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Editor's Note

Hope everyone enjoyed the many long weekends in April and May. Now it's the long slog till the next one. In this edition, I am so late that I am actually early for next summer and the inevitable thunderstorms. A friend of mine has a severely noise phobic dog and the impact on the owners' life cannot be underestimated. Dr Quixi Sontag has supplied a comprehensive article regarding management and medication of such a patient. All that's missing is the cannabis oil....

Prof Leisewitz has written a clear step wise article on how to perform a food trial to diagnose food allergic versus atopic skin disease. Too often clients present and report that they have followed their veterinarians' advice to change the diet - and have them changed from Alpo to Pedigree. This elicits sniggers from the students as to the stupidity of the clients, but is actually an indictment on the veterinarian who is guilty of poor communication and patient management. How must the client know better? It's like asking me to work on my own car engine.

Included this month are also two insightful articles on changes in veterinary practice due to societal changes and how we need to start adapting to change and then an article on professional life and health, not something I usually publish, but reading through this one I saw a lot of points to take home and which I have had to learn the hard way so I hope many can take something positive out of this and also see that we all face the same challenges.

Regards

Liesel

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VET360 aims to be a leader in the field of continuing veterinary development in Southern Africa by providing veterinary professionals from diverse disciplines with tools to help them meet the challenges of private practice. The magazine aims to make information accessible, both paper and electronic, and provide clinical, business and other veterinary information in a concise form to enable the practitioner to rapidly acquire nuggets of essential knowledge.

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Madaleen Schultheiss

Thunder and Lightning, Very, Very Frightening!

Dealing With Noise Phobia in Dogs and Cats

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Definition and signs

Noise phobia refers to a profound response to loud sounds such as thunder, fireworks and gunshots. It is characterized by intense avoidance, escape or anxiety behaviours associated with the activities of the sympathetic nervous system. Noise reactive animals that show concern with loud noises but are not phobic are referred to as "fearful" or "reactive".

A phobic animal shows a reduction in behavioural variation and the phobia interferes with day-to-day functioning. These animals are hyper vigilant, hyper reactive and show attempts to avoid what is going on in the environment. A variety of signs are associated with noise phobia/reactivity (Table 1). Noise phobic cats most commonly hide during noisy events and thus their condition is easily overlooked. The same treatment principles applied in dogs also apply to cats.

Prevalence

A study undertaken in 2005 in the UK found that 49% of dogs showed signs of noise phobia. However, only 25% of these dogs' owners thought that they showed signs of fear, and less than a third of owners seek assistance for their fearful dog. A study in Norway found a prevalence of 23%.

Table 1: Specific and non-specific signs of noise phobia

Hiding	Panting
Escape behaviour	Salivation
Destructive	Shivering, shaking
Aggressive	Urination
Vocalising	Defaecation
Seeking close physical contact	Loss of appetite
Attention-seeking	Vomiting
Hypervigilance	Diarrhoea
Pacing	Mydriasis
Freezing	Cowering
Self-harm	

Risk factors

Some animals are genetically predisposed to developing noise phobia. Although the condition occurs in animals of all breeds, it is more common in herding breeds and cross-bred dogs. Multiple gene involvement is likely.

Risk factors include age (over 4 years, except for lines where the condition is heritable), exposure to loud noises in the first four months of age, ambilateralism and unstable prior experience. Dogs that stayed with the breeder had a lower risk of developing the condition.

Noise phobia often co-exists with other anxiety disorders such as generalised anxiety disorder and separation anxiety.

Differential diagnoses

Noise phobia can be confused with separation anxiety when the dog shows more severe behaviour in the absence of the owner. Due to the owner being a safety signal the noise phobia is less severe in the presence of the owner, and it can appear to be separation-linked. Another possible differential diagnosis is attention-seeking behaviour – the animal may have learned that fearful behaviour results in the owner giving attention. Such behaviour would be absent in the absence of the owner. Videotaping the patient when the owner is not present during a storm will help to confirm or eliminate this diagnosis, as attention-seeking behaviour per definition only occurs in the presence of the owner.

Clinical approach

A complete physical examination focusing particularly on conditions causing pain should be performed. Concurrent behaviour conditions should be identified by obtaining a detailed history.

Treatment

The most important aspect of treatment is to start treatment early, when the animal starts showing signs of fear due to noises. The sooner fearful animals are treated, the less likely they are to progress to severe phobias. The mildest signs of anxiety during phobic events justify at least short-term medication. Noise phobias usually progress to severe levels if left untreated. Advising clients to withhold treatment until the condition deteriorates is not in the animal's best interest.

Treatment consists of environmental modification, medication (chemical manipulation) behavioural modification and physical modification.

Environmental modification

- **Avoid exposure:** If possible, keep the dog indoors in a dark room with many furnishings to absorb the sound. In the case of known events e.g. fireworks shows, consider taking the pet to another location for the duration of the event

- A **safe, soundproof den** or crate should be provided in a familiar, accessible place such as in a bedroom or on the patio in a sheltered spot, where the dog already tends to go voluntarily. The pet should have free access to it even when the owner is not at home. Get the dog used to it in a fun way when there are no scary sounds so that he will voluntarily enter the den when necessary. Put some soft furnishings like pillows or blankets inside the den as this helps to absorb sounds. A pile of blankets to crawl under, even without a den, will help to block out sounds. If indoors, windows and curtains or blinds should be closed to block out light and sound.

- **Pheromonatherapy:** The Adaptil range of products (Ceva) contains dog appeasing pheromone. The different formulations can be used individually or combined - a collar lasting one month, diffusers in the home (1 month effectivity) and a spray sprayed inside the den and/or on a scarf that is put around the dog's neck (unless it is wearing a collar already).

- **Classical music** has been showed to reduce anxiety in dogs and cats and can be played during the thunderstorm or other event.

Physical manipulation

- So-called "thunder shirts":
  - Some dogs benefit from a garment or bandage around the trunk e.g. form-fitting anti-static capes (Storm Defender) or anxiety wraps. In some cases just a relatively tight-fitting T-shirt may be helpful. For some dogs, wearing a garment is in itself scary and they freeze when it is put on them – freezing should not be mistaken for reduced anxiety. In controlled trials improvements were noted with these products but the effects were found to be insignificant.
- Ear muffs or ear plugs may be helpful to dull the sounds

Behavioural/psychological modification

- Counter-conditioning: Associate the noise with pleasant stimuli e.g. toys, games, physical interaction between the owner and the dog, music. In very severe cases the animals will be unable to respond to counter-conditioning.
- Systematic desensitisation: The dog is gradually exposed to low levels of the fear-eliciting sound, slowly becoming louder and louder. The recommended product to use is the Sounds Scary which is available at https://www.dogstrust.org.uk/help-advice/dog-behaviour-health/sound-therapy-for-pets. It is important that this product is used correctly by following the instructions carefully. This is a longer term approach as the desensitisation process should commence when

it is unlikely that any storms or noisy events will occur e.g. winter in Gauteng. Although this approach can be very helpful, some dogs appear to remain sensitive to storms even when they are desensitised to the noise itself, suggesting that there are other factors involved such as barometric pressure or static electricity.

- Provision of emotional support by the owner is appropriate as long as the owner remains neutral and doesn't make a big fuss – the dog needs to see that the owner is calm and coping.

- Any form of punishment is inappropriate. A phobic animal may resort to undesired behaviour such as aggression or destruction due to it being highly distressed. Punishment will simply increase the fear.

Chemical manipulation – medication

Medication consists of drugs that act immediately and can be used in the short term during fearful events, and drugs that have a longer (usually delayed) action and are used for a longer period. The two groups of drugs can be combined.

Medication with immediate effect

- **Nutraceuticals** may be helpful for mild anxiety
  - Calm-Eeze
    (L-tryptophan, L-theanine and B-complex vitamins)
  - Anxitane (L-theanine)
  - Nutricalm (L-tryptophan)

- **Benzodiazepines:**

The dose ranges with benzodiazepines are very wide and effective doses differ between patients. It is recommended that clients give several test doses to establish the ideal dose before the drug is used for its purpose by starting at a low dose and titrating upwards. Some individuals may require well above the recommended doses to achieve an effect. If the initial effect is inadequate, additional doses can be given repeatedly every 30-60 minutes to effect. In general benzodiazepines have a wide safety margin.

The anxiolytic effect usually precedes any effect on the motor system, i.e. scuffing of feet, loss of balance, drowsiness etc. generally occurs after anxiolysis is achieved. Increasing the dose beyond that is unlikely to result in a further decrease in anxiety. Ideally the patient should not show any signs other than a decrease in anxiety. The recommended doses are shown in Table 2.

<u>General information on benzodiazepines:</u>

- Contraindicated in hepatic conditions
- May cause paradoxical excitation or anxiety – this is why test dosing is so important (patients that react to one benzodiazepine may be able to tolerate another one – not likely)
- May cause disinhibition of aggression – i.e. animals that are not aggressive may manifest aggression that was inhibited due to anxiety – this simply unmasks another problem and should not be seen as a drug failure
- Do not allow cats treated with benzodiazepines access to outdoors due to limitation of depth perception
- Can be used ongoing for a few weeks, but may interfere with short-term memory. Patients may develop tolerance therefore long-term use is limited
- Alprazolam has a more rapid onset of action and less sedative effect than the other benzodiazepines
- Can be used concurrently with long-term anti-depressants on an as needed basis
- Can be used concurrenty with alpha-agonists (clonidine – see "Polypharmacy" below) – both as needed
- Caution in cats, especially if used long term (possible but not proven risk of hepatic necrosis, especially diazepam)

Medication for long term treatment
Anti-depressant therapy

Dogs with noise phobias are usually constantly anxious as they are anticipating the next fear-eliciting event. Anti-depressant treatment helps to address the underlying anxiety by normalising neurotransmitter levels in the brain, in particular serotonin. The drugs of choice are fluoxetine and sertraline (SSRIs - serotonin-specific re-uptake inhibitors) and clomipramine (TCA – tricyclic anti-depressant). They are particularly effective when there is a panic component to the phobia. Selegiline, a mono-amine oxidase inhibitor (MAOI) can be used in severe cases, especially where behavioural inhibition and social withdrawal are evident.

Side-effects are seen more commonly in the first week or two and relate mainly to gastro-intestinal signs (anorexia, diarrhoea, vomiting). The incidence of side-effects is reduced if a loading dose of half the recommended dose is given for the first 7-10 days (especially for sertraline). The full effect is only evident after 6-8 weeks, so decisions about effectivity can only be made after 8 weeks.

Doses are given in Table 2.

