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Veterinary PracticeToday

FOR PERSONAL & PROFESSIONAL DEVELOPMENT

How much is that puppy in the window?

Animal welfare and the puppy trade

Glaucoma in dogs
Cause, clinical signs and diagnosis

Ear-based swellings in rabbits
A diagnostic and therapeutic approach

Avoiding unlawful discrimination
What you need to know

Milk fever
A disease that can largely be prevented and controlled

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UP FRONT...

Welcome to the first issue of *Veterinary Practice Today* for 2019. The journal is now in its sixth year and goes from strength to strength. We have an excellent and ever-growing selection of authors writing on all aspects of work in veterinary practice and both David Watson and I would like to thank them for their excellent contributions.

Having just read Ann Cleeves' latest book in the 'Shetland Series', featuring the charismatic detective, Jimmy Perez, I was pleased to be able to include in this issue of *VPT*, Juliet Nicholson's excellent 'real life' article on working as a vet in Shetland. For those – myself included – who love peace, solitude and getting away from it all, the appeal of this cluster of islands, with names such as Yell, Unst and Mainland, is huge. As is the way with things, of course, the reality is somewhat different, but Juliet paints a fascinating picture of the working life of a veterinary practice and its vets, the problems of reaching far flung farmsteads and the unforgiving weather.

Recruitment of vets and nurses can be a problem in such isolated places, and most of the long-term staff at the practice have family connections to Shetland. The practice is highly involved in fish farming – a subject we covered in John Sutherland's article in our last edition *[VPT* **6**(6)] – and it is also unusual in that it is now employee owned; as Juliet puts it, a mini John Lewis.

Staffing is always one of the major issues for any veterinary practice manager. Deborah Croyle's article on the use of receptionists introduces a new twist on how receptionists – who play such an important role in the practice – can be used to their full potential. Using locum nurses to their full potential is also covered in this issue by Samantha Flavell, who points out that, without correct preparation, locum cover can quickly be rendered ineffective and expensive.

One of our most regular contributors is Jane Ellison, a senior information scientist at the Veterinary Poisons Information Service (VPIS). She has supplied the journal with numerous informative articles on poisons and their effect, treatment and prognosis in companion animals. She always manages to convey this very serious information with a degree of appropriate humour, particularly when it come to the antics of cats. In this issue, she talks about 'what's new' in poisoning – covering such agents as electronic cigarettes, jerky treats, and vitamin D creams.

We look forward to continuing to provide excellent, informative and thought-provoking reading for our readers in 2019.

Maggie Shilcock
Editor

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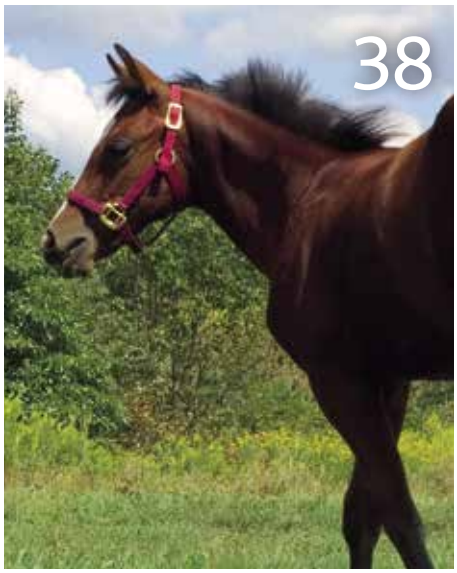

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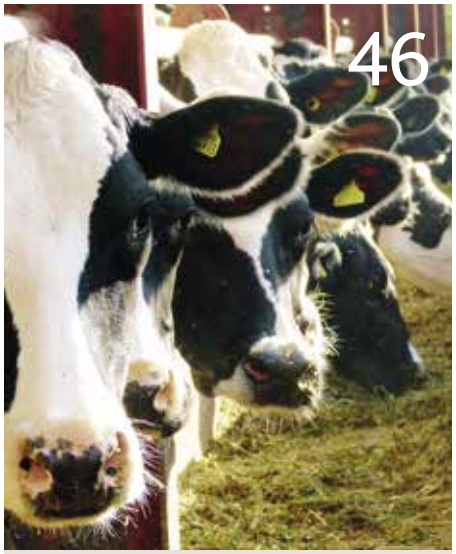

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How much is that puppy in the window?

Christopher James Laurence
MBE QVRM TD BVSc FRCVS

Chris qualified as a veterinary surgeon from Bristol University in 1968 and went into mixed practice in Somerset, moving a year later to take up purely small animal practice at the Hale Veterinary Group until 1998. He was subsequently Chief Veterinary Officer at the RSPCA and Veterinary Director of the Dogs Trust, retiring in August 2011. He was awarded the MBE for services to animal welfare in 2007 and granted Fellowship of the Royal College of Veterinary Surgeons in 2017.

Chris is currently Chairman of the Canine and Feline Sector Group of the England Health and Welfare Board and Treasurer of the Central Veterinary Society. He is Chairman of the Animal Welfare Foundation and the British Veterinary Behaviour Association. He is also a trustee of the Pet Blood Bank, the Bella Moss Foundation and North Wiltshire Branch of the RSPCA and Treasurer of the Animal Behaviour and Training Council.

If you use the Dogs Trust annual survey of stray numbers as a crude measure for dog welfare, you could be forgiven for thinking that all was well in the canine welfare world (**Figure 1**). Total stray numbers and the numbers euthanised by local authorities have shown a healthy downward trend over many years. But newspaper headlines about the increasing number of brachycephalic breeds – largely generated from campaigns by the veterinary profession – give a hint that some significant issues remain.

DOG OWNERSHIP

Even the government has woken up to the deficits in welfare. New regulations on dog breeding, boarding, pet sales, using animals in entertainment and riding establishments came into effect in October and there is a promise of more to come on shock collars, third party sales and sanctuaries.

So what's going on? Twenty-six per cent of households together own nine million dogs, according to the latest annual survey by the Pet Food Manufacturers' Association (www.pfma.org.uk/pet-population-2018). This is probably the most accurate estimate. If their life expectancy is an average of 11 years and the population is approximately stable, that means over 800,000 puppies enter the population annually.

Roughly 250,000 of these come from Kennel Club-registered dogs. The most popular breed is the French bulldog – a brachycephalic breed that most of us accept has a higher incidence of brachycephalic obstructive airway syndrome (BOAS) and other similar, related, inherited defects. And the breed's popularity has increased exponentially – the numbers registered with the Kennel Club have increased by 2,964 per cent over the past decade – to surpass even the Labrador retriever, which has topped the popularity table for decades.

The remaining half a million or so puppies come from a variety of sources. A relatively small number come from licensed pet shops – the 'puppy in the window' is now an unusual sight. And that source will dry up if the ban on third party sales is introduced and enforced. Even if the activity isn't banned, the new licence requirements that came into effect in October will be a significant disincentive to selling puppies legally under a pet-vending licence.

The other major source is almost certainly the internet. The anonymity it allows enables a variety of illegal dog breeding activities – primarily puppy farming and the illegal commercial import of puppies via the Pet Travel Scheme (PETS). The trade is driven by the demand for puppies, the ease with which the point-of-sale and vendor can be obfuscated, poor detection and enforcement, and the derisory penalties following conviction. There is good evidence that organised crime is involved, because the profitability is high and the likelihood of a prison sentence is very low compared to smuggling drugs, weapons or people.

Of course, the welfare of the puppies is inevitably the casualty – both in the short term from disease and the long term from inherited defects and behavioural issues resulting from a lack of socialisation/habituation.

Media-driven folly

Why does the general public continue to buy inappropriate puppies in spite of the negative publicity about brachycephalic

"There is good evidence that organised crime is involved, because the profitability is high and the likelihood of a prison sentence is very low compared to smuggling drugs, weapons or people"

breeds and puppy farms? I believe that ignorance and social factors incentivise how people purchase and the main drivers are the desire to mimic celebrity and the need to be able to satisfy demand instantly – "I want it; and I want it now."

Endorsement of anything is aimed at increasing sales, so when some so-called celebrities are pictured in the press with their French bulldog or 'designer' (actually just a crossbred) puppy, there is a rush to buy one. When advertisements similarly use brachycephalic breeds, the demand is ramped up yet again. And we humans have a natural affinity for 'baby-faced' puppies, which enhances the appeal of brachycephalics.

Of course, responsible breeders should consider the genetic material of their breeding stock and only breed from the best. The huge increase in the registration of French bulldogs is just not compatible with doing so and the breeding authorities have made no attempt to limit the number of puppies produced.

The so-called 'popular sire' that wins on the showground remains able to be used repeatedly by other show breeders. The inevitable consequence is that effective population size (EPS) for pedigree dogs is often in the tens or hundreds. Is it any surprise that inherited defects and exaggerated conformation to satisfy fashion are commonplace?

Some defects are well known and have been addressed in spite of the bar to doing so. Urate urinary calculus formation in Dalmatians is common and the underlying defect was well recognised and ubiquitous in the breed. The only realistic solution was to 'out-cross' to an unaffected breed and this has been done to an unaffected dog. The crossbred offspring have been bred back to pedigree Dalmatians and, after five generations, are now accepted back into the show ring as 'pure-bred'. The cost must have been significant and, of course, if that particular line is well used it will further reduce the EPS.

Key role for nurses

For decades, welfare organisations and the veterinary profession have been 'banging on' about always seeing the pup with its mother and siblings. The BVA and BSAVA have been highlighting the long-term issues with brachycephalics for months and the KC/BVA Health Schemes have been in place for over 40 years. So where has it all gone so badly wrong that we still have the breeding and sale of hundreds of thousands of poorly bred, low-welfare puppies every year?

> "... the welfare of the puppies is inevitably the casualty – both in the short term from disease and the long term from inherited defects and behavioural issues resulting from a lack of socialisation/habituation"

Influencing behaviour change in the general public has now started to attract the attention of both government and scientists. The Behavioural Insights Team, colloquially known as the Nudge Unit, is now established under the Cabinet Office. And social scientists are increasingly interested in what persuades people to act or not. The Animal Welfare Foundation Discussion Forum last June discussed the topic and video footage of the presentations is to be found at www.animalwelfarefoundation.org.uk/2018-discussion-forum

How do we expect the puppy buying public to know how to do the right thing and what to look for? There has been much discussion recently about whether pre-purchase advice from the purchaser's veterinary practice is a way forward and whether it should be free of charge. It seems to me that this is an ideal nurse consultation. While I recognise the nurses' view that they have value and so their advice should be chargeable, in this instance I believe the potential welfare benefit outweighs the desire to be valued. If the profession united behind the 'Ask your vet for free puppy purchase advice', surely the benefit – both in welfare and, I suspect, financial terms in the long view – would be a fillip for our reputation?

Of course, nurses would need the tools to inform the consultation. The new legislation in England, with its star rating system for licensed breeders (see later), will be a good

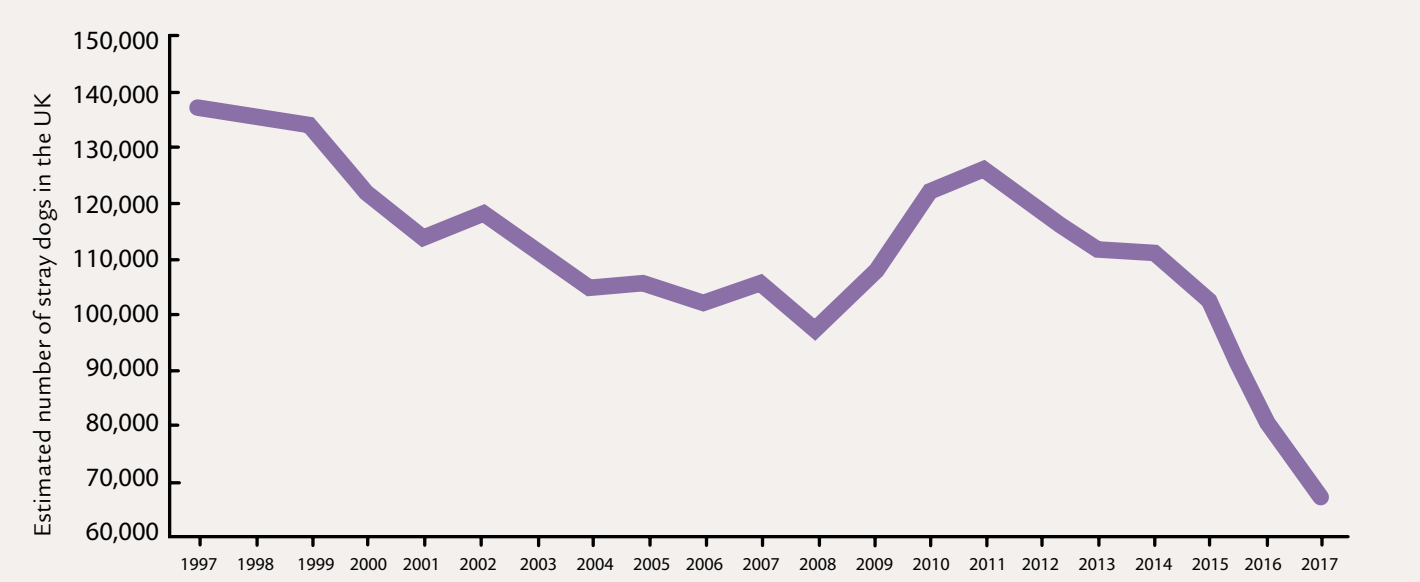

Figure 1. *Estimated number of stray dogs in the UK since 1997. (Source: Dogs Trust)*

"It seems to me that this is an ideal nurse consultation"

indication. And the use of the re-vamped Puppy Contract (www.puppycontract.org.uk) designed by the Animal Welfare Foundation and the RSPCA, in consultation with the other major charities, is also good advice.

Closing loopholes

The new English Animal Activities Licence (AAL), (the Animal Welfare (Licensing of Activities Involving Animals) (England) Regulations 2018) bring into the 21st century the regimen for controlling dog breeding (amongst other activities). There are a number of new features; although the standard is equivalent to the old local authority guidance.

First the number of litters requiring a licence is reduced from five or more to three or more litters per year. That will increase the number of licensed breeders.

Second, the breeder has to have considered the 'genotype, phenotype or state of health' of the breeding stock and whether breeding will 'have a detrimental effect on its health or welfare or the health or welfare of its offspring'. That is aimed at controlling both detectable inherited defects and extreme conformation.

Third, any licensed breeder advertising their puppies will have to display their licence number. That will make it apparent to purchasers that the breeder is doing so commercially; but, coupled with the rating system outlined below, may encourage the good breeder.

Fourth, the inspections will be risk-based and will result in a star grading. The assessment is clear and well constructed and should result in clarity for purchasers of the quality of the entire breeding operation.

The recent government consultation on the proposal to ban third party sales of puppies and kittens seems likely to result in a ban. That will remove one relatively low volume source of poorly bred and reared puppies.

Of course, there are flaws to every plan; and illegal activity which is difficult to detect underlies many of the problems with dog breeding.

Tightening controls

As noted above, much is based around internet sales that obfuscate the breeder's location and quality. As long as there is a 'number of litters' threshold, illegal activity will masquerade as being below it. Some of that activity will be via puppy farms, while other aspects of it will be illegal imports.

One solution is to require every breeder to register if they are below the licence threshold. Registration would be simple by completing an online application, declaring that the breeder complies with welfare law and paying a fee to cover the cost of the local authority running the database – probably less than £25. The local authority would issue a registration number that would be required on any advert for the sale of puppies. The UK internet-based sites, such as Gumtree, would be required to confirm and display the number.

A second requirement is to better control imports. There is a general view that the health risk to both the canine and human population of importing dogs is significant and not being properly recognised. In particular, the wait between rabies vaccination and import is too short and should be extended to 12 weeks.

After 29 March 2019, we will have the ability to set our own rules and could impose such a regimen – perhaps also modifying the tapeworm treatment and re-introducing tick treatment. As the lowest age at which rabies vaccine can be administered is 12 weeks, it would be impossible to import any dog under 24 weeks old and they would clearly not be saleable as puppies.

If these actions were put into effect, we would stand a much better chance of reducing the supply of poor welfare puppies and would almost certainly force many puppy farms out of business. That would inevitably reduce supply and increase the cost of a puppy. While the initial reaction might be that it would prevent some less-caring owners from getting a puppy in the first place, there are arguments for encouraging the responsible ownership of dogs because they are good for our health.

So we might need to think about how we could encourage high quality responsible breeders to produce more high welfare puppies. That begs questions about whether it is possible to be a high-volume breeder and still provide well-adjusted healthy puppies; and who might do so and at what cost? Perhaps a welfare charity would like to step up to the plate? ■

Comment on Comment

In response to the Comment article written by R Eddie Clutton and published in the November/December 2018 issue of Veterinary Practice Today [6(6): 6-9], *RC Ruberry BSc BVetMed MRCVS writes...*

'I qualified in 1976, when the veterinary world was completely different from the one we see today. The changes since then have almost been beyond belief, and most of those changes have been for the betterment of animal health and welfare. However, I cannot agree more with the comments made by R Eddie Clutton that the profession is progressing too rapidly; and that, perhaps, some of the treatments/surgical procedures carried out now are not in the best interests of the animal concerned, but are, in fact, for other reasons – such as scientific interest, experimentation (possibly with genuine motives for overall improvement), kudos and financial gain.

The great Sir Robert Hutchison (1871-1960) stated at one stage of his career:
"From inability to leave well alone
From too much zeal for the new
And contempt for what is old
From putting knowledge before wisdom
Science before art
From treating patients as cases and
From making the cure of the disease
More grievous than the endurance of the same,
GOOD LORD DELIVER US"

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Karen Wild
Dip App Psych CCAB

Karen is an ASAB-Certificated Clinical Animal Behaviourist with 20 years of experience in the field and runs a full-time behaviour practice, 'Pawprint', near Peterborough, working with family pets on a veterinary referral basis. She is a full member of the Association of Pet Behaviour Counsellors (APBC) and an Animal Behaviour and Training Council (ABTC) Registered Clinical Animal Behaviourist and Animal Training Instructor.

Karen has written three books: What your Dog Wants, 21 Days to the Perfect Dog *and* Being a Dog – *all aimed at communicating welfare and training issues to the wider dog-owning public. She is resident behaviour and training feature writer for* Dogs Today *magazine as well as other UK and international pet titles.*

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BEHAVIOUR

Is 'bite prevention' too late? Early body signals and the escalation of stress

The concept of 'bite prevention' has always been popular, and is a convenient slogan, given the severity of the specific injury that can be inflicted by any dog's mouth. Such education is without doubt essential; and yet, dogs still inflict injuries ranging from scratching, knocking people over, bruising, punctures – to more severe tearing and, of course, mutilation and death of the victim.

Given this serious concern, the laws appertaining to dogs with regard to injuring humans carry serious penalties for both dog and human.

However, it still appears that there is much to be done. The focus of this article is to recognise that by its very nature, the title 'bite prevention' implies an incident that has been handled far too late in the progression of biting and injurious behaviour. This is an important area of discussion and, as such, is intended to help practitioners advise the clients in our care of the earlier risks to their dog's potential welfare and reactions.

I propose that we, as practitioners both overlapping within behaviour and veterinary contexts, and as social citizens – and often parents too – ensure that 'prevention' becomes a more active 'intervention'. I also propose that 'bite' is too late a term, and could be retitled to reflect a more timely effort on behalf of animal carers.

Extent of the problem

Epidemiological data have indicated that there are an estimated 6,743 hospital admissions for 'dog bites and strikes' in England every year. However, such information includes any dog-related injury, not simply a bite. This number does not include incidents that have not required admission to hospital, since the data are not collected; but may be treated by a local general practitioner, Accident & Emergency department or simply at home. In other words, the data are not recorded accurately, potentially giving a skewed and easily misinterpreted set of information. Waiting for the 'final' injury that needs hospital treatment may be the event at the end of a long chain of repetition and warnings from any individual dog. In addition, with 21 fatal dog attacks occurring in the UK during the last 10 years, public protection has focused on these extremes.

A dog bite usually requires some form of medical treatment – for infection risk rather than always needing repair. Without a puncture, it may not be reported. However, the crush injury following a dog bite is often underestimated. **Figures 1-8** show the progression of a bite injury that, whilst in the first photograph appears to show minor puncturing and teeth marks, rapidly develops into a large haematoma.

All dogs are capable of biting, regardless of breed, age and size. And yet, a dog that bites is usually experiencing a degree of stress prior to the bite incident. Admittedly, there are dogs that will bite in the first instance; but generally dogs appear to show behavioural signs of withdrawal and attempts to avoid conflict wherever possible.

"...there are dogs that will bite in the first instance; but generally dogs appear to show behavioural signs of withdrawal and attempts to avoid conflict wherever possible"

Where does the real risk lie?

Even those seeking help for biting behaviour in the home are self-selecting; meaning that data from behavioural practitioners will not give a clear picture as to who is at risk – and when. Some dog owners will seek to re-home the dog, or choose euthanasia, rather than seeking assistance for any issues. There is a shame and admission of fault related to stating one's dog has bitten, injured, snapped or growled. Clients report that muzzling their dog, whilst responsibly mitigating risk, carries a social stigma.

This, in turn, may lead to dog owners viewing the dog sitting in their home as a non-risk, simply because the media representation of 'dogs that bite' or specific breeds that are supposedly dangerous, is inaccurate. This simply cannot be the case – as clinical behaviour counsellors will support – since the range of breeds, types and ages of dogs inflicting injury varies widely.

This article seeks to promote practical intervention, but the 'References' on page 13

Figures 1-8. *The crush injury of a dog bite is often underestimated.*

permit further reading; which is encouraged.

Tools to 'read' body language

The *Ladder of Aggression* by Kendal Shepherd, illustrates some of the behaviours dogs will express – often involuntarily – that are easily observed by humans. What is also essential is that we recognise that such behaviours move across a continuum. They can escalate and/or de-escalate, depending on the dog's perception of its immediate surroundings.

The *Bite Prevention* handouts, such as those by Lili Chin (via CattleDog Publishing), are excellent visual aids to educating owners and their children – as is the *Blue Dog* programme. What is particularly useful with this approach is that the earliest signals of stress are clearly highlighted (**Figure 9**), together with the tools that must be introduced. But this is not enough.

Where further intervention is essential

A flaw in 'bite prevention' programmes can often be the assumption that all dogs will experience the same levels of response, given a potential 'threat'. For example, a sleeping dog should not be disturbed, which is excellent advice. However, it may be that certain dogs will tolerate such disturbance better than others.

Likewise cuddling and kissing dogs is often seen as a means to express affection, but is dissuaded as a means to prevent a bite. Once again, many pet dogs will tolerate such treatment, even if they are not actively enjoying it. There are always some dogs that seek out such behaviour from humans. Additionally, whilst our own dogs might enjoy such contact, would they actively enjoy it from strangers?

As such, the picture is blurred. How can owners and children know what is right for their own dog, when society around them shows dogs that seem to enjoy such interactions?

> "Most bites occur with familiar dogs and, in particular, the family dog"

Dogs are individuals

Within each practice, we see a range of responses to such approaches. The goal is to educate our clients about their own dog. The following attitudes and activities can be introduced at early check-ups and vaccination consultations:

- having owned a dog before is no guarantee that this current pet will enjoy the same lifestyle
- how does the puppy respond to being handled

Figure 9. *It is important to be able to read the signs of stress.*

Figure 10. *Defensive body language can take the form of passive defences, where a dog may not retreat at first but may show signs of unrest.*

Figure 11. *An integral practice policy can be developed for the education of owners and their families.*

by someone familiar – and unfamiliar, such as the vet?
- is the puppy avoiding any particular forms of contact? In particular showing defensive body language (see below) around:
  - touch
  - being picked up
  - being stroked in bed
  - around food
  - around possessions (including human possessions)
- do the children have access to anyone else's dog within the family? What does each dog like to do?
- how can the dog 'tell' us that things are uncomfortable for them?
- use examples within human life, such as not wishing to be hugged by a stranger.

Education on body signals – what to identify

Owners frequently report body language in its simplest form, such as whether or not the dog's tail is wagging. However, this is an inaccurate picture. A wagging tail can be a sign of arousal and is no indicator of whether or not the dog is 'happy' – often it may simply be agitated, when we would prefer a relaxed state.

Defensive body language can take the form of passive defences, where a dog may not retreat at first but may show signs of unrest (**Figure 10**):
- signs of mild retreat (eyes and head turn away, ears back, head lowered)
- lip-licking, yawning, narrowed eyes, sudden sniffing of ground, scratching or other displacement activity
- active retreat (moving away or hunching over).

Depending on the level of stress and threat that the dog is experiencing, more active defensive signs may emerge including:
- stiffening of the body
- staring (sometimes past the threat, but with a fixed gaze)
- tension in the head, body, ears and mouth.

The dog may then (or initially, depending on the dog's prior learning and the level of threat experienced) move to:
- growling
- snapping
- biting (mild injury without puncture, to puncture wounds, to deeper puncture wounds, tearing, maiming, or killing the victim).

This is, of course, not an exhaustive list; but practitioners can commentate on each individual dog as a guideline for owners. Many dogs may not growl as a warning, because they may have been punished for doing so, and thus may only feel that they are left with the more escalated methods of defence.

Owners must be educated on the nature of how to read a dog's reactions to something stressful. They must also be clear that this is the dog's perception of the potential threat, and not their own. Evidence of this comes with the cluster of popular videos where viewers are encouraged to laugh at the 'guilty' dog, fail to see the dog's reactions to stress and, instead, misinterpret it as humorous engagement.

Finally – and most importantly – owners must be taught to empathise with their dog's discomfort, and certainly not to shout or smack the animal or otherwise punish it for communicating that it cannot cope.

Children

Most bites occur with familiar dogs and, in particular, the family dog. Owners must be clear that children are simply not able to 'read' a dog's body signals in the same way as an observing adult might. The younger the child, the more they are likely to pursue their own goals and ignore the needs of the dog. It has been stated that 70 per cent of all fatal dog bites involve children.

Younger children are more often injured in the face, neck and upper torso, perhaps indicating their normal exploratory behaviours of placing their face and upper body close to investigate objects. This, of course, is a highly confrontational behaviour for animals.

Children have been shown to confuse the look of a 'friendly' dog with one that was displaying defensive behaviours; so they need not just adult supervision, but also active coaching on how to behave around dogs – as well as being separated when this is not possible.

"...owners must be taught to empathise with their dog's discomfort, and certainly not to shout or smack the animal or otherwise punish it for communicating that it cannot cope"

It is not easy for most parents to enable this level of risk prevention. It is essential, however, that they have this knowledge and do not assume things will not change as the dog ages or perhaps becomes unwell, when tolerance levels will reduce.

Once again this must be educated as stress prevention or protecting the welfare of the pet dog, rather than awaiting a bite. Any retreat from children on behalf of the pet dog should be taken as seriously as an incident of snapping. All dogs should have the choice to move away, especially when held on a lead, to prevent more serious behaviours becoming necessary to 'repel the threat'.

In-house demonstration of good practice

In summary, in modern practice we are educators on welfare as well as providing emergency care, so this approach can be a primary aim.

Puppy parties and regular check-ups provide an excellent early opportunity for staff to provide running commentary on the 'behavioural temperature' of the dog(s). Puppies moving around freely will indicate a great deal of varying body language that organisers must point out to owners. Advice can be given on how to intervene calmly to protect the puppy's welfare and to prevent escalation or further stress.

As well as the handouts described above – and general advice being offered – an integral practice policy can be developed for the education of owners and their families (**Figure 11**).

This should be our long-term plan for all clients, to protect the welfare and care of their dogs, preventing at least some of the daily stresses and strains of being a pet. ■

PPD Questions

1. Name three early signals of passive defence that a dog may display
2. Why are younger children more likely to be injured around the upper body and face?
3. Why might it not be helpful to address the programme as 'bite prevention'?

Answers

1. licking lips, yawning, retreat of head/body
2. young children investigate by putting their faces close in, rather than using their hands
3. owners think their dog breed doesn't bite, early signals of stress can lead to biting, but are easier to de-escalate at this early stage.

Resources

http://info.drsophiayin.com/dog-bite-prevention-activity-sheet-for-kids

https://www.thebluedog.org/en/

http://dogpanions.co.uk/index_htm_files/Aggression-Ladder.pdf

References

Brogan TV et al (1995). Severe dog bites in children, Pediatrics, 96(5 part 1): 947-950.

De Keuster T et al (2005). Dog bite prevention – How a Blue Dog can help. European Journal of Companion Animal Practice, 15(2): 137-139.

Kahn A et al (2004). Prevalence of dog bites in children. A telephone survey, European Journal of Pediatrics, 163: 424.

Lakestani NN et al (2006). Keeping children safe: how reliable are children at interpreting dog behavior?, Proceedings of the 40th International Congress of the International Society for Applied Ethology, p233 ISAE Committee, Cranfield University Press.

Love M and Overall K (2001). How anticipating relationships between dogs and children can help prevent disasters. Journal of the American Veterinary Medicine Association, 219: 446-451.

Overall K and Love M (2001). Dog bites to humans: demography, epidemiology, injury and risk. Journal of the American Veterinary Medical Association, 218: 1923-1934.

Westgarth C et al (2018). How many people have been bitten by dogs? A cross-sectional survey of prevalence, incidence and factors associated with dog bites in a UK community. J Epidemiol Community Health 72: 331-336.

Kerry Doolin
BSc BVSc MVetMed MRCVS

Kerry graduated from the University of Sydney in 2005 and, after 12 months working in a small animal general practice in the city, spent several years as an emergency clinician in private practice.

In 2013, she completed a specialty emergency and critical care internship at the University of California, Davis; followed by an emergency and critical care residency at the Royal Veterinary College in London.

Kerry's interests include transfusion medicine, mechanical ventilation and toxicology.

**Suggested Personal & Professional Development (PPD)*

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NUTRITION

Nutrition in emergency and critical care

Nutrition in any patient is a vital – yet often forgotten – component of patient care. Voluntary food intake is frequently inadequate in hospitalised veterinary patients and this can be associated with poor wound healing, compromised organ function, immunosuppression and increased morbidity and mortality (Chan, 2015; Whitehead et al, 2016).

In the emergency and critical patient, nutrition is often delayed owing to patient instability, disease or clinical sign contraindications to feeding, intended starvation for interventions, or inadvertently. In humans, there is an association between inadequate nutrition and poor outcome.

In veterinary species, early nutritional intervention is associated with a positive outcome in certain critical illnesses, such as pancreatitis (Harris et al, 2017) and sepsis (Liu, 2012) and, in general, is positively associated with hospital discharge (Brunetto et al, 2010). A recent study evaluated early nutrition in canine pancreatitis and found early assisted feeding was associated with a more rapid return of voluntary intake of food (Harris et al, 2017). Early nutritional support in septic peritonitis was evaluated in another study and found to be associated with shorter hospitalisation length (Liu, 2012).

Indications and contraindications

A nutritional assessment and feeding plan should be initiated when the patient is hospitalised, even if the plan is, for example, to stabilise the cardiovascular system first and consider nutrition the following day. Voluntary food intake has often been depleted or absent in cats and dogs at least one day prior to presentation, so any delay in nutritional planning can lead to marked body condition changes.

> "In veterinary species, early nutritional intervention is associated with a positive outcome in certain critical illnesses..."

Caloric intake in the healthy patient differs from the ill patient because the former loses fat whereas the latter loses lean body mass, when calorie deficit is present (Freeman, 2015). **Table 1** shows the WSAVA Global Nutrition Committee recommendations for when to initiate nutritional intervention.

The indications and contraindications for whether a patient should be offered enteral or parenteral nutrition can be seen in **Table 2**. Note there is considerable overlap.

Separate to the indications, are the benefits achieved with the administration of enteral nutrition over parenteral nutrition (Chan, 2015, Whitehead et al, 2016):

- maintenance of gastrointestinal epithelium structure and function
- stimulation of intestinal contractility to sweep bacteria downstream
- stimulates splanchnic blood flow.

Calculating nutritional requirements

Complications of overfeeding include volume overload, vomiting, regurgitation and hepatic dysfunction (Chan, 2015) and, as such, caloric requirements should be calculated daily. Resting energy requirement (RER) is the energy level for an animal at rest in a thermoneutral environment and is based on bodyweight. Illness factors are no longer recommended as they are associated with increased incidence of complications.

Two calculations can be used, based on bodyweight, for the calculation of RER in cats and dogs (**Figure 1**).

Days of anorexia/hyporexia (*must* include days at home also)	
1-2 days	Write feeding orders, monitor food intake and clinical condition daily
3-4 days	Nutritional support likely to be required, if recovery is not imminent
5 days	Nutritional support *is* required

Table 1. The WSAVA Global Nutrition Committee recommendations for when to initiate nutritional intervention (WSAVA, 2013)

Enteral nutrition		Parenteral nutrition	
Indication	*Contraindication*	*Indication*	*Contraindication*
3-5 days anorexia/hyporexia	hypotension	3-5 days anorexia/hyporexia	hypotension
	absent/reduced gag reflex	absent/reduced gag reflex	
	intractable vomiting	inability to meet full nutritional requirements enterally	
	coagulopathy	inability to have anaesthetic for tube placement	
	respiratory disease (for nasally placed tubes)	intractable vomiting	

Table 2. Indications and contraindications as to whether or not a patient should be offered enteral or parenteral nutrition (Chan, 2015)

- animals 2-30kg: RER (kcal) = BW(kg) x 30 (+70)
- animals <2kg and >30kg: RER (kcal) = 70 x $BW(kg)^{0.75}$

Figure 1. *The calculation of RER in cats and dogs.*

The clinician must also decide what percentage of RER should be offered to the patient – where the longer a patient has been anorexic or hyporexic, the slower the RER must be increased towards full 100 per cent RER (in general over a two to four day period but would vary with patient illness and clinical signs).

