

Veterinary PracticeToday

FOR PERSONAL & PROFESSIONAL DEVELOPMENT

Account and accountability

How do we quantify welfare as veterinary professionals?



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Helping them to live life to the full

Rare breeds

The veterinary surgeon's role in progressive health management

Wildlife

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UP FRONT...

At the time of writing this editorial, I am reading a fascinating book – *The Invention of Nature* by Andrea Wulf. It describes the life of Alexander von Humbolt (1769-1859) whom the flyleaf heralds as 'the great lost scientist', pointing out that more things are named after him than anyone else – towns, rivers, mountain ranges, plants, an ocean current, a penguin, a giant squid and even the Mare Humboldtianum on the moon.

Many of Humbolt's ideas were ahead of his time and he shaped science, conservation, nature writing, politics, art and the theory of evolution. But above all, he established a vision of the holistic interrelationships of nature – something he called *Naturgemälde* or nature made up of connections and unity.

His 'light bulb' moment came during an arduous expedition to climb Chimborazo, a majestic inactive volcano 100 miles south of Quito, with distinct zones of plants and vegetation, some of which were identical to plants he knew existed in other parts of the world. Nature, he wrote, was 'a reflection of the whole' – scientists had to look at the flora, fauna and rock strata globally. They needed to leave their garrets and travel the world.

And he suggested that they should not only open their minds across the scientific disciplines, but also be prepared to share their findings and concerns with the wider world. To illustrate this point, Humbolt rubbed shoulders with many of the great men of his day and influenced their thinking – Napoleon Bonaparte; US president, Thomas Jefferson; poet and philosopher, Johann Wolfgang von Goethe; Joseph Banks, botanist for Captain Cook and president of the Royal Society in London; South American revolutionary, Simón Bolívar; evolutionist, Charles Darwin and botanist, Joseph Hooker. The list was a long one.

In this issue of *Veterinary Practice Today* there is the second part of an article on the natural history and management of honeybees. In his conclusion, author John Hill writes: 'A honeybee colony is a remarkable entity ruled by a highly complex system of communication in the form of chemical smells, food transference, vibrations, sounds and temperature. This complexity is so elaborate that we are only just beginning to understand a little of how it works and its potential benefits for mankind'.

If ever there was an example of Humbolt's *Naturgemälde*, this is it.

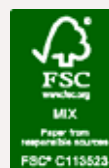
As a 'scientific' profession, we should not lose sight of the bigger picture. Our professional bodies are encouraging ever more specialisation and introspection; yet our greatest contribution to the world in which we live can be through an understanding of the wider application of what we already know and understand.

David Watson
Editor

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Printed in Great Britain by Swallowtail Print Ltd, Norwich
Tel: 01603 868862
www.swallowtail.co.uk

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Publisher

Published six times a year by Vision Media,
a department of Central Veterinary Services Ltd.

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ISSN: 2053-440X



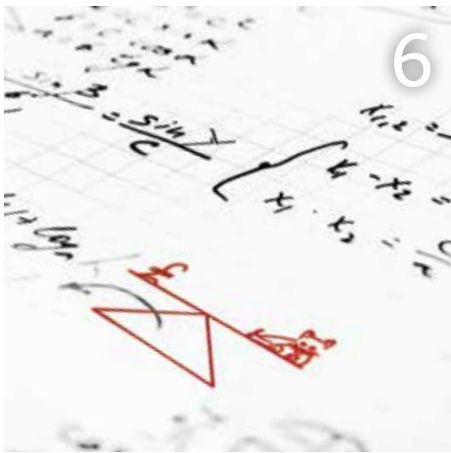
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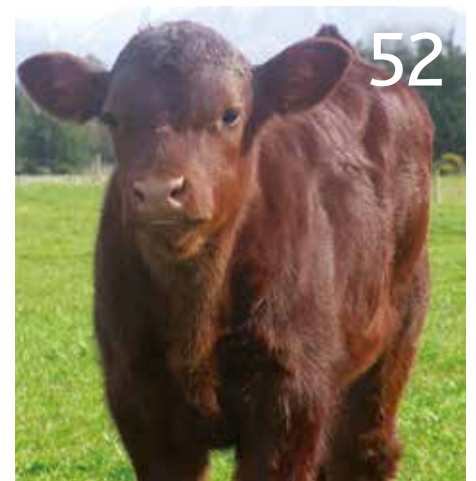


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Account and accountability



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As veterinary surgeons, we are accountable – morally or legally – in many ways. Being accountable involves being required to explain or justify our actions. We are accountable to owners for how we care for their animals. We are accountable to our professional bodies for our conduct, which should place animal welfare as its first priority. And we are accountable to ourselves in the guilt and stress that we shoulder.

