Extraction Pearls:
How I Try and Make Extractions Easier
Heidi Lobprise, DVM, DAVDC
Main Street Veterinary Hospital
Flower Mound, TX

Extraction decisions
Sometimes it is easy to decide when to keep a tooth and when to extract, but at others time, the choice is not as obvious. Of the three criteria to evaluate, examining the tooth in question is the first step. If periodontal attachment loss is greater than 50% or the pulp is compromised or there is extensive tooth resorption, then it is typically best to remove. If periodontal disease is moderate, then you consider the relative importance of the tooth and if the disease around it can impact a more strategic tooth. For instance, if either the fourth premolar or second molar adjacent to the large mandibular first molar can compromise the health of that important tooth, it may benefit the patient to extract the smaller tooth, thus giving better access to treat the adjacent surface of the first molar. The same would apply to the mandibular third incisor or even the maxillary third premolar. If the decision is still up in the air, the health of the patient is to be considered: any patient with an ongoing systemic issue (heart murmur, diabetes, renal disease) would likely benefit more from an extraction that will remove the source of infection in one visit, as compared to extended anesthetic times and more frequent procedures. And third, consider the owner: if an advanced periodontal procedure or root canal is to be done, are they willing to consider the additional expense, and be committed to thorough home care and regular re-treatments? If not, then again, extraction may be optimal.

Requirements

Equipment

- Periosteal elevator – Molt #2 and Molt #4 – for elevating flaps
- Means of sectioning –
  - High speed handpiece/unit is preferable, but sectioning teeth can be done with a lowspeed unit, just have someone dripping water on the site for cooling
  - Set up regular maintenance schedule, including daily oiling
  - Sectioning burs – replace regularly, they get dull quickly
    - 700L – dog teeth
    - 699 – cat teeth
    - #2 or #4 – round burs for alveoloplasty
- Dental elevators
  - Winged, not too thick – to fit in the PDL space
  - SHARPEN on a regular basis, even during the procedure
  - If used and sharpened regularly, they will wear down and will need to be replaced
- Dental luxators – thinner, more delicate – be careful not to bend
- Extraction forceps – small breed
- Blade – 15C
- Suture – 4-0 to 5-0 poliglecaprone
  - Reverse cutting for dogs
  - Tapered for cats
- Magnification – better posture

Pain management
Apply general principles of surgical pain management to every dental patient, even if not performing extractions. Pre-operative analgesia with opioids, alpha 2 agents, and NSAIDs when appropriate, with post-operative dispensing of NSAIDS, opioids. Peri-operative regional, local and splash blocks can minimize the amount of general anesthesia used, help keep the patient more stable, and provide better post-operative analgesia for a smoother recovery. While lidocaine and bupivacaine can be mixed, if surgery sites are identified early in the procedure, use bupivacaine alone if it can be administered 20 minutes prior to extraction. Bupivacaine with 1:200,000 epinephrine premixed will provide longer analgesic effect and reduce bleeding. Watch total dose, not to exceed 1 mg/kg for cats and 2mg/kg for dogs.

Regional blocks can be very effective when placed accurately and not causing damage. Adequate training should proceed any attempts on patients, as nerve damage can result. If a regional block cannot be placed (infraorbital on brachycephalic, inflamed purulent tissue, etc), then at least place a linear local block in the alveolar mucosa above/below the tooth, and you can place additional material directly at the site when open (splash block). Caudal maxillary blocks method.
**Radiographs**

Extractions are one of the major reasons to use intraoral radiographs, particularly when challenging procedures are encountered. Pre-operative radiographs should be closely evaluated to determine the presence and condition of the periodontal ligament (PDL), as this is the structure that elevation attempts to impact. If there is no periodontal ligament space, indication of ankylosis or even tooth/root resorption, then elevation will not go as planned. Radiographs will also alert you to abnormal root structure (or number), and if there is any compromise to the jaw strength. Radiographs will not always be decisive in evaluation teeth with compromised pulps, so use transillumination and examination to assess those teeth. Post operative radiographs are a good medical and legal record, to show the correct tooth was extracted completely, without any complications (root tip, fractured jaw).

**Steps of extractions**

**Flaps**

With few exceptions (very loose incisors, premolars where envelope flaps are sufficient), most extraction sites benefit from full thickness mucoperiosteal flaps with releasing incision(s).

- **Flap design** – broad base, not directly over bone defect if possible
  - Extend releasing incision just past mucogingival junction, into alveolar mucosa
  - Maxillary canine – two releasing incision
  - Maxillary fourth premolar – one releasing incision mesially (rostral)
  - Mandibular canine – T- or Y- shaped distal incision, mesial incision
    - Follow the ‘path’ of the root – angled lingually
    - Elevate buccal flap completely
    - Elevate lingually to expose distal aspect of root
  - Maxillary first molar – if extracted on its own, a flap will not be reasonable

- **Flap elevation and release**
  - Debride gingival margin before elevating – cut 1-2mm away
  - Periosteal elevation to lift full thickness flap off of bone – past MGJ
    - Only elevate as far as you need for adequate access
  - Use blade or iris scissors to snip the fibers of the periosteum on the under side of the flap

**Alveoloplasty/sectioning**

- **Maxillary Canine**
  - Make a groove at mesial and distal aspects of the root – place for elevator – to the widest part of the root, then connect across

- **Mand Canine**
  - Remove bone from buccal, distal and lingual surfaces, as well as a groove at the buccal-mesial aspect

- **Multi-rooted teeth**
  - Shave away buccal bone until furcation is visualized
  - Using crosscut fissure bur – section from furcation through the crown
    - Max fourth premolar – one cut from furcation into developmental groove; second cut from furcation mesially to remove ‘diamond’ shaped piece of crown
    - Access to furcation between two mesial roots now visible, section those two apart
    - Mand first molar – section from furcation to just past mesial crown, but not at too much of an angle
    - Max molars – section palatal root away from two buccal roots, then separate the two buccal roots

**Elevation** – the goal is to fatigue the periodontal ligament to the extent that the tooth can be elevated from the socket

- Advancing the sharpened tip of the dental elevator down the root, in the periodontal ligament space, with rotational hold, is the best force to use
- Elevating in between crown portions with the fulcrum of force below the alveolar ridge – teeth may break
- Elevate tooth/section against adjacent tooth – make sure that tooth is very stable
- Gently grasping the tooth/segment with the extraction forceps and putting rotational force can help fatigue the ligament and/or tell you where you need further elevation
- If there is no movement and Radiographically the PDL was healthy, remove more buccal or interseptal bone.
  - In the maxilla, additional buccal bone removal is reasonable (window washer movement of the bur on the bone surface)
  - In the mandible, particularly of small dogs, preserve as much buccal bone as possible (cortical bone)
    - To access adjacent roots, remove one first, then remove the cancellous bone that was in between the roots to get better access for elevation without having to remove buccal bone
- Once fully elevated, radiograph to confirm

116
Finishing

- Elevate the lingual/palatal mucosa once the tooth is gone for better exposure for alveoloplasty and to facilitate suturing
- Smooth any rough edges of the alveolar bone (alveoloplasty)
- Curette any debris or infected tissue from the alveoli
  - Determine if any bone graft material is needed
  - Small breed dog – mandibular canines and first molars, incisor?
- Osseconductive or promotive?
- Scarify any epithelial edges
- Simple interrupted, bite through palatal, lingual mucosa first, then buccal flap

Complications

One of the most important resources in performing extractions is a load of patience. As soon as you lose focus or are distracted, that’s when you hear the ‘crack’. If that sound is a root tip breaking off, go through these steps to manage the situation:

- On radiographs – was the PDL intact and healthy
  - Elevation should continue – more bone may have to been removed
    - Buccal bone removal at maxillary teeth – ‘shave’ the cortical bone away to expose the root further
    - Mandibular teeth – try to preserve buccal bone, but remove the cancellous bone that was in between the teeth for better access
    - Palatal root – dig a trench around the root and make sure there are no overhangs
  - If there is any periapical bone loss (and the pulp is dead or infected), the root HAS to come out
    - Avoid aggressive elevation toward the apex – the root could punch through into the nasal cavity or mandibular canal
    - Work the root tip from side to side – use a root tip pick
- If the root tip goes into the nasal cavity or mandibular canal, every effort should be made to remove it THEN! – this is your best chance to remove it while it is still loose and not encased in scar or fibrous tissue
  - Take radiographs at several angles to localize where the tip is
  - Open the hole it pushed through even more (watch for important vessels)
  - If you can gently grasp it without damaging other structures, attempt to do so – but it will usually move further away
  - Once the hole is wider than the root tip without overhangs, uses copious water to flush the area, and adjust the head to allow ventral drainage
  - Many times you won’t even see the tip flush out – so re-radiograph often.

If you hear the big ‘crack’ – the jaw breaking – hopefully you had pre-operative radiographs and have told the owner that the jaw could be fragile. If this is a pathological fracture due to extensive periodontal disease, it will be a difficult area to stabilize, as the affected teeth usually have to be extracted anyway. Sometimes a partial rostral mandibulectomy is the best option for the patient.

Tooth resorptions

The term Tooth Resorption (TR) is now used to describe any level of root and/or crown erosion or loss due to a variety of processes. While this is most commonly seen in cats, dogs can also exhibit signs of TR. The ‘typical’ tooth resorptive lesions that are diagnosed are those in cats, frequently in the premolars (mandibular third premolar) where radiographically it appears as if the root is being turned into bone. This odontoclastic lesion is a Type 2 TR, and should be distinguished from the less common Type 1 inflammatory lesion. The inflammatory lesions may appear similar to odontoclastic lesions in the physical appearance of the crowns (some crown loss with gingival tissue growing into the defect), but radiographs will show roots with intact periodontal ligament space(s) and intact roots, other than where the resorption is taking place. If this type is diagnosed, careful extraction of the entire root(s) is necessary.

If the radiograph shows root structure that is not distinct, with no clear periodontal ligament (PDL) space (as the root is being converted into bone, the PDL space is obliterated), and if there is no indication of apical bone loss or infection, then a modified extraction technique may be appropriate. While some of these roots can still be gently elevated, if the PDL is damaged, elevation will not be able to fatigue the ligament for extraction. If this is the case, after radiographic evaluation and initial attempts at elevation result in the crown breaking off, the modified technique may be done: remove the remainder of the crown and coronal aspects of the root (if possible), and smooth the alveolar bone before suturing the gingival closed. These areas should be radiographed post-operatively, the client should be informed that there was intentional root retention of the resorbing roots, and that the patient should be monitored for any persistent inflammation in the area.
**Post-operative**
Most patients benefit from appropriate pain medications, and some may require antibiotics after the oral surgery. Depending on the extent of surgery, a softened diet may be needed, and in rare instances, supplemental feeding may be needed. Active tooth brushing may be delayed for two weeks, until the oral recheck, but oral rinses and gels may be used immediately post-operatively to help with tissue healing and antimicrobial needs.

**Summary**
With the right equipment, training and patience, extractions in practices can be successful surgical procedures with minimal complications. Often these patients will clinically be much healthier once the infection in their oral cavities have been managed with extractions.
For any practitioner who treats cats, it seems like those creatures are experts at trying to get rid of their own teeth! Two of the most common dental dilemmas, tooth resorption and stomatitis, continue to frustrate general practitioners and specialists alike.

“Decades ago, in a galaxy very close, it was once believed that the world of veterinary dentistry would be able to fully comprehend, understand the causes and find the cures to all oral and dental ailments that befell our feline companions.

It is now 2016, and while we continue to explore the many facets of unique oral dilemmas our feline patients may encounter, many questions are still not fully answered; though we have managed to rename many terms!”

**Stomatitis**

Aka – Lymphocytic-plasmacytic stomatitis (LPS), feline chronic gingivostomatitis (FCGS) and Feline Gingivostomatitis, this syndrome may have many names, but there is a base of definitions to be found on the website of the American Veterinary Dental College. Officially - inflammation of the mucous lining of any of the structures in the mouth; in clinical use the term should be reserved to describe wide-spread oral inflammation (beyond gingivitis and periodontitis) that may also extend into submucosal tissues (e.g., marked caudal mucositis extending into submucosal tissues may be termed caudal stomatitis).

Inflammation limited to the gingiva (gingivitis) may be the only indication of early periodontitis, but when inflammation extends past the mucogingival line into the alveolar mucosa and even into the vestibular space, this alveolar mucositis generally signifies a more advanced process. While inflammation in the oral cavity can involve any group of tissues, from buccal mucositis to glossitis and palatitis, one of the most important regions to inspect is the mucosa of the caudal oral cavity. This region, bordered medially by the palatoglossal folds and the fauces, dorsally by the hard and soft palate and rostrally by alveolar and buccal mucosa, is often the site of significant to extreme ulceration and proliferation of tissues.

In a consensus statement from the AVDC and the European Veterinary Dental College, stomatitis can be divided into two types: Type 1 – cases with alveolar and labial/buccal mucositis/stomatitis only, or Type 2 – cases with caudal mucositis/stomatitis, with or without alveolar and labial/buccal mucositis/stomatitis. Identification of caudal mouth involvement is important, as these are the case that are generally most difficult to manage.

**Distinguishing from periodontal disease**

While early cases of stomatitis may resemble inflammatory periodontal disease, and stomatitis may be a different in a case of severe periodontal disease, the refractory or non-responsive nature of the syndrome also plays an important role in the diagnosis and determining the prognosis. In early management of these cases, a thorough effort should be made to provide optimal oral conditions to monitor the patient’s response to treatment.

Phase I treatment includes a complete dental assessment, including radiographs, as well as thorough cleaning (scaling), root planing and polishing. If any teeth are identified with attachment loss (gingival or bone) or tooth resorption, complete extraction with appropriate alveoloplasty and gingival closure should be performed. Attention should also be paid to other antigenic stimulation, including discussing hypoallergenic diets, appropriate food and water dishes and removal of any environmental contaminants. Antibiotics may be used judiciously to maximize the patient’s response, but are not to be used as a stand-alone therapy. While corticosteroids have been used extensively in the past for patient comfort, they not only can make a non-responder, but can have unwanted side effects. As practitioners become more comfortable with using other anti-inflammatory products, early use could help these patients, particularly in early cases.

At the time of recheck, in 7 to 10 days, a patient with (fairly) simple gingivitis or periodontitis show be showing a response to treatment with appropriate healing of extraction sites and decrease in the level of inflammation throughout the mouth. It is very important for these patients to receive whatever level of home care the owner is capable of providing, and regular, routine professional care should be administered to monitor the case closely.

**Refractory – Chronic – Disease**

While some descriptions may just use the presence or absence of caudal mouth inflammation to categorize cases of stomatitis, others recognize that earlier cases may not yet have caudal involvement. The aspect of these Type 1 patients is to recognize the lack of response to conservative or Phase I therapy. Persistent inflammation with labial/buccal mucositis/stomatitis will often progress to include the caudal oral cavity, when the term stomatitis is generally accepted. There is wide variation to the range of this syndrome, from patient to patient, and even different time frames for the same patient.

Once identified, it is important to be able to somewhat quantify the level of disease, both for initial diagnosis, and to evaluate any response to treatment, whether clinical or in therapy evaluations/trials. The Stomatitis Disease Activity Index (SDAI) evaluates four aspects of owner observation, including appetite, activity level, grooming behavior and perceived comfort (or lack thereof). The
veterinarian then scores specific areas on a 0 to 3 basis for the level and extent of inflammation. These scores are then computed to assign a number to the degree of disease. The patient’s dental chart should be thorough, indicating the level of plaque and calculus, the degree and extent of inflammation, especially caudal mouth, any missing teeth or retained roots. Photos should be taken of all regions described, particularly the caudal mouth.

If, after the Phase I therapy, no response is seen within 7-10 days, the client should be counseled that early caudal mouth extractions (CME) will provide the best level of relief for their pet. In one study, patients with CME needed no further treatment, and an additional 37% only needed low levels of inflammatory support. No significant difference was seen between cases of CME or FME (full mouth extraction). (Jennings 2015)

Extractions
Full details of extractions will not be provided here, but some salient points are offered. Depending on the practitioner’s level of skill and equipment, CME can be scheduled as one or two surgical procedures. Multi-modal analgesia should be provided from the first, including appropriate opioids, regional and local blocks and post-operative medications. Unless complicated, in this author’s experience, removal of the teeth provides significant relief for the patient and with reasonable levels of surgical pain management, the patients return to function and eating quickly.

Working quadrant by quadrant, full elevation of buccal gingiva and mucosa, past the friable edges, allows visualization of the teeth, furcations and alveolar bone. A small 699 crosscut fissure bur is ideal for sectioning feline teeth, and initial removal of alveolar bone. Careful elevation, starting with a thin, flat elevator or luxator and then using small winged (sharpened) elevators can help loosen the tooth segments. Gentle elevation with small bread extraction forceps should remove the entire root. The lingual and palatal mucosa are then elevated away from the alveolar ridge. It is important to remove all rough bone edges, debriding down to healthy bone in a fairly aggressive alveoloplasty. The alveoli should also be debrided. Closure with 5-0 monofilament should be done with no tension. While a continuous pattern will leave least number of knots, any knot failure would be a detriment. Simple interrupted or an interrupted cruciate pattern can be used to close the extraction sites.

Other therapy options
There is a very long list of medications that have been used in attempt to manage feline stomatitis, with great variability in response. In a European study with FCV (Feline Calicivirus) positive cats, non-responders to FME, transmucosal administration provided comfort and reduced inflammation in some of the patients. (Hennet 2011) Subcutaneous and intralesional administration has also been described. Mesenchymal stem cell therapy has been initially investigated in a number of non-responsive patients with 5 of 7 having complete resolution. (Arzi 2016) Long term NSAID use in cats has been studied with other diseases, so its use in stomatitis may be able to play an adjunctive role.

Corticosteroids are used frequently in general practice to provide some level of relief from inflammation for patients, though often with a gradual decrease in effectiveness. Cyclosporine has also been studied to look at its effect on this syndrome that demonstrates an inappropriate immune response, to effect in some patients. (Lommer 2013) There is no general consensus of the impact of laser therapy, but removal of significant proliferative tissue can be beneficial to some patients, when used with other treatment.

Summary
A key point is to realize that these cases can be quite frustrating to everyone involved, and particularly the patient. Efforts should be made to find the best combination of care that will make individual as comfortable as possible, which often entails extensive extractions. While generally thought to be more prevalent in cats starting around 7 years of age, a trend seems to be including younger patients in the group that require early extractions.

Tooth resorption (TR)
In the name game race, this group of lesions beats out ‘stomatitis’! From feline caries to neck lesions to cervical line lesions and Feline Odontoclastic Resorptive Lesions (FORLs), the identification and understanding of these pathological changes has changed over the years. Our management approach has also changed – no more glass ionomer kits for repair!

The AVDC has again provided guidance for the classification and definitions of these lesions, basing the TR type on their radiographic appearance. Knowing that these are progressive lesions, the staging looks at the levels of severity, from which treatment decisions can be made. Generally speaking, the broader terms of tooth resorption (TR) can be applied to any type of resorption – external or internal, replacement or inflammatory, in dogs or cats, or any species.

Tooth resorption types
TR Type 1 is identified radiographically if a focal or multifocal radiolucency is present in the tooth. Other portions of the tooth will be otherwise of normal radiopacity, and a normal-appearing periodontal ligament (PDL) will be identified. This type of resorption typically occurs in response to an inflammatory process such as periodontal disease. This inflammatory resorption can be seen particularly when the periodontitis has caused the loss of gingival tissue and bone, exposing the neck of the tooth and the root. The exposed hard tissue now is susceptible to demineralization and erosion by the surrounding inflammatory processes. The remaining root structure that is still protected by alveolar bone will generally have a healthy and visible PDL space.
While tooth resorptions may have many different presentations, the odontoclastic feline version by far is the most common type. It will seldom result in the ‘snapping’ off of the crown, so an actual ‘crown amputation’ may be necessary, removing just enough tissue. Once the surface cementum and underlying dentin are resorbed, reparative bone-like or cementum-like tissue covers the evacuated spaces. The PDL is destroyed as bone cells basically try to convert the root into bone.

Often these lesions go unnoticed until they progress up the root into the crown, where defects are then filled in with inflamed gingiva or granulation tissue at the neck of the tooth. If left un-addressed, the lesion will progress until structural loss of the crown is eventually covered with healing gingiva.

TR Type 3 description covers those teeth that have features of both Type 1 and Type 2. There will be areas of normal and abnormal (narrow or lost) PDL space. Focal or multifocal inflammatory radiolucent areas may be distinct from decreased opacity in other regions of the tooth, including the roots.

TR stage

While this is a progressive disease, the rate of progression can be highly variable among patients, and even among different teeth in the same patient. Personal clinical observations have sometimes noted active progressive disease in young cats with multiple lesions as compared to older patients with limited lesions and a slower progression.

TR Stage 1 – or mild dental hard tissue loss (cementum or cementum and enamel) would be a very challenging level to identify clinically. While it certainly occurs, it is often not appreciated until progressing to TR Stage 2. This second stage will exhibit moderate dental hard tissue loss, to included loss of dentin that does not extend into the pulp cavity. Radiographically this may be assigned to a tooth exhibiting loss of PDL space and initial root conversion into bone.

Once the pulp cavity is involved, a TR Stage 3 classification should be applied. While most of the tooth will retain its structural integrity, the extent of the lesion with deep dental hard tissue loss will necessitate its extraction. Further progression with extensive hard tissue loss, or TR Stage 4, will include teeth that have lost its integrity and structure, but with some crown or root tissue still remaining. Subcategories include TR4a (crown and root equally affected) TR4b (crown more severely affected) and TR4c (root more severely affected). The final stage – TR5 – there are only remnants of dental hard tissue, visible only as irregular radiopacities. The gingival covering signifies complete healing, and is a sign that the body has completed its effort to get rid of the tooth.

Management

One aspect of handling TR lesions is early identification. In the exam room, an effort should be made to visualize the mandibular third premolar, typically the first tooth affected by resorption. If even one indication (loss of tooth structure, ingress of gingival or granulation tissue, complete loss of the crown) is present, the entire dentition needs to be radiographed. These patients exhibit pain when the teeth are palpated (under anesthesia), and extractions are typically needed.

Intraoral radiographs are absolutely essential in managing tooth resorption lesions. Close evaluation of the periodontal ligament space is necessary in order to determine the type of resorption – inflammatory (Type 1) or odontoclastic (Type 2). No matter what the extent of resorption, if the PDL space is intact and visible radiographically, the entire root/tooth must be elevated. This can be challenging if the resorption has damaged the structure of the tooth, making it fragile and more prone to fracture during extraction. All apical portions must be completely elevated, as bacteria may have entered the pulp cavity during resorption/inflammation. Complete extraction is even more critical in cats with concurrent stomatitis.

On the other hand, if radiographs show Type 2 odontoclastic or replacement resorption with loss of the PDL and conversion of the root into bone, a modified approach may be taken. Routine steps of regional/local block, an envelope flap, sectioning the tooth and starting gentle elevation should be started. Occasionally an involved root will actually elevate completely out of the socket. Typically, though, there will be little indication of fatiguing of the PDL, and the crown section will often snap off. As long as there is no visible PDL and no evidence of apical bone loss, it is generally acceptable to finish the extract by smooth any rough alveolar edges, elevating the gingival margins, and suturing the site closed (cruciate). It should be noted on the record, and the owner informed, that a modified extraction technique was used (MET), with intentional root retention (IRR) and that you will continue to monitor (CTM) the site. Any remaining root should undergo continuing resorption, and complications are very unlikely, but radiographs are essential to determine the MET is the appropriate therapy for that tooth.

One slight difference might be encountered with Type 2 resorption of canine teeth. Sometimes they are slower to progress (not always), and may be preserved with extensive root involvement as long as the crown is stable and pain-free. Doing the initial elevation will seldom result in the ‘snapping’ off of the crown, so an actual ‘crown amputation’ may be necessary, removing just enough structure to be able to close the gingiva at the site. Pulverization of roots is not recommended.

Summary

While tooth resorptions may have many different presentations, the odontoclastic feline version by far is the most common type encountered. Intraoral radiographs are an absolute necessity when managing these lesions for the best care for our patients.
References
Johnston NW. An updated approach to chronic feline gingivitis stomatitis syndrome. Veterinary Practice 2012 Vol. 44, 5; pp34 -38
There are many ways to teach and take dental radiographs; the author’s preference is to have the patient in lateral recumbency and slightly adjust the head position using towels, depending on the image needed. Others prefer dorsal and ventral recumbency for taking radiographs - determine what works best for you and your staff.

**Parallel**

While a parallel technique (film and object parallel with x-ray beam perpendicular) would be ideal to minimize distortion, most areas of the oral cavity do not lend themselves easily to this positioning. The only region where the film can be placed parallel to the teeth is that of the mandibular premolars and molars, with a corner of the film pressing into the intermandibular space. The most mesial (rostral) roots and teeth may not be visible on this view, as the film may be limited by the mandibular symphysis, but aiming the radiographic beam from a slightly rostral oblique position may allow these roots to be imaged.

**Bisecting angle technique**

For the rest of the teeth in the oral cavity, a parallel positioning is not possible, so, a film is placed as close to a parallel plane to the object (root or tooth) as possible. Remember to place the film so the roots will be imaged, not necessarily the crown. One option is to use a bisecting angle technique for these films by aiming the beam at a line that bisects the angle formed by the long axis of the object (tooth) and the film.

**Modified technique**

Another way of determining beam position is to first line up the beam (or similar object such as a 2-inch roll of tape) perpendicular to the film. This would result in an image that is too short (shadow of a tree at noon). Next, line up the beam perpendicular to the root (tooth); this image would be too long (shadow of a tree at daybreak). Then, split the difference between these two positions, and the resulting image will be approximately the same size as the object, thus minimizing the distortion (and the beam will be perpendicular to that bisecting line mentioned earlier). Helpful devices, such as connecting two tongue depressors with a pushpin, and using a roll of tape to visualize where the beam will travel, can help you determine the two positions (perpendicular to film; perpendicular to tooth), so you can aim the beam halfway between the two. This perspective will also help you make appropriate adjustments to an image; if you want to make the image shorter, move the beam to a position more perpendicular to the film.

**Challenging radiographs – the cat quick 6-7**

- With the cat in lateral recumbency (e.g. – left side down), take the first image of the mandibular premolars and molar with a parallel technique.
  - If the mesial (rostral) root of the mandibular third premolar does not show, adjust the x-ray head further ventral and forward
- Take an image of the lower canines and incisors: roll the tongue back into the pharyngeal area to keep the sensor in place better; use the modified technique
- Take an image of the upper canine and incisors with the sensor ‘wide’ across the palate
  - If you need to isolate the right canine tooth apex better, come slightly off midline
- Take an image of the maxillary premolars
  - Place the sensor up against the palate
  - Using a tape roll, visualize where the beam would be, if aimed directly perpendicular to the teeth: you will not be coming directly laterally to the maxilla, but slightly from in front
  - Then visualize where the beam would be perpendicular to the film
  - Split the difference
  - The zygomatic arch will always be in the way – if you elongate the image by moving the x-ray beam more perpendicular to the teeth, the arch ‘moves’ a little more out of the way.
- Using a clear feline mouth gag (cut part of a tuberculin syringe); place the sensor under the head on the left side (extraoral); the left maxillary premolars will be placed nearly flat on the sensor in this position.
  - Using the tape roll, and angled from the back of the head, look across the arch at an oblique/angle, until you see the palatal surfaces of the left maxillary premolars without the right premolars superimposed over them
• Make sure the sensor is placed far enough forward and dorsal that the angled beam will go through the teeth and hit the plate.

• 5 of the 6 films are done!
  o Adjust the cat to left lateral recumbency and take the left mandibular premolars

Challenging dog radiographs

• Maxillary incisors – in most dogs with a normal head shape, then ventral portion of the nares will be lined up with the base of the xray cone when positioned
  o Place the sensor centered at the maxillary second premolar
  o Adjust the xray beam from midline to a slight oblique so the canine is not superimposed over the premolars in the image; make sure it is centered on the spot where you palpated the canine apex

• Maxillary canine apex – palpate where the apex is positioned by running your finger up the buccal jugae to the tip (it is usually somewhere over the second premolar
  o Place the sensor in the mouth lined up with the two molars (usually angled in a palatal direction)
  o Aim the beam almost directly onto the sensor (just a slight adjustment)

• Maxillary molars – with a skull or model, observe how the molars are in a different ‘line’ than the premolars
  o Since the symphysis restricts the sensor from going far enough forward to get a true parallel image of the first and second premolars, adjust the beam to come from in front of and below the teeth to ‘push’ them onto the image (or take it extraorally)

• Mandibular canines
  o If you place the sensor across both lower second premolars and aim the beam perpendicular to the sensor, you will have both canine apices for good comparison

• Mandibular premolars
  o If the teeth imaged are incisors or canines
    - “Shake hands”
    o The patient’s right is on your left, and vice-versa
  o If the teeth images are premolars and molars
    - “which way is the nose?”
    o It is VERY important to only rotate the image digitally – NEVER “FLIP”
    o Flipping the image – horizontally or vertically – reverses right and left

Identification of teeth or region

Most digital intraoral radiography software systems have precise ways of taking images to correspond with the appropriate teeth. While this is very helpful in record keeping, if anesthetic time needs to minimized, or if images are unlabeled or mislabeled, it is important to be able to identify a tooth or structure in any image taken.

With actual digital films, part of this identification process deals with how the film is placed in the mouth. A dot is embossed on the film (through the packet), so the raised dot faces the xray beam source. In reviewing hard films, placing the film so the raised dot is facing you orients the image in the same way as digital films are viewed, as if you are looking onto the outward surfaces of the patient. Having models or skulls are helpful guides when starting out, until you become familiar with structures, including the differences between maxillary and mandibular images.

With either digital or actual films, there are a few quick steps to take to be able to identify what teeth are being viewed:

• First, orient or rotate the film/image until the roots are pointing in the appropriate direction
  o Maxillary roots pointing up
  o Mandibular roots pointing down

• If the teeth imaged are incisors or canines – “Shake hands”
  o The patient’s right is on your left, and vice-versa

• If the teeth images are premolars and molars -
  o Ask – “which way is the nose?”

• If the nose is to the right – it is the right side, and vice-versa
  o It is VERY important to only rotate the image digitally – NEVER “FLIP”
  o Flipping the image – horizontally or vertically – reverses right and left
• However, for images taken with the sensor or film placed extraorally:
  o Then right and left are reversed
  o This should be noted on the film/image that it was taken extraorally

Know normal
By reading lots of films/images, you will become more familiar with normal structures of the oral cavity. Superimposition of the nasal cavity, the mandibular canal, foramina and osseous structures such as the zygomatic arch can complicate evaluation of the films. An apex of a tooth superimposed over a less dense structure, such as the nasal cavity or mandibular canal, may give the impression of a wider periodontal ligament space, or even bone loss. This chevron effect should be verified by imaging the tooth on the opposite side, or taking multiple views at different angles. Further evaluation for tooth vitality, such as transillumination, can provide additional input. Imaging both sides can also help identify lucencies that may appear as lesions that are actually mental foramina. Adjusting technique and angles to ‘move’ the zygomatic arch away from maxillary premolars can allow you to visualize certain tooth portions better.

Evaluation of periodontal bone
In the evaluation of periodontal disease, it is important to be able to assess the extent of periodontal bone loss, as well as the type of bone loss. This information, along with probing depth and visual assessment, will give a complete picture of the staging of the disease for that tooth or region, and will guide treatment decisions. Each tooth in a patient’s oral cavity can have a different bone loss pattern, and the pattern can differ from root to root of the same tooth.

• Stage of disease – with each subsequent stage of disease, there is an increase in the percentage of attachment loss, which included bone
  o Stage 1 – no attachment loss
  o Stage 2 – up to 25% attachment loss
  o Stage 3 – 26 to 50% attachment loss
  o Stage 4 – greater than 50% attachment loss

• Type of bone loss
  o Crestal bone loss – initial loss of the rounded alveolar crest in between teeth
    ▪ There is typically little periodontal pocket formation
  o Horizontal bone loss – bone loss proceeds in a linear fashion across a tooth or several teeth
    ▪ If accompanied by gingival recession, roots can be exposed, and even the furcations of multi-rooted teeth, with variable extents of soft tissue pockets that will be suprabony
    ▪ If there is no gingival recession, the horizontal bone loss will result in the formation of soft tissue or suprabony pockets
  o Vertical bone loss – bone loss extends down the length of a root or roots
    ▪ This will form an infrabony pocket that can be challenging to access without gingival flaps or surgery
    ▪ If the vertical bone loss extends to the apex of a root, the infection will enter the root canal system at that point and infect the pulp, eventually killing the pulp
      • This may lead to endodontic or apical bone loss of additional roots of a multirooted tooth

Endodontic disease evaluation
There are several ways to assess the health of the endodontic system: if the pulp is exposed by fracture, resorption or caries, treatment (extraction or root canal) must be performed, even in the absence of radiographs signs or lack of transillumination. Discolored teeth should likely be considered to be non-vital, though transillumination may help in the evaluation. The absence of radiographic signs does not mean the tooth is vital, as osseous changes may be very subtle, may take extended periods of time to occur, or may be missed. When present, however, radiographic signs are confirmation of pulpal compromise and can also be used to determine the best course of therapy.

• Apical bone changes – apical periodontitis
  o If the periodontal ligament at the apex is wide, this may be an early indication that infection or compromise is present
  o The typical ‘mushroom’ area of bone loss – often termed an apical abscess – won’t be found in every case, and in theory, cannot be termed an abscess unless histopathology or culture is done. Some lesions could be sterile granulomas
  o Chronic lesions may also show resorption of the root itself
• Significant changes would decrease the likelihood that an endodontic treatment would be successful, so extraction may be needed.

• Canal width – normal aging changes includes a narrowing of the pulp canal as the dentinal walls increase in width with a healthy pulp and odontoblasts
  o A wide canal, in comparison to a relatively more narrow canal of a similar tooth, may indicate the pulp became non-vital at some time in the past (the tooth stopped growing)
    ▪ This comparison is used to assess teeth that have sustained injury (pulpitis) or have been treated (vital pulpotomy) to make sure they continue to mature
  o Internal resorption – irregular areas of wider canal
    ▪ Indicative of an inflammatory process occurring in the pulp – likely non-vital or compromised

• Combination periodontal and endodontic diseases
  o Type 1 Perio-endo lesion – an initial endodontic lesion at the apex extends up the root length coronally until it reaches the base of the sulcus (J-shaped)
  o Type 2 Perio-endo lesion – an initial periodontal lesion (deep infrabony pocket) extends down the root to the extent that the infection reaches the apex of the tooth and the infection compromises the pulp; a periapical bone loss pattern may occur on other roots of multirooted teeth
  o Type 3 Perio-endo lesion – concurrent periodontal lesion and endodontic lesion – either separate or eventually coalescing

Tooth resorption
While classically thought of as feline odontoclastic lesions (FORL), the term tooth resorption (TR) refers to any resorptive or erosive lesion of the hard tissues of the teeth (enamel, dentin, cementum), internal or external, dog or cat. Both the type and extent of resorption should be determined radiographically. (AVDC Website)

• Severity of resorption
  o Stage 1 – mild dental hard tissue loss (cementum or enamel)
  o Stage 2 – moderate dental hard tissue loss (cementum or cementum and enamel with loss of dentin) that does not extend to the pulp cavity
  o Stage 3 - deep dental hard tissue loss (cementum/enamel/dentin) – extends to pulp cavity but most of the tooth retains its integrity
  o Stage 4 – extensive dental hard tissue loss, extends to the pulp cavity, most of the tooth has lost its integrity
  o Stage 5 – Remnants of dental hard tissue are visible only as irregular radiopacities and gingival covering is complete (usually odontoclastic)

• Types of resorption
  o Type 1 – focal or multifocal radiolucency is present in the tooth with otherwise normal radiopacity and normal periodontal ligament space
  o Type 2 – there is narrowing or disappearance of the periodontal ligament space in at least some areas and decreased opacity of part of the tooth
  o Type 3 – features of both 1 and 2
Practical Periodontal Plans: How to Manage the Disease You Find
Heidi Lobprise, DVM, DAVDC
Main Street Veterinary Hospital
Flower Mound, TX

The extent of periodontal disease you might encounter in patients can vary from patient to patient and even from tooth to tooth in the same patient. From minimal inflammation and no attachment loss in Stage 1 Periodontal Disease to the beginnings of attachment loss (up to 25%) in Stage 2, then deeper pockets (up to 50% attachment loss in Stage 3) and even compromised teeth (greater than 50% loss) in Stage 4, you must be able to tailor the treatment to the problem. Beyond the dental cleaning, being able to provide advanced periodontal management for your patients is not only good medicine, but good business. By adding simple instruments, materials and skills to your dental armamentarium, you can identify and treat those teeth that may have been extracted in the past.

**Therapy goals**

When looking at periodontal disease, therapy is determined by a number of factors, such as the stage of the disease, the involved tooth, the client’s commitment and the desired outcome. There are several goals to set, including removal of all debris or biofilm (plaque, calculus), keeping the maximum amount of attached gingiva, minimizing attachment loss and minimizing the pocket depth. Certainly, all foreign material, from bacteria to desquamated cells must be removed from the tooth surfaces and pockets in order to attain healing. Since the attached gingiva is the first line of defense against bacteria, a minimum of 2-3 mm is necessary to protect underlying tissues, as the looser alveolar mucosa doesn’t afford that protection. The inability to halt attachment loss will eventually lead to tooth loss. Minimizing pocket depth is related to attachment loss, but is a more specific parameter, because pocket depth in itself directly affects the ability for effective home care and maintenance, and deeper pockets can harbor more virulent strains of bacteria. There are even times where excessive gingiva will be removed to decrease pocket depth (hyperplastic gingiva) or the gingiva will be sutured further down the root (apically repositioned flap) for the same effect. Attachment loss without pocket formation occurs when gingival tissue and bone is lost at the same time, exposing the roots and even furcation areas.

The ability to take intraoral radiographs is essential, in order to determine the extent and characteristics of bone loss. With recession of gingiva and bone across several roots and/or teeth, a horizontal bone loss pattern will often result in exposed roots. With a deeper osseous loss down one root surface, an infrabony pocket may result from the vertical bone loss, and specific therapy may be needed to address that specific defect. These deeper pockets are more difficult to treat and maintain, and anaerobic infections may persist.

**Attachment loss – Treatment decisions**

In evaluating teeth at either end of the spectrum – minimal disease with stage 1 or 2 teeth, or extensive stage 4 disease – the decision process is pretty straightforward. With stage 3 periodontal disease affected teeth – there is more of a challenge to decide whether to extract or try to save. The extent and type of attachment loss is a part of the decision process, as is the consideration of the relative importance of the tooth itself. Major teeth (canines, carnassials) will often be considered for advanced procedures, and adjacent, smaller teeth that are contributing to the infection should be considered for extraction, as their removal will allow better access to the strategic tooth. By extracting the middle tooth in the middle of three rotated, crowded premolars can often enhance the health of the remaining two teeth.

If the attachment loss results in root exposure with minimal pocket formation, professional cleaning and home care may be easier. Any involvement of the furcation puts the tooth at higher risk, due to challenges of continued care. If a pocket is present, it should be thoroughly evaluated: how deep is it? is it suprabony or infrabony?

Patient health status is also evaluated: patients with systemic disease would like benefit more from extraction with the immediate removal of the infection, and a decreased anesthetic time. Clients also are involved in the decision: advanced periodontal therapy requires excellent home care and more frequent professional visits.

**Advanced periodontal therapy**

**Moderate pocket depths**

With suprabony pockets (soft tissue only) of up to 5 mm in depth, evaluate not only the pocket, but the amount of attached gingiva left. If there is 7mm of attached gingiva due to inflammation or gingival enlargement, a simple gingivectomy/plasty can immediately reduce the pocket depth to a more manageable level. A 12-fluted bur on a high-speed hand-piece is extremely helpful with minor trimming. If there is minimal gingival enlargement and only 2-3 mm of attached gingiva, then closed root planing and placement of a perioceutic can provide excellent care for the defect.
**Root planing/subgingival cleaning**

This is by far the most important aspect of periodontal therapy. If the debris is not thoroughly removed from the pocket depths, the disease will remain and intensify. The rounded tip of the curette, and it’s rounded back, makes it ideal for subgingival therapy, as opposed to the sharp tip and back of a hand scaler. Certain ultrasonic scalers are modified for subgingival treatments, but most are not. If root surfaces are exposed, or if the pocket depth is less than 5 mm, closed root planing and subgingival curettage may be performed. Using a curette subgingivally with overlapping strokes in horizontal, vertical and oblique directions, root planing removes calculus, debris and necrotic cementum to provide a clean, smooth surface. Root planning that is too aggressive can damage the root, so take some care. The curette can also be angled slightly to engage the gingival surface for removal of diseased or microbial tissue) growing back into the defect faster than the more important supportive tissues of the periodontium (alveolar bone, periodontal ligament). Placing bone graft material and barrier membranes can actually help exclude the soft tissue and allow bone to grow back into the defect (guided tissue regeneration). If an adjacent, smaller tooth is involved in the area of attachment loss, its extraction is sometimes the best way to get access to the larger, more strategic tooth’s surfaces. The releasing incision is made away from the tooth being treated, allowing a complete attached gingival coverage of the treated site. Extraction of the middle of three crowded teeth also allows better exposure and treatment of the remaining teeth.

**Specific conditions**

**Mandibular canines and incisors**

The mandibular incisors are frequently affected by periodontal disease and bone loss, especially in smaller dogs. It is tempting just to wiggle out a loose tooth, and that will remove the primary source of the disease, but leaving the involved, less healthy soft tissues can continue to impact adjacent teeth, especially the mandibular canines. The bone loss between the mandibular third incisor and canine can result in a persistent deep soft tissue pocket (with some intrabony extension) once the incisor is gone. A deep soft tissue pocket may also be present around the mandibular canine if the tooth is not fully erupted, as gingiva cannot attach to the enamel that is still below the gum line. Persistent pockets here can predispose the canines to additional periodontal disease with anaerobic plaque bacteria present.

In order to minimize these pockets, the soft tissue linings often have to been excised, and the level of the gingival margin may have to be moved further apically down the tooth. A wedge excision of the tissue from the mesial margin of the canine (the surface closest to the midline of the symphysis) helps remove the excess and granulomatous tissue, and can minimize the pocket depth if the height is
reduced (if sufficient attached gingiva remains). With partially erupted teeth, the wedge incision may not be enough: the attached gingiva may have to be elevated past the muco-gingival junction to release the flap at the level of the looser alveolar mucosa. This way the flap can be repositioned further apically on the tooth and secured with sutures, revealing more of the crown and decreasing the pocket depth. In other teeth, trimming the gingiva or securing the margin further apically will actually expose more root surface, but root exposure is simpler to keep clean that a root within a pocket.

**Mandibular first molar**
Any attachment (bone) loss at the mandibular first molar deserves attention. Advancement of bone loss at this tooth is one of the most common reasons for pathological fracture of the mandible. Bone loss at the mandibular fourth premolar or second molar, particularly if vertical bone loss has started at the first molar, is sufficient reason to extract the smaller tooth to provide access to treat the first molar more effectively. For best periodontal treatment, a releasing flap is made at the furthest margin of the adjacent tooth to be extracted, with the gingiva elevated to facilitate extraction, and thus exposure of the affected root of the first molar. Any pocket lining or granulation tissue in the region should be removed, and the area scaled until healthy root and bone is exposed. If there is an intrabony pocket around the first molar, a bone graft material can be placed, as well as in the alveolus of the extracted tooth. At the very least, the disease tissue should be removed, the root cleaned thoroughly, and the gingiva sutured closed around the first molar.

**Maxillary premolars**
In smaller dogs and brachycephalic breeds, maxillary premolars can often be crowded, sometimes with significant rotation that stack them up on each other. The lack of healthy bone in between these teeth predisposes them to additional periodontal attachment loss, and it can be challenging to keep them healthy. While some propose prophylactic extraction of any rotated and crowded maxillary premolars, in most patients, regular examination and cleaning can alert the practitioner to those that may require extraction. Often, the ‘middle’ tooth in a series of three teeth can be extracted to improve the condition of the two adjacent teeth. Special attention should be paid to the maxillary third premolar, for if the distal root is crowded between the two mesial roots of the fourth premolar, the third premolar may need to be sacrificed.

As a strategic tooth, it is often worth it to provide additional effort to preserve the health of the maxillary fourth premolar. In smaller dogs, it is critical to evaluate the status of the periodontal tissues around the palatal root. It is often so small, that a 3-4 mm pocket with bone loss can completely envelope the root, compromising the entire root. In fact, an infraorbital swelling in a small dog with an intact (not fractured) fourth premolar should lead a close examination of the palatal root.

**Maxillary canines**
Periodontal bone loss at the palatal aspect of maxillary canines can lead to oronasal fistulae, once a deep pocket extends past the level of the palatal bone. Once formed, the fistula is nearly impossible to correct, so extraction is necessary. Chronic fistulation can be challenging to close, as every breath puts tension on the sutured flap. Prevention of fistulation is critical, so careful evaluation of the palatal (and mesiopalatal aspect) of the maxillary canine is important. If a moderate pocket is formed, closed root planning and a periosteum may help stop the progression. If an intrabony pocket has formed, there may an opportunity to provide advanced periodontal treatment for guided tissue regeneration to build back the lost bone before the fistula is formed.
Good medicine is good business
All of the areas of dental care that have been discussed obviously provide better medical care for our patients. With a focus on growing that business, dentistry can be a substantial part of your practice’s business as well. There are always challenges to making that happen, and a big challenge can be implementing the great ideas you might have.

Smart goals
The SMART acronym is often used in business applications, but not as well known in the veterinary field:

- S – Specific
- M – Measurable
- A – Attainable
- R – Realistic
- T – Timely

If you really want to make changes in a practice, you need to select 1 or 2 specific goals that you want to accomplish, and you can only see if you were successful if that goal can be measured. Of course, the outcome needs to be realistic and attainable, but you need to make sure that you set a time limit on reaching that goal as well. Specific goals may be doing more dental procedures (how many more? Compared to what?), taking more radiographs, getting better at extractions (training). One important aspect may be building the value of what you provide for your patients, as this can help overcome many client objections.

Overcoming objections
Two of the most common objections most owners have for dental procedures are the cost and the risks of anesthesia. In the past, anesthesia concerns likely held more importance, but with advances in anesthesia and analgesia management, these risks can be minimized for most of our patients. Appropriate pre-operative patient screening allows us to customize the anesthetic protocols to minimize risk, and use of multi-modal analgesia, including local and regional blocks, can help keep anesthetic doses to a minimum. Advanced patient monitoring and supportive care helps protect these patients during the procedure and close post-operative monitoring gets them through to discharge.

Unfortunately, these advances in anesthetic care have driven the costs of good dental care up, as well as the costs of intraoral radiology and advanced procedures. Practicing a good standard of care does not come cheaply, but providing sub-standard care (including anesthesia-free dentals) can cost our patients their health.

Providing a consistent message about the benefits of good oral care from all clinic team members is important – from the veterinarian to the technician/nurse to the front office staff. We know the medical benefits of the procedures provided, and should be able to confirm this to the client. Sometimes having a ‘pet-parent testimonial’ – a note from a previously reluctant owner – about how good dental care impacted their pet’s health – can help another owner.

Build the value
Part of a client’s objections, especially the monetary ones, come from a lack of appreciation of everything that is provided with dental care. Building the appreciation of the value you provide may start when the ‘phone shopper’ calls in to see how much a ‘dental’ is. Be sure to invite any clients to visit your clinic for a complimentary dental examination, and give them a tour of your facilities to show off your dental capabilities. Part of this visit underscores the education you provide about how many problems can be present in the oral cavity, and how many problems may never be discovered until the complete dental exam under anesthesia.

In the exam room, alert the client to obvious problems – even beyond plaque and calculus – like broken, chipped or discolored teeth, or tooth resorptions in cats. This ‘red flag’ check can be your opportunity to insert two important words – PAIN and INFECTION. While they may be aware of the oral odor their pet has, they may not realize how much the bacteria can be affecting their pet. You can even discuss the impact oral disease can have on systemic health. This is a great time to bring in that ‘pet-parent testimonial’ – the story where the dog felt like a puppy again after getting its oral problems treated.

Another great way to build the value and educate clients is the use of photos. While there are some very good brochures and handouts that help explain the stages of periodontal disease and tooth resorption, nothing hits closer to home than pictures of their own pet’s teeth. Pictures in the exam room (or while they are boarding) can be printed so they can take them home. Before and after pictures the day of the procedure are often quite amazing. Even pictures of the external surfaces of the teeth combined with the appearance of the radiographic structures can help build the value of the importance of taking dental radiographs. A dental photo album following all the steps of a dental procedure at your practice can demonstrate how much goes on during “Fluffy’s Day at the Dentist”.

The Business of Dentistry
Heidi Lobprise, DVM, DAVDC
Main Street Veterinary Hospital
Flower Mound, TX

Good medicine is good business
All of the areas of dental care that have been discussed obviously provide better medical care for our patients. With a focus on growing that business, dentistry can be a substantial part of your practice’s business as well. There are always challenges to making that happen, and a big challenge can be implementing the great ideas you might have.

Smart goals
The SMART acronym is often used in business applications, but not as well known in the veterinary field:

- S – Specific
- M – Measurable
- A – Attainable
- R – Realistic
- T – Timely

If you really want to make changes in a practice, you need to select 1 or 2 specific goals that you want to accomplish, and you can only see if you were successful if that goal can be measured. Of course, the outcome needs to be realistic and attainable, but you need to make sure that you set a time limit on reaching that goal as well. Specific goals may be doing more dental procedures (how many more? Compared to what?), taking more radiographs, getting better at extractions (training). One important aspect may be building the value of what you provide for your patients, as this can help overcome many client objections.

Overcoming objections
Two of the most common objections most owners have for dental procedures are the cost and the risks of anesthesia. In the past, anesthesia concerns likely held more importance, but with advances in anesthesia and analgesia management, these risks can be minimized for most of our patients. Appropriate pre-operative patient screening allows us to customize the anesthetic protocols to minimize risk, and use of multi-modal analgesia, including local and regional blocks, can help keep anesthetic doses to a minimum. Advanced patient monitoring and supportive care helps protect these patients during the procedure and close post-operative monitoring gets them through to discharge.

Unfortunately, these advances in anesthetic care have driven the costs of good dental care up, as well as the costs of intraoral radiology and advanced procedures. Practicing a good standard of care does not come cheaply, but providing sub-standard care (including anesthesia-free dentals) can cost our patients their health.

Providing a consistent message about the benefits of good oral care from all clinic team members is important – from the veterinarian to the technician/nurse to the front office staff. We know the medical benefits of the procedures provided, and should be able to confirm this to the client. Sometimes having a ‘pet-parent testimonial’ – a note from a previously reluctant owner – about how good dental care impacted their pet’s health – can help another owner.

Build the value
Part of a client’s objections, especially the monetary ones, come from a lack of appreciation of everything that is provided with dental care. Building the appreciation of the value you provide may start when the ‘phone shopper’ calls in to see how much a ‘dental’ is. Be sure to invite any clients to visit your clinic for a complimentary dental examination, and give them a tour of your facilities to show off your dental capabilities. Part of this visit underscores the education you provide about how many problems can be present in the oral cavity, and how many problems may never be discovered until the complete dental exam under anesthesia.

In the exam room, alert the client to obvious problems – even beyond plaque and calculus – like broken, chipped or discolored teeth, or tooth resorptions in cats. This ‘red flag’ check can be your opportunity to insert two important words – PAIN and INFECTION. While they may be aware of the oral odor their pet has, they may not realize how much the bacteria can be affecting their pet. You can even discuss the impact oral disease can have on systemic health. This is a great time to bring in that ‘pet-parent testimonial’ – the story where the dog felt like a puppy again after getting its oral problems treated.

Another great way to build the value and educate clients is the use of photos. While there are some very good brochures and handouts that help explain the stages of periodontal disease and tooth resorption, nothing hits closer to home than pictures of their own pet’s teeth. Pictures in the exam room (or while they are boarding) can be printed so they can take them home. Before and after pictures the day of the procedure are often quite amazing. Even pictures of the external surfaces of the teeth combined with the appearance of the radiographic structures can help build the value of the importance of taking dental radiographs. A dental photo album following all the steps of a dental procedure at your practice can demonstrate how much goes on during “Fluffy’s Day at the Dentist”.

130
Building compliance
With all of the education we provide, why are there still issues with compliance? Studies have shown that it takes several ‘touch points’ to get clients to comply with recommendations. Consistent messaging from all staff members is important, and even the wording of recommendations can play a part. Stronger messages of how important the care is for the patient, and detailing the steps of the assessment, radiographs, cleaning and polishing can be more impactful that suggesting a ‘dental’ might be helpful in the next few months.

Consistent recording of the level of disease and other problems is essential in providing recommendations for the patient. Those with significant disease (stage 3 to 4 periodontal disease, non-vital teeth or tooth resorption) should have the procedure scheduled before they leave the practice. If not, they should be called in the next two days to get it scheduled. Mild to moderate disease may not need immediate treatment, but a reminder card or call should be made in the near future to schedule it. Similarly, any patient receiving therapy should be placed into a reminder system, with appropriate time frames for re-calls: 12 months for stage 1 treatment, down to 3-4 months for more advanced cases.

Compartmentalizing some of the costs can help with compliance also. When the patient has been identified as needing therapy, getting the blood work at the time of exam, and dispensing appropriate antibiotic and pain medication serves two purposes. First, it can help defray some of the costs over the two visits (exam and procedure). Second, if the blood work is done, following up with the dental work is a logical step.

In fact, screening blood work and diagnostics (senior care, etc), can easily lead to compliance to recommendations for dental care. Once the blood work is done (and is within appropriate health limits), an important initial step is completed, driving the conversation for dental care. In reverse, the need for dental care may allow you to provide appropriate senior screening for patients that might have not had it otherwise. Occasionally, such pre-operative screening may also uncover previously undiagnosed diseases that can now be managed appropriately. In some clinics, having the blood work done can provide a small discount or incentive for the dental work.

Home care compliance
As challenging as compliance for dental recommendations may be, compliance for home care is likely much lower. We should still encourage our clients to provide appropriate home care for their pets, and we should continue to be their best resource for education, and products. Puppy and kitten training should include some discussion on a lifetime of oral care, including professional exams, professional care, and home care. Training to brush should be a gradual process, and alternatives to brushing should be covered as well.

After every dental procedure, a two week re-check can allow you to monitor the recovery of the patient – and also to hear directly from the owner about how well their baby is doing! A toothpaste taste test at this visit (for dogs) gives the opportunity to show how you can ‘pet-alize’ their pet’s home care, using their favorite flavor (or the owner’s favorite, if the dog doesn’t choose), and appropriate brushing device. Discussion should also include appropriate chewing devices (nothing too hard), as well as diets and other products.

Clinic challenges
Once you have the clients complying with your recommendations, now you have to handle some challenges within the practice. Three common areas of hurdles include space, equipment and training. Space issues may not have much flexibility, and may determine some choices on equipment (dental and radiographic units on stands, wall-mounted?). Equipment choices are extremely variable, with many levels of investment, but some means of high-speed dental equipment and dental radiography are absolutely essential. Substantial improvement in your instrumentation may be as simple as sharpening your instruments (periodontal curettes and dental elevators) on a regular basis (daily, not monthly).

Staff training is the foundation for a strong dental practice. Without the basics for both veterinarians and technicians/nurses, providing any level of care will be frustrating at best, and sub-standard at the worst. Continuing education is one of the best investments you can make for your patients’ care.

Scheduling and treatment plan challenges
Inherent in the challenges of providing good dental care is the fact that there can be so many hidden problems in the mouth that aren’t discovered until the complete examination under general anesthesia with probing and radiographs. Estimates for costs and time of procedure can be ‘guestimated’ at the time of examination, but that is only the beginning. It will be necessary to be able to contact owners during the procedure, and you should inform them that the problems found can substantially change the treatment plan or estimate.

In the work flow of most practices, the technician is providing the bulk of the work, from cleaning and polishing to taking radiographs. It is often helpful to determine at the beginning of the procedure if there will be additional therapy needed, such as extractions that will need the veterinarian’s participation. An initial ‘red flag’ check (after the patient is stabilized and on monitors) can identify many of these problems right away: deep periodontal pockets (palatal aspect maxillary canine or fourth premolar, at either end of the mandibular first canine, between mandibular third incisor and canine), any broken or discolored teeth, tooth resorption lesions. If these are found, they should be marked on the chart, and early placement of local/regional blocks and radiographs can be
taken to confirm if surgery is needed. One quick assessment of broken, worn or discolored teeth is using transillumination (shining a bright light through the tooth) to determine if it is vital (pink pulp apparent) or non-vital (dark or diffuse).

Even with the best planning and exams, it is not uncommon to find substantial disease that may extend the anesthetic time needed for any one patient. Multiply that by the 3 to 4 procedures scheduled for that day, and it can be problematic. Clinics can set up scheduling guidelines based on the level of disease estimated at the time of exam (stage of periodontal disease, or obvious extractions needed), and determine what time frame (or segment) might be needed for that patient. For example, if a clinic can do up to 4 procedures a day, but has 7 ‘segments’ set aside, and a stage 4 patient takes up 4 of those segments, then the remaining procedures only have 3 more segments in which to schedule.

And in those patients where the unanticipated level of disease would either cause a prolonged anesthetic time (or if there are issues during monitoring), it is not unreasonable to consider staged therapy. Being able to do the majority of the cleaning and removing most of the cause of the infection (including very simple extractions) can provide enough initial treatment for the patient to support them until the additional oral surgery is performed 2 to 3 weeks later. Not only can this provide healthier tissue for the more advanced procedure that is needed, but it can help avoid prolonged anesthetic time and give some flexibility in an over-booked schedule.

Challenging procedures
In building your dental practice, once you’ve overcome the obstacles of reluctant clients and scheduling nightmares, you will encounter disease that may be beyond your presumed capabilities. Certainly, if there is a referral practice in your area, suggesting a referral is always an option, and if the owner declines, make a note of this in the record. Continuing to build on your dental expertise through training and experience, having the right (and sharpened) equipment, and keeping basic principles in mind, you can likely take on challenges with reasonable results. Dentistry is a practical field, and while advanced procedures can be done to save teeth, sometimes extraction is an option. Your end goal is to provide your patient with a functional oral cavity without pain. That non-healing fracture or oral mass may require a partial mandibulectomy, but knowledge of basic anatomy and surgical skills can help you through that also. The great blood supply of the oral cavity helps tremendously with healing (though challenging during the procedure).

Summary
The potential to grow your dental practice is nearly unlimited – from concentrating on expanding the scope of dental procedures to increasing client compliance through education. You can provide a lifetime of care for your patients, and with early intervention and preventive care, many believe you can enhance not only the quality of life of your patients, but you can extend their lifespans as well.

It is essential to support the practice’s effort by obtaining and maintaining appropriate equipment and providing training for the team members. That training will include education of all clinic personnel, in order to support the best messaging for your clients. Working as a team with setting specific goals can help drive the changes you need to build your dental practice. And the good business of dentistry will provide good medicine for your patients.

References/Recommended reading