Enteral nutrition

Types of food available are extensive and can be maintenance, age-specific, low-fat, cater to organ dysfunction and various recovery diets – the latter being more commonly employed in the ER/ICU. Although assisted feeding via a syringe in the mouth is convenient and inexpensive, the risk of aspiration and food aversion outweigh the benefits.

Feeding tubes can be placed into the nostrils as naso-oesophageal or nasogastric tubes (**Figure 2**), oesophagostomy tube, gastrotomy tube (G- or PEG tubes) or jejunostomy tube and can be effective alternatives when voluntary intake of food is inadequate. Michel and Higgins in 2006 found that cats and dogs receiving tube feeding during hospitalisation received about 90 per cent of their RER during hospitalisation.

Table 3 lists the common characteristics of the feeding tubes listed above.

Parenteral nutrition

Enteral nutrition is associated with better outcomes when compared to parenteral nutrition (PN). However, for those patients with contraindications to enteral nutrition – such as those anaesthetised for mechanical ventilation for a long duration or in gastrointestinal intolerance – parenteral nutrition can meet the patient's caloric needs and is not necessarily difficult for the emergency and critical care clinician.

The clinician must consider the potential contraindications for the use of parenteral nutrition as mentioned above. Studies have shown conflicting reports regarding the effects of parenteral nutrition in humans, specifically concerning the effect of PN on frequency of infections, duration of mechanical ventilation, hospitalisation time and survival (Chan, 2015).

Figure 2. *A nasogastric feeding tube.*

Parenteral nutrition can be provided through a central or peripheral catheter. Thrombophlebitis is a common complication in PN – seen more in peripheral catheters as a result of the osmolarity of the solution. Peripheral parenteral nutrition should have an osmolarity of <1,000mOsm/L, which leads to reduced protein and carbohydrate concentrations of the solutions and, as such, full RER is not possible peripherally.

Recommendations for catheter use to reduce the frequency of infection and thrombophlebitis include:

- via a central line as a fresh catheter or after heparin-lock
- fresh peripheral catheter, sole use
- no breach to any port with additives or drugs
- keep patient always connected to solution
- fresh administration set for new solution.

Table 3. Characteristics of feeding tubes (Chan, 2015; Kathrani, 2016; Yu et al, 2013; Mazzaferro, 2001; Yagil-Kelmer et al, 2006)

	Nasal feeding tube	Oesophagostomy	Gastrotomy	Jejunostomy
Chemical restraint required	Local anaesthetic applied to nares $^{+}$/- sedation	General anaesthetic	General anaesthetic	General anaesthetic (nasojejunal may be possible with sedation)
Surgical approach if required	N/A	Left lateral cervical region	Percutaneous via blind technique or endoscopically guided (PEG), or surgical placement	Placement via gastrotomy-guidance or surgical if already performing celiotomy. Less frequent approaches include nasojejunal, gastrojejunal and oesophagojejunal
Can patient be managed at home with feeding tube?	No	Yes	Yes	No
Indications	Short-term use	Longer-term nutritional support required, disease pathology located from nares to pharynx, need for non-liquid diet	Longer-term nutritional support required, disease pathology located from nares to oesophagus, need for non-liquid diet	Disease pathology located in stomach or pancreas
Contraindications (other than previously mentioned general contraindications for enteral nutrition)	Respiratory distress or with secretions, nasal, oral or pharyngeal disease	Protracted vomiting or regurgitation. Unable to have general anaesthetic	Pancreatitis, gastric dysfunction such as outflow obstruction or delayed emptying, Unable to have general anaesthetic	Unable to have general anaesthetic
Complications	Placement into airways rather than GI tract leading to aspiration pneumonia, more common complications are mild and tube related such as patient irritation, removal via sneezing or vomiting	Tube-related factors such as blockage, removal via vomiting and less commonly infection. Serious but less frequent complications include inadvertent placement in mediastinum and damage to major vessels	Tube removal prior to stoma formation leading to septic peritonitis. Higher risk of splenic trauma in blind placement	Tube removal prior to stoma formation leading to septic peritonitis, retrograde tube migration, leakage of GI contents
Tube characteristics	Polyurethane, polyvinylchloride (more strong), silicone (biocompatible) and red rubber 4-10Fr (1.3-3.3mm); 3.5-5Fr for most cats	Open or closed-end. 12-14Fr for cats, up to 20Fr dogs	Tube kits available. 15Fr cats 15-24Fr dogs	Red rubber, polyurethane, polyvinyl chloride and silicone. 5-10Fr
Confirmation of tube placement	To be certain with survey radiographs; however, alternatives include instilling 3-5ml saline and assessing for cough (absence confirms appropriate location), applying suction with 5-10ml syringe and absence of negative pressure means in airways (or stomach), capnography whereby CO_2 reading confirms placement in airway	Survey radiographs	Visual via endoscopy or surgical placement, contrast radiographs	Visual via surgery

Table 4. A guide to calculating parenteral nutrition (Chan, 2015; WSAVA, 2013)

Step 1	Calculate RER using basic equation (**Figure 1**)
Step 2	Protein requirement and volume: dog 4-5g/100kcal cat 6g/100kcal = RER x __g/100kcal 100 = grams of protein required per day
Step 3	Volume of nutrient solutions required each day: (i) Most commonly the amino acid solution is 8.5% = 0.085g protein per ml; __g protein required per day ÷ 0.085g/ml = __ml of amino acids per day (ii) Non-protein calories = Total RER(kcal) – protein calories (4kcal/g); – First, __g protein required per day x 4kcal/g = kcal provided by protein – Second, RER – kcal provided by protein = __non-protein kcal needed per day (iii) Non-protein calories are 50% lipid and 50% dextrose; – Lipid (20% solution=2kcal/ml); __lipid kcal required ÷ 2kcal/ml = ml of lipid – Dextrose (1.7kcal/ml); __dextrose kcal required ÷ 1.7kcal/ml = ml dextrose
Step 4	Add all constituents: __ml 8.5% amino acid solution __ml 20% lipid solution __ml 50% dextrose solution __ml TOTAL VOLUME OF PN SOLUTION

Parenteral nutrition has three major components – amino acid, lipid and carbohydrate. In general, additives such as electrolytes, trace minerals (potentially indicated in long-duration PN) and vitamins (especially vitamin B) are not required owing to the short-term use of PN.

Commercial products such as Kabiven (Fresenius Kabi) or ProcalAmine (Braun Medical) provide the amino acids, glucose for carbohydrates and lipids in compartments in one bag, and although the concentrations are not quite high enough to meet daily RER (Olan and Prittie, 2015), their use is generally adequate in the ICU for short term. Alternatively the solutions can be compounded – however, this is laborious, must be sterile and is time consuming.

Table 4 offers a guide to calculating parenteral nutrition.

Multiple complications can occur as a result of parenteral nutrition, including septic, metabolic or mechanical (Reuter et al, 1996; Gajanayake et al, 2013). Septic complications are severe, yet infrequent, and include catheter-related infections and solution contamination.

Mechanical complications include catheter- or line-related complications and thrombophlebitis and are relatively common.

Metabolic complications are related to glucose, lipid. electrolyte and biochemical derangements. Refeeding syndrome is a severe, yet infrequent, complication secondary to re-introduction of food to starved patients and causing major electrolyte and nutrient abnormalities.

A retrospective study evaluating parenteral nutrition in 40 cats found that over half of these cases developed complications – with the most common being hyperglycaemia – but most complications were mild and none required discontinuation of PN (Crabb et al, 2006). Wakshlag et al (2011) reported mediastinal extravasation of PN and cellulitis in a cat caused by jugular catheter migration.

"A nutritional assessment and feeding plan should be initiated when the patient is hospitalised, even if the plan is, for example, to stabilise the cardiovascular system first and consider nutrition the following day"

Appetite stimulants

The use of pharmacological agents to stimulate appetite is, in general, not indicated; especially in the emergency patient, because the overall outcome may be increasing appetite when a condition requiring specific interventions is undiagnosed. However, there are certain cases where the use of appetite stimulants may be indicated, such as chronic disease of known cause. Mirtazepine is a more commonly used appetite stimulant used in feline patients.

"The use of pharmacological agents to stimulate appetite is, in general, not indicated..."

Summary

Intervention of inadequate nutrition should be considered early in the ICU. There are multiple ways in which either enteral or parenteral nutrition can be delivered to the patient after nutritional assessment has revealed appropriate indications for it. Nutritional requirement calculations and the supply of nutrition to patients are readily accessible to all clinicians. ■

References

Brunetto MA et al (2010). Effects of nutritional support on hospital outcome in dogs and cats. JVECC 20(2): 224-231.

Crabb SE et al (2006). Retrospective evaluation of total parenteral nutrition in cats: 40 cases (1991-2003). JVECC 16(2): S21-S26.

Freeman LM (2015). New tools for the nutritional assessment and management of critical care patients. Special article, JVECC 00(0): 1-2.

Gajanayake I et al (2013). Clinical experience with a lipid-free, ready-made parenteral nutrition solution in dogs: 70 cases (2006-2012). JVECC 23(3): 305-313.

Harris JP et al (2017). Retrospective evaluation of the impact of early enteral nutrition on clinical outcomes in dogs with pancreatitis: 34 cases (2010-2013). JVECC 27(4): 425-433.

Kathrani A (2016). Nutritional support in the intensive care unit. In Practice Nov 2016 pp18-24.

Liu DT et al (2012). Early nutritional support is associated with decreased length of hospitalisation in dogs with septic peritonitis: A retrospective study of 45 cases (2000-2009). JVECC 22(4): 453-459.

Mazzaferro EM (2001). Esophagostomy tubes: Don't underutilize them!. JVECC 11(2): 153-156.

Michel KE and Higgins C (2006). Investigation of the percentage of prescribed enteral nutrition actually delivered to hospitalised companion animals. JVECC 16(2): S2-S6.

Olan NV and Prittie J (2015). Retrospective evaluation of ProcalAmine administration in a population of hospitalised ICU dogs: 36 cases (2010-2013). JVECC 25(3): 405-412.

*Reuter JD et al (1996). Use of total parenteral nutrition in dogs: 209 cases (1988-1995). JVECC *(3): 201-213.*

Wakshlag J et al (2011). Extravasation injury associated with parenteral nutrition in a cat with presumptive gastrinomas. JVECC 21(4): 375-381.

Whitehead K et al (2016). Gastrointestinal dysmotility disorders in critically ill dogs and cats. JVECC 26(2): 234-253.

WSAVA (2013). http://www.wsava.org/Guidelines/Global-Nutrition-Guidelines. WSAVA 2013 Global nutrition Guidelines.

Yagil-Kelmer E et al (2006). Postoperative complications associated with jejunostomy tube placement using the interlocking box technique compared with other jejunopexy methods in dogs and cats: 76 cases (1999-2003). JVECC 16(2): S14-S20.

Yu MK et al (2013). Comparison of complication rates in dogs with nasoesophageal versus nasogastric feeding tubes. JVECC 23(3): 300-304.

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John Redbond
RVN

John started working as a trainee nurse in 2001, qualified in 2004, and went on to run a dermatology clinic for eight years from 2011. He was also head nurse and practice co-ordinator at the same practice, and is now group manager of a new Veterinary Nursing Dermatology Group, www.vetnursedermgroup.co.uk, being set up to support nurses interested in this field.

**Suggested Personal & Professional Development (PPD)*

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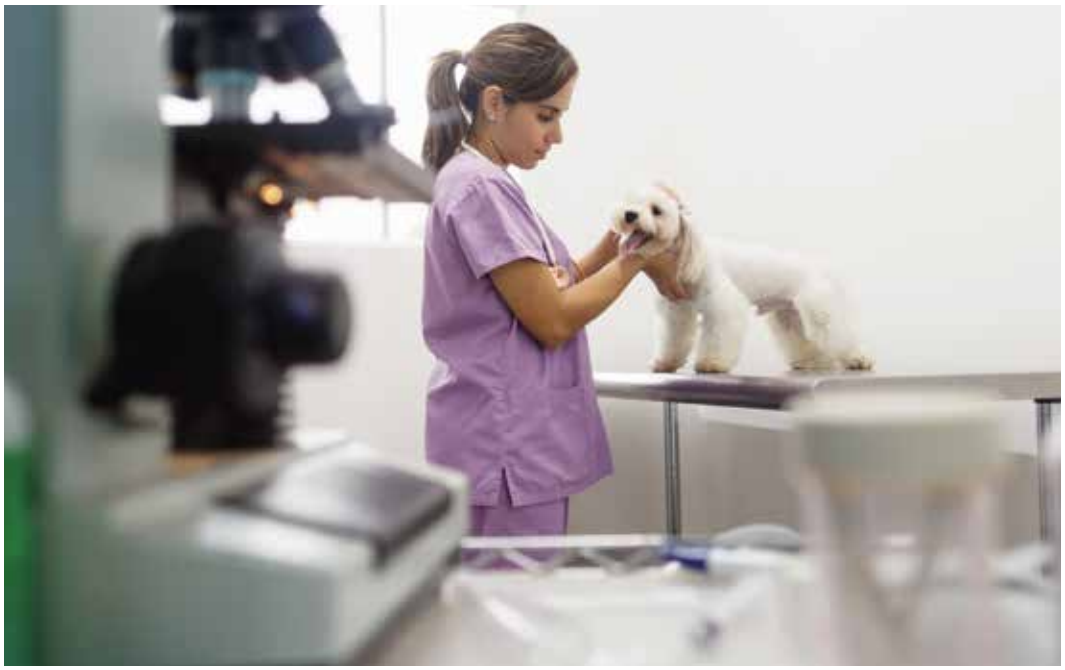
NURSE CLINICS

Me and clinics

Nurse clinics were not my thing. I never really wanted to do them; and even once I had become used to them – even enjoyed them – they were not where I felt my interest lay when I qualified. Despite this, I went on to run a dermatology nurse clinic for eight years, providing a one-hour specialist clinic for the benefit of patient, owner and practice.



It was my passion, my clinical identity and my reason for continuing to practice. A nurse clinic. How had I been so wrong?

Well, the truth is, I never felt like it was a nurse clinic. I simply felt I was a dermatology nurse providing a dermatology service. So perhaps it was my perception of the role of the VN in delivering nurse clinics in the first place that was wrong.

Nurse clinics are not a new idea. They have been a part of general practice now for many years; but where do they fit in the changing times of veterinary practice and veterinary nursing? Would my new-found perception of clinics be useful to others?

Clinics today

The RCVS *Survey of the Nursing Profession* (Williams and Robinson, 2014) summarised its assessment of clinics in 2010 and 2014 as follows: 'VNs' involvement in nursing clinics has remained stable, with around three quarters of respondents involved in clinics, most commonly nutrition and puppy/kitten clinics. However, there has been a large increase in the proportion of VNs reporting particular areas of expertise, up from 53 per cent in 2010 to 70 per cent currently (2014)'.

I found this increase in nurses reporting 'specialism' interesting as it reflected my own feelings. So I then looked at the statistics for this increase in expertise generally in the profession; and it was evident across nearly every discipline – showing that nurses not only believe in their own expertise, but also recognise speciality.

So looking at this part of the survey, with clinics in mind, the number of nurses citing general or referral 'nurse consults' as their area of expertise had increased from six per cent in 2008 to a whopping quarter (25.8%) of respondents in 2014 (**Table 1**). So whilst VN involvement in clinics had remained stable, there was an increase in nurses seeing this as their area, their skill, their passion. This is good news.

Taking a specific example, weight management clinics are an area that represents a great model for other specialist nurse clinics – the nurses citing this as an area of expertise went from three per cent in 2008 to an incredible 38.7 per cent in 2014. What's more, this matches perfectly with 39 per cent of respondents in 2014 reporting performing this exact type of clinic.

Now, interestingly, in 2008 this was only 22 per cent; but that group of nurses were

Table 1. Summary of nurse clinic areas of expertise (%) from the RCVS *Survey of the Nursing Profession* (Williams and Robinson, 2014)

Area of expertise	2014	2010	2008
VN Assessor/verifier	21.3	23.2	49.0
Nutritional/diabetes	29.5	15.0	25.0
Behavioural management	19.2	11.2	16.0
Dentistry	16.7	8.4	10.0
Emergency critical care	26.2	9.9	8.0
General/referral nurse clinics	25.8	13.5	6.0
Management/office specialist	13.2	9.1	6.0
Specific animal specialist	8.0	5.2	6.0
Dermatology	2.1	0.6	4.0
Physio/hydrotherapy	6.3	3.9	3.0
Anaesthesia	26.4	11.1	3.0
Weight management	38.7	21.0	3.0
Other	4.7	5.4	15.0
None	30.0	47.0	-

Table 2. Summary of types of nurse clinics (%) from the RCVS *Survey of the Nursing Profession* (Williams and Robinson, 2014)

Type of clinic	2014	2010	2008
Nutrition	53.6	51.0	58.6
Dental	43.5	44.0	49.1
Puppy/kitten	50.9	48.0	51.2
Vaccination	27.5	23.0	24.4
Geriatric/senior	28.1	26.0	11.0
General post-op check-ups	43.0	44.0	41.0
Weight/obesity	39.0	21.0	22.0
Behaviour			7.0
Diabetic/renal	30.0	15.0	5.0
Flea/worming			4.0
Specific animal			4.0
None	26.7	28.0	24.7

performing these clinics with only three per cent recognising it as an area of expertise. Six years later, not only were a greater percentage performing them, but also a far greater proportion recognised the service they are offering. Again, exactly matching my own experience (**Table 2**).

The diversification of nurse clinics is, therefore, the key to their success. Have nurses running specific, specialist clinics and the nurses themselves will grow to recognise their abilities and deliver that service even better. An evolution from free, general and non-specific clinics; where neither the client nor the nurse are getting the maximum benefit.

The industry today

OK. So this isn't a new concept. Huge focus in the profession at the moment is towards the role of the Registered Veterinary Nurse (RVN), how to develop it and utilise it for the benefit of the nurses themselves, but also the practices they work in and the industry as a whole. Brexit is widely considered to have already had an impact on the number of veterinary surgeons coming from overseas, creating a need – more than ever – to ensure we use nurses where we can to share the workload.

> "Have nurses running specific, specialist clinics and the nurses themselves will grow to recognise their abilities and deliver that service even better"

An Onswitch survey in 2016, across 100 practices, observed only four per cent of vets referring clients to nurses for flea and worming advice and four per cent for weight guidance – two areas in which we already know nurses to be invaluable in support. The VN Voice survey of the same year also found only 24 per cent of nurses believed the practice made great use of their skills – with only four per cent saying cases were referred to them more than three quarters of the time. This same survey supported our earlier example, in that weight clinics dominated – 87 per cent of respondents saying they offered that service, with only 47 per cent offering diabetic advice and 45 per cent on wound management.

So there is room for growth.

The RCVS is in discussions regarding the possibility of a veterinary nurse 'prescriber' role; which, whilst in its infancy at the moment, would offer the chance to shift further workload from the vet to the nurse clinic by increasing the responsibility of the nurse in that role. Whilst this is only talk at the moment, it suggests a positive future for the role of the nurse clinic in practice. Interestingly, it is nurse retention that is cited as the big benefit to this and so it would seem the driving force, alongside a genuine fear over the number of vets available. Certainly the wake from Brexit seems to have already altered positively the direction of the 'good ship VN'.

But what does that mean for nurses clinics specifically? A vet's workload is primarily split between consultations and surgery; and whilst, as nurses, there may be more we can do to help with minor surgeries and procedures, much of the potential progress in personal growth and business benefits comes from the client-facing arena.

Now our governing bodies are looking not to define what nurses *can't* do, but to maximise what we *can;* which should only make us feel more confident in pushing on with nursing clinics.

There is, however, a feeling amongst nurses that further qualifications do not mean further pay increases. This is a concern as our professions plan for VN progression and retention is underpinned by exactly that, with the new proposed post-registration framework involving graduate and postgraduate certificates. But this may not necessarily be the case, as there are many nurses who would disagree. It is just as important the nurse must apply their qualification for the benefit of the business. Again, I appreciate clinics are not exclusively the method for doing this, but they are certainly a very direct one.

Jill Macdonald DipAVN (Surgical) RVN FHEA, who set up and runs ONCORE ePD

online learning and regularly lectures on the subject of nurse clinics, certainly sees potential in the new framework helping nurse clinics progress: "The new RCVS post-registration qualifications could potentially have a meaningful impact on the roles and responsibilities for nurses in practice, including the medical care that nurses are able to offer in nurse-led clinics and consultations. The framework is still in the development stage, so the different paths that will be available are not finalised and this will also be influenced by providers of the programmes."

Jill does go on to add: "There will undoubtedly be an elective module, or modules, that offer further learning in specific areas that address the work nurses can perform in clinics and currently 'medical nursing' and 'nurse consultation, communication and bereavement counselling' are listed as potential designations."

So there is real hope the framework will help the role of the consulting nurse. But I was also interested in Jill's thoughts on how nurse clinics had progressed during her involvement: "I started work in a very progressive practice 'way back' in 1996, and by 2000, we were using nurses to their full capabilities – in carrying out all consultations where a veterinary surgeon wasn't required and in providing clients with regular nurse check-ups to enhance preventive care," she said. "And we had a fee structure for all of these consultations. I thought at this time, that this was how practice would progress, but sadly I've seen very little evidence of this.

"On our course – and beyond – many nurses are frustrated at being constrained by their veterinary practice's approach and that their professional time is portrayed as having zero financial value. For the new advanced qualifications to effect change in the nurse's role, this approach needs to be revised."

The future of nurse clinics

With this in mind I felt the time had come for me to look to human nursing, which is always a great benchmark for us. Keeping it within my own discipline, I asked a dermatology nurse in the human sector, Jane Day, for her perspective on what dermatology nursing had offered clients with just two legs. Jane is Dermatology Clinical Nurse Specialist at Cambridge University Hospital, Addenbrookes NHS Foundation Trust. She is a Registered Nurse (RN) – adult and nurse independent prescriber and holds an MSc in Dermatology Skills and Treatment and a Diploma in Dermatology.

> "Now our governing bodies are looking not to define what nurses *can't* do, but to maximise what we *can*..."

"Extended nursing practice in medicine has a long history since the realisation that we could be utilised to fill the gap in reduced junior doctor's hours," said Jane. "However, rather than being cheap substitute medics, nurses have become recognised as having a key role in many specialisms within medicine."

She goes on to add: "With support from government initiatives aimed at improving patient access to care, academic pathways for professional development have grown. Additional qualifications, including prescribing as well as a range of clinical practice competencies, have promoted extended autonomous practices."

So the direction in which we are aiming matches the destination, but what is really encouraging is what Jane had to say about how clinics can benefit the clients: "Within dermatology, our roles have been shaped by financial and waiting time targets, as well as national and local clinical guidance on managing skin disease issued by NICE, NHS England and so on. Another factor increasingly considered is the patient voice.

"In the NHS, we are required to listen and respond to our clients who, at the end of the day, pay for our services. In dermatology, many skin conditions are largely self-managed either by the patients themselves, or parents/carers. User groups have indicated that they want better access to care and improved communication often delivered through nursing services."

So the progression of RN clinics has been shaped by outcome, both from a business and client perspective; so we must push ourselves to achieve the same.

The future right now

But whilst I knew from my own experience this could work for dermatology, I looked for other nurses who are identifying an area of interest or passion – and then pursuing it.

Carla Finzel is an RVN who identified a gap in between the veterinary clinic and home care and created her own business as a district nurse, delivering a range of veterinary nursing services. This is beneficial to the patient in order to expedite recovery but also to the owner, who, whilst paying for the service, can save money by reducing the risk of relapse.

It is also clearly beneficial for Carla in running the business, so there is no reason why – with the necessary staff resources – veterinary practices themselves across the country couldn't start offering this service. In fact, this specific example has been identified in the VN Futures Report and Action Plan as a growing service that makes excellent use of the skills and knowledge of veterinary nurses.

Jill Macdonald is also a fierce proponent for this direct

"In eight years running a dermatology clinic, I never once had a client complain or even quibble about the price of my consult"

use of nursing consultation: "Carla Finzel's model involves working closely with the client's practice team in providing at-home follow-on patient care, under the direction of the veterinary surgeon in charge of the case. Carla performs invaluable work in helping and supporting clients (and practices) and in ensuring the pets (and clients) she visits receive the care they need.

"District veterinary nursing has a massive One Health and Welfare impact. We now need an 'army' of District Veterinary Nurses and I feel that district nursing should undoubtedly be added to the list of potential post-registration modules to allow nurses to gain the district skill set required by this role."

So what is holding the rest of the industry back from getting there?

The biggest obstacle

For this to be successful, it is critical we should not shy away from charging for clinics. Their value to the business measures their sustainability, as only once they become such a commodity can they be measured next to vet consultations.

Jill Macdonald states: "Practices have a tendency to focus on offering nurse-led clinics as a 'free' service to entice clients in to the practice, and as a way of encouraging sales in other areas such as veterinary diets, blood testing, dental procedures, for example. We would all benefit from development of a structure that will utilise nurses' professional skills to expand the service offered to clients and their pets, to incorporate this into a holistic approach to patients that involves the whole team (from front desk staff, through nurses, to advanced nurses and vets) and develops fee structures that enable this to be a sustainable feature of practice."

So we need to move away from the idea that these are a free-of-charge, lost leader for which a client would never pay. They will and they do. In eight years running a dermatology clinic, I never once had a client complain or even quibble about the price of my consult. I still undercharged though – in the opinion of my superiors and my peers – so I suppose I was just as guilty of the under confidence nurses have in their value, financially at least.

The Veterinary Wellbeing Benchmark Report 2018 found nurses to have the lowest confidence levels of all the practice team, whilst feeling they have less impact compared to their colleagues. In my own personal experience, we (nurses) have always worried about what we *can't* do, rather than what we *can.* So it seems nurses themselves may be the biggest limitation in pushing nurse clinics forward.

Nicola Ackerman, author of *The Consulting Veterinary Nurse,* identifies that nurse clinics require confidence – and that this is something which can be improved and boosted. It is, of course, important to underpin your knowledge to improve confidence, but experience can be just as – if not more – important, whether through practising your own consulting style or observing other nurses perform theirs.

During my own time as a head nurse, training nurses to begin clinics, a fear of 'not knowing the answer' to a question was always the biggest thing, holding nurses back. It is not that more confident nurses know these answers, but that they feel content not knowing and going to find out.

My suggestion

If 2.1 per cent of 14,319 nurses are interested in dermatology, this means there are 300-odd nurses out there interested in this field. I plan to bring them together into one group to support one another, nurture their interest and, in turn, grow the number of interested nurses. This group is called the Veterinary Nursing Dermatology Group (VNDG) and is designed for any nurses interested in dermatology. Details can be found at www.vetnursedermgroup.co.uk.

The group encourages them to interact with each other for clinical insights and advice, specialist and peer support, CPD, social events other member benefits such as access to a closed Facebook group.

Membership is completely free and the group benefits from the support of experienced Veterinary Dermatology Nurses and European Specialist Veterinary Dermatologists. There's also the opportunity to attend whole-day VNDG meetings covering a variety of topics.

So, if this model works for an interest of 2.1 per cent, imagine the potential for such a group serving the 6.3 per cent interested in physiotherapy, or 16.7 per cent in dentistry, or 38.7 per cent in weight management! ■

References and further reading

Ackerman N (2018). Building your confidence in consultations. VN Times, 18(1): 6-7.

Hardy H (2017). Nurses' skills under-used in practice. Veterinary Practice, 48(12): 1.

Hardy H (2017). Wider role possible for VNs after Brexit. Veterinary Practice, 49(2): 1.

Hubbard R (2017). Course spotlights postgraduate VN qualifications value. VN Times, 17(7): 1.

Imrie P (2018). Research finds low VN confidence levels. VN Times, 18(3): 2.

Imrie P (2018). RVN prescriber role considered. VN Times, 18(4): 1.

Kernot H (2016). VN referrals 'critical' to improving caseload. Veterinary Times, 46(42): 1.

Kernot H (2017). RVN creates 'district nurse' role to aid clients and clinics. Veterinary Times, 47(49): 1.

Kernot H (2018). VN prescriber role aims to improve retention. Veterinary Times, 48(13): 1.

Macdonald J (2017). Retaining our Veterinary Nurses: a management perspective. Practice Life, (Mar/Apr), 20-22.

Munro, M. Robinson, D. (2008). The RCVS Survey of the Veterinary Nursing Profession 2008. London: RCVS. 32, 39.

Pearson C (2018). VN Futures: stating a case for investment in nurses' skill sets. Veterinary Business Journal, 184: 16-17.

Robertson-Smith, G. Robinson, D. Hicks, B. Khambhaita, P. Hayday, S. (2010). The 2010 RCVS Survey of the UK Veterinary and Veterinary Nursing Professions. Brighton: Institute for Employment Studies. 49, 57-58.

Tottey H (2017). Are vets a barrier in preventing VN consults. VN Times, 17(3): 14-15.

Williams M and Robinson D (2014). RCVS 2014 Survey of the Nursing Profession, Institute for Employment Studies.

Glaucoma in dogs – (1) cause, clinical signs and diagnosis

Andra-Elena Enache
Dr med vet MVM MRCVS

After graduating with a Masters Degree from the Faculty of Veterinary Medicine, Bucharest, Andra spent a short time in general practice before relocating to the UK. Here, she enjoyed working in general practice for four years before completing an ophthalmology internship at the Animal Health Trust, Newmarket.

Andra began her studies toward a European College of Veterinary Ophthalmology Diploma at the Royal Veterinary College in July 2017.

Outside of work, she enjoys travelling and spending time with her husband and their cat.

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OPHTHALMOLOGY

Glaucomas refer to a large group of neuro-degenerative diseases caused by persistent and ongoing elevation of intraocular pressure. Eventually this will lead to permanent retinal degeneration and blindness owing to loss of the retinal ganglion cells and optic nerve damage (Pizzirani, 2015).

On the other hand, elevated intraocular pressure is termed ocular hypertension and should be distinguished from glaucoma. The final outcome is irreversible blindness and, in some primary glaucoma cases, bilateral enucleation is required.

Although elevated intraocular pressure is one of the most consistent risk factors for glaucomas, development in dogs (Pizzirani, 2015) genetics, ageing, vascular, immunologic and environmental factors all contribute to the optic nerve degeneration.

According to the *European College of Veterinary Ophthalmologists Manual,* 'It is characterised by an elevation of intraocular pressure (IOP) which, when sustained, results in destruction of intraocular structure and function, resulting in blindness. The elevated intraocular pressure occurs mainly with developmental abnormalities or disease processes affecting the intraocular circulation and especially the drainage of aqueous humour from the eye through the irido-corneal angle (ICA).

'Diagnosis and classification of glaucoma requires measurement of the IOP (tonometry) and examination of the iridocorneal angle (gonioscopy). DNA-tests for primary open angle glaucoma (POAG) in specific breeds are available.'

Measuring intraocular pressure

This can be performed using different devices: commonly either by an applanation tonometer (Tonopen) that measures the force to flatten a distinct area on the cornea; or a rebound tonometer (TonoVet) that expels a small, rounded probe on to the cornea – the higher the intraocular pressure, the quicker the probe returns to the instrument (**Figures 1** & **2**).

***Figures 1** & **2.** Intraocular pressure – can be measured using a tonometer.*

When measuring the IOP, one should ensure there is no pressure on or underneath the neck of the patient – for example, tight collars, harnesses, owners holding – or on the eye globe itself. When opening the eyelids, the fingers should rest on the bony orbital rims, not on the eye; and it is important to avoid overstretching the eyelids as well.

The dog should be in a sitting or standing position with the neck straight, and no overextension or flexion of the neck. When using the Tonopen, care should be taken to gently flatten the cornea without causing an obvious indentation – false high IOPs are easily obtained if the tip of the Tonopen is pushed with force against the cornea. Blepharospasm may also falsely elevate the IOP owing to eyelid spasm.

Repeated measurements should be taken. If in doubt, admit the dog for an IOP curve (measured every three hours) and monitor in hospital (Sanchez et al, 2017).

Diagnosis

It is important to take a full history and carry out a

"The final outcome is irreversible blindness and, in some primary glaucoma cases, bilateral enucleation is required"

Figures 3-7. *Acute onset signs in primary glaucoma cases.*

thorough general physical examination, looking in particular for evidence of previous trauma and to rule out underlying systemic diseases, such as lymphoma. This should be followed by a full ophthalmic examination: including visual reflexes ('menace' response, dazzle and pupillary light reflexes), pupil size (miotic/mydriatic), fluorescein test, tonometry (TonoPen/TonoVet), funduscopy and gonioscopy.

Ocular ultrasonography is useful in order to rule out intraocular neoplasia, intraocular haemorrhage, vitriitis/vitreous membranes, and retinal detachment.

Depending on the stage of the disease, glaucomas can be classified as acute or chronic.

Acute onset glaucoma

This is more common in primary glaucoma cases (**Figures 3-7**) as evidenced by:

- severe ocular and head pain
- lethargy, reduced appetite
- diffuse corneal oedema
- blepharospasm
- epiphora
- marked conjunctival hyperaemia and, sometimes, mucoid discharge that can be misdiagnosed as conjunctivitis
- third eyelid protrusion
- marked episcleral vascular congestion
- mid- to large dilated and unresponsive pupil
- deep perilimbal corneal vascularisation
- mild aqueous flare or pigment dispersion in the anterior chamber
- changes to appearance of the optic nerve – pale or dark optic nerve head (atrophy), attenuation of the retinal vasculature, cupped optic nerve head (retinal vessels stop at the rim of the optic nerve, no vessels are seen crossing the optic nerve), hyperreflectivity of the tapetum fundus.