Nowadays we may feel more ‘accountable’ than in the past; our conduct is less a matter of personal morality and more one of societal demands. Google statistics suggest the word is being used more now than at any time since 1800; whereas ‘responsible’ has been declining in usage.

Society may not have the unquestioning trust in experts or professionals that it had in some earlier periods. The public does trust veterinary surgeons; but that trust is earned – and can easily be lost – by each practitioner and the profession, rather than assumed.

Stress factor

This accountability can add to the levels of stress and dissatisfaction in the profession. It can make us constantly fearful of being challenged in the consulting room, courts or a disciplinary hearing. Ours is a difficult enough job without having the fear of being held to account. Even if those fears are exaggerated or ungrounded, this does not necessarily make them easier to deal with. Indeed, I would hypothesise that this stress is highest in those who are, in fact, least likely to do anything that would lead to such sanctions.

Increased accountability also risks our forgetting that we are helping animals and clients for their own sake – not simply to avoid complaints, litigation or disciplinary action. It risks our making clinical decisions to ‘cover our backsides’ rather than in the best interests of the animal.

A key example of this would be the increase in concern over ‘informed consent’, rather than thinking of owners as collaborators in helping the animals. And it makes us focus on the negative rather than the positive aspects of our work – worried about the risks rather than enjoying the successes.

Welfare accounts

Each of us has an ‘animal welfare account’ as the sum total of all our effects on animal welfare (Yeates, 2013). Harms to animals are debited from this account; helping animals is to our credit.

I think we are accountable – at least to ourselves – for all the good and harm we do, particularly to animals. Perhaps in our clinical setting, we should consider this as a ‘clinical account’ – the impact of our clinical veterinary work. We may also have other, non-clinical impacts on our welfare account, such as the food we eat and our charity fund-raising.

Every person has such an account, but veterinary professionals’ accounts have the chance of being particularly profitable – or indebted, if we cause harm. We are the animal welfare ‘Masters

of the Universe' (in the Tom Wolfe sense, although the He-Man/She-Ra sense works well too!) with the potential to change the world, yet also to cause major damage to both ourselves and others. Our actions can cause significant harm, but they can also add enormous value.

The good news is that we do a great deal of good to go 'in the black' on our welfare account. Veterinary work helps animals to avoid pain, malaise, pruritus, hunger, thirst, fear and distress, and to continue enjoyable lives. In some cases, this good requires an 'investment' of short-term harms – postoperative pain or hospitalisation for later recovery, for example.

Sometimes our investments have risks of poor clinical outcomes – drug reactions or particular sequelae, for instance – but in each case, we should be aiming to have a positive effect. The harms risked should be outweighed by the expected benefits in terms of improved quality of life.

This idea of an animal welfare account also allows us to 'credit' ourselves even when we are doing work that is less financially rewarded – pro bono work, for example. Our animal welfare accounts are personal accounts: so giving should be credited. As well as seeing how healthy we and our practices are in financial terms, we can also assess how well we and they are doing in terms of our impact on the world.

Mind the GAAP

Generally accepted accounting principles (GAAP) allow us to use accounting practices to evaluate what we have done and quantify its effects. Others can evaluate the health of our practice by means of year-end financial accounts and, more importantly, we can use them as management accounts to plan the development of our practice in line with our strategy.

The suggestion here is that we can use accounting principles in our clinical governance. As well as managing the financial accounts (using financial and management accounting), we can also manage our welfare accounts. Currently, we often approach clinical audit using scientific methods – testing hypotheses about specific procedures or protocols – to assess the actual incidence of specific post-op complications, for example. We could also use management accounting practices within clinical audit to ask bigger questions of whether particular treatment regimens are beneficial or harmful.

Such clinical management accounting should, in turn, facilitate communication (such as clinical case discussions), the provision of relevant information, analysis of impacts, and should build trust (CIMA/AICPA, 2014).

How it might work

This accountancy approach can be adopted at the individual patient level. Imagine assessing no amputation and limb-sparing procedures to treat osteosarcoma, in order to develop a Standard Operating Procedure. For each, we can quantify the short-term effects on each patient's welfare: pain and nausea (the 'initial outlay'); the longer value of the intervention (the 'return on investment'); and the probabilities of side-effects (the 'risks').