<u>General information on SSRIs</u>

- After the initial 6-8 week trial period, the medication should be continued for at least another 5 months or until the start of the next thunderstorm season when the dose is gradually reduced to see if the

Table 2: Benzodiazepine doses for treatment of noise phobia

Active ingredient	Trade name	Dose in dogs	Dose in cats	Notes
Diazepam	Valium	0,5-2 mg/kg every 4-6 h	0,2-0,4 mg/kg every 12-24 h	
Alprazolam	Xanor, Alzam, Azor etc	0,01-0,1 mg/kg every 8-12 h	0,01-0,1 mg/kg every 12 h*	Considered preferable for cats
Oxazepam	Purata	0,2-1,0-2,5 mg/kg every 12-24 h*	0,2-0,5-2,0 mg/kg every 12-24 h*	5-10 mg/kg according to Crowell-Davies (2006)
Clorazepate	Tranxene	0,5-2,0-4,0 mg/kg every 8-12 h	0,2-2,0 mg/kg every 12 h*	

Table 3: SSRI, TCA and MAOI doses for treatment of noise phobia

Active ingredient	Trade name	Dose in dogs	Dose in cats
Fluoxetine	Prozac (20mg) Generics; Lorien, Prohexal	0,5-1,0-2,0 mg/kg every 24 h	0,5-1,0-1,5 mg/kg every 24 h
Sertraline	Zoloft (50mg) Generics: Serdep, Serlife	2 mg/kg every 12-24h	Not reported
Selegiline	Parkilyne (5mg)	0,5-1,0-2,0 mg/kg every 24 h	0,25-0,5-1,0 mg/kg every 24 h

**Please note that some dosages have been amended from previous recommendations*
- Trazodone (see "polypharmacy" below) may be useful as a short-term medication at higher doses

animal can cope without the medication.

- Never suddenly discontinue an SSRI or TCA – gradually wean the patient over several weeks (one week per month on the drug i.e. 6 weeks if the dog was on it for 6 months). Should the signs re-appear on a lower dose, go back to the previous effective dose. Some animals require lifelong treatment.
- If it is decided to change to another SSRI or TCA, the change can be made immediately without a weaning or washout period.
- When replacing an SSRI or TCA with an MAOI, a washout period of at least 2 weeks is recommended.
- SSRIs and TCAs can be used in conjunction with benzodiazepines.
- SSRIS or TCAs should never be given concurrently with MAOIs .
- Behavioural disinhibition may occur – careful monitoring is required. Note that this applies to non-aggressive animals whose aggression may be unmasked when the anxiety is reduced (uncommon).

Polypharmacy – combining medications

SSRIs and TCAs can be used concurrently with other drugs including benzodiazepines. Benzodiazepines are used as follows in conjunction with anti-depressants:

- For the first 2-4 weeks on an anti-depressant when an immediate anxiolytic effect is required
- On an as needed basis during fear-eliciting events.

Other medicines that can be used with anti-depressants on an as needed or continuous basis are (doses are for dogs):

- Trazodone (Molipaxin) 3-5, up to 20 mg/kg every 12 hours (an atypical serotonin antagonist and reuptake inhibitor)
- Clonidine (Dixarit, Menograine) 0,02-0,1 mg/kg every 12 hours (alpha agonist)
- Gabapentin (Epleptin) 2-5, up to 20 mg/kg every 12 hours (GABA agonist)
- Amitryptaline (Trepiline) 0,5-1 mg/kg every 12 hours (TCA)

Trazodone and clonidine can be used in combination with an anti-depressant.

While many patients require lifelong treatment, there is evidence that the concurrent use of medication and other measures can lead to significant improvement and even complete resolution of the condition.

Most of the drugs recommended here are used extra-label in animals, therefore the client must be made aware of this. However, the use of these agents is well researched and published and it is therefore not experimental use.

Phenothiazines (ACP)

Acepromazine is contra-indicated for treatment of anxiety, fears and phobias. It is a dissociative agent having its effect through its dopamine-blocking action on the reticular activating system (RAS) in the brain:

The animal is aware of stimuli in the environment but cannot respond to them due to the effect on the RAS which would normally enable the animal to process environmental stimuli and take appropriate action. As a result, a noise phobic animal will become more fearful of noises while under the influence of ACP.

ACP is a popular drug for use in noise phobic patients for specific events (e.g. at New Year) because it immobilises the animal, making it less likely for the animal to hurt itself in its attempts to escape. It must be noted however that its repeated use will make the phobia worse and as a result, its repeated use is likely to lead to poor welfare. Practitioners are advised to recommend long-term anti-depressant treatment to cases with noise phobia where benzodiazepines are not effective as a short-term measure in preference to treating symptomatically during severe events only. These patients are likely showing signs of noise phobia throughout the year and not only during certain events when their fear is more noticeable (note that the majority of owners do not recognise the signs of fear). It is therefore justified to treat their noise phobia as a chronic condition.

Prognosis

Prognosis is not dependent on duration or severity of the condition, thus it is worthwhile treating long-standing and severe cases. The combination of systematic desensitisation and dog appeasing pheromone as well as the combination of clomipramine and systematic desensitisation have been found to be effective with a good prognosis.

Prevention

Gradual exposure of young puppies to a variety of sounds and positive conditioning (i.e. making pleasant associations with sounds) may be helpful in preventing the onset of noise phobia.

Conclusion

- Teach clients to recognise signs of fear
- Treat early to avoid progression of signs
- It is never too late to start treatment

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1. Which one of the following statements regarding noise phobia is correct?

i. It is the precursor to noise reactivity in animals.
ii. Is a function of the parasympathetic nervous system.
iii. It is a profound response to loud sounds such as thunder, fireworks and gunshots.
iv. It is characterized by intense excitement behaviours.
v. A phobic animal shows increased behavioural variation.

2. Which one of the following statements regarding the risk factors for noise phobia is most correct ?

i. Some animals are genetically predisposed to developing noise phobia.
ii. Less common in working dogs: herding breeds.
iii. Risk factors include age > 4 years.
iv. Exposure to loud noises in the first four months of age.
v. Dogs that stayed with the breeder had a lower risk of developing the condition.

3. Which one of the statements regarding differentials for noise phobia is incorrect?

i. Noise phobia can be confused with separation anxiety.
ii. Noise phobia less severe in the presence of the owner.
iii. Noise phobia can be confused with attention-seeking behaviour.
iv. Noise phobia often co-exists with other anxiety disorders.
v. Noise phobia can be confused with focal seizure activity.

4. Which one of the following statements regarding noise phobia in dogs is incorrect?

i. The most important aspect of treatment is to start treatment early.
ii. Dogs with noise phobias are usually constantly anxious as they are anticipating the next fear-eliciting event.
iii. Noise phobias usually progress to severe levels if left untreated.
iv. Prognosis is dependent on duration or severity of the condition.
v. Concurrent use of medication and other measures can lead to significant improvement and even complete resolution of the condition.

5. Which one of the following methods does is not a management method for noise phobic dogs.

i. Keep dogs indoors in a dark room with many furnishings to absorb the sound.
ii. Provide a safe, soundproof den or crate.
iii. Place soft furnishings like pillows or blankets inside the den to absorb sound.
iv. Play Jazz music to block out the sound.
v. Utilise the Adaptil range of products (Ceva) - contains dog appeasing pheromone.

6. Which one of the following interventions is contra-indicated in dogs with noise phobic behaviour?

i. Counter-conditioning by associating the noise with pleasant stimuli.
ii. Systematic desensitization.
iii. Punish the inappropriate behaviour.
iv. Form-fitting anti-static capes (Storm Defender) or anxiety wraps.
v. Provision of low key emotional support by the owner.

7. Which one of the medications listed below does not have an immediate effect for noise phobia?
i. Calm-Eeze
ii. Anxitane
iii. Nutricalm
iv. Selegiline
v. Benzodiazepines

8. Which one of the following statements regarding benzodiazepines is INCORRECT?

i. Dose ranges with benzodiazepines are very wide and effective doses differ between individuals.
ii. Several test doses may be required to establish the ideal dose before the drug is used for its purpose.
iii. If the initial effect is inadequate, additional doses can be given repeatedly every 30-60 minutes to effect.
iv. The anxiolytic effect usually precedes any effect on the motor system.
v. Increasing the dose beyond motor effects will cause cumulative anxiolytic effects.

9. Which one of the following statements regarding antidepressant therapy in dogs is incorrect?

i. Antidepressants are particularly effective when there is a panic component to the phobia.
ii. The drugs of choice are fluoxetine and sertraline and clomipramine.
iii. No washout period or weaning is required is changing out between SSRIs', TCAs' or MAOIs'.
iv. SSRIs and TCAs can be used in conjunction with benzodiazepines.
v. SSRIS or TCAs should never be given concurrently with MAOIs.

10. Which one of the following statements regarding antidepressant therapy in dogs is incorrect?

i. Dogs with noise phobias are usually constantly anxious as they are anticipating the next fear-eliciting event.
ii. Selegiline, a mono-amine oxidase inhibitor (MAOI) can be used in severe cases, especially where behavioural inhibition and social withdrawal are evident.
iii. GIT side-effects to antidepressants are seen intermittently throughout therapy.
iv. The full effect of antidepressants is only evident after 6-8 weeks.
v. Noise phobic animals will become more fearful of noises while under the influence of ACP.

The Lincoln Sound-sensitivity Scale

Please describe your dog's normal response to firework noises in the home in terms of the frequency (how often it occurs relative to the number of times your dog is scared) and intensity of each of the following behaviors

Behavior	Frequency	Intensity
1. Running around	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—occasional burst of acvtivity ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—continuously running around
2. Drooling saliva	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—damp around mouth ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—pools of saliva
3. Hiding (e.g., under furniture, behind owner, etc.)—please indicate where	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—retreats ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—will not be removed from hiding area
4. Destructiveness (e.g., furniture, doors, carpets, etc.)—please indicate which items tend to be damaged	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—small items, e.g., pens ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—e.g., holes in the wall
5. Cowering (e.g., tucks tail, flattens ears, etc.)	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—uneasy ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—petrified
6. Restlessness/pacing	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—fixed route continuously traced
7. Aggressive behavior (e.g., growling, snapping, or biting)	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—occasional growl ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—severe biting attempts made
8. 'Freezing to the spot'	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs sporadically—within an event ○ 2 ○ 3 ○ 4 ○ 5 Most of the time
9. Barking/whining/howling—please indicate which of these behaviors	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount
10. Panting	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs sporadically—within an event ○ 2 ○ 3 ○ 4 ○ 5 Most of the time

Behavior	Frequency	Intensity
11. Vomiting, defecating, urinating and/or diarrhea—please indicate which of these behaviors	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs sporadically—within an event ○ 2 ○ 3 ○ 4 ○ 5 Most of the time
12. Owner-seeking behavior	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Seeks out owner occasionally during the event ○ 2 ○ 3 ○ 4 ○ 5 Will not leave owner in any circumstance
13. Vigilance/scanning of the environment	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs sporadically—within an event ○ 2 ○ 3 ○ 4 ○ 5 Most of the time
14. Bolts	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs occasionally, in response to certain events ○ 2 ○ 3 ○ 4 ○ 5 Occurs always, in response to a wide range of sounds
15. Exaggerated response when startled	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs occasionally, in response to certain noises ○ 2 ○ 3 ○ 4 ○ 5 Occurs always, in response to a wide range of sounds
16. Shaking or trembling	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Occurs occasionally, in response to certain noises ○ 2 ○ 3 ○ 4 ○ 5 Occurs always, in response to certain noises
17. Self-harm	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount—e.g., licking feet ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount—e.g., broken teeth or nails
18. Others **Please detail:** _____ _____ _____	○ 0 Never ○ 1 Rarely ○ 2 Frequently ○ 3 Every time	○ 1 Small amount ○ 2 ○ 3 ○ 4 ○ 5 Extensive amount

19. Considering both the frequency of signs and their intensity and duration, how would you rate your dog's fear of fireworks on a scale of 1–10, where 0 = quite mild and 10 = could not be worse? ____

From Mills et al.[53]

This scale allows not only diagnosing and measuring the severity of the case but also can be used to evaluate the evolution of the patient over time in an objective way.

See key on www.vet360.vetlink.co.za

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The 5 Waves of Change

Threat or Opportunity

Alan Robinson BVSC MRCVS DMS, Director, Vet Dynamics UK Ltd

During this article, I would like to share with you my thoughts and concerns about the 5 major waves of change due to affect our profession.

Well, you might say, there's always been change – so what's new? Yes, waves of change of various intensity have come and gone – and we've survived. What is happening this time is unprecedented and on a scale NEVER seen before. The 5 waves I will be talking about are converging into the 'Perfect Storm' of change that is going to be either a profound threat to many, OR a profound opportunity for others. Which of these applies to you, will depend on whether you have a ring-fenced buffer, elevation, or a place of safety you can maintain above the coming changes. The 5 waves are not discrete. They will mix and merge as one giant tsunami of change. There are essentially 3 external mega-trends and 2 seismic internal trends.

Wave 1: The Economy – what is it going to do over the next 5 years?

We have seen the volatility of the Dot Com, Global Financial Meltdown and the current mega boom. Add to this the current Geo-political cycle of Brexit, Trump, ISIS, Syria, Egypt and the EU – something has to give. So what does this mean for you and your business?

Wave 2: The Society - this wave is closer to home as a significant inflection point in world demographics.

The moving out of the post-war Baby Boom generation; the largest, most influential, most consumptive generation ever – 'the pig moving through the python'. Transitioning into their legacy phase – what will that be? They are being replaced as clients and employees by Generation X - the 'lost' generation and the Millennials - the 'I don't want that' generation. What does this mean as a fundamental shift in world view and human needs? Personally, commercially and as communities?

Wave 3: The Infrastructure - is a duo of changes within our professional infrastructure.

They are Corporatisation and Commoditisation. No one really knows what these changes will mean however they will have an impact on:

- Employment
- Career paths
- The division of clinical and management roles
- Skill levels and polarisation
- Consumer choice

There is a feeling that this will suppress the intrinsic motivators of entrepreneurial spirit that have, up to now driven vets and vet businesses to build quality clinical care, client experience, financial success and team performance. Are we actually now driving business models that are swapping purpose for profit – and people for processes?

Wave 4: The Competition - with the above comes the

fear of perceived Competition.

Is this just corporates or are there other things to worry about? Is it the new practice, corporate or otherwise, the internet, lack of vets, regulation or bureaucracy that is going to be a competitive threat? There are three key principles to bear in mind:

1. Practices fail from the inside – out, NOT because of competition.
2. Most practices are too busy to:
    - Practice good medicine
    - Deliver excellent customer service
    - Increase and sustain profitability
3. Veterinary practices do not need more clients – they need better relationships with their existing clients to be profitable. The solution to this challenge lies in identity and positioning.

Wave 5: The Advancements in Technology:

- Artificial Intelligence
- Robotics
- Virtual reality
- Biological Nano-technology
- Communication
- Education
- And the actual value of information

Vets are no longer the purveyors of veterinary knowledge – all this is freely available – vets need to become the curators of information. To remain significant and relevant as a profession, we need to let go of the certainty and authority of 'the white coat' and instead become curators of wisdom within our community. The questions are: How difficult will this be? How is it possible? And can it be learnt?

Perhaps the more fundamental question is, 'Why should I care?'

Whether you are starting-up, wanting to stay in the game or wanting to exit with a legacy, these changes will affect you, and you have a choice to make.
The question I want to ask is: 'Do you, your business and your team have the personal resilience, the professional business skills and the purposefulness to withstand the changes to come?

Recruitment, Retention and Resilience: A Question of Identity

The veterinary industry is transforming in terms of corporatisation, competition, commoditisation, client compliance and public perception.

These changes are accompanied by concerns about vets' mental well-being, new graduate support and preparedness and attrition from the profession.

Much of this comes from the fact most vets work far too hard for far too long for far too little return due to inefficiency, frustration and poor profitability in their businesses. They labour under the induced fear, guilt and obligation of the false public and professional myth of expected altruism, social contract and non-commercialism that is at the heart of the Pet vs. Profit Paradox.

These issues raise questions about how veterinary professionals are aligning 'who they are' with this new world and raises questions of self and professional identity.

Veterinary professional identity is (in contrast to other career identities) is stable over a very long time (from adolescence), global in that it affects all domains of life (not just work) and highly internalised through very strongly held set of sub-conscious values and beliefs

Their are three main identity themes in veterinary professional identity:

Self as Technically Competent

"Doing the thing RIGHT" is linked to Mastery. This is the most important element of veterinary professionalism among students and academics. This is central to professional identity from an early stage. An inflexible thinking style means this can cascade into perfectionism and micro-management

Self as Dedicated and Resilient

"Doing all-RIGHT" is linked to Autonomy. This is the ability to cope with hard work and stress, being resilient under pressure and perceived by others as dedicated to their work. Inflexibility in this area can lead to fear of failure and heightened sensitivity to criticism and mistakes.

Self as Ethical and Moral

"Doing the RIGHT thing" is linked to Purpose. Vets have to reconcile their own values with the expectations that are placed upon them and to be seen by others to behave in a moral and ethical manner. Inflexibility can lead poor decision making and unreasonable behaviour (because they are right!).

We need to ask: Do we really have a recipe for successful professionals?

- Early fixed mind-set that could lead to an inability to cope with change
- Extreme regard for technical expertise that could lead to perfectionism and inflexibility in all areas of life
- A high need for autonomy and perceived resilience that could lead to control freakishness and micro-management
- Poor ethical and moral reasoning skills that could lead to poor decisions because of conflicting ethical reasoning.

There is no doubt that these norms associated with veterinary professional identity can cause stress, anxiety and undermine wellbeing and self-esteem.

These issues have three very important implications

1 Fixed Identity and a Changed Reality.

Unfortunately from day one of being in practice vets are faced with the stark reality of dealing with clients and patients in a commercial world – things go wrong - exposing then suddenly to a catalogue of real and perceived threats to technical competence, dedication, resilience and ethical and moral challenges such as:

- Complaints & mistakes
- Anaesthetic deaths/treatment failure
- Rejection/questioning of treatment options
- Rejection/questioning of competence
- Clinical perfectionism vs. pragmatism
- Appraisals and feedback
- Disciplinary proceedings
- Job dissatisfaction or loss
- Illness & stress
- Accountability & targets
- Euthanasia
- Commercial accountability

Research shows that technical competence threats in particular, can have catastrophic psychological effects for individuals who have invested heavily in their identity as prof essionals. (Mellanby and Herrtage's 2004) Other studies have shown that other professionals (doctors) who had experienced a current or recent complaint were at increased risk of moderate/severe depression, anxiety and suicidal ideation. (Bourne and others 2015)

2. "Who am I" and "What do I do" Mismatch.

These three identity themes are completely at odds with the widely held 'Veterinary Myth' held by the public, vet students and academics and espoused by the profession at all levels. The Myth says that vets act out of Altruism - that veterinary professionals should put the interests and welfare of others before their own; and Social Justice - the veterinary profession should, in the interest of fairness, provide equal opportunities of care to all clients. Nearly all veterinary students start their training with these beliefs intact and they are reinforced by their academic training. However they struggle to survive in the commercial real-life world of veterinary practice but the need to conform to the myth is still there.

As a result vets are robbed of their primary purposeful belief in who they are and what they do. Student vets enter the profession with a distorted view of the professions expectations, an incompatible professional identity and a fixed mindset. This can psychologically damaging and undermine resilience.

3. Veterinary career choices.

Because self-identification with the veterinary profession is far stronger than identification with either a particular organisation or their own values and beliefs, they seek organisations where their identity is a good fit and makes it less likely that veterinary professionals will adopt organisational rules, participate in activities or promotions or act 'as the organisation' they don't believe in.

With the increasing corporatisation of the veterinary profession, and trends towards employment rather than self-employment, individuals will increasingly need to work within organisational values.

Can Commercialism help? The same research suggests that 'Commercialism' is of least importance to vet students in terms of desirable character traits and of low importance to their academic tutors. Veterinary professionals equate being a commercial organisation with being unethical. However the reality of veterinary practices puts commercialism centre stage as a pragmatic necessity of business. This is why the fundamental pets versus profit paradox issue is so hard – it is an ethical problem of identity.

Practices and the profession have a significant challenge to manage the pets versus profit paradox. The veterinary profession has at its core a moral and purpose vacuum and a battle raging as Commercialism tries to replace Altruism & Social Justice as our sense of purposeful identity at the very beginning of our careers.

However Commercialism can be a pathway back to Purpose.

We need to find a way to be commercially successful that is ethically acceptable to the profession.

One way to address this is to redefine and expand the definition of commercialism to include balancing 4 conflicting outcomes of:

- clinical care,
- financial viability,
- client experience

- team harmony.

Once the practice is commercially viable you can get back to the Purpose.

Stories of congruence lack the discomfort of the stories of tension and give the feeling of an enriched position. Independent veterinary practices have an opportunity to generate competitive advantage through their people by working towards organisational and individual identity congruence. If veterinary professionals can achieve validation and enrichment at work, this in turn leads to employee retention and attraction

Suggestions

- Have the 'Commercial' discussion at recruitment
- Make 'Financial viability & sustainability' one of the practice and personal KPIs along with Clinical, Client and Team KPIs
- Give practice financial information feedback on a regular basis
- Be aware of 'Fixed Mindsets' – yours and others
- Get comfortable with commercial reality
- Play with your identity 'act as if...'
- Get other staff to understand
  - Why profit is important
  - How profit is generated
  - What you can do with profit to improve patient care, client experience and team harmony
- Lead by example
- Reward on congruence – not turnover

Recommended Resources:
1. Mindset - Carol Dweck
2. Drive – Daniel Pink
3. Mans Search for Meaning – Victor Frankl

Research:
1. S. Page-Jones, G. Abbey, Career identity in the veterinary profession, Veterinary Record, April 25, 2015
2. C. Roder, K. Whittlestone, S. A. May December 8, 2012, Views of professionalism: a veterinary institutional perspective

The Use of Imepitoin (Pexion™) on Fear and Anxiety Related Problems in Dogs – a Case Series

Kevin J. McPeake, Daniel S. Mills,
BMC Veterinary Research 2017 13:173, https://doi.org/10.1186/s12917-017-1098-0

Summarised from the abstract by Dr L L van der Merwe

Why they did it.

Fear and anxiety based problems are common in dogs. Besides behaviour modification programmes, a range of medications may be utilised to treat these problems. Few of these are however licensed for use in dogs and the onset of action of the antidepressants is delayed for up to 6 weeks. Imeptoin (Pexion™) is a low affinity partial benzodiazepine receptor agonist licensed for treating canine epilepsy and has a fast onset of action in dogs and has shown anxiolytic properties in rodent models.

What they did

In a case series the use of imepitoin in a group of dogs identified as having fear/anxiety based problems is reported on. Twenty dogs were enrolled into the study. They underwent a behaviour consultation and routine laboratory evaluation. Nineteen dogs proceeded to be treated with imepitoin orally twice daily (starting dose approximately 10 mg/kg, with alterations as required to a maximum 30 mg/kg) alongside a patient-specific behaviour modification plan for a period of 11–19 weeks. Progress was monitored via owner report through daily diary entries and telephone follow-up every two weeks.

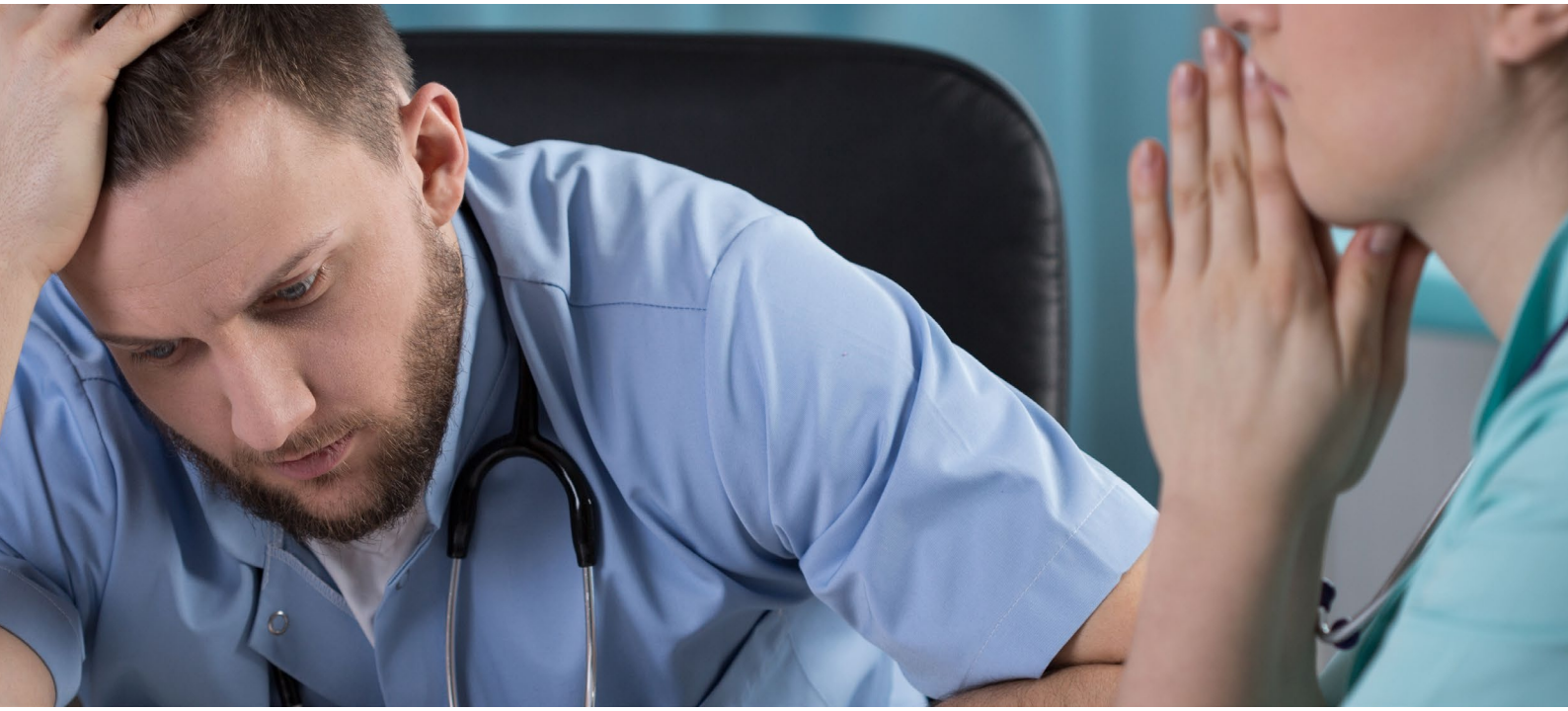
What they found

Seventeen dogs completed the trial. Treatment with imepitoin alongside a behaviour modification programme resulted in owner reported improvement with reduced AWG (average weekly global scores) and reduced AWR (average weekly reactivity scores) for anxiety across a range of social and non-social trigger events/contexts including noise sensitivities. Significant improvement was apparent within the first week of treatment and even further improvement was seen at the 11 week review point. 76.5% of owners opted to continue imepitoin at their own expense after completion of the study.

Conclusions

This study provides initial evidence indicating the potential value of imepitoin (Pexion™) alongside appropriate behaviour modification for the rapid alleviation of signs of fear and anxiety in dogs. Further research with a larger subject population and a placebo control would be useful to confirm the apparent efficacy reported here.

Medical mistakes: "Just don't make them" isn't a sustainable strategy



By Meghann Berglund, DVM

One mistake can make you put so many obstacles in your path to avoid doing so again that you can't move forward—or worse, decide it's best to leave the veterinary profession altogether. As one veterinary professional to another, let's band together to stop this from happening!

How to screw up and kill your patient, method #4 372.

These sarcastically cheery words from my classmate, scribbled in the margin of our notes, summed up the majority of my education on medical errors in veterinary school.

I spent four years learning all the things I shouldn't do if I wanted my patients to live—don't mess up the decimal, don't write abbreviations, don't mix up Drug A with Drug B.

I learned all about how to give bad news: "I'm afraid I have bad news that will be difficult for you to hear, Mrs. Smith."

I never learned how to say, "Mrs. Smith, something horrible happened, and it was my fault."

I thought if I took careful notes on all the ways that I could screw up, I would be protected from doing it. If I buried my clients in waivers and disclaimers, I could make them sign away my anxiety. If I monitored my technicians diligently and thoroughly, they would never make mistakes—and they certainly wouldn't complain to my superiors about my micromanaging personality and lack of faith in their abilities. (Spoiler alert: They totally did.)

I read the cautionary tales of negligence, oversight and shame sent to me monthly by my liability insurance company and said to myself, "That won't be me. That can't be me." I put mental placeholders between me and the infamous «Dr. A.» I would have double-checked the dosage. I would have recommended referral. I would have used an E-collar.

I realize now this roundabout form of victim-shaming was only a subconscious way to try to protect my mind from the truth: One day this was going to happen to me.

Medical errors are exceedingly common, both in human and veterinary hospitals. Yet even though everyone makes mistakes, almost no one is talking about them. Not to each other, not to the public, sometimes not even to our closest friends or loved ones. Why? Shame.

Defined by my personal hero Brené Brown as a fear of disconnection and unworthiness of belonging, the avoidance of shame is at the heart of every perfectionist. Be perfect, and everyone will love you. Slip up, and you will be exiled. And so, when we do inevitably make a mistake, we suffer in silence. We fear that we are alone in our failure and that there is something critically wrong with us.

We do what we have to in order to get through the moment. Then maybe we go home and cry or fall into a bottle of wine or a Netflix binge to numb the doubtful thoughts that whisper, We shouldn't be trusted with anything that anyone loves for the rest of our lives.

Maybe we wake up the next morning and think about not going to work, that day or ever again. Maybe we go to work, but we have such high anxiety and fear that we can't function. Maybe we leave the field. . Maybe we take our lives.

This happens too much, and for the health of our profession and everyone in it, it has to change.

It's well-documented that both patients and caregivers experience trauma, stress and grief related to medical errors. Administrative processes and protocols often focus on assigning (or denying) blame and punishing or removing those involved. There are rarely procedures put in place to address the systemic flaws that lead to errors or to help those who have committed the mistake, commonly referred to as "second victims."

In fields where only the most exceptional get through the academic and professional rigours required to succeed, it only seems natural that the field becomes self-selecting for perfectionists. And sometimes a perfectionist runs up against the cold, hard truth that sometimes bad things will happen no matter what you do. Even more difficult? Sometimes bad things will happen because of what you do—that jarring reality is nearly unbearable. We are told from an early age that we must be good, not just *do* good. And so, when errors occur, our self-talk is not "I did something bad," but rather "I *am* bad."

A 2009 study describes the healthcare provider as a "second victim" after adverse patient events.[1] The study also shows that there are three themes that emerged in providers' long-term recovery from a medical error:

Thriving. We are able to put the event into context and realise that we are imperfect — but still good — doctors. We build our personal resiliency. We work to learn from the mistake and make our workplace safer.

Surviving. We "move on" in a literal sense, but only because we feel we have no choice. We repress our feelings and discussion about the event. At best, we can function with no visible adverse effects, but no added wisdom. At worst, we continue to be traumatised by the memory of the event. We overcompensate, double- and triple-check, micromanage our staff, and harbor a deep distrust in ourselves.

Dropping out. We can't live with the memory of our mistake or the fear and certainty that we will make another one. We feel paranoid, depressed and hopeless. Feeling unredeemable and untrustworthy, we may even contemplate self-harm. Dropping out may involve ceasing the performance of a certain procedure, changing fields or leaving the profession altogether.

So what helps? How do we process mistakes in a way that allows us to walk the path of long-term resilience instead of repeated trauma? To this, I'll add my personal thoughts, with the disclaimer that my only credentials are that I am a flawed, human veterinarian who walked away from a good job that I was really good at because I was too afraid to make another mistake.

- Remember that your merit is not binary. One mistake in a career of lives saved and bettered does not make you a bad doctor.
- Understand resiliency is an action, not an attribute. You are not "born brave." Small, everyday acts of courage build your strength, one molecule at a time.
- Create a personal narrative that embraces a growth-based mindset. You are a work in progress—always. So is everyone else.
- Don't strive for perfection. Understand that letting go of the need to be perfect does not equate to lowering your standards.
- Create good habits for positive self-talk. Surround yourself with people who will hold you to it.
- Break up with superstition. It perpetuates the idea that your actions can prevent bad things from happening to you, and if bad things do happen, you've done something wrong.
- Explore your "bone pile." Take a look at those cases and mistakes that haunt you—but don't live in it. Understand the events are in the past, but what you can learn from them can stretch far into the future.
- Remember that every fail safe was born out of failure. From calculators to childproof lids to traffic lights—these things exist because someone lived out their worst nightmare and decided to make the world a safer place because of it.
- When it comes to processing our own failures, understand that it's not just about learning to move on, but about learning that we are fallible, that effort, merit, failure and worthiness can all exist simultaneously in the same beautifully flawed, complex human being.

One thing I tell my daughters when they experience fear and anxiety about the unknown is to find someone who looks more scared than you. Help that person feel at ease. Help them feel less alone. More than likely, the things you tell them are what you need to hear yourself.

As someone who has marinated in my perfectionism until my toes got wrinkly, this tactic has helped me have a healthier outlook on mistakes. I share my bone pile with my colleagues. I tell them about the things that scare me. I tell them about the near misses. I tell them about the patients that still twist up my insides at 3 in the morning.

The best part? Instead of responding with silence, judgment or shame, more often than not I find they reach back out to me and open themselves up in return. Even more amazingly, they will often then share their own suggestions for getting through those cases, or talking to those clients, or moving on from those heartaches. And in that moment, the world feels a little smaller, a little safer and a little kinder. It's the kind of world that a profession full of perfectionists and self-critics deserve to spend a little more time in.

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Scrotal *versus* Prescrotal Castration in Dogs

By Kimberly Woodruff, DVM, MS, Philip A. Bushby, DVM, DACVS, Karla Rigdon-Brestle, DVM, Robert Wills, DVM, PhD, DACVPM, Carla Huston, DVM, MS, DACVPM

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For many years, the prescrotal technique has been taught as the only acceptable method of canine castration.° However, scrotal castration has gained popularity in recent years as a safe alternative to the prescrotal technique. First described in 1974,[2] this technique may offer the advantage of reducing surgical time while not increasing complication rates over the traditional prescrotal approach.

The scrotal technique has been described as an accepted method for paediatric canine castrations.[1] It is becoming widely accepted for adult canine castrations by veterinary surgeons in high-volume spay-neuter clinics, which often have limited resources and many animals to sterilise.[3] Procedures that reduce anaesthetic time and expedite the surgical procedure by even a few minutes can be of tremendous benefit to these programs.

Although numerous clinics perform the scrotal technique, to our knowledge, there is no published research documenting its complication rate or comparing complications between the scrotal and prescrotal techniques. Our study was conducted to compare complication rates and surgical efficiency between the two castration techniques in male dogs more than 6 months old. We wanted to evaluate the hypothesis that there are no differences in complication rates between the two techniques.

COMPLICATIONS

Orchiectomy, like all surgeries, carries risks of complication. While there is a perception that scrotal castration in adult dogs is more prone to complications than prescrotal castration is, limited data are available comparing complication rates of scrotal and prescrotal canine castrations. Data are difficult to obtain because complications and degree of detail of records vary by practitioner.[4,5] Additionally, some minor complications occur at home and may go unnoticed or unreported by owners. Complication rates after prescrotal castrations have been reported to range from 0% to 32%, with the incidence of complications often considered to be lower in younger patients.[4,6]

Complications of both prescrotal and scrotal techniques include dehiscence, scrotal swelling, haemorrhage, subcutaneous bruising, scrotal haematoma and self-trauma to the surgical site. Dogs with minor complications may need no intervention, while others may require veterinary care. In one study of 218 animals, seven dogs and two cats developed scrotal haematoma after castration.[3,7] Dogs with severe scrotal haematoma may experience necrosis of the scrotal skin, necessitating a scrotal ablation.[7]

In the past, scrotal castrations have been discouraged because male dogs are considered to be scrotal conscious.[8] The accepted thought has been that disturbing the scrotal skin will cause excessive self-mutilation by the patient, most likely because of irritation caused by skin sutures.[3] For this reason, several studies have discouraged clipping or prepping the scrotum at all and have recommended draping the scrotum out of the surgical field.[8] The potential for self-mutilation has been given as the reason to avoid performing scrotal castrations, despite the fact that there is no reported scientific evidence supporting this conclusion.[3]

Recently, advances have been made in surgical and diagnostic procedures, especially in human medicine, toward less invasive techniques. These advances have led to reduced morbidity and wound contamination as well as less pain and shorter patient recovery periods.[9] While this practice is developing at a slower rate in veterinary medicine, there are ongoing efforts to make common procedures less invasive. The scrotal technique, although not well-documented, is considered by many veterinarians working at high-quality high-volume spay-and-neuter clinics to be quicker and less invasive than the traditional prescrotal approach.[3]

METHODOLOGY

Dogs for this study were selected from five shelters serviced by the Mississippi State University (MSU) mobile surgical unit and from all dogs presented for castration to Humane Alliance (HA) in Asheville, North Carolina. All dogs were healthy males more than 6 months old. Dogs with signs of disease or cryptorchidism were excluded from the study. The dogs were randomly allocated by a coin toss into two treatment groups, scrotal castration and prescrotal castration. Both groups of dogs were tattooed after surgery to identify the procedure performed.

Time efficiency was recorded for the procedures done by the MSU surgeons. Efficiency was measured in minutes of surgical time, starting when the surgeon made the incision and concluding after the last suture was placed. The duration of each surgery was recorded by a veterinary assistant present in the surgery suite. No data on the duration of surgery were recorded at HA.

Surgical preparation

Dogs were anaesthetised with butorphanol (0.35 mg/kg), ketamine (3.5 mg/kg), and dexmedetomidine (17.5 µg/kg) given as an intravenous mixture. Before surgery, each dog was given a subcutaneous injection of carprofen (4.4 mg/kg) for pain control.

For both procedures, the surgical area, including the scrotum and prescrotal area, was clipped and prepared with chlorhexidine scrub, and the surgical area was covered with a clean, chlorhexidine-soaked surgical sponge. The dog was then moved to the surgical suite and placed in dorsal recumbency. The clean surgical sponge was removed, and the surgical site was aseptically draped. There were no differences in surgical prep between the two techniques (Figures 1A & 1B).

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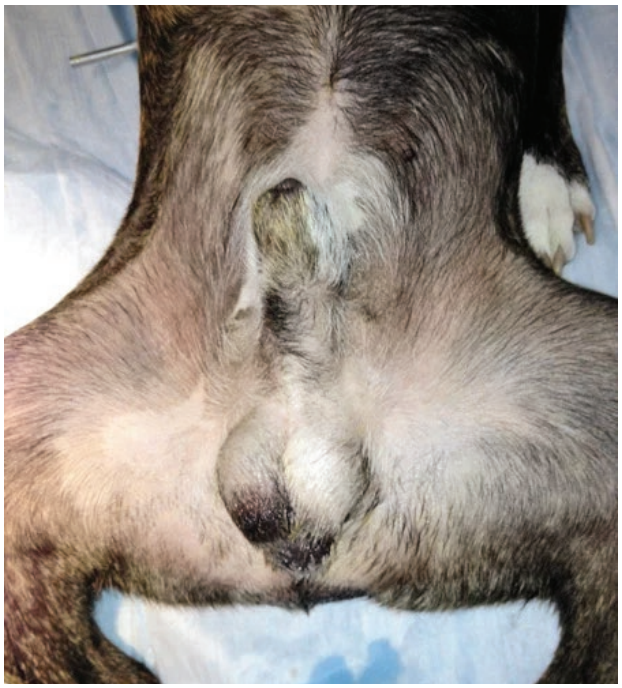
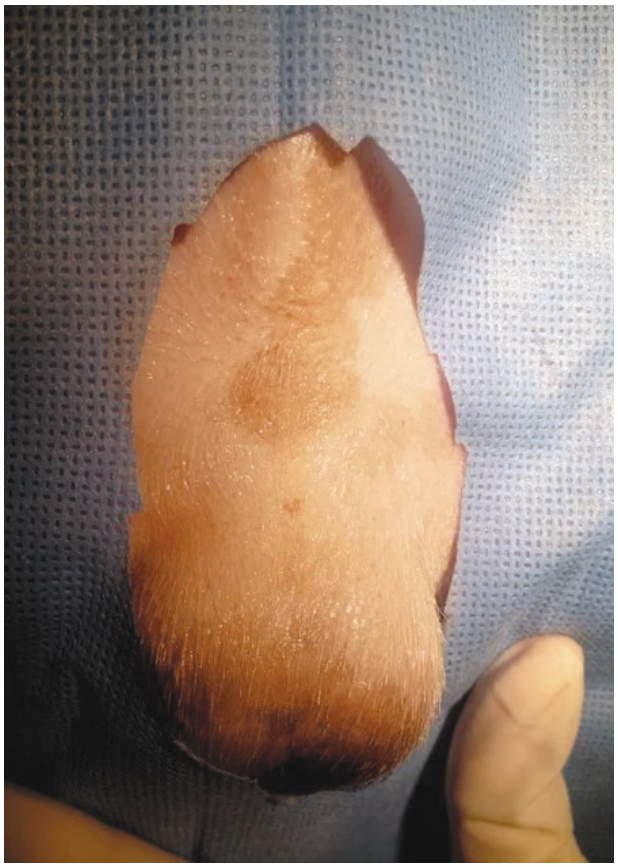


1A. A dog aseptically prepared for scrotal castration. There were no differences in surgical preparation between the two techniques.



1B. A dog prepped for prescrotal castration.

Prescrotal incision technique

For those dogs undergoing the prescrotal incision technique, a No. 15 scalpel blade on a No. 2 Bard-Parker handle was used to incise the prescrotal skin. The incision was made just cranial to the scrotum and continued cranially 2 to 5 cm, depending on the dog's size, until the incision was of sufficient length to allow the testicles to be exteriorised (Figure 2). The parietal tunic was left intact.

Fig 2. The prescrotal incision was made just cranial to the scrotum and continued cranially 2 to 5 cm, depending on the dog's size, until the incision was of sufficient length to allow the testicles to be exteriorized.

The first testicle was delivered through the prescrotal incision; fascia was stripped from the spermatic cord to allow the testicle and spermatic cord to be fully exteriorized for a closed castration technique. Two curved Kelly haemostats were used to crush the tissues of the spermatic cord proximal to the testicle. The spermatic cord was transected distal to the second haemostat with a No. 15 scalpel blade. The most proximal haemostat was removed, and ligature of 2-0 polyglactin 910 (Vicryl—Ethicon) suture was secured with a Miller's knot in the area previously crushed by the haemostat.

The remaining haemostat was subsequently removed, and the remainder of the spermatic cord was placed back into the incision after checking for haemorrhage. The procedure was repeated for the second testicle. The incision was closed with 2-0 polyglactin 910 suture in an interrupted intradermal pattern (Figure 3)

Fig 3. The prescrotal incision was closed with 2-0 polyglactin 910 suture in an interrupted intradermal pattern.

Scrotal technique

For the scrotal technique, a No. 15 scalpel blade on a No. 2 Bard-Parker handle was used to make a

Fig 4. For the scrotal technique, the first testicle was delivered through a scrotal incision near the median raphe.

2- to 5-cm incision in the scrotum (Figure 4). The first testicle was delivered through a scrotal incision near the median raphe, and a closed castration was performed as described for the prescrotal technique. The procedure was repeated for the second testicle using the same incision. A single subcutaneous suture was placed in the scrotal incision by using 2-0 polyglactin 910 suture (Figure 5).

Fig 5. A single subcutaneous suture was placed in the scrotal incision by using 2-0 polyglactin 910 suture. Both groups of dogs were tattooed to identify the procedure performed.

Postoperative monitoring

The dogs were placed in a cage or run and monitored during recovery. Dogs were ultimately returned to the shelter environment within two hours. Privately owned dogs were returned to their owners about 24 hours after surgery.

Dogs treated at MSU were monitored by shelter employees, while dogs treated at HA were monitored by individual owners. Whenever possible, the same individual assessed multiple dogs. All observers were given verbal and written instructions concerning proper observation and documentation of complications on a provided questionnaire (see Castration postoperative assessment form). Complications were defined as the presence and absence of haemorrhage (blood from the incision site), pain (vocalization on palpation of the incision site), self-trauma (licking, chewing or scratching at the incision), and swelling of the incision site or scrotum. Swelling was evaluated two, four, six, 24, 48 and 72 hours after surgery.

Results

Four hundred thirty-seven dogs met the inclusion criteria for this study. The average weight of the dogs included was 17 kg and ranged from 3 to 60 kg. The prescrotal approach was performed on 206 dogs, and 231 were castrated by using the scrotal approach. Surgeries were performed by nine licensed veterinarians. All veterinarians were proficient in high-quality high-volume spay-neuter techniques and had a minimum of four years of experience. No complications were noted during the surgical procedures.

For statistical purposes, the frequencies of complications were categorised by method and location (Table 1). The mean weights for dogs with or without complications are also presented in Table 1. The results of the multivariable logistic regression analysis are listed in Table 2. (See Data assessment.)

It is interesting to note that 54 dogs (prescrotal = 34; scrotal = 20) were recorded as inflicting self-trauma through biting, licking or chewing their incisions (Table 1). The odds of self-trauma were 1.96 times greater ($P = 0.04$) in dogs undergoing the prescrotal method than in those castrated by the scrotal method when adjusted for state and weight (Table 2).