"Glaucomas, however, can easily mask underlying systemic diseases, such as infectious uveitis and neoplasia"

Chronic glaucoma

Signs of chronic glaucoma include:

- Haab striae – breaks in Descemet membranes secondary to stretching of the globe
- buphthalmos – a permanently enlarged eye caused by chronically elevated intraocular pressure
- scleral thinning and visualisation of the underlying choroid owing to globe enlargement
- phthisis bulbi – in advanced cases, when the ciliary body stops producing aqueous humour.

Glaucomas can be classified into congenital, primary and secondary, depending on their cause.

Congenital glaucoma

This is rare in the dog. It develops within the first few months of life (three to six months) and is a consequence of extensive goniodysgenesis or trabecular meshwork maldevelopment. Different structural genes have been associated with the trabecular meshwork malformation.

Primary and secondary glaucomas can be difficult to distinguish clinically.

Primary glaucoma

Primary glaucoma is a bilateral disease that occurs spontaneously with no evidence of trauma or other intraocular disease. There is an increased incidence of the condition with age and this could be the result of changes in the iridocorneal angle seen with age (Palko et al, 2016).

Primary glaucomas are classified on the gonioscopic

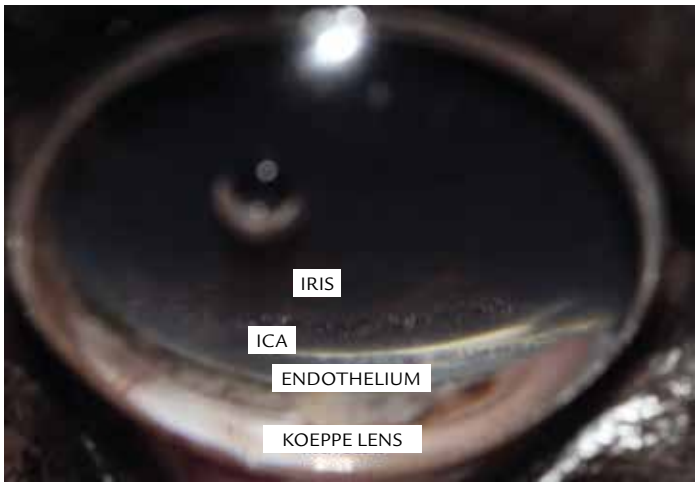

***Figure 8**. In order to perform gonioscopy, a special contact lens (goniolense, such as the Koeppe lens) is placed on the surface of the cornea to change the refraction angle of the incoming light.*

***Figures 9-12.** Secondary glaucoma occurs when the aqueous humour outflow is impeded by the presence of other intraocular diseases.*

appearance as open-angle glaucoma – seen particularly in the beagle, petit basset griffon vendeen, basset hound, shar pei, Norwegian elkhound – and closed-angle glaucoma which is seen in the majority of breeds, for example, the cocker spaniel and Welsh springer spaniel.

The ICA can be assessed by gonioscopy and an abnormal appearance is termed goniodysgenesis. This occurs owing to a defect in the development of the angle, which can have a decreased width or malformation of the pectinate ligament (Miller and Bentley, 2015).

In order to perform gonioscopy, a special contact lens (goniolense, such as the Koeppe lens) is placed on the surface of the cornea to change the refraction angle of the incoming light (**Figure 8**). The ICA can then be visualised using a slit lamp biomicroscope. The pectinate ligament (thin fibres from the iris base to its insertion at the cornea) and the iridocorneal angle width are evaluated by gonioscopy – the latter to determine its proportion of 360 degrees. A grading scheme of the changes visualised at gonioscopy is in place to classify the degree of goniodysgenesis – open, narrow, closed, closed angle.

The degree of goniodysgenesis also changes with age. Evaluation of the ICA in the affected glaucomatous eye may be difficult because of the presence of corneal oedema; therefore, a gonioscopy of the contralateral unaffected eye is recommended. This technique requires practice and training under specialist supervision.

A list of breeds recognised to be predisposed to goniodysgenesis may be found under the BVA Eye Health Scheme available online. Pre-eminent among these are the dandie dinmont terrier, Japanese shiba inu, Leonberger, flat-coated retriever, Siberian husky, cocker spaniel, English springer spaniel and Welsh springer spaniel.

Primary closed-angle glaucoma (PCAG)

This is the most common form of primary glaucoma in dogs. There is a strong breed predisposition – American cocker spaniel, basset hound, chow chow, Welsh springer spaniel, miniature and toy poodles, great Dane – as well as a genetic influence. In most breeds, there is a significant female predisposition and most dogs are middle- to older-aged.

A dog can be considered to have PCAG, if it is presented with clinical signs of glaucoma (mydriasis, blepharospasm, elevated IOP), with absence of other intraocular diseases (neoplasia, chronic uveitis with iris bombe, lens luxation), and abnormal ICA at gonioscopy of the contralateral unaffected eye (Miller and Bentley, 2015).

An acute presentation of glaucoma – with no other intraocular findings in a dog included on the list of predisposed breeds for PCAG – should raise the suspicions of primary glaucoma and prophylactic treatment of the contralateral eye should be considered.

Early diagnosis and treatment is essential, because normalising the intraocular pressure reduces the progression of the disease and prolongs the retention of vision. Therefore, referrals of glaucoma cases should be made early, if not straight after, diagnosis. However, despite treating the initial pressure spike event promptly, the disease continues to progress.

When presented in the acute congestive phase, the visual reflexes are reduced or absent; but they can return if the intraocular pressure normalises

"Early diagnosis and treatment is essential, because normalising the intraocular pressure reduces the progression of the disease and prolongs the retention of vision"

quickly. The normal canine retina begins to show evidence of effects from an elevated IOP at 33mmHg (Gelatt KN et al, 2013). Lowering IOP is critical for maintaining vision. The optic nerve axons are sensitive to pressure oscillations and their flow becomes 100 per cent obstructed at an IOP of 50mmHg (Gelatt KN et al, 2013).

Primary open-angle glaucoma

Primary open-angle glaucoma is the least common form of glaucoma in dogs and has been linked to a mutation in the ADAMTS10 and ADAMTS 17 genes in several breeds – beagle, Norwegian elkhound, basset hound and petit basset griffon vandeen (Komáromy and Petersen-Jones, 2015). The iridocorneal angle is normal initially, however it progressively closes during successive months to years owing to the effects of elevated intraocular pressure.

Secondary glaucoma

This occurs when the aqueous humour outflow is impeded by the presence of other intraocular diseases, such as uveitis, cataract, post-phacoemulsification, iridociliary cysts, lens luxation, neoplasia, retinal detachment and haemorrhage (**Figures 9-12**).

Diagnosing glaucoma secondary to chronic uveitis can be difficult as inflammation is present in all cases of glaucomas (Weinstein et al, 2007).

Signs of active or chronic uveitis may already be present in the glaucomatous or contralateral eye – with fibrin, hyphaema or hypopion in the anterior chamber, keratic precipitates, iris bombe, anterior or posterior synechiae – which could help in guiding the diagnosis. Pre-iridal fibrovascular membranes (PIFMs) form with chronic uveitis and lead to iris bombe and obstruction of the aqueous humour circulation in the eye and impaired outflow. Always examine the contralateral 'unaffected' eye, which can reveal subtle signs of uveitis, such as flare and cells in the anterior chamber.

Cataracts

Cataracts can cause phacolytic uveitis via the 'leakage' of proteins in the anterior chamber or phacoclastic uveitis owing to rupture or tear of the lens capsule (in diabetic cataracts). Glaucoma occurs either as the result of the tumescence of the lens – which occludes the ICA (phacomorphic glaucoma); or secondary to uveitis resulting from extensive posterior synechiae, or PIFMs, or secondary to retinal detachment or inflammation of the vitreous (vitriitis) and/or secondary traction bands.

The incidence of postoperative hypertension after phacoemulsification was reported to be 18 per cent in non-Labrador retriever dogs and 33 per cent in Labrador retrievers. The latter are also at increased risk of postoperative glaucoma and blindness – the risk further increasing with age and whether they had postoperative hypertension (Moeller et al, 2011). Furthermore, other breeds – such as cocker spaniel, Boston terrier, bichon frise, shih tzu and Jack Russell terrier – were found to be at increased risk of glaucoma following cataract surgery in a histopathological study (Scott et al, 2013).

Pupil block glaucoma

This occurs with anterior lens luxation, anterior vitreous prolapse, mature diabetic cataracts (intumescent lenses) and extensive posterior synechiae. Aqueous humour circulation from the posterior to anterior chamber is impeded owing to pupil block and cannot exit via the conventional outflow (iridocorneal angle). This leads to increased pressure in the posterior chamber, which then displaces the iris anteriorly towards the cornea. The ICA becomes narrow and collapses.

This can be visualised on slit lamp examination as the anterior chamber becomes very shallow and the iris is swollen and anteriorly displaced ('iris bombe').

Glaucoma secondary to iridociliary cysts has been reported in several breeds – golden retriever, great Dane – and although the mechanisms are not completely understood, it is thought that glaucoma occurs secondary to anterior displacement of the iris and occlusion of the ICA (Pumphrey et al, 2013; Holly et al, 2015).

Retinal detachment can lead to glaucoma as a result of the obstruction of the ICA with photoreceptor outer segments – released during degeneration of the retina – and formation of PIFMs secondary to retinal hypoxia (Matsuo et al, 1986).

Intraocular neoplasia causes obstruction of the ICA – anterior uveal melanocytoma or iris melanoma, for example – owing to the space-occupying lesion. When the iris is expanded by the tumour, secondary uveitis also occurs.

Summary

Glaucoma is an irreversible blinding disease defined by degenerative changes of the retinal ganglion cells and optic nerve. Elevated intraocular pressure is a consistent risk factor in dogs. Early diagnosis and treatment are essential to the prolongation of vision. Ultimately, all glaucoma cases might have the same outcome and require enucleation to restore comfort.

Glaucomas, however, can easily mask underlying systemic diseases, such as infectious uveitis and neoplasia. Therefore, submission of the enucleated eyes for histopathological examination is always recommended in order to gain a better understanding of the underlying disease process and to rule out intraocular neoplasia or evidence of metastatic disease. ■

The author wishes to express her thanks to Dr Ursula Dietrich, DipIACVO, ECVO, for reviewing this article.
Part 2 will be published in the March/April 2019 issue of *Veterinary Practice Today.*

PPD Questions

1. With respect to primary glaucoma, which of the following sentences is FALSE?
   A. dogs with primary open-angle glaucoma have a normal iridocorneal angle initially, which becomes abnormal with the progression of the disease
   B. iridocorneal angle can be evaluated by gonioscopy and this helps identifying dogs that have goniodysgenesis
   C. dogs with goniodysgenesis have an increased risk of developing primary closed-angle glaucoma
   D. you can differentiate primary glaucomas from secondary glaucomas based on the lack of inflammation in the former.

2. Regarding gonioscopy, which of the following sentences is TRUE?
   A. you can evaluate the iridocorneal angle using a direct ophthalmoscope
   B. gonioscopy of the glaucomatous eye is easy to perform
   C. special lenses (e.g. Koeppe) are used to aid visualising the iridocorneal angle with a slit lamp biomicroscope
   D. the iridocorneal angle does not change with age.

3. Regarding secondary glaucoma, which of the following sentences is TRUE?
   A. lens luxation and tumescent cataracts cause secondary glaucoma owing to pupil block and impeded aqueous humour flow in the anterior chamber
   B. uveitis causes secondary glaucoma owing to an increased production of aqueous humour
   C. secondary glaucoma in chronic uveitis occurs through overhydration of the vitreous humour and posterior displacement of the iris
   D. retinal detachment causes secondary glaucoma by anterior displacement of the iris and obstruction of the iridocorneal angle.

Answers
1.D 2.C 3.A

References

Gelatt KN et al (2013). Veterinary Ophthalmology. 5th edn. Ed KN Gelatt, Wiley-Blackwell.

Holly VL et al (2015). 'Golden retriever cystic uveal disease: a longitudinal study of iridociliary cysts, pigmentary uveitis, and pigmentary/cystic glaucoma over a decade in western Canada.', Veterinary Ophthalmology, pp. 1-8. doi: 10.1111/vop.12293.

Komáromy AM and Petersen-Jones SM (2015). 'Genetics of Canine Primary Glaucomas', Veterinary Clinics of North America – Small Animal Practice, 45(6): 1159-1182. doi: 10.1016/j.cvsm.2015.06.003.

Matsuo N et al (1986). 'Photoreceptor outer segments in the aqueous humor in rhegmatogenous retinal detachment.', American Journal of Ophthalmology, 101(6): 673-679. Available at: http://www.ncbi.nlm.nih.gov/pubmed/3717250 (Accessed: 14 October 2018).

Miller PE and Bentley E (2015). 'Clinical Signs and Diagnosis of the Canine Primary Glaucomas', Veterinary Clinics of North America – Small Animal Practice. Elsevier Inc, 45(6): 1183-1212. doi: 10.1016/j.cvsm.2015.06.006.

Moeller E et al (2011). 'Postoperative glaucoma in the Labrador Retriever: incidence, risk factors, and visual outcome following routine phacoemulsification.', Veterinary Ophthalmology, 14(6): 385-394. doi: 10.1111/j.1463-5224.2011.00896.x.

Palko JR et al (2016). 'Influence of Age on Ocular Biomechanical Properties in a Canine Glaucoma Model with ADAMTS10 Mutation.', PloS one. Public Library of Science, 11(6), p. e0156466. doi: 10.1371/journal.pone.0156466.

Pizzirani S (2015). 'Definition, Classification, and Pathophysiology of Canine Glaucoma', Veterinary Clinics of North America – Small Animal Practice. Elsevier Inc, 45(6): 1127-1157. doi: 10.1016/j.cvsm.2015.06.002.

Pumphrey SA et al (2013). 'Glaucoma associated with uveal cysts and goniodysgenesis in American Bulldogs: a case series.', Veterinary Ophthalmology, 16(5): 377-385. doi: 10.1111/vop.12000.

Sanchez RF et al (2017). 'Design of an intraocular pressure curve protocol for use in dogs', Journal of Small Animal Practice, 58(1): 42-48. doi: 10.1111/jsap.12600.

Scott EM et al (2013). 'Major breed distribution of canine patients enucleated or eviscerated due to glaucoma following routine cataract surgery as well as common histopathologic findings within enucleated globes', Veterinary Ophthalmology, pp. 64-72. doi: 10.1111/vop.12034.

Weinstein WL et al (2007). 'Identification of ocular matrix metalloproteinases present within the aqueous humor and iridocorneal drainage angle tissue of normal and glaucomatous canine eyes', Veterinary Ophthalmology, 10(s1): 108-116. doi: 10.1111/j.1463-5224.2007.00586.x

Juliet Nicolson
BVM&S MRCVS

Juliet graduated from the Royal (Dick) School of Veterinary Studies in 1982. She has worked as a vet in Shetland since 1986, in mixed practice until 2001, then taking a role that combined small animal work with practice management. In 2000, she was awarded a Postgraduate Certificate in Management Studies from Robert Gordon University, Aberdeen.

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SHETLAND

Challenges of a Shetland practice

I came to live in the Shetland Islands in 1985. My husband, Jim, and I qualified from the Royal (Dick) School of Veterinary Studies in the early '80s, and had been working in Aberdeenshire for a couple of years. We were ready for a change, and a croft with a house – plus around 20 acres – came up for sale on the West Mainland of Shetland, where Jim had been brought up. We were keen to try crofting, so that was the main motive for our move.

It soon became apparent that the islands needed more veterinary surgeons, so we set up our practice in 1986 – initially in a garage showroom owned by my brother-in-law. There was another vet in the main town of Lerwick at that time, so we called ourselves Westside Veterinary Surgery.

The 1970s and 1980s were a time of great change in Shetland. Europe's largest oil terminal had been built at Sullom Voe, and the oil industry was a significant employer, paying high wages. The Shetland Islands Council negotiated a lucrative deal based on throughput of oil, and set up a charitable trust to re-invest these funds in local infrastructure. New schools, sports centres, care homes and cultural centres gave the local construction industry a massive boost, and went on to provide plenty of employment and career opportunities for Shetlanders of all ages.

Steady evolution

When we started the practice, 75 per cent of our small animal work was with working collies and farm cats. A graphic designer friend drew our logo to reflect this, and it has stayed with us despite all the developments over 30 years. As people became more prosperous, they wanted to have family pets, and our small animal work has greatly increased. We see as many French bulldogs, pugs and exotics as anyone else now!

The practice soon outgrew the garage showroom, so we built our own surgery at Bixter on the West Mainland, which is still our administrative hub. We have opened branches in Scalloway and Lerwick (**Figure 1**) in more recent years.

Figure 1. *The branch practice in Lerwick.*

Figure 2. *The spring lambing and calving season is still a busy time for the practice.*

There have been changes in agriculture too, with fewer people relying on crofting and farming as a full-time job. Government subsidies used to be calculated on headage, but are now area-based with limitations on livestock numbers. However, because crofters tend to have a smaller number of cattle, they are generally happy to call the vet to a calving without interfering too much themselves. The spring lambing and calving season is still a busy time for the practice (**Figure 2**), and the Shetland Islands Council has implemented various health schemes – EAE and

Figure 3. *Native Shetland cattle.*

Figure 4. *Shetland sheep.*

Figure 5. *Shetland ponies on the remote island of Foula.*

Figure 6. *Livestock are screened for infectious diseases on arrival at the port.*

BVD eradication, for instance – to raise the health status of flocks and herds here (**Figures 3**, **4** & **5**).

All imported livestock are screened by a vet from the practice for infectious diseases on arrival at the port (**Figure 6**). There is a local bylaw making sheep scab treatment compulsory, and sheep are also tested for CLA and Maedi Visna. Our Johne's disease testing scheme for cattle has been operational for eight years.

Logistical challenges

The mainland of Shetland is 50 miles long, with the large islands of Yell, Unst and Fetlar to the north of the mainland (**Figure 7**). Having a vet available 24 hours a day to serve this large area has been one of the major challenges for the practice. Driving to the north of Unst from the surgery takes at least two hours, including catching two ferries (**Figure 8**).

We are part of the Highlands & Islands Veterinary Services Scheme (HIVSS), which is administered by the Scottish Office. The HIVSS pays the practice a mileage rate to allow us to charge the same visit fee to crofters – currently £25 – no matter how remote their location. This is seen by the Scottish Office as ensuring crofters have access to a vet at an affordable price, thus improving animal welfare. Occasionally we have to call out a ferry crew during the night, and the HIVSS also reimburses the practice for expenses such as this.

Expanding expertise

We became involved with fish health during the early years of the aquaculture industry, at the same time as several other veterinary practices in the Highlands and Islands. Originally our local fish farms were set up by crofters as a form of diversification, and several fish species were trialled; but over the years, the local owners gradually sold their sea sites and hatcheries to multinationals. There are no longer any locally-owned fish farms; yet the industry continues to be a large employer – and salmon exports from the isles are substantial. We have retained some involvement with disease prevention and fish health monitoring, and we employ a part-time 'fish vet' to carry out this work.

We have tried to keep up with developments in small animal practice over the years, not least because referral to specialist centres in Scotland is not an option for many of our clients. Ferries and flight connections are expensive, and a long journey may not be appropriate for an injured animal on welfare grounds. Jim has done a lot of orthopaedic surgery over the years, particularly cruciate repair, which is a common injury in our working collies. It has been very useful to be able to offer this for valuable working sheepdogs (**Figure 9**) as well as for all the pets.

I was an early adopter of ultrasound, and we soon acquired laboratory and X-ray equipment to allow us to work up medical cases more satisfactorily. Other vets in the practice have their own areas of interest – for example, dentistry, dermatology and exotics (**Figure 10**). So we can use internal referral at times, which clients seem to appreciate and has helped to build confidence in our team.

Nursing – a critical aspect

We started VN training in the 1990s; but having a sufficient number of qualified nursing staff for our three branches is still a challenge for us. Staff retention has been generally good, and we have several greatly valued employees

Figure 7. *A map of Shetland.*

Figure 8. *Ferry travel is an integral part of Shetland practice.*

Figure 9. *Working sheepdogs are still an important asset for crofters.*

Figure 10. *Vets in the practice have their own areas of special interest.*

"The 1970s and 1980s were a time of great change in Shetland"

"... because crofters tend to have a smaller number of cattle, they are generally happy to call the vet to a calving without interfering too much themselves"

who have been with us for over 20 years. However, we have occasionally lost staff to larger organisations perceived as offering better wages and conditions. Unemployment rates in Shetland are still comparatively low and the recruitment market can be very competitive.

We currently have two student VNs – although the changes in recent years to VN training in Scotland are not helpful to rural practices. There is a move away from the SVQ block-release model to full-time degree qualifications, or day release, and funding can be difficult. However, we've been able to retain some staff – including nurses – by offering flexible part-time working following maternity leave. We currently have around 25 staff, which is a 50:50 mix of full-time and part-time.

Clinical work pattern

Our clinical veterinary team consists of four full-time and two part-time vets. The rota for the vets gives them one weekend on call per month, followed by a Monday off; and everyone has one weekday night on duty. Most of our staff have a working pattern based on a four-day week, with a rota for the two surgeries we open on Saturdays. This gives everyone reasonable flexibility, but makes rota planning for vets and staff something of a nightmare! However, it's a big improvement on our early years when we were on call most of the time and had to take separate family holidays!

Our vets who have stayed here on a long-term basis have mostly had family connections or origins here, or have met local partners. There seem to be plenty of locums interested in trying a short spell in Shetland, but it has at times been difficult to find permanent vets who like the challenge of mixed practice in a remote part of Scotland. It takes a certain type of vet to enjoy this sort of work – which can be unpredictable and requires a broad base of skills and adaptability.

Employee ownership model

Five years ago we started thinking seriously about succession and the future of the practice, which by this time was the only one in Shetland. None of our vets had any interest in practice ownership.

We put out some feelers, and had some interest from the corporate veterinary groups, but had concerns about their long-term commitment to such a remote practice. We have always felt a moral obligation to our crofting clients, and were concerned that this side of the practice could suffer in corporate ownership. We were also unsure how being managed from a distance would suit our staff and the unique situation here.

I read an article about Arrowfield Vets who had used the 'employee ownership' model to purchase their practice from a retiring vet, and wondered if it could suit our situation.

The Government is very keen to promote co-operatives and employee ownership, so there are tax incentives to follow this route, and grants are available to help with consultancy and legal fees. Any bonuses paid to staff are also tax free.

We negotiated with the staff using a lawyer who specialises in employee ownership.

It certainly wasn't all plain sailing, since some staff were upset by the prospect of major changes and that we were even considering a future for the company without our being in charge. However, after much discussion we reached the point where a valuation was agreed and our shares were transferred to an employee ownership trust in December 2014.

The valuation was a compromise between the full commercial value, and what we felt the company could afford to pay from profits in instalments over the term of the loan. This loan repayment period is now completed, and in effect we have a practice which is a mini version of John Lewis!

We've been able to pay the staff small bonuses throughout this period, and we hope these will increase now the loan is repaid.

We have a board of directors, elected by the staff; which is responsible for day-to-day management and includes at least one vet, a nurse and one of our administrative or reception staff. We also have a board of trustees, again elected, who look after the interests of the employees and the Trust.

So we have reached the point where the vets and nurses can concentrate on their clinical work, and the practice is managed by staff who have the necessary skills to do so. I have recently retired, and my roles have been taken over by others younger, smarter and keener!

The employee ownership route as a means of succession in our profession is not widely known, but may be worth others considering. I hope that the core values of our practice will remain in local ownership, and that all the staff will continue to benefit from being part of the company we set up all those years ago. ■

"We currently have two student VNs – although the changes in recent years to VN training in Scotland are not helpful to rural practices"

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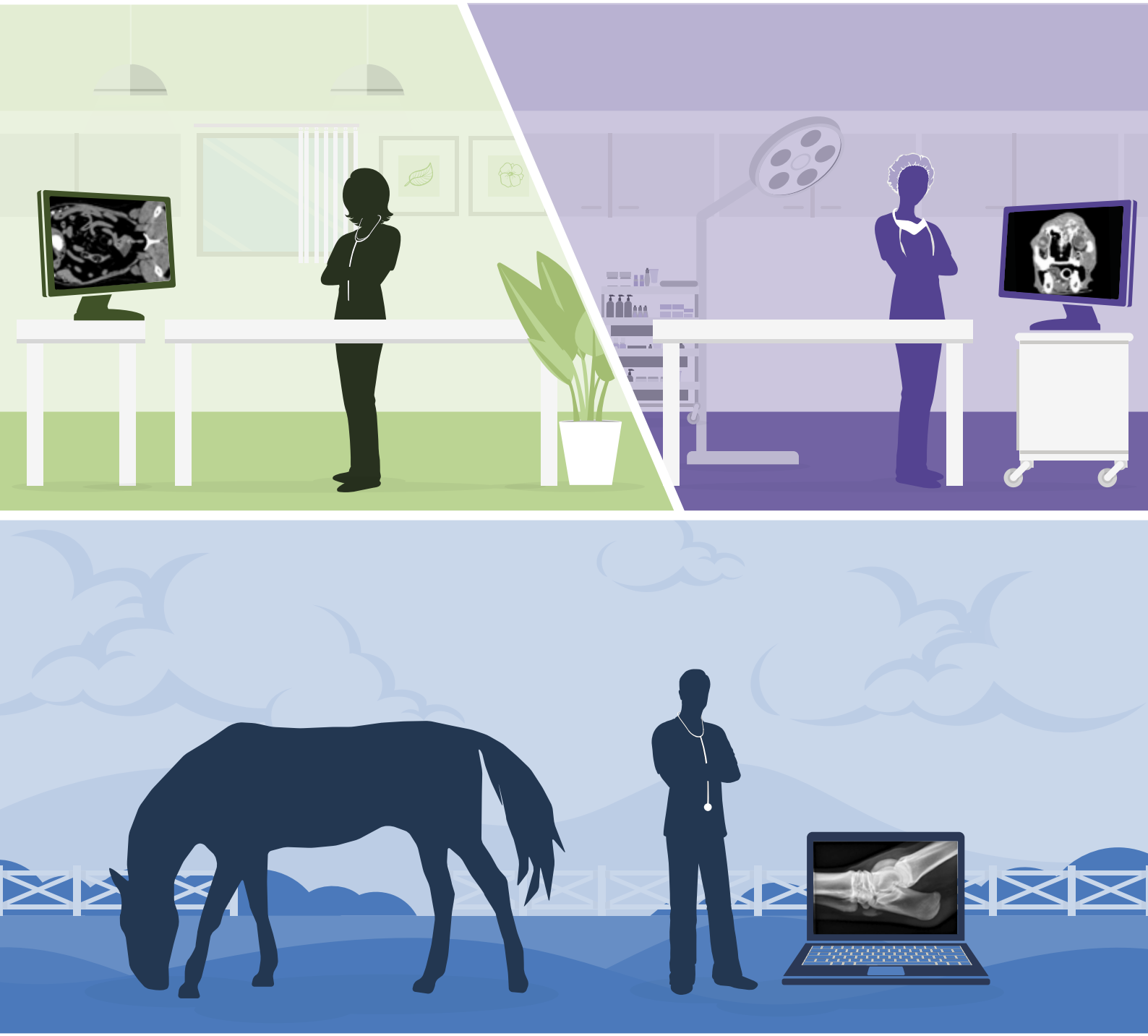

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Jane Ellison
BSc(Hons)

Jane is one of the senior information scientists at the Veterinary Poisons Information Service, having started her career in human toxicology at the National Poisons Information Service at Guy's Hospital. In addition to working on the 24-hour team, she provides CPD courses on small animal poisonings, lectures at conferences and to veterinary practices and their clients, and writes for a number of publications.

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POISONS

Emerging concerns. What's new in poisoning?

The Veterinary Poisons Information Service (VPIS) receives around 12,000 enquiries per year and, as has been mentioned before (Ellison, 2017), the pattern of poisoning remains much the same – with the majority of agents involved being things that owners have in and around the home, such as food, cleaning products, analgesics and rodenticides. So the answer to the question of "What's new in poisoning?" is, thankfully, "Not much".

Cats will continue to eat tablets dropped on the floor and dogs will continue to eat, well, everything!

Newer formulations of existing products may represent a heightened risk of exposure, whilst increased prescribing or new medications may present a greater likelihood of contact or exposure. Laundry capsules – representing highly concentrated hits of detergent – have been covered in a previous issue.

Electronic cigarettes

Electronic cigarettes and their refill liquids continue to gain in popularity amongst smokers trying to give up – or reduce – their dependency on nicotine, and hence are more likely to be found in bags, homes and cars. The numbers of enquiries regarding these agents mirrors their increasing popularity; but no serious cases have been seen by the VPIS, with approximately half of the animals remaining asymptomatic.

Those that do develop clinical signs will exhibit mild degrees of hypersalivation, vomiting, diarrhoea or tachycardia. Owners are usually well aware of which strength of nicotine is present in the electronic cigarette or refill liquid with the various and wide-ranging flavours ranging from 3mg of nicotine per ml up to 20mg/ml. The refill bottles are usually 10ml, making it a straightforward calculation when the weight of the animal is known. Treatment should be considered for anything over 1mg/kg.

The oral bioavailability of nicotine is low (Svensson, 1987) as it is subject to 'first pass' metabolism that converts it to inactive metabolites. This is precisely the reason it must be smoked rather than ingested to obtain the effects of nicotine.

In addition, nicotine is a weak base, so absorption in the stomach is low because of the low pH. The oral mucosa is the principal site of nicotine absorption and it is also readily absorbed from the nasal mucosa (Svensson, 1987). In addition, the emetic effect of nicotine also reduces absorption (Anderson, 1989).

It would be expected that clinical signs – if they are to develop – would present within 15 minutes to four hours. If the treatment dose of 1mg/kg has been exceeded, activated charcoal should be administered and the mouth and skin washed and irrigated. Any symptomatic animal should be monitored for four hours, with attention being paid to pulse, respiration, temperature and blood pressure.

If the animal shows any hyperactivity, diazepam may be given; but, beyond that, treatment is essentially supportive with most animals recovering quickly.

'Jerky' treats

Since 2007, the US Food and Drug Administration (FDA) has received a number of reports of 'jerky' treats, originating from China, causing illness in dogs. As of 31 December 2015, the FDA has received approximately 5,200 complaints of illnesses associated with consumption of chicken, duck, or sweet potato jerky treats – many of which involve products imported from China, which produces most of the jerky pet treats on the market. The reports involve more than 6,200 dogs, 26 cats, three people, and include more than 1,140 canine deaths.

Reports have also been received from Canada, New Zealand and Australia, and although there has been no definitive link with these treats causing Fanconi syndrome, there does seem to be an association that merits close investigation and awareness.

As such, the VPIS has issued a warning to pet owners who regularly feed jerky treats to their dogs, instructing them to be on the watch for any abnormal signs, such as extreme tiredness; and has set up a case registry, where vets are invited to submit cases to establish the extent of the problem in the UK.

The development of new drugs – along with altered prescribing status of existing drugs – means that companion animals will potentially be exposed to medications not previously seen in a home situation before.

Dovonex

Vitamin D cream (Dovonex, Leo Labs) for the treatment of psoriasis, can now be bought over the counter, having previously only been available on prescription. This will, of course, not impact the numbers of people suffering from psoriasis or requiring treatment; but it may possibly increase the ease with which animals can access the medication in the home if it is more readily available.

Calcipotriol, the active ingredient of Dovonex, is a synthetic derivative of calcitriol, a form of vitamin D. In an overdose situation, such as when a dog chews or licks the tube, or even licks the product from the owner's skin, there is greatly enhanced reabsorption, which leads to remineralisation of the kidneys and the soft tissues.

Clinical signs would include polydipsia and polyuria accompanied by profuse vomiting and diarrhoea. As the course of the poisoning progresses and calcium concentrations rise, dyspnoea and tachypnoea, muscle spasms and convulsions would become evident. Higher calcium concentrations would lead to cardiac changes and death is usually as a result of shock and pulmonary oedema.

"Cats will continue to eat tablets dropped on the floor and dogs will continue to eat, well, everything!"

The aim of therapy would be to ensure adequate hydration and urinary output, to control calcium concentrations whilst reducing phosphorus concentrations. This would be achieved with a combination of intravenous saline with a diuretic, steroids, antiemetics, gastroprotectants, phosphate binders, corticosteroids and either a bisphosphonate or calcitonin, but not both.

Anticoagulants

Since the development, in the early 2000s, of newer anticoagulant medications, drugs such as rivaroxaban and dabigatran have become more commonplace in households. Rivaroxaban does not inhibit thrombin (activated Factor II) and has no effect on platelets – working instead higher up the coagulation cascade to inhibit the production of Factor Xa.

Ingestion of any amount by companion animals could result in an increase in the prothrombin time, although this would be expected to resolve within 24 hours. As rivaroxaban is rapidly absorbed, an emetic is unlikely to be worthwhile; but activated charcoal could be considered if ingestion was very recent (<1 hour).

If there is any reason why the animal is at particular risk of bleeding – such as renal or hepatic impairment or active ulcerative gastrointestinal disease – observation for 24 hours should be considered, with the additional measure of cage rest and limited physical exercise for 24 hours.

If possible, check the prothrombin time (PT) at four hours. The aPPT is also prolonged, but does not correlate well with plasma concentrations and is not a reliable test for assessing the effect of rivaroxaban (Xarelto SPC, 2013).

As there is no reversal agent for rivaroxaban – and Vitamin K and protamine are not expected to affect the anticoagulant activity of rivaroxaban – treatment would be symptomatic in the event of any bleeding complications and may include measures such as mechanical compression, surgical intervention, fluid replacement and haemodynamic support, blood transfusion, fresh frozen plasma and platelets.