An immediate concern is that such derived values are 'subjective' which seems a major issue when we are using 'scientific' methods. However, this is less of an issue for accounting methods – money is also not a real thing, it is only a quantitative

representation of the subjective value people place on real things! We can use such methods, with empathy, to quantify value to animals.

This should include both quantifiable clinical data (median survival times that vary from one to three months if untreated; around six months with amputation alone; around one year for surgery and chemotherapy); incidences of postoperative implant failure (11–60%); infections (40–70%) (Corr and Yeates, 2014); and aspects that are harder to quantify, such as lack of stimulation through exercise. The latter can draw on current research about how to quantify quality-of-life (Belshaw et al, 2015) or on economic approaches (assessing owner willingness to pay, or trade-offs).

In our case management, we can draw analogies with some financial management principles:

- we should employ 'risk mitigations' to reduce the harms – analgesia, for example
- we should employ a risk-averse investment strategy to minimise the risk of catastrophic welfare outcomes, and
- we should avoid major short-term harms, such as severely painful or distressing surgery, in the hope of distant benefits in longevity – for animals as for businesses, the short-term 'cash-flow' may be more important than 'profit-and-loss'.

Just as companies should balance short-term commercial interests with long-run value for stakeholders, this approach can help veterinary surgeons maintain public and personal trust in the profession.

We might also assess whether changes in our hospitalisation practices improve overall welfare. Changing our waiting room and ward design can reduce animals' stress or fear during hospitalisation. For example, separating dogs and cats (and cats and cats!) can help make our practices more 'cat-friendly' (ICC, 2015). Such changes will need financial investment – and may not always lead to financial profit – but they can lead to profit in our welfare accounts.

We can use the welfare accounting approach to evidence the value that such changes add – even celebrating the fact that they cost us money to do so. We can use these methods to demonstrate the value we add and to enhance our transparency, and to help show us as the force for good that we are, should be, and are expected to be. And that our 'bottom line' is not all about money. ■

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Kieran has a particular interest in minimally invasive interventional procedures and is involved in several collaborative research projects on feline hypertrophic cardiomyopathy.



*Suggested Personal & Professional Development (PPD)



RADIOLOGY

Interventional radiology in veterinary practice

Interventional radiology (IR) is a term used to describe minimally invasive, image-guided procedures, often performed using natural body orifices or percutaneous access. They are associated with less postoperative pain, a more rapid recovery time and a shorter hospitalisation period than routine surgical methods. In the following article, we aim to introduce readers to a series of the more commonly performed IR techniques in our clinic using a series of short case reports to illustrate their value.

Interest in this field began in humans in the 1920s and has developed to provide a range of treatments for diseases affecting most body systems, generating

its own 'specialty' within the medical profession. In veterinary patients, vascular and cardiac catheterisation has been performed for experimental purposes for

some decades. In fact, the world's first carotid access documented in a companion animal was performed in England by Stephen Hales on a horse in the 18th century,

Table 1. Indications for interventional radiology and procedures available, performed using fluoroscopic or endoscopic guidance

Body system	Indication	Procedure
Cardiovascular	<ul style="list-style-type: none"> Patent ductus arteriosus Pulmonic stenosis Subaortic stenosis Atrioventricular valve stenosis Cortriatrium Septal defects Neoplastic obstruction Heartworm obstruction Supraventricular tachycardia Bradyarrhythmia Arteriovenous fistula 	device occlusion coil embolization balloon valvuloplasty transvalvular stent cutting balloon dilation balloon valvuloplasty ballon/cutting balloon dilation device occlusion (trans-)caval stent image-guided extraction radiofrequency ablation pacemaker implantation coil embolization
Respiratory	<ul style="list-style-type: none"> Tracheal collapse Nasopharyngeal stenosis Foreign body Epistaxis Nasal tumours 	tracheal stent nasopharyngeal stent image-guided extraction embolization chemoembolization
Urinary	<ul style="list-style-type: none"> Ureteric obstruction Urethral obstruction Ectopic ureters AUSMI 	ureteric stent subcutaneous ureteral bypass (SUB) device nephrostomy tube urethral stent antegrade urethral catheterisation cystostomy tube laser ablation endoscopic injectable bulking agents
Gastrointestinal	<ul style="list-style-type: none"> Foreign body Oesophageal stricture Oesophageal neoplasia Anorexia 	image-guided extraction balloon bougienage oesophageal stent (if persistent) oesophageal stent image-assisted feeding tube placement
Hepatobiliary	<ul style="list-style-type: none"> Portosystemic shunt Hepatic neoplasia Biliary obstruction 	coil embolization device occlusion chemoembolization retrograde endoscopic stent placement

to demonstrate the power of systolic blood pressure, and the first documented cardiac catheterisation (again, on a horse) was performed in 1844 by Claude Bernard and François Magendie.