The odds of haemorrhage (26.45), pain (8.11) or self-trauma (14.66) were significantly greater ($P < 0.01$), when adjusted for method and weight, in dogs castrated at MSU than in those castrated at HA. The odds of haemorrhage, when adjusted for method and state, were 1.04 times greater ($P = 0.02$) for each 1-kg increase in weight of the dog.

The odds of swelling from two to six hours after surgery were significantly greater ($P < 0.01$), when adjusted for method and weight, in dogs castrated at MSU; however, the odds of swelling from 24 to 72 hours were significantly less ($P \leq 0.04$) in dogs castrated at MSU.

Overall, dogs with prescrotal incisions had significantly higher incidence of self-trauma. These data are noteworthy considering the perception of scrotal consciousness in dogs and do not support the concern that a scrotal approach may increase the incidence of self-trauma.[8] Larger dogs had greater odds for haemorrhage, but that was found to be independent of method.

The length of surgery was recorded for cases at MSU. A significant difference ($P < 0.01$) was recorded between the two procedures, with the average surgical time for the scrotal approach being 5.1 minutes and

Table 1
Frequency of complications

	Method		Location		Mean weight	
Complication	**Prescrotal # (%)**	**Scrotal # (%)**	**MSU # (%)**	**HA # (%)**	**Present lb (#)**	**Absent lb (#)**
Hemorrhage	35 (15%)	34 (17%)	63(38%)	7 (3%)	40.8 (70)	36.4 (360)
Pain	30 (13%)	23 (11%)	41 (25%)	11 (4%)	40.8 (52)	36.6 (378)
Self-trauma	34 (15%)	20 (10%)	46 (28%)	7 (3%)	38.1 (53)	36.8 (377)
Swelling 2 hours after surgery	33 (14%)	28 (14%)	53 (32%)	7 (3%)	39.5 (60)	36.6 (370)
Swelling 4 hours after surgery	32 (14%)	23 (11%)	46 (28%)	8 (3%)	39.7 (54)	36.6 (376)
Swelling 6 hours after surgery	31 (13%)	26 (13%)	42 (26%)	16 (6%)	41 (58)	36.4 (371)
Swelling 24 hours after surgery	49 (21%)	47 (23%)	35 (21%)	60 (22%)	41.7 (94)	35.5 (335)
Swelling 48 hours after surgery	50 (22%)	41 (20%)	25 (15%)	65 (24%)	43.4 (89)	35.3 (339)
Swelling 72 hours after surgery	40 (17%)	31 (15%)	16 (10%)	54 (20%)	48.5 (70)	34.4 (357)
Total cases	231	206	164	273		

= number of complications recorded
% = percentage of dogs with complications recorded
lb = pound

the average surgical time for the scrotal approach being 3.6 minutes, which is about a 30% reduction in surgical time (Table 3). The difference in surgical time by surgical approach was consistent between the two MSU surgeons.

DISCUSSION

Canine castration is one of the most common procedures performed in veterinary medicine, and the prescrotal surgical approach has traditionally been the most commonly taught method.[1,6] The emergence of high-quality high-volume spay-neuter organizations has increased the need for more efficient techniques.

Consideration should be given to other possible approaches that may be as effective, safe and efficient as the long-accepted prescrotal castration. To our knowledge, this study was the first designed to evaluate the differences in complication rate and time efficiency between scrotal and prescrotal canine castration.

In this study, the complication rates of the prescrotal and scrotal techniques were similar, but the scrotal approach was faster and had lowered incidence of self-trauma.

In future studies, efforts should be made to eliminate or further minimise interobserver variability. While swelling was tracked out to 72 hours after surgery, pain, self-trauma, and haemorrhage were recorded only in the 24 hours immediately following the patient's recovery from anaesthesia. It may be useful to follow the incidence of pain, self-trauma, haemorrhage, incisional discharge and infection rates out to at least seven days.

CONCLUSION

Scrotal castration was comparable with traditional prescrotal castration in terms of incidence of most postoperative complications. However, the scrotal method was associated with less self-trauma. Scrotal castration also offered an approximately 30% faster surgery time. Either surgical method may be safely and effectively performed in high-quality high-volume spay-neuter clinics.

Table 2

Multivariable logistic regression

Complication	Explanatory variable	Comparison or unit	Odds ratio	95% confidence interval	*P* value
Hemorrhage	Method	Scrotal vs. prescrotal	1.08	0.60, 1.96	0.79
	State	MSU vs. HA	26.45	11.41, 61.3	< 0.01
	Weight	Pound	1.04	1, 1.072	0.02
Pain	Method	Scrotal vs. prescrotal	0.65	0.35, 1.2	0.17
	State	MSU vs. HA	8.11	3.97, 16.55	< 0.01
	Weight	Pound	1.03	0.99, 1.06	0.07
Self-trauma	Method	Scrotal vs. prescrotal	0.51	0.27, 0.97	0.04
	State	MSU vs. HA	14.66	6.37, 33.72	< 0.01
	Weight	Pound	1.02	0.98, 1.05	0.3
Swelling 2 hours after surgery	Method	Scrotal vs. prescrotal	0.90	0.5, 1.66	0.75
	State	MSU vs. HA	18.65	8.13, 42.77	< 0.01
	Weight	Pound	1.03	0.99, 1.06	0.12
Swelling 4 hours after surgery	Method	Scrotal vs. prescrotal	0.73	0.39, 1.36	0.32
	State	MSU vs. HA	13.14	5.94, 29.06	< 0.01
	Weight	Pound	1.03	0.99, 1.06	0.12
Swelling 6 hours after surgery	Method	Scrotal vs. prescrotal	0.79	0.44, 1.41	0.43
	State	MSU vs. HA	5.62	3.00, 10.51	< 0.01
	Weight	Pound	1.03	0.99, 1.06	0.06
Swelling 24 hours after surgery	Method	Scrotal vs. prescrotal	0.85	0.53, 1.34	0.47
	State	MSU vs. HA	0.98	0.61, 1.57	0.93
	Weight	Pound	1.02	1, 1.05	0.03
Swelling 48 hours after surgery	Method	Scrotal vs. prescrotal	0.63	0.34, 1.01	0.06
	State	MSU vs. HA	0.58	0.34, 0.97	0.04
	Weight	Pound	1.03	1.01, 1.05	0.01
Swelling 72 hours after surgery	Method	Scrotal vs. prescrotal	0.59	0.34, 1.02	0.06
	State	MSU vs. HA	0.45	0.24, 0.83	0.01
	Weight	Pound	1.05	1.02, 1.08	< 0.01

Table 3

Average surgical time

Method	No. of cases	Mean (min.)	Standard deviation	Standard error	Confidence interval	*P* value
Prescrotal	84	5.1	1.26	0.138	4.86, 5.41	
Scrotal	80	3.6	1	0.1	3.38, 3.82	< 0.01

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Shaping the future of animal health

Food Trials

A Rule Out for Cutaneous Adverse Reactions To Food In Dogs And Cats

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Skin disease is a very common reason for dogs and cats being presented for veterinary care. Of all skin disease seen, pruritus is the single most common reason for presentation. Adverse food reactions account for 1-2% of all disease diagnosed, around 6% of all skin disease and around 18% of all pruritic skin disease. About 20% of all allergic skin disease and up to 29% of all dogs that fulfil Favorat's criteria for atopic dermatitis may have a food allergy.

There are several helpful references that have evaluated the role of food in pruritic skin disease that have critically appraised the published evidence in this area (1-6).

Where in the work up of a pruritic skin disease does a diet trial fit?

It is imperative that a thorough and ordered investigation be followed when investigating the role of food and pruritus.

1. This requires a complete history that explores such issues as:

- Is the pruritus seasonal (atopy is more likely to be seasonal);
- Has the owner been diligent with flea control on this and all other pets in the household (if fluralaner or similar class of product has been used, fleas and all the mite infestations can probably be ruled out);
- How responsive has the disease been to various previously used drugs (atopy is usually significantly more steroid responsive compared to a food allergy); What kind of response has been seen to the use of topical agents (such as steroids, antiseptic shampoos, systemic antibiotics or antifungals);
- Are any in-contact animals or humans affected (Sarcops and dermatophytosis are zoonoses)
- Has the owner ever tried a diet trial before, with what, for how long and with what response
- It is helpful to know what the dogs diet has been
- Are there any gastrointestinal signs? Food allergies may result in more frequent stools that are less formed)

2. A complete physical examination with a focus on the skin is essential

- How severe is the pruritus (Sarcops is the most severe, and food is usually more severe than atopy)
- It is crucial to intentionally evaluate the skin through the lens of Faverot's criteria (see table 1) as this will help to distinguish atopy and food from all other causes of pruritus
- How is the disease distributed on the body surface area? Atopy and food allergy cannot be distinguished this way but these two hypersensitivities can often be distinguished from other causes of pruritus.
- Are there any primary lesions (erythema and papules are the most common primary lesions seen with atopy and food allergy). Other primary lesions are suggestive of other diseases. Secondary lesions are usually the consequence of self-trauma (excoriation, traumatic alopecia, hyperpigmentation with lichenification and hyperkeratosis in very chronic cases).
- Has ear disease been a significant part of the disease. This is more common in food allergy and may be the only clinical sign of food allergy.

Having completed this portion of the evaluation it is essential make sure that you are convinced that ectoparasites (fleas, Sacops, Demodex, Otodectis, Cheyletiella) and dermatophytes are not involved. Remember, depending on where you practice, flea allergic dermatitis may be the single most common cause of pruritus in dogs and cats.

3. It is then important to conduct some simple diagnostic tests to further define the factors involved in the pruritus. These would include:

- An ear smear must be prepared in all pruritic cases to diagnose perpetuating causes of otitis (allergy is by far the most common primary cause).
- A sellotape strip cytology prep should be made of alopecia areas to evaluate the surface cyotology (for such things as Malassezia, cocci and exocytosed neutrophils)
- Alopecic disease should always be scraped for Demodex and a trichogram should be prepared to look for dermatophytes.
- In some cases, fine needle aspirates or impressions smears may be helpful with diagnosing neoplasia that may be pruritic (such as mastocytomas, histiocytomas or cutaneous lymphoma).

4. Having gone through the above steps, it is important to treat what has been diagnosed and gauge response following the old adage, "treat what you can see and see what you are left with".

Should appropriate treatment for diagnosed diseases result in resolution of the trigger (e.g. fleas or other ectoparasites, bacteria and Malassezia are no longer present), the next step would to investigate the role of a food antigen in the cause of the pruritus.

Atopy, although much more common as a cause of pruritus, can only be diagnosed by RULE OUT and hence can only be diagnosed once here has been a failure of the pruritic skin disease to respond to all the steps listed above.

Are there other ways of diagnosing an adverse reaction to food besides a diet trial?

No. Serum allergen specific IgE titres are inaccurate and should not be relied upon to identify offending proteins. Others tests that have been employed such as lymphocyte proliferation assays are technically difficult and only used in research environments.

What are the most common food allergens in dogs and cats?

Beef and dairy are the most common in both dogs and cats. In dogs this is followed by chicken and in cats by fish and chicken. Wheat and lamb are also

included in the list of likely allergens.

What would we feed in a food trial and why?

Hydrolysed protein diets are currently the best way to investigate the role of a dietary allergen in pruritic skin disease.

The quality of the hydrolysed diet is very important

The more completely hydrolysed the protein source, the better the quality of the trial will be. The quality of the diet is crucial as contamination of the prepared food during production has been shown to compromise the diet. It has also been shown in some cases that the label claim on the food bag does not always match the protein source of the diet in the bag. These factors must weigh on the clinician's choice of a diet – the higher the quality of the diet used, the more likely the outcome of a trial are to be trustworthy.

For how long do we feed the test diet?

80% of dogs with food allergies can be diagnosed with a 5 week trial. Six weeks are necessary to catch the same proportion of cats. By 8 weeks, around 90% of dogs and cats that are food allergic will show a response. For this reason we traditionally conduct trials for 8 weeks.

What advice do we give to owners about conducting a food trial?

Satisfying dermatology practice depends very heavily on excellent communication with the client. Frustration with helping owners with itchy pets can very often be attributed to poor communication, a hurried consultation with inadequate information provided to the owner to give them the opportunity to come on board for what is going to require great compliance over a long time and will invariable cost more than what they were bargaining. A poorly conducted food trial is a huge waste of money time and the owners energy.

Here is a suggested discussion framework to use when trying to help pet owners understand how a food trail should be done:

1. Redefine the owner's definition of 'success'. To them success invariable means, 'I fed this diet and the skin got better'. That is not my definition of a successful food trial. Success to us is, 'I fed this diet in such a way as to be sure that after the completion of the trial, the response I see in the skin (improved or not), is believable'. A well conducted trial provides results that can be trusted – not a particular result.
2. Always help owners decide if a food trial is even doable in their home environments. A dog that comes from a large farm with 10 other dogs that are all fed together may never allow a proper trial.
3. Help owners decide of they will feed all the dogs in the home the prescribed diet or will they feed the affected dog in isolation. Remember, even licking the empty food bowls of other dogs negates the food trial.
4. If there are cats in the environment, their food must be well out of reach of the dog on trial.
5. ALL treats must STOP. Here it important to explore what owners do to treat their dogs and they may not appreciate what you mean by 'treats' (biscuits, biltong or droëwors when watch the Saturday game on TV, a bit of fat from the Sunday afternoon braai, to small piece of cheese at bedtime etc)
6. All flavoured medication must be stopped for the trial duration. The only medications that should be allowed are those used to treat serious medical disease (such as drugs used for heart failure or seizure control).
7. Avoid starting a trial over Christmas or other times of the year when there is a lot of food around a family home. Avoid starting a trial that will span a holiday season for the owners. The pets owners must be the ones fully invested in the trial; you cannot expect a sitter to conduct this.
8. Dogs love small children because they leave a trail of half eaten hotdogs, popcorn and chips that they delight in vacuuming up. This destroys a trial. Kids parties are the worst!
9. Anyone who lives or works on the property (in a flatlet, house or garden help) must be fully informed and on board with what is happening.
10. Some dogs love to lick the dirty dishes in the open dishwasher. This is a no-no.
11. Care should be taken to prevent access to food thrown away in the bin or on a compost heap.

After this discussion, owners usually understand the seriousness of the trial and that a well conducted trial will almost always result in some level of domestic upheaval.

Because many of these pets are really pruritic when we start the diet trial, I will almost always provide some form of oral and/or topical treatment to make their lives more comfortable for the first 6 weeks of the diet trial. The last 2 weeks must be free of all drug use (except shampoo treatment) so that the effect of the diet alone can be unmasked and assessed. I will commonly use oral prednisone or prednisolone at a low dose to at least provide some relief. Oclacitinib (Apoquel®, Zoetis) can also be used very effectively for this purpose.

How do we judge response?

Assessing response to the diet trial on a daily basis is important. I use a 10-point scale with 0 being a normal dog and 10 being the score that would be given for the worst the owners have ever seen the skin. It is unimportant to me exactly what a 3 or a 7 may mean – what is more important to me is the trend of these scores over time. Owners will have a way of judging the seriousness of the skin disease in their own heads and trying to teach them to adapt this to a strict set of

generic and widely accepted criteria is not necessary.

What I am aiming to achieve in asking owners to score the skin is ensuring that the owners look and think daily about what is happening and score that response in a numerical way (albeit very subjective). It is important that the same person should do the scoring daily. Scores must be written down so that at the follow up consultation when the response to the diet trial will be assessed, the score sheet can be examined and discussed by veterinarian and owner.

What to do if the diet trial results in a significant improvement in the skin score?

To be sure that food really is playing an important role in the signs seen, provocative exposure to the old diet is required. That said, many owners are unwilling to do this. In these cases they may choose to stay on the hydrolysed diet or try to change to a sensitive skin diet formulation and monitor response.

Always remind owners that allergy is never cured and as such this pet is going to require lifelong assistance to keep the skin disease controlled (as control, not cure, is our objective). In addition to diet it is important to remember that these pets are more prone to relapsing secondary skin and ear infections.

For this reason long term use of a medicated shampoo is always indicated. In some instances topical ear canal rinsing (or even steroid application) 2 to 3 times a week is necessary. Should an animal that was previously well controlled suddenly deteriorate, the first place to look (as long as there wasn't dietary indiscretion) is a flare up of secondary infection (bacteria or Malassezia).

References of interest

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Table 1. Favorot's criteria. Dogs that fulfil these criteria are most likely to have either atopy or a cutaneous adverse reaction to food.

	Set 1		
	Criteria	**Use**	**Reliability**
1	Age of onset<3 years	Used for clinical studies If higher specifity required eg. drug trials, then 6 criteria should be met. If higher sensitivity is required, then 5 criteria should be met	If 5 criteria are met: Sens = 85.4% Spec = 79.1% If 6 criteria are met: Sens = 58.2% Spec = 88.5%
2	Mostly indoor		
3	Corticosteroid-response pruritus		
4	Chronic or recurrent yeast infections		
5	Affected front feet		
6	Affected ear pinnae		
7	Non-affected ear margins		
8	Non-affected dorso-lumbar area		

	Set 2		
	Criteria	**Use**	**Reliability**
1	Age of onset<3 years	Used to evaluate the probability of a diagnosis of Atopic Dermatitis (AD) 5 Criteria should be fulfilled. Do no use alone for diagnosis of AD, rule out similar diseases	If 5 criteria are met: Sens = 77.2% Spec = 83%
2	Mostly indoor		
3	Alesional pruritus at onset		
4	Affected front feet		
5	Affected ear pinnae		
6	Non-affected ear margins		
7	Non-affected dorso-lumbar area		

Pet Export

Tick the boxes and avoid these common pitfalls

Compiled by Dr. Anouska Rixon (BVSc) with special thanks to Dr Fabian Fiff, Dr Tin Htwe & Dr Vincent Henwood of the Milnerton Veterinary Export Control Office, Western Cape for their contributions.

Save yourself and client time, money and annoyance by following these basic guidelines

Rabies vaccinations

- Only rabies vaccinations administered on the date of micro-chipping or after are considered.
- Rabies vaccinations are only valid if administered after 3 months of age.
- Primary vaccinations are only considered effective 30 days after administration.
  Day of vaccination=day 0.
- Booster vaccinations, where relevant, are effective from the day of vaccination.
- A registered veterinarian must have administered the vaccination. Vaccinations administered at welfare facilities, not by a veterinarian, are considered invalid.
- Please remember to **include your qualification** next to your signature in the patient's vaccination book.
- Whether the patient's rabies vaccination status is valid or not is dependent on the manufacturers' instructions of the particular vaccine used and not on South African legislation, individual veterinarian's/private practice's opinion or common logic.

A common pitfall:
The validity of a booster vaccination is only so if the vaccination used as a booster is of the same manufacturer as that of the primary vaccination.

VACCINE	BOOSTER REQUIRED	WHEN	VALIDITY
MSD-Nobivac	No	N/A	3 years
Merial-Rabisin	Yes	Between 1 month & 12 months	Primary: 1 year Boosters: 3 years
Zoetis-Defensor 3	Yes	Between 1 month and 12 months	Primary: 1 year Boosters: 3 years
Rabigen Mono	N/A	N/A	1 year

Example 1: **One-year-old patient vaccinated with Rabisin on the 01/01/2018.**
Vaccinated again with Rabisin on the 01/06/2018.
Validity of last rabies vaccination: 3 years.

Example 2: **One-year-old patient vaccinated with Rabisin on the 01/01/2018.**
Vaccinated with Defensor 3 on the 01/06/2018.
Validity of last rabies vaccination: 1 year.

The exception...Namibia:

- No microchip required, although recommended.
- Validity of rabies vaccinations follows that of South African legislation and logic. i.e. regardless of the manufacturer of vaccine used: primary vaccination validity is one year
- Booster vaccination validity: Three years (Cat: One year)
- Exception: Rabigen Mono validity is always only one year.
- Primary vaccination only considered valid 30 days after vaccination. *Day of vaccination=day 0.*
- Booster vaccinations are valid from the day of vaccination.
- If a puppy is younger than 3 months of age the dam's rabies vaccination record must be up to date, and proven to be so with relevant supporting documentation.

Titer testing (EU)

- Blood drawn for Rabies titer testing must be drawn a minimum of 30 days after vaccination (day of vaccination=day 0).
- If the patient's rabies vaccination record is up to date and kept this way, as per manufacturer's instructions, a rabies titer test can be performed at any point.
- Ensure that the microchip numbers on ALL documentation correspond.
- Australia & New Zealand's rules differ-please refer to these countries' particular import requirements.

Ecto & endo-parasite control

- Canine Bravecto®, although often used extra-label for the control of ectoparasites in our feline patients, is not considered as valid ectoparasite control in cats.
- In **Australia** only topical ectoparasite control is considered as being effective, so unfortunately our oral ectoparacitides are a no-go.
- In the **EU** only dogs, not cats, need to be de-wormed. Only dogs en-route to Finland, Ireland, Malta and the UK require endoparasite treatment.

Health Checks

- Ensure that the correct template is completed; province specific.
- Normally needs to be completed 5-10 days before export, look at the specific importing countries' requirements.
- For **Namibia,** within seven days of export, not thirty days. *This is a common mistake; the wording on the Namibian import/export permit is often misinterpreted.* The clause concerning thirty days refers to animals returning to South Africa from Namibia, and not those travelling to Namibia from South Africa.

Please always advise your clients to bring the documentation dictating the relevant importing countries' requirements to export consultations.

For more information regarding import requirements of specific countries a useful site is: www.elsenburg.com/services/3rd-level/basic/veterinary-services-export-control.

The ABCs of Veterinary Dentistry

'R' is for Retained, Primary, Decidous Teeth

Attention to persistent primary teeth is essential to the dental health of our patients, especially smaller breeds such as Maltese, Yorkshire terriers, Pomeranians and miniature Schnauzers.

Jan Bellows, DVM, DAVDC, DABVP, FAVD

In cats and dogs, primary (baby) tooth roots are normally resorbed from pressure as the permanent (secondary, adult) teeth erupt pushing them out of the alveolus, starting at 14 weeks of age. The mechanism that causes resorption of primary roots isn't fully understood, nor is the cause of resorption failure. Persistent primary teeth, fail to exfoliate because the permanent tooth buds are malpositioned rostrally (maxillary canines) or lingually (mandibular canines) removing the direct force to push them out of mouth. Permanent canines normally erupt by the time most dogs and cats are 6 months old.

Defining the problem

Let's take a look at the terminology of this dental issue.

Primary - The first teeth, which are normally shed and replaced by permanent teeth.
Retained - Primary teeth that continue to be present in cases where secondary teeth are not present.
Persistent - Primary teeth that are still present despite the eruption of permanent teeth.
Deciduous - A dental term applying to the primary teeth that is borrowed from trees and shrubs that seasonally shed leaves as a tree matures.
Secondary - Adult teeth.

The terms "retained deciduous" and "retained primary" should be reserved for rare cases when only the primary tooth clinically and radiographically exists without an accompanying secondary (adult) tooth. (Figures 1A-1C).

Figure 1A. A retained right mandibular primary second premolar. (All photos courtesy of Dr. Bellows.).

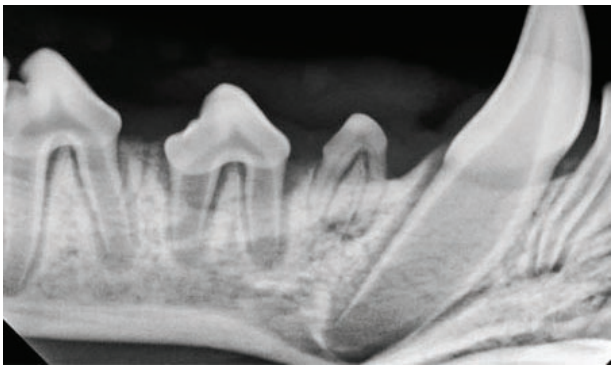

Figure 1B. A radiograph confirming the absence of secondary first and second premolars.

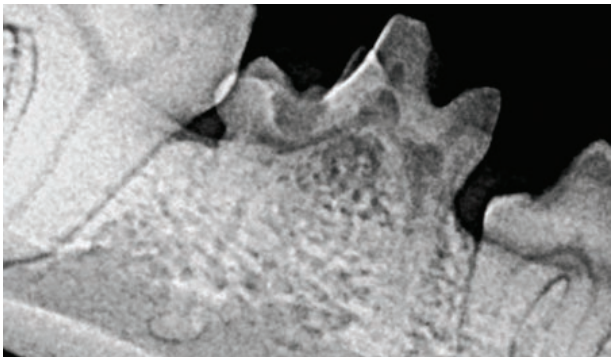

Figure 1C. A retained deciduous fourth premolar.

Persistent primary teeth are diagnosed when the primary and secondary teeth are present in the same alveolus. This results when the normal resorption of primary teeth fails to occur due to malposition of the secondary tooth, causing the secondary teeth to erupt next the primary teeth. A retained deciduous tooth occurs where there is a primary (deciduous) tooth without an accompanying secondary (adult) tooth visible either clinically or radiographically (Figures 2A-2E).

Figure 2A. A persistent right maxillary canine. Note the swelling around the primary and secondary canine.

Figure 2B.

Figures 2B and 2C. Persistent primary maxillary canines and the right third incisor.

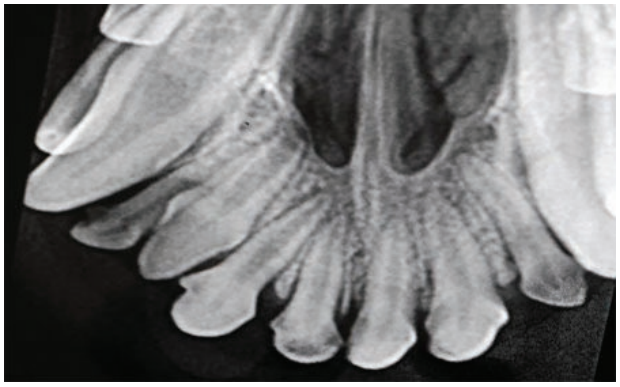

Figure 2D. Radiographic confirmation of the persistent right maxillary third incisor.

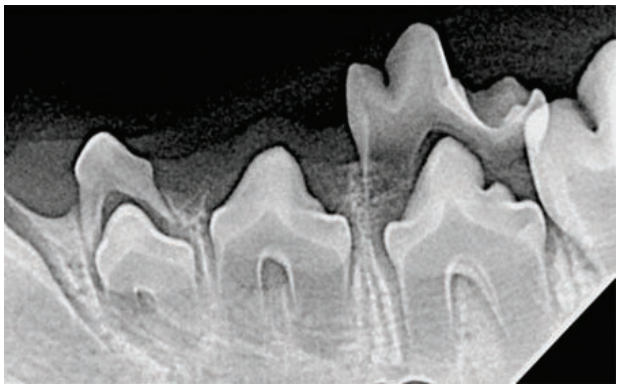

Figure 2E. Persistent primary left mandibular second and fourth premolars.

Persistent primary teeth may overcrowd the dental arch, moving the secondary teeth to abnormal locations, causing oral discomfort. Double sets of roots may also prevent the normal development of the alveolus and periodontal support around each permanent tooth, resulting in early tooth loss. Malpositioned, primary mandibular canine teeth result in mesioversion (lingual displacement) of the permanent mandibular canine teeth causing traumatic occlusion of the hard palate (Figures 3A and 3B).

When a delayed approach is taken to determine whether the persistent primary tooth will exfoliate, the secondary adult tooth often becomes permanently malpositioned, requiring orthodontic movement, crown reduction or extraction. It is for this reason that the "wait and see" approach isn't recommended.

Just say 'no' to a trim

Some breeders trim the primary canine crowns in hopes that they'll shed early and possibly prevent orthodontic problems. Trimming, also known as deciduous tooth crown reduction, isn't recommended because it results in pulp exposure, causing the animal pain and risking the development of the surrounding permanent teeth.

Figure 3A. A persistent primary right mandibular canine producing mesioversion of the secondary mandibular canine.

Figure 3B. Mesioversion of the left mandibular canine.

Treatment

Now that we've defined the problem, let's fix it! A persistent primary tooth should be extracted as soon as the permanent tooth is observed to erupt in the same alveolus. The goal is to remove the entire primary tooth without fracture of the root. Examination of intraoral radiographs before extraction is important to get an appreciation of the subgingival anatomy of the tooth to be extracted.

Here are the extraction steps after examining intraoral radiographs:

1. Make a diagonal incision over the caudal primary canine root (Figures 4A and 5A).

Figure 4A. Left maxillary persistent primary canine tooth. Gingical incision used to expose the persistent primary tooth.

Figure 5A. Left mandibular persistent primary tooth extraction indicated.

2. Use a No. 2 molt periosteal elevator to expose the primary canine root (Figure 4B)

Figure 4B. Flap exposure of the primary canine tooth.

3. Insert and gently torque a wing-tipped elevator to create mobility of the tooth before delivery (Figures 4C and 5B).

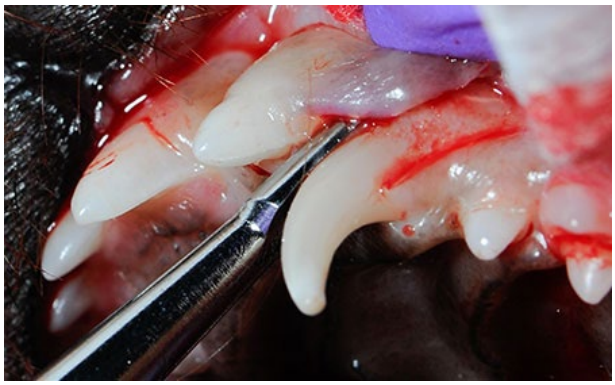

Figure 4C. Wing-tipped elevator used to loosen the primary canine tooth.

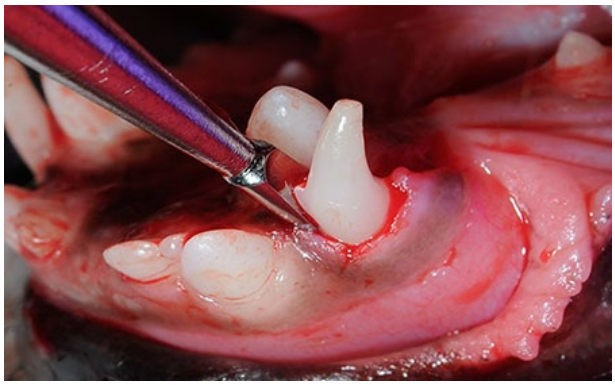

Figure 5B. Wing-tipped elevator used during extraction.

4. Use extraction forceps or a rongeur to deliver the tooth from the alveolus (Figures 4D and 5C).
5. Suture the incision with 4-0 absorbable suture on a P-3 reverse cutting needle.

Extraction must be done carefully to avoid accidental damage to the unerupted, permanent canine tooth that lies lingual to the mandibular teeth and rostral to the maxillary deciduous canines. Avoid placing the elevator along the lingual surface of the mandibular deciduous teeth. Instead, only elevate along the mesial surface (front), labial surface (toward the lip), distal surface (caudally) of the mandibular deciduous teeth and buccal distally around the maxillary deciduous canines.

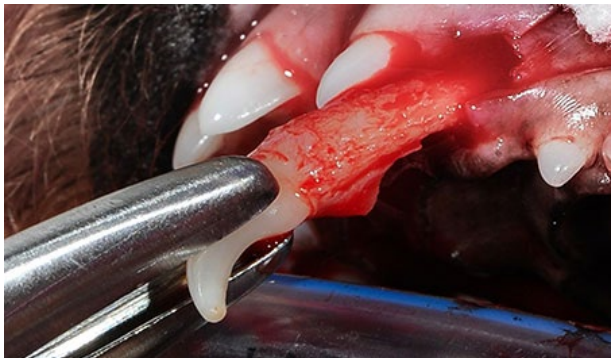

Figure 4D. Primary canine tooth delivered from the oral cavity.

Figure 5C. Persistent primary tooth delivered from the oral cavity.

If extraction is performed early, the abnormally positioned permanent tooth frequently moves into the normal position.

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Canine and Feline Pododermatitis

Pododermatitis is defined as inflammation of the skin of the paw(s). Affected tissues may include interdigital spaces, footpads, nail folds (paronychia), and nails. Pododermatitis is often seen in general practice and one of the more challenging manifestations of skin disease, both in terms of establishing a definitive diagnosis and providing effective care. This webinar will look at the different causes, discuss a diagnostic approach and general treatment and discuss the more common causes such as pododemodicosis, allergic pododermatitis, infectious pododermatitis, interdigital follicular cysts (also known as sterile pyogranulomatous pododermatitis), hepatocutaneous syndrome and feline plasma cell pododermatitis in more detail.

Dr Heidi Schroeder
Small Animal Specialist Physician BVSc MMedVet(Med)

Dr Heidi Schroeder obtained her BVSc degree in 1988 and her MMedVet(Med) degree in 1994, both from the Faculty of Veterinary Science, Onderstepoort. She was a senior lecturer in the Small Animal Medicine Department, while completing her specialist degree. She left the University in 1996 to start a Small Animal Medicine referral practice in Pretoria. She has a special interest in Dermatology and attends to many dermatological referral cases. She has been lecturing to veterinarians all over South Africa on a variety of dermatological topics and has written several CPD articles on various dermatology topics. She is a co-founder of the South African Veterinary Dermatology Interest group which aims to promote dermatology in South Africa.

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