Lilies and meerkats

It is well known – although poorly understood – that cats are at risk of nephrotoxicity from lily exposure in a way that dogs are not. There has been a report in the literature recently of suspected lily toxicosis in a meerkat, following ingestion of the flowers and buds of the Oriental lily by the animal. The meerkat died 40 hours after ingestion, having presented with oliguria seizure, tachypnoea, nystagmus and self-biting.

Gross and histopathologic lesions consistent with acute renal failure were evident in the animal, but in addition, massive hepatocyte necrosis and pulmonary congestion

and oedema were observed, suggesting that in addition to the renal failure seen in domestic cats, lily toxicosis in meerkats is characterised by hepatic and pulmonary failure.

Over the horizon?

There are not really any 'new' or emerging treatments for poisoning on the horizon.

Methacarbomol

Methacarbomol (Robaxin, Almirall), the centrally acting muscle relaxant used therapeutically in multiple sclerosis, cerebral palsy and muscular dystrophy, is a useful additional treatment in situations where convulsions are proving hard to control – such as tremorgenic mycotoxin poisoning, metaldehyde, baclofen or permethrin toxicity. It can be given in addition to diazepam, barbiturates or propofol and administered orally, rectally or crushed and delivered via a nasogastric tube.

Lipid therapy

Lipid therapy or intravenous lipid infusion is no longer considered a new treatment, and the agents on which it works well – such as ivermectins, permethrin, tremorgenic mycotoxins and high-dose, non-steroidal anti-inflammatory drugs – are well established.

It would be expected to work well on drugs or compounds with a short to moderate half-life and which are lipophilic; however, this cannot be the whole story as lipid infusion works well on baclofen toxicity, and baclofen is barely lipophilic. There are other mechanisms at work and responsible for the mode of action and it may be a combination of a lipid sink or shuttling action, partitioning of the toxin away from the target organs and, given that it is lipid, it may act as an energy source for the cardiac myocytes, with the result that there is improved cardiac contractility.

One of its less-obvious advantages – in addition to its being cost-effective, relatively safe as long as the dose given is correct and not exceeded, and the animal has no pre-existing pancreatic or liver disorders – is that its use should reduce the severity of clinical effects, in addition to reducing the amount of time the animal needs to be receiving other treatments, such as propofol continuous-rate infusions.

There have been some recent reports in the literature where lipid infusion appears to have had a role in treating agents where we would not have expected any positive results, namely metaldhyde (not lipophilic) and vitamin D (an agent with a long half-life) (Lelescu, 2017; Perry, 2016). It may be that future use and research will give clarity on the mechanism of action of lipid infusion and may add to the range of agents for which it can be used successfully.

Footnote

The VPIS and other worldwide poison control centres play an important role in identifying and monitoring emerging toxicological issues and their treatments, and we are extremely grateful for all the follow-up information provided to us by veterinary surgeons and nurses, as it not only makes the data more robust but also helps pinpoint trends, incidences and changes in the pattern of poisoning cases. ■

"There have been some recent reports in the literature where lipid infusion appears to have had a role in treating agents where we would not have expected any positive results"

References

Anderson Y (1989). Tobacco ingestions in children. Clinical Pediatrics 28(12): 592-593.

Ellison J (2017). The current pattern of small animal poisoning. Veterinary Practice Today 5(3): 32-34.

Ozaki K et al (2018). Suspected lily toxicosis in a meerkat (Suricata suricatta): a case report. Journal of Veterianry Medical Science 80(3): 485-487.

Svensson CK (1987). Clinical pharmacokinetics of nicotine. Clinical Pharmacokinetics 12(1): 30-40.

Xarelto SPC (2013) Bayer plc.

Website leads the way to exposing scams and crooks

A new website was launched at the end of last year to protect pet owners from scams. It will allow anyone to report suspicious websites or traders in confidence and has been hailed as a useful resource that will help people buy pets responsibly.

The UK's top welfare organisations, trade associations and veterinary bodies have joined forces to protect the public from 'dodgy pet sellers'. Chaired by Dogs Trust, the Pet Advertising Advisory Group (PAAG) includes the BVA, BVNA, Cats Protection, City of London Trading Standards and the Exotic Pet Trade Association. Together, these organisations are fighting back against unscrupulous pet sellers who make a living by trading animals that are often sick, under age or illegally imported.

The move comes after research by the PAAG found that 37 per cent of the British public did no research at all before buying a pet. With around 1,000 new online pet advertisements appearing every day, the group has launched www.howtobuyapet.co.uk to give the public the knowledge they need to spot an untrustworthy advert or scam.

Welcome online initiative

The website focuses on the research prospective owners should undertake before buying a pet and what they can expect from pet ownership. It will also provide regular updates on scams and allow anyone to report suspicious websites or traders, in confidence.

PAAG chair, Paula Boyden, says: "Many of these sellers are underhand, putting profit before welfare. The public – who have the best intentions and want to give an animal a loving home – are not at fault. HowToBuyAPet.co.uk is designed to protect them; to help stop people becoming victims of a scam and to eliminate their chance of ending up with a sick pet, huge veterinary bills and heartbreak. We want our website to become the first step in their journey to getting a happy, healthy pet."

In addition to its public advice, the PAAG says that it will continue to work alongside classified websites, such as Gumtree and Pets4Homes, to remove illegal adverts. It is also pressing for all websites to commit to a set of minimum guidelines to which all of their animal adverts should adhere.

Paula continues: "We want the day to come when people are confident regarding the authenticity of an advert or seller. We are working hard today, to ensure the pet owners of tomorrow can buy a happy, healthy pet knowing it has been bred responsibly and the person they are buying from can be trusted.

"We would always encourage people to look at rehoming a rescue animal, but if you do decide to buy from a breeder, make sure you do your research to ensure you're buying from a trustworthy source."

Necessary exposure of crooks

This initiative comes hot on the heels of a report from the Dogs Trust that confirms widespread abuse of pet travel laws. The Trust is calling for urgent action to tackle puppy smuggling before Brexit, after a recent undercover investigation confirmed the scale of the problem.

According to the charity's latest report, a network of corrupt breeders, dealers and veterinary surgeons openly admit to breaking the law to export puppies. Sedated puppies have been found hidden, covered in their own faeces in cramped conditions, forced to travel over 1,000 miles in 30 hours with little water and no toilet breaks. Heavily pregnant bitches were also caged in 'sickening' conditions for gruelling journeys, so that their puppies could be 'born in the UK'.

One dealer admitted they had 300 bitches producing 'designer' puppies, such as French bulldogs – some of which were then advertised and sold in the UK. Another dealer, who claimed to evade border controls across Europe, said around 400 puppies a week – 20,000 a year – are exported from his home town and sold for an average price of £1,400.

The Dogs Trust says corrupt vets were also found to be falsifying passports and providing fake vaccination stamps.

This allows puppies to travel when they are younger than the law allows, without rabies and other vaccinations. Some vets were also willing to supply sedatives to bring puppies across the UK border undetected, the report says.

New trade routes from Serbia have been discovered; and evidence suggests under-age puppies are being sold with EU microchips and pre-filled European passports, to be passed off as EU-bred animals for easier entry into EU countries.

Urgency to do something

Paula Boyden, says: "With Brexit around the corner this is an opportunity of a lifetime to put robust measures in place that protect dogs and the public. We urge the Government to take forward our clear recommendations to overhaul our pet travel legislation and increase the penalties for those caught fuelling this despicable trade."

The Dogs Trust is encouraging people to write to their local MP asking them to take steps to end puppy smuggling. This should be a priority for veterinary practices too, together with drawing the attention of potential new puppy owners to the website, www.howtobuyapet.co.uk ■

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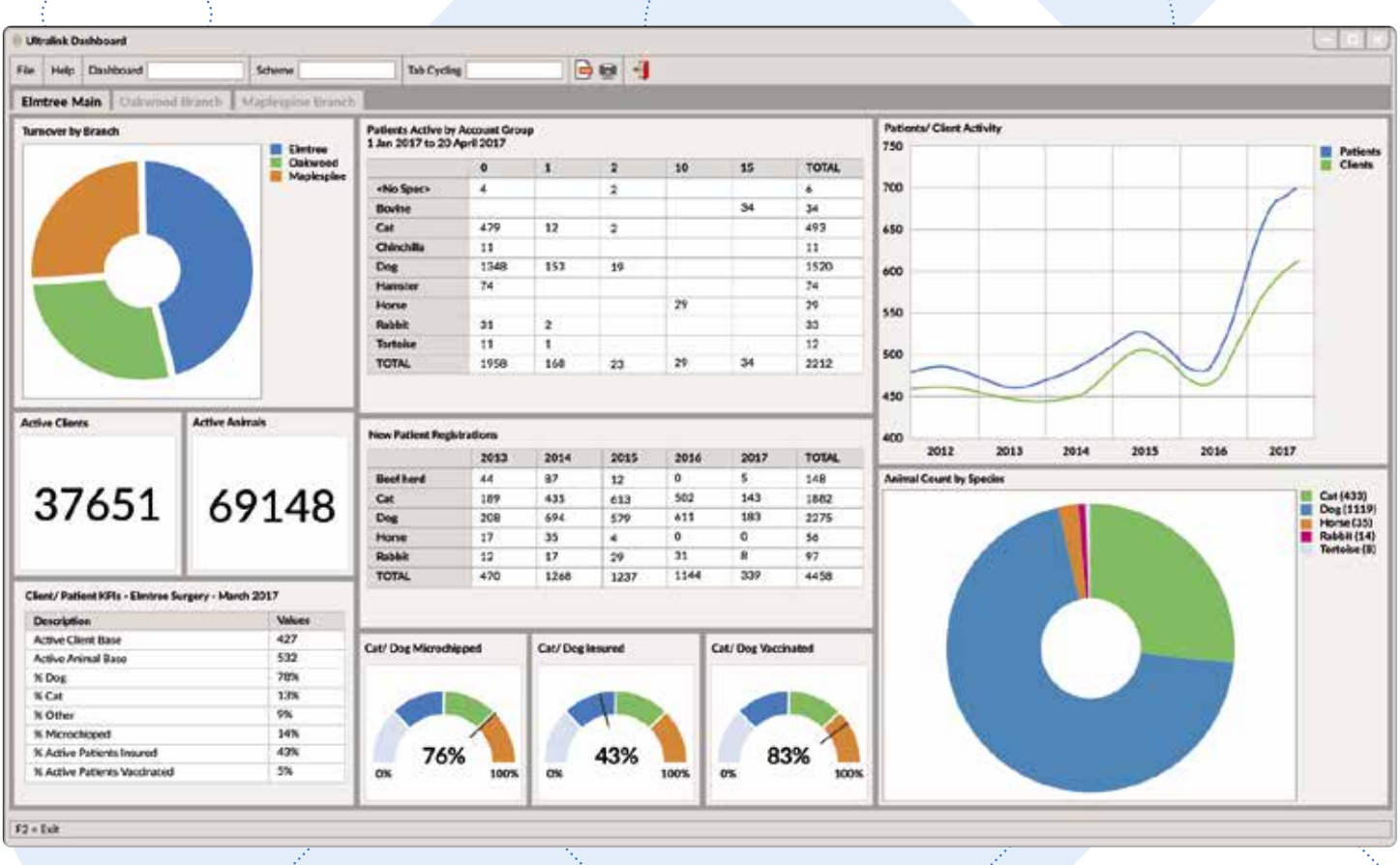

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Headshaking – an update

Sara Fleck
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Sara graduated from the University of Liverpool in 2010. She completed an internship in orthopaedics and diagnostic imaging at the Animal Health Trust before working in practices in both Newmarket and now, Bishopton Equine in North Yorkshire – a member practice of XLVets. Sara holds the RCVS Certificate in Advanced Veterinary Practice (Equine Medicine) and has a particular interest in cases of poor performance.*

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NEUROLOGY

Horses may shake their heads for a variety of reasons including: external irritation from parasites such as flies, or badly fitting tack; poor riding technique; challenging behaviour; irritation of the nasal passages, foreign bodies or masses within the nasal passages; dental pain; back pain or lameness.

Trigeminal neuropathy causing facial pain or dysaesthesia (abnormal sensation) in equine idiopathic headshaking has been confirmed recently (Aleman et al, 2013), although because an apparent cause has not yet been identified, the term idiopathic continues to be used.

The syndrome is best described as idiopathic trigeminal-mediated headshaking (ITMH). The prevalence of ITMH is reported to be 1 to 1.5 per cent in the UK.

Signalment and clinical signs

The occurrence of ITMH has been reported in horses with ages ranging from one to 30 years (Mills et al, 2002) but the age of onset is usually that of a young adult. Several studies suggest it may be more common in geldings, and that geldings are more frequently seasonally affected (Mills et al, 2002). All breeds appear to be susceptible and the onset may be acute or insidious.

Approximately 60 per cent of horses with ITMH exhibit seasonal variation in clinical signs, while others may have either constant or erratic episodes. Horses showing seasonality are usually affected most severely during the spring and summer months (Madigan and Bell, 2001; Mills et al, 2002). Horses with severe clinical signs during bright sunny days and with a reduction of signs at night are termed 'photic headshakers'. In other horses, headshaking may be triggered by wind or rain or loud noises. Clinical signs may occur at rest, but are usually worse at exercise and may be more extreme outdoors (Madigan and Bell, 2001; Newton et al, 2000).

Grade	Description
0/3	No headshaking
1/3	Headshaking at exercise; but not sufficient as to interfere with ridden exercise
2/3	Headshaking at exercise making the horse impossible or dangerous to ride
3/3	Headshaking even at rest

Table 1. A grading system for headshaking in horses

The classical clinical signs usually involve vertical head and neck movements, often with some sharp vertical jerks and twitches. These may be accompanied by other signs such as an 'anxious' facial expression, snorting, twitching lips and muzzle rubbing. Some horses may strike at their nose with their forelimbs and this can be so severe that the horse inflicts considerable self-trauma and becomes dangerous to handle and ride. (Pickles et al, 2014).

Progression of clinical signs has been reported anecdotally and it seems that spontaneous remission is rare but not impossible (Newton et al, 2000; Mills et al, 2002) – however, a longitudinal study of ITMH has not been published (Pickles et al, 2014). A grading system for the severity of clinical signs has been suggested, and is described in **Table 1**. The use of a grading system may be beneficial for more accurate monitoring of the disease, treatment efficacy and for comparison of published studies.

Aetiopathogenesis

'Neurosis of the infraorbital portion of the super-maxillary division of the trifacial nerve' was initially proposed over 100 years ago; however, confirmation of trigeminal involvement has only recently been definitively identified (Aleman et al, 2013). The studies conducted by Aleman et al. demonstrated differences in the threshold for activation of the infraorbital nerve – a branch of the maxillary division of the trigeminal nerve – with affected horses having significantly lower stimulus thresholds (≤5mA) than control horses (≥10mA) (Pickles et al, 2014).

"The syndrome is best described as idiopathic trigeminal-mediated headshaking (ITMH)"

This confirmed involvement of the trigeminal nerve hyperexcitability in the pathophysiology of disease. It was also suggested that the threshold of the nerve is changeable, because a horse with seasonal ITMH tested during a time of remission showed a threshold for activation similar to control horses.

The cause of trigeminal nerve hypersensitivity remains unknown. Studies undertaken in horses with ITMH have failed to find any pathological abnormalities of the trigeminal nerve (Aleman et al, 2013) or any evidence that the condition is directly heritable. There may be some kind of environmental influence given that some horses are affected seasonally and, as horses can go into spontaneous remission, it appears that trigeminal nerve hypersensitivity might be reversible, rather than the result of permanent damage. This supports the theory of a functional – rather than a structural – alteration in the sensory pathway of the trigeminal complex.

Exercise is a stimulus for signs of ITMH in some horses, possibly owing to increased air currents causing allodynia of the muzzle.

The over-representation of geldings has not yet been explained. A lack of testosterone-induced negative feedback of gonadotropins has been investigated as a hypothesis for this – and for the seasonality of clinical signs – but remains unproven (Pickles et al, 2011). Seasonal fluctuations in pasture nutrition, might offer an explanation for the seasonality of clinical signs and further investigation of such an association would be valuable.

Diagnosis

A thorough and complete history is vital in the diagnosis of ITMH and the signalment may offer additional information as to potential differential diagnoses. A diary of daily weather patterns, the horse's management, exercise regimen and the incidence of headshaking behaviour can be very helpful.

Observation of the horse at rest, exercise, inside, outside, loose, on the lunge, stabled, in the field, is also essential. It is important to see the horse ridden in different tack and weather conditions. Video recording may help the clinician to evaluate the horse in a variety of scenarios. Determining when headshaking appears – or when it is at its worst – can also help to determine if factors such as poor riding technique, bad behaviour and ill-fitting tack are the cause of the headshaking, or even concurrent factors in a case of ITMH.

> "The cause of trigeminal nerve hypersensitivity remains unknown"

A thorough clinical examination should be performed encompassing oral examination, ophthalmic examination, otoscopic examination, upper respiratory tract examination, guttural pouch endoscopy and head radiography. Computed tomography (CT) and magnetic resonance imaging are useful to discount other disorders of bone and soft tissue of the head. CT studies of horses with ITMH have not revealed any abnormalities (Pickles, 2014).

It is important to rule out any pathological disorder before a clinical diagnosis of ITMH is made. In cases of ITMH, there is a lack of apparent anatomical and pathological findings. If headshaking resolves following treatment of gross pathology, then one could deduce that this pathology was the cause and a diagnosis of ITMH excluded.

Diagnostic analgesia may also be used in the diagnosis of facial pain in the horse. Bilateral diagnostic analgesia of the maxillary nerve appears to have reasonable diagnostic value with a reported improvement in 13 out of 17 (Newton et al, 2000) and 23 out of 27 horses with ITMH (Roberts et al, 2013) when performed by an experienced clinician.
The 'gold standard' for diagnosis of ITMH is now considered to be measurement of somatosensory-evoked potentials and observation of a reduced threshold for nerve activation (Aleman et al. 2013). Such studies, however, are invasive and require general anaesthesia, which limits their clinical use.

Treatment

As a consequence of the largely unknown aetiology of ITMH, the majority of horses are managed rather than cured. As some horses appear to go into remission, the aberrant trigeminal nerve activity may be reversible and, if so, this may be the key to successful future treatments. Approximately 75 per cent of owners reported some improvement in ITMH with the use of nose nets (Mills and Taylor, 2003). However, their mechanism of action is unknown. It is possible that the sensory input is altered or inhibited by applying a different type of stimulus.

A variety of medications with differing mechanisms of action have been tried for the treatment of ITMH. Cyproheptadine, an antihistamine, and carbamazepine, an anti-epileptic drug, have been used, separately and in combination (Newton et al, 2000; Madigan and Bell, 2001) as well as gabapentin, a neuromodulatory drug. All three agents have shown variable results and their bioavailability, side effects and limitations regarding regulations and withdrawal times in competing horses may limit their use.

Surgical treatment has also been attempted. Bilateral infraorbital neurectomy was effective in three out of 19 horses, but serious side effects of self-trauma to the muzzle were common (Mair, 1999). Its use is, therefore, contraindicated. Better results have been seen with caudal ablation of the infraorbital nerve via coil compression. In a study of 58 horses, 49 per cent stopped headshaking –

"As a consequence of the largely unknown aetiology of ITMH, the majority of horses are managed rather than cured"

however, 26 per cent of these relapsed within two months to five years post-surgery (Roberts et al, 2013).

Most horses developed side effects, such as nose rubbing, following the procedure. These were short-term in most cases; although four out of 58 horses were euthanased owing to severity or non-resolution of these side effects. This procedure can be considered where euthanasia is the only other option.

Percutaneous electrical nerve stimulation (PENS) is one treatment available on the NHS for people suffering with neuropathic pain and has recently been trialled in horses suffering from ITMH. Approximately 50 per cent of horses that received treatment returned to their previous level of ridden work after a course of three treatments (Roberts et al, 2016). However, the length of the remission is variable, with an average of nine weeks. Although still in the early stages of development, electrical nerve stimulation carries minimal risks and may currently be the best first-line treatment for trigeminal-mediated headshakers who fail to respond to a nose net.

Conclusion

Despite recent advances, and the identification of abnormal trigeminal nerve physiology, idiopathic trigeminal mediated headshaking remains poorly understood. The underlying cause of this decreased activation threshold remains elusive and this limits the development of rational treatments.

Further research is required to truly understand the pathophysiology of ITMH and to enable further advances to best serve the welfare of horses suffering from this disease. ■

PPD Questions

1. What is the reported prevalence of ITMH in the UK horse population?
2. Is the stimulus threshold for activation of the infraorbital nerve of a horse affected by ITMH higher or lower than in unaffected horses?
3. Diagnostic analgesia of which nerve is most helpful for the diagnosis of facial pain in horses?
4. Which piece of equipment has been shown to reduce the clinical signs of headshaking in some horses with ITMH?

Answers

1. the prevalence of ITMH is reported to be 1-1.5 per cent in the UK
2. the stimulus threshold for activation of the infraorbital nerve is lower in affected horses (≤5mA) than in unaffected horses (≥10mA)
3. bilateral diagnostic analgesia of the maxillary nerve appears to have reasonable diagnostic value
4. approximately 75 per cent of owners reported some improvement in ITMH with the use of nose nets.

References

Aleman M et al (2013). Sensory nerve conduction and somatosensory evoked potentials of the trigeminal nerve in horses with idiopathic headshaking. Journal of Veterinary Internal Medicine 27: 1571-1580.

Madigan JE and Bell SA (2001). Owner survey of headshaking in horses. Journal of the American Veterinary Medical Association 210: 334-337.

Mair TS (1999). Assessment of bilateral infra-orbital nerve blockade and bilateral infra-orbital neurectomy in the investigation and treatment of idiopathic headshaking. Equine Veterinary Journal 31: 262-264.

Mills DS et al (2002). Reported response to treatment among 245 cases of equine headshaking. Veterinary Record 150: 311-313.

Mills DS and Taylor K (2003). Field study of the efficacy of three types of nose net for the treatment of headshaking in horses. Veterinary Record 152: 41-44.

Newton SA et al (2000). Headshaking in horses: possible aetiopathogenesis suggested by the results of diagnostic tests and several treatment regimes used in 20 cases. Equine Veterinary Journal 32: 208-216.

Pickles KJ et al (2011). Use of a gonadotrophin-releasing hormone vaccine in headshaking horses Veterinary Record 168: 19.

Pickles KJ et al (2014). Idiopathic headshaking: is it still idiopathic? Veterinary Journal 201: 21-30.

Roberts VL (2013). Caudal anaesthesia of the infraorbital nerve for diagnosis of idiopathic headshaking and caudal compression of the infraorbital nerve for its treatment in 58 horses. Equine Veterinary Journal 45: 107-110.

Roberts VL et al (2016). Neuromodulation using percutaneous electrical nerve stimulation for the management of trigeminal-mediated headshaking: a safe procedure resulting in medium-term remission in five of seven horses. Equine Veterinary Journal 48: 201-204.

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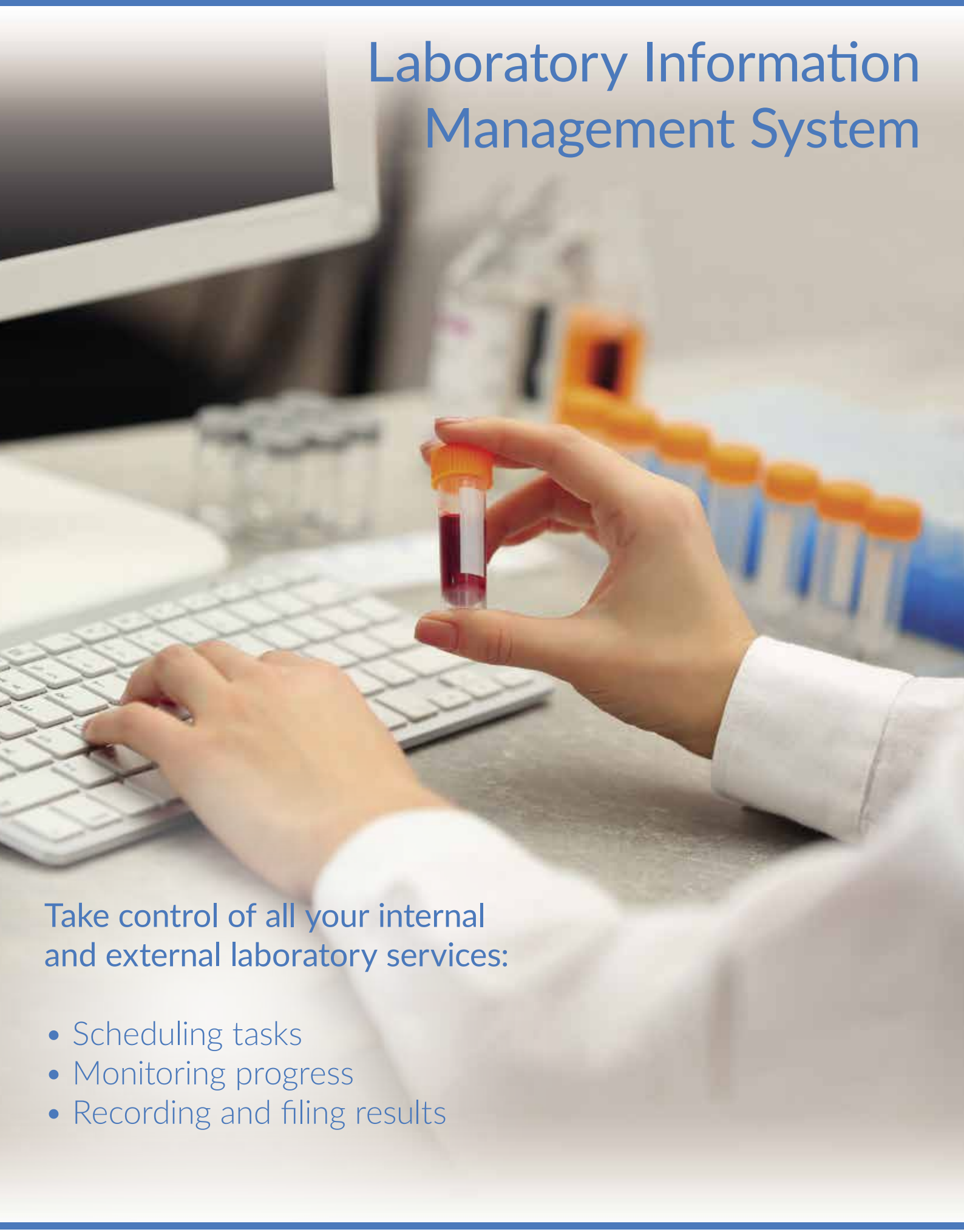

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Equine emergencies. Can reducing stress improve clinical performance?

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EMERGENCIES

It is four o'clock in the afternoon on a Friday before a bank holiday weekend and the vets are frantically sorting through their paperwork when the phone rings. You strain to overhear the receptionist's half of the conversation. "Mr Walden's horse is down." Your pulse rate goes up a touch and anxiety levels rise. Any details obtained prior to the visit are sparse at best – and often unreliable or inaccurate. How long has it been down? Is it colicking; or worse, neurological? How old is it? What size is it? Questions tumble through your mind as you head out of the door. Sounding familiar?

In the authors' experience, anxiety associated with the equine emergency comes from the lack of information provided and thus, fear of the unknown. Will I know what's wrong? What am I going to do? Should I refer it? Our attitude to such cases directly influences the client's decision-making, and thus the clinical outcome (Fessler and Adams, 1996). The ability to embrace the challenge of the unknown is perhaps the hardest part of veterinary medicine to master.

The are many invaluable texts regarding the veterinary medicine of the equine emergency (Archer, 2013; Orsini and Divers, 2014; Southwood and Wilkins, 2015); however, little is said about our mindset and how this influences our communication. It is reassuring to remember that, regardless of the case presented to you, there is much common ground which can aid your approach.

Adequate preparedness

It is not uncommon to find veterinary professionals trying to obtain valuable information regarding the case from the receptionist prior to leaving to examine the animal. Whilst entirely rational, in the authors' opinion it is far more useful to ring the client yourself whilst on the way to the call. This has several benefits.

Information gathering

Essentially this starts the history taking whilst on your way. Direct communication is the most reliable. It also affords you the ability to explore certain details further, improving accuracy of the information. This may expedite your approach to the case, particularly should you identify a need for further assistance to manage the situation safely, effectively and professionally – prompt contact with the Fire and Rescue Service, for example, will prevent unnecessary delays for a trapped horse.

Offering reassurance

Simply knowing help is on the way is often enough to provide valuable reassurance to the client, and may serve to improve their confidence in you.

Providing focus

Taking a history is not only automatic for the veterinary professional, but could be viewed as a 'comfort blanket', particularly if the equine emergency is unfamiliar ground. Obtaining a good case history is far from species specific and may help to build confidence as knowledge of the situation is acquired. Focussing your mind on the safety considerations of the scenario, as well as the potential causes for the clinical condition, can help you to present a logical, ordered approach to the case once you arrive.

Establishing rapport and managing expectations

In general, a client's expectation once you are with the horse is for you to *do* something. Establishing a rapport with an anxious client is highly challenging, but critical to set up constructive communication for the consultation (Radford et al, 2006). Opening dialogue with the client en route to provide support and discuss the case allows you to better understand and meet their needs following arrival. Additionally, understanding the severity of the horse's clinical state enables you to signpost and deliver 'warning shots' as necessary.

Anticipating potential conflicts or difficulties

Pitfalls in practice most commonly arise from failures in communication. Being aware of potential conflicts ensures you are best placed to manage them. Maybe the owner's strong ethical beliefs regarding their animal's end-

> "In the authors' experience, anxiety associated with the equine emergency comes from the lack of information provided and thus, fear of the unknown"

of-life care are at odds with your own? It is imperative that such differences are identified, acknowledged and managed for a successful resolution. For example, the authors find it easier – and fairer – to ask a client about their views on surgical treatment of colic before the need arises, rather than waiting until they are presented with an ultimatum – surgery or euthanasia?

Of course, one of the reasons for obtaining further case information prior to leaving the safety of the clinic is to ensure you have appropriate equipment or medication. Ensuring your car is appropriately stocked at the start of each day/on-call period is vital. Useful checklists can be used (Archer, 2013) and the authors recommend the clinic has dedicated kits for more specific emergency cases – such as foalings, ophthalmic cases, splinting and so on. Knowing you are properly equipped goes a long way to improving comfort levels.

On arrival

On arrival it is useful to spend a brief amount of time observing the situation. Identify the client, introduce yourself and assess the safety of the situation for you, all other personnel and the horse. It is very easy to get drawn into focussing on the major presenting problem from the client's perception; and without stepping back to assess the situation broadly first, the potential for overlooking other injuries or clinical problems increases.

In general, emergency appointments are requested on the basis of observation – recumbency or inability to bear weight, for instance – that could originate from a variety of causes. Is a horse down secondary to colic, limb trauma, neurological disease, exhaustion and age, physical restriction or something else? The key to ascertaining suitable differential diagnoses is perform a systemic, thorough physical examination. It is prudent to acknowledge the owner's concerns verbally to them, and qualify your reasons for examining the rest of the horse, before focussing on the primary or obvious problem.

By keeping a calm, logical, systematic approach to your examination you are more likely to build a complete clinical picture, resulting in an accurate and relevant problem list from which to work (**Figures 1-4**). In turn, this facilitates appropriate triaging of the problems detected, such that a management plan can be formulated.

Consider whether additional diagnostics are required. Just because we can, doesn't mean we should. Often diagnostic options are available, but it is worth asking the question 'Will the findings from this diagnostic test affect what I do or advise; or what the client will do?'. Involving the client in this thought process is critical.

For example, you ascertain a seven-year-old Warmblood gelding has severe endotoxaemia. It is apparent from physical examination this is most likely to be secondary to a strangulating small intestinal lesion. It has been made clear by the owner that surgical management is not optional. You are aware that euthanasia is the only viable treatment option remaining; however, in the owner's eyes, the horse that had colic, is now just very dull and depressed. In this case, performing abdominocentesis, despite the fact that this result is unlikely to alter what you would do or advise, may provide the owner with objective evidence to support your opinion and guide them towards the necessary outcome.

Building confidence

Once a working diagnosis emerges, clinicians often feel on more familiar terrain and confidence in managing the case grows. Therefore, it is perhaps worth considering that it is not the limit of our clinical knowledge, skill, nor ability that affects outcomes in such situations; but rather our attitude to the emergency situation itself. It is possible, using neuroscience theory, to attempt to explain and, therefore, normalise these feelings of anxiety.

The 'approach-avoid response' is well documented and illustrates why we are likely to experience anxiety and lack confidence in such situations (Rock, 2008). By recognising this as a natural phenomenon, we are able to adjust our behaviours and interactions with others, hopefully improving clinical performance and outcome.

Rock (2008) identified that much of our motivation and social behaviour is governed by a need to minimise threats and maximise reward. The central networks of the brain involved use the same pathways as those utilised for primary survival needs. In essence, social needs are treated in the same way by the brain as the need for food and water (Rock, 2008).

In the SCARF model, five domains of social experience are described which activate either the primary reward or primary threat networks of the brain (Rock, 2008):

- **Status** – the importance to others
- **Certainty** – being able to predict the short-term future
- **Autonomy** – the sense of control over situations
- **Relatedness** – feeling amongst friends rather than foes
- **Fairness** – the perception of fairness between interactions with others.

One can see how this model may be used to explain the

"... in the authors' opinion it is far more useful to ring the client yourself whilst on the way to the call"

Careful diagnosis – a case history example

Figure 1. *A nail located in the mid-third of the median sulcus of the right hind frog. The location naturally raised suspicion as to whether there had been penetration of the navicular bursa, distal interphalangeal joint, or deep digital flexor tendon. The horse was 8/10 lame at presentation.*

Figure 2.

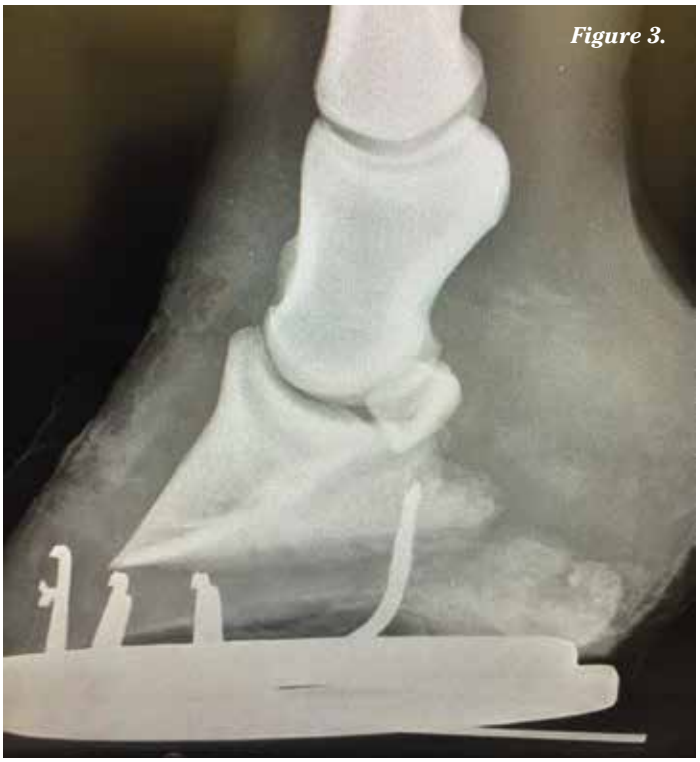

Figure 3.

Figures 2 *&* ***3.*** *Dorsoplantar and lateromedial radiograph of the right hind foot with the nail in situ. It was unclear from these images alone whether DIP joint or navicular bursa penetration had occurred.*

Figure 4. *The nail, having been removed at surgery. While it appeared only around three quarters of an inch of the nail had penetrated through the sole, DIP synoviocentesis was consistent with significant inflammation. In light of this, navicular bursoscopy was performed under general anaesthesia. During surgery the wound was probed and the end of the probe visualised within the bursa confirming septic synovitis.*

It is likely that the force of the impact of the nail penetrating the foot was significant enough to enter the navicular bursa; but owing to reduced weight-bearing the penetration does not appear to be as deep as it actually was. It is important that the clinical appearance of the case is considered at the forefront of one's mind when assessing the diagnostic evidence, to ensure the correct diagnosis is reached.

emotional challenge of the equine emergency to the veterinary surgeon. Thoughts that may pervade the mind of an uncertain individual could include:

- "If this situation doesn't end well, the client might not respect me as a vet" (status)
- "I don't know how this case is going to end" (certainty)
- "The horse is injured and the client is upset. I have no control over this" (autonomy)
- "The client won't ask for me in future" (relatedness)
- "Can someone else not attend?", underpinned by feelings of "I haven't seen this problem before, it's not fair to send me" (fairness).

Using SCARF to improve clinical confidence involves finding ways to minimise threat and increase reward in each of the five domains.

Status

Following the advice above regarding communication, history taking and undertaking a full, logical and detailed clinical examination helps to firmly establish the status of the attending veterinary surgeon as the clinical lead in that situation.

Certainty

Whilst driving to the visit, break down the task into several smaller steps and consider the possible outcomes for each clinical scenario. For example, if the 'down' horse is trapped, further – possibly mechanical – assistance may be required, such as the Fire Service. Certainty of those around the injured animal can be increased by telling them what you are going to do, doing it, then telling them what you have done.

Autonomy

Once again, breaking down the situation into smaller steps will increase control over each stage.

Relatedness

Information perceived from people "like us" is processed differently in the brain from information received from people "not like us". Simply using words like "we" and "us" in the conversation can encourage these pathways. For example: "This is the situation we have. Now we have this information, we can make a decision together."

> "Understanding the domains of SCARF and finding personalised strategies to use the model will assist individuals become more effective in situations which, initially, appear threatening and intimidating"

Fairness

Fair exchanges and interactions between individuals are intrinsically rewarding (Rock, 2008). Re-framing the situation can increase the reward from the fairness domain. Thoughts of "I'm going to do this visit, I will learn from it, and this will reward me with valuable experience" reduces unfairness threat pathways. Both practice and individual have had a fair exchange.

Conclusion

Understanding the domains of SCARF and finding personalised strategies to use the model will assist individuals become more effective in situations which, initially, appear threatening and intimidating. Ultimately, if we can approach an emergency being comfortable – rather than feeling uncomfortable – we may find the whole experience much more rewarding. ■

PPD Questions

1. Why is it imperative to obtain a detailed clinical history? (Multiple answers may be applicable)
   - A. to help create an appropriate list of differential diagnoses
   - B. to help create a treatment plan on my way to the call
   - C. to provide an opportunity to obtain accurate, relevant case information; establish a rapport with the client and improve my clinical approach
   - D. to provide the client with a prognosis.

2. Which factor is most important to take into account when choosing whether to perform further diagnostics?
   - A. cost
   - B. practicality
   - C. the result will change what I do and/or advise; or what the owner will do
   - D. convenience.

3. Breaking a complex task into smaller manageable chunks increases the reward in which domains?
   - A. status and certainty
   - B. certainty and autonomy
   - C. fairness
   - D. all five domains.

Answers
1. A&C 2. C 3. B.

References

Archer D (2013). Handbook of Equine Emergencies. [electronic book]. Saunders, Edinburgh. (Online access with subscription: Elsevier (Sciencedirect Freedom Collection)). Available at: https://liverpool.idm.oclc.org/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cat00003a&AN=lvp.b3994749&site=eds-live&scope=site (Accessed: 13 October 2018).

Fessler JF and Adams SB (1996). Decision making in ruminant orthopaedics. Veterinary Clinics of North America: Food Animal Practice 12: 1-18.

Orsini JA and Divers TJ (2014). Equine Emergencies. [electronic book] : treatment and procedures. Elsevier/Saunders, St. Louis, MO. (Online access with subscription: Elsevier (Sciencedirect Freedom Collection)). Available at: https://liverpool.idm.oclc.org/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cat00003a&AN=lvp.b3994832&site=eds-live&scope=site (Accessed: 13 October 2018)

Radford A et al (2006). Development, Teaching, and Evaluation of a Consultation Structure Model for Use in Veterinary Education. Journal of Veterinary Medical Education 33(1): 38-44.

Rock D (2008). SCARF: a brain-based model for collaborating with and influencing others. NeuroLeadership Journal 1: 1-9.

Southwood LL and Wilkins PA (2015). Equine Emergency and Critical Care Medicine. Boca Raton, FL: CRC Press.

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METABOLIC DISEASE

Milk fever – an overview

Milk fever or periparturient hypocalcaemia, is a metabolic disease of dairy cows that occurs around the time of calving. During the dry period, calcium requirements are relatively low; but at calving there is a sudden increase in calcium requirement as lactation begins. If this demand is not met quickly enough, the concentration of calcium in the blood drops below a critical threshold, resulting in either clinical or subclinical milk fever.

A cow can lose 23g of calcium in 10 litres of colostrum in one milking; yet, typically, only has 12g of free calcium available to her. This huge demand for calcium must be met from elsewhere to prevent milk fever developing. The average incidence of clinical milk fever in the UK dairy herd is four to nine per cent, while the incidence of subclinical milk fever is estimated to be between 25 to 50 per cent. The average cost of a case of milk fever is approximately £200 (Husband, 2005).

As plasma calcium is required for neuromuscular function, milk fever is characterised by decreased feed intake, decreased heart rate, inhibition of urination and defaecation, rumen and intestinal stasis and reduced rectal temperature. If it is left untreated, cows progress to lateral recumbency, and eventually coma and death.

Reduced feed intake leads to greater fat mobilisation, and one study (Reinhardt et al, 2011) has shown cows with low blood calcium levels post calving (<2mmol/L) have higher concentrations of non-esterified fatty acids (NEFAs). As muscle contraction is inhibited, the teat sphincter relaxes; which leads to an increased risk of mastitis. Hypocalcaemia post calving also directly impairs immune cell response to an activating stimulus, therefore making these cows more susceptible to disease.

As shown in **Figure 1**, the incidence of mastitis and ketosis in cows recovering from

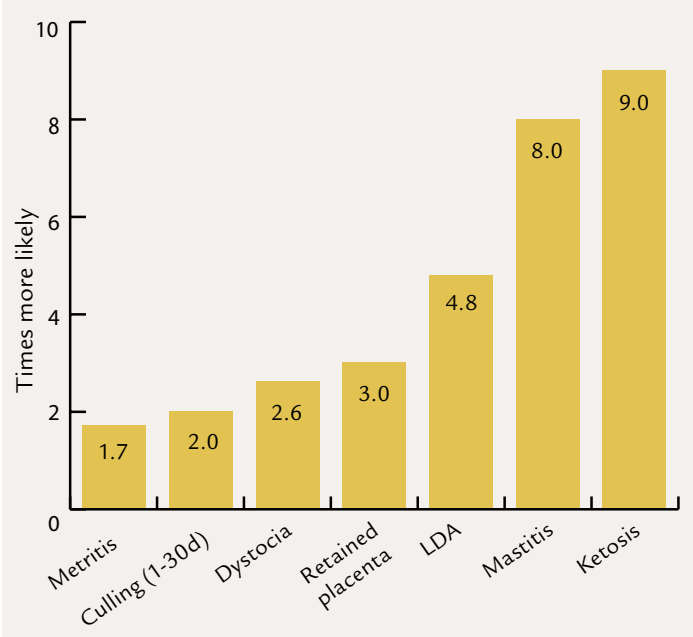

Figure 1. *The incidence of other conditions associated with milk fever (Source: EBVC, 2011).*

Figure 2. *A cow with milk fever and metritis.*

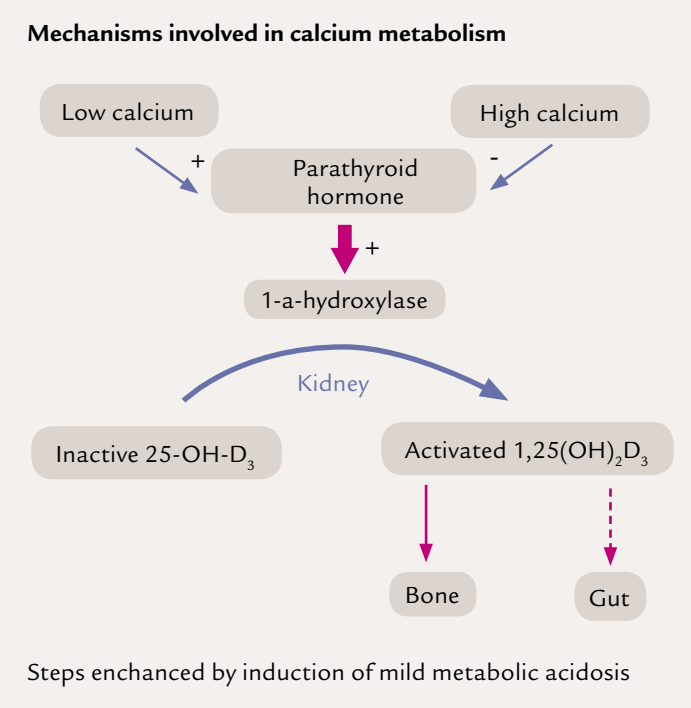

Figure 3. *The mechanisms involved in calcium metabolism in the cow (Husband J, 2005).*

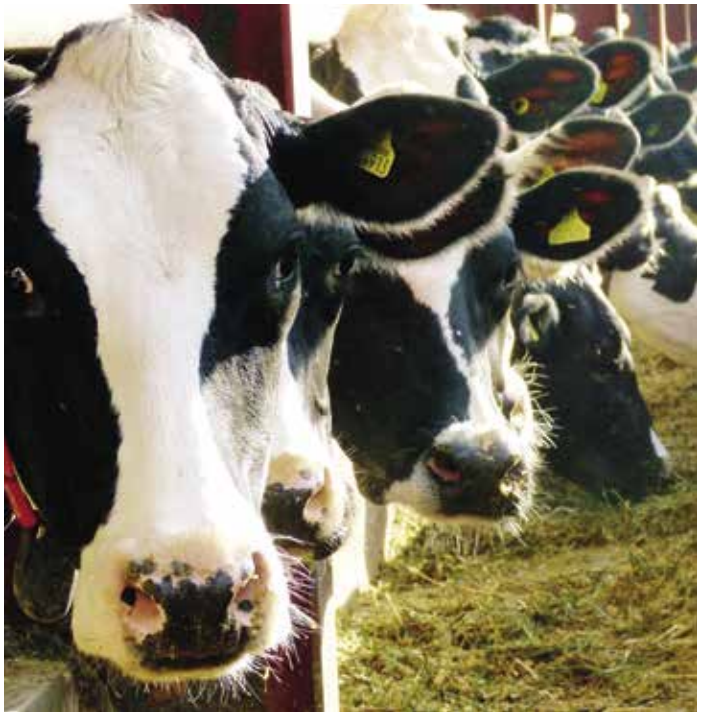

Figure 4. *Milk fever is a disease that can largely be prevented and controlled through careful transition cow feeding.*

milk fever is eight and nine times greater, respectively. The incidences of dystocia, retained foetal membranes, displaced abomasum and uterine prolapse are all greater in cows with milk fever (**Figure 2**).

During the dry period, calcium requirements for skeletal development and maintenance are low – at less than 30g/day. At calving, the demand for calcium is much increased – 2.3g Ca/L of colostrum produced and 1.2g Ca/L milk produced. Calcium quantity in milk increases as butterfats increase. The cow does not have enough calcium in her bloodstream to meet these increased demands, and so it must be replaced by the activation of homeostatic mechanisms to increase its intestinal absorption, reduce renal excretion and increase resorption from the bone (**Figure 3**).

Low blood calcium causes the parathyroid glands to secrete parathyroid hormone (PTH). This hormone increases renal re-absorption of calcium from glomerular filtrate within minutes. Although the amount of calcium available for recovery from the urine is small, this process may still be sufficient to compensate for small decreases in plasma calcium. However, in many cases this mechanism alone is insufficient and continued PTH secretion stimulates calcium resorption from bone. The bones are the source of 95 per cent of the cow's calcium, which is available to the cow in two forms.

There is a soluble, readily available pool of calcium in the fluid surrounding bone cells. PTH acts on bone lining cells to transfer this soluble calcium into the extracellular pool. There is approximately 6-10g of calcium available here, which can be increased by 6-8g in cows under metabolic acidosis.

PTH also activates the renal enzyme responsible for producing the vitamin D metabolite, 1,25 $(OH)_2 D_3$. This stimulates osteoclastic bone resorption activity to mobilise more calcium from the skeleton – cows typically lose nine to 13 per cent of skeletal calcium in first month of lactation. 1,25 $(OH)_2 D_3$ also increases renal tubular reabsorption of calcium and stimulates active transport of dietary calcium across the intestinal wall.

These mechanisms take between 24 and 48 hours to correct the negative calcium balance and both are magnesium dependant. The nadir in blood calcium occurs at 12 to 24 hours post calving. Normal blood calcium for an adult cow is 2.1-2.8mmol/L, with clinical or subclinical milk fever occurring below this (*Merck Veterinary Manual*).

Certain breeds are more susceptible to milk fever, including Jerseys, Channel Islands and Swedish red and whites. It is thought this is a consequence of the increased loss of calcium in their milk with increasing butterfat, and that there are fewer intestinal receptors for 1,25 $(OH)_2 D_3$ in these breeds.

The risk of milk fever also increases with age, rising by nine per cent per lactation. (DeGaris et al, 2009). There are several reasons for this – there is usually an increasing milk yield and, therefore, demand for calcium with increasing age. Older cows are also less able to mobilise calcium from the bone, and have reduced active transport of calcium from the intestines owing to reduced production of the steroid hormone, 1, 25 $(OH_2)D_3$ and reduced receptors on target tissues.

Prevention of milk fever

Milk fever is a disease that can largely be prevented and controlled through careful transition cow feeding (**Figure 4**). Some of the key principles are discussed overleaf.

"A cow can lose 23g of calcium in 10 litres of colostrum in one milking; yet, typically, only has 12g of free calcium available to her"

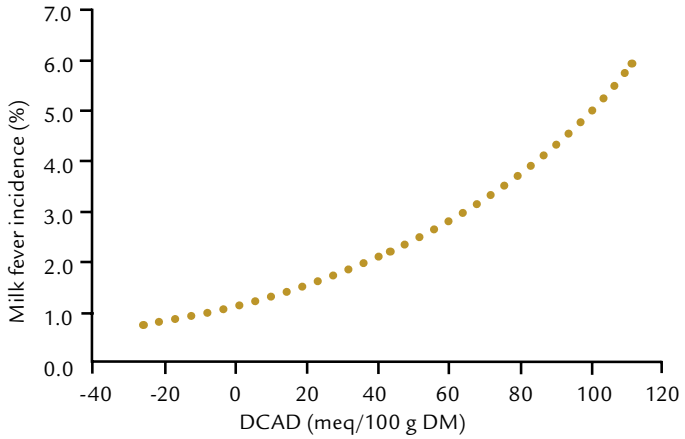

Figure 5. *The linear relationship between DCAB and milk fever incidence (DeGaris PJ and Lean IJ, 2009).*

Dietary cation anion balance (DCAB)

The transition diet can be manipulated to push the cow into mild metabolic acidosis, which has been shown to reduce the risk of clinical milk fever. Reducing the DCAB reduces the risk of milk fever – the two have a linear relationship (**Figure 5**).

DCAB (meq/kg DM) = (sodium + potassium) - (chlorine + sulphur)

Feeding a dry cow diet higher in anionic salts, chloride and sulphur, reduces the DCAB, making the cow acidotic and the blood and urine pH decrease. These acidotic conditions increase the tissues' responsiveness to PTH as the receptors for PTH on bone and kidney cells function better, as well as increasing the production of 1,25 $(OH)2D_3$ and, therefore, increasing active transport of calcium across the intestine. Cows in metabolic acidosis are thus more able to mobilise more calcium and meet the increasing requirements without suffering from milk fever.

A low DCAB dry cow diet can be achieved by two means.

1. Manipulating the diet to achieve a low DCAB

By manipulating the diet, it may be possible to achieve a DCAB of <50-100 without adding anionic salts. The two cations in the DCAB equation, sodium and potassium must be kept at low levels to achieve a low DCAB. Potassium in UK diets is usually the most difficult to control. Grass, grass silage and hay can all be very high in potassium, while maize, whole crop silages and straw are usually low in potassium.

It is crucial to have all forages fed to dry cows analysed for their mineral content, because there can be great variation (**Figure 6**). As a rule, potassium must be kept <1% DM. Potassium in grass can be reduced by having dry cow paddocks with no manure spread on them and using just N fertiliser at moderate to heavy applications. Potassium levels in grass are highest in spring and autumn, when the grass growth is greatest, and the potassium antagonises magnesium, which causes seasonal peaks in staggers or hypomagnesaemia.

2. Adding anionic salts to achieve a low DCAB

It can be difficult to achieve a low enough DCAB just by manipulating forages and concentrates fed. Anionic salts can be added to the diet to reduce the DCAB further. Typical choices are magnesium or ammonium chloride. Care must be taken when adding anionic salts not to acidify the diet and the cow too much. If high levels of anionic salts are fed, palatability is reduced and, therefore, so is dry matter intake (DMI).

Feed component	DCAB (mEq/kg DM)	Comments
Grass silage (2003 season to date)	+390	Extremely variable (up to +1,000), higher with legumes
Grass silage (2002 season)	+391	
Maize silage	+194	Less variable than grass silage
Whole crop silage	+158	Consistently low DCAB
Straw	+139	
Barley	+25	
Brewer's grains	-220	Can be useful to 'dilute' high DCAB silages
Fodder beet	+300	
Kale	+806	
Maize gluten	+137	
Molasses	+681	
Potatoes	+343	
Rape extract	-201	
Wheat	-6	
Sugar beet pulp	-123	
Soya extract	+203	
Wheat feed	+177	

Data supplied by Thomson & Joseph, Norwich.

Figure 6. *The DCAB of common feedstuffs (Husband J, 2005).*

Urine pH is a good indicator of whether the dry cow diet is acidified enough or too much. Target urine pH is 6.2-6.8. If average urine pH is 5-5.5, the diet is too acidic and DMI will be suppressed. Urine pH can be checked 48 hours after dietary changes and should, ideally, be measured after one to three weeks.

Magnesium

Magnesium – although not included in the DCAB equation – is important for the prevention of milk fever. It increases the supply of PTH in response to hypocalcaemia and increases the tissue sensitivity to PTH. Magnesium is primarily absorbed from the rumen and cows need a constant supply of it in the diet. As the rumen pH increases above 6.5 – and on higher forage diets, conditions common to dry cows – magnesium solubility declines sharply.

High potassium concentrations may also reduce magnesium absorption in the rumen. Recommended levels of magnesium are 0.4% DM. Increasing dietary magnesium from 0.3% DM to 0.4% DM can reduce milk fever by approximately 62 per cent (Lean et al, 2006).

"Treatment of milk fever should raise the blood calcium levels for long enough until the homeostatic mechanisms are functional"

Calcium

Calcium requirements for a dry cow are around 30g/day. Calcium-restricting dry cow diets – where calcium in the diet is less than 20g/day for three weeks pre-calving and the cow is in true negative calcium balance – work to reduce the risk of milk fever at parturition. The mechanisms to increase calcium production once lactation starts are already activated and the cow can meet increasing calcium demand once she calves. However it is not usually possible to get the calcium supply in the diet this low, with most ranging from 50g-100g calcium per day.

Calcium binders, such as zeolite, can be added to diets to achieve these low dietary calcium levels. These products bind calcium in the intestines and it is passed out in faeces. They often have to be fed in large quantities of 0.5kg-3kg per day for at least two weeks. They can bind phosphorus as well, so extra phosphorus may sometimes be required.

The basics!

Ensure all dry cows have access to fresh food and clean water. Dry cows need 80cm of feed trough space per individual. Making sure that food troughs are cleaned out and fresh food is presented daily will ensure palatability is maximised. Current recommendations are to provide at least 10cm of drinking space per cow and ensuring there are enough water troughs for 10 per cent of the group to drink at once (AHDB Dairy, 2018).

Treatment of milk fever

Treatment of milk fever should raise the blood calcium levels for long enough until the homeostatic mechanisms are functional (**Figure 7**).

Intravenous calcium borogluconate

Each 400ml of 40% $^{w}/_{w}$ solution provides 12g calcium – cows need approximately 2g calcium per 100kg bodyweight to correct hypocalcaemia. Intravenous (IV) calcium should be administered slowly, at 1g/minute to avoid cardiac complications and arrhythmias. Increases in blood calcium following IV administration last approximately four hours.

Figure 7. *A recumbent cow following treatment for milk fever.*

Subcutaneous calcium salts

Absorption of calcium from preparations administered by this route is variable as blood flow to the periphery is compromised.

Oral calcium

Large amounts of soluble calcium can be given orally. This forces calcium across the intestinal tract by passive diffusion between intestinal epithelial cells. Oral solutions contain approximately 50g of calcium; and many of these products are available for administration at calving and again 24 hours later. ■

PPD Questions

1. What is the normal blood calcium range for a dairy cow?
2. How much calcium is required a) per litre of milk produced and b) per litre of colostrum produced?
3. Which hormones are released when blood calcium levels are too low?
4. What is the recommended level of potassium in a dry cow diet to prevent milk fever?
5. When urine pHs are used to monitor acidification of the diet, what is the target range?

Answers
1. 2.1-2.8mmol/L
2. 1.2g and 2.3g respectively
3. PTH and 1,25 (OH_2) D_3
4. <1% DM
5. 6.2-6.8.

References

DeGaris PJ and Lean IJ (2009). Milk fever in dairy cows: A review of pathophysiology and control principles The Veterinary Journal, 176: 58-69.

Goff JP (2008). The monitoring, prevention, and treatment of milk fever and subclinical hypocalcaemia in dairy cows. The Veterinary Journal 176: 50-57.

Horst RL et al (1997). Strategies for Preventing Milk Fever in Dairy Cattle. J Dairy Sci, 80: 1269-1280.

Husband J (2005). Strategies for the control of milk fever. In Practice, 27: 88-92.

Lean IJ et al (2006). Hypocalcaemia in Dairy Cows: Meta-analysis and Dietary Cation Anion Difference Theory Revisited. Journal of Dairy Science, 89(2): 669-684.

Merck Veterinary Manual. https://www.msdvetmanual.com

Reinhardt TA et al (2011). Prevalence of subclinical hypocalcaemia in dairy herds. The Veterinary Journal, 188: 122-124.

Hospital workflow management

Hospital procedures, outpatient appointments, visits, laboratory tests, regular maintenance, equipment usage, meetings and regular consultations are just a few of the tasks and procedures that have to be organised in the normal working day.

As veterinary hospitals grow in size – both in staff numbers and in procedures and treatments – so effective management of the workflow becomes more complex and more time consuming. Trying to manually ensure that everything and everybody knows their daily duties and are in the right place at the right time is not only time consuming, but also prone to error.

AT Veterinary System's Spectrum, Hospital Workflow Manager module, provides an effective way to manage so many of the integrated activities of the hospital, saving time, reducing errors and using resources with maximum efficiency.

Workflow Manager allows complete monitoring of workflows in the hospital, enabling efficient and integrated management of the many tasks and procedures involved in a busy day. Staffing needs, who and where personnel need to be, surgical schedules, room and equipment allocation, and kennel occupancy can all be integrated into the workflow model. The different wards – intensive care, cat and dog wards, and so on – can be included in the workflow and a pet's progress and its treatment procedures can be tracked.

Workflow Manager can also schedule a recurring task – for example, checking car inventories every month – and there can be a 'to do' list for each individual, mapping out their activities and tasks for the day. Multiple 'whiteboards' display tasks categorised by employee group, clinic, department or equipment type, helping staff to identify the schedule relevant to them with easy switching between the different items and activities.

Employees can self-assign or designate responsibilities according to their privilege status. These 'real time' schedules mean that all personnel know the status of any task at any time – with each being assigned a specific status and sub-status. In this way, a complete picture of the day's workflow can be seen at any time.

> "… a complete picture of the day's workflow can be seen at any time"

> "… allows complete monitoring of workflows in the hospital, enabling efficient and integrated management of the many tasks and procedures involved in a busy day"

The interactive 'whiteboards' are designed for display throughout the practice on any terminal. With the easy scaling feature they can be sized appropriately for large screen displays – for example, surgical whiteboards – or diagnostic imaging lists.

Custom digital forms and diagrams can be designed and integrated into the patient record, ensuring the hospital benefits from paperless efficiency. Digital forms, ophthalmology, dental and dermatology diagrams allow multiple users to make changes, with all revisions saved to the patient record.

With seamless integration of all patient data, the selected clinical history can easily be printed or e-mailed to referring vets. This includes temperature, pulse, respiration and other indicators that are recorded in the patient record.

Another useful feature of Workflow Manager is that scheduled tasks can prompt the user to enter the integrated invoicing module, ensuring charges are not missed.

Resources can be assigned to tasks, allowing you to identify under-resourced and over-resourced areas, while task conflicts immediately identify double bookings. A period of availability can be set for each resource, allowing for routine maintenance or specialist clinic hours.

The Workflow Management module allows you to schedule tasks and procedures directly from the patient record. This complete integration into the client and animal database provides time savings from copying data between systems and ensures complete traceability for reporting and analysis. ■

Special features and advantages of Spectrum's Workflow Manager

- **dynamic workflows** are generated based on task schedules, distributing work in a logical structure for optimised resource management
- **every action is logged** with a time stamp user and details of the update or change
- **task libraries** can be built with items scheduled according to your time frames – tasks can then be posted to whiteboards, ready to be assigned, viewed and completed
- **multiple 'whiteboards'** display tasks categorised by employee group, clinic, department or equipment type
- **tasks can be placed into folders and arranged in a hierarchy**, with facilities to group sequential tasks together in a 'macro'. Tasks within a macro can be given offset timings, allowing procedures with multiple stages to be scheduled clearly, with time offsets for sub-procedures. This feature is ideal for multiple-stage procedures
- the **invoicing prompt feature** provides the option to link the user directly to invoicing
- tasks that have been assigned to a specific user, or tasks that are available for action, appear in a **personal 'to do' list** for the logged-in user
- each task can have a **specific privilege level** set, ensuring only appropriate users can schedule or edit the task
- **task status updates** can be entered at any stage of the process, along with notes
- **user-defined sub-status** provides further detail of task progression
- 'whiteboards' provide an **interactive display of practice activity**. Each 'whiteboard' can be uniquely customised – for example, lab procedures may be listed by priority or equipment type, surgical procedures arranged by surgeon, and routine maintenance activities displayed by location
- tasks can be altered through a **simple drag-and-drop system**, changing the assignee, time, location, equipment and so on.

For more information, contact AT Veterinary Systems

enquiries@vetsystems.com | 01359 243 400

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Assessing rumen health – a practical guide

The rumen is a large fermentation vessel with a highly complex ecosystem containing populations of bacteria, protozoa, archaea, fungi and bacteriophages, all with a unique role. The microbiome has a symbiotic relationship with the cow, is adapted to aid digestion of plant materials (hemicellulose and cellulose) and convert ingested feed to energy and protein (volatile fatty acids and microbial protein respectively).

Sarah-Jane Redman
MRCVS BVSc CertAVP(cattle)

Following graduation from Bristol University in 2012, Sarah-Jane worked in a mixed practice in Devon for 18 months. Here, her interest in farm animal vetting grew, prompting her to join a specialist farm practice in Gloucestershire. Having confirmed her decision to move towards farm animal vetting, Sarah-Jane moved to Prostock Vets – a member practice of XLVets in Carmarthenshire, where much of her work involves dairy cows. Sarah-Jane's interest in cattle medicine led her to complete a Certificate in Cattle Health and Production through the University of Liverpool.*

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*Suggested Personal & Professional Development (PPD)

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CATTLE PHYSIOLOGY

The rumen microbiome is unique to each cow (**Table 1**), as demonstrated by Weimer et al, 2010, when 95 per cent of rumen fluid was removed and exchanged between two cows. The concentrations of volatile fatty acids (VFAs) and pH returned to that before transfer within 24 hours and both animals' bacterial populations returned to their original composition within nine weeks. Whilst the microbiome is unique to each animal, it is highly adaptive to change – including feeding substrates, additives and regimen, health, age and season (Lean et al, 2014).

Maintaining rumen health has become increasingly challenging owing to the vast energy requirements of the modern dairy cow for milk production. In order to increase energy input, either the voluntary feed intake (VFI) or energy density of the ration can be increased. However, the VFI is a rate-limiting step, especially post-partum when intakes are low and are not maximised until 60 to 80 days into lactation. Therefore, to match energy demands, the energy density of rations is often very high.

For the cow to be able to digest these diets efficiently, there must be:

- rumen papillae adaptation (increase in size and length) to the diet during the transition period – the larger surface area promotes efficient absorption of VFAs (**Figure 1**).
- microbial flora adaptation to the diet for efficient digestion and feed conversion
- sufficient long fibre to promote cudding, saliva production and fibre mat formation – the fibre mat traps feed particles for digestion by the microflora
- no excessive quantities of concentrates and rapidly fermentable carbohydrates that will exceed the ruminal papillaes' ability to absorb VFAs (Grove-White, 2004).

If any of the above are not achieved, the microbiome will alter. An accumulation of VFAs will cause rumen

Microorganism	Role within the ecosystem
Bacteria	■ reproduction ■ fermentation/break down substrates
Protozoa	■ reproduction ■ fermentation/break down substrates ■ engulf particles – starch and bacteria
Archaea	■ metabolise hydrogen ions
Fungi	■ source of cellulolytic enzymes ■ break down and digest fibre
Bacteriophage	■ infect bacteria

Table 1. Role of each microorganism in the rumen ecosystem (Russell, 2002)

Volatile fatty acids (VFAs) are a product of ruminal fermentation and provide nearly 80 per cent of ruminants' energy supply. They are weak acids, dissociating in the rumen to release a proton. When production exceeds the papillaes' capacity for absorption, rumen pH will decrease, and acidosis can result.

Rumen pH is kept under tight homeostatic control through many buffering systems – one important mechanism is VFA absorption across papillae epithelium via bicarbonate exchange (Penner, 2014). This provides a source of bicarbonate to the rumen and proton neutralisation.

The three main VFAs are:

- acetic acid – used in synthesis of ATP and lipids
- proprionic acid – major source of gluconeogenesis in the liver
- butyric acid – leaves the rumen as β-hydroxybutyrate; which is oxidised for energy production.

Lactic acid is a stronger acid, formed predominantly during sugar fermentation.

***Figure 1.** What are volatile fatty acids?*

pH to decrease, thereby allowing lactate-producing bacteria (*Streptococcus bovis*) to thrive, whilst protozoal populations die. The production of stronger lactic acid will drive rumen pH lower, exacerbating the problem. This altered microbiome will decrease feed conversion efficiency, cause ruminal papillae necrosis and even rumenitis resulting in translocation of bacteria across the ruminal wall to other organs (Grove-White, 2004).

Subacute ruminal acidosis (SARA) is one of the most commonly recognised syndromes of poor rumen health, with a herd-level diagnosis made when five out of 12 cows have a rumen pH<5.5 (Oetzel, 2003). However, studies have shown that apparently healthy, high-producing dairy cattle have a rumen pH below 5.5 with no ill-effect; therefore, a precise diagnosis of SARA remains ambiguous. It is possible to have poor rumen health and reduced microbial activity in the absence of SARA, such as in high fat content or very low energy density diets (Atkinson, 2009).

When investigating rumen health, a full on-farm assessment must be undertaken looking at:

- ration – as formulated, fed and eaten
- the cows – their production, clinical and biochemical assessment.

The diet must be assessed on paper to ensure some rules of thumb are followed (**Figure 2**).

Ration assessment

This should be performed using a previously formed checklist to ensure all aspects are covered. These can be split as shown below.

Forage clamp

Is the forage clamp well compacted? Is there evidence of secondary fermentation?

Are there any areas of mouldy or butyric silage? Is there evidence of heating in the clamp?

What is the forage quality? Does it match the forage analysis used to formulate the ration? In order to check, take samples from the clamp face in a 'W' shape for analysis and dry matter estimation.

Feed face

Measure the feed face space per cow (target is 0.75m/cow). Does this vary between lactating and dry cows?

Is feed easily accessible? How regularly is it pushed up? Are there calluses on any of the cows' necks indicating inadequate food accessibility or inappropriately placed feed barriers?

Is there always palatable food in front of the cows? Is there evidence of heated and mouldy feed? How often are the troughs cleaned with all refusals removed?

Feed management

Is fibre chopped adequately? Over-chopping will result in a lack of physically effective fibre. Under-chopping will result in sorting and different rations fed to formulated. A Penn State Forage Separator can identify sorting when performed on a ration before and after feeding.

How is the diet calculated and adjusted when cattle numbers change? Only adding additional forage will dilute TMR energy density. How often are cattle fed? Feeding TMR once a day will lead to larger ruminal pH fluctuations than twice-a-day feeding.

Are cattle fed for five to 10 per cent refusals? How long are they away from food/milking/waiting to be fed?

Is there always clean fresh water, especially after milking? A lack of water will reduce intakes and increase the risk of acidosis.

- **forage : concentrate ratio** should not be lower than 40 : 60 – care must be taken with maize silage, with its high starch/low fibre content owing to its chop length
- **neutral detergent fibre** (NDF) must be a minimum of 35 per cent
- **dietary sugars and starches** should be kept below a maximum inclusion of 25 per cent
- **processing of cereals** used – will affect speed of starch release
- **buffers** – inclusion rates and method of feeding.

Figure 2. *Assessment of the diet (Huxley, 2004).*

How much cake is fed in and out of the parlour per milking per day? If this exceeds 4kg at any one time, ruminal pH will fall, and substitution effect will occur as cattle eat less forage – this is termed 'slug feeding'.

Assessment of the cows

Milk records

Before a farm visit is conducted, it is useful to look at the farm milk-recording data to ascertain whether production is as expected – days-in-milk at peak yield, for example. Great care should be taken, however, when analysing milk constituents in association with rumen health because there is very little evidence-base behind any connection (Atkinson, 2013) and there are too many confounding variables to draw accurate conclusions.

Farm visit

Whilst a walk around all cattle can be very revealing, attention should be focused on post-partum and peak lactation cattle. These groups are most at-risk of poor rumen health owing to poor rumen adaptation or highest intakes of the ration. Dry cows should also be assessed because inadequate transitioning will have detrimental effects on lactation.

During the farm visit, crude assessments can be made to assess rumen health and adequacy of forage structural fibre:

- 50 per cent of cattle lying down should be chewing their cud
- when cudding, there should be approximately 60 chews per cud.

For further, more detailed analysis, six dry cows, post-partum and peak lactation cows should be separated for assessment (Atkinson, 2009).

Rumen fill

This is scored on a scale of 1 to 5 and is performed by assessing paralumbar fossa concavity; which is formed by the last rib, transverse process and ileum (**Figure 3**). Score 5 should only be seen in heavily gravid cattle (Doyle and Moran, 2015).

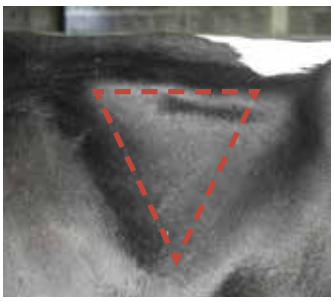
Faecal consistency and sieving

These scoring systems can be useful to draw inferences on the diet – the variability of diet eaten or its fibre content. Score 1 is very watery faeces and, therefore, pathological. The target score for lactating cows is 3 and dry cows is 4; although this can vary if the cows are being grazed on lush pastures.

There is, however, very little evidence to support the use of them, therefore they must be interpreted with other clinical assessments (Atkinson, 2009). Atkinson (2013) found there was no correlation between rumen health and faecal characteristics.

For faecal sieving, place a handful of faeces in a sieve and run under a tap for 30 seconds. Remaining particles are scored 1 (good digestion) to 5 (poor digestion) as described by Atkinson (2009) (**Table 2**).

Score 1. The cow will have eaten very little, normally due to illness
This score is **UNDESIRABLE**



Score 2. Commonly seen in post-partum cows, after seven days-in-milk
This score is **UNDESIRABLE**

Score 3. Target score LACTATING COWS

Score 4. Target score LATE LACTATION and DRY COWS

Figure 3. *Scoring system for rumen fill (Doyle and Moran, 2015).*

Rumenocentesis

This should be performed on post-partum cows and those with the highest intakes (**Figure 5**). Cattle in the last trimester of pregnancy should not be sampled, owing to the invasive nature of the procedure.

The ruminal pH can be measured using a digital pH meter; but timing is important because of diurnal and feed-induced pH fluctuations. Arguably more useful is examining samples under a microscope at 37°C to assess subjectively numbers and motility of protozoa present. A scoring system of 0 to 3 can be applied, as described by Atkinson, 2009.

Energy status

Cows immediately post-partum are at the highest risk of suffering from poor rumen health as discussed earlier. This will decrease their feed conversion efficiency. Therefore, by combining several assessments of energy status in early post-partum cows, inferences can be drawn on the efficiency of feed utilisation. These assessments include:

- body condition scoring – best done quarterly to assess cows throughout their lactation, rather than generating a 'snap-shot' impression of each group (Targets: prepartum 2.5 to 3, peak-yielder 3)
- biochemistry – NEFA indicative of fat mobilisation pre-partum (Target: <4mmol/litre pre-partum).
- β-hydroxybutyrates – indicative of negative energy balance (Target: <0.9mmol/litre during lactation)

The biochemistry should be performed on a random selection of cows as regular monitoring rather than sampling the 'oddities'; which will lead to a bias.

After all data have been collected, an overall assessment of rumen health can be made. ■

Score	Appearance	Interpretation
1	<25% remains; creamy emulsion	Target for lactating cows
2	<33% remains; smooth with few longer undigested particles	Acceptable for lactating cows
3	<50% remains; not homogenous	Acceptable for in-calf heifers and dry cows; but NOT lactating cows
4	~75% remains; particles over 2cm can be seen	Not acceptable in ANY cow
5	hardly reduces; resembles diet	Not acceptable in ANY cow

Table 2. Scoring system for faecal consistency and sieving analysis (Doyle and Moran, 2015)

WHEN?
- TMR herds – four to six hours post-feeding
- for herds feeding large concentrate meals – two to four hours post-feeding.

HOW?
- clip an area
- place 5ml local anaesthetic under the skin and muscle layers
- clean the area with surgical spirit-soaked swabs until they come away visibly clean
- after the anaesthetic has taken effect, insert 12cm 16G needle (Air-Tite Products, USA) cranially in one movement to the entirety of its depth
- rumen fluid should be seen; connect a 10ml syringe and aspirate 2-5mls
- if no fluid is seen, the needle may be blocked with rumen content, apply positive pressure to the needle via the connected syringe. Theoretically applying negative pressure can falsely elevate pH.

WHERE?
- left-hand side, hands-width behind the last rib at the level of the stifle.

RESTRAINT?
- crush that allows easy access to ventral abdomen without risk of trapping hands
- ensure the tail is lifted by an assistant.

Figure 5. *Method for rumenocentesis.*

Figure 6. *The site for rumenocentesis.*

Figure 7. *Equipment required to perform rumenocentesis.*

PPD Questions

1. Which of the following is incorrect when thinking about 'rules of thumb' for ration formulation?
   A. the forage : concentrate ratio should not be lower than 40 : 60
   B. the neutral detergent fibre (NDF), must be a minimum of 35 per cent
   C. dietary sugars and starches kept below a maximum inclusion of 25 per cent
   D. no more than 6kg concentrate should be fed per milking.

2. The target rumen fill score for lactating cattle is:
   A. 1
   B. 2
   C. 3
   D. 4.

3. Which of the following is correct? Volatile fatty acids...
   A. provide ruminants with a source of protein
   B. dissociate in the rumen to release an electron
   C. are a product of oxidation in the rumen
   D. provide ruminants with a source of energy.

4. Below the physiological ruminal pH threshold of 5.5, which of the following will occur?
   A. the cow will die
   B. protozoal populations will die
   C. *Streptococcus bovis* will survive and thrive
   D. voluntary feed intakes will increase.

5. How long after TMR is fed should rumenocentesis be performed?
   A. two to four hours
   B. four to six hours
   C. six to eight hours
   D. it doesn't matter.

Answers
1.D 2.C 3.D 4.B&C 5.B.

References

Atkinson O (2009). 'Guide to the rumen health visit'. In Practice, 31(7): 314-325.

Atkinson O (2013). 'Prevalence of Subacute Ruminal Acidosis (SARA) on UK dairy farms' Cattle Practice, 22(1): 1-8.

Doyle R and Moran J (2015). Cow Talk. Clayton South: CSIRO Publishing.

Grove-White D (2004). 'Rumen healthcare in the dairy cow In Practice, 26(2): 88-95.

Huxley J (2004). 'Optimising health, productivity and welfare of dairy cattle: on-farm nutrition' In Practice, 26(9): 466-475.

Lean I et al (2014). 'Feeding, Evaluating, and Controlling Rumen Function' Veterinary Clinics of North America, 30(3): 561.

Penner G (2014). 'Mechanisms of Volatile Fatty Acid Absorption and Metabolism and Maintenance of a Stable Rumen Environment'[online] Available from http://dairy.ifas.ufl.edu/rns/2014/penner.pdf (accessed:15/9/18)

Oetzel G (2003). Herd-based biological testing for metabolic disorders.[online] Available from: https://www.vetmed.wisc.edu/dms/fapm/fapmtools/2nutr/herdtest.pdf accessed on:10/9/18

Russel J (2002). Rumen Microbiology. Ithaca:NY

Weimer P et al (2010). 'Host specificity of the ruminal bacterial community in the dairy cow following near-total exchange of ruminal contents' Journal Dairy Science, 93: 5902–5912.

Not a time for finger pointing

'With antibiotic consumption increasing worldwide, the challenge posed by antibiotic resistance is likely to get worse. As with climate change, there may be an unknown tipping point, and this could herald a future without effective antibiotics. Even in the absence of tipping points, the decline of antibiotic effectiveness represents a major threat to human health.'

This was one of the conclusions from a study carried out by researchers from institutions in the US, Switzerland, Sweden and Belgium, and published online in March 2018 in the peer-reviewed *Journal Proceedings of the National Academy of Sciences* (PNAS).* Individual authors received funding grants from several organisations, including the Bill and Melinda Gates Foundation and the Global Antibiotic Resistance Partnership.

The study was an analysis of observational data with the aim of determining trends in antibiotic consumption from 2010-2015 in 76 countries – the researchers wanting to assess the trends in antibiotic consumption between high-income (HIC) and low-middle income countries (LMIC).

Interesting demographics

They found that between 2000 and 2015, antibiotic consumption increased by 65 per cent; from 21.1 billion defined daily doses (DDDs) – a single antibiotic capsule or injection – of antibiotics to 34.8 billion DDDs. The primary driver of the increase in global consumption was the increased consumption in low-middle income countries (**Figure 1**):

- in LMICs, antibiotic consumption increased 114 per cent (11.4 to 24.5 billion DDDs) and the consumption rate increased 77 per cent (7.6 to 13.5 DDDs per 1,000 inhabitants per day). This was found to correlate with increased economic development
- LMICs with highest consumption in 2015 were India, China and Pakistan
- in HICs, the total antibiotic consumption increased 6.6 per cent (9.7 to 10.3 billion DDDs) and the rate of consumption increased by 4 per cent (26.8 to 25.7 DDDs per 1,000 inhabitants per day). There was no correlation with economic growth
- HICs with highest consumption in 2015 were the US, France and Italy.

However, the consumption of newer and 'last resort' antibiotics increased across all countries.

This study serves to highlight the challenge and increasing threat of antibiotic resistance and reinforces the fact that this is now a global problem. And therein lies the nub of the problem. It is a *global* problem – in its way a threat as pressing and critical as tackling the factors behind climate change and overuse of plastics.

Need for perspective

So we must welcome the high-profile initiative by the NHS to reduce unnecessary antibiotic usage in both primary and hospital environments; especially in the face of recent 'shock-horror' headlines – such as 'Antibiotic madness: a fifth of prescriptions given out by GPs are to patients who do not need them' – trumpeted by the *Mail Online*, and based on a study published in the *Journal of Antimicrobial Chemotherapy*.**

This study concluded, 'Applying the most conservative assumptions, 8.8 per cent of all systemic antibiotic prescriptions in English primary care were identified as inappropriate, and in the least conservative scenario 23.1 per cent of prescriptions were inappropriate ... The four conditions that contributed most to inappropriate prescribing were sore throat (23.0% of identified inappropriate

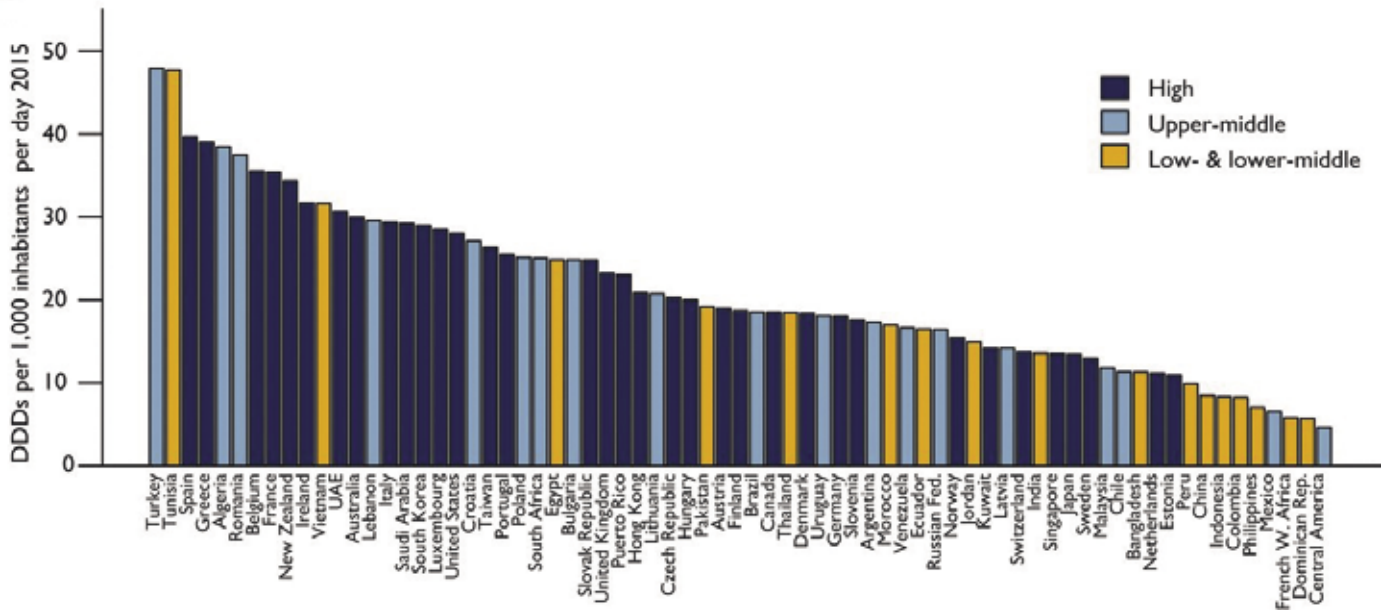


Figure 1. *Global antibiotic consumption by country: 2000–2015 (Source: Klein EY et al, 2018).*

prescriptions), cough (22.2%), sinusitis (7.6%) and acute otitis media (5.7%)'.

So perhaps it is no wonder that the UK medical profession casts around for scapegoats to take its own shortcomings out of the spotlight.

Presidents and leading spokespeople of the Royal College of General Practitioners, the Royal College of Surgeons and the Royal Society of Medicine, together with the editors-in-chief of the *British Medical Journal* and *The Lancet* are among those who have signed a letter to the secretaries of state for health and environment just weeks after the European Parliament voted almost unanimously for legislation that would ban preventive antibiotic treatments of healthy animals by 2022.

"If the Government fails to implement a ban on group prevention, the UK will have some of the lowest regulatory standards in Europe and will be aligning itself with the US administration's position, which is to strongly oppose the European ban," said Cóilín Nunan, scientific adviser to the Alliance to Save Our Antibiotics.

"This should raise alarm bells about the kind of post-Brexit trade deal the UK may agree with the US, where antibiotics are used in enormous quantities in livestock."

Professor John Middleton, president of the Faculty of Public Health, added: "Animal health and human health must be equally protected to save our antibiotics – that is why we're making this call on government. In the post-Brexit world, it will be even more vital that we increase our standards on antibiotic use by doctors and farmers, so that the UK is a world leader, saving our antibiotics to save lives in future."

No room for complacency

In the face of this, we should welcome the news from a RUMA Target Task Force report that UK farm antibiotic sales have fallen 40 per cent in the past five years. However, RUMA secretary general Chris Lloyd comments in cautionary fashion: "What this review shows is the industry as a whole is committed and making good progress – but also that the sectors are all in very different places.

"The approach has to be sustainable with an end-goal of optimal – not zero – use. Antibiotics play an important role in preventing pain and suffering in our farm livestock as well as ensuring food safety. This is why it's important to judge progress against the whole range of qualitative and quantitative measures in the review."

And on 18 November 2018, ahead of World Antibiotic Awareness Day, the BVA and the VMD issued a call to veterinary surgeons who prescribe antibiotics in all sectors of the industry to shun complacency and redouble their efforts to be more critical in their prescribing decisions, especially under the cascade.

As BVA president, Simon Doherty, said: "The cascade provides much-needed flexibility in allowing veterinary surgeons to treat animals in situations where a licensed product for a condition in a particular species is not available in the UK, but we are concerned that it could in some circumstances lead to decisions that could exacerbate antimicrobial resistance."

Not a time for finger-pointing or local self-congratulation then. More an urgent need for us all to reach out and co-operate to tackle a massive global problem. ■

* Klein EY et al (2018). Global increase and geographic convergence in antibiotic consumption between 2000 and 2015 *PNAS*. Published online March 26 2018.

** Smieszek T et al (2018). Potential for reducing inappropriate antibiotic prescribing in English primary care *Journal of Antimicrobial Chemotherapy*. Published online February 27 2018.

Common conditions in captive aquatic chelonians

Chelonia, within the Class Reptilia, comprises 270 species of tortoises and turtles, most of which are aquatic or semi-aquatic (Jacobson, 1997). Aquatic chelonians are very popular, robust pets, with many species available for ownership (Timmerman and Doolen, 1994).

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Sonya qualified from Bristol University in 2013. In early 2015 she started work as an exotic species veterinary surgeon at Highcroft Veterinary Referrals, completing her zoological medicine certificate in early 2018.

She has a special interest in reptile medicine and surgery, but enjoys all aspects of caring for exotic species.

In the author's experience, certain species have often been bought when very small, by owners who have often done little or no research on what these animals require when they are fully grown. This has resulted, historically, in some owners dumping their pets into local water sources, which in turn is damaging our native wildlife and has resulted in *Trachemys* species being listed and controlled as invasive (**Figure 1**).

Figure 1. *A chelonian,* Trachemys *spp.*

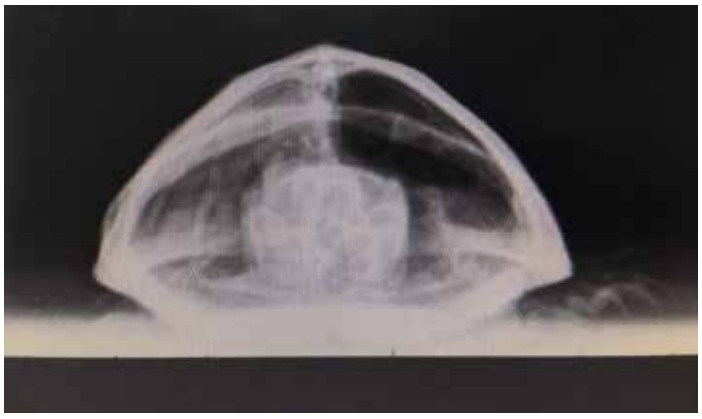

Figure 2. *A cranio-caudal radiograph showing pneumonia in a musk turtle (*Sternotherus odorous*). On clinical examination, this turtle was showing abnormal buoyancy.*

Environment and husbandry

Most aquatic chelonians are a long-term responsibility – sometimes living longer than 25 years – and some commonly owned species can grow to over 12 inches in length (Kramer, 2005). As such, they require large volumes of water in their environment. This author recommends 40 litres per inch of shell (straight carapacial length [SCL]) for the largest individual, and an additional 20 litres per inch of shell of each subsequent individual.

All water sources should be heated suitably for the particular species and have a filtration system that clears three times the volume of water every hour. It is vitally important that all species are exposed to adequate ultraviolet (UV) light and have a 'basking area' available where they are able to exit the water fully and become 100 per cent dry.

Diet varies between the species, with adult *Trachemys scripta* ideally being fed 75 per cent leafy greens and 25 per cent various protein sources (Kramer, 2005). Clients often rely too heavily on imbalanced – but convenient and seemingly complete – turtle food, which is often inappropriately supplemented. Without the correct species-specific care, aquatic chelonians may succumb to a myriad of conditions.

Clinical problems

Hypovitaminosis A is probably the most common disease of freshwater aquatic turtles (Lewbart, 2001). Reptiles with hypovitaminosis A often present with blepharitis, anorexia, aural abscesses and, in advanced cases, respiratory disease (Lewbart, 2001).

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Figure 3. *Superficial ulcerations caused by SCUD.*

Figure 4. *Deep ulceration caused by a* Citrobacter *spp. infection initially caused by a traumatic injury.*

Figure 5. *Oedematous soft tissues as a result of septicaemia – this musk turtle (*Sternotherus odorous*) was suffering from a reproductive tract infection.*

Figure 6. *Erythematous changes to the shell of a Mississippi Map Turtle (*Graptemys pseudogeographica kohni*) with septicaemia.*

Over time mucous secretions become caseous and more difficult to treat.

These clinical signs are as a result of squamous cell metaplasia, hyperkeratosis and subsequent mucous membrane dysfunction (Lewbart, 2001; Jacobson, 1997).

Hypovitaminosis A is a preventable condition, as long as the reptile is fed the correct diet and provided with adequate supplementation. Treatment involves correction of any environmental deficiencies, correcting diet and supplementation, in combination with analgesia, antibiotics based on culture and sensitivities, as well as flushing and, in some instances, surgery to remove caseous deposits (Kramer, 2005; Boyer, 1992)).

Care should be taken to avoid over-supplementing vitamin A, which is the reason why this author does not recommend vitamin A injections. In severe cases, hypervitaminosis A can cause skin sloughing and secondary infections (Kramer, 2005; Boyer, 1992; Lewbart, 2001). Aural abscesses are not uncommon in aquatic and semi-aquatic chelonians (Kramer, 2005). There can be many causes for hypovitaminosis A – including poor hygiene, oro-faecal contamination and upper respiratory tract infections (Tatli et al, 2016; Boyer, 1992). Treatment of aural abscesses – which mostly occur bilaterally – is usually surgical because of the failure of antibiotics to penetrate the abscess pouch and through the often-thick pus present (McArthur, 2004; Tatli et al, 2016).

Surgery should, however, be followed by a course of antibiotics based on culture and sensitivity results as well, together with appropriate analgesia. In the author's experience, it is best to leave surgical sites open to allow adequate flushing throughout the healing process.

Respiratory disease in aquatic chelonians is often evidenced by the presence of the following clinical signs:

- oral discharge
- nasal discharge
- 'wheezing'
- open-mouth breathing
- neck extension
- anorexia and
- changes in buoyancy – with the affected side sinking and the normal side staying buoyant (Kramer, 2005).

In this author's experience, hypovitaminosis A, inadequate ventilation, poor temperature and UV lighting control, poor water filtration and hygiene, – and even trauma – have been implicated with the respiratory disease process. What can initially start off as an upper respiratory tract infection can, if left untreated, progress to pneumonia (**Figure 2**). It is recommended that radiographs are taken; as well as full biochemistry and haematology profiles, together

with cultures to determine antibiotic sensitivity and target treatment (Kramer, 2005).

Aquatic chelonians kept in unsanitary conditions – as well as those prevented from exiting the water and drying fully; or those kept in enclosures with too high a humidity – in combination with inadequate heating, lighting, diet and supplementation, will be prone to bacterial and fungal shell infections. These can result in septicaemic cutaneous ulcerative disease (SCUD) and, in severe cases, systemic septicaemia.

The primary bacteria implicated include *Citrobacter fruendii*, *Pseudomonas* spp. and *Aeromonas* spp. (Kramer, 2005). Clinical signs can range from retained scutes and ulcerations of varying depths on the shell (**Figures 3** & **4**) to severely swollen limbs (**Figure 5**), anorexia and erythematous shell (**Figure 6**) seen in systemic septicaemia. Antibiotic treatment should be based on culture and sensitivity results, in addition to topical iodine treatment, analgesia and, sometimes, surgical debridement, depending on the extent of the lesions. A general improvement of environmental care, including diet and supplementation should be implemented (Kramer, 2005; Lewbert, 2001).

Dietary problems

Inadequate diets consisting of dried shrimp, muscle and organ meats will lead to the development of metabolic bone disease (MBD) and other nutritional problems (Lewbert, 2001; Kramer, 2005). This is often exacerbated by a lack of adequate UV light, calcium, vitamin and mineral supplementation (Lewbert, 2001) or an excess of dietary phosphorus (Kramer, 2005). If the reptile's diet should consist of protein sources, feeding adequately supplemented and gut-loaded live food – such as insects or whole prey items – is wise, in addition to muscle and organ meats. Feeding should take place outside of the enclosure to avoid fouling of the water (Lewbert, 2005).

Clinical signs of dietary inadequacy include poor quality shell condition and beak deformities, soft shells, fractured limbs and stunted/abnormal growth (Kramer, 2005; Boyer, 1992). Treatment – including the provision of species-appropriate UV light, correct supplementation of the correct diet for that species, calcium therapy, analgesia for fractures and, in some severe cases, euthanasia – is recommended (Kramer, 2005).

In the author's experience, aquatic chelonians that may be suffering from nutritional deficiencies, such as MBD, attempt to self-regulate their own calcium levels. They will often do this by ingesting any gravel that might be being used as substrate in their tank. Owing to this, and the fact that aquatic chelonians are curious by nature, it is advised that any substrate used should be large enough to prevent its ingestion. If not, gastro-intestinal obstructions may result – which are often diagnosed via radiographs – and require surgical removal or, in severe cases, euthanasia.

Prolapses

Prolapses in aquatic chelonians may involve various organs – including the oviduct, penis, bladder, intestine and cloaca. There is always an underlying reason for a prolapse and, as such, any chelonians with one should undergo investigations. As a minimum, these should include radiography, parasite testing and blood samples including ionised calcium. Simply replacing the prolapse and placing sutures to close the cloaca, without investigations, is not appropriate.

The most common prolapse seen in male aquatic chelonians is a penile prolapse. Once this has been discovered, the organ should be cleaned of dirt and debris. If there is no necrosis, hyperosmotic solutions can be applied to reduce swellings and the tissue should be replaced whilst investigations as to the reason for the prolapse are undertaken (Kramer, 2005).

Figure 7. *A red-eared slider (*Trachemys scripta elegans*) after a successful ovariosalpingectomy.*

Once replaced, two simple interrupted sutures of monofilament suture material, placed in the cloaca should be used to close the opening. The author finds this method more effective than the purse string suture technique. If the tissue is necrotic – or if it 're-prolapses' – surgical removal should be considered (Boyer, 1992). This does not affect the reptile's ability to urinate because the penis is only used for reproductive purposes (Boyer, 1992).

Egg-laying abnormalities

There are many potential pathological and environmental causes of an inability to lay eggs (Innis and Boyer, 2002), with most cases presenting in either spring or summer (Boyer, 1992). Most cases are as a result of nutritional disease, lack of suitable nesting sites, overly large or deformed eggs, reproductive tract torsions or infections, pelvic abnormalities, and even space-occupying lesions that prevent the egg from being passed (Boyer, 1992).

Clinical signs vary dramatically, with common signs including unproductive straining (sometimes with oviductal prolapse), repeat nest making, with only a few – or sometimes no – eggs being produced. Increased activity, anorexia, lethargy and, in severe cases, death if the condition is missed and allowed to persist (Innis and Boyer, 2002; Boyer, 1992). Dystocia in chelonians is rarely a medical emergency (Innis and Boyer, 2002).

Full biochemistry, haematology, palpation and radiographs help with diagnosis, allowing the determination of obstructive and non-obstructive cases (Innis and Boyer, 2002; Boyer, 1992), as well as assessing the number, quality and size of eggs present (Innis and Boyer, 2002). If blood results are normal and a non-obstructive case is diagnosed, offering the female multiple, suitably sized laying areas – along with correcting any other environmental deficiencies and removing any interfering males – is a suitable starting point (Innis and Boyer, 2002).

The female should be hydrated and, if environmental changes do not encourage her to lay, oxytocin in conjunction with calcium intramuscular injections can be used. In the author's opinion, if no eggs are passed after three injections spaced 90 minutes apart, or if the case presented is obstructive, surgical intervention is recommended.

Surgical intervention may include egg removal per-cloaca, performed under anaesthesia (Innis and Boyer, 2002). It involves fracturing the egg and removing the pieces. This can only be done if the egg is close to the cloacal opening and can sometimes result in iatrogenic damage of the surrounding soft tissues (Innis and Boyer, 2002). Surgical removal of eggs (salpingotomy) can be performed by means of a plastral coeliotomy or via the pre-femoral windows (Innis and Boyer, 2002).

Retained follicles are a common condition in female aquatic chelonians (Innis and Boyer, 2002), often diagnosed based on imaging and blood testing. Large follicles can develop on the ovary but fail to ovulate or they may undergo atresia. These can remain 'stagnant' for months, causing anorexia and lethargy; or they can become necrotic or inspissated, sometimes rupturing causing a yolk coelomitis (Innis and Boyer, 2002).

Treatment is accomplished by performing an ovariectomy (ovariosalpingectomy in the case of concurrent oviductal disease) again via a plastral coeliotomy or via the pre-femoral windows (**Figure 7**). Supportive care following surgery should include pharagostomy tube placement for medicating and feeding, analgesia and appropriate antibiosis (Innis and Boyer, 2002).

Summary

A significant proportion of the common conditions seen in captive aquatic chelonians are a consequence of inadequate care. So an understanding of the appropriate environmental provisions and the correct diets for the species under your care is essential in order to pinpoint specific precipitating factors, often aiding in the diagnosis of the underlying condition. Swift and thorough investigations should be undertaken and suitable treatment implemented. ■

PPD Questions

1. What are the minimum filtration rates recommended for aquatic chelonians?
   A. 2x the volume of water per hour
   B. 3x the volume of water per hour
   C. 4x the volume of water per hour
   D. 5x the volume of water per hour.

2. What are the dietary proportions recommended in adult *Trachemys* species?
   A. 75 per cent leafy greens and 25 per cent various protein sources
   B. 50 per cent leafy greens and 25 per cent various protein sources
   C. 25 per cent leafy greens and 75 per cent various
   D. protein sources
   E. 10 per cent leafy greens and 90 per cent various protein sources.

3. What bacteria are primarily implicated with SCUD?
   A. *Citrobacter fruendii*
   B. *Pseudomonas* spp.
   C. *Aeromonas* spp
   D. All of the above.

4. What is the most common organ prolapsed in male aquatic chelonians?
   A. bladder
   B. cloaca
   C. intestine
   D. penis.

1.B
2.A
3.D
4.D

References

Boyer TH (1992). Common Problems of Box Turtles (Terrapene spp) in captivity. AARV 2(1): 9-14.

Innis CJ and Boyer TH (2002). Chelonian Reproductive Disorders. Vet Clin Exot Anim 2: 555-578.

Jacobson ER (1997). Diseases of the respiratory tract of chelonians. Verh ber Erkrg Zootiere 38: 1-5.

Kramer MH (2005). What Veterinarians need to know about Red-eared sliders. Exotic animal care 7(6): 1-6.

Lewbart G (2001). Turtle (Chelonian) Medicine, Atlantic Coast Veterinary Conference. VIN.

McArthur S (2004). Problem-Solving Approach to Common Diseases of Terrestrial and semi-aquatic chelonians. In Medicine and Surgery of Tortoises and Turtles McArthur S et al (eds), Blackwell Publishing, UK.

Tatli ZB et al (2016). Aural Abscess in a Red-Eared Slider Turtle (Trachemy scripta elegans). Harran Univ Vet Fak Derg 5(2): 170-172.

Timmerman AM and Doolen MD (1994). Common Reptilian Diseases. Iowa State University Veterinarian 57 (1): Article 5. Available at https://lib.dr.iastate.edu/iowastate_veterinarian/vol57/iss1/5

Ear-based swellings in rabbits

Ear-based swellings are common in lop-eared, brachycephalic rabbits and result from a build-up of cerumen in the soft-walled part of the canal, owing to the failure of cerumen to drain either via the external auditory meatus or the Eustachian tubes. Some cases may become secondarily infected.

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He was President of the European Association of Avian Veterinarians 2015-17 and President of the British Small Animal Veterinary Association 2017-18.

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RABBITS

These cases have frequently been referred to as 'ear-based abscesses', which does not adequately describe their aetiology and may encourage a less appropriate surgical approach.

This article will describe the aetiology of what may be more adequately described as 'aural diverticulosis' and will outline a diagnostic and therapeutic approach based on cerumen removal and facilitating drainage/removal thereafter.

Aetiology

The 'normal' or 'prick-eared' rabbit ear anatomy is well described (Popesco, 1978; Chow, 2011) and is best described as three interlocking auricular cartilages that provide a rigid support for the erect ear. The anatomy of the lop-eared rabbit, however, has less commonly been described as to how the lop 'forms' – in these animals there is a gap between the second and third cartilages, which being soft tissue only, therefore allows the ear to fall (Darwin, 1868; Chitty and Raftery, 2013) (**Figure 1**).

This loss of rigidity also closes the canal – effectively forming 'separate' horizontal and vertical canals, thus preventing drainage of cerumen to the exterior. In brachycephalic breeds, there is additionally likely to be reduced drainage via the Eustachian tubes, such as occurs in Cavalier King Charles spaniels.

As a result, cerumen will build up continuously inside the 'horizontal canal' (**Figures 2a** & **2b**). This applies pressure to the soft-walled portion of the canal, causing stretching and a bulging mass of cerumen in what is, effectively, a diverticulum of the ear canal (Chitty and Raftery, 2013).

This cerumen may become secondarily infected with a resultant inflammatory reaction, although this reaction is not present in all cases. Even when infected, this lesion does not represent a true 'abscess' as it does not represent infection within a tissue.

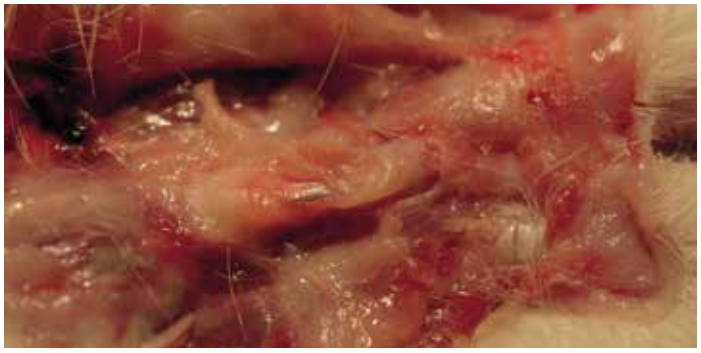


Figure 1. *Dissection of a lop-eared rabbit ear showing the soft-walled portion of the ear canal (Source:* BSAVA Manual of Surgery, Dentistry and Imaging*).*

Figure 2a. *Swelling at the base of the ear, typical of an aural diverticulum.*

Diagnostic investigation

Clinical signs of a palpable bulge in the lateral wall of the ear canal are diagnostic. In some cases, there will also be discomfort or irritation of the ear. There may also be signs of deeper ear disease – 'head tilt', for instance.

The main aims of a diagnostic investigation are to determine the:

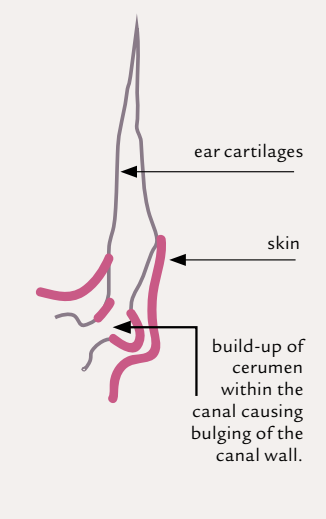


Figure 2b. *Diagram showing how cerumen builds up within the soft-walled canal.*

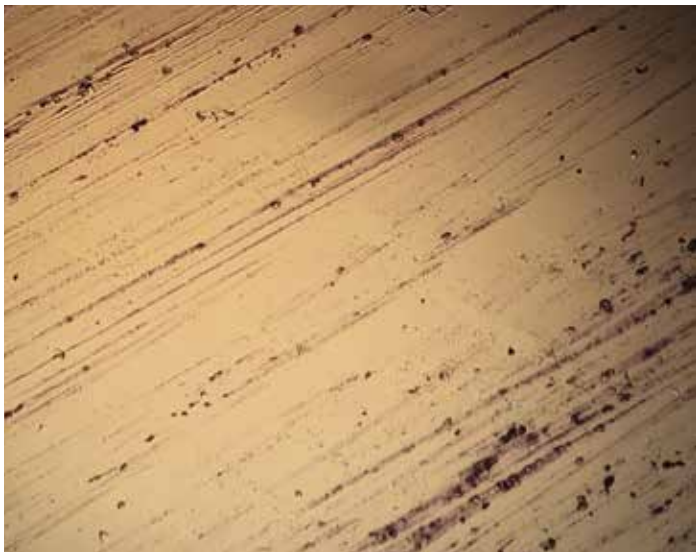


Figure 3a. *Cytology of normal cerumen – acellular, with masses of 'debris'.*

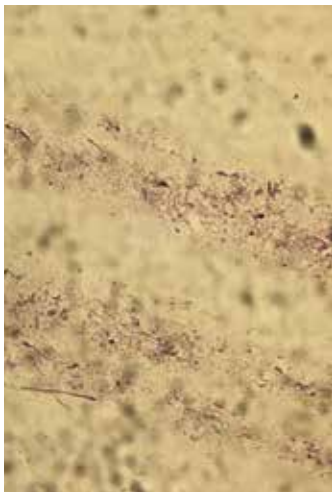


Figure 3b. *Cytology of cerumen with an inflammatory response – cellular exudate with many micro-organisms present.*

- degree of ear disease
- therapeutic approach
- significance of any bacterial infection.

A full clinical examination – and any further testing suggested by examination findings – should always be performed to gain an idea of the overall health of the rabbit.

Auroscopic examination is of little value in the conscious animal. It is impossible to see the tympanum in a lop-eared rabbit, even with a clear canal. In these cases, cerumen totally precludes extensive examination. In terms of determining the presence of inflammation/infection, rabbit pus and cerumen are visually identical.

Imaging

Radiography can be performed and congestion of the middle ears may be seen. However, this technique is insensitive and cerumen may not be visualised.

Computed tomography (CT) is vastly superior and, with increasing access and reduced costs, should be performed in all cases pre-surgery. CT will enable visualisation of soft tissue and fluid parts of the ear and canal, as well as the bony portion of the middle ear.

Cytology/bacteriology

Bacteriology should always be performed as antimicrobial resistance is encountered in some isolates. However, it should be borne in mind that there is a background bacterial microflora in the normal rabbit ear (Chitty et al, 2016) and a variety of isolates may be commensal, including *Pasteurella* spp., *Staphylococcus* spp., *Pseudomonas* spp. and yeast. Cytology should, therefore, always be performed in order to distinguish whether there is an inflammatory reaction or not (**Figures 3a** & **3b**).

"Ear-based swellings are common in lop-eared, brachycephalic rabbits ... owing to the failure of cerumen to drain either via the external auditory meatus or the Eustachian tubes"

Therapy

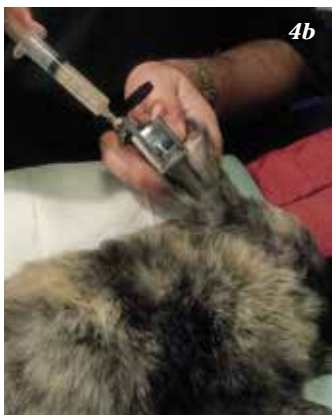
Unless there is lysis in the bulla – in which case a bulla osteotomy technique may be required (Eatwell et al, 2013) – the initial technique of choice is syringing of material from the external and, if required, middle ear.

This has the effect of relieving pressure and reducing/diluting any infected material.

This procedure should always be performed under general anaesthesia and the technique used is similar to that used in other species – with alligator forceps to remove large pieces of cerumen and a Spreull needle to insert/remove saline (**Figures 4a** & **4b**).

Saline is the fluid of choice because ototoxicity is seen in rabbits and care must be taken with potentially oto-toxic agents. In this author's experience, chlorhexidine must never be used in the ear canal.

Systemic antibiosis is not required unless there are deep inflammatory bone lesions. Non-steroidal anti-inflammatory drugs (NSAIDs) will be required where there is discomfort and in the immediate postoperative or post-syringing period.



Figures 4a *&* ***4b.*** *Use of alligator forceps (4a) and flushing (4b) to remove cerumen.*

In cases of inflammatory ear disease with bacterial infection, an antibiotic-impregnated 'ear wick' may be placed following syringing. The choice of antibiotic should be based on culture and sensitivity. However, if not resistant, this author tends to use water-soluble trimethoprim-sulphonamide solution in the wick.

Where there is multiple drug-resistance, pure TRIS-EDTA solutions (no chlorhexidine!) may also be added with, to date, no noted side effects. Wicks should be removed after seven to 10 days. If left longer, an extensive granulomatous reaction may develop that makes the wicks harder to locate and remove.

In all cases, owners should be taught how to massage the ear bases and push cerumen into the distal ear canal – once the main accumulation has been broken down this is generally a simple, well-tolerated procedure and is greatly eased by concurrent use of a squalene-based ear cleaner. This author has tried various preparations and Otoact (Vetruus, UK) has appeared the most efficacious.

In cases where the swellings keep recurring, or where cleaning is not tolerated, lateral wall resection is indicated. A standard Zepp-modification (as used in dogs) is used and achieves excellent results because the:

- stretched, soft part of the ear canal provides an excellent and large 'draining board'
- ateral soft part of the canal wall is removed, thus preventing accumulation of cerumen
- 'horizontal canal' is easily accessed for regular cleaning.

The technique (**Figure 5**) is described by Chitty and Raftery (2013) and Capello et al (2015).

Figure 5. *Lateral wall resection in a rabbit.*
(a) *The site has been prepared and parallel incisions are made from the external opening of the ear canal to approximately 2cm ventral to the ear-based swelling.*
(b) *The incisions are deepened to include the entire lateral wall, which is reflected ventrally. This exposes the cerumen build-up which can be removed at this stage.*
(c) *The majority of the reflected tissue is removed leaving a 1-2cm remnant as a 'draining board'. This is sutured to the skin margin ventral to the ear canal.*
(d) *Once the draining board has been secured, the canal and skin edges can be sutured*
(e) *Completed surgery showing the open 'vertical portion' and the new opening of the 'horizontal portion'.*
(f) *Healed ear canal – during healing the wounds should be cleaned daily with saline. Particular care must be paid to the draining board. This author does not use Elizabethan collars because they cause considerable stress to the patient.*

Prevention

The main way of preventing these ear-based problems is through owner education or, more importantly, *prospective* owner education.

Fundamentally, the disease results from anatomical changes produced by selective breeding. New owners should be advised to purchase 'prick-eared' rabbits rather than 'lop-eared'; and to purchase rabbits with long noses – a photograph in the clinic of a wild rabbit is a very good aid to educate people as to what a rabbit *should* look like.

However, it is unlikely that purchasing of lop-eared brachycephalics will stop or that veterinary professionals will be presented with these animals before they have ear problems.

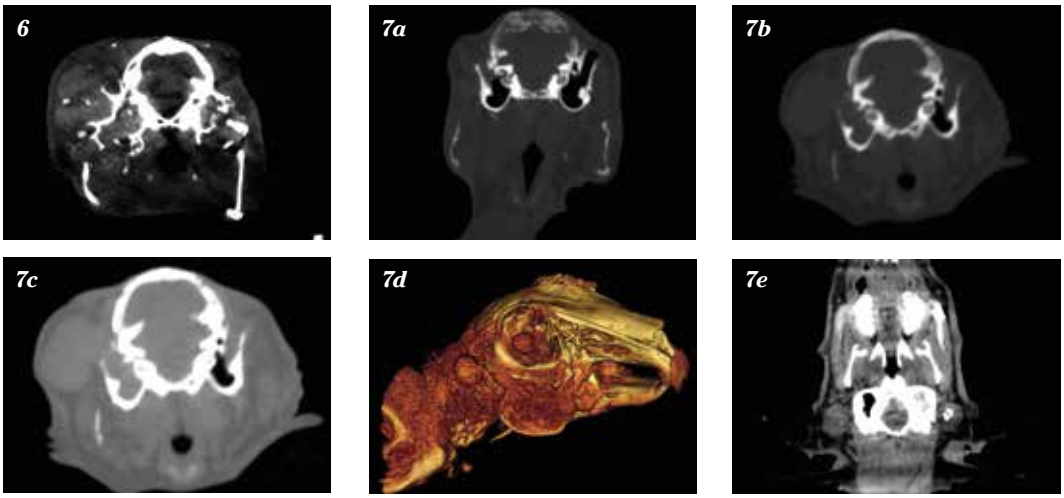
Some authors have suggested the prophylactic application of lateral wall resection for these rabbits. However, not all will develop aural diverticula and such extensive surgery does seem excessive, especially as the procedure is much more difficult with an unstretched lateral wall making it more difficult to create an effective draining board and maintain the reformed canal opening.

Nonetheless, there is the likelihood that these rabbits will be suffering some accumulation of cerumen within the closed-off ear canals. As such it may be appropriate to advise ear massage and the use of squalene-based cleaners from an early age; although it should be noted that there are no studies performed to establish the efficacy of such a prophylactic regimen.

In summary, the only definite method of preventing these problems is by avoiding breeding susceptible conformations.

Conclusions

Aural diverticulosis is common in lop-eared, brachycephalic rabbits owing to the anatomical conformation of the ear canal and Eustachian tubes. Computed tomography and cytology/culture of the cerumen are important parts of the diagnostic investigation. Therapy involves syringing of the ear canals, followed by use of squalene-based cleaners and ear massage. In recurrent cases, lateral wall resection is effective in preventing cerumen build-up and facilitating cleaning. ■



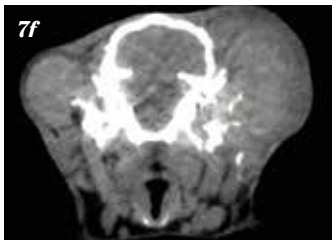


Figure 6. *Total destruction of the bullae associated with ear-based swelling. The material within the swelling was purulent and there is clear extensive osteomyelitis. This is a rare case that can be treated and managed as an abscess – either surgically or conservatively. Ear canal flushing is not recommended in these cases.*
Figure 7a. *Ear based swelling in the right ear. Both bullae are intact and empty of purulent material.*
(b) *More extensive cerumen filling in this case with the affected right side showing fluid filling the entire right external ear and bulla. There is cerumen filling of the left ear canal. The right bulla also shows bone thickening which may represent reactive change.*
(c) *Same case as 7b but different weighting the extent of the cerumen filling can be seen.*
(d) *Same case – 3D reconstruction demonstrates the containment of the cerumen.*
(e) *A more chronic case showing calcification of the cerumen, in this case of bilateral swelling.*
(f) *Bilateral ear-based swellings. On the right there is bone reaction but the bulla is intact. This side responded well to flushing and regular cleaning. On the left there is bulla destruction and extensive distension of the ear canal. Lateral wall resection was required on this side.*

PPD Questions

1. *Pseudomonas* spp may be isolated from an ear swab. It may be regarded as:
   A. a serious primary pathogen
   B. a potential zoonosis
   C. a commensal organism in the rabbit ear
   D. an opportunistic pathogen.

2. Aerobic/anaerobic culture of ear swabs should always be interpreted together with:
   A. nothing – culture findings are adequate in their own right
   B. ear cytology
   C. skull radiography
   D. skull CT.

3. Ear-based swelling in lop-eared rabbits is primarily linked to:
   A. anatomical defects in ear cartilage formation, together with brachycephalism
   B. inflammatory skin disease
   C. bacterial infection
   D. iatrogenic damage with the otoscope.

4. Which of the following is most suitable for use in syringing the ear?
   A. saline
   B. glucose-saline
   C. dilute chlorhexidine
   D. salicylic acid-based low-pH cleaners.

Answers
1.C 2.B 3.A 4.A

References and further reading

Capello V (2004). Surgical treatment of otitis media and externa in pet rabbits. Exotic DVM 6(3): 15-21.

Capello V et al (2015). Ear Surgery of Pet Rabbits. Self-published iBook

Chitty JR and Raftery AP (2013). Ear and sinus surgery. In BSAVA Manual of Rabbit Surgery, Dentistry and Imaging. Eds Harcourt-Brown and Chitty. pp 212-232.

Chitty JR et al (2016). Normal Flora of the Rabbit Ear. Proceedings of the 8th World Congress on Veterinary Dermatology.

Chow EP (2011). Surgical Management of Rabbit Ear Disease. Journal of Exotic Pet Medicine 20: 182-187.

Darwin C (1868). The Variation of Animals and Plants Under Domestication Volume 1. Chapter IV. John Murray, London

Eatwell K et al (2013). Partial ear canal ablation and lateral bulla osteotomy in rabbits. J Small Anim Pract, 54: 325-330.

Popesco P (1978). Atlas of Topographical Anatomy of Domestic Animals 2nd edn. Saunders.

Bats in the belfry

Bats are the second largest order of mammals, and make up about 20 per cent of all classified mammalian species worldwide. They are the only mammals naturally capable of true and sustained flight – with the smallest bat being only three centimetres long with a wingspan of 15 centimetres, and the largest (the 'flying fox') weighing up to 1.6 kilogrammes and having a wingspan of 1.7 metres.

They are natural reservoirs for many pathogens, such as rabies, and because they are highly mobile, social, and long-lived, they can readily spread disease. They often gain bad press and in many cultures are associated with darkness, malevolence, witchcraft, vampires and death. In reality, bats play a vital role in a healthy ecosystem as pollinators and insect eaters. In the UK, some bats are 'indicator species', because changes to their populations can indicate changes in aspects of biodiversity.

Bat populations in the UK have undergone significant declines since the mid-1900s with the main reasons for this thought to be:

- increasing agricultural intensification
- loss of natural habitat
- loss of roosts through development and exclusion from buildings
- direct and indirect impacts of pesticides.

This loss of habitat has forced some species to take refuge in buildings, such as historic churches. While many church communities live harmoniously with bat roosts, in some cases bats are causing irreparable damage to historically significant monuments and memorials, as well as 'impacting' on people who use the buildings.

Autumn 2018 saw a boost to the protection of bats with the introduction of the 'Bats in Churches' project, designed to fund the protection of bats and historic churches. The project has received £3.8 million funding from the Heritage Lottery Fund. Led by Natural England, it will deliver a five-year partnership between wildlife, heritage conservation and church organisations. It will aim to find practical solutions to enable 102 of the most severely affected church communities to reduce the impact of bats on the church, without harming them, and create a new network of fully trained volunteers who can undertake bat surveys and support congregations who have bat roosts in their churches.

The project will also train professional ecologists and historic building specialists to build up knowledge and improve their advice to congregations, as well as collect and collate up-to-date data from over 700 churches across England, helping to build a specialist knowledge base of bats and their use of churches.

This is good news for both bats and the protection of churches; but we, as individuals, can also help in bat preservation by caring for them in our gardens. There are 17 species of bats in Britain – the more common species that use gardens for feeding or daytime shelter are the common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule and Daubenton's bat. All British bats feed on insects, particularly those that are active at dusk and during the night, such as moths. But they will also eat mosquitoes, flies, mayflies, some beetles, caddis flies, lacewings and other nocturnal insects that they catch on the wing, as well as picking off insects that are resting on foliage.

During the day, bats hide in dark places, such as in hollow trees, roof spaces and under tiles. At different times of the year, bats will move between several resting places that are used as daytime roosts, maternity roosts where females give birth and nurse their young, and hibernation sites for the winter months.

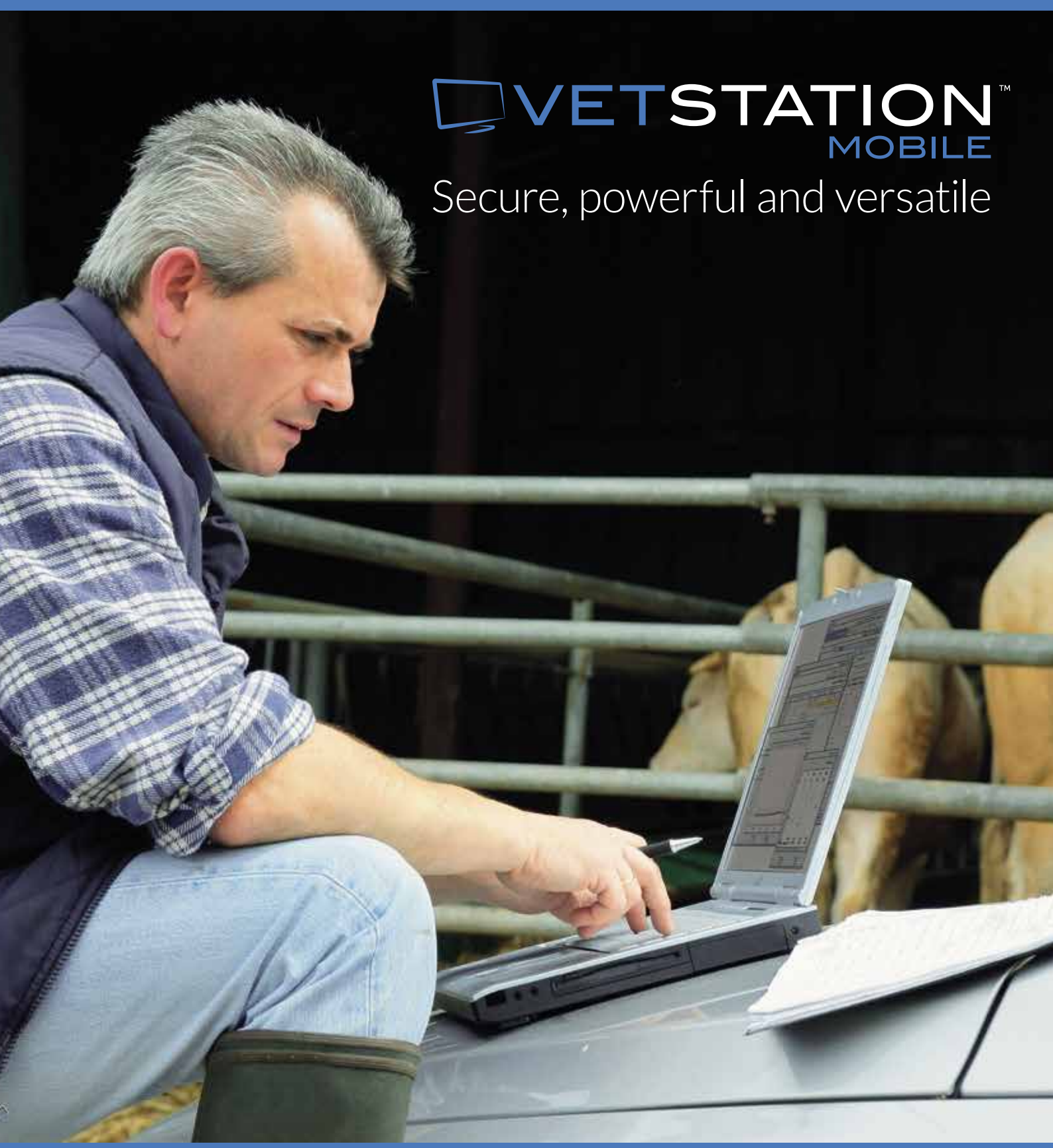
We can make our gardens more bat friendly, particularly by increasing the food supply. Compost heaps and ponds are good for generating the types of insect that bats like; and growing white or pale-coloured flowers that are more likely to be seen by – and attract – the nocturnal insects hunted by bats. Avoiding the use of pesticides is also an obvious way to protect the bat population in the garden.

Although bats will generally find their own places to shelter, bat boxes can be placed on tree trunks or walls of buildings, making sure that they have not been treated with wood preservatives. Bats seek warm, sheltered places in summer; so when placing bat boxes, choose locations with a sunny southerly or westerly aspect and avoid them above doors or windows, or anywhere that the bats might be disturbed by people or pets.

As well as bat boxes, any old trees with cavities in the trunk, loose bark or splits in the trunk or branches will make ideal bat shelters.

Bats may have a bad reputation; but they are, in fact, fascinating creatures deserving of a place in our ecosystem and in our gardens. Be aware that all bats in Britain are protected legally and this protection extends to the places where they are roosting or hibernating – be that houses or your garden. ■

For more advice on protecting and dealing with bats, contact the Bat Conservation Trust at www.bats.org.uk



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Choosing independence and freedom

The changing shape of the veterinary world presents challenges and opportunities for independent veterinary practices, as they adapt to a new business environment where the growth of 'corporates' continues.

As a consequence, independent practices have had to become more proactive in their efforts to retain and grow their share of the veterinary market. But every cloud has a silver lining, and this enforced proactivity has led to better planning, recruitment and, most of all, provision of the very best service to clients.

Successful practices not only attract clients, they attract good vets and nurses. Successful independent practices provide good personal development opportunities for all their employees, as well as embracing the values of professional health care held dear by veterinary professionals.

"FIVP provides a voice for independent veterinary practices, as well as promoting and supporting the great services they provide"

Support ... and a voice

The Federation of Independent Practices (FIVP) was set up to support and provide a voice for independent practices and the great service they provide for the animal-owning public. It is a not-for-profit association of independently owned veterinary practices, with services centred on the needs of its members. Through regular dialogue and meetings, the executive committee is able to prioritise its work and deliver effective results in the four key activities of the federation:

- **promoting**
- **sharing**
- **representing**
- **supporting.**

Membership is practice-based and available to all independent UK practices that meet the FIVP entry standards.

There are exciting opportunities for veterinary surgeons who want to work in thriving practices committed to remaining independent and providing the freedom so important to most practising vets. The veterinary professionals in independent practices are committed to making decisions in the best interests of the animals under their care.

In any business, there is a need to make a profit but, typically, independent practices are best placed to ensure that profit generated is reinvested in the facilities, equipment, staff and the local communities that these practices serve, rather than distributed to non-veterinary shareholders.

Flexibility and freedom of choice

Independent practices can be sole practitioners, partnerships, limited companies and not-for-profit organisations – from single-species practices to mixed practice and from narrow specialisms to larger referral practices. Many of these practices can be regarded as true social enterprises because these businesses primarily benefit people and their pets. This model of ownership sits comfortably with the lifestyle choice made by many of those choosing to earn their living in the veterinary profession.

Working in an independent practice also provides the veterinary professional with the 'freedom to choose' as they grow in their career, rather than being channelled along the narrower lines of procedure, prescribing and CPD choice they might find in a non-independent practice.

The FIVP is actively seeking vets who want to work in thriving practices committed to remaining independent. The FIVP website has a careers section where those seeking employment in an independent practice can register their interest and independent practices seeking like-minded colleagues can list vacancies. There is always an FIVP presence at the major veterinary conferences where those who are interested can talk to other FIVP members.

So if you are looking for employment in an independent, progressive practice with the values that you hold dear, contact FIVP today.

Membership of FIVP is open to all UK-based practices meeting the essential criteria of independent ownership and core standards of veterinary service. It aims to ensure that independent practices remain at the forefront of excellent veterinary service.

"Working in an independent practice also provides the veterinary professional with the 'freedom to choose' as they grow in their career…"

FIVP™ Federation of Independent Veterinary Practices

To join the Federation or for more information, go to www.fivp.org.uk or contact the FIVP team by telephone on **03301 239 351** or by e-mail at **enquiries@fivp.org.uk**

Avoiding unlawful discrimination – Part 1

Legal protection against unlawful discrimination under the Equality Act* is not only prohibited against employees, but also locum vets, and your customers as 'service users' (as defined by the Equality Act). In the first of two articles, the author introduces some of the important legal considerations and the fundamental elements of discrimination claims veterinary practices may face, as employers and service providers.

Stephenie Malone

Stephenie qualified in 2005 and is a specialist employment solicitor, part of the health and social care team at Harrison Clark Rickerbys solicitors, www.hcrlaw.com. She advises and assists clients on the employment aspects of the acquisition and disposal of businesses, including veterinary practices.

Stephenie also works as an HR consultant for HR4VETS and is a qualified mediator. Her articles have been published in a number of health and social care sector publications, she often presents at seminars and offers training on a variety of employment topics.

What does it cover?

The Equality Act codified the multiple strands of anti-discrimination legislation[1], which had been established in the UK over a 40-year period. It prohibits discrimination in several forms – direct discrimination, indirect discrimination, harassment and victimisation and applies in the following areas:

- employment (including workers and self-employed contractors)
- provision of goods
- facilities and services
- exercise of public functions
- premises
- education
- membership of clubs and associations.

For your practice, the main areas of focus will be protecting your staff and clients against discriminatory treatment. Failing to consider how to avoid unlawful discrimination within the practice risks exposure to claims, which can be costly, and also the impact of the stigma of a successful claim. In order to establish a discrimination claim, the first requirement is for the claimant[2] to establish that they possess (or are perceived to possess, or associated with someone who possesses) a protected characteristic (**Figure 1**). If the alleged treatment is for another reason, it might give rise to a separate ground of complaint, but it will not succeed as a discrimination claim.

There is no service requirement in order for a discrimination claim to be issued: it can apply from Day one of employment, or for a first-time customer.

What are the forms of discrimination?

In respect of discrimination against staff and customers, four forms of discrimination apply.

Direct discrimination

Because of a protected characteristic, A treats B less favourably than A treats – or would treat – others (**Figure 2**).

To establish a claim for direct discrimination, the claimant must use a real or hypothetical comparator[3] to differentiate the treatment they have received, so they can demonstrate it has been less favourable.

The less favourable treatment must be because of a protected characteristic. What was the practice's

- sex/gender
- disability
- race (including ethnic origin and nationality)
- age
- religion or belief
- marriage or civil partnership
- pregnancy or maternity
- sexual orientation
- gender reassignment.

Figure 1. *What are the 'protected characteristics'?*

Figure 2. *Examples of direct discrimination.*

Employment	An employer: ■ refuses to recruit or consider applications from applicants because of a protected characteristic ■ offers less favourable terms of employment, opportunities for promotion or training, or any other benefits offered to them are less favourable because of a protected characteristic ■ dismisses or terminates the working relationship because of a protected characteristic.
Goods & services	A practice: ■ refuses to provide goods or services to customers because of a protected characteristic ■ offers less favourable terms on which they provide the service or goods to a customer because of a protected characteristic; the quality of the service or the manner in which it is offered is comparatively poor ■ terminates the provision of the service or goods because of a protected characteristic.

*Suggested Personal & Professional Development (PPD)

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DISCRIMINATION

- bringing discrimination claims
- complaining about harassment
- getting involved in some way with another claimant's discrimination complaint (such as giving evidence in an internal disciplinary or grievance process, in an Employment Tribunal).

Figure 3. *What are protected acts?*

conscious or subconscious reason for the less favourable treatment? Was the decision taken for another, non-discriminatory reason?

'Less favourable treatment', whilst not defined in the legislation, is deemed to cover experiencing a clear disadvantage compared to others. It is important to note that the difference in treatment is not in itself enough to establish a discrimination claim; the legal examination will need to investigate the *reason(s)* for the difference.

The discriminatory treatment can be because of the claimant's association with someone who has the protected characteristic[4]. For example, a non-disabled claimant might bring a direct disability discrimination claim where they have been treated less favourably because they have a disabled child – where they need to request time off at short notice for medical appointments, for example.

An incorrect perception that someone has a protected characteristic[5] leading to less favourable treatment is also prohibited. For example, mistakenly believing someone of an ethnic origin is of a particular religion and treating them less favourably as a result.

Indirect discrimination

Indirect discrimination occurs where acts, decisions or policies are applied by the practice that are not intended to treat anyone less favourably, but in fact have the effect of disadvantaging a group of people with a particular protected characteristic. This is commonly referred to as a 'PCP' (provision, criteria or practice).

It is not necessary for the PCP to be a formal policy to be capable of challenge as indirectly discriminatory. The disadvantage caused by the PCP must be something that a reasonable person would complain about, and it must put persons who share a protected characteristic at a particular disadvantage.

Where an individual with that characteristic is disadvantaged, it will amount to indirect discrimination unless it can be justified objectively. If the disadvantage can be objectively justified, the practice will avoid liability for indirect discrimination. To demonstrate this, the PCP must be a proportionate means of achieving a legitimate aim.

Indirect discrimination may be triggered by recruitment criteria (whether compulsory or merely desirable) – for example, by requiring an employee to work full time, which disadvantages women as a group, because women, as a whole, hold a greater part of domestic and childcare responsibilities than men. Accordingly, they are more likely to work part time. In the absence of objective justification, the need for a full-time worker might be indirectly discriminatory against a woman with childcare responsibilities.

Avoid use of candidate requirements in a job advertisement such as 'strong' or 'tall', which may imply

male candidates are suited; or 'dynamic', which may imply a younger person is sought.

Indirect discrimination may also be precipitated by provisions in an employment contract – for example, enhanced overtime rates of pay only payable after full-time hours have been performed, which is likely to be indirectly discriminatory against women (see previous reasons) who are less likely to work full time. Instead, offer overtime rates after that employee's contractual hours have been performed, so individual working patterns are not impacted. Working practices around annual leave might discriminate indirectly against religious groups.

Indirect discrimination involving goods and services might, for example, include formal or informal rules, conditions or pre-requisites of service. Allowing working customers to pay by instalments is likely to discriminate indirectly against retired customers on grounds of age.

Harassment

A person (A) harasses another (B) if A engages in unwanted conduct related to a relevant protected characteristic which has the purpose or effect of either:

- violating B's dignity; or
- creating an intimidating, hostile, degrading, humiliating or offensive environment for B.

To determine if the conduct shall be considered as having such an effect the following must be taken into account:

- the perception of B
- other circumstances of the case
- whether it is reasonable for the conduct to have that effect.

'Sexual harassment' occurs when A harasses B by engaging in unwanted conduct of a sexual nature, and the conduct has the purpose

or effect referred to in the general definition. It is not necessary to have been an ongoing course of unwanted conduct – a one-off incident can amount to harassment. Further, there is no obligation on the victim to have made the perpetrator aware that the conduct was unwanted.

As with other forms of discrimination, the Equality Act protects an employee against harassment based on the protected characteristic[6] of another, or based on the perception that they have a protected characteristic.

Harassment claims do not need a comparator. The claimant does not have to show that they were, or would have been treated less favourably than another person.

Victimisation

A person (A) subjects another person (B) to a detriment because either:

- B has done a protected act (**Figure 3**)
- A believes that B has done, or may do, a protected act.

The aim of the legislation is to protect claimants against being subjected to a detriment which is discriminatory if they do (or might do) 'protected acts'.

Victimisation is usually carried out by a practice that has been the subject of a discrimination complaint by a current or former employee or service user. For example, instigating 'trumped up' disciplinary action against an employee who is supporting a colleague in their own grievance.

However, it can be carried out by an unrelated party – for example, a prospective new employer could refuse to employ a candidate who has given evidence against a previous employer in a discrimination case. Or a prospective service provider could refuse to provide services to a potential customer who has given evidence or complained about other customers in a discrimination case. In both circumstances, the practice would be liable for victimisation.

Coming up...

In the second part of this article, the author will discuss the legal requirements relating to accommodating disabled staff and clients. ■

*** Equality Act (2010) Glossary**

1. Included the Sex Discrimination Act 1975, the Race Relations Act 1976 and the Disability Discrimination Act 1995 among others
2. In legal terms, the complainant is defined as 'the claimant'
3. A comparator is not required in claims of pregnancy or maternity discrimination
4. Associated discrimination does not apply to claims for marriage or civil partnership discrimination
5. As 3 above
6. Marriage and civil partnership, and pregnancy and maternity, are not relevant protected characteristics for harassment purposes. However, unwanted conduct related to these matters could amount to sex or sexual orientation harassment.

PPD Questions

1. What is the legal term used for a person who complains about discrimination?
   A. plaintiff
   B. claimant
   C. complainer
   D. aggrieved.

2. Which is not a category of discrimination?
   A. bullying
   B. victimisation
   C. harassment
   D. indirect discrimination.

3. How can indirect discrimination be objectively justified?
   A. where it applies to more than one person
   B. if this is the first instance
   C. where it is a proportionate means of achieving a legitimate aim
   D. if the employee or customer has not been employed or received goods or services for at least a year.

4. Which protected characteristic does not require a comparator?
   A. gender
   B. age
   C. religion
   D. pregnancy.

5. What is not a protected act under a victimisation complaint?
   A. bringing discrimination claims
   B. telling a colleague that you have been invited to a disciplinary hearing
   C. complaining about harassment
   D. getting involved in some way with another claimant's discrimination complaint.

Answers
1.B 2.A 3.C 4.D 5.B.

Reception or client care. Does the title fit the role?

We are all well aware that 'reception' is one of the most important roles in a great veterinary practice. But does the job title accurately describe the role in your practice? Does it work for you? If not, why not? And do you really know what you want from the role anyway?

Deborah Croyle

Following successful careers in customer service and people management, Deborah joined the veterinary business sector in 2002, and has held roles in it as diverse as receptionist, administrator, practice manager and business director. She has a miniature dachshund that was born blind, another older dachshund, a tailless cat, a very old rabbit and a tortoise.

*Suggested Personal & Professional Development (PPD)

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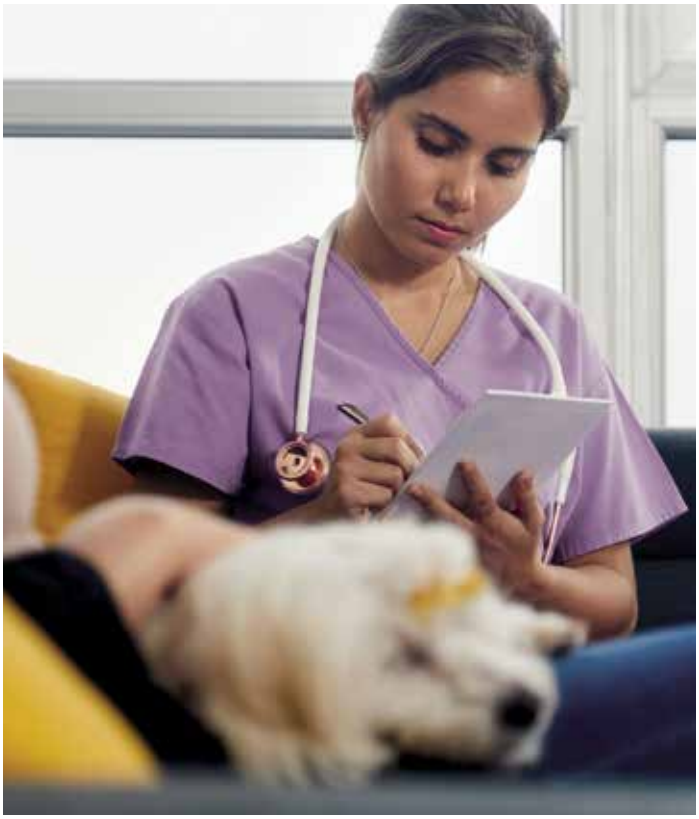
FRONT-OF-HOUSE

When did you last sit in another veterinary practice as a client and observe the reception? Was your greeting genuinely friendly, or just part of a process? Did you feel that the receptionist struck the right note and made you feel welcome? Did she or he have the time for you or did you feel they were rushing to the next task? Did they remember you when you approached them to pay? Were your queries answered with confidence?

Is client care your priority...?

If you are fortunate enough to have a reception team at your practice then, normally, the receptionist will be the first person a client will see. So you have, of course, spent time in their training and impressed upon them that they must achieve the following:

- acknowledge clients as soon as they enter the building. The phone's ringing, remember three rings!
- be efficient in dealing with their request – whether that be arriving for an appointment, dealing with a repeat order or another query. Talk through their insurance claim, explain what packages are available – and don't forget to answer that phone!
- be aware of who is in reception, for what, and how long they have been there. Check e-mails for that history the vet is waiting for, find out where the medication is for the client waiting at the desk – and who is answering the phones?
- ensure the client's exit is smooth and professional; thank them, book their next appointment, be aware of other clients – and will somebody get that phone!
- deal with all the 'admin' tasks that come under the reception hat. Register microchips, put together puppy/kitten packs, check through health package paperwork, check laboratory e-mails, send off history requests – and the phones are all ringing now!



So, in reality, does this happen? How can you ensure that the receptionists have enough time to complete all the tasks expected of them and that the phones do get answered.

... or is it 'admin and support'?

Have we, as a profession – whilst trying to train and develop a team that is efficient in dealing with any query from a client or a team member, who have their fingers on the pulse at all times, who ensure that the phones are managed and that they deliver not just good but excellent client care – turned the focus away from

"When did you last sit in another veterinary practice as a client and observe the reception?"

the client and towards the administration and support side of the role?

In the grand scheme of things, how important is it really that the filing tray is emptied every day? Does it matter so long as those microchips are registered once a day or week? Would you rather your receptionist is the most efficient administrator or the most accomplished client care manager? You may not get what you expect but you will get what you inspect – so what do you want them to be?

Two heads, two roles, two people

Have you considered splitting the role? Removing all the day-to-day tasks that result in your receptionist being taken away from the front desk and their client-facing role? Before you say, "That's impossible", stop for a moment and think about all the 'admin' that you have put into the reception role.

For example, apart from providing information and answers to clients, they may be receiving deliveries, re-stocking displays, filing, faxing, scanning documents and laboratory results, collating histories, dispensing medications, completing healthcare plan paperwork, dealing with insurance queries, fixing office equipment, cleaning, and keeping track of who is in and out. Oh, and running errands to the bank or post office, shops, and making tea and coffee several times a day.

So how much time does this add up to on a daily basis that ultimately takes receptionists away from the front desk? By simple measurement it can easily be three to five hours a day! So who is looking after the clients at these times? Your receptionists are being taken away from what you actually employed them to do – client care to bond them to your practice.

There are several ideas you could consider. However, first you need to know some basics about what are the busiest times in your practice – not only in terms of 'footfall' but also in volume of incoming calls on different days of the week. This will tell you what the priorities are at any given time – which will vary from hour to hour and day to day – and help you arrange optimum staffing that, in turn, will increase efficiency.

Making it work for you

Once you have this information, then you could consider some of the following.

Split roles

If you are fortunate to have more than one receptionist manning the front desk on any given shift, then split their roles. One's priority is to answer the phones and manage any necessary admin; and the other's is to attend to the front desk and serve clients. When the volume of incoming calls is high, make it a priority for other members of your team – a dispensing nurse, for instance – to help answer the phone, to ensure that your front desk receptionist is still free to deal with clients. It's amazing how many practices have only the receptionists answering the phone, then wonder why so many calls go unanswered!

Be creative

Consider giving 'admin' tasks to someone else altogether within the practice. If a nurse manages your insurance claims, maybe he or she can deal with the insurance queries and the requests for histories as well. Do you already have an administrator who is better suited to managing the healthcare plans or registering microchips?

Look at all the 'admin' tasks and decide if they all need to happen every day; and consider reorganising what happens when – for example, history requests could be sent on certain days of the week only. Could you create a separate support role of 'back receptionist'? This person could work part time; their function would be to manage the reception administration, from filing through to scanning or shredding documents, checking e-mails, and so on. They would still be a part of the reception team because they can fill in when there is sickness and holidays, or at times of peak demand.

Harness skill sets and experience

Are there people within your team who can take on a slightly more senior role? This might mean they are not always part of the rota but are available to spend time with new clients, or talk through healthcare plans in more detail – taking the client away from the desk and giving them undivided quality time. This may seem unrealistic, but where it has been adopted it works really well, because the receptionist is then free to carry on attending to other clients and need not feel guilty about not having enough time to spend with the more 'time-hungry' client.

How well utilised are your qualified nurses? Do you have

"In the grand scheme of things, how important is it really that the filing tray is emptied every day?"

"How well utilised are your qualified nurses?"

a nurse who is always available if a client at reception has any clinical queries – for example any 'post-op check' or flea and worm issues. Your receptionist may be able to deal with these up to a point if they are straightforward queries; but, if not, it helps efficiency if they can pass the question to a clinical colleague who can explain in more detail, whilst at the same time promoting their role within your practice.

Efficient IT

Is your phone system user friendly? Is your team able to transfer calls – such as those from suppliers or governing bodies – to different areas of the building? Or do they spend time running around the practice to find the people concerned, whilst leaving the reception desk unattended?

How much time do your receptionists spend filling the printer, emptying or unjamming the shredder, or sizing and franking outgoing post whilst sorting incoming mail? Can they really do this whilst keeping an eye on the desk?

These are just a few ideas. There are many more different ways in which reception tasks can be managed more efficiently whilst freeing the receptionists' time so they can actually perform good client care. There is no one right or wrong way because there is such a variation in the size of practices, as well as those that are multi-sited or centrally managed. But looking at what happens now and deciding what works and what doesn't is a start to putting into place a different way of working.

Reaping the benefits

Although conventional wisdom says that people don't like change, don't worry about resistance. If you ask receptionists what they would wish for most, the answer will be to have the time to be able to deliver the best client care that they can, because they actually do care about wanting to do a good job. It's up to practice managers and owners to ensure that happens.

Once you have found a way that works for your practice, the benefits will outweigh the initial disruption as the reception roles will then become more achievable, because you will have released the pressure which at the moment stops receptionists from delivering in their role. Their frustration is seldom about their ability to do the job, but rather the sheer volume and pressure of other tasks put upon them, which hinder their performance.

So next time you find yourself wondering why the phone isn't being answered, find out the real reason and do something about it! ■

PPD Tasks

1. What do you really want from the reception role? Take a few minutes to list the tasks you expect your reception team – whether receptionists, nurses, or a combination of both – to do.
2. Now identify which of these tasks are really parts of the client-facing receptionist role, and which are back-of-house or support tasks. You may be surprised...
3. Visit a few nearby practices and make a note of what they do well in reception and where they could improve.
4. Now compare your notes with what happens in your own practice. What ideas could you take and use from elsewhere? And give yourself a pat on the back for what you're already doing better than the others!
5. Now the big one – put those ideas into action!

There are, of course, no definitive answers because all practices vary. However, if you carry out these PPD tasks and – more importantly – put your learnings into practice, you will have gleaned a great deal that will directly benefit your own practice, and from which you may be able to quantify savings and financial efficiencies.

Making the most of your locum nurse

Locum nurses can be an invaluable resource to a veterinary practice. The 'Recruit4vets' locum pay rate survey in 2017 showed that the majority of nurses questioned were charging between £14-£16 per hour for their services. So, having a locum nurse is a financial commitment; but, if utilised correctly, they can more than prove their worth in practice.

Samantha Flavell
CertVN ECC CertVNES RVN

Samantha gained her veterinary nursing qualification in 2005 and has, subsequently, gained the Veterinary Nursing Certificate of Emergency and Critical Care in 2013 and the Veterinary Nursing Certificate of Exotic Species in 2015. Samantha is a West Midlands-based locum nurse; but she has, however, travelled the country providing cover for first-opinion, charity and referral practices.

There are many reasons why a veterinary practice may require locum nurse cover. These include:

- maternity cover/ adoption leave
- sabbatical cover
- long-term sickness
- recruitment gaps
- short-term/unplanned sick days
- holidays
- exams/CPD cover
- practice expansion/creation of new job roles.

Often a locum is required in these situations so as not to put undue pressure on existing staff members. This is one reason why it is important to consider how to make the most of this temporary member of staff.

Before the locum arrives

If possible, it is a good idea to get in touch with the locum directly – although if the work was booked independently, then this contact will already have been made. However, if the booking was through a recruitment agency, it is important to either obtain the contact details from the agency or to ask the agency to encourage the locum to contact the practice themselves.

As well as gleaning basic information from them – such as confirming their preferred contact number and e-mail address – it is best to share (as early as possible) the dates of their employment and the hours they are expected to work. Enabling a locum to arrive for their placement with a clear picture of what is expected of them will make their integration go so much more smoothly.

Figure 1. *If the locum is only going to be with you for a short time, assign them to generic tasks, such as anaesthesia and in-patient care.*

This is also the ideal time to make it known whether they will be required to work weekends or participate in the on-call rota, in addition to their basic defined duties. For example, there is a big difference to the locum if they will be taking client calls as opposed to just being called by the duty vet.

These may appear to be small things but discussing them can help eliminate any potential issues further down the line, such that both parties know exactly what to expect. With that in mind, it is also a good idea to ascertain the locum's previous experience – whether they are able to drive a car should 'branch cover' ever be required; whether they have worked in other practices connected to yours; and whether they have used your computer system anywhere else before. Also, if you are a specialised practice, knowing whether the locum has experience with that speciality can help you to know how best to utilise their skills long before they arrive for their first day.

The next stage is to consider how long the locum may be with the practice. The information the locum will need will be a lot less if they are only covering a day or two as opposed to a maternity cover contract. Bearing this in mind, it can be helpful to create a short 'go to' sheet outlining the most-needed information for the locum's stay. It will only need to comprise short bullet points; but should, ideally, include the appointment booking protocol if reception cover is likely; vaccine and flea/ worm protocols; and also premedication protocols, if they will be admitting patients and assisting in theatre.

Having this in writing will allow the locum to be able to start assisting with basic procedures straight away and will eliminate the time

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spent answering their more basic questions about your practice. Clearly you can vary the amount of information on the help sheet depending on the length of stay, but once it has been created, you will only need to print it out whenever you employ a new locum.

Before the locum arrives, it is a good idea to sort out general housekeeping tasks, such as computer log-ins, car park passes and practice keys, if required. Again, this will save time on the first day and will mean the locum can start work quicker.

Organisation of accommodation should also be done well in advance to allow the locum to know what facilities they will have whilst staying and working at the practice.

Having a small team meeting to inform all staff that a locum will be coming to the practice can be beneficial. The group should be told the name and experience of the locum, what dates he or she will be working, together with an idea of for how long. The co-operation of existing staff will be vital in making the most of the locum nurse, because they must be able, initially, to support the covering nurse and, hopefully, help with their integration into their teams.

Locum's first day

When the locum nurse comes in on their first day it is important to give them a tour of the practice to meet existing staff and, more importantly, to show them where key equipment – such as the 'crash box' – can be found. If possible, it is good to assign an experienced member of staff as the main point of contact for any questions they may have.

If the locum is to be staying at the practice on a long-term basis, it may also be worthwhile getting them to work with other nurses during the first couple of days as a way of learning all of the different elements in the surgery quickly – from consulting and in-patient care, to pharmacy and anaesthesia.

If they will only be with you for a few days, then it is better to have them employed as efficiently as possible by considering only assigning them to more generic tasks – such as anaesthesia and in-patient care – activities that do not differ from practice to practice as much as reception tasks – ordering medicines and nurse consultations.

The first day is also the time to have the locum logged into the computer system and given a quick lesson, if required (**Figure 2**). There are many different practice management systems, so it is best to presume they have not used yours before unless they say otherwise. This is also a good opportunity to show the locum where price lists and reception protocols can be found.

They will also need to have confirmed what the procedure is for lunch, how long they are allowed to take, and when to take that break. The health and safety folder will also need to be read and signed – so the more organised this is, the quicker it will be for the locum to complete. No one wants to be spending a long time on this, including the locum!

Also consider if the locum will be working in 'sole charge'. Will they be required to lock up at night on their own? Will they be responsible for the final order of the day and locking everything away? If so, you will need to make time to be sure there is an opportunity to go through this *before* they are in the situation where they are on their own in the practice. By doing this you can minimise the chances of mistakes happening.

Once all of these things have been done, the locum nurse will be able to work efficiently within the practice and spend longer simply nursing and filling the role required.

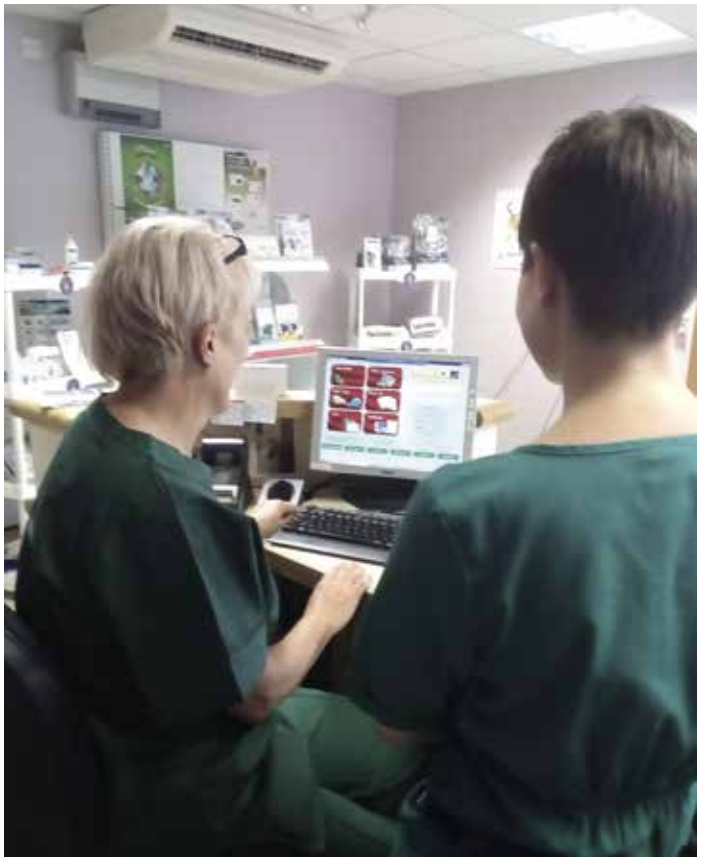

Figure 2. *The first day is the time to have the locum logged into the computer system and given a quick lesson.*

Investing in the future

Fostering a good relationship with locum nurses and looking to use them again in the future can also be a great way of increasing locum efficiency. Returning nurses will already know how your practice works and will already know the team, so welcoming them in the first instance and making their stay a pleasant one will have the obvious benefits of attracting them back.

It will also mean they slot in effortlessly next time. And if the locum likes the practice, they may even decide to stay – perhaps filling the particular recruitment gap that was the reason for their cover in the first place.

Ultimately, locum nurses have a big and growing role to play within the industry and they are often vital in helping practices continue their work in the face of staff shortages and unexpected busy spells, often at short notice.

Without correct preparation, locum cover can quickly be rendered ineffective. However, by putting in just a little organisation beforehand – with your temporary nurse's perspective in mind – you can soon change how much both parties can gain from the initial placement and any possible future work. ■

Reference

'Recruit4vets' locum pay rate survey September 2017, p12.

So what *does* your nurse do?

Sadly, despite numerous campaigns and attempts to educate and inform clients about the role of the Registered Veterinary Nurse (RVN), many of them still do not understand the importance of RVNs in practice or the extent of their qualifications and abilities.

Yet, perhaps there is no reason to be surprised at this. After all, how many people know about dental nurse qualifications, or indeed the numerous and different qualifications that nurses in the human healthcare profession possess?

It is probably ingenuous of us to expect the public to understand the different qualifications nurses and, indeed, vets may have. And, if we are honest, not that many are really very interested as long as a job is well done. Nor is it particularly helpful that for many years the term 'veterinary nurse' was used for all those who had a 'nursing' role in the practice – whether qualified or not. The legacy left by this is a significant barrier to the better understanding of the modern veterinary nurse's role.

So, if this is the perception of the public, it should come as no surprise that we face an uphill struggle when we try to explain in detail how well qualified our veterinary nurses actually are, the numerous tasks they can undertake, and the extra value they add to the practice and its services.

Roles and responsibilities in the practice have always been a difficult area for clients to fully grasp. The days when pretty much all the vets were men and all the nurses were female have long gone; and things are not made any easier by the fact that corporate uniforms can make it even more difficult to distinguish between vets, nurses and receptionists.

The role of the human nurse in the health service is not only greater than the equivalent role in veterinary practice, but it also seems to be so much better accepted by the public. Human nurses take on really responsible medical tasks and patients have full confidence in their abilities. Veterinary nurses, although respected and trusted by clients, still have some of that mountain to climb and many clients – unsure of the real abilities of the nurse – still want reassurance or advice from the veterinary surgeon on matters that the nurse is actually fully qualified to supply.

In some ways, the nurse is stuck in the middle – vets are the experts while, ironically, it is often the receptionist who is asked the questions that the client, for whatever reason, was unable to ask the vet. Nurses often seem to be behind the scenes in the practice too and maybe it is this 'hidden' aspect that makes their recognition more difficult.

Nurse clinics of all kinds certainly help to demonstrate their skill and knowledge, but this is not the only way to use them. RVNs are professionals in their own right and are now legally accountable for their actions. Surely, when we have a shortage of veterinary surgeons and uncertainty about continuity of their supply post-Brexit, we should be delegating appropriate tasks and roles to these skilled team members? By doing so we would be exposing clients to the nurses' expertise in the same way that they are exposed to the human health nurses' skills.

This, more than anything else, is likely to promote the role of the veterinary nurse to our clients – 'seeing is believing'; to coin yet another phrase, 'actions speak louder than words'. In the past, we have debated about how to 'tell' our clients how well qualified our veterinary nurses are, how to promote their skills, and how to persuade clients to see them as veterinary professionals. The 'telling' has not been a great success – far better then to get over the message in 'the doing'.

'The Future Role of the Veterinary Nurse: 2017 Schedule 3 Survey' was a report carried out for the Royal College of Veterinary Surgeons (RCVS) in the early summer of 2017, in order to assess the understanding and practice of Schedule 3 of the Veterinary Surgeons Act 1966 – by both veterinary surgeons and veterinary nurses. The RCVS commissioned the research because it was considering a review of the activities of Schedule 3 with a view to extending the role of the RVN. It was clear from the results of the survey that there was considerable support among both nurses and vets for a review of Schedule 3 and an enhancement of the RVN role for those who wish to progress and take on additional tasks.

There are still many nurses in practice who are not used to the full extent of their abilities. Hopefully, the survey will highlight this and encourage practices to make best use of this valuable human resource. We must let veterinary nurses – especially RVNs – get on with the job of providing veterinary nursing care to the highest level, leading the way to public respect and a better understanding of their role. ■

Industry Profile

Name: Averil Jarvis MBE
Position: Founder & CEO
Company: Cinnamon Trust

David Watson writes...

The first thing that strikes you as you enter the headquarters of the Cinnamon Trust in Hayle in Cornwall is the number of people engaged in the work of the charity, their busyness and their underlying commitment.

Once you meet the founder and CEO of the organisation, Averil Jarvis, MBE, you understand why. This is a 'top-down' organisation built on firm principles and with a strong sense of purpose. But it is only when you hear the scale of the operation that you can begin to appreciate the enormity of what Mrs Jarvis has achieved since she established the Trust in 1985.

There are 72 paid staff, including employees in the two sanctuaries – one in Devon and one in Cornwall – who co-ordinate 16,000 volunteers stretching from Wick in Scotland to St Just near Land's End, from Port Talbot in Wales to Lowestoft in Suffolk, the Isle of Wight, the Isles of Scilly, Orkney, the Inner Hebrides and the Isle of Man. And, as of March 2018, they were supporting 86,745 people; which adds up to 108,435 pets.

Although the majority of the animals under the Trust's care are elderly dogs and cats, as I was to find out later when I visited the Poldarves Farm Sanctuary, there are few constraints on species. I met rabbits, tortoises, ducks, geese, squirrels and a pig. Oh, and two ponies. All treated as part of one big family and given comfort and loads of TLC.

Ethos based on altruism

The Cinnamon Trust was founded for elderly people and their pets, but its services are offered to terminally ill pet owners, for they are often faced, prematurely, with the same worries and fears as elderly pet owners. In reality, anyone of any age can make arrangements for pets that might outlive them to enter the Trust's care.

Mrs Jarvis explains: "In the early '80s I realised that when pet animals were bereaved through the loss of their owners – they had to go. Often they were put into kennels and this upset them from a behavioural perspective. They would then appear to be aggressive – this only really being the manifestation of fear – and would either be put to sleep or subjected to unsuccessful attempts at rehoming. I felt that something had to be done."

The Trust's primary objective is to respect and preserve the treasured relationship between owners and their pets. To this end it works in partnership with owners to overcome any difficulties that might arise. "To many of the people we serve," says Mrs Jarvis, "their pet animal is the most important thing in their life. They trust us and we cannot betray that trust."

The national network of volunteers provides practical help when any aspect of day-to-day care poses a problem, such as walking a dog for a housebound owner. And a fostering service is provided for pets whose owners face a period of time in hospital – with volunteers taking the animals into their own homes to care for them until they can be reunited safely with their owners. During this time, every effort is made to stay in touch with the owners through visits, cards and letters; and, if there is a health problem, veterinary advice is sought and appropriate treatment given.

The Cinnamon Trust also provides long-term care for pets whose owners have died or moved to residential care that will not accept pets. Legal arrangements are made well in advance if possible, committing the Trust to offering the very best care and giving the owners peace of mind in return. "We undertake to ensure that every pet coming into our care is happy, loved and safe for the rest of its days," affirms Mrs Jarvis.

All this work costs money and the Trust relies entirely on voluntary contributions. It receives no State or Local Authority aid, and does not charge people for its services. However, it naturally hopes that pet owners who benefit from its work will make a financial contribution or remember the organisation in their will.

In addition to this, there is considerable gratitude to all the donations from a wide range of external sources – not least the veterinary professions who, both as individual practices and national bodies, give of their time and fund-raising efforts to support the charity. The British Veterinary Nursing Association, for example, made the Trust its Charity of the Year in 2011. Bearing all these financial consideration in mind, it came as a

Just as Mrs Jarvis was starting to develop the work of the charity, her beloved corgi, Cinnamon (pictured), died aged 17. It seemed appropriate to name the Trust in her memory.

In 2005, Mrs Jarvis was awarded an MBE for her services to the welfare of elderly pet owners and their pets.

little bit of a surprise that, when asked what was the greatest challenge facing the Trust at the moment, Mrs Jarvis answered emphatically, "Volunteers. The recruitment of volunteers." She said the demand was across the board – ranging from dog walkers to foster homes.

Special kind of people

Our conversation turned to the involvement of veterinary professionals in and with the Trust. At the time of the interview, there were two veterinary nurses employed directly and they had received specific training to cope with the special nursing required by geriatric animals and to cope with the emotional bonds between the pets and their owners.

Mrs Jarvis also mentioned that she was looking for a manager for the sanctuary at Hillside Farm, Lewdown in Devon. "We need a very special kind of person," she said. "In fact, it is not just a job, but more a way of life, a vocation. It is not a career progression, rather more of a fulfilment.

"Putting it bluntly, many of the pets coming to stay with us, come to die. So all our staff, especially those caring for the animals at the sanctuaries, understand that those pets once made somebody's life worth living and now it is their turn to return that love by allowing them to be themselves in a protected environment. And sometimes, terminally ill owners want to see their pet settled before they themselves die."

Mrs Jarvis continues, "I like to think that, in some way, we can try to improve the life of the bereaved pet once it has overcome its own grief; although I have found that animals grieve for an animal companion more so than for their owner. Either way, they must be allowed to express that grief."

The Cinnamon Trust believes strongly that more residential homes and hospices should be encouraged to accept old people with their pets. It campaigns widely for this provision to be more widely available and publishes a Pet Friendly Care Homes Register for individual counties – a 'must read' for anyone who is considering entering a home or sheltered accommodation.

Plea for open minds

It doesn't take too long before one realises that Mrs Jarvis has strong views on a number of matters of more than passing interest to the veterinary profession – the role for alternative medicine, including homoeopathy, in the treatment and prevention of disease in geriatric animals; and the interrelationship between diet and health. She studied physiology and biochemistry at university and specialised in neurophysiology – indeed, she continues to follow scientific updates in the latter subject, with great interest.

Of homeopathy, Mrs Jarvis says, "Scientists cannot tell you *how*, but we *know* it works. You don't have to understand how it works, just try it." She cites several case histories of animals that have responded to homeopathy, including the two ponies with Cushing's syndrome at the Poldarves Farm Sanctuary, and explains how she and the Trust have taken the Royal College of Veterinary Surgeons (RCVS) to task over its decision to withdraw its support for homeopathy in veterinary practice.

In a position statement sent to the RCVS, she states: 'The Trust takes on lifetime care of pets who outlive their owners either in two unique home-from-home sanctuaries, or in lifelong foster homes where there are currently some 1,305 pets. We pay veterinary fees for all these expending some £510,000 per annum.

'Most of these animals are elderly with chronic conditions. Over 35 years we have found, that complementary and alternative therapies – homeopathy, herbal, acupuncture, laser – serve elderly pets far better than conventional medications most of which have side effects which can be devastating'.

Whilst freely acknowledging that "some vets are amazing and want to know more about the application of complementary therapies", Mrs Jarvis says there are others who simply appear to have closed minds to the possibilities. "It is second nature to what we do here," she says. "I wish there was less antipathy in the veterinary profession towards this approach and more open-mindedness towards the idea of using things such as homeopathy *first* before rushing in to employ more conventional therapies."

As to the subject of nutrition, great emphasis is placed upon the feeding of fresh and home-prepared diets based on eggs, cheese and yoghurt for "breakfast", pasta and rice-based meals for "lunch", and chicken, turkey, rabbit, green foodstuffs and vegetables, together with balancing supplements.

Mrs Jarvis explains, "Nearly all the animals under the Trust's care are old and the homemade diets lend themselves to 'tweaking' in order to match the needs of more chronic conditions, such as renal disease." She puts the longevity of many of the resident pets down to this dietary approach. "At least 80 per cent of it is

down to diet," she claims. "If you keep the brain healthy, the rest – physical health – follows."

Dedicated life

Asked about her hobbies and interests away from her role as CEO, Mrs Jarvis admitted, "The Cinnamon Trust is my life!" although she conceded that she does like spending time with her natural bobtail Pembrokeshire corgis, her chickens and nurturing her garden. "And I'm always learning," she said. "Finding out more and more about the application of alternative and complementary therapies and encouraging people to make educated assessments of them, based as much on logic as on critical evidence."

As we come to the close of the interview, our conversation returns to the subject of the ethos of the Cinnamon Trust, which Mrs Jarvis likens to the role of almoners in hospices. "Just as they give people comfort and take away their pain, to give them comfort and peace, we can do the same thing for pets. It's a huge responsibility. And I try to get everyone who works for the Trust to see that. It is not always easy, but it is imperative."

Poldarves Farm Sanctuary

Poldarves Farm, near Penzance, Cornwall, was purchased in 1988 and became the Cinnamon Trust's 'blueprint' sanctuary.

Mrs Jarvis has ensured that the layout and management of the Trust's sanctuaries are closely aligned with the ethos of the organisation. So there are no kennels and very few cages, because these would only bewilder an old and much-loved pet.

There are settees and armchairs, large rooms to share, rugs on the floor – all familiar, comforting and comfortable. The routine mimics that of an average household, and the experienced, loving care provided by sanctuary manager, Emma, and her devoted team, ensures that even a very old animal soon feels at home.

The adjacent farmland pastures and woods provide a perfect environment for gentle walks; and all manner of wildlife finds its way into the surrounding fields too and adds to the peaceful atmosphere. ■

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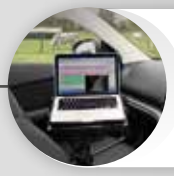

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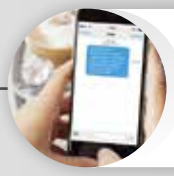

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