By the 1980s and 1990s, various pioneering veterinary clinicians were performing cardiac catheterisation for diagnostic and therapeutic reasons, including the transvascular balloon dilation of stenotic valves and occlusion of patent ductus arteriosus (PDA). Although ultrasonography has superseded diagnostic catheterisation for diagnostic purposes in the vast majority of clinical cases, image-guided interventions in veterinary patients are becoming more refined and experience has grown, such that using IR is a viable treatment option for many conditions in dogs and cats.

The range of IR procedures available to veterinary clinicians (**Table 1**) ranges from aberrant vessel occlusion (for example, PDA or portosystemic shunt) to palliative treatment of neoplasia (using vascular stents or chemoembolization).

CASE STUDIES

Intrahepatic portosystemic shunt embolization

Although we have used IR for the attenuation of extrahepatic portosystemic shunts in a minimally invasive manner, IR techniques have revolutionised the treatment of intrahepatic shunts, which are very difficult to close via an open surgical approach because of their position.

Ruby, a one-year-old female entire Cocker spaniel, was diagnosed with an intrahepatic portosystemic shunt (PSS) on computed tomographic (CT) imaging (**Figure 1a**). She was

stabilised medically for four weeks pre-operatively. Under anaesthesia, percutaneous jugular access was obtained for her shunt occlusion.

A catheter was passed into the PSS and portal pressure was measured. Because portal hypertension was not present, occlusion was appropriate. A second catheter was advanced into the caudal vena cava, and simultaneous portal and caval injections of contrast were used to locate and size the PSS on fluoroscopy. A laser cut caval stent was deployed in the caudal vena cava, to cover the mouth of the PSS (**Figure 1b**).

Thrombogenic embolization coils (**Figure 1c**) were then deployed in the shunt vessel – after flowing up against the stent, thrombosis leads to attenuation of the PSS.

Pressure within the shunt was measured continuously, and coil deployment was ceased after a pressure increase to 14mmHg (the maximum desired increase is up to 16mmHg). Vascular catheters were removed and a jugular catheter placed for 24 hours postoperatively. A post-procedure radiograph was taken as a baseline to monitor stent and coil position (**Figure 2**).

Ruby recovered well, and was monitored for the development of seizure activity (reported in 5% of dogs after PSS surgery/embolization) and discharged 48 hours postoperatively on medical management as before. Lifelong omeprazole – initiated one week pre-operatively – was prescribed (1mg/kg once or twice daily), to prevent the development of gastrointestinal bleeding. This complication occurs (via an unknown mechanism) in 20 per cent of dogs if no gastroprotectant treatment is provided. In our experience, it is uncommon with omeprazole use.

Figure 1. (a) Non-selective computed tomographic (CT) angiography, illustrating the position of Ruby's large, intrahepatic portosystemic shunt (PSS), which was of a left divisional anatomy. (b) Intra-operative fluoroscopy image, showing the caval stent in position immediately after deployment over the mouth of the PSS. (c) Photograph of a thrombogenic coil to illustrate their Dacron fibres, which stimulate thrombogenesis.

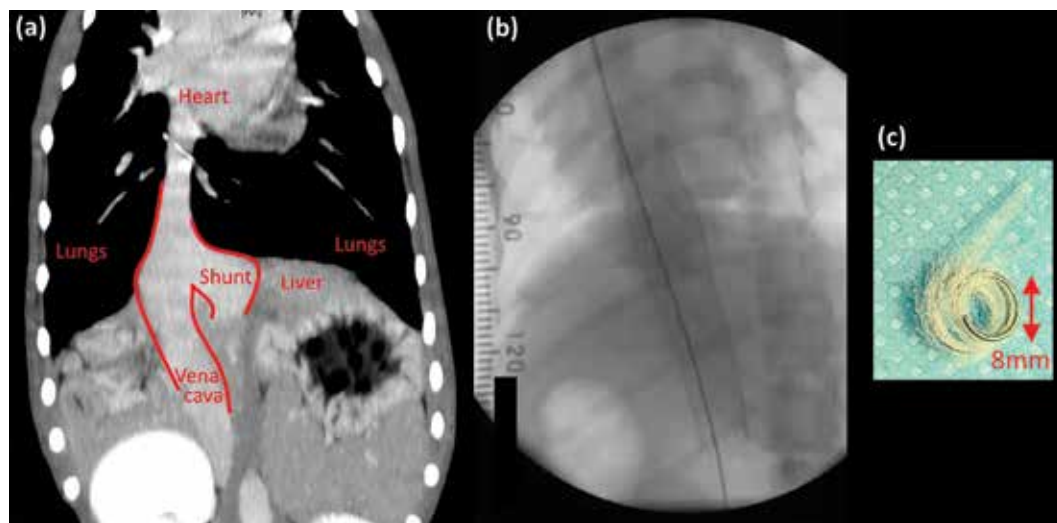
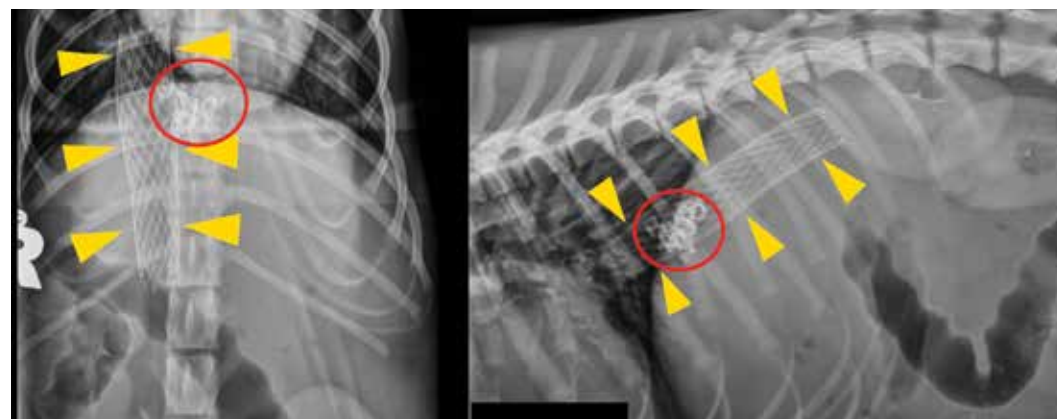


Figure 2. Post-procedure radiographs showing the position of the caval stent (arrowheads) and embolization coils situated within the intrahepatic shunt (circle).



Cutting balloon dilation for subaortic stenosis

Subaortic stenosis (SAS) is a common congenital heart disease in dogs. In the most severe cases, interventional treatment may help reduce clinical signs that have failed to respond adequately to medical therapy with beta-blockers.

Milly, a one-year-old female entire Pug, presented with a very severe SAS (trans-valvular pressure gradient over 200mmHg; severe stenosis classified as >80mmHg, and normal <30mmHg). The SAS was caused by a tunnel of fibromuscular tissue below the aortic valve annulus.

A recently described technique, a cutting balloon procedure, was performed to help alleviate Milly's current clinical signs and attempt to reduce myocardial workload, potentially improving her longer-term outcome (this technique is novel and long-term outcome data has not yet been published).

Vascular access was achieved via the carotid artery under general anaesthesia. A pigtail catheter was advanced into the left ventricle and a left ventriculogram highlighted the severe SAS lesion (**Figure 3a**).

First, a peripheral cutting angioplasty balloon was advanced over the lesion and dilated three times, to score the fibromuscular lesion (**Figure 3b and 3d**). Next, a larger, high-pressure balloon was advanced over the lesion and dilated to increase the diameter of the left ventricular outflow tract in a controlled manner (**Figure 3c**). Invasive measurement of central pressures showed a reduction in the pressure gradient over the lesion of 42 per cent (procedural success is defined as 30-50%).

Milly was discharged the following day, and within 48 hours her owners noticed a significant improvement in



Figure 3. (a) Left ventriculogram showing a tunnel-like lesion of tissue below the aortic valve annulus (arrowheads) as well as post-stenotic dilation of the aortic arch. (b) Initial inflation of the cutting balloon. (c) Final inflation of a high pressure balloon to dilate the stenotic lesion. (d) Photograph of the cutting balloon, showing the microsurge blades which are designed to create precise incisions in the fibromuscular tissue of the stenosis.

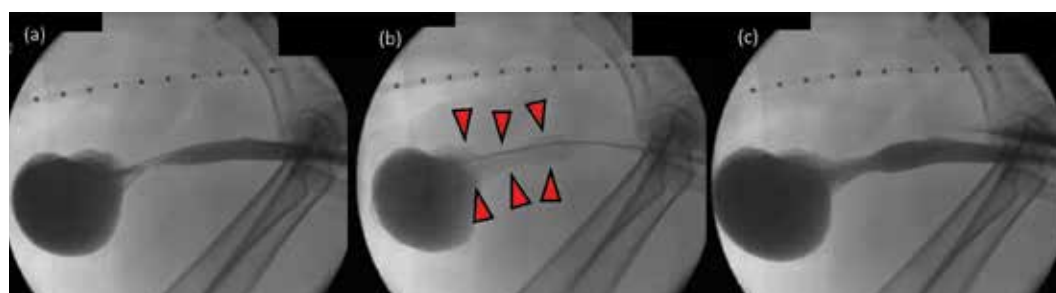


Figure 4. (a) Retrograde cystourethrogram illustrating the site of neoplastic compression. (b) Urethral stent deployed over the compressive lesion (arrowheads). (c) Post-stent retrograde contrast study illustrating reduced urethral compression.



Figure 5. Selective angiography of the tumour's arterial supply, arising from the left hepatic artery. Compared to before embolization, images post-embolization show blunting and dilation of the regional arterial supply.

her demeanour and exercise tolerance, and a reduction in clinical signs of breathlessness. She remained on long-term treatment with atenolol.

Urethral stent for urinary obstruction

Transitional cell carcinomas are malignant tumours of the urothelium, which are associated with obstructive

dysuria when they occur in the urethra or at the urethrovesicular junction. In many cases, euthanasia is the result of a poor quality of life associated with dysuria. Clinical signs of stranguria may be alleviated by placement of a urethral stent.

Stella, a 14-year-old neutered female Bull terrier crossbreed,

presented with a six-month history of progressive dysuria. Ultrasound and CT imaging confirmed a soft tissue mass infiltrating the bladder neck. Cystoscopic biopsies were diagnostic of a transitional cell carcinoma.

Stella was anaesthetised and a retrograde cystourethrogram performed under fluoroscopic

guidance to localise the cranial and caudal margins of the tumour. Over a guide wire, a urethral stent was advanced to bridge the site of neoplastic obstruction.

A follow-up retrograde contrast study showed reduced compression after stenting (**Figure 4**) and Stella recovered well and her clinical signs of dysuria resolved postoperatively. Although 25 per cent of female dogs have severe incontinence post-stent, Stella remained continent and received long-term treatment with non-steroidal anti-inflammatory agents on the basis of their potential anti-tumour effects.

Chemoembolization for palliative treatment of neoplasia

Chemoembolization is the delivery of a chemotherapeutic agent combined with an embolization technique to cause local tissue ischaemia, into the arterial supply of a tumour. Most operators use intra-arterial doxorubicin or epirubicin, combined with small-diameter polyethylene embolization beads.

The technique is best described in dogs with large hepatocellular carcinomas, but treatment of nasal tumours and other types of neoplasia has been described. It is a palliative treatment to consider where no good medical or surgical alternative exists, where access to radiotherapy is limited, or as a pre-surgical treatment to attempt tumour size reduction.

Lucy, a 12-year-old neutered female golden retriever presented with ascites, cachexia and a history of an abdominal mass detected on ultrasound imaging. She had progressive inappetence and intermittent vomiting and diarrhoea. Abdominal CT showed a large, isolated hepatic mass with no evidence of metastasis within the thorax

or abdomen. Fine-needle aspirate cytology suggested a hepatocellular carcinoma.

A femoral arterial approach was made, and selective catheterisation of the arterial supply to the tumour was performed using progressively smaller catheters and guide wires. A dose of doxorubicin was administered intra-arterially, combined with micro-embolization beads.

Compared to before embolization, angiography post-embolization showed blunting and dilation of the regional arterial supply (**Figure 5**). Within three days, ascites had resolved, Lucy was brighter, more interactive and her appetite returned with resolution of the gastrointestinal signs. CT imaging of the tumour four weeks after chemoembolization showed an approximate 25 per cent reduction in the volume of the mass (**Figure 6**), which had a more organised and less vascular appearance, with evidence of necrosis within the mass.

Surgery was performed subsequently to remove all of the macroscopic tumour, and Lucy recovered well. She remains free of clinical signs, and has regained a normal body condition score.

Endoscopic gastric foreign body extraction

Endoscopic extraction of foreign objects from the oesophagus, stomach and larger airways (and, rarely, the proximal duodenum) has been performed by many centres for some years, and does not represent a novel technique. However, access to a suitable range of flexible endoscope sizes in one clinic is not common in first-opinion practice. Despite this being a well-described technique, we wanted to share with readers a memorable case from our hospital.

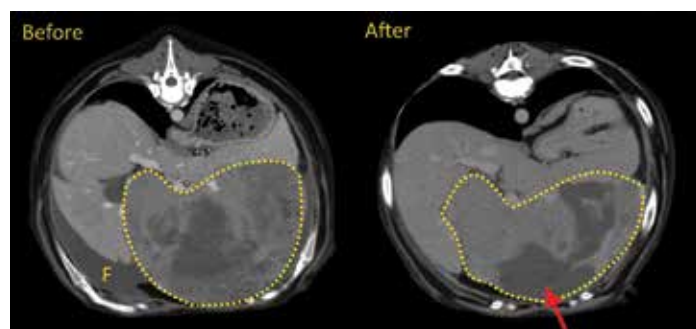


Figure 6. Computed tomographic imaging of the tumour four weeks after chemoembolization showed an approximate 25 per cent reduction in the volume of the mass (outlined), a more organised appearance to the parenchyma and resolution of the previous free peritoneal fluid (labelled F). Areas of necrosis were present within the mass (arrow) but the patient was clinically much improved.

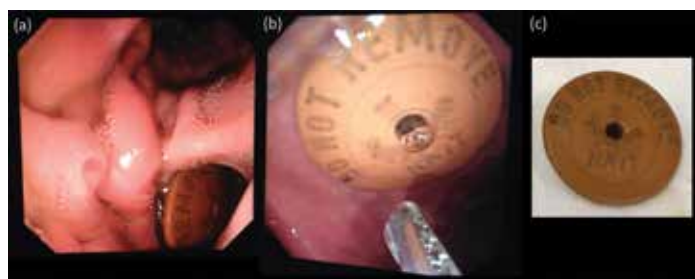


Figure 7. Images of a plastic foreign body extracted from the stomach in a dog with intermittent vomiting. Endoscopic (a and b) and post-extraction (c) images clearly show the message 'do not remove'. This item transpired to be a part of an ear-tag used in small ruminants, presumably eaten whilst out walking in fields.

Monty, an eight-year-old neutered male Border terrier, was presented with a history of vomiting intermittently for two weeks. His owners reported a lifelong history of scavenging, and abdominal ultrasonography showed evidence of a foreign body in the pylorus.

A flexible video endoscope was advanced into the stomach and a brown, circular foreign body was identified. After some manipulation, a message was clearly seen written on the object (**Figure 7**). Disobeying the message, the foreign body was extracted per os using a set of endoscopic basket forceps. In contrast to most patients undergoing a gastrotomy, Monty recovered rapidly, with little or no post-procedure pain, and was discharged that evening. Clinical signs did not recur.

Trans-atrial stent for palliation of large cardiac tumour

As in the urethra, a metallic stent may be used to relieve neoplastic obstruction or compression of blood vessels. Stent use may be performed in any large blood vessel, but has been most widely reported in the vena cava, hepatic veins, pulmonary artery and trans-atrial sites.

Although not a cure for the neoplasia, palliative improvement or resolution of clinical signs relating to vascular congestion may significantly improve quality of life, especially in slow-growing tumours. A post-stent survival time of six to 24 months has been reported for dogs with large venous obstruction causing clinical signs.

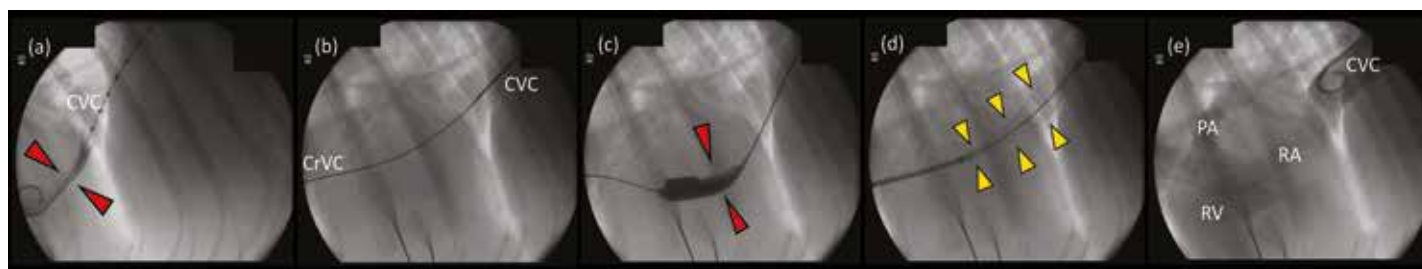


Figure 8. Sequential images from fluoroscopy, showing the procedure to place a trans-atrial stent. (a) Caudal vena caval selective angiography shows the margins of the tumour, obstructing venous return from the caudal body (red arrowheads). (b) Next, a through-and-through wire is placed from caudal vena (CVC) to cranial vena (CrVC). (c) Balloon dilation to pre-dilate the compressed cava and right atrium prior to stent deployment. (d) The trans-atrial stent mid-deployment (yellow arrowheads). (e) Post-stent selective angiography, showing contrast enhancement of the caudal vena, right heart (RA and RV), and main pulmonary artery (PA). This confirmed relief of the neoplastic obstruction by the stent.

Finley, a 10-year-old neutered male English Springer spaniel was presented to his primary vets with sudden-onset lethargy and ascites. Thoracic ultrasound detected a cardiac mass. At the time of referral, Finley had a poor body condition score, and was severely ascitic and lethargic.

Echocardiography and CT imaging showed a large homogenous mass at the heart base, compressing the caudal vena cava at its junction with the right atrium (**Figure 8a**).

Non-selective angiography, performed via the lateral saphenous vein, showed that blood flow from the caudal body returned to the heart via a dilated azygous vein and several dilated vertebral veins. No evidence of metastasis was present.

Approaching the heart from cranial (left jugular vein) and caudal (right femoral vein), a through-and-through approach was made to the right atrium (**Figure 8c**). After serial balloon dilations of the compressed region of vena cava, a metallic stent was deployed from the caudal vena cava, trans-atrially, to the cranial vena cava.

Post-stent angiography showed good venous return to the right heart through the caudal vena cava (**Figure 8d**). Finley recovered rapidly and was discharged the

following day. Within five days, his ascites resolved and his appetite and demeanour improved significantly.

One month later, he had gained muscle mass and at nine months post-procedure he remained free of clinical signs and was no longer under-weight (body condition score 6/9).

Thoracic radiography at this time (**Figure 9**) showed no change in stent position and echocardiography confirmed good venous return cranially and caudally.

Occlusion of a patent ductus arteriosus

Patent ductus arteriosus (PDA) is one of the most common congenital heart diseases of dogs. The ductus – a normal foetal structure that allows blood to bypass the non-expanded foetal lungs – should constrict in response to prostaglandins and increased oxygenation within 72 hours of birth.

A congenital lack of normal smooth muscle tissue leads to patency of the ductus, which typically presents as a continuous murmur in a young dog, with the abnormal flow ultimately overloading the left heart and causing left-sided congestive heart failure. Survival to one year old is reported at a level of 50 per cent.

Surgical ligation is widely performed, but interventional device occlusion using a

transvascular approach has a higher rate of complete occlusion and a significantly lower risk of haemorrhage than a surgical thoracotomy.

Dudley, a 12-week-old entire male Border collie, presented for murmur evaluation. A PDA was diagnosed on echocardiography and device occlusion pursued. Under anaesthesia, a vascular approach was made via the right femoral artery. After angiography in the ascending aorta to confirm the location and size of the ductus, a delivery sheath was placed across the PDA and into the main pulmonary artery. Through this, an Amplatzer Canine Duct Occluder (ACDO) device was situated in the ostium of the PDA (**Figure 10**).

After deployment, selective angiography showed almost immediate occlusion of flow, and the heart murmur disappeared. Discharged the following day, Dudley returned four weeks later for re-evaluation and had grown well. His owners reported an improvement in exercise ability, despite not having previously reported clinical signs.

Dogs such as Dudley tend to have a very good prognosis for a normal lifespan, and do not routinely require follow-up once their PDA is occluded.

Summary

Through these seven cases, we hope to have

illustrated the varied use of interventional radiology to provide both curative and palliative treatments for a range of clinical small animal presentations. The lower level of procedural risk and postoperative pain may favour the use of certain IR procedures over more traditional surgical approaches (PDA occlusion, for example).

In other cases, IR techniques may offer a novel treatment, where no good alternative has previously existed – chemo-embolization of inoperable masses, occlusion of intra-hepatic shunts, or tracheal stents to alleviate collapse, for instance.

Although open surgery remains the primary treatment for many structural diseases in pets, the future is bright for image-guided procedures and we are standing on the threshold of realising their potential. ■

