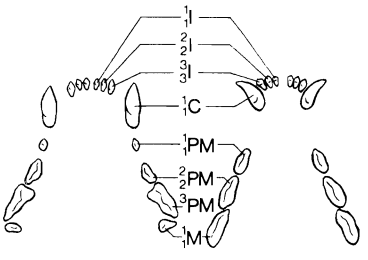
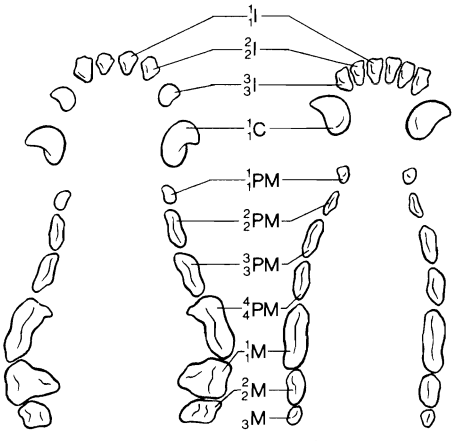
DENTAL RECORD



Upper Lower

FELINE



Upper Lower

CANINE

Codes:

missing

extracted

pockets
(indicate depth; 3, 6, 9 mm and surface)

fracture

caries

neck lesions - feline

*Note any oral lesions, e.g. erosions, tumors, gingival hyperplasia

Date	Class	

Figure 1.

Iowa State University
Veterinary Teaching Hospital
College of Veterinary Medicine
Ames, Iowa 50011
Large Animal—(515) 294-1500
Small Animal—(515) 294-4900

DENTAL HOME CARE

Congratulations for being a pet owner who understands the need for teeth cleaning (dental prophylaxis). We have done our best at ISU to make sure that your pet is going home with a mouth free of plague, both on the tooth surface and below the gum line. Our hard work, however, will not be enough to keep your pet from having gum and tooth disease.

More than 85% of our animal patients suffer from periodontal disease. This is a condition involving the supporting structure of the tooth, the periodontal ligament. Left untreated this disease leads to gum loss, jaw and facial bone loss, and infections of the mouth. The infectious process can be so extensive as to involve the organs of the body including the heart, kidneys, bladder, prostate and eyes. The best treatment, of course, is prevention since periodontal disease can not be cured; however, it can be controlled. If your animal suffers from periodontal disease certain surgical and nonsurgical procedures have been performed during the dental prophylaxis. It is even more important that these animals receive extensive home care and more frequent dental prophylaxis. If your pet has been diagnosed as having good to excellent teeth, a yearly dental prophylaxis along with your home care may be all that is needed to maintain this healthy mouth. Animals with periodontal disease will require dental prophylaxis every three to six months even with home care. Home care involves rubbing all the teeth surfaces in contact with the cheeks or lips. You may use a child's Oral B toothbrush or any of the brands now available for dogs. If your pet is not use to a toothbrush, it may be better for you to use a thin wet washcloth or large wet gauze pad. You may also apply, to the cloth, a thin smear of human toothpaste, Colgate, Crest, or Peak. This rubbing action will remove plaque, prevent tartar accumulation and prevent oral disease. This should be done every day especially after the last meal. You should then flush the mouth with the solution provided to you. Depending on the health status of the mouth, water, Nolvadent or Peridex may be prescribed. If your pet has periodontal disease with pocket formation, it will be important that you spend extra time in these areas. Failure to do so will mean progression of the disease with tooth loss and possible bone infection.

Home care should not be seen as a punishment to your pet. Therefore, be patient, slow and easy. Always give praise and provide positive reinforcement after cleaning.

Home Care Checklist:

A. Rub all cheek and lip surfaces of the teeth especially after the last meal.

B. Spend extra time at areas of periodontal pocketing.

C. Flush the mouth after rubbing.

Figure 3. Dental home care directions for pet owners. Source: M.A. Nieves, Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa.