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UP FRONT...

What's the risk and who's to blame?

There was a time - quite a few years ago now - when tripping over a paving stone was an unfortunate accident and the person concerned might simply say that they should have been more careful or should have looked where they were going. Sadly, in today's blame culture the individual has to find someone to blame - everything has to be someone else's fault and a simple 'accident' just does not seem to be in most people's psyche.

This blame culture has certainly sharpened our attitude to health and safety in veterinary practice – and quite rightly so – but it has also created a 'worry culture', particularly among younger vets, who now expect to be sued at least once during their career; resulting in extra stress in what is already a stressful job.

Nich Roper's article in this issue takes a sideways look at this blame culture by considering the potential risks to the public on farm visits. It makes interesting reading and for some would persuade them that farm visits open a can of very dangerous worms. It also highlights the veterinary surgeon's responsibility with regard to advising his or her clients on these types of health and safety matters.

Health and safety is about risk – defined by the Oxford Dictionary as a 'chance or possibility of danger, loss, injury or other adverse consequences'. Even the Health and Safety Executive agrees that it is impossible to totally eliminate risk. We have to make life as safe as is reasonably possible and, having achieved this, it could be argued that any resulting accident should be just that, and we should not be searching for someone to blame.

If we continue with the blame culture, there will inevitably come a time when people just stop doing anything that might have the possibility of risk – vets will not try new procedures, 'open days' both at the surgery and on the farm may disappear and we will all be the poorer.

We all need to accept a certain responsibility for our own health and well-being and take on board the fact that life is simply not without risk. To quote Albert Einstein, 'A ship is always safe at the shore – but that is not what it is built for'.

Maggie Shilcock Editor

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A question of conscience



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One of the toughest challenges we face in veterinary practice is how much support we give to management practices and systems of which we do not approve. Some systems can cause unacceptable levels of suffering – through pain, fear, boredom, confinement and isolation. Some are not beneficial to the owner – a failing farm, for instance; and some cause wider harms through pollution, disease threats or antimicrobial overuse.



These challenges are not unique to farm animal practice – we also have to decide how much support to give to pedigree breeding that can lead to unhealthy bloodlines and exaggerated physical features. 'Puppy farming' can involve all the harms of poor intensive farming. Racehorse trainers may keep their horses in permanent individual stabling or feed excessive concentrates, and dressage riders may use unsuitable training methods. And many exotic animals are kept in unsuitable, restricted conditions.

On the one hand, we can try to make such practices less bad – advising surgery to ameliorate problems, such as skin folds and tail-biting. On the other hand, such interventions may improve the management system – by enhancing productivity or avoiding financially catastrophic problems.

How can we balance these competing concerns? One way is to think of the 'system' as a 'patient' as a whole. In particular, we can think of whether the system is one that we would want to 'keep alive' or one upon which we would want to 'call it a day'.

The euthanasia option

As veterinary surgeons, euthanasia is in our portfolio of treatment options. When animals are unhealthy and their suffering is expected to continue or worsen, 'putting them to sleep' may be the kindest thing. But, of course, euthanasia is a last resort. If there is a treatment option that has a reasonable chance of success, then we should provide that instead.

Sometimes, a treatment option is unavailable – for example if the owner will not fund it, or it relies on a level of compliance with your recommendations that the owner is unlikely to manage. Sometimes other treatments are not in the animal's interests. And when all other options are effectively ruled out, there comes a point where the best option is to call it a day.

Indeed, during our treatment, it is useful to develop an 'exit plan' - detailing how far we should go and what would prompt a euthanasia decision. Such plans help develop other aspects of our clinical plans, and help owners to know where they stand. In some cases, discussing euthanasia can help motivate owners to make other changes or fund other treatment options. As veterinary professionals, we have the empathy to see euthanasia as helping the animal (and the owner) – and having such plans is better for the animal than waiting until they are *in extremis*.

Extending life

In some cases, we can extend life; although we should take great care not to extend suffering. So we have to balance extending life with ensuring a good quality of life. Some treatments might extend the life of an unhealthy patient, but that is not in their interests because the quality of that life is too low to be worth having.

"We can – and should – refuse to provide unethical treatment"

"We should not provide support that helps a practice or system to continue if that practice would be better stopped"

We should also avoid providing 'futile' treatments that would be either ineffective – excising a cancer that has already metastasised or treating a downer cow after several days, for instance; or outweighed by the suffering they cause – subjecting a cow to a painful surgery that would extend life only fractionally. Such treatments can delay a decision to provide euthanasia for a moribund animal.

Part of our expert professional judgement as veterinary surgeons is to know when to make the right decision. We can – and should – refuse to provide unethical treatment. In some cases, another veterinary surgeon may then choose to provide that treatment, but that should not in itself make us provide any treatment that *we* consider unethical.

Tough decisions

In making such decisions, we consider the harms and benefits of the individual's continued existence to the animal and client. For the animals, we assess whether the expected level of suffering would outweigh the likely enjoyment that continued life could provide. For the clients, we consider whether we are simply extending a relationship that will end at some point anyway.

We may also consider whether society at large has a view on what is acceptable – for example, ensuring we and the owner are not causing or allowing unnecessary suffering and are providing adequately for the animals' needs.

Sometimes we explicitly make assessments about groups of animals. We may decide that a whole herd or flock needs to be culled. In practice, for large flocks of broilers or layers, we cannot assess each and every animal, so we make an overall assessment at a group level. These assessments are difficult but are part of the job.

Quality of 'systems'

The same approach could help us in deciding how to help various current husbandry or clinical practices. We could consider the pros and cons of their continued existence. We should assess whether a practice or system is 'unhealthy' enough that it is best to call it a day.

We should consider if it causes unacceptable levels of suffering, or more suffering than it provides enjoyment – especially where animals' behaviour, social interaction or feed are restricted. We should consider whether the practice is actually beneficial to the owner – for example, if the daily grind and financial risks of their farm outweigh the benefits compared to selling up or constructing a golf course.

We should consider if it causes unacceptable risks to other people or animals, through pollution, disease threats or antimicrobial overuse. We should consider if the practice is 'moribund' either because it is financially unsustainable or because society is increasingly opposed to it. Since post-war industrialisation, the societal direction of travel in developed countries is for systems that provide better animal welfare and public concern increasingly counters more harmful practices. Progress may be slow, but it seems inevitable.

We should not provide support that helps a practice or system to continue if that practice would be better stopped. That includes not providing coccidiostats or authorising routine mutilations where the practice relies on our doing so. It also includes defending the practice in public (or remaining culpably silent), or providing treatment.

Sometimes, sadly, it is our representative veterinary organisations' prevarication or mealy-mouthedness that gives these systems their best societal defence.

Whose life is ill anyway?

By resisting the pressure to perpetuate such systems, we can drive improvements, and stimulate owners to make use of other methods. By not authorising tail-docking as a profession, we may make owners provide better enrichment. By not performing Caesarean sections, we may force owners to make responsible breeding decisions. Some farmers and owners may feel forced into such systems by their competition, and might be surprisingly relieved by not being allowed to continue practices with which *they* are uncomfortable.

Each individual veterinary professional must make a personal, professional judgement about which systems would be better off discontinued. However, making such decisions of conscience – swimming against the prevailing current of opinion – can be difficult if one does not feel supported by colleagues. So, as a matter of urgency, we need a co-ordinated profession-wide discussion on what systems and aspects of current practice we are happy to help perpetuate.

"Sometimes, sadly, it is our representative veterinary organisations' prevarication or mealy-mouthedness that gives these systems their best societal defence"



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*Suggested Personal & Professional Development (PPD)



FELINE BEHAVIOUR

Multi-cat households – a pragmatic approach

The proportion of cats kept in multi-cat households is rising and while it is clear to see the benefits for owners, is this necessarily a good thing for the cats? Finding the answer to this question may be surprisingly difficult. As a self-reliant species, the cat does not overtly display negative emotions. The resulting subtle and ambiguous ways it demonstrates distress makes it difficult for owners to identify problems when there are several cats in a household.

Are multi-cat households good for cats?

Cats are not 'pack' animals but have the ability to adapt to form social groups. Where social groups of cats do exist, they appear only to work well when the members of the group are familiar with each other and when there is no competition over food or other resources.

Groups of household cats form differently to those that occur naturally in the species. Humans select those cats that live together and so they may or may not be related. They are routinely neutered an appropriate measure for the household cat - and are then either confined within a property with no opportunity to put distance between them, or allowed to roam in a wider territory which may contain numerous other unrelated cats, some in close proximity.

This potentially puts the companion cat under a great deal of pressure; but as an adaptable species, it is fair to say that some cats seem to cope well. It is important to remember that there is a wide spectrum of sociability in the household cat - some choose social contact with their own species, many will avoid it (given the choice) and all cats, arguably, are capable of living without feline company.

The veterinary team plays a role in the prevention of poor welfare and stressrelated behaviour associated with conflict in multi-cat households by:

- educating owners about the social structure of the domestic cat
- advising about the acquisition of multiple cats or additions to multi-cat households
- communicating the importance of ensuring the cats' environmental needs are met.

There will also be those occasions when the conflict already exists, so the veterinary team should then be vigilant to:

- identify behavioural issues requiring early intervention
- offer 'first-aid advice' to clients
- refer to a suitably qualified APBC, CCAB, ABTC
 registered practitioner or veterinary behaviourist.

"... there is a wide spectrum of sociability in the household cat – some choose social contact with their own species, many will avoid it (given the choice) and all cats, arguably, are capable of living without feline company"

The key to success

Multi-cat households can work well under the right circumstances. There are three important factors that influence success:

- compatibility of the cats within the group
- availability and accessibility of resources
- population density of the cats in the territory.

1. Compatibility

Siblings that have been brought up together often represent the best pairings, particularly if there was evidence of sociability with each other as kittens and their temperaments remain complementary – for example, probably not one very confident kitten with one very shy one.

If the multi-cat household is established with a number of cats within it, then it is possible that they do not form one single, cohesive group. Once cats mature, they can form sub-groups - pairs, factions of three or more, and singletons. These individual groups then cohabit within the territory making every effort to avoid other groups and remain at a distance.

If these social groupings can be identified then, in theory, an optimum environment can be provided that distributes cat resources within the home to take into consideration the need of each individual group not to share with another. "There are no reliable, predictive tests for compatibility in cats and there are many diverse opinions regarding the significance of gender and breed"

Adding cats to existing cat households

One way that the veterinary team can assist in the prevention of conflict in multicat households is to offer good advice before the owner actually acquires any new additions. On these occasions it is always helpful to have a methodical approach to the process of decision making, giving the client sufficient information to make an informed decision.

Points to consider are:

- does the client think they need to get another cat to keep the other/s company?
- do the client's existing cats get on?
- if they acquire another cat, will they get along?
- where should they go to get another cat?
- which cat will best complement their existing cat household?

There are no reliable, predictive tests for compatibility in cats and there are many diverse opinions regarding the significance of gender and breed. A kitten will be easier to introduce to an adult cat because it does not represent such a territorial threat – they can, however, be extremely playful and cause the resident cat some distress with the constant play-related attention. The kitten chosen should be playful with the other kittens in the litter, but not hyperactive, boisterous or over-confident.

If an adult cat is chosen, then it should, in theory, have a proven history of positive multi-cat living; but, in reality, it is extremely hard to obtain such history and it is debatable whether or not this is predictive of a good outcome in a new multiplecat environment. On that basis, a calm temperament is recommended. It would not be advisable to consider any cat with a history of straying or one that has been castrated as an adult because these cats can be sensitive to territory.



Kitten introduction

Ensure that the resident cat(s) and the new kitten have been health checked and all are vaccinated. The collection of the kitten should be timed so that the new owner can start the introduction process, for example, during a holiday from work. Each cat should be exposed to the presence of the other gradually, beginning with their scent, followed by sight of them from a distance, leading eventually to direct contact. There is no absolute rule about these introductions; although one recommended sequence is summarised in **Table 1**.

Table 1. Introducing a kitten to a multi-cat household

- create a room specifically for the kitten – ideally one that isn't favoured by the resident cat(s)
- check that the room is safe for the kitten - no poisonous plants, fireplaces, gaps in floorboards, window blind cords, breakable objects, open windows
- provide essential resources (bed, litter tray, food bowl, water bowl) located separately in the room
- swap bedding/familiar objects between the cat and kitten, in the first instance
- purchase or hire a 'kitten pen' or 'dog crate' – a collapsible cage with a solid floor that is at least 90cm x 50cm
- position the kitten pen against a wall or in a corner to avoid the risk of the resident cat circling it

- allow the kitten to explore the pen, feed it in there and put the bed and toys inside
- put a cover over the top of the pen and a box inside the pen for the kitten to hide in if it feels threatened; monitor for fear responses
- the initial contact should be when the kitten is fully settled in the new environment and distracted in the pen, with toys or food
- allow the resident cat to explore the kitten pen without intervention
- give praise and high value food treats to reward calm or positive behaviour
- if the cat or kitten behaves aggressively or fearfully, remove the adult cat from the room

- provide attention to the existing cat throughout the introductory process, but not exceeding the amount it finds enjoyable
- try to maintain normal routines as much as possible
- move the kitten pen to other rooms once both cat and kitten are relaxed in each other's company in the first room and repeat the process in different rooms
- allow up to several weeks before opening the pen and facilitating physical contact
- maintain the kitten room to reinforce litter training and shut the kitten in there at night
- keep the kitten separated until approximately five months old.

Adult cat introduction

The sequence for introducing adult cats should be similar to that for kittens with the exception of the 'kitten pen'. The adult cat should not be confined to anything smaller than the one room during the introduction. **Table 2** contains some additional measures that will aid an adult introduction.

2. Availability and accessibility of resources

Cats don't share important resources with other social groups. These resources include everything a cat may need to survive and thrive in a domestic environment – food, water, litter trays, beds, high resting places, hiding areas, scratching posts, entry/exit points and toys.

If these resources are provided in sufficient numbers and distributed so that the locations chosen are accessible for each cat or the social group's core area (where they spend most of their time) then tension and conflict can often be avoided. Various suggestions have been made regarding appropriate numbers; but a commonly used resource formula is: one resource per cat, plus one extra, positioned in different locations.

For example, in a four-cat household, the owner would be recommended to provide five of everything.

Population density in the area

Household cat population densities exceed those that occur naturally, particularly as each cat household may also contain separate social groups. The external population of cats has an impact, with a high population density potentially creating high levels of distress – even if cats are housed indoors, they can observe others through windows. Therefore, a strategy to avoid conflict may be to:



- collect both cats' facial pheromones by using fine cotton gloves and stroking their cheeks, chin and forehead (one glove per cat)
- rub the gloves against doorways and furniture at cat height in all parts of the house
- present the glove with the new cat's scent in front of the resident cat (and vice versa) and allow them to investigate – give a food treat for calm behaviour
- stroking both cats with the same glove, one after the other, also aids the process if there is no adverse response to the gloves previously

- introduce the cats visually from a distance, with the new cat in its room with the door propped open with a 5cm gap
- give praise or high-value food treats or toys to reward calm behaviour
- if either cat behaves aggressively or fearfully, close the door
- increase the time the two cats are in visual contact
- it may be helpful to fit a wood and wire frame to the recess of the doorway so that they can have direct contact without being able to chase or fight (**Figure 1**).

Table 2. Additional tips for introducing an adult cat to a multi-cat household

- avoid multi-cat households (or limit to two cats) in areas of high population density
- consider a secure garden to exclude other cats
- use safe deterrents if cats are coming into the garden and bothering indoor cats.

Conclusion

Multi-cat households are not all bad but the choice of the individuals involved matters and they need careful management and resource provision to ensure that each cat has what it needs. Following these simple guidelines will help towards reducing stress and making a multi-cat household a positive experience for owners and cats alike.



Figure 1. A wood and wire frame recessed into a doorway.

PPD Questions

- 1. Which of the following best describes the domestic cat as a companion animal?
 - A. pack animal
 - B. solitary animal
 - C. social species
 - D. species with a flexible social structure
- 2. Which of the following multiple-cat households is *most* likely to be successful?
 - A. all cats in the group are related, abundant resources, high cat population in the area
 B. all cats in the group are compatible, abundant resources, low cat population in the area
 - C. all cats in the group are related, limited resources, high cat population in the area
 - D. all cats in the group are incompatible, limited resources, low cat population in the area
- 3. A client wants to discuss adding another cat to an existing multiple-cat household.
- Which of the following questions would be least helpful, regarding the well-being of the cats concerned, when making this decision?
 - A. do the existing cats get on?
 - B. is there sufficient space to accommodate the extra resources required for an additional cat?
 - C. does the owner want more cats?
 - D. is the owner aware of the cat's environmental needs?

4. Which list comprehensively describes 'cat resources'?

- A. food, water, litter trays, beds, collar, cat carrier, toys
- B. litter trays, beds, scratching posts, food, hiding places, high perches, toys, water, entry/ exit points
- C. beds, collar, cat carrier, toys, companions, scratching posts, litter trays, harness and lead
- D. food, litter trays, beds, high perches, toys, entry/exit points, collar, lead and harness, companions, cat carrier

1.D 2.B 3.C 4.B

Further reading

Bowen J and Heath S (2005). Appendix 3: Advice Sheets. In: Behaviour Problems in Small Animal Practice – Advice for the Veterinary Team. Elsevier Philadelphia.

Bradshaw J and Ellis S (2016). Chapter 5: Cats and other cats. In: The Trainable Cat. How to make life happier for you and your cat. Allen Lane

Ellis SL (2013). AAFP and ISFM: Feline environmental needs guidelines J Feline Med Surg 15(3): 219-230.

Heath S. (2005). Chapter 4.4: Multicat households. In: The Welfare of Cats, Ed Rochlitz I. Springer Dordrecht.

Heath S (2009). Chapter 19: Aggression in cats. In: BSAVA Manual of Canine and Feline Behavioural Medicine 2nd edn, Eds Horwitz DF and Mills DS. BSAVA Gloucester.

Rodan I and Heath S (2016). Chapter 26: Intercat Conflict. In: Feline Behavioural Health and Welfare. Elsevier St Louis.

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*Suggested Personal & Professional Development (PPD)



SENSORY IMPAIRMENT

Nursing patients with sensory disorders

Holistic nursing – the consideration of the whole patient and its environment – is considered as best practice. Nursing care plans should be developed to support effective nursing goals based on potential and actual problems of the individual patient (Jeffery, 2012). Most patients have problems that can be prevented or minimised, but patients with sensory disorders have issues which may never be cured and require special additional needs.

Animals with sensory impairment may benefit from a process of barrier nursing – with a limited number of staff involved in their care so that they can recognise individuals and, hopefully, have reduced stress levels. Stress management techniques should be introduced – whether that be natural pheromone therapy or articles from the animal's home to provide comfort (Lander and Williams, 2016).

Sensory impairment can include sight, smell, hearing and neurological problems. We will discuss each of these, together with some suggested protocols to be used in care provided for them. Individuals will require time and patience for their nursing and their care should not be rushed. Their cages should be labelled clearly with the specific disorder - reduced sight in both eyes, for instance - and they will require extensive TLC and nursing support (Maughan et al, 2016).

A general handling principle must be that the animals should feel secure at all times. They should be held close to the body and handled using a recognised technique (Lander and Williams, 2016).

Impaired vision

Animals with diminished or total loss of sight need to have the continuity of a daily routine. Blind patients will have learned coping mechanisms within the home, but these will need to be 'relearned' within the practice environment. To ensure that the animal has the optimum level of care, we will need to act promptly on any additional needs or requirements.

Veterinary nurses should not overlook simple things that could cause unwarranted distress – over-filling water bowls, for example – or causing hygiene issues. Also, light levels will need consideration because this can sometimes be painful (**Figure 1**).

As with all patients, we should have carried out a thorough nursing assessment to ensure familiarity with their comforts. The patient will rely heavily on their hearing, so it is important to ensure that everything completed is done so that the animal can hear it.

When approaching the individual's kennel to carry out a procedure, you must ensure that you are heard. This could be by calling the animal's name or by simply opening the door to attract their attention. When opening the cage door, you must ensure that the animal is aware that you are approaching – if it is not, it may bite or scratch in fear or surprise.

"Animals with sensory impairment may benefit from a process of barrier nursing – with a limited number of staff involved in their care so that they can recognise individuals..."



Figure 1. Light levels may need adjusting because bright surroundings can sometimes be painful to patients with impaired vision.



Figure 2. When placing the patient on to a monitoring surface or table, ensure that it is 'non-slip' to reduce stress.

Aggressive animals will be harder to judge because they may bite, even after acknowledgement that they are being approached. Sometimes the use of a softer voice is better when nursing aggressive individuals, especially ones that may be further confused by the situation. They must be handled with time, patience and care.

Feeding bowls, water bowls and litter trays, if appropriate, should be placed in the same place throughout the animal's stay to ensure that they can recognise the position of these items in the kennel. This should be continued at home by the owner.

A key thought for visually impaired patients in the hospital environment is the provision of padded kennels to prevent any accident or injury - most kennels can be adapted to meet these requirements. Time should be spent guiding the animal around the accommodation, so that they gain a sense of familiarity. This familiarity will help with the reduction of stress because anxiety is a major factor which can compromise immune systems and cause other unwarranted conditions.

When carrying out procedures on the animal, it is advisable

to stroke it first so that it can be prepared for any other touching or manipulation. Verbal cues should be given to keep the animal calm. When removing the patient or replacing it into the strange environment, the procedure must be completed slowly, ensuring the individual feels secure throughout. When placing the animal on to a monitoring surface or table, ensure that it is 'non-slip' to reduce stress (**Figure 2**).

If the animal is suffering from an acute ocular injury, positioning and handling can be different depending on the nature of the injury and damage (Opperman, 2014). All care provided should be specific to the patient and its subsequent illness.

Hearing loss

When you are nursing animals with hearing loss, it is important to ensure that the patient can see you at all times. Hearing loss in animals can make them more susceptible to being 'spooked' by handling because they cannot hear you open their cage door. If they are sleeping, then it is advisable first to move the blanket or something within the accommodation - a bowl, for example. This should stimulate the patient to look towards the front, hopefully then seeing you at the front of the cage.



Figure 3. If the animal has a loss of olfaction owing to a discharge, use a warm damp cloth or cotton wool soaked with warm water to clean the area (Image: Hanisha Valand).

If the animal escapes or is alarmed during handling, give it time to calm down and then approach it again, this time ensuring that it can see you. These patients will often respond to stimulation from stroking to indicate that you are about to handle them.

Patients with hearing loss may be noisy within their accommodation – unfortunately they do not know how loud their meow or bark is! Owners may have trained them by using hand signals, so it is important that this information is gained on admission and recorded such that all staff can access it. This is why the use of a nursing care plan will ensure everyone is aware of the animal's specific needs (Jeffery, 2012).

Olfactory disorders

Animals with an olfactory disorder struggle to carry out many regular daily activities. A key one is eating – most individuals will smell their food before commencing gustation. An example would be a cat suffering with 'cat flu' where the mucus build-up results in a loss of the sensation of smell and crusted discharges impair inspiration. Cats are very sensitive to not smelling their food – and many will not eat if they cannot smell it (Goddard and Irving, 2012).

There are many techniques that can be put into place to relieve this situation:

- ensure the cat is cleaned before eating
- use a eucalyptus steam bath to encourage the movement of mucus and, hopefully, decongest the nasal tract
- provide a strongsmelling food
- warm the food to increase its palatability
- groom the cat this stimulation can sometimes encourage the cat to eat
- wash the cat's face, including its nose and ears.

If the animal has a loss of olfaction owing to a discharge, use a warm damp cloth or cotton wool soaked with warm water to clean the area (**Figure 3**). Be careful,

"Sometimes the use of a softer voice is better when nursing aggressive individuals, especially ones that may be further confused by the situation"



Figure 4. When preparing the accommodation, it is important to ensure that there is plenty of padding on all accessible surfaces.

however, not to remove scabs as this may cause bleeding and make the area sore. Sometimes applying a barrier cream can be helpful in preventing sore areas from developing in the first instance.

It may be necessary for a veterinary surgeon to prescribe medicinal therapy to treat or prevent any secondary infections. Although, in some cases, intravenous fluid therapy may be necessary in order to ensure hydration of the animal, these patients should also be encouraged to drink, with free access to water.

The individual should be weighed daily to monitor and track any weight loss resulting from a decreased appetite or anorexia. Nursing care plans should be reviewed and used to monitor these changes effectively.

Neurological dysfunction

Neurological disorders can take many forms. In this instance we will specifically be discussing the support of a disorientated ataxic patient, so identification of the underlying cause of the disorder will be a primary consideration to ensure that appropriate supportive methods are put in place. Key considerations of this patient will include accommodation, handling and restraint. An animal with ataxia will be uncoordinated and confused. It is likely that the confusion will result in panic and, possibly, flailing of limbs. Disorientated pets often do not adapt well to change and this makes them difficult patients in the hospital environment (Urquhart, 2001). It is important to ensure that the animal feels secure at all times, especially when being moved or receiving treatment.

A dimly lit room is preferable and noise should be kept to a minimum. Calm handling with limited restraint should be provided at all times; and sometimes it may be better to cover the animal's eyes with a towel and reduce exposure to light. When preparing the accommodation, it is important to ensure that there is plenty of padding on all accessible surfaces (Figure 4) - and synthetic veterinary bedding is a suitable type of bedding or a foam/duvet bed. (Goddard and Irving, 2012).

Careful consideration is needed in the placement of food and water bowls. Indeed, the animal may require other, more innovative, methods to make this provision; and intravenous fluid therapy using a form of a spiral giving set may be appropriate if there is a high risk of the



Figure 5. We are trained providers of TLC, so we must ensure that the animal has the love that is truly deserved and that we are qualified to provide.

patient falling into its food or water. Feeding should always be completed under supervision, with proper support to prevent possible complications, such as aspiration pneumonia (Maughan et al, 2016).

The patient may be best isolated from other animals to reduce noise and stimulation. Litter trays may be placed in the cages for cats and some individuals appear to find comfort from lying in a low-sided litter tray. If that is the case, it can be better provided by placing two trays - one with litter and one with bedding inside it.

Finally, when moving these patients out of their accommodation, make sure that they are placed onto a non-slip surface so as to not panic them, and provide extra reassurance when they are being moved by ensuring that all their weight is supported.

Conclusion

When we have patients in the veterinary practice that have needs that we cannot heal,

we will need to amend their nursing requirements.

These individuals should be nursed holistically, with their own specific set of nursing goals. As RVNs, students and animal nursing assistants we must ensure that all these patients are assessed individually and that we provide the correct accommodation, nursing care and feeding techniques.

Above all, we are trained providers of TLC, so we must ensure that the animal has the love that is truly deserved and that we are qualified to provide (**Figure 5**).

"... we must ensure that all these patients are assessed individually and that we provide the correct accommodation, nursing care and feeding techniques"

PPD Questions

- 1. The term olfaction describes the sense of:
 - A. smell
 - B. taste
 - C. sight
 - D. eating
- 2. The term gustation describes:
 - A. smell
 - B. taste
 - C. sight
 - D. eating
- 3. When nursing a cat with sight impairment in both eyes you should:
 - A. turn off the light
 - B. use a crush cage
 - C. stimulate to alert entry into the accommodation
 - D. approach quietly
- 4. When preparing accommodation for a cat with hearing impairment in both ears, you should:
 - A. place them in a higher level cage
 - B. provide hiding areas
 - C. stimulate with sound to alert entry into the kennel
 - D. ensure they can see your entry into the kennel
- 5. When examining a patient with neurologically induced ataxia, it is best handled on:
 - A. rubber-coated table
 - B. stainless steel table
 - C. stainless steel kennel
 - D. blanket-covered table

Answers A.A 2.D 3.C 4.D 5.A

References

Goddard L and Irving L (2012). 'Essential patient care', in Cooper B et al (eds) BSAVA Textbook of Veterinary Nursing. Cheltenham: British Small Animal Veterinary Association

Haskey E (2015a). 'Nursing the critical patient. Part 2: Case history', Veterinary Nursing Journal, 30(2): 47-50.

Haskey E (2015b). 'Nursing the critical patient: Part 1', Veterinary Nursing Journal, 30(1): 16-21.

Jeffery A (2012). The nursing process, nursing models and care plans, in Cooper et al (eds) BSAVA Textbook of Veterinary Nursing (5th edn), Gloucester, BSAVA, pp. 346-364.

Joiner T (2000). An holistic approach to nursing. Veterinary Nursing 15(4).

Lander J and Williams J (2016). 'Behaviour and handling of the dog and cat', In Ackerman N (ed) Aspinall's Complete Textbook of Veterinary Nursing. UK: Butterworth-Heinemann.

Maughan et al (2016). 'The essentials of patient care', In Ackerman N (ed) Aspinall's Complete Textbook of Veterinary Nursing. UK: Butterworth-Heinemann.

Mitchell N (2010). 'Cats living with blindness: Part 1', Veterinary Nursing Journal, 25(5): 38-40.

Mothersdale S (1999). 'Care of patients undergoing cataract removal', Veterinary Nursing Journal, 14(3): 92-98.

Siracusa C et al (2010). 'Effect of a synthetic appeasing pheromone on behavioral, neuroendocrine, immune, and acute-phase perioperative stress responses in dogs', Journal of the American Veterinary Medical Association, 237(6): 673-681. doi: 10.2460/javma.237.6.673.

Urquhart C (2001). 'Appreciating the needs of elderly in patients', Veterinary Nursing Journal, 16(6): 206-208.



Jane Ellison BSc(Hons)

Jane is an information scientist who has worked for the Veterinary Poisons Information Service (VPIS) and the human poisons service at Guy's Hospital, on and off since 1984, and has also worked in the pharmaceutical industry. Jane was a founder of the veterinary service in the 1980s and has recently returned to work for the service in the 24-hour rota team.



*Suggested Personal & Professional Development (PPD)



POISONS

Household hazards – bath, bed and beyond

Bathrooms and bedrooms may not be the natural habitat of some pets; but as they generally have the run of the whole house – even if expressly prohibited from doing so – care should be taken to ensure that exposure to potential risks is minimised.

Bathrooms

Many bathrooms are 'home' to the family's medicine cabinet – often, but not always, located on a wall; although this is not necessarily a guarantee that it is out of reach of intrepid explorers, or that dropped medications will not be pounced upon instantly.

Paracetamol and ibuprofen probably occupy a space in the majority of medicine cabinets, along with any prescription medications belonging to members of the household.

Paracetamol

Cats are very sensitive to paracetamol and, in particular, they may develop methaemoglobinaemia, haemolytic anaemia, Heinz body formation and hepatic necrosis. Given that the Veterinary Poisons Information Service (VPIS) recommends treatment for any ingestion >20mg/kg – and the most usual presentation of paracetamol is 500mg – any ingestion by a cat should be treated.

The initial clinical effects develop within one to four hours following ingestion, with progressive cyanosis being the most striking sign - in 43 per cent of cases (VPIS case data), it was associated with tachycardia, tachypnoea and dyspnoea. In addition, mucous membranes appear brown in colour, and weakness and lethargy may be observed.

Between four and 24 hours, facial and paw oedema may be observed – it was seen in 19 per cent of symptomatic cases (VPIS case data) and 29 per cent in a review of 17 cases (Aronson and Drobatz, 1996). Dark-brown blood may be noted indicating severity of methaemoglobinemia (Osweiler, 1996) and depression, vomiting, anorexia and vocalisation may also be evident.

From day two onwards, raised ALT, AST and bilirubin have been reported (Kolf-Clauw and Keck, 1994); but hepatic necrosis is not the principal cause of fatality in cats because they usually die as a result of severe methaemoglobinaemia.

Haemoglobinuria, intravascular haemolysis, jaundice and other evidence of liver damage may be seen in individuals that survive the initial stages of paracetamol poisoning. Coma, convulsions and pulmonary oedema are occasionally reported and are poor prognostic signs.

With prompt treatment, however, the prognosis is good; although it is dependent on the severity of the methaemoglobinemia (Aronson and Drobatz, 1996; Osweiler, 1996). It may be that the time between ingestion and treatment is more important than the dose ingested (Aronson, 1996); and it should be noted that in cats with cyanosis present, there is a 41 per cent fatality rate (VPIS case data).

The aim of treatment is to ensure adequate oxygenation and prevent further metabolism of paracetamol to toxic metabolites with the use of antidotes – and also to prevent damage to the liver and erythrocytes. Any cats with signs consistent with paracetamol toxicity should be treated irrespective of the time since ingestion.

If there is any doubt about the timing or dose taken, the cat should be treated.

For late-presenting animals, if there have been no clinical signs within 12 hours, then there appears to be no risk of toxicity because most cats develop clinical effects in the first four to eight hours following ingestion. In cases where owners seek veterinary advice at 12 hours or more, they should be questioned thoroughly about any clinical signs the cat may have had and, if necessary and where possible, the animal should be assessed and laboratory evaluation carried out.

Initial gut decontamination should include emesis and repeat-dose activated charcoal. The use of antidotes, particularly acetylcysteine, is crucial in securing a successful outcome in paracetamol toxicity.

Non-steroidal anti-inflammatories

Non-steroidal antiinflammatories (NSAIDs) represent the largest number of enquiries to the VPIS every year – responsible for around eight or nine per cent of our total enquiries. The NSAIDs are many and varied and are available, both as prescription and over-thecounter medication, in many different formulations, such



as tablets and capsules, liquid suspensions, sprays, injections and topical preparations.

Some preparations may contain other actives including codeine, paracetamol, phenylephrine or pseudoephedrine, especially those formulations indicated for the relief of cold and 'flu' symptoms.

The clinical effects are generally seen within two hours of ingestion. Renal failure may occur within 24 hours or may even be delayed for several days, which represents a problem if the animal is 'late-presenting'. The different NSAIDs vary in their toxic dose and clinical signs; but they all generally cause gastrointestinal and renal effects. Some, such as naproxen, have a higher incidence of anaemia, although this may be a result of gastrointestinal bleeding.

Initial signs after an acute overdose of an NSAID are gastrointestinal with vomiting, haematemesis, diarrhoea, melaena, abdominal tenderness and anorexia; and weakness, ataxia, incoordination, lethargy, depression and drowsiness are often noted.

Ingestion of a large dose may cause dyspnoea, hyperventilation, tachycardia, agitation, hyperactivity, hyperaesthesia, tremors, twitching or convulsions and coma. Metabolic acidosis can also occur after ingestion of a large dose.

From 12 hours onwards, evidence of gastrointestinal irritation and renal impairment may occur, depending on the dose ingested. There may be protracted vomiting, pyrexia, anaemia, anorexia, polyuria, polydipsia, dehydration and collapse.

Treatment is aimed at preventing – or minimising – damage to the gastrointestinal tract by the use of gastroprotectants, such as H2 receptor antagonists and proton pump inhibitors, and intravenous fluids to protect the kidneys and enhance excretion. This topic was covered in an earlier issue of *Veterinary Practice Today* [Jan/Feb 2015, **3**(1): 28-29].

Shower gels, shampoo and soaps

Animals do not tend to ingest large quantities of shower gels or shampoos deliberately, but they will often chew the bottles or tubes, which can result in skin/fur exposure and ingestion via grooming. Although these products are generally considered to have a low acute toxicity, they are irritant and designed to foam. As such, the main risk following ingestion is the aspiration of the foam produced during vomiting, coughing and retching, or when large volumes are ingested.

Once the fur of the animal has been thoroughly rinsed to prevent any further ingestion through grooming, the aim of treatment is to control and prevent vomiting to reduce the risk of this aspiration and to manage the clinical signs. Emesis and gastric lavage are contraindicated precisely because of the risk of foam aspiration, and the use of activated charcoal is not of benefit and not recommended for these preparations and products.

It may be necessary to administer an antiemetic to prevent or control vomiting and hypersalivation. An antifoaming agent, such as simeticone (Infacol 40mg/ ml, Forest Labs UK) may be helpful and is readily available from supermarkets and pharmacies and commonly used for babies with colic.

The suggested dosages of the product are:

- small dog or cat: 0.5ml, three times daily
- medium dog: 1ml three times daily
- large dog: 2ml, three times daily.

Simeticone is chemically inert and not absorbed orally. It works by decreasing the surface tension of bubbles, causing them to break down (Watson, 2014). There are no studies examining its effect in the management of detergent ingestion, although it has been used in children after such exposures (Leibetrau et al, 2014).

Any further management should be supportive, with rehydration, if required.

Products containing hydrogen peroxide

Hair dyes, environmentallyfriendly cleaning products and contact lens cleaners generally contain three to six per cent hydrogen peroxide. Owing to their presentation, large amounts of these products are difficult for an animal to ingest. Local irritation, however, with hypersalivation and vomiting, may be expected depending on the quantity involved.

The vomitus may be frothy owing to the liberation of oxygen, with the risk of aspiration. Gastric distension may occur owing to the release of oxygen - dullness, haematemesis, oral and tongue ulceration have also been reported in dogs. Gut decontamination is not worthwhile after ingestion of hydrogen peroxide because of its rapid dissociation into oxygen and water, and again, owing to the risk of foam aspiration, it is best avoided.

Charcoal is not useful because hydrogen peroxide is not a polar compound and consequently no binding will occur. The administration of oral fluids, water or milk, will both dilute the chemical and soothe any irritation. Asymptomatic animals who have ingested only a small quantity probably do not require observation. However, any individual with haematemesis, abdominal discomfort, persistent vomiting, CNS or respiratory effects should be admitted for observation and assessment.

Dermal exposure to hydrogen peroxide will result in dermal irritation with whitening of the skin and fur and a burning sensation. The affected area should be irrigated thoroughly with saline or water – further treatment being symptomatic.

Products containing bleach

Bleach - sodium hypochlorite, for example, in household toilet cleaners - is widely believed to be corrosive, but this is not the case. Household sodium hypochlorite bleaches are usually solutions of up to 10 per cent, but more commonly about five per cent.

Sodium hypochlorite solution causes moderate mucosal irritation, the extent of which depends on the volume ingested, the viscosity and concentration of the preparation and the duration of contact. Although sodium hypochlorite solution is



alkaline, it does not tend to cause corrosive damage except following ingestion of a large quantity or a concentrated solution.

The commonest clinical effects following ingestion are hypersalivation, vomiting, lethargy and inappetence. Oral and tongue ulceration occurs in some cases; and less common effects include diarrhoea, polydipsia, haematemesis, collapse, dysphagia, hyperthermia or hypothermia and respiratory distress (coughing, frothing at the mouth, dyspnoea, tachypnoea). Restlessness, aggression and excitability have been reported in some cases.

Corrosive injury to the oesophagus and stomach can occur with sodium hypochlorite bleach but the incidence is low. Hypernatraemia, hyperchloraemic acidosis and increased serum osmolality have been reported with a large quantity of a fairly concentrated (6.5%) solution in dogs (Chapman et al, 2008).

As with hydrogen peroxide, gastric lavage and emesis are not recommended and again, activated charcoal is of no benefit. Oral fluids are to be encouraged. Protracted vomiting should be managed with antiemetics and rehydration, and respiratory distress should be managed supportively with oxygen, if required.

Endoscopic evaluation of the upper airway and/or gastrointestinal tract may be required in severe cases in which there is dysphagia, dyspnoea or significant oropharyngeal burns. In these severe cases, electrolyte monitoring should occur, particularly of sodium and chloride.

Many dogs will drink water from the toilet bowl; although this is not usually



a problem owing to the dilution effect on any product used. However, if the dog or cat ingests part or all of a toilet block that contains paradicholrobenzene, there are some important differences in clinical effects and treatment. Besides irritancy to the gastrointestinal tract, ingestion of paradichlorobenzene may cause trembling (DeClementi, 2005). It can cause mild hepatic - and possibly renal - damage; but this is rare. Convulsions can also occur.

Methaemoglobinaemia could occur, particularly in cats as they are more susceptible to oxidative damage. However, it has not been observed in any cases reported to the VPIS or the American Animal Poison Control Center (DeClementi, 2005).

Gut decontamination is unlikely to be required; but it is very important to avoid fatty foods or milky fluids since these can enhance absorption and could increase the risk of systemic toxicity.

Rehydration and antiemetics may be given, if required, with sucralfate as a gastric protectant. Hepatic and renal function should be checked in any animals with effects other than gastrointestinal irritation and any convulsions treated conventionally.

Bedrooms

Paradichlorobenzene, is also found in the bedroom, in the form of mothballs that are usually 100 per cent paradichlorobenzene or 100 per cent naphthalene. Foreign brands may contain camphor. Any animal ingesting mothballs should be assessed at a veterinary practice.

Naphthalene may cause vomiting, diarrhoea, lethargy, depression and inappetence. Irritation of the urinary bladder may occur owing to naphthalene metabolites, with dysuria and black/brown



urine. Convulsions, coma, jaundice and deranged liver function may also occur, and urine and stools may have the odour of naphthalene.

Acute intravascular haemolysis can occur up to three to five days later, with anaemia, leucocytosis and Heinz body formation. In humans, haemoglobinuria, albuminuria, urinary casts and acute renal failure have also been reported.

An emetic should be considered and charcoal is, again, not beneficial. For any suspected naphthalene ingestion, avoid fatty foods since this can enhance absorption and could increase the risk of systemic toxicity. Additional treatment will be the same as that required for paradichlorobenzene (see previous section)

The bedroom is often where oral contraceptives are kept, but despite being high-dose steroids, an acute ingestion – even if the whole month's dose is consumed – is unlikely to cause anything other than mild gastrointestinal upset, and no cases of serious toxicity have been reported to the VPIS.

Progesterone-containing preparations may disrupt oestrus in bitches; yet this is rarely reported. No treatment will be necessary, even for a very substantial acute ingestion of a sex hormone preparation. Finally, cosmetics are also considered to be of extremely low toxicity although there may be a notional risk of gastric obstruction. No treatment should be required - apart from the emergency purchase of a replacement Chanel lipstick as soon as possible!

References

Aronson LR and Drobatz K (1996). Acetaminophen toxicosis in 17 Cats. J Vet Emerg Crit Care 6(2): 65-69.

ASPCA (2012). Personal communication.

Chapman S et al (2008). Sodium hypochlorite bleach ingestion in two dogs. Vet Med 103(1): 13-18.

DeClementi C (2005). Moth repellent toxicosis. Vet Med 100(1): 24-28.

Kolf-Clauw M and Keck G (1994). Paracetamol poisoning in dogs and cats. Eur J Compan Anim Pract 4: 85-92.

Leibetrau G et al (2010). Exposures to liquid detergent capsules in children [poster]. 34th EAPCCT Annual Congress, Brussels, Belgium 27-30 May.

Osweiler GD (1996). Over-thecounter drugs and illicit drugs of abuse. Toxicology, NVMS, Williams & Wilkins, p303.

Watson MK (2014). Simeticone. J Exotic Pet Med 23: 415-417.



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Susan is an in-home animal hospice and emergency vet, and an entrepreneur as the co-founder of Vets2Home Veterinary Service (2005) which was re-launched in 2012 as Vets2Home – Peaceful Pet Goodbyes. It is a fully dedicated in-home end-of-life referral service specialising in palliative medicine, animal hospice and gentle euthanasia.

Susan is also a columnist, blogger, consultant in end-oflife services (www.sunsetpet. solutions), the co-founder of the British Mobile Veterinary Association (BMVA) and the UK representative of the International Association of Animal Hospice and Palliative Care (IAAHPC). She is also the executive programme consultant for Compassion Understood, an online CPD training programme for the whole veterinary practice team.



*Suggested Personal & Professional Development (PPD)



HOSPICE CARE

Saying goodbye at home heals the whole family

"Because pets are now regarded as fully-fledged family members, the belief that they have a right to a peaceful end following a happy life is becoming more and more the norm. Giving a well-designed, peaceful 'goodbye' at home, which is increasingly requested by pet owners, reflects this trend." (Gregersen, 2016)

Recent surveys (Compassion Understood, 2015; Lambert, 2014) indicate that around 16 per cent (almost one in five) pets in the UK are euthanised in the comfort of their own home. It is a figure that reminds us of the James Herriot days – a time before small animal veterinary services made the big move out of the home and into a practice setting, matching growing consumer demand and advances in veterinary science.

A move into the home has also occurred in the human sector. In Britain, human hospice care has evolved and matured as a result of patients' and families' increasing disgruntlement with the lack of service, time and care allocated in conventional hospitals at this special time of life. Now, in recognition of pets' full integration and status in the family unit, it is high time for the veterinary profession to reconsider its approach and embrace the changes in our clients' expectations for close family pets in their final days.

To continue to offer what pet owners want, thus operating a feasible client-centred service, we must listen and adapt to this change in the expectations of our customers. In this way, clients and families can help us re-define what we offer our patients at the end – whether the pet has reached advanced old age, lives with debilitating, life-limiting disease, or is given a terminal diagnosis.

As such, the end of life is not defined by age but by life stage, and the end stage is distinct in every way when it comes to needs in medical treatment, palliative care and emotional support for the whole family. This is why it should perhaps be considered by our profession to make this final life stage a formal fourth life stage, adding to the existing three.

At this stage, it is especially important to offer support with decision-making, expectations and with the timing of the euthanasia. Veterinary staff have a key role in making sure the euthanasia is neither premature nor delayed unnecessarily so it compromises animal welfare, as can happen when uneducated owners feel unsupported in managing all of these difficult variables themselves.

Reaching the end in comfort and familiar surroundings

As a caring, forward-thinking profession, there has never been a better moment to reconsider and redesign the service we deliver to our clients at this sensitive and memorable time. It is our final opportunity to make a great last impression (or the opposite!) depending on our level of preparation.

After more than 9,000 general home consultations in 10 years, I have gained a wealth of knowledge and

I know what works in the home - and also what does not. It has been a steep, but never boring, learning curve that has convinced me I never want to return to the limitations of normal practice again. Some more seasoned veterinary colleagues will understand - although most may not - when I say that I absolutely love helping families say 'goodbye' to a pet on a home visit. Having made the many diverse, and sometimes challenging, home settings of pet families 'my own', it is clear that this calm, familiar setting has the ingredients necessary for such an emotional experience to be successful by effortlessly allowing the attention, comfort, compassion and gentleness that a normal, time-allotted clinical practice environment simply cannot provide. (Figure 1).

Making a lifelong, treasured, peaceful memory at the end for both pets and their families is the main reason I am now happy to specialise in the new field of animal hospice and palliative medicine. This specialty emerged in the US during the last decade and has been expanding rapidly ever since. Recently, formalisation of animal hospice and palliative care as a discipline has been boosted by the

"... the end of life is not defined by age but by life stage, and the end stage is distinct in every way when it comes to needs in medical treatment, palliative care and emotional support for the whole family"



Figure 1. It is sometimes appropriate that related pets are allowed sufficient time to say 'goodbye' on the day before home euthanasia.

introduction of a certification programme offered mostly online from the summer of 2016 and in conjunction with the International Association for Animal Hospice and Palliative Care's annual conference (www.iaahpc.org/ certification.html).

Animal hospice gives a better goodbye

I am called out for home euthanasia on average 20 times a week and occasionally families will ask, tearfully, if more time with their beloved pet is possible. In most instances, a few extra hours, days or even months are indeed possible with a carefully tailored palliative care plan. However, this always takes into consideration the Animal Welfare Act and the overriding hospice philosophy of not compromising the animal's comfort and ensuring it is free from suffering while the family prepare themselves to embrace what is imminent.

This is exactly where the justification and need for animal hospice fits in - to give owners more options and time at the end, yet to avoid the pet suffering by leaving its care up to the owner.

A peaceful home euthanasia is the gold standard of animal hospice - or occasionally a hospice-assisted 'natural' death. The calm, familiar setting and extra time at home means pet owners experience a good, professionally supported ending that lessens their worries at this highly emotional time (**Figure 2**).

The conducive environment also helps veterinary staff to support pet owners with a range of internal struggles, including making the actual decision to euthanise, getting the timing right and knowing exactly what to expect at the end. It has been demonstrated often that this peaceful ending helps pet owners tremendously



Figure 2. The calm, familiar setting and extra time at home means pet owners experience a good, professionally supported ending that lessens their worries at this highly emotional time.

when coping with their subsequent bereavement.

There are many reasons why experts in the field recommend that animal hospice – and ultimately the euthanasia procedure as the most common end point – are unlike any other procedure we do in the clinic, in that they are best carried out at home. It is most important that the home setting:

- allows all family members and friends - young, old, or with various physical or mental disabilities - to be present at this seminal time in a familiar setting. For example, children can come and go as the intensity of the procedure progresses, allowing them to have a (possibly) less traumatic first encounter with the loss of a loved one
- lifts the restrictive constraints of time allocation in a busy surgery or limited consultation facilities

- impacts the whole perceived experience, giving a calm and unstressful process, paving the way for healing afterwards and, ultimately, the memories held
- allows for other pets (often multiple) to be close to the dying pet; this is rarely possible nor practical in a busy clinic setting because of spatial limitations, time allocation, planning, transport and also the pet's own behavioural or social features
- makes a traumatic experience less traumatic by removing the need to transport a large dog or fractious animal (rescued, nervous dogs and most cats). This allows those involved to focus on saying 'goodbye' and emotional healing, rather than solving practical obstacles.

Losing a house mate or close companion at home With regards to a pet's passing and the impact on

other pets, there has, so far, been very little scientific research. However, my own observations gathered over years of seeing this behaviour at home and hearing owners talk about previous pets' reactions, may shed light on this poorly studied area.

Of the many thousands of home euthanasias I have conducted, other pets unsurprisingly, mostly cats and dogs - have been present about half of the time. It is most interesting when observing (usually from outside a window to allow undisturbed privacy) how long, and in what way, these other pets conduct their post-death 'inspection' of their deceased mate (Figure 3). Although there is scant research in this area, letting other pets carry out this final interaction is recommended by some pet bereavement experts (Trotsky, 2013).

I have personally found it is highly indicative of the type of bond shared and, if measured in scientific metrics, one could even postulate some proportionality with the strength of this and the length of period of grief behaviour displayed afterwards. Most commonly, pets take only a few moments (an average of 5-10 seconds) to inspect the deceased animal, usually using their sense of smell. Occasionally, some individuals spend much longer on inspection - in some cases, where pets were very close, or related, they will even lie down with, or on top of, the deceased pet.

An American colleague recounts one highly



Figure 3. Letting other pets carry out a final interaction is recommended by some pet bereavement experts.

memorable experience in a multi-dog household. Upon hearing the characteristic agonal breaths of their dying mate, the other dogs rushed in from different rooms, gathered around the deceased pet and synchronically started to howl loudly. The agonal breaths are usually avoidable and for a euthanasia specialist they are an undesired, unnecessary overt display of death but in this case they were intentionally provoked by my seasoned colleague to signal this unique event to the other dogs (who until that point had seemed disinterested in the euthanasia process), to help them perhaps better understand the loss. (Cooney, 2015).

Re-designing the best ending ... going for gold! Euthanasia is the most

common end point (around 80%) for domestic animals such as cats and dogs. This also means that it is a common procedure for

"The calm, familiar setting and extra time at home means pet owners experience a good, professionally supported ending that lessens their worries at this highly emotional time" veterinary staff to perform – on average in full-time employment we probably do this 10 to 15 times a month.

In order to achieve the best possible outcome - whether conducting an in-clinic or in-home visit for euthanasia - it is very similar to all other one-off, high-stake public performances, whether in the theatre or in sport. Unsurprisingly, the rewards are directly proportional to the amount of preparation, practice and repetition dedicated to the task. In other words, the more veterinary staff and businesses prioritise and value their (home) euthanasia service, the better the result for clients, patients and professionals alike.

I have conducted more than 6,000 home euthanasias in 10 years and it has become clear that there are three critical areas upon which to focus attention in order to achieve a consistent, successful outcome:

 allocating enough time (by setting an appropriate fee covering the real time consumption/drug costs) to allow an unhurried approach with plenty of time for privacy for the family to digest the imminent and permanent once-in-alifetime loss

- using a tailored sedation with a well-designed preeuthanasia (not pre-surgical) protocol, remembering the very clinical, straight un-sedated intravenous approach has no place in a home setting
- actively showing the family an abundance of compassion, respect and empathy – especially upon arriving and leaving – as you might be physically taking their beloved pet away from them. Removing pets using plastic bags is not recommended practice!

When it comes to euthanasia - both in the clinic and in the home - perfection can be approached and client expectations exceeded through the tireless repetition and preparation of a wellplanned and well-designed approach from the outset.

At first this may be challenging, because for many veterinary individuals this means leaving the usual comfort zone, departing from well-known current practices. However, it is only when we take these brave, conscious steps that we can ensure the best, most consistent, gold standards are reached. Why settle for anything less than gold?

PPD Questions

- 1. In the UK, how many pets, on average, are euthanased at home?
 - A. 8 per cent
 - B. 16 per cent
 - C. 50 per cent
 - D. 28 per cent
- 2. Which of the following statements are true with regards to animal hospice care? A. animal hospice care allows owners to spend extra time with a seriously ill pet but
 - always with respect to animal welfare B. animal hospice care involves palliation of a veterinary patient's clinical signs and aims to prevent euthanasia
 - C. it is a type of veterinary practice that allows pet owners to keep their pets alive for as long as they need
 - D. this form of veterinary care is a client-centred approach which occurs only in small animal practices in the USA
- 3. When dogs inspect the body of a recently deceased animal they tend to depend mostly on their sense of...
 - A. feeling
 - B. hearing
 - C. sight
 - D. smell
 - E. taste
- 4. Which of the following clinical steps/skills are recommended in a home-call euthanasia procedure?
 - A. an ability to inject the euthanasia agent without need of sedation
 - B. having an extra pair of hands a veterinary nurse, for example to assist
 - C. sending out the invoice afterwards, so as not to upset the client
 - D. use of a specific and tailored pre-euthanasia sedation protocol
- 5. Which of the following represents one of the main advantages of at-home euthanasia? A. many more clients can be fitted in during the day
 - B. more cost-effective for the veterinary staff involved owing to the shorter time invested
 - C. means that immobile or fractious animals don't have to be moved from the home
 - D. veterinary staff don't have responsibility for the pet's body

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

References

Compassion Understood (2016). Website. [Online] Accessed on 24/07/2016. Available at: www. compassionunderstood.com

Cooney K (2015). IAAHPC Annual Conference.

Lambert A (2014). London Vet Show.

Trotsky K (2013). "Should your other dogs or cats be present during euthanasia?" [Online] Accessed on 24/07/2016. Available at: http:// peacefulendings.net/pets-presenteuthanasia/

Additional links

www.PeacefulPetGoodbyes.uk ("Helping families say goodbye to their pet at home")

Facebook/Vets2Home



Donna Griffiths MSc BSc Hons MSCP ACAPT(A) DYG Physiotherapy

Donna is a fully qualified chartered physiotherapist and a category A member of the Association of Chartered Physiotherapists in Animal Therapy (ACPAT). She qualified with a BSc in Physiotherapy (Hons) in 1996 and has worked in the NHS throughout her career – currently working alongside GPs and orthopaedic consultants to organise and diagnose patients for surgical or conservative interventions.

Donna also practises animal physiotherapy out of a number of primary and secondary orthopaedic veterinary centres and has 20 years' experience in the handling of animals. She sees a number of different conditions relating to neurological and orthopaedic injuries, surgical repairs and work-ups for working dogs, including pre-season assessments and fitness rehabilitation.



*Suggested Personal & Professional Development (PPD)



PHYSIOTHERAPY

Veterinary physiotherapy in the management of hip dysplasia

Hip dysplasia is a common developmental disorder, primarily seen in medium to larger breeds of dog. It causes pain and discomfort and can lead to osteoarthritis. With multiple breeds affected and different surgical procedures employed, there are a number of different physiotherapy methods that can be explored and used to improve the individual's function and help manage their pain.

Hip dysplasia (HD) is a multifactorial and developmental condition leading to hip joint laxity (Kirkby and Lewis, 2011; Gemmill et al, 2011) with certain breeds being more at risk (Smith et al, 2001). There is a significant genetic, environmental and developmental influence on the development of HD and its eventual affect on the individual. The condition is more prevalent in medium to larger breeds and affected dogs are commonly presented to veterinary practices at a young age - around four to eight months (Anderson, 2011).

These patients have a high tendency to have lax ligamentous structures around normal hips, and this soft tissue laxity allows repeated subluxation to occur whilst walking, which causes damage to the joint capsule, articular cartilage and surrounding bone (Figure 1). As time progresses, the joint capsule thickens, the articular cartilage degrades and is eventually lost and the bone of the femoral head and acetabulum becomes deformed (Barr et al, 1987).

Presentation and assessment

The owners usually seek veterinary attention having seen an altered gait pattern/ lameness (Poy et al, 2000). Once the owners have discussed and reviewed the animal with the veterinary surgeon, further investigations may be carried out, through palpation, gait analysis, and radiography (Innes, 2013). The results of these procedures



Figure 1. Diagram of the anatomical changes associated with hip dysplasia.

can reveal poor or retarded muscle development, pain on manipulation, and subluxation. There is often radiographic evidence of changes to the bone structure of the femoral head and acetabulum (**Figure 2**).

Once a diagnosis has been made, the best treatment strategy may be selected and will depend on surgeon preference, animal well-being and cost (Kirkby and Lewis, 2011, Gemmill et al, 2011). The following case studies show how different strategies have been used on four different animals of a similar age and development. In each of the cases, although the surgical procedures have been different, all have benefited from physiotherapy techniques.

Chartered physiotherapists use science- and research-

Figure 2. Radiographic evidence of changes to the bone structure of the femoral head and acetabulum in a case of hip dysplasia (Case study 'Bear' at four months old).



based skills to adapt and utilise manual therapy, thermotherapy, electrotherapy and exercise to improve their client's health and well-being, function and pain (CSP, 2014).

CASE STUDY 1: 'George'

George was a black Labrador retriever who was presented at the veterinary surgery with intermittent lameness. There were problems with performing hip replacement surgery because, at six months old, he was not skeletally mature and total hip replacement is ideally performed when the longitudinal bone growth has ceased at around nine to 10 months of age (Anderson, 2011). George, therefore, had to be managed conservatively for three months prior to the planned surgery becoming viable.

The aim of the conservative pre-operative physiotherapy was to provide pain management and to enhance muscle mass in the pelvic region, thereby increasing stability of the joint. Medical management was instituted by means of nonsteroidal anti-inflammatories (NSAIDs) (Farrell et al, 2007).

Gentle mobilisation of the joint and passive limb movements were the first choice and, at first, this aided function; but there was no change in muscle wastage. Treatment was enhanced with an electrical muscle stimulator (**Figure 3**) and treadmill hydrotherapy.

Rapid skeletal growth meant that George's functional ability deteriorated further by the age of nine months – with increased extension at his hocks and potential further involvement of other joints. So, at just 10 months, a hybrid total hip replacement was carried out on the right hip.

Physiotherapy was reviewed at four weeks following surgery and it was deemed that strict rest would be more appropriate owing to the dog's age and the need for the replacement to combine with his own bone structure. There was, however, a complete difference in George's behaviour and attitude to walking and exercise, with the owners commenting on how

CASE STUDY 2: 'Reed'

Reed, an eight-month-old golden retriever, was presented at an orthopaedic practice with gait changes thought to be associated with HD. There were moderate hip changes and, although various treatment options were discussed, the owner would only consider conservative methods.

Reed – who had already had problems with his elbows indicating the involvement of genetic factors (Farquhar et al, 1997) – was referred for physiotherapy. He was found to be very thin with minimal muscle mass to his hind limbs and a marked sway gait. He could only walk for short periods and would sit or lie down very frequently. On rising, he would pull up using his forelimbs with no effort from his hind limbs. He would also sit with his stifles held laterally in a 'frog leg position' (**Figure 4**) trying to help stabilise his hips (Edge-Hughes, 2007).

The approach to this case was one of moderation – prior to review at the veterinary practice, he had been walked quite regularly with the owner's other dogs. NSAIDs were used to modify pain and physiotherapy for pain management was in the form of laser therapy (Thor, 2013). he was behaving like "a naughty puppy" and "getting into everything" at home.

His muscle mass remained low, but the change in his stifle posture and hock had already reverted to a more normal stance. A muscle stimulator was not used on the right hind limb because of its possible heating effects on metal components (Houghton et al, 2010). As pain was now no longer an issue, exercise-based rehabilitation was more appropriate and passive stretches, loading and gait rehabilitation recommenced with gradient changes on walks, increased walking distances and pole work.

With this altered programme and the pain being under control, muscle development occurred and George was able to walk further. Indeed there was sufficient sustained muscle development that further surgery to replace the other hip was postponed.



Figure 3. An electrical muscle stimulator (EMS) in action.



Figure 4. Reed sitting with his stifles held laterally in a 'frog leg position'.

Passive mobilisation and proprioception exercises were then included because it was paramount that stability of the joint was gained to help control pain, improve strength to the gluteal region and enhance 'body awareness' (Edge-Hughes, 2007). Wobble cushions (**Figure 5**) and theraband wraps were used to assist with Reed's stability.

He was managing to maintain muscle and increasing his walking distances, but following a period of rapid growth he became unable to control the stability of his hips. Physiotherapy was modified further to include transcutaneous electrical nerve stimulation (TENS). This was used prior to exercise, following exercise and throughout the day during the growth period; and then, when he re-stabilised, it was used as required for additional pain control.

As with the previous case, Reed had dramatic growth periods and then phases of minimal change. These periods of growth correlated with phases of increased pain, which was related to changes to the body that eventually resolved. It was noted that they were temporary and not a deterioration in his condition.

CASE STUDY 3: 'Daisy'

Daisy was a 10-month-old Shetland sheep dog that was referred for physiotherapy following her first excision arthroplasty – another surgical management of HD – with her second operation pending in eight weeks' time. Assessment indicated limited hip extension (15 degrees bilaterally, where the normal is 80 to 90 degrees), a shortened stride length to accommodate pain prior to surgery and, therefore, a reduction in muscle mass and capsular restrictions. The hip that had undergone surgery was also grossly swollen with crepitus present.

Physiotherapy was commenced with passive stretches; although it quickly became apparent that she would not tolerate these, so auto-assisted stretches – using an inflatable 'peanut' support – were instigated (**Figure 6**). The passive stretches were tried in the first instance because they were of lower torque with longer duration and could, therefore, stretch and increase a range of movement far greater than other forms of stretching (Millis and Levine, 2014) and thus improved the range of Daisy's, now fibrotic, joint.

Active stretching and auto-assisted methods achieve an active range and, therefore, may encourage the joint capsule to shrink and not regain the dog's full potential range of movement. At no stage was Daisy allowed to be in more discomfort from treatment, as this would have caused the potential for chronic pain behaviour. Therefore, when she did not tolerate the passive stretches – possibly the consequence of extreme pain prior to surgery and tightness of the capsules – an auto-assisted approach, with her loading and stretching herself was the most appropriate route, with the understanding that full capsule range might not be gained. At present, Reed, at three years old, is fully grown, has overcome the pain and is remodelling without surgical assistance in stabilising the joint (Millis et al, 2004). He is managed using a modified exercise programme, and conservative treatment with a laser (Thor, 2013), theraband and hydrotherapy programme. Regular reviews to assist with maintaining pain management are vital to him.



Figure 5. Wobble cushions are useful for assisting with stability control.

Treatment was limited, primarily owing to available finances and the fact that surgery on the second limb was due to be completed.

Following the second operation, the veterinary surgeon noted that there was enhanced muscle mass, faster recovery and post-surgical swelling was markedly reduced in comparison with the first operation. Peanut work and laser therapy was performed and Daisy's behaviour changed in that she was more playful and was able to walk further.

Hip extension has now increased to 60 degrees, she has commenced jumping and this has been incorporated into her exercise programme so that stability is obtained within a good remodelling process of the acetabulum and proximal femur (Anderson, 2011).



Figure 6. An inflatable 'peanut' for balance and stretching.

CASE STUDY 4: 'Bear'

Bear was a seven-month-old cross breed (Samoyed and springer spaniel) that presented with moderate hip subluxation, leading to altered gait and audible clicking whilst walking. There was no evidence of established osteoarthritis on radiographs.

Following discussion between the owner and veterinary surgeon, a triple pelvic osteotomy (TPO) was performed on the more severely affected right hip (Figures 7 & 8) and physiotherapy commenced afterwards.

As with the other case studies, the primary aim was to restore function and reduce pain. A combination of modalities were used to aid in his recovery - so



Figures 7 & 8. Radiographs following triple pelvic osteotomy (TPO) on Bear's right hip.

Physiotherapy techniques

In all of the case studies there were a number of physiotherapy techniques used - but in different orders and for different reasons.

Electrotherapy

There were two types of electrical stimulation used in the cases of George, Reed and Bear - an EMS (electrical muscle stimulation) and TENS (transcutaneous electrical nerve stimulation), which affect the biological stimulation of the animal's motor response by means of an electrical current. They encourage motor responses to the muscle fibres by increasing the blood flow to working muscles and releasing vasodilators; and induce

analgesia via the 'pain gate' control system, reducing muscle tone, stimulating blood supply and releasing endogenous endorphins (Robertson et al, 2006).

 \mathbf{R}

The EMS produces a direct stimulation of a denervated muscle via its muscle fibres; while a TENS stimulates the target tissue via an intact nerve. The responses differ according to the frequency used.

So, for an improvement in muscle mass, an EMS with a low frequency of 20 to 80Hz can increase muscle tone; less than 10Hz you may induce tetanic contractions where the contraction lasts longer than the stimulus (increasing muscle strength); and above



Figure 9. Wobble cushion work.

2,500Hz, muscle cells are

With the TENS, frequencies between one to 100Hz cannot stimulate the nerves and it is between the frequency of able to derive effective nerve Control Theory (Bockstahler

The application of EMS was to strengthen muscle and prevent further disuse atrophy. The electrodes were placed over the motor point of the muscle and muscle insertion. The TENS was used for pain control by producing an electrical current at the

immediately after surgery, passive stretches and massage were employed for aiding tissue healing and circulation (Bloomberg et al, 1998) and proprioception and wobble cushion (balance) control was also commenced (Figure 9).

Bear's walking distance was restricted for the first four weeks to allow healing to the bone structure, so a muscle stimulator was used to minimise muscle loss caused by rest. After this period, theraband and figure-of-eight walking were used to assist in strengthening the hind limbs. This was progressed to speed interval walking and use of a water treadmill as he had a tendency to revert to 'habit' walk (Figure 10).



Figure 10. A hydrotherapy treadmill.

frequency of A-beta nerve fibres that would lead to activation of substantia gelatinosa interneurons, thus blocking the transmission of pain signals from peripheral nerves to the brain.

The dosing was tailored to individual dogs and was reliant on observing them during the application of the electrodes - the aim being to gain a reaction from the dog that there was some sensation felt but not discomfort. With the EMS, a motor criterion was also to observe a visible twitch to confirm that the motor threshold had been reached.

Durations of use were subjective and adjusted according to tolerance and

stimulated directly.

50 to 150Hz that you are interaction and analgesic affect in the form of the Melzack and Wall's Gate et al, 2004).

patient co-operation – 20-minute durations being classed as very long and 10 minutes being the average.

Laser therapy

Laser therapy - used in the cases of Reed and Daisy - is the use of light as an energy source to help assist the body's own natural defences in repair, inflammation and pain. All laser therapy products use red and nearinfrared light at wavelengths of 600 to 1,000nm. The application of the light reduces oxidative stresses and increases ATP by chemical reactions that improve cellular metabolism - with a more continuous application, the energy exchange causes a nerve block and thus, pain relief.

A Thor 3B was employed in the cases of Reed and Daisy with the use of a selection of probes with LED and laser (810mn, 200nw) set at 2.5Hz for healing, and continuous mode for analgesic affect. The protocol advises that regional lymph nodes are treated first, then the target area, followed by any 'trigger' points (if present), then, finally, spinal segments for a nerve block affect and analgesia (Thor, 2013).

Passive therapy

This is therapy completed by the owner or physiotherapist

to aid the healing and can be in the form of massage techniques or passive stretches. The desired effect is to regain normal fluid movement, to assist in improving oxygen supply, the removal of waste from the area, stimulation of endogenous endorphins for pain relief, to aid muscle recovery, mobilise adhesions, improve proprioception and assist in the mental well-being of the animal and also its owner.

Massage is used to reduce muscle tension and assist the body in its healing and repair. A number of different techniques are used.

In the case of Bear, pain management and maintaining a reduction in swelling were priorities and, therefore, effleurage was encouraged. This is a stroking affect that increases blood flow and promotes movement of lymph fluid. The passive stretches were then used to assist in stretching and adapting the collagen production. They were completed on all the joints in the hind limbs and also the forelimbs to ensure that, while Bear was on restricted walking, there was no change in his range of joint motion, and to help with maintaining muscle length.

Active exercise and proprioception

Active exercise is simply progression of the rehabilitation and is adapted to the needs of the client and the dog. In all cases, however, proprioception is the priority.

In surgical cases, the joint structures have all been involved, so the proprioception or 'body sense' has been affected. In the case of animals – in contrast to humans – correcting body sense is very difficult to do. The requirement to walk with a more normal gait pattern is imperative for prevention of further damage and to aid recovery; unlike with a human patient, you cannot tell a dog that it is walking with a limp and to stop!

While a dog is sound, it remodels its weight-bearing structures in a normal manner and functional position. However, as soon as it becomes lame, the remodelling and off-loading of one limb puts pressure on the others and alters the remodelling process. Once altered, the angles and weight-bearing areas of the joints become changed and can lead to further offloading and progression of joint destruction.

Proprioception and balance exercises – involving wobble cushions, pole work and alternating leg lifting – enhance the dog's own ability to improve its spatial awareness and neurological reactions to movement.

Conclusion

The case studies have shown that the complementary application of physiotherapy and surgery have improved the function of the patients and improved their gait patterns. The pain was also controlled and the use of medication dramatically reduced.

The principle of restoring function and reducing pain is fundamental to both surgery and physiotherapy and it has been shown here that these can be achieved using different methods tailored to an individual patient's needs.



PPD Questions

- 1. What are the causes of hip dysplasia (HD)?
 - A. congenital joint structure
 - B. laxity of the ligaments
 - C. environmental
 - D. all of the above
- 2. What is a common sign of HD that would bring an owner to the vets?
 - A. shiny coat
 - B. good muscle development
 - C. jumping around
 - D. altered gait pattern

3. What is the commonest age of onset?

- A. 4-8 months
- B. 6-26 months
- C. 5-6 years
- D. 7-10 years

4. What are 'wobble cushions' used for?

- A. sitting on
- B. proprioception exercises/balance
- C. joint range of motion
- D. walking

5. What is an EMS machine used for?

- A. pain relief
- B. muscle stimulation
- C. wound healing
- D. fluid intake

Answers 1.D 2.D 3.A 4.B 5.B

References

Anderson A (2011). Treatment of Hip Dysplasia. Journal of Small Animal Practice 52: 182-189.

Bockstahler B et al (2004). Essential facts of physiotherapy in dogs and cats. Rehabilitation and pain management Vet Be Verlag

Barr ARS et al (1987). Clinical hip dysplasia in growing dogs: the long-term results of conservative management. Journal of Small Animal Practice 28(4): 243-252.

Bloomberg MS et al (1998). Canine Sports Medicine and Surgery Saunders.

CSP (2014). What is physiotherapy? http://www.csp.org.uk/your-health/whatphysiotherapy accessed March 3rd 2014

Edge-Hughes L (2007). Hip and Sacroiliac Disease: Selected Disorders and their management with physical therapy. Clinical Techniques in Small Animal Practice 22: 183-194.

Farrell M et al (2007). Retrospective evaluation of the long-term outcome of non-surgical management of 74 dogs with clinical hip dysplasia. The Veterinary Record 160: 506-511.

Farquhar T et al (1997). Variations in composition of cartilage from the shoulder joints of young adult dogs at risk for developing canine hip dysplasia. Journal of the American Veterinary Medical Association 210(10): 1483 -1485.

Gemmoll GJ et al (2011). Hybrid Cemented/Cementless Total Hip Replacement in Dogs: Seventy-Eight Consecutive Joint Replacements. Veterinary Surgery 40: 621–630.

Houghton PE et al (2010). Electrophysical Agents: Contraindications and Precautions. Physiotherapy Canada 62(5).

Innes J (2013). Treating common articular disorders in dogs The Veterinary Record 172: 332-335.

Kirkby KA and Lewis DD (2011). Canine hip dysplasia: reviewing the evidence for nonsurgical management Veterinary Surgery 4: 2-9.

Millis DL and Levine D (2014). Canine Rehabilitation and Physical Therapy 2nd edn. Saunders.

Millis DL et al (2004). Canine Rehabilitation and Physical Therapy Saunders.

Poy NSJ et al (2000). Additional kinematic variables to describe differences in the trot between clinically normal dogs and dogs with hip dysplasia. American Journal of Veterinary Research 61: 974-978.

Robertson V et al (2006). Electrotherapy Explained (4th edn) Principles and Practice, Butterworth-Heinemann.

Smith GK et al (2001). Evaluation of risk factors for degenerative joint disease associated with hip dysplasia in German shepherd dogs, golden retrievers, Labrador retrievers and rottweilers. Journal of American Veterinary Medical Association 219: 1719-1724.

Thor (2013). Training course material – Low Level Laser Therapy Training – unpublished.

Watson T (2008). Electrotherapy: Evidence-based Practice. Elsevier.





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Coming of age challenges the veterinary nursing profession

'By taking control of its destiny, the veterinary nursing profession will remain sustainable and relevant, while maintaining animal health and welfare at its heart'. This was the statement presented by Julie Dugmore RVN and Liz Cox RVN at the 'Vet Nurse Futures' stream at the British Veterinary Nursing Association (BVNA) Congress back in 2015. It raises a series of challenging issues.

Following the launch of the 'Vet Futures Report' in November 2015, where one of the recommendations was to 'encourage veterinary nurse leaders to develop a report and recommendations which are directly relevant to veterinary nurses and their future...', the RCVS joined forces with the BVNA in February 2016 to launch 'VN Futures', as a companion project to 'Vet Futures', which aims to draw up a blueprint for the future of the veterinary nursing profession.

The time frame allocated for the project was only five years – rather than the 15 years for Vet Futures – which meant that a lot of work would need to be carried out in a relatively short period of time. By July 2016, the VN Futures Action Group had shown that they could meet the challenge when they presented the VN Future's action plan at the 'Futures Summit' held at the Royal Veterinary College, London.

The action plan had 31 action points contained within six 'ambitions', which were: creating a sustainable workforce

- Creating a sustainable workforce
- structured and rewarding career paths
- a confident, resilient, healthy and wellsupported workforce
- a proactive role in 'One Health'
- maximising nurses' potential
- a clarified and bolstered VN role via a reformed Schedule 3.

Some of the issues discussed by Liz Cox and the BVNA president, Sam Morgan, showed the determination and commitment to moving the association forwards and really dealing with some of the important issues facing the profession over the coming years.

Tough cookies to chew on

The VN Futures project will address the facts that whilst there is an everincreasing demand for RVNs, only five per cent return to full-time work after maternity leave; and out of 14,000 nurses, only 310 are male. This action will include



looking at better job-sharing schemes and out-of-hours shifts for returning nurses, as well as targeting recruitment at potential male nurses, as is done in the medical profession.

Career paths for nurses will be assessed, as will more advanced and specialist qualifications. The One Health concept is something that is currently being embraced within the veterinary profession, but it was also included in the Vet Nurse Futures stream at this year's BVNA Congress, highlighting the need to value RVNs by charging clients for their time rather than 'nurse clinics' simply being promoted as free of charge.

Nurses are highly qualified individuals and the issue of increasing the number of Schedule 3 tasks that they can tackle will also be explored.

Have head nurses have had their day?

Looking at these ambitions, there is no doubt that VN Futures could significantly change and improve the functionality, motivation and status of the veterinary

"The VN Futures project aims to deliver an action plan that will help take the veterinary nursing profession into its next phase of development" nursing profession. One of the really interesting suggestions made at the summit was the removal of the 'head nurse' role. Liz Cox quite rightly said that this role can be a demanding and lonely one thrust upon RVNs who are inexperienced and untrained in management.

By its nature, the job of a veterinary nurse is very much a practical, hands-on role and, as with veterinary surgeons, management tasks are not necessarily their preferred choice. It makes a great deal of sense, therefore, to use the individual strengths and skills of the nursing team to create well-managed nursing provision. It is a good, sensible idea, but one that will take time and effort to establish within a practice and, maybe initially, a significant amount of help and support from the practice manager.

A real and positive call has been made to veterinary nurses to look to the future of their profession and play their role in steering it towards a bright and successful future by, and beyond, 2030. Leaders in the nursing profession can see the strength it has and its potential for more input into veterinary care. It is, however, now very much up to veterinary nurses out there in the wider world to follow their lead, to take a greater interest in what is happening in the profession, to vote at elections and to jump wholeheartedly on board the VN Futures bandwagon.

Achieving clientfriendly pricing

Keeping your prices affordable but realistic is a difficult balance to strike – yet achieving this will establish you in your community as a reliable and reputable practice.

any practices – in particular those that are still independent – have a degree of flexibility when it comes to their charging structure, and offer clients different incentives and schemes. In these circumstances, automation is essential to enable staff members who are responsible for invoicing clients and taking payments, to do so correctly and efficiently.

Configuring your practice management system to automate your pricing schemes and incentives is the best way to manage your practice's pricing structure and the **Spectrum Practice Management System** is equipped with a range of features designed with reliability, profitability, consistency and efficiency in mind.

Invoicing macros

The **Spectrum Practice Management System** has an invoicing macros facility, which allows a clutch of one or more existing stock items to be grouped together and sold by referring to just a single descriptor – the title given to the macro. This not only speeds up the process of selling items, but also ensures consistency throughout the practice.

Grouping items according to procedures – particularly those that are routine or commonly occurring – can be a vital timesaving tool for veterinary surgeons when writing up notes. Using your practice management system to establish several preset items that your staff can input will dramatically reduce the time spent invoicing individual products. When using **Spectrum's** invoicing macro system, any items dispensed from your pharmacy from within a group will not only produce a label, but also be deducted from your stock room levels accordingly.

Discount matrices

The **Discount Matrix System** will allow you to configure permanent discounts for individual clients (or a selection of their animals) or client account groups, on individual stock items or grouped stock items. Discounts can either be specified amounts, percentages of sale prices or configured for price ranges and quantities.

Loyalty counts

It is increasingly common for many businesses to offer reward schemes to their customers in order to acknowledge loyalty. In today's competitive marketplace, it is well worth considering creating a means of rewarding loyalty.





Loyalty schemes can help clients feel included in your business, and consolidate their relationship with the practice.

The **Spectrum Practice Management System** can be configured to award points to clients according to their expenditure. Spending habits and behaviour can be tracked and contact made through mail-outs offering vouchers and associated material.

Spreading the cost

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*Suggested Personal & Professional Development (PPD)



INFECTIOUS DISEASE

Protection through partnership – what will you do to help?

Equine infectious diseases are highly prevalent, represent a major welfare concern and cause considerable financial losses. In addition, the threat of the incursion of exotic infectious diseases to the UK is a constant concern (Copas, 2013). A new research study, called 'Protection through Partnership', is a collaboration between the Animal Health Trust, Royal Veterinary College and the University of Nottingham, with funding provided by The Horse Trust. It aims to provide owners with the necessary tools to protect their horses, ponies or donkeys against the threat posed by these diseases.

Common infectious diseases in the UK

There are many infectious diseases endemic to the UK and these affect a variety of body systems. The diseases highlighted below are a few of the more prominent conditions, for their key features, see **Table 1**.

Strangles

Strangles is an upper respiratory tract disease resulting from infection with *Streptococcus equi* subspecies equi (*S. equi*) and it is endemic to the UK, particularly among the non-Thoroughbred equine population (AHT/BEVA/ DEFRA, 2016). Common clinical signs include pyrexia, enlarged lymph nodes, depression and poor appetite.

Transmission of *S. equi* can occur directly (horse-tohorse contact) or via indirect methods, which include the sharing of contaminated housing, water sources, feed, tack and on other fomites, such as clothing or equipment used by owners, farriers and veterinary professionals.

Recovery in most cases occurs within two to three weeks (Sweeney et al, 2005) with subsequent development of solid immunity that persists for five years or longer in 75 per cent of horses (Sellon, 2007). However, approximately 10 per cent of affected horses become asymptomatic carriers – these horses are outwardly healthy but provide a source



of infection for susceptible animals. Introduction of these carrier horses to herds can result in new disease outbreaks (Sweeney et al, 2005).

Equine influenza

Equine influenza is a common viral respiratory infection of horses. Vaccines against this disease have been used since the 1960s; however, owing to the presence of a reservoir of infection in aquatic birds and the ability of the virus to mutate, eradication has not been possible (Daly et al, 2011). The most common clinical signs seen are pyrexia, a hacking cough and serous nasal discharge. Vaccinated horses may have milder infections or may not show any clinical signs of infection, but they can still shed virus and act as a source of infection for other animals (Cullinane, 2009).

Outbreaks of equine influenza have been reported worldwide, with the exception of a few island nations, including Iceland and New Zealand. Although equine influenza has a low mortality rate, it can affect a large number of horses - resulting in disruption of equestrian activities which has a significant financial impact (Cullinane, 2009).

"Introduction of these diseases into the UK could have a devastating impact on equine health and welfare, as well as being highly disruptive to the equine industry as a whole"
	Strangles	Equine influenza	Equine herpesvirus
Incubation period	3-14 days	1-5 days	2-10 days
Transmission	Direct and indirect	Direct and indirect	Direct and indirect
Common clinical signs	 pyrexia enlarged lymph nodes depression poor appetite 	 pyrexia hacking cough serous nasal discharge 	 Respiratory: serous- mucopurulent nasal discharge lymphadenopathy
			2. Abortion within last third of pregnancy
			 3. Neurologic disease: ataxia - complete paralysis (most severe in hind limbs) bladder dysfunction sensory deficits
Carrier status possible?	Yes	No	Yes – latent infections
Treatment	Supportive only. Antibiotics may be used prior to the formation of abscesses, but this will inhibit the development of protective immunity (Sweeney et al, 2005)	Supportive only	Supportive only
Vaccine available?	Yes	Yes	Yes

Table 1. Key features of strangles, equine influenza and equine herpesvirus

Equine herpesvirus

Equine herpesviruses (EHVs) are also ubiquitous worldwide and highly successful at infecting both domestic horses and wild equids. There are nine EHVs characterised; however, the most important to the domestic horse population are EHV-1 and EHV-4. Infection with either of these can result in respiratory disease, abortion and neurologic disease (Slater, 2007). Transmission can occur via direct or indirect contact with respiratory secretions, and aborted material is also highly infectious.

The ability of these viruses to remain latent in horses that have recovered from clinical disease is key to their persistence in equine populations. Latentlyinfected horses not only enable the virus to be maintained in an infected herd, but can also act as a source of virus for new herds. Periodically, the virus will reactivate following a stressful situation. During these periods, it will be shed in the respiratory secretions of the infected horse. All horses with signs of disease and reactivating horses are contagious reactivation often occurs asymptomatically and horses shedding virus may show no overt signs (Slater, 2007).

Good management practices, including vaccination, should be utilised to help prevent the spread of disease and reduce the severity of clinical signs in infected horses. Owing to the sophisticated life cycle of this virus, aiming to eradicate this disease within equine populations is not practical; however, careful control and management can limit the impact of outbreaks (Gonzalez-Medina & Newton, 2015).

Exotic infectious diseases

Exotic infectious diseases are transmissible diseases not currently present in the UK. The global movement of horses, importation of contaminated blood-products or semen and changes to disease vectors - often midges or mosquitoes - may all result in the occurrence of exotic infectious disease in the UK. These diseases include notifiable diseases - West Nile virus (WNV), African horse sickness (AHS), equine viral arteritis (EVA) and equine infectious anaemia (EIA) - as well as nonnotifiable diseases, including piroplasmosis (Copras, 2013).

Within the last couple of years, outbreaks of some

of these diseases have been reported across Europe. Greece and Italy both reported cases of EIA early in 2016 (AHT/BEVA/ DEFRA, 2016). In 2015, WNV outbreaks occurred in Spain, Hungary and France, where one outbreak resulted in 45 infected animals across 34 separate premises (AHT/ BEVA/DEFRA 2015).

Introduction of these diseases into the UK could have a devastating impact on equine health and welfare, as well as being highly disruptive to the equine industry as a whole. Moreover, some of these diseases, such as glanders and WNV, are zoonotic and so human health is also at risk (Copras, 2013).

Although EU and UK legislation exists to reduce the risk of incursion of exotic diseases into the UK, and pre-importation testing reduces the likelihood of a diseased horse entering the country, these measures are not foolproof. As reported in a review by Dominguez et al (2016), an OIE-listed disease occurred because of the international movement of horses 54 times between 1995 and 2014 - 87 per cent of these resulted in the introduction of the pathogens into the importing country and about half of them lead to transmission of disease to local horses.

Protection through Partnership

This new research study is to be carried out over three years. The study is aiming to determine current owner awareness and perceptions of biosecurity, describe facilities present on a variety of non-racing British equestrian premises and establish consensus to inform improved uptake of practical, effective, evidence-based biosecurity recommendations.



Biosecurity encompasses hygiene and management practices, designed to reduce the introduction of infectious agents and to control their spread within populations or facilities (Morley, 2002), and is crucial in the prevention of disease transmission. Within the UK Thoroughbred industry, voluntary biosecurity recommendations for the control and prevention of a range of infectious diseases are available (HBLB Codes of Practice, 2016). However, despite their relevance, the extent to which existing biosecurity guidelines are utilised in the non-racing population is currently unknown. By increasing awareness of equine biosecurity and its importance to the entire equestrian community, this study hopes to take a step towards improving nationwide equine health.

One of the prominent outcomes of the study will be improved guidance regarding the most effective methods to deliver targeted owner education. The study population covers all non-racing British horse owners and, consequently, is incredibly varied owing to the highly variable nature of horse ownership within Britain. Therefore, a 'one-size-fits-all' approach is not appropriate for educating owners about infectious disease risks and the measures they can implement to reduce these risks. Tailoring education to horse owners will facilitate a greater engagement in disease prevention.

As well as the educational aspects involved, the research team is aiming to improve the accessibility of biosecurity guidelines available to horse owners. Current published advice can be unrealistic

"A new research study, called 'Protection through Partnership' ... aims to provide owners with the necessary tools to protect their horses, ponies or donkeys against the threat posed by these diseases" for individual premises to implement within the constraints of the existing layout and facilities of their own premises. Results obtained from the study will, therefore, be utilised to develop guidelines that are practical, effective and able to be tailored to individual requirements.

Improved biosecurity awareness and practices among the equestrian community will ultimately result in beneficiaries on a wider scale. Results from this study will aid prevention of large scale disease outbreaks, and guidelines can be used to inform recommendations for the control of endemic diseases and inform outbreak management protocols for exotic infectious diseases.

Disease outbreaks result in the imposition of movement restrictions that have detrimental effects across many sectors locally, regionally and nationally. The 2001 foot-and-mouth disease outbreak resulted indirectly in devastating losses to both the tourism and equine industries – the latter of which had losses estimated at £100 million per month for the first three months and many equestrian events were cancelled (Ellis & Watkins, 2004). Therefore, greater uptake of biosecurity measures and reduction of widespread disease transmission will, over time, benefit multiple industries.

The study itself will run in three phases. The initial phase includes a postal questionnaire of British horse owners, in which questions are focussed on owner knowledge and perceptions of biosecurity, facilities available on premises and potential motivators or barriers for carrying out biosecurity measures.

A subset of respondents to the questionnaire will then be selected for a premises visit, where information will be gathered on the spatial layout of the premises and facilities present. This will form the second phase.

The final phase will consist of the use of consensus gathering techniques in the development of evidence-based guidelines.

For further information about this study, visit: www.aht.org.uk/ protectionthroughpartnership or e-mail: caroline.hodgkinson@ aht.org.uk.

PPD Questions

- 1. Strangles is caused by infection with which bacteria?
 - A. Streptococcus equi subspecies zooepidemicus
 - B. Streptococcus pneumonia
 - C. Streptococcus equi subspecies equi
 - D. Corynebacterium pseudotuberculosis
 - E. Rhodococcus equi
- 2. Which two of the herpesviruses are most important in the domestic horse population?
 - A. EHV-1 and EHV-2
 - B. EHV-1 and EHV-4
 - C. EHV-1 and EHV-6
 - D. EHV-3 and EHV-4
 - E. EHV-4 and EHV-5
- **3.** What is the incubation period for equine influenza infection?
 - A. 1-5 days
 - B. 2-10 days
 - C. 3-14 days
 - D. 7-14 days
 - E. 3-7 days
- 4. Which exotic equine infectious diseases also pose a threat to human health?
 - A. Equine viral arteritis
 - B. African horse sickness
 - C. Equine infectious anaemia
 - D. Piroplasmosis
 - E. Glanders

5. What is the definition of biosecurity?

Answers 1.C 2.B 3.A 4.E 5. hygiene and management practices designed to reduce the introduction of infectious agents and to control their spread within populations or facilities.

References

AHT/BEVA/DEFRA (2015). Equine Quarterly Disease Surveillance Report 11(3) July-Sept 2015.

AHT/BEVA/DEFRA (2016). Equine Quarterly Disease Surveillance Report 12(1) Jan-Mar 2016.

Copas V (2013). Exotic disease threats in the horse. Livestock 18: 249-252.

Cullinane AA (2009). Equine Influenza: A constantly evolving challenge. In: Infectious diseases of the horse, 1st edn., Ed: TS Mair TS and Hutchinson RE, Equine Veterinary Journal Ltd, Cambridgeshire, pp. 21-28.

Daly JM et al (2011). Equine Influenza: A review of an unpredictable virus 189(1): 7-14.

Dominguez M et al (2016). Equine disease events resulting from international horse movements: Systematic review and lessons learned. Equine Vet J 48: 641-653.

Ellis PM and Watkins KL (2004). International movement of athletic horses – quarantine and regulatory controls. In: Equine Sports Medicine and Surgery, 1st edn., Eds: Hinchcliff KW, Kaneps AJ and Geor RJ. Elsevier Limited, pp 1227-1238.

Gonzalez-Medina S and Newton JR (2015). Equine herpesvirus-1: dealing practically but effectively with an ever-present threat. Equine Vet J 47(2): 142-144.

HBLB Codes of Practice (2016). Available at http://codes.hblb.org.uk.

Morley PS (2002). Biosecurity of Veterinary Practices. Vet Clin Food Anim 18: 133-155.

Sellon DC (2007). Streptococcal Infections. In: Equine Infectious Diseases, 1st edn, Eds: Sellon DC and Long MT, Saunders, Elsevier, pp. 134-153.

Slater J (2007). Equine Herpesviruses. In: Equine Infectious Diseases, 1st edn., Eds: Sellon DC and Long MT, Saunders, Elsevier, pp. 244-257.

Sweeney CR et al (2005). Streptococcus equi Infections in Horses: Guidelines for Treatment, Control and Prevention of Strangles. J Vet Intern Med 19: 123-134.



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*Suggested Personal & Professional Development (PPD)



LABORATORY

Laboratory techniques for use in equine patients

It is estimated that in up to 70 per cent of cases, clinical diagnosis depends on some form of laboratory result (Naylor et al, 2012); although it must be remembered that laboratory tests are sometimes expensive and will not always give conclusive results. With this in mind, it is important for veterinary nurses to support veterinary surgeons – in managing the expectations of the client, by performing some of the laboratory testing and learning to interpret the results. This article will focus on a few practical laboratory tests that can be performed by RVNs in practice.

Blood sampling

Blood makes up approximately 10 per cent of bodyweight and comprises cells in plasma (Naylor et al, 2012). It is usually collected via the jugular vein using the following procedure.

Restrain the horse properly, calming the animal by talking to it and offering reassurance. Adult horses should wear a head collar or a bridle; and foals must be held properly, with one arm round the chest and one arm around the hindquarters. This is known as a 'foal hug'. It may also be useful to have one hand under the foal's chin and to gently squeeze its ear to keep it still during blood sampling.

Have the appropriate equipment - vacutainer and needle or separate syringe and needle ready and assembled for use beforehand, together with the required blood tube (**Table 1**). Raise the jugular vein (usually done on the left side) and select the correct site for venepuncture. This is usually in the upper third of the neck and will help to reduce the risk of the needle puncturing the carotid artery.

Gently advance the needle – bevel up and parallel with the vein – into the skin until a lack of resistance is felt; then clip the 'vacutainer' tube onto the needle or attach the syringe and take the blood sample. Once this has been done, remove the needle from the vein and apply pressure to the sample site for two minutes while inverting the blood tube.

Label the blood tube and take it to the laboratory to either be stored correctly or packaged up to be sent away.

Packed cell volume

The packed cell volume (PCV) determines the percentage of whole blood made up of cells. In the horse, it varies with age, fitness and breed and the 'normal' value differs between laboratories. However, general values are (Naylor et al, 2012):

- thoroughbreds 40-46 per cent
- hunter types 35-40 per cent
 ponies 33-37% per cent

Higher values are found in the more 'hot-blooded' breeds, such as Arabians; and horses that are very fit, frightened or excited may have a higher PCV reading as a consequence of splenic contraction. This results in the spleen releasing six to 12 litres of red blood cell-rich blood into the circulation and is the reason why it is so important that RVNs learn to keep horses calm during blood sampling.

Neonates have a PCV of 40-52 per cent, which decreases to 29-41 per cent by six months of age. Interpretation of blood samples from foals should take this into account.

A raised PCV may indicate: • dehydration, stress and/or

- excitement endotoxic shock.
- A decreased PCV may indicate: blood loss

- anaemia
- decreased red blood cell production. This can sometimes occur secondarily to chronic inflammatory disease, nutritional deficiency, neoplasia or toxicity.

A technique for estimating the PCV is given in **Table 2** (Naylor et al, 2012). This is a quick, easy and accessible method for RVNs working in practice or out of hours. The PCV can also be determined using a machine (**Figure 2**); which takes longer and is more expensive, but will give a more accurate result.

Blood smears

Blood smears are used to look at individual cells – mainly white blood cells (WBCs) and red blood cells (RBCs). The horse has a number of different WBCs.

Neutrophils may be mature with a lobed nucleus, or immature with a band shaped nucleus. Neutropaenia (reduced numbers) may be seen with peracute infection and endotoxaemia; whereas neutrophilia (increased numbers) may be seen with inflammation, stress or corticosteroid use.

Lymphocytes have a large rounded nucleus that dominates the cell. Lymphocytosis (increased numbers) is seen in acute viral infection; while lymphopenia (reduced nunbers) may be

	Red	Purple	Green	Grey	Yellow	Blue
Anticoagulant	None	Ethylenediamine- tetraacetic acid (EDTA)	Heparin	Oxalate fluoride	Acid citrate dextrose	Citrate
Use	Biochemistry (serum) Serum amyloid A	Haematology Ammonia	Biochemistry	Glucose	Blood typing and cross matching	Coagulation studies Fibrinogen

Table 1. Top colours and uses of 'vacutainer' blood tubes - if other tubes are used, check the labels first (Naylor et al, 2012)

- take whole blood in an EDTA tube
- ensure it is mixed adequately
- fill a plain capillary microhaematocrit tube three-quarters full by capillary action
- plug end with plastic while a finger is on the other end
- use microhaematocrit centrifuge for five mins at 1500-300 rev/min (Figure 1)
- place haematocrit reader with bottom of tube contents at zero and top of plasma meniscus at 100
- read off number level at top of red column this is the PCV that must be recorded
- the buffy coat is the grey layer on top of the red cells
- the plasma sits above the buffy coat layer.

Table 2. Estimating the PCV (Naylor et al, 2012)

seen in chronic viral infection, stress or corticosteroid use.

Monocytes have a large beanshaped nucleus. Monocytosis (increased numbers) may be seen in chronic inflammation.

Eosinophils are covered in granules, and appear raspberry-like when stained with 'Diff-Quik' stain. Eosinophilia (increased numbers) may be seen with hypersensitivity disorders, such as recurrent airway obstruction (RAO) or parasite infection.

Basophils are also covered in granules, but they stain blue with 'Diff-Quik' stain. They are mainly associated with hypersensitivity disorders.

A technique describing how to make a blood smear is shown in **Table 3**.

Blood smears do not always go to plan and a good technique is only obtained by repeated practice. The following is a list of some common faults in blood smears (Naylor et al, 2012):

- too thick and the individual cells cannot be seen; or too thin and there are insufficient cells to analyse
- uneven distribution that leaves thin and thick bands of cells
- crenation caused by slow drying of the smear
- streaks and spots that make interpretation difficult
- incorrect staining.

Faults one, two and four are avoidable once a good technique has been developed. Blood smears should be examined logically using the 'battlement technique' in which the slide surface is covered by repeatedly moving two fields up, two fields down until 100 cells have been counted to give a percentage of each type of cell. In this way, a manual differential count can be performed. Alternatively, automated counters may be used.

Biochemistry

Most biochemical assays are performed by automated machines. High-throughput



Figure 1. Centrifuges can be used when assessing PCV in equine patients.



Figure 2. Haematology analysers can be expensive to use, but give more accurate results than manual tests.

diagnostic laboratories use 'wet' analysers where liquid reagents are added to samples and the chemical reaction is measured by a spectrophotometer.

Smaller laboratories may use 'dry' analysers. These are more expensive per test but give instant results from a small number of samples. With all laboratory tests – but particularly biochemistry – it is important to check against the normal values of the laboratory you use (Naylor et al, 2012).

Urinalysis

Urine may be collected as a free-flow sample during normal urination and it is most useful to catch a midstream sample. A urinary catheter may also be used. Urine samples should be collected into clean, sterile containers and analysed immediately. If this is not possible, boric acid can be used as a preservative (Naylor et al, 2012).

Specific gravity

Specific gravity is a measure of the density of a fluid. It is measured with reference to distilled water which has a reference value of 1,000. Specific gravity is usually measured by a refractometer, or less reliably on a dipstick. Normal equine urine has a specific gravity in the range of 1.020-1.050 (Naylor et al, 2012).

Faecal analysis

Faecal samples should be as fresh as possible. If the sample is not fresh, it should have been stored in the fridge. Equine faecal samples are often assessed for the number and type of parasite ova or larvae they contain – these being counted using faecal flotation or sedimentation, usually followed by the McMaster technique, which involves using a special counting chamber (**Table 4**).

Flotation is based on differences in specific gravity

between water at 1,000, compared with most ova at 1,100-1,200 and certain solutions, such as zinc sulphate, at 1,200-1,250.

Large and small strongyle (cyathostome) eggs may be identified. It is also possible to identify tapeworm eggs (*Anoplocephala* species), although they rarely float out of the solution and so may be missed. Whole adult tapeworms or their segments may be seen but only sporadically. A serum test is available for more accurate assessment of tapeworm infection (Naylor et al, 2012).

Faecal eggs counts are an important part of strategic worming protocols. They give an idea of adult worm burdens and can be used to decide when to worm or when not to worm a horse. This all contributes to keeping resistance to equine anthelmintics as low as possible.

Conclusion

Laboratory diagnostics are an important part of equine veterinary practice. While some tests are more accurate than others, all will give a guideline and help to inform clinical decisions.

RVNs can play a fundamental part of the diagnostic and clinical decision-making process by training to perform laboratory diagnostic tests – particularly out of hours – to make sure that gold standard care is given at all times.

- prepare slide as soon as possible after blood collection cells are alive and start to degenerate immediately after collection, affecting their morphology
- take a clean smear-free microscope slide
- place a small drop of EDTA and whole blood at the left end of the slide
- place the spreader slide edge on the right side of the drop at an angle of 30° to the main slide
- draw spreader towards the left blood will fill the join between the spreader and the main slide
- briskly push the spreader to the right, drawing out a film of blood across the rest of the main slide
- stain the slide following the manufacturer's instructions for each type of stain
- example stains include: Leishman's, Giemsa stain and quick polychromatic stains such as 'Diff-Quik'.

Table 3. Preparing a blood smear (Naylor et al, 2012)

- mix faeces with zinc sulphate and sieve through a fine gauze
- collect draining sample into test tube so that it is full and seal with a cover slip
- leave for 20 minutes
- lift the cover slip off vertically and place on a microscope slide, so that fluid is trapped between them
- using low-power objective, examine microscopically.

Table 4. A faecal flotation technique (Naylor et al, 2012)

PPD Questions

- 1. What percentage of bodyweight does blood make up in the horse?
- 2. What type of blood tube should be used when collecting a sample for haematology?
- 3. What is the normal PCV reading for a pony?
- 4. What is the normal specific gravity range for equine urine?
- 5. What is the name of the technique used to count ova in equine faeces?

Answers 1. 10 per cent 2. ethylenediaminetetraacetic acid (EDTA) – purple 'vacutainer' 3. 33-37 per cent 4. 1.020-1.050 5. faecal flotation technique

Reference

Naylor RJ et al (2012). 'Laboratory diagnostics' in: Coumbe K (Ed) Equine Veterinary Nursing 2nd edn, John Wiley & Sons, West Sussex.

New insights on horseracing injuries

A number of studies have explored fatalities and specific health conditions or injuries in horseracing; but until recently, no large-scale studies had been carried out on race-day incidents relating to flat racing Thoroughbreds in Britain.

Over the past decade, fatality rates in British flat racing have remained relatively stable rather than declining, according to the Royal Veterinary College (RVC). Injuries are one of the main reasons for retirement from racing and respiratory or cardiac conditions can lead to poor performance, retirement or death. Yet less is known about non-catastrophic raceday injuries in Thoroughbreds.

New research* carried out by the RVC and the British Horseracing Authority (BHA) linked race start data with incidents recorded by race-day veterinary surgeons over a 14-year period.

During the study period there were 7,993 reported events involving 6,727 horses, which equates to 9.37 incidents requiring veterinary attention for every 1,000 starts.

Soft tissue injuries (including wounds and lacerations) were the most commonly reported issue, accounting for 24.1 per cent of incidents, followed by respiratory conditions (primarily epistaxis) and gait abnormalities (lameness, poor movement or stiffness without a specific cause being identified), which accounted for 21.2 per cent each. Bone injuries made up 13.8 per cent of incidents.

There were 628 fatalities between January 2000 and December 2013 – an incidence rate of 0.76 per 1,000 starts – of which the majority (77.2%) were bone injuries.

Sixty-four fatalities were the result of cardiac conditions, while the remaining 54 were the consequence of tendon and ligament injuries.

Researchers found all-weather tracks had a higher incidence of veterinary events and fatalities than turf tracks, while firmer (turf) or faster (all-weather) going were associated with a higher rate of all events requiring veterinary attention.

Unsurprisingly, the results show the majority (70%) of injuries in Thoroughbred flat racing are relatively minor and not career-ending. However, the more severe bone, joint, tendon and ligament injuries had a greater impact on whether the incident resulted in a fatality.

While the data are based on presumptive rather than definitive veterinary diagnosis, the findings will help to prioritise research and inform efforts to reduce the occurrence of incidents. Ongoing surveillance is essential for reducing the occurrence of injuries, health conditions and deaths in British horseracing.

Although the industry boasts a track record to be proud of when it comes to welfare, the sport stirs up mixed emotions among equestrians, the general public and animal welfare groups. While it is beloved and celebrated on the one hand, a number of high profile deaths reported in the media each year are the source of considerable backlash. This year the deaths of seven horses during the four-day Cheltenham Festival led to an assessment by the RSPCA, and shortly after there were four fatalities during the Grand National at Aintree.

Overall, equine racing fatalities are said to have fallen by a third in the past two decades – from 0.3 per cent to 0.2 per cent of all runners. And while eradicating deaths entirely will never be possible, clearly all parties must continue working to minimise the risk and improve welfare.

The recent findings offer much-needed insights into the most common health conditions and injuries being reported in flat racing horses on race-day. Such research will help to identify risk factors and evaluate the effectiveness of any subsequent interventions.

Facts and figures

- worldwide, injuries to the muskuloskeletal system are the most common reason for race-day fatalities
- in British flat racing, a fatality incidence of 0.8 per 1,000 starts has been reported, with 3.07 limb injuries per 1,000 starts
- incidence of sudden death in apparently healthy Thoroughbreds, where death is not attributed to catastrophic injury, has been reported at 0.07-0.09 per 1,000 flat racing starts.

* Rosanowski SM, Chang YM, Stirk AJ and Verheyen KL (2016). Descriptive epidemiology of veterinary events in flat racing Throroughbreds in Great Britain (2000 to 2013). Equine Veterinary Journal. https:// www.ncbi.nlm.nih.gov/pubmed/27208544. Accessed 19 October 2016



Photo: Royal Veterinary College (RVC).

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*Suggested Personal & Professional Development (PPD)



TOXICOLOGY

Copper toxicity in dairy cows

Copper is usually very well supplemented in the majority of UK dairy herds. Although deficiency can – and sometimes does – occur, it is much more likely that copper toxicity becomes a problem (for dairy herds), and this is increasingly being diagnosed.

The Animal and Plant Health Agency (APHA formerly AHVLA) diagnosed 413 cases of toxicity in cattle between 2002 and 2011, and these were mainly in dairy cows. Of 546 diagnoses by APHA laboratories of copper deficiency (based on plasma copper levels) between 2005 and 2010, these were entirely in suckler herds, none in dairy herds (Payne, 2012).

The predominant reason for toxicity is inadvertent and haphazard oversupplementation, sometimes in a vain bid to improve fertility. Monitoring copper status is not straightforward and this can lead to a challenge when investigating whether copper toxicity is likely to be an issue. This article summarises the theories of copper deficiency and toxicity, looks at common on-farm scenarios and guides the practitioner through a practical approach to becoming more involved in monitoring copper status in dairy herds.

Background to toxicity

To get to grips with copper toxicity, it is perhaps important to first understand the theories of copper deficiency.

Copper is required for various metabolic functions, being an important co-enzyme in several metabolic pathways. It is involved with oxygen metabolism, iron uptake, pigment production and enzyme function. Deficiency is associated with poor pigmentation – brown tinge to coats, 'spectacle' rings around eyes, stunted growth, poor production, reduced fertility and potentially impaired immunity.

The problem is, whilst these symptoms are 'classic', they are in no way pathognomonic for copper deficiency. For example, sub-optimal fertility on dairy farms is very common and may be caused by a variety of managemental, environmental and nutritional factors (not to mention the bull!) - and often a combination of all three. Brown tinges to coats are very common when cows naturally shed winter coats (Figure 1) and 'spectacles' are a common sight in winter-housed cows owing to mange, particularly if they are concurrently metabolically stressed and/or suffering from poor immunity.

It is sadly not uncommon to come across accounts of farm advisers - including veterinary surgeons - advocating further copper supplementation on the basis of these symptoms. Faced with a farmer who is clamouring to know why his cows are not getting in calf and looking for a quick-fix solution, perhaps it is easy to see the initial attraction of administering an additional bolus, upping the mineral level in the dairy nut or mineral pack, or simply increasing the daily amount of bagged mineral to be added to the mixer wagon.

The justification which is usually given is not primary

copper deficiency, but socalled 'secondary copper deficiency' or 'copper lock-up' or 'molybdenum toxicity'. This is where it all gets a bit complicated and the waters muddy. It might take more than this article to guide you through the minefield but the following summary is an attempt.

Complex metabolic interrelationships

Primary copper deficiency is very rare in UK dairy cows and this is because they are almost always supplemented in some way. Some regions of the UK, notably the 'teart' pastures of parts of Somerset, are known to have high soil molybdenum levels.

Thiomolybdates are complexes of molybdenum and sulphur. It is thought they are formed in the rumen when the two elements are present and copper binds strongly to thiomolybdates. There is a school of thought which believes thiomolybdates are absorbed into the bloodstream of cattle and bind to copper-dependent enzymes, thereby exerting a detrimental effect and causing symptoms similar to copper deficiency. This is so-called thiomolybdate toxicity, which may also be referred to as 'secondary copper deficiency'.

An alternative theory is that thiomolybdates exert a toxic effect in a different way – not by binding to

"Although deficiency can – and sometimes does – occur, it is much more likely that copper toxicity becomes a problem"



Figure 1. These dairy cows have brown coat tinges and one has 'spectacles' around her eyes. However, these are perfectly normal coat colourings for these animals and it would be wrong to suspect copper deficiency on this basis.

copper-dependent enzymes; and a third position is that thiomolybdates might be absorbed through the gut into the blood but that any theory about toxicity is at best unproven and, quite possibly, may not exist (Suttle, 2016).

If thiomolybdate toxicity is a real phenomenon, it is usually manifested by poor fertility and, possibly, other symptoms normally associated with primary copper deficiency, such as poor coat colour and pale rings around the eyes.

Thiomolybdate toxicity is very difficult to diagnose, and thiomolybdates are not assayed directly. Certainly, plasma copper levels are not useful as these may be adequate (high) yet still so-called secondary copper deficiency or thiomolybdate toxicity could occur. One postulated way of diagnosing the condition is by measuring the activity of copper-dependent enzymes or proteins, particularly superoxide dismutase (SOD) and caeruloplasmin. This is the basis of some tests available in the UK - the NuVetNA (Nottingham

University Veterinary Nutritional Analysis), for instance. However, there is not universal agreement that these are effective tests, and validation is lacking.

The theory of copper supplementation to counter thiomolybdate toxicity is two-fold:

- feed more copper which binds to thiomolybdate in the rumen to make insoluble complexes that are not absorbed. This is sometimes called 'sacrificial' copper and is the main theory behind supplementing copper using a coppercontaining bolus that dissolves slowly in the rumen
- feed more copper which is absorbed into the blood thereby 'flooding out' thiomolybdates there. 'Organic copper' or 'chelated copper' is advocated for this purpose because it is not released in the rumen where it might potentially be bound and, therefore, not absorbed; but is released from its organic molecule once it has passed into the intestine where it can be absorbed. Chelated copper is bound to an amino

acid and hugely increases its availability for absorption.

Most supplementary copper given to dairy herds is given in the belief that it is necessary to counter thiomolybdate toxicity, which might be exacerbated by other elements in the diet, such as iron, that can also bind to copper and make it less available for absorption. In any case, only a very small proportion of copper provided in the diet is normally absorbed - an estimated two to 10 per cent. This 'availability' depends on the form in which it is provided and the amount of so-called antagonists that bind it in the rumen or intestine.

Copper toxicity

Cows store excess copper in their livers. Some is also excreted in faeces via bile. Clinical copper toxicity occurs once the storage capacity of the liver is exceeded and massive acute liver damage results in rapid release of free copper into the blood, quickly followed by methaemoglobinaemia and haemolysis. This gives rise to symptoms of red urine, brown blood, jaundice, collapse and sudden death. At this stage, high blood copper levels and low liver copper levels occur, and the condition is terminal. Quite often the first indication that copper toxicity or oversupplementation is a problem on a farm is when one or more animals dies suddenly. Many cases probably go undiagnosed. It may occur in adult cows or in youngstock – fed dairy concentrate that tends to have higher copper levels than youngstock nuts, for example.

Until clinical toxicity occurs and copper is released from the liver, plasma copper levels remain stable, even in the face of oversupplementation. Therefore, whilst plasma copper might be useful to help diagnose primary copper deficiency – for example, in cattle relying on grazing or forages without any mineral supplementation – it is not at all useful to diagnose over-supplementation.

A recent UK survey of 419 dairy cull cows found that high liver copper levels were very prevalent, 38 per cent having above the APHA normal reference level of

Mineral ratio	Level which might indicate likely antagonism (mg/mg)
Sulphur : copper	>500-1000:1
Iron : copper	>50-100:1
Molybdenum : copper	> 0.3-1:1

Table 1. Mineral ratios useful to assess the likely level ofcopper antagonism

8,000µmol/kg dry matter of liver copper (Kendall et al, 2015). One way of expressing this is 'copper loading'. This can - and does - clearly occur quite commonly in the absence of clinical toxicity symptoms. It is a moot point whether copper loading per se is detrimental to the health and performance of the cow, or whether it simply represents over-supplementation and a higher risk of clinical toxicity occurring should the balance tip further, or should the oversupplementation continue for a longer period.

Chronic copper toxicity caused by copper loading may give rise to liver pathology that could potentially be detected by raised liver enzymes (GLDH, AST, GGT, bile acids). There may be a trigger event or other condition which might precipitate acute clinical toxicity. These factors are still poorly understood.

How much copper is required?

Somewhat confusingly, copper requirements are usually quoted in mg/kg dry matter intake (DMI). Actually, the important factor is the total mg/day intake, regardless of dry matter intake. Dairy cows require between eight to 11mg/kg DMI/day (Sinclair and Atkins, 2015) and certainly no more than 20mg/ kg DMI/day (Suttle, 2010). So, for a cow eating around 20kg DM, this equates to between 160 to 400mg per day.

Milk has very little copper content, so copper requirements are not markedly different for different stages of lactation or yields, though higher yielding cows have a

"The best and simplest starting place is with a pad of paper and a pencil"

marginally higher requirement. Practically, there is no need to take this into account.

As previously alluded to, the availability of copper varies at least five-fold (from two to 10 per cent) and this depends on the form in which it is fed - chelated or otherwise - and the presence or absence of potential antagonists, such as sulphur, molybdenum and iron. Nevertheless, for the purposes of calculating supplementation levels, this is not usually taken into account - or indeed calculable to any degree of accuracy - and it is another 'grey area' with which we have to live. If chelated copper is being fed in the mineral supplement, it is advisable to take it into consideration as this is likely to increase the risk of oversupplementation, particularly in borderline scenarios.

Copper supplementation is governed by regulation (EU Regulation 1831/2003 on additives in animal feed). This sets a maximum permitted level (MPL), which is at 35mg/ kg for feed with 88 per cent dry matter (this being the usual dry matter content of a concentrate feed). This equates to 40mg/kg DM. Confusing?

The existence of an MPL is intended to safeguard cattle from toxicity because a veterinary prescription is required for any manufactured feed (such as dairy nuts) that exceeds this level. In fact, the effect that the MPL often has in practice is that this figure (40mg/ kg DM) is used as a *target*, which is detrimental.

Let us take an example of a dairy cow with a predicted DMI of 24kg/day (not unusual for high-yielding cows with good feed access). If the MPL is used as a target copper level, she will be fed 40 x 24 = 960mg copper per day.

This is far in excess of her probable requirement of between 160-220mg/day or the upper level of 400mg/ day. In terms of how much mineral to add to her diet,



usually a 'background' copper level is calculated from all the components of her diet (typically 140-150mg in total), and she is supplemented above this to reach the 'target'. This is poor practice, is dangerous and should be discouraged.

When is molybdenum too high?

There is no hard and fast rule on this. Molybdenum-rich swards are >2mg Mo/kg DM. These are unusual. Anything less than this is unlikely to be a problem.

Table 1 gives ratios to assesswhether dietary copperantagonism is at all likely.Even if it is likely, it is highlyimprobable that a cow'scopper requirement willexceed around 400mg/day. If the antagonist riskis considered high, it stillshould not be used asjustification to use the MPLas a target for overall coppersupplementation (Grace andKnowles, 2015).

Sources of copper

All sources of copper must be taken into consideration. Figure 2 illustrates the multiple routes through which a cow may receive copper. Ideally one person takes overall responsibility on a dairy farm for calculating copper intake. Unfortunately, this rarely happens, and it is not unusual for a farmer to be supplementing using a combination of sources, all purchased from different suppliers. For example, a bolus from the vet or agri-merchant, a dairy nut from the compounder (with mineral included), a bagged mineral from a third supplier, and sometimes moist feeds that might contain unknown copper levels, from a fourth supplier.

Unless someone actually sits down and identifies the different sources and tots up the amount of copper that each is supplying, it is quite possible to be regularly feeding in excess of 400mg/ day, or even in excess of the MPL of 40mg/kg DM (around 800-900mg/day).

Monitoring copper status

The best and simplest starting place is with a pad of paper and a pencil. It is quite possible, with the aid of a reference guide such as *The Feeds Directory* (Context Books) or the internet, to work out the likely copper level of each dietary component.

There may be recent forage mineral laboratory reports available for the farm, but if not this is not important because forage copper levels are generally low and reasonably consistent, so a typical reference level is good to use. The mineral bags will state the copper levels, as will the feed tickets for any dairy concentrate. Don't try and differentiate the availability of the different sources of copper in the mineral, just look for the overall inclusion rate (typically 1,500-3,000mg/kg).

The next step is to calculate how much, on a dry matter basis, the cows are eating of each ingredient on average. Then calculate the total dietary copper level. Add to this the likely amount of additional copper received from boluses or injections (from data sheets) and, if relevant, mineral added to drinking water.

It usually quickly becomes apparent that the most significant source of copper is the mineral supplement. Be sure to estimate as accurately as possible how much of this

"...for veterinary surgeons who are not used to dealing with nutrition, it can be a daunting area in which to venture"

each cow is *actually* fed each day (as opposed to what *should* be fed).

Add up the total intake. If it is more than 400mg/cow/day it is likely to be plenty. If it is more than 900mg/cow/day it is likely to be above the MPL and very risky.

After the calculations, the second task is to monitor the cows more directly. Blood tests, as previously discussed, are not generally useful. Liver biopsies are more reliable and these can be taken from cohorts of live animals - midlactation cows, for example - or from cull cows at the slaughterhouse. Liver mineral levels will stay stable postmortem, so it is not necessary to collect biopsies from live animals, although sometimes this is the only way possible.

Liver biopsy is best done after some training and using a trochar and cannula designed for the purpose (**Figure 3**). With these two provisos, it is reasonably straightforward and there are a number of laboratories in the UK or New Zealand which will do the assays. It is advisable to contact them beforehand because each has different requirements for the weight of the liver samples to be sent.

Some farms, despite your best efforts, will insist on feeding higher than required copper levels. In these cases, liver biopsies are sometimes used on a brinkmanship basis; copper is over-supplemented until liver copper levels are perceived to be too high for safety – above 8,000µmol/kg dry matter, for instance – but

Figure 3. A made-for-purpose biopsy needle and trochar is recommended for liver biopsy. A thin slither of liver collected with the biopsy needle around 4cm long (approximately 1g, as shown) is sufficient for most laboratories to assess copper levels.



sometimes higher thresholds are used, perhaps inadvisably.

Summary

There are still plenty of unknowns about copper requirements, supplementation and toxicity, and for veterinary surgeons who are not used to dealing with nutrition, it can be a daunting area in which to venture. However, veterinary surgeons are often the ones best placed to take an unbiased view of copper supplementation on their clients' farms and help the farmers take control of something which, quite possibly, might cost them and their cows dearly.

If you don't seek, you don't find. Copper oversupplementation is common. Copper toxicity is more frequently being reported and those cases are maybe only the tip of the iceberg. I urge all dairy veterinary surgeons to keep a wary eye out for oversupplementation, to definitely avoid unwittingly contributing to the problem and to make more copper audits on clients' farms, using liver biopsies where necessary. It is an interesting subject area and you have great potential to make a positive difference.

PPD Questions

- Copper deficiency is still diagnosed by laboratories more frequently than copper toxicity in cattle in general. A good reason for this is most likely to be which of the following:
 A. more suckler herds are blood tested than dairy herds
 - B. deficiency is easier to diagnose, based on a blood sample (low plasma copper); whereas toxicity is much more difficult to diagnose, requiring liver biopsies and/or a liver histopathology after a post-mortem examination
 - C. deficiency is more common than toxicity
 - D. copper deficiency is really thiomolybdate toxicity
- 2. Which level of copper supplementation for dairy cows is most likely to be appropriate:
 - A. 900mg/day
 - B. 40mg/kg DM
 - C. 35mg/kg DM
 - D. 15mg/kg DM
- 3. The most significant source of copper for a dairy herd is likely to be which of the following: A. boluses
 - B. injections
 - C. minerals added to the ration
 - D. forages
- A good starting point to investigate the likelihood of copper toxicity is which of the following:
 A. a desk-top exercise to calculate copper intakes
 - B. blood samples from six fresh-calvers, six mid-lactation cows and six dry cows
 - C. blood samples from 12 lactating cows to assay caeruloplasmin : plasma copper ratios
 - D. liver biopsies from six mid-lactation cows to assay liver copper levels
 - E. collecting samples of livers (e.g. 5g per sample) from six to 12 cull cows from the abattoir and assaying liver copper levels

Answers Answers (هاנhough D and E are also valid answers). A.A 2.C 4.A (هادhough D الم التي 2.C 4.A).

References

Grace N and Knowles S (2015). Taking action to reduce the risk of copper toxicity in cattle. Research editorial, Veterinary Record 177: 490-491.

Kendall NR et al (2015). Liver copper concentrations in cull cattle in the UK. Are cattle being copper loaded? Veterinary Record 177: 493.

Payne J (2012). Copper toxicity in cattle and sheep. AHVLA presentation to Livestock NorthWest, Preston.

Sinclair LA and Atkins NE (2015). Intake of selected minerals on commercial herds in central and northern England in comparison with requirements. Journal of Agricultural Science 153: 743-752.

Suttle NE (2010). Copper. In Mineral Nutrition of Livestock, 4th edn. CABI International pp. 255-305.

Suttle NE (2016). Reducing the risk of copper toxicity in dairy cattle (letter). Veterinary Record 178: 195-196.



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When it comes to health and safety, the majority of us roll our eyes, look to the sky and suddenly think of something else we really ought to be doing. This is also often the way we feel when it comes to biosecurity. However, when we stop to think about it, all that these words are trying to say is, "Let's find a way to minimise risk to people and their animals – pets or livestock".

Managing health and safety and biosecurity should be a partnership between all parties concerned, rather than all the risk being placed on one side or the other.

The farming community might wish to 'diversify' for a whole host of reasons, including improving public image and financial reward. Those involved in the veterinary industry will inevitably be asked to provide advice. As every situation will have its own issues, it will never be possible to provide a one-size-fits-all approach, so the aim of this article is to provide food for thought and some pointers as to how to approach questions and where to go for further advice.

Many on-farm diversification activities will involve reviewing

what the risks are to visitors and their pets coming on to the premises, as well as the risk from people and their pets interacting with the farm, especially its livestock (**Figures 1, 2 & 3**). In many cases, the visitor will have come to the farm with a genuine interest in everything that goes on there, as well as an expectation for the farm to provide a welcoming, interactive and educational experience.



Figures 1, 2 & 3. Many on-farm diversification activities will involve reviewing the risks from visitors and their pets interacting with farm livestock.







*Suggested Personal & Professional Development (PPD)



DIVERSIFICATION

Scenario

You are just completing a routine visit and the farmer mentions he is taking part in an 'open farm Sunday' event in a few days. He is a good sort and feels that with farming how it is, he needs to diversify and he thinks this might be a foot in the door of something bigger. He also feels that engaging with the public can only help raise awareness of the plight of farmers with the community. "Is there anything I should think about?" he says as you get into the car.

Option A

"Hope for a nice day," you joke. The phone is vibrating in your pocket and you need to be moving along – the "Whilst you were here" had taken more time than you had hoped. "Yep, that will be nice," he responds followed by, "Oh, don't bother sending those scour samples. We never find anything useful and I don't want to waste the money." With that you move on.

A few days later, the farmer is proudly saying how well the day had gone. The neighbour had also brought over a couple of his rare breed calves for the day. "They looked really good and everyone loved stroking the calves and feeding the lambs," he said, before continuing, "The only down side was one of the children tripped and fell down, knocked his head, bit of a cut, but as the parents said, it could have happened to anyone". We then got on with examining the calves with scour that had not really responded, how they normally do...

A few more days down the line and the farmer is on the phone saying several of the children are unwell and they think it is something they picked up whilst on the farm. On top of that, the parents that hadn't seemed to be bothered about the fall had changed their minds and now feel that the scar their child will now have was the fault of the farmer for not having secured the gate properly.

The farmer is now definitely wishing it had rained all day and no one had come. You have a faint sinking feeling as you prepare to give the client the laboratory results from the samples taken on the last visit. Actually these were the same results that later that day he would be giving the neighbouring farmer...

It is fairly obvious in the above scenario that there were a number of opportunities for the farmer to identify and manage the risks on this farm and also the neighbouring farm. There was also the opportunity for the veterinary surgeon to help his rather naïve client by calling to mind the adage that 'failure to prepare is preparing to fail'.

Assessing the risk

In the first scenario, there was more than a hint that there might just be a problem - but this was overlooked. If a farm is to receive visitors, a 'safety first' approach should be taken. Remember also that, even where tests are available or have been carried out, a negative test does not guarantee freedom from a zoonosis. It should always be assumed that animals at visitor attractions - even if they appear healthy - carry a range of potential zoonoses, of which some are

more serious than others. The risk to the young, old and immunocompromised is greatest and extra care should be taken with these visitors. The risk to pregnant women is of specific note as a risk may not be large but the consequences are so much greater. Bear in mind too that young stock, stock under stress, pregnant stock or stock unfamiliar with people are more likely to excrete microorganisms and the risk of infection may be direct or indirect (Table 1). Assume that visitors have

Option B

Having said, "Hope for a nice day", you then start thinking about the scour sample you just took. Whilst it may be a remote possibility, there is a zoonotic risk, and perhaps there are other risks too. You wonder if there are any sources of advice out there to help prevent problems on the day.

You find there are a few and begin to categorise the risks. You find that the principles of health and safety and biosecurity are very similar (**Figure 4**).





Risk of exposure
Touching or kissing animals
Feeding, stroking or touching through gates
Contact with gates, pens and other items contaminated with faeces
Picking up contaminated feed from the floor
Removing contaminated footwear or clothing
Eating, drinking and smoking with contaminated hands
Using contaminated play equipment
Touching personal items that have become contaminated (e.g. toys, pushchairs, mobile phones)
Being struck, bitten or pecked

Table 1. Activities leading to risk of exposure to zoonoses

little or poor understanding of what may or may not be safe (**Figure 5**). Fingers might get trapped in latches, feet might get caught in loose string. They might climb over a fence to retrieve a dropped toy or mobile phone – and last time I looked, zoonoses were not bright purple!

Summary of the risks

It will never be possible to record every risk, but is possible to assess the types of risk and then begin to remove them; or failing that, reduce the risks both to visitors and their pets and to the farmer and his stock. Take the opportunity to encourage public engagement

Figure 5. Some visitors will have little understanding of what may or may not be safe.



Table 3. Common infectious hazards with zoonotic potential

and education. **Tables 2 & 3** summarise some of the types of hazards that might be encountered.

Each event will have different risks – farm walks and orienteering activities might have a greater risk of visitors begin attacked, whilst the risk of picking up infections might be higher where young stock are being handled, petted or fed.

Controlling the risks

Having assessed the risks, the aim now is to make them as low as possible and, ideally, avoid them entirely. Breaking down the hazards

Table 2. Hazards leading to physical injury

Hazard	Source
Being attacked, kicked or butted	 animals not restrained properly animals unsettled owing to unusual surroundings/exposure to unfamiliar people/animals aggressive/nervous stock (e.g. bulls, stock with calves/lambs at foot, especially if dogs also present)
Being bitten or pecked	hand-feeding animalspetting and stroking animals
Manual handling	 turning sheep or cattle
Tripping or falling	 floor hazards and steps slippery paths, yards and terrain loose string

Hazard	Source	Route	Consequence	Notes
Campylobacter abortus	Birth fluids, abortion products, faeces, contaminated workwear	oronasal – ingestion and inhalation	systemic illness, miscarriage	Rare
Toxoplasma gondii	Soil, hay or feed contaminated with cat faeces, abortion products from sheep & goats	cuts, ingestion	miscarriage, stillbirth, congenital malformation of foetus	Rare – 90-95% of occurrences have no symptoms
Q fever	Birth fluids from sheep, cattle, goats & deer	oronasal, tick bites, drinking unpasteurised milk	systemic illness	
Leptospirosis	Urine	oronasal	systemic illness	
Listeria	Infected food, silage, abortion products from sheep, cattle & goats, contaminated water	ingestion	systemic illness, miscarriage	
Salmonella	Infected food, faeces and abortion products	ingestion	systemic illness	
Campylobacter	Contaminated food, faeces from farm animals, pets and poultry, abortion products	ingestion	systemic illness	
Escherichia coli	Faeces from farm animals, pets, wild animals, contaminated workwear	ingestion	systemic illness	
Ringworm	Direct/indirect contact with lesions	cuts and wounds	local lesions	Risk to the young or immunocompromised
Cryptosporidia	Faeces from calves, sheep, deer & goats	ingestion	systemic illness	

into 'chunks' means it is less likely that important aspects will be missed. For each, consider the human risks – both to visitors and farm staff – and the risks to and from the stock. **Table 4** is an example of a simple risk assessment form.

Option 1 Premises

In this scenario, it is a working farm and the objective is for the visitors to have appropriate access and for their visit to be educational, whilst minimising the risk both to themselves and to the farm. Areas should be set out to which visitors have access – a halfway house, where it is easier to keep an eye on

what is going on (Figure 6).

Ensure that the 'tour' routes guide visitors away from restricted zones - including normal working areas, slurry and chemical stores and so on - by providing suitable fencing, closed (and locked) gates and clear signage. Washing hands is a 'must' after any contact with any animal and before eating or leaving the premises. Where possible, take routes that do not cross tracks that animals or vehicles normally use. Alternatively, ensure the area is clear and clean - possibly even using boards to walk on as a barrier.

It may be worth encouraging visitors to wear Wellington boots – especially if is likely that they have been on other farms – and providing facilities for washing and disinfecting footwear before and after visiting. Signage explaining why these things are important will certainly help.

Check that fencing and other barriers are safe, secure and clean; and disinfect pen divisions, gates and walkways as required.

Animal contact

Decide on suitable, designated contact areas, taking into account the risk to and from

	Hazard 1	Hazard 2
Identify the hazards		
Decide who might be harmed and how		
Evaluate the risks and decide on precautionary action required		
Record your findings and implement actions		
Review your assessment and implement new action, if necessary		

Table 4. Simple risk assessment form headings



Figure 6. Areas should be set out to which visitors have access and the 'tour' routes should guide them away from restricted zones.

the stock. This area should only contain fit and healthy animals, and avoid including animals that are nervous or aggressive. As veterinary professionals, we should always ensure that clients are aware of potential zoonoses and encourage appropriate diagnostic work-ups.

Where zoonoses are found, then the prudence of continuing with animal contact should be considered, even if the stock appear healthy. New 'display' animals should be brought on to the farm only after careful consideration of the risk and should come from trusted sources. In the case of the example scenario, bringing on animals should almost certainly have been avoided. In order to avoid the risk of picking up or introducing infections, visitors should not enter pens. Where close handling is offered - feeding or petting, for instance - a separate, purpose-made area should be designed, to which animals are brought for a short period. There must be close supervision and all visitors should be reminded to wash their hands after animal contact. Prevent eating, drinking or finger-sucking in animal contact areas, and all staff should set a good example by using the hand-cleaning

facilities and encouraging others to do the same.

There should be clear signage advising visitors not to touch any animals outside this particular designated area, and it should be cleaned as soon as possible after and before further close animal contact.

Eating and play areas

The aim is to provide a clean, low-risk eating/playing area for visitors, who in turn should not leave anything that might be a risk to stock. The area should not have had stock for

"Assume that visitors have little or poor understanding of what may or may not be safe" at least three weeks and from which any contamination, especially faeces, has been cleared. Ideally the grass should be short – silage aftermath, for example. There should be easy access to hand washing and toilet facilities to use prior to eating, drinking and smoking.

Washing facilities

Washing facilities – including for footwear, pushchairs & wheelchairs – should be easily accessible and adequately signed. They should be near any designated animal 'contact' areas and, ideally, visitors should have to walk past them on leaving.

Wipes and gels are unlikely to be as effective as proper hand washing facilities.

Visitor information

Information should be provided covering the risks to health, the precautions to minimise these risks and reminding people of their own responsibilities (**Figure 7**), including complying with hygiene precautions and carrying out hand washing. Ideally there should be a site plan and directions.

Training and supervision

Ensure all the team involved in organising and running the event understand the health risks – both to stock and people – when visitors are interacting in and around a farm. Provide training and encourage them to set high standards and encourage visitors to meet good standards also.

Livestock

management procedures

Be clear as to which animals are suitable for contact and display; and keep newborn animals (up to 48 hours old)



Figure 7. Warn visitors that chickens will peck them!

and their mothers away. Monitor all the animals closely – be prepared to remove immediately, any individual that is distressed or appears unwell – and keep them and their housing clean and well-bedded, with access to food and water.

Option B

Follow up You were able to direct the farmer to several sources of information that enabled him to identify the risks of holding an open day on his farm. You helped to identify the most likely risks applicable to the open day. As a consequence, he decided to avoid bringing on the neighbour's calves and, instead, had some pictures of different breeds.

Fortunately, the scour samples came back negative for the common zoonoses associated with calf diarrhoea. However, the farm team understood that this did not eliminate all

"There must be close supervision and all visitors should be reminded to wash their hands after animal contact" risks, so only a small number of young healthy calves and lambs were on display in secure pens made up in a separate clean barn with plenty of room all around and an absence of physical hazards. The main calf area was kept out of bounds.

The carefully laid out leaflets and posters reminded people they were on a working farm and that this carried risks which would be minimised if they took a few simple precautions.

The farmer had a great day, the visitors had a great day and there was minimal risk to humans and animals. On the back of your discussion, the farmer is happy because he had subsequently heard of another farmer who was going through the first scenario above. "There but for the grace of God," he had said. Not only that but he had started to take a real interest in preventive vaccinations.

A few weeks later the farmer began plans for setting up a permanent visitors' facility for his farm, clear in the knowledge that with a bit of thought and planning, there is a future in diversification.

Summary

The benefits of diversification – in terms of public image and potential financial reward, versus the risk of physical injury and zoonoses to people and compromised biosecurity – are ever present. It is all too easy to say it simply isn't worth it. However, on reflection and with thought and planning, it is perfectly possible to minimise the risk whilst maximising the educational experience of all concerned.

The principles set out in this article can easily be applied to farm walks, rural craft days, running bed & breakfast and any other activity that might involve direct or indirect contact with livestock.

PPD Questions

- 1. What opportunities were missed to help the farmer in Option A?
- 2. What are the five steps of risk assessment?
- 3. List one zoonosis from four different types of organism.
- 4. Why should visitors not be encouraged to enter pens containing animals?

5. Are medicated wipes and gel considered effective hand cleansers for on-farm use?

ou <mark>.</mark>

- 4. risk of transmission of infection to or from visitors and risk of injury
 - Rickettsia (Q fever)
 - epiconsection (Toxoplasma/Cryptosporidia)
 - bacterial (e.g. Salmonella)
 fungal (e.g. ringworm)
 - organisms and zoonotic potential include:
 - review your assessment and implement new actions, if necessary
 actions, if necessary
 - record your findings and implement actions
 - evaluate the risks and decide on precaution action required
 - decide who might be harmed and how
 - identify hazard
 - 2. the five steps are to:
 - sizonoos laitnatoq a seongaib
 - gninneld viiuosecold ni egegne =
 - engage in effective health and safety risk analysis

1. missed opportunities to:

Answers

References

Barret DC (2000). Cattle News 1999 Part 4-6. Cattle Practice 8(2): 201-205.

Gascoigne E (2016). Biosecurity and the threat of infectious disease to sheep flocks. Veterinary Practice Today 4(2): 37-40.

Kavanagh N (2002). Milk-borne Zoonotic Infections. Cattle Practice 10(1): 15-18.

Lovatt F et al (2008). Health and safety considerations for pregnant farm animal vets. In Practice 30: 573-575.

Moredun (2002). Zoonotic infections Associated with Keeping Sheep in the UK The Moredun Foundation News Sheet 3(14).

Moredun (2002). Human Health Issues (Zoonotic Infections) Associated with Rearing Cattle in the UK The Moredun Foundation News Sheet 3(15).

Pritchard G (2011). Prevention and control of zoonoses on farms open to the public. In Practice 33: 242-251.

Useful websites

www.hse.gov.uk/agriculture/topics/zoonosis.htm www.hse.gov.uk/pubns/priced/hsg270.pdf www.bva.co.uk/Workplace-guidance/Practice-management/farm-health-and-safety www.hse.gov.uk/workers/ www.visitmyfarm.org

BVA takes a look at Brexit

It is good that the veterinary profession – so often criticised for a certain apathy when it comes to anything political – has grasped the bull by the horns and taken a position on Brexit. Or at least this is the case with the British Veterinary Association (BVA).

Brexit will have implications for all professions and businesses, including the veterinary 'industry'. We may not know exactly what form these consequences will take, but the key to coping with the forthcoming changes is to be prepared – and the BVA has done just this with its document, *Brexit: the British Veterinary Association's principles for negotiating the UK's exit from the European Union* (BVA, 2016).

There are a number of areas where the profession may be affected – both directly and indirectly – and the BVA has highlighted these, listing its requirements for any negotiations. The significant areas of interest are:

- the veterinary workforce
- animal health
- animal welfare
- food hygiene and safety
- veterinary medicines
- research and development.

The veterinary workforce

There have already been reports of uncertainty among European veterinary professionals accepting jobs in the UK for fear of what will happen when the UK leaves the European Union (EU). The BVA is asking for the working rights to remain the same for all non-British veterinary surgeons and nurses working in the UK and for British veterinary surgeons and nurses working in EU countries.

They have added the rider, however, that the Royal College of Veterinary Surgeons (RCVS) should have the authority to determine the recognition of veterinary qualifications and language competency requirements. This last point would be a 'plus' for the industry, if adopted.

Animal healthcare

The main point of this area is that there should be no deleterious effect on animal health following the implementation of Brexit and that resources for disease control, reciprocal data sharing and standards should be maintained. One interesting requirement is that when legislation is reviewed, the Government should ensure that these things happen and regulations are not overly



prescriptive, in order to reduce any unnecessary administration – another 'plus' for the industry.

Animal welfare

The BVA insists that there should be no dilution of any existing welfare standards; indeed, it is suggesting that any new legislation should seek to improve animal welfare and that animal welfare standards should be integral to the negotiation of any new trade agreements. So there is the possibility here of improved animal welfare post Brexit.

Food and hygiene safety

Again, there is a call for existing food hygiene legislation and standards to be maintained – as they should be, given the vital role of veterinary involvement in public health and food safety. The BVA suggests that, if and when legislation is reviewed, the regulatory environment should be based on risk whilst still maintaining current health and welfare standards.

Veterinary medicines

It is essential that access to veterinary medicines licensed in the EU should be guaranteed and that the 'cascade' should be maintained, together with measures sought to simplify it; whilst any new UK veterinary medicines legislation should be based on safety, quality and efficacy.

Research and development (R&D)

The BVA stresses that any new legislative framework must ensure that the UK continues to be a globally attractive place for R&D and that we should maintain and develop access to EU funding, as well as developing new opportunities with global partners. When we look at the principles set out by the BVA, we can see that the association creates not only a very positive approach to Brexit, but also highlights some excellent post-Brexit opportunities to change and improve some of our existing legislation and systems – something that we would have been unable to do if we had stayed within the EU.

There are one hundred and one 'ifs and buts' about Brexit and it is inevitable that there will be some downsides - if not immediately, then in the future. One of the big issues for the veterinary workforce may well be - as was mentioned earlier this year in the Veterinary Times (11 July 2016) - the issue of the Working Time Directive. This piece of health and safety legislation has had a great impact upon 'on call' and night-time duties, and whether in the long term the Government may repeal it, once it is no longer under the control of EU legislation, remains to be seen. It has been cited as good for employers and bad for employees, depending upon your point of view.

Conclusion

Nothing is going to change overnight and we are faced with a long period of uncertainty. Only time will tell to what extent Brexit has affected the veterinary industry. In the meantime, adopting a proactive and positive approach simply has to be the way forward.

Reference

www.bva.co.uk/uploadedFiles/Content/News,_ campaigns_and_policies/Policies/BVA-principles-fornegotiating-Brexit.pdf

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Risky business. Why a multifaceted approach to computer security can minimise performance restrictions

Computer security is fundamentally important to every business and managing the risks is an essential part of the day-to-day management of the veterinary practice.

he increasing demands for internet-connected computer systems to be faster, more efficient and reliable means that understanding how your practice's computer system can best perform within secure circumstances is vital.

Malware threats

Computer malware is the collective term that refers to a program code which is designed to disrupt or damage a computer system. It can either cause irreparable damage to your computer or steal passwords, bank/credit card details, and e-mail addresses. Computer viruses, Trojan horses, worms, ransomware, spyware and other forms of malware, spread easily between computers through shared files from the internet and through attachments in e-mail messages.



Unscrupulous writers and organisations worldwide are continually producing new malware. When this happens, the suppliers of protection software have to understand how each new threat spreads – and what it is trying to do – in order to develop, test and send out new antivirus updates to deal with it. Because of this, it is necessary to update and deploy new malware signatures as soon as they are released. One of the first steps in making your practice's computer network secure is performing a network audit to determine the risks to security.

There are many ways that malware can infect your computer. However, there are three basic rules you can follow to minimise your chances of contracting a virus:

- do not open unsolicited e-mail attachments regardless of whom they have come from
- save file attachments to disk and scan before opening them with antivirus software
- ensure you are running up-to-date antivirus software.

Firewalls

Firewalls help prevent intrusion from an outside source, and they also block some viruses from spreading from computer to computer. Using a computer without a firewall is risky, as viruses can be transmitted from any other computer that shares the same network, so you should always have a firewall installed and running.

As with antivirus software, it is important to have your firewall managed centrally to prevent the most prevalent threats automatically.

Network access control

Account management is integral to increasing your network security. Unique ID and password systems – that in turn have preset privileges and tiers of access – will ensure that only designated staff with sufficient access authority can make fundamental changes to your system configuration. Limiting access as much as possible will minimise the chances of staff members opening and downloading corrupt files or making irreversible changes or deletions.

Back it up

Daily backing up of system and e-mail data is essential. Implement a backup routine that will transfer all vital data and files on to a number of external drives that can be removed from your premises. A successful backup of data is often the only way in which your system can be restored in the event of a software virus attack or a hardware malfunction.

Controlling internet access and removing vulnerabilities

Vision Sentinel Security is a security solution that incorporates antivirus software with advanced network safeguarding to maximise the security of your practice management system and terminals.

The **Vision Sentinel Security** package provides remote monitoring and an automatic alert mechanism, informing users and the centralised customer service team of any potential intrusions. Equipped with a pre-installed and dynamic firewall that is updated and maintained externally and remotely, the security system also offers a quarantining holding zone for information that filters information between the internet and your practice's LAN (Local Area Network).

Loaded with device control software and a fully configurable account management system to determine access levels, the system protects your client records, vital data and controls internet access. And by implementing a system of 'risk-banding', your network terminals may highlight weak spots or areas where security could be tighter. The following table outlines the security risk and the affect on overall performance of the following software options. It takes into account the purpose and functionality of veterinary software and the programs that are required. The overall rating refers to the performance of the computer for its intended purpose.

Network devices	Security risk	Overall rating
PC, no anti-virus, no account management, internet access		*
PC, anti-virus, account management, internet access, trained users		**
PC, anti-virus, account management, internet access, Vision Sentinel Security and updates		****
VetStation with access to intranet and Spectrum		***
Apple Mac, no anti-virus, no account management, internet access		*
Apple Mac computer, anti-virus, account management, internet access		**
Apple Mac computer, anti-virus, account management, internet access, Vision Sentinel Security and updates		****
VetStation Pro		****
IRIS workstation with no internet access		****

Maximum performance

The **VetStation Pro** and the **VetStation** are advanced terminals designed to meet your practice's needs which when combined with **Vision Sentinel Security**, become highpowered, industry specific terminals that bring the power and performance of a full computer to every user without the administrative issues and risks associated with fully functioning personal computers. Risk-banded to compete and outperform alternatives, performance needn't be compromised by security.

Hardware is also future-proofed because **VetStation** terminals can be updated to run improved versions of software. The **VetStation** and **VetStation Pro** offer a high-power and low-cost option as programs run locally but data are held centrally.

For further information or a demonstration of how **VetStation Pro** and **Vision Sentinel Security** could benefit your practice, contact enquiries@vetsystems.com or phone 01359 243 400

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Emma Purnell BSc MSc RVN CertNut

Emma qualified as a veterinary nurse in 2008 and works full-time as an area sales manager for Nutravet (UK). Until recently, she was a head nurse based in Worcestershire and loves keeping in touch with practices. She also has a BSc in Zoology with Animal Ecology and a MSc in Ecology, helping to fuel her interest in more exotic species. She has a particular love of 'small furries' and nursing clinics, and has just gained a Grade A with distinction in Canine and Feline Clinical Nutrition (CertNut).



*Suggested Personal & Professional Development (PPD)



GUINEA PIGS

Guinea pigs – a basic guide

Guinea pigs can make wonderful pets – they are 'cheeky' and inquisitive and will happily chat to anyone who may offer food! However, they live for five to six years and are a long-term commitment, so we need to be advising clients of the correct way to house and care for them in order to ensure their well-being and longevity.

Environment and enrichment

The average hutch does not provide enough stimulation for guinea pigs, because they are active animals and need a large space to explore, with plenty of hiding places. They require a dark sleeping area and an open area with plenty of space to be active – both well-ventilated and with access at all times. Hiding places can include tunnels, boxes and plastic 'caves', which need to be replaced when they become chewed.

Guinea pigs struggle to jump or climb because their spines are long and fragile, so the angle of any ramps should be shallow (Mancinelli et al, 2014). They are easily frightened by sudden noises and possible predators – this includes large birds, so shadows above them will be 'scary'. All outside enclosures should be fully enclosed and secure to prevent escape and the entry of predatory animals (**Figure 1**).

It should also be noted that guinea pigs are particularly averse to change and altering their environment can cause depression and anorexia (Mancinelli et al, 2014).

Guinea pigs cannot cope with extremes of temperature – the ideal for them is around 17 to 20°C (RSPCA). It is advised that they are kept indoors if the temperature outdoors dips below 15°C – if this is not possible, then they must have plenty of bedding material to keep them warm. If the temperature is too high, they will also struggle and can overheat. They should not be in direct sunlight at any time.



Figure 1. All outside enclosures should be fully enclosed and secure.



Figure 2. The bulk of a guinea pig's diet should be high in fibre gleaned mainly from grass and other plants.

Bedding can include a newspaper lining, paperbased litter for toileting areas and plenty of good quality, dust-free hay. It is advised that softwood products (such as pine sawdust) are not used because it can be a factor in some respiratory conditions. Straw should be avoided, where possible – although it is good for providing warmth, it can introduce skin parasites and cause eye injuries.

Diet is critical

Guinea pigs are herbivores and the bulk of their diet is high in fibre gleaned mainly from grass and other plants



Figure 3. As pets, guinea pigs need to be kept in pairs at least.

(Figure 2). They have a singlechambered stomach, large caecum and large intestinal tract (Kerrigan, 2015). It is important, therefore, that the bulk of their diet is goodquality hay, replenished daily. High-quality pelleted guinea pig food should also be offered on a daily basis – this is vital as these pets cannot synthesise vitamin C and need a daily supply to keep them healthy.

Pelleted diets are far better than muesli diets because they prevent the guinea pigs from just picking out the tasty bits and ensure they receive a fully balanced diet. The vitamin C levels in processed foods will decline with age, so a fresh bowl of food (not just topped up) is needed every day – with this in mind, it is advisable to buy small bags that can be kept in a sealed container once opened.

The inability to make or store vitamin C means that green leafy vegetables are also an important part of the guinea pig diet. Cabbage, kale, broccoli and other similar plants are all a good source of vitamin C and should be fed daily. Fruit and root vegetables, such as carrots, should be offered only as treats because they can be high in sugars and are not part of the natural wild diet (Kerrigan, 2015).

It is especially important to advise owners that guinea pigs will eat caecotrophs and that this is normal behaviour and necessary for a healthy gut.

Social life and sex

Guinea pigs are highly social and live in communal groups in the wild. As pets, they need to be kept in pairs at least – with two females being the easiest pairing (**Figure 3**). Two males (boars) can also be kept together; although, if they are not neutered, there is a risk they may fight. Groups can work well, but care must be taken to monitor for bullying.

Guinea pigs can breed at a very early age and so males and females should be kept separate from three weeks old. Pregnancy is risky in young females and in older females that have not been bred after seven to eight months



Figure 4. Norman is a happy guinea pig.

old (Mancinelli et al, 2014). So where possible, breeding should be discouraged – there are plenty of guinea pigs in rescue centres.

Handling is a sensitive issue

Guinea pigs have a reputation for being good children's pets because, if managed in the correct manner from a young age, they can be handled – always under strict supervision – by children, and will rarely bite. This will, however, depend on the individual involved and the manner of the handling, as they can still become stressed and cause themselves injury trying to escape capture (Mancinelli et al, 2014).

They have a fairly delicate spinal column and can suffer severe injuries if handled incorrectly. The best plan is for an adult to catch and pick them up and for the child to sit to handle them, thereby reducing the risk of injury if they are dropped accidently. When being handled in the veterinary practice, guinea pigs should be kept the correct way up with all feet on a horizontal surface supporting the length of their body (Mancinelli et al, 2014).

Vocalisation

One of the most appealing features of a guinea pig is its range of vocalisations. Learning the different sounds – which ones relate to conversations between themselves, which mean "feed me now", and which are grumpy little 'mumblings' - make for hours of entertainment. Happy guinea pigs (Figure 4) will often do little hops and skips in their runs while adventuring - this is known as 'popcorning' and can be done at high speed.

Health problems

There are a number of health problems seen commonly in guinea pigs. In a 2015 study, dental disease was the most frequent ailment seen with 36.3 per cent of the group having a problem (Meredith, 2015). Guinea pig teeth grow continuously and can malocclude if the wear is not correct (Mancinelli et al, 2014), with genetic factors, dietary imbalances, damage through teeth clipping (which should no longer be done), vitamin D optimisation and UVB levels all being possible complicating factors (Meredith, 2015).

Skin problems, including sarcoptic mange and mites, are regularly encountered; as are ophthalmic diseases and gastrointestinal disorders. Ovarian cystic disease is common and the recommendations are for routine neutering – ideally by means of ovariectomy which is less invasive (Meredith, 2015).

As previously mentioned, hypovitaminosis C can develop in guinea pigs as a consequence of inadequate diet. It generally presents with clinical signs that include lethargy, weakness, anorexia, dribbling, a poor, staring coat, diarrhoea, reduced immunity, dental problems, petechiae, subcutaneous haemorrhage and joint pain leading, in turn, to stiffness and reduced mobility (Kerrigan, 2015; Mancinelli et al, 2014).

Conclusion

Considered overall, guinea pigs can make very satisfactory and rewarding pets. Our role as veterinary professionals is to ensure their well-being by giving appropriate advice to their owners in what can be a minefield of confusing and conflicting information.



PPD Questions

- 1. What temperature range is best for guinea pigs?
 - A. 12-15°C
 - **B**. 14-17°C
 - C. 17-20°C
 - D. 18-24°C
- 2. What is the easiest combination of sexes for a guinea pig pair?
 - A. male/female
 - B. male/male
 - C. female/female
 - D. should be kept individually
- 3. Which is the best guinea pig diet from these choices? A. mainly hay, with some guinea pig muesli and green
 - leafy vegetables B. green leafy vegetables, pellet food and some hay
 - C. good quality hay, guinea pig pellets and green leafy vegetables
 - D. good quality hay, guinea pig pellets and carrots
- 4. What is the most common health problem reported in guinea pigs?
 - A. skin problems
 - B. dental disease
 - C. ovarian cysts
 - D. hypovitaminosis C
- 5. Which of these is not a symptom of hypovitaminosis C?
 - B. diarrhoea
 - C. stiffness
 - D. hyperactivity

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

References

Kerrigan L (2015). Small animal nutrition: significance of feeding a species-specific diet. VN Times, April 2015, pp16-18.

Mancinelli E and Bament W (2014). Chinchillas, guinea pigs and degus: what vets need to know. Veterinary Times, February 2014, pp4-6.

Meredith A (2015). Guinea pigs: common things are common. Veterinary Record, August 2015, 198-199.

RSPCA: How to take care of your guinea pig (http://www.rspca. org.uk/adviceandwelfare/pets/ rodents/guineapigs) Accessed 6th March 2016.

The state of nature in the UK

The *State of Nature 2016* report was published in September. It makes very uncomfortable reading – indicating that more than one in 10 UK species is threatened with extinction and 56 per cent are in decline.

This report builds on the findings of the previous *State of Nature* report published in 2013 to highlight the need for conservation projects across the UK. It pools data and expertise from more than 50 nature conservation and research organisations to give an overview of the 'state of nature' in the UK.

Despite its negative data, the report also illustrates that targeted conservation has produced some inspiring success stories. It suggests that with sufficient determination, resources and public support, we can turn the fortunes of at least some of our wildlife around.

Inspiring examples of such action to conserve and recover wildlife are cited in the cases of the pine marten and the large blue butterfly; and there are examples of where habitats are being successfully restored in our uplands, meadows and along the coast.

Nevertheless, the UK was revealed to be among the most 'nature-depleted countries in the world' – lagging behind most of our European neighbours when it comes to looking after our natural environment.

Not a great record so far

Many factors have resulted in the decline of the UK's wildlife over the past few decades, but changes in agricultural practices have been by far the most significant contributor. Modern farming practices that rely on damaging pesticides and insecticides and favour monoculture over diversity have created 'bio-deserts'. Climate change has also had a significant impact – with both detrimental and beneficial effects – and it is acknowledged that, in the long term, climate change is perhaps the greatest global threat to nature.

Simon Cowell, MBE, founder of the Wildlife Aid Foundation, wrote in his recent blog: 'This year particularly, I've noticed some of the impacts of our longer, warmer summer. Animals are having more young, which means rescue centres such as mine stay busier for longer.

'While this might sound like good news for wildlife numbers, it means that the late-born young have much more of a struggle to survive and resources are fewer. This year's 'orphan season' was one of our most demanding yet and we almost reached a point where all our pens and cages were full. Wildlife is held in a delicate balance and if the balance is upset, things start to go awry – and they already are.'

Mr Cowell went on to point out that in the last 70 years, the population of British hedgehogs has declined by 96.6 per cent – a reduction in numbers that has almost reached the level of extinction.

Remember, life is bottom up

He also commented that, "One of the most important aspects of the *State* of *Nature* report – and the headlines it generated – was that for a time, it diverted attention away for conservation messages around the bigger, more highprofile endangered species and reminded people that smaller, lesser-known species are also in peril.

"This is important," he said, "because the natural world exists in a complex, holistic web of interlocking systems, and when the ones at the bottom get knocked out of kilter, everything above suffers. I still remember my first science lesson in secondary school. It was an explanation of how the food chain works and how everything at the top relies on everything at the bottom.

"The subtext was clear - ignore the small stuff at your peril. It is so easy to get excited about the big iconic species, such as elephants and lions, and forget that they all rely on an intact food chain. So all species, right down to the invertebrates, are equally as important."

There is no doubt that man has – and is – damaging the environment. *The State of Nature 2016* report highlights the urgent need for investment in nature and wildlife in the UK and conservation action that helps to recover species and habitats. Everyone can do their bit and people who care about the planet, wildlife, the robustness of the food chain and climate change need to make their voices heard and take action, no matter how small.



Oh yes you can

It's easy to think that someone else will sort out the problem or that one person alone will not have any effect, so there is no point in doing anything. It may be too late for some species, but it's not too late for all of them if the public becomes more wildlife and environmentally aware.

We can make a difference. Just think of the introduction of the five pence charge for plastic bags brought in by the Government in October 2015 – the number of single-use plastic bags used by shoppers in England plummeted by more than 85 per cent after that measure. Translate this into other efforts to save/ help/protect wildlife and the results could be amazing.

The Wildlife Aid Foundation has launched an awareness campaign and action plan on Facebook. The 'iDot' campaign is a call to arms for everyone who cares about the world with the simple message that if we all do one thing a day to help wildlife and the natural world around us, our combined efforts will add up to something huge.

References

www.wildlifetrusts.org/stateofnature16 www.somersetwildlife.org/stateofnature www.wildlifeaid.org.uk www.wildlifeaid.org.uk/idot-do-you-dot



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*Suggested Personal & Professional Development (PPD)



MARKETING

Opening the way to success

An open day is a fantastic way to market your practice; but before you put out the bunting, it's important to know what you want to achieve and how you are going to achieve it. This article offers some tips on how to go about planning, organising and hosting open days, and explains why it is so important to set yourself clear goals along the way.

For pet owners, having a choice is great. But when it comes to choosing which veterinary practice to register with, most people like to carry out some research. Open days can be an invaluable part of this. Not only do they give prospective clients a chance to meet practice staff, but they also give clients a unique opportunity to see behind the scenes.

For you, open days can make a significant difference to the integrity and profitability of your practice (Glen, 2010). As well as enabling you to build support and increase trust in your practice, open days can also help to raise public awareness, gain more clients and give you a sense of being part of the community. An open day is also a great way to motivate staff as it fosters pride and gives family members a chance to learn more about where their relatives work (Morrell, 2011).

Where to begin

Planning is key to a successful open day. Establish a team of veterinary professionals and support staff around two to three months before the event and share out areas of responsibility. The team should meet regularly to check the project's progress – and don't forget to be mindful of potential health and safety issues and ensuring appropriate insurance cover.

In your first meeting, decide what you want to achieve. Perhaps you would like to raise funds for a charity or put something back into the community. Maybe you want to address specific issues in your practice, like reintroducing old clients. You could host a themed event based around certain animals or even an issue such as microchipping. Whatever you decide to do, set a date for your open day that doesn't clash with any local, national or sporting events. Weekends and evenings are an accessible time for many people. Think about who you are targeting and when they might be free.

Setting a budget

Consider how much you want to spend on your open day. Flyers, banners, adverts and other marketing materials can be costly and have little return on investment. Instead, you could try a more targeted, personal approach by sending a letter to local people asking them to come along. Don't forget to harness the power of social media either - a few well-timed Tweets or Facebook posts about your event are easy, cheap and effective ways to promote your open day and set people talking about your practice.

You can also cut costs by speaking to local charities. They may wish to bring in an animal for children to pet, donate a prize or contribute towards any advertising you wish to do. Food and pharmaceutical company sales representatives might like to set-up a stand to promote their products – alternatively, you could request financial contributions towards refreshments and advertising, in return for displaying their posters and logos on the day.

What are you going to do?

The next task is to make a list of enticing activities that will

keep your visitors entertained. Try to include aspects geared towards children using a 'fun for the whole family' theme and invite as many charities or stall holders as you can to keep the event looking busy. Here are some ideas:

- guided tour of the surgery
- equipment demonstrations
 - laboratory demonstrationssurgical 'mock up'
 - operation for visitors to do
 - short talks giving advice on flea treatment/worming/ neutering and nutrition
 - meet the animals encourage staff to bring in their pets
 - first aid for pets demonstrations
 - veterinary careers advice stand
 - children's quiz or competition
 - 'goody bags' and 'lucky dips'
 - guess the name of the cuddly toy
 - pet portrait competition involving local schools
 - children's colouring competition
 - face painting
 - free prize draw/raffle find out if suppliers will let you have a free or discounted bag of pet food or toys in return for advertising
 - obedience training
 - 'have a go' agility course.

Practicalities

Other more practical things to consider for your open day are the facilities. Do you have enough toilets and seating areas? Do you have enough car parking spaces? If you need to keep some of the practice running while the event takes place, plan your visitor's route so that the two can coexist. You may also want to put together a plan to record enquiries so that you can follow up with clients when the event is over. If you are going to provide food and drink, make it easy to access and consume. Tea, coffee, juice, biscuits and cake work best. Avoid sticky food and provide plenty of waste bins!

Publicity and promotion

The work to publicise your open day should begin no more than one month ahead of the event. Put up posters in your waiting room and distribute them to local shops and public buildings. If your budget permits, print leaflets and send them out with booster reminders. You can also leave them in the reception area, and hand them out to local businesses too.

Work to attract the local media to cover the event should also begin around this time. Write a press release and send it to the editors of local newspapers, keeping it both interesting and positive. In the press release explain how your practice contributes to pet health care in the local area and how much better off clients will be if they register with you. Your press release will be more successful if you have a good 'hook', such as a celebrity guest or new equipment.

You can also try sending your press release to local radio and television broadcasters – and always follow up with a telephone call to the programme producer and be prepared to go 'on air' to talk about the event should they wish to cover it.

Lastly, if you are going to give away items at your open day - and your budget will stretch to it - put your practice logo on everything! That includes quiz sheets and pens, balloons, clothing and literature.

Running the day

On the day of the event arrive early to ensure that you

CASE STUDY

Ipswich Veterinary Centre

In 2015, Ipswich Veterinary Centre in Suffolk opened its doors to the public for the first time. Launched by television presenter and local farmer, Jimmy Doherty, the open day was a huge success, with some 2,000 visitors passing through the doors.

Fifteen veterinary surgeons and 20 nurses ran presentations and demonstrations throughout the day on farm, equine and pet-related issues. The surgery also ran hydrotherapy and treadmill demonstrations, and visitors could catch a glimpse of the dog groomers at work.

In the ultrasound room, staff pets helped to demonstrate the new equipment, and visitors were able to test their surgical skills in a game of 'hunt the foreign body'. Children took part in an 'around-the-bases' quiz and there were plenty of animals to meet and learn about, including some more unusual pets, such as snakes, tortoises and miniature donkeys.

All proceeds from the event have since been donated to the charities, Help For Heroes and the Royal British Legion.

have enough time to brief your team before the doors open. Keep yourself free to speak to clients as they arrive and be on hand to sort out any problems that might emerge. Most importantly, don't forget to smile! This is a fantastic opportunity to sell yourself, the staff and your practice. Have advice leaflets ready and take plenty of photographs as you might want to use them afterwards.

Don't stop there!

After the event, remember to celebrate with your team. Thanking all the supporters will ensure they are happy to attend next time. You should also use the open day itself as further publicity material, so send out another press release telling journalists all about the open day and how successful it was.

Now is also a good time to review the event's success for effectiveness and future improvements. Did anyone book in for treatment? Did the practice gain any new clients? Four to six weeks after the open day, why not quiz your new patients? Put together a short



questionnaire and hand it to new clients at reception asking:

- how did you hear about us?
- what did you think about the publicity material you received?
- what did you think about the open day?
- why did you choose this practice?
- is there anything we can improve on?

You can then use the feedback to plan your next open day!

References

Finlay M (2011). 90 Steps to employee engagement & staff motivation. Forest Gate Publishing.

Glen N (2010). Keeping clients trotting to your door. Veterinary Management for Today, September 2010.

'How your practice can profit from open days'. Available at: http://www.vettimes.co.uk/article/open-your-eyes-to-importance-ofopen-day/ [Accessed 22 August 2016].

'A guide to planning an open day'. Available at: https://www.practiceplan.co.uk/resource-library/marketing-advice/a-guide-toplanning-an-open-day. [Accessed 22 August 2016].



Rosalind Parkin

Ros qualified in 1986 and worked as a litigation and contract law solicitor in both London and Hong Kong, before co-founding Lockharts as a partner in 1995 and also leading the partnership department. She specialises in partnership work and particularly enjoys the drafting of partnership deeds, which she believes is not dissimilar to completing enormous crossword puzzles!



*Suggested Personal & Professional Development (PPD)



PARTNERSHIPS

Why an up-to-date partnership deed or members' agreement is essential

Although partnerships are now less popular as a business model for veterinary practices across the UK, there are still a significant number in operation and they provide particular challenges for those members of the profession engaged in them.

Traditional partnerships

These are formed when two or more persons are trading together in partnership with a view to profit. They can exist without a 'partnership deed' and, in such cases, they are regulated by the default provisions in the Partnership Act 1890 ('the 1890 Act').

Such partnerships are called 'partnerships at will' that, whilst governed only by statute and not under the terms of a partnership deed agreed by the partners, will render the partners vulnerable because the default provisions under the 1890 Act can have unintended and unexpected results.

These consequences include that a partnership at will can be brought to an end at any time by one of the partners giving notice to the other(s) – for example, simply by stating, "I have lost the will to be in partnership with you". Not only is this the most unstable relationship, there are a number of default provisions that will almost certainly not reflect the intended arrangements.

For example, under the 1890 Act, the partners are to share equally both the profits and the losses of the practice. Often this equal division does not reflect the individual contributions made. A partnership deed, by contrast, allows for individual interests and profit shares to be clearly defined.

When a partner decides to leave a partnership at will, the partnership dissolves automatically. This also happens when a partner



is asked to leave or when a new partner joins. Such dissolution may cause a forced sale of the partnership assets – potentially including the premises, redundancy of practice staff and automatic termination of contractual arrangements. The problems can be multitudinous.

In stark contrast, under a formalised partnership deed, dissolution should not occur unless all of the partners agree or a dissolution is ordered by the Court or an arbitrator.

Limited Liability Partnerships (LLPs)

The Limited Liability Partnerships Act 2000 ('LLPA 2000') introduced a new form of legal entity known as an LLP. This may be described as a cross between a partnership and a limited company. It can be used by a professional firm or a small business in which there are at least two partners. As is the case with a limited company, an LLP is a separate legal entity, which gives limited liability to its members.

"...the absence of a properly drafted partnership deed or members' agreement may lead to problems emerging in the course of time" It must be registered at Companies House and there is a cost involved.

An LLP will be governed by the 'default provisions' set out in the LLPA 2000 and the Limited Liability Partnerships Regulations 2001 ('the Regulations') unless a 'members' agreement' – similar to a partnership agreement – has been entered into.

A members' agreement is not mandatory and an LLP can be constituted without one. However, reliance on the default provisions is unlikely to be entirely satisfactory and, therefore, entering into a members' agreement is highly recommended. Where an LLP is formed by the incorporation of an existing traditional partnership, any partnership agreement that was in place does not carry over automatically.

Whilst a member leaving an LLP without a members' agreement will not bring about the end of the LLP, the default provisions in the Regulations may well be inadequate to deal with the sort of issues that often arise. An example of this is that there is no provision for the repayment of a retiring member's capital.

Provisions to be included

There are key features that should be included in partnership deeds for traditional partnerships and members' agreements for LLPs. In both cases, these will contain the basic provisions necessary to ensure the business operates smoothly. The list below refers to partners but the same applies to members of LLPs. Such information includes, but is not limited to:

- who the partners are
- the commencement date of the partnership
- the nature of the business and its name
- the provisions for the sharing of the profits and losses of the business

- identification of what are partners' personal expenses and what are the expenses of the business – such as professional indemnity insurance, locum insurance and costs of CPD
- the investments to be made to the capital of the partnership
- the valuation mechanisms for the assets of the business
- the management of the business
- voting provisions including decisions that can be decided by a simple or a specified majority of the partners; and decisions, if any, that are to be subject to a unanimous vote of the partners
- authorised absences such as absences for holiday leave, CPD leave, leave for illness, maternity, paternity adoption and parental leave, compassionate leave, leave for Jury Service, any sabbatical leave and leave if a partner is suspended from the RCVS Register
- the terms relating to authorised absences - such as how long a period is permitted, any continuing entitlement to a share of drawings and profits during the absence, who is responsible for the cost of any locum that is required, the partner as an individual expense or the business, whether holiday leave continues to accrue during the absence and whether any accrued holiday leave may be added to extend the period of absence
- provisions for dealing with unauthorised leave encompassing not only whether the partner will be entitled to any share of drawings and profits but who will be responsible for the cost of covering their work whilst they are absent
- the partners' obligations to each other including personal and professional conduct, promoting the business, not bringing the business into disrepute, making good any loss

"Whilst partnerships may have operated satisfactorily without a formalised agreement for a number of years, changes in circumstances may create issues"

caused by their negligence, discharging their debts and liabilities and indemnifying the other partners against them

- the partners' obligations to the business
- whether a partner is permitted to carry out any work outside the business
- who is to keep the payment for any work carried out outside a partner's usual working hours
- the right to stop a partner carrying out work outside the business where this is considered detrimental to the business
- the resolution of disputes, including provisions for mediation and arbitration, where required
- the grounds for the expulsion of a partner
- provisions relating to the admission of any partner – for example, with regard to any probation period and contribution to capital
- provisions relating to the death, retirement or expulsion of any partner – for example, the period for payment out of their capital in the business and any undrawn profits
- covenants from partners, including postretirement covenants.

While this appears somewhat obvious, the absence of a properly drafted partnership deed or members' agreement may lead to problems emerging in the course of time. Whilst partnerships may have operated satisfactorily without a formalised agreement for a number of years, changes in circumstances may create issues.

Previously cordial relationships between partners may worsen for any number of reasons - such as a partner feeling that he or she is carrying out an increasing amount of the work for no extra reward, changes in a partner's personal circumstances resulting in a change in their behaviour at work and/or their commitment to the practice, the absence of a partner on long-term illness, issues caused by employees, a new partner joining and disturbing the previously harmonious dynamic that existed between the other partners or simply the increasing stresses of running any professional practice.

Conclusion

Businesses are urged to adopt a preventive approach by formalising their arrangements, rather than suffering when problems arise.

Disputes between partners in a partnership and between members of an LLP are inherently disruptive and very costly, both in terms of stress and money. Whilst partnership deeds and members' agreements do not always prevent disputes, they should provide a method through which to approach such disputes with hope of a resolution.



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)



CLIENTS

Client relationship? Or customer transaction?

Many years ago, there were only two businesses that had clients – solicitors and 'ladies of the night'. Both offered clients a service and considered they had a relationship with them, however brief. Other businesses had customers, with whom they had transactions. Now, however, more and more businesses are referring to their patrons as clients. The veterinary profession is no different – increasingly practices are referring to clients.

There will always be a place for customers in our business. There are people who just want to buy treats or a toy and pop in for a one-off transaction. We need to offer them the same levels of care and service as we would anyone - the courteous greeting, individual attention and so on. There are also people who only ever want a transaction - we do this when we shop online, using a search engine to find a product at the right price, rather than going to our favourite retailers' websites.

However, the basis of a relationship is about respect and individuality. We are told we should categorise people to enable us to serve them better - for example, the busy mum juggling time and childcare, the professional who wants speed and efficiency. This may well work for supermarket chains and retail parks who mostly deal with customer transactions. But for the majority of our clients, recognition as individuals, understanding their needs and, most importantly, understanding their pets, is paramount.

Why do clients like relationships?

A pet owner once told me, "I want to go to a vet who understands where I'm coming from." To understand that, you need to develop a relationship. As a veterinary professional, you need to prove that you are to be trusted with their pet's health



and their concerns. You have to ensure you deliver what you have promised, and be there when they need you.

We spend a high proportion of time and energy in educating our teams, hoping that this will be converted into repeat or higher-value transactions. Good business practice – but did we ask our clients what they want? If you are proactive in communicating with your client, he or she will feel that you have engaged with them and that you respect their individual point of view.

Think of yourself and your relationship with a hairdresser, salon or dentist. You trust them with your health, your image and your self-esteem. The fundamentals are similar for your clients – they want a relationship to work.

It's about the comfort it gives them – in the knowledge that, whatever issue they may have, it will be dealt with efficiently and honestly. It's about keeping in touch and feeding the relationship just enough so as not to be intrusive. It's about remembering things they have shared with you and your team. It's about making them feel comfortable in your company. It's about trust – being sure they can trust you with their pet's life, no less.

It is so easy to get wrapped up in the hype that says we should be constantly reviewing our business and predicting what services and products to offer. In order to be efficient and deliver a better service than competitors, somewhere along the way the relationship sometimes becomes a little lost. Maybe we should pause for a moment and bring back that individual relationship to our daily routine.

The personal relationship

We know that clients start to engage with you before they arrive in your consulting room, otherwise they wouldn't be there. So what builds that engagement – adequate parking, clear signage, a clean waiting room? All those are important; but the key is the engagement between the client and that first team member – receptionist or nurse – which determines how the relationship will evolve. You will have seen a receptionist checking with a veterinary surgeon on behalf of the client: "Mrs Jones just wanted me to check with you again about when Snowy can resume exercise." The relationship they have with the receptionist is very different to the rapport they will build up with the veterinary surgeon or nurse.

It is about identifying what is important to the client. Clearly Mrs Jones wants reassurance and to feel comfortable to ask. This doesn't mean that the veterinary professional isn't communicating, it's just how Mrs Jones is. However, she will expect a much higher level of clinical expertise from the veterinary surgeon or nurse. But does she want to know everything that they know about Snowy, or just the bottom line about exercise? Find out what's important to her!

There is a relationshipbuilding opportunity every time a client visits. There is an expectation of the member of staff to recognise them - remembering a snippet of information from a discussion in the consulting room or over the counter is more valuable than we credit. The ability to choose to see a specific veterinary surgeon or veterinary nurse will also be important to many clients. They're not just being picky. If you listen, they're telling you that they have a relationship with that particular person and they would rather change their ideal appointment time than see a different one. As an aside, why is this? What skill does one have that another lacks?

Relationships are fragile

We have all seen how fragile personal relationships are; they can take years to develop but be broken in an instant. The same is true of client/ practice relationships; they are valuable but delicate. They may be shattered by the smallest thing – a busy, harassed greeting, a nonreturned call or a forgotten repeat order can destroy them instantly.

These things shouldn't - but all too frequently do - happen. We find ourselves caught up in the day and feel irritated at being asked to "deal with" a client. Put yourself in the client's shoes and look at the way you handle such situations and whether you help build the relationship or break it. And if you think you have that covered, ask vourself whether an encounter with your nursing assistant or handyman will give the same impression of quality you strive for with front line staff.

It has been suggested that younger people are more concerned with transactions, whereas an older client is more open to a relationship with your practice. Although a sweeping generalisation, there is truth in this – more mature clients will often have a higher expectation of the practice. And where younger clients do want a relationship, it may be of a very different kind to that expected by a more mature client.

Social media

It has also been suggested that younger people have a greater interest in – and engagement with – social media, than older people. With the pressure it exerts, particularly on the young, social media can be a make-or-break factor in your relationship. As it provides instant access to shared opinions, practices are forever trying to keep one step ahead – and the more you improve, the more is demanded.

Many clients do their research before engaging in a relationship with a veterinary practice – wanting to hear about other peoples' experiences through Facebook, Twitter, and other social media. These people can be your greatest promoters, or your greatest detractors, so you need to engage with them online too. It is worth devoting a proportion of your time – or that of a responsible team member – to monitoring and, where appropriate, responding to these posts. But keep a firm reality check on what this means. You may have 2,400 followers, but this doesn't equate to 2,400 clients, or even potential clients.

Many of those who don't have social media accounts will still use the internet. and their relationship with you may start by looking at your website, perhaps having looked via a search engine. Is your website optimised for smartphone viewing? More and more people are doing business this way. Remember though, without diminishing the importance of social media to client relationships, it is far outweighed by the personal experience you provide. To state the obvious, clients bring their pets to you in person, not by phone!

Loyalty is not dead

Amongst other criteria, clients will choose different veterinary practices on the basis of the experiences created by them. This may mean that loyalty varies for different people – it is more about *how* they spend with you and not necessarily *what* they spend money on. They may even choose to patronise two different practices, and in their view they are loyal to both; their kind of loyalty is no better or worse than others – just different.

Given the amount of online information at their disposal, we need to recognise and accept that the nature of loyalty has changed. Rather than trying to bond all your clients into a total relationship covering everything, accept differences in their loyalty and look at how best you can serve that client and what they want from you, just as you would with a bonded client.

And finally...

Much has already been written about the mechanics of nurturing relationships by text, e-mail, tailored offer, and so on. But never lose sight of the importance of the personal touch in maintaining relationships with your clients. Remember, people buy people, long before they buy products or services.

PPD Questions

- 1. How would you decide whether a patron is a customer or a client?
- 2. What is the difference between a relationship and a transaction?
- 3. Why are relationships important to your practice?
- 4. Why are relationships important to your clients?
- 5. What is the most important factor in building a relationship?

4. they want to trust you – literally with their pet's life

Answers

^{5.} people – the emotional experience a client has with your team.

examine whether you fulfil transactions or have a relationship with them
 each transaction is a 'one-off'; relationships are continuous
 to help build profitable repeat business and favourable social media comment



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What would we do without part-time workers?

Part-time working has changed significantly from the time when the part-timer was almost seen as the second class worker. Now it is here to stay.

Today 'part-time' workers have the right to be treated no less favourably than comparable 'full-timers', which means that they should receive the same rates of pay as their full-time counterparts, not be excluded from training simply because they work part-time, receive holidays pro rata to comparable full-timers and have any career break schemes and contractual and parental leave made available to them in the same way as for full-time workers.

The veterinary profession, by its very nature, has always been in the forefront of employing part-time workers. In the past, most part-timers were receptionists and the nature of part-time employment suited both employer – because parttime work allowed for greater coverage of the day – and employee, because many receptionists wished to follow a lifestyle that involved part-time employment.

Veterinary nurses have also been accustomed to part-time and flexible working in order to cover the long days in a veterinary practice and now part -time working for veterinary surgeons is very much on the increase as the gender balance changes to a predominantly female workforce.

Pros and cons

From an employer's point of view, there are a number of advantages - and some potential challenges - when employing part-time workers. Providing part-time work, as well as being an efficient way to keep costs down in areas where full-time cover is not yet needed, also enables the employer to expand the pool of potential recruits who for various reasons - such as childcare and family commitments, for instance - may not want to work full time but who can bring a wealth of skills, experience and expertise. Employing part-time staff increases the ability of a business - so important in a veterinary practice - to respond to change and peaks of demands.

It is inevitable, however, that there are also some disadvantages. Recruitment costs are likely to be greater than when employing a single full-time worker and there could be additional costs in terms of pension provision, benefits and training. On the people management side, good communication and keeping everyone informed can be more challenging and providing sufficient handover time from one part-time employee to another is essential, yet sometimes difficult to achieve.

From an employee's perspective, now that part-timers are treated so much more favourably, part-time work can be generally seen as a very good thing. For staff working in a demanding – and often stressful – veterinary environment, the ability to work part-time can help prevent the negative effects of stress and fatigue and generally improve well-being. For many mothers, full-time work would simply not be an option, so being able to work part-time at a job for which they have trained so long is a great bonus.

There is, as always, a downside. Working part-time means that for many there is less of a connection with the workplace and it is more difficult to see through work projects started. The feeling of being part of a team is more difficult to achieve, although by no means impossible. For veterinary surgeons in particular, the nature of work makes part-time employment a challenge when it comes to following through cases and connecting with clients.

Continuity challenge

And so we come to the effects on clients when a large number of veterinary staff work part-time. The big issue for clients is, of course, consistency. It is an old 'chestnut' and a common complaint that is bandied around when we talk about good client care; but the fact is that clients do like to see the same veterinary professional when they return to the practice with their pet, especially if the pet has an ongoing condition. Their confidence in the practice can be dented if every time they visit they see different faces and, in some cases, have to start explaining their pet's problems again to another 'new face'.

Although within the profession we know that careful notes are made and case histories can be consulted by any veterinary professional presented with an animal to examine, in the client's world this is not so easy to accept. They are already worried and having to 'start all over again' explaining what is wrong with their pet does not help.



There is no complete or satisfactory answer to this consistency issue, but some sensible client education on how the staffing at the surgery works, how case histories are meticulously recorded and available to all vets would certainly help. Perhaps when an animal is first seen, part-time veterinary professionals can help reassure the owner that if next time they see a different team member that person will be just as familiar with the pet's condition as they are themselves. The secret is for the owner to feel that the practice is working as one big team to help look after their animal.

Alternatively – and this will not always work if an animal really has to be seen on a particular day – a more detailed timetable of when particular vets are available might be helpful so that clients can book appointments with the professional of their choice.

Continuity really is a big issue and it is ignored at the practice's peril. The public are creatures of habit – they like consistency, they do not like change and continually seeing new faces can throw them and chip away at their confidence in the practice.

Part-time veterinary surgeons are here to stay, and practices must deal with the issues that can arise from this by helping part-timers to integrate into the practice and clients to adapt and accept a slightly different approach to the veterinary care of their pet.

How visual aids can enhance your practice management system

It is often said that a single picture is worth a thousand words. And it is certainly the case that images enhance good and effective communication between veterinary surgeon and client, as well as being an excellent tool for comprehensive recording and documentation of procedures. Attaching images to client records will create an accurate history of both the location and severity of injury or disease too, providing an objective account of the condition.

uring a full surgical schedule, using a graphical system to record dental extractions or skin biopsies is a useful method for initially documenting work done, while more extensive notes can be added later if required. Similarly, medical conditions encountered during a busy surgery can be recorded instantly with an imaging feature on your practice management system.

Spectrum's Dental Diagrams software provides the ability to record an animal's dental notes in graphical form. Diagrams are saved in chronological order, providing an

historic record of work. Currently, dental diagrams exist for dogs, cats and rabbits, and by utilising the variety of tools to illustrate different conditions or procedures, surgeons and nurses can generate graphical images that are both detailed and visually impressive.

With multiple angles available and a gingivitis scoring system, full dental profiles can be created and saved to an animal's record. Whether used in a surgical scenario, or to simply record the condition of a patient's mouth at regular intervals – for example, during vaccination consults – the digital images will help surgeons to better monitor oral health.

For ophthalmological conditions and records, a graphical imaging solution with multiple angles and views enables the recording of comprehensive records of the patient's eye. **Spectrum's Ophthalmology Diagram** software can be used to create visual ophthalmology profiles that can accompany a surgeon's notes. There are five views available – external, corneal and scleral, anterior, lens, and a vitreous and fundus – each of which can be scrolled through to create a three-dimensional, multi-angled impression of the eye.

In a referral scenario, diagrams and images provide clear information about the status and history of a condition, particularly when there are several veterinary professionals involved in one case. Using images to


support clinical notes when communicating with insurance companies may also help with accurate claim settlement by providing more information about an animal's condition. Available as both print-outs and e-mails, **Spectrum's Diagram** tools allow for instant transfer of visual information in an easy-to-read format. Visual accompaniments to clinical notes are also impressive during consultations, enhancing the professionalism of services and conveying your practice's forward-thinking approach to client communication. Owners collecting patients after procedures may also benefit from a hard copy of a diagram to show other family members or friends involved in aftercare. Designed and provided with accompanying training, **Spectrum's Dental, Ophthalmology and Skin Diagram** features can be used as basically or as creatively as the user chooses. From simple tools to freehand options, it is possible to create detailed, interactive and annotated images that can bridge some of the communication and knowledge barriers between veterinary professionals and owners.

Transmitted in just a few clicks by e-mail and compatible with **Spectrum's Insurance Claims Manager**, automated, systematic transfer of diagrams can also be an incredibly useful tool when communicating with other practices and insurance companies.

For further information and a demonstration of **Spectrum's** visually interactive **Practice Management System**, contact the team on **enquiries@vetsystems.com** or call **01359 243 400**.

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Industry Profile



Your name: Kevin Sinclair BSc PhD DSc RA Position: Professor of Developmental B Company: School of Bioscie University of Not

What is developmental biology?

There are various definitions out there – it is a pretty broad church. One definition is that 'it is the study of the process by which organisms grow and develop'. Developmental biology studies the genetic control of cell growth and differentiation, which is the process that gives rise to tissues and organs. One can expand on this to make it more contemporary by including the concept of epigenetics, which is the central focal point of work undertaken in my laboratory, and the key regulatory process that drives cellular differentiation.

Epigenetics can be defined as 'the study of changes in organisms caused by modifications in gene expression, rather than alterations to the genetic code'. These changes in gene expression arise primarily as a result of chemical modifications to DNA, associated proteins and RNA. Such modifications occur during normal development and determine cell fate – and are the focus of considerable international research endeavours currently.

They can also, however, be modified by 'environmental factors', such as parental diet, health, stress or following the use of advanced breeding technologies, particularly during early development. Cloning by somatic cell nuclear transfer (SCNT) falls into this latter category.

What have been your connections with the veterinary profession?

I have collaborated with veterinarians on several research projects for most of my research career, which spans 29 years. In addition to collaborating with colleagues at the School of Veterinary Medicine and Science at Nottingham on an Agriculture and Horticulture Development Board (AHDB) project investigating dairy cow nutrition and health, I am currently working with veterinary colleagues within Paragon Veterinary Group and XLVets on two Innovate UK projects that seek to develop advanced *in vitro* fertilisation (IVF)-based breeding technologies for cattle.

Were you involved with the original work with Dolly? If so, how?

No I wasn't. However, I was collaborating with Ian Wilmut and other colleagues at the Roslin Institute at that time on a parallel – but related – project that investigated the causes of the so-called 'Large Offspring Syndrome' (LOS). Having been involved in cattle IVF since the late 1980s, I and others, quickly realised that a significant proportion of offspring born were not only exceptionally large at birth (with associated obstetrical complications) but some harboured congenital defects; and many had difficulty adjusting to extra-uterine life. Cloned offspring encountered similar difficulties, although often the incidence and severity were greater.

Clearly, industry acceptance and widespread use of these advanced breeding technologies required the underlying causes of these developmental problems to be identified and resolved. In the case of offspring conceived by IVF, we identified a number of components in culture media that contributed to this problem, and that the underlying mechanism was found to be primarily a consequence of disruption in the regulation of a small group of 'imprinted' genes [*Nature Genetics* (2001) **27**: 153-154 – doi:10.1038/84769].

'Imprinted' genes play a key role in regulating *in utero* and early postnatal development, and we discovered that some of these genes were 'epigenetically' altered as a consequence of IVF. A similar picture emerged for cloned offspring.

In a nutshell, what were the results of your study published in *Nature Communications*?

As a result of the work undertaken above, modifications to contemporary systems for culturing cattle and sheep embryos generally ensure that LOS is avoided, although there are rare sporadic occurrences. The efficiency of cloning by SCNT has also improved greatly since the original Dolly study. However, *in utero* and perinatal losses are still greater than encountered following IVF or natural conception, so there is still scope for further refinements.

What our study in *Nature Communications* (doi: 10.1038/ ncomms12359) showed, however, is that those cloned offspring that survive beyond the perinatal period go on to lead normal and healthy lives, and can expect a life span comparable to animals conceived naturally. But where there are some, so there can be many; and our study has given fresh impetus to improve current systems of producing cloned animals by SCNT.

What does it teach us about the process of ageing?

We have yet to fully investigate the underlying mechanisms of ageing in these animals, although phenotypically it is clear that they have aged normally. Studying these mechanisms awaits euthanasia and full post-mortem analyses which will take place during the next few months. Much was made of the fact that Dolly apparently aged prematurely because of telomere shortening.

Telomeres are repetitive sequences of DNA at the ends of each chromosome that help to prevent damage. These sequences don't replicate with each round of cell division so they get progressively shorter in cells from older animals. If not properly 'remodelled' during SCNT, then the concern was that cloned offspring may be 'physiologically older' than their chronological age. However, more recent studies in cattle and sheep indicate that telomere length is restored in the vast majority of clones, and we expect that our current research endeavours will confirm this.

What are the practical implications of your findings for livestock production?

An effective ban on cloning of livestock within the EU came into effect in September 2015 (http://www.sciencemag.org/ news/2015/09/eu-parliament-votes-ban-cloning-farm-animals). There are legitimate welfare concerns regarding cloning by SCNT that pertain to the aforementioned *in utero* and perinatal losses. However, studies underway elsewhere within the EU,



North America, New Zealand and Japan should see significant improvements in the overall efficiency of cloning by SCNT which will mitigate many of these problems in the not too distant future.

As previously stated, our results indicate that cloned offspring that survive beyond the perinatal period go on to lead normal and healthy lives. Previous studies within the EU and elsewhere have demonstrated that food products from cloned animals are perfectly normal and healthy, such that the Food and Drug Administration has not instigated a ban on cloning of farmed livestock with the United States.

It is hoped that with current and future technical refinements to SCNT, together with the increasing body of data on the health status of cloned offspring and safety of food products, the ban on cloning may eventually be lifted. In future, the primary use of cloning by SCNT will be to produce transgenic animals – perhaps for increased disease resistance, improved product quality, or use for biomedical purposes.

Will your findings improve the public perception of cloning?

Initial feedback from television, radio and media reports of our study indicate that public perception of cloning has improved. It is 20 years since the birth of Dolly and many of the original fears raised at that time have not come to fruition. The fact that we have now demonstrated that cloned offspring can lead long and healthy lives has further reassured the public that cloning by SCNT can, in future, be used safely and with good intent, and without undue concerns for animal welfare.

Are there applications in human medicine?

Yes. Indeed SCNT can and has been used to create human embryonic stems cells (hESC). The efficiency with which it

can achieve this is greater than that achieved using so-called 'Yamanaka factors' to generate induced pluripotent stem cells (iPSCs). It nevertheless is technically challenging and there are some ethical concerns, which means that at present its use is limited to a small number of labs worldwide.

The fact that our study indicates that some somatic cells can effectively undergo complete reprogramming to produce healthy offspring that age normally indicates that, in future, it should be possible to generate stems cells (by either approach) for therapeutic purposes in the knowledge that these cells can be used safely.

What do you anticipate will be the next developments in the field of developmental biology?

As we develop our understanding of pluripotency and the mechanisms of cellular differentiation and de-differentiation, so it will be possible in future to influence and guide cell fate in a manner that can be exploited for therapeutic purposes.

This presents exciting opportunities for tissue regeneration and repair in both human and veterinary clinical medicine. An aspiration for more than a decade now, realisation of this potential awaits greater understanding of the underpinning basic biology.

A conversation overheard

James Herriot, whose real name was Alf Wight, would have been 100 years old on 3 October 2016. He qualified as a veterinary surgeon from Glasgow in 1939, and spent his working life in the Yorkshire Dales.

In 1969, he began to write books about his life in veterinary practice; and when his publisher merged his first two books into a single volume, titled *All Creatures Great and Small*, his writing began to receive widespread acclaim. Subsequent television series captured the imagination of the nation and established an enduring image of the veterinary profession.

Two of our more 'mature' veterinary surgeons – let's call them Richard and Daniel – were overheard at a recent conference musing on the changes James Herriot would have seen over his lifetime and be confronted with today.

Richard: "Do you realise, it's now 100 years since James Herriot was born? And 1939 was when he first started to practise in Yorkshire."

Daniel: "I wonder what he would make of veterinary practice today?"

R: "I doubt he would recognise it as the same profession. A lot has happened. Specialisation has to be the 'biggie' for me. In his time, mixed practices were the norm – although vets may have specialised within them. Outside the major conurbations, there were few who wouldn't take a call to see a horse – and a few that wouldn't see a cat! There were almost no referral practices, and only the vet colleges and London Zoo provided any expertise in exotics."

D: "Yes, and practices were so much smaller. I think that most were only two-, three- or four-man practices, the large outfit was a rarity. This produced a very intimate feel to a practice, and a strong bonding with colleagues. It meant too that sharing case histories and discussing clinical options was a natural part of daily practice life – not something that required special sessions or dedicated mentors.

"No corporates, of course; and there was often fierce rivalry between local practices!"

R: "Client expectations were far lower as well. Television and the media weren't there as they are today raising expectations as to what we can do – especially for companion animals. It would never have even occurred to James' clients to have blood samples taken or to demand a definitive diagnosis – or even less so the complex surgery that can be seen weekly nowadays on TV programmes, such as Channel 4's *Supervet*, and consequently expected of every practice. So often the only option was to put an animal to sleep.

"Mind you, house visits seem to have gone full circle. For many years I ran a coastal round twice a week which would make 15 to 20 house calls a day. We called at local shops to pick up messages. This very much went out of favour with our colleagues but now there are practices setting up with house visits as their speciality. That would make Mr Herriot chuckle.

D: "Much of the current client expectation has been driven by the massive increase in clients' disposable income and the availability of pet insurance. I am sure James would be deeply disturbed by the sometimes obscene amount of money spent on pet animals at one end of the spectrum contrasted with the relentless and unreasonable financial pressures being applied to livestock farmers in the food-producing sectors in agriculture. Three family farmers have committed suicide in my area during the past three months and there have been many bankruptcies.

"He might feel that the pet-owning public has lost any sense of perspective. I think the figures are something like 50 to 60 per cent of household income was spent on food in the 1950s versus eight to 11 per cent now. Food and food security – and the people who worked hard to produce it – were valued and not taken for granted.

"The other thing now is that 'accidents no longer happen' and immortality for pets is the norm. The "he did his best" respect for vets has gone and resorting to litigation with a view to blame and recompense is the automatic response. I think James would struggle with this prevailing climate."

R: "It almost goes without saying that we have come a long way in every veterinary field - treatment, surgery, imaging and so on. I think the thing James would notice most though is diagnosis. We now do diagnose things - then we largely guessed. Inspired guesses, based on textbook learning, experience and perceived wisdom - but guesses nevertheless.

"Nowadays readily available and almost instant pathology prevails. My first practice sent blood samples to our local hospital – on the quiet – and we were lucky to see results in less than a week!"

D: "Yes, you're right. The two complementary pieces of advice I received early on in my veterinary career were: 'Seventy per cent of your cases will get better in spite of your treatment!' and 'Remember, you have no Divine Rights, all you are trained to do is to assist Mother Nature with her natural healing processes'. I think James would have subscribed to these – and would be alarmed at the increasing number of vets who are 'playing God' today at the expense of the real heroes who are the general practitioners struggling to instill the basics of adequate health care at the coal face. The media-driven, popular acclaim of these 'supervets' also adds to the physical and mental pressure on practising vets especially young graduates to perform similar 'miracles'."

R: "The majority of today's vets have very different lifestyle expectations to those working in James' days. He would be astounded at the thought of not being 'on call' and 'weekends off' were a bonus not a right. Many jobs had accommodation and a car provided and often a wife was a 'required accessory' who was expected to provide telephone answering services in return for a small share of the assistant's salary.

CPD was a rarity and often reserved for more senior partners – especially the SPVS congress! Today, as we all appreciate, it is a necessary requirement."

D: "I agree with you about expectations. I spent school holidays either working on a local farm or, increasingly, at my local

veterinary practice. Becoming a vet was something I grew into – a vocation and way of life – it was certainly not a 'career option' or a 'nine-to-five' job. I think James would have difficulty getting his head around this notion of a 'career option' based on academic prowess rather than flexibility of mind, sound problem-solving ability and the application of common sense and 'people skills'.

R: "Managing a practice was very different then too. In those days 'practice management' was totally ad hoc. If a practice had a good receptionist or office person, they often did the accounts, made the phone calls, arranged the rotas, chased the debtors and so on. Otherwise vets and partners did it themselves. Today's practices have embraced good management and along with that has come expertise in marketing, credit control, income generation, pet health insurance and many other aspects of commercial life that would be completely alien to James.

"Of course, there is certainly more commercial pressure today, overheads are in a different league and earnings have to keep up. It really wasn't that important if an odd client didn't pay, we were lucky to get farming cheques twice a year, and there was little control over drugs left on farms. Second consultations, post-op checks, 're-exams' and check-ups were 'all part of the service'. I reckon James would also be astounded by the range of products we now stock, the diversion into pet supplies and food. I recall the opening of the first wholesaler. Prior to that, penicillin came from the manufacturer direct by the tea-chest full!

"Staffing is so different as well today. We now take the provision of a skilled trained support team as a given. What wouldn't James have given for our VNs? Even their predecessors, RANAs, were still a twinkle in the Royal College's eye in his day. Most of us had some sort of self-trained assistants to help with small animal surgery, but consultations were all solo affairs, as were many ops.

"Many is the cat I have castrated on a kitchen table. And that brings me on to health and safety; we are a thousand times better at this. I still shudder at the thought of all the anaesthetics I have breathed in, all the 100-pound dogs I have tried to lift, and looking down the direct beam of an X-ray at a fluoroscope!

D: "Yes, and wielding syringes of S19 live brucella vaccine as we waded through pens of tightly packed cattle to vaccinate them – and occasionally ourselves. I have the serum titres to prove it!"

R: "The other big thing that James would notice, of course, is today's gender balance in the profession. My year at college had five females and 90 males in the first year. The gender shift has brought to the forefront the role of part-time working – unheard of in James' day. Continuity of consulting vets was less of a problem too all those years ago because of practice size; although I suspect there have been great advances in empathy of approach.

D: "When I was at vet school, we had 14 women in a year of 64. In hindsight, it was not divisive and we all treated each other as equals. The gender balance 'problem' seems to have proliferated in parallel with the insidious march of political correctness."

R: "James would be amazed at the 'never out of touch' world we now live in. Radio telephones in cars were a wonder of the age, but meant it was much more difficult to get "lost" for an hour or so. Access from anywhere to case notes, drug data, X-rays you don't have to develop, and client account information has



evolved dramatically in the last few years. We had case cards, slips of paper, and the accounts were handwritten. My ambition when a partner was at least to be able to tell a client how much they owed us!"

D: "Hmm. Call me a cynic but I think that the world of James' time has long passed. Most of what used to be aspirational is no longer achievable owing to the litigious, finance-driven realities of existing as a small business. I think the profession is mostly regarded as just another group of 'service providers' who are perceived as expensive to consult and who have failed to explain the real value of what they provide. I am not so sure that James Herriot would actually want to be a vet today."

R: "Agreed, practice has changed so much – almost out of recognition. Different times and different measures; but I still believe that the profession, both communally and individually, remains dedicated to curing sick animals, promoting animal welfare, and the best interests of their patients.

"Who knows how James would react today? After all, his adaptable, common sense, client-oriented approach saw him through difficult and physically demanding times, so he might well surprise us by simply accepting that he is in a different time and place and carve out a niche for himself as the veterinary clinical manager of a corporate branch practice!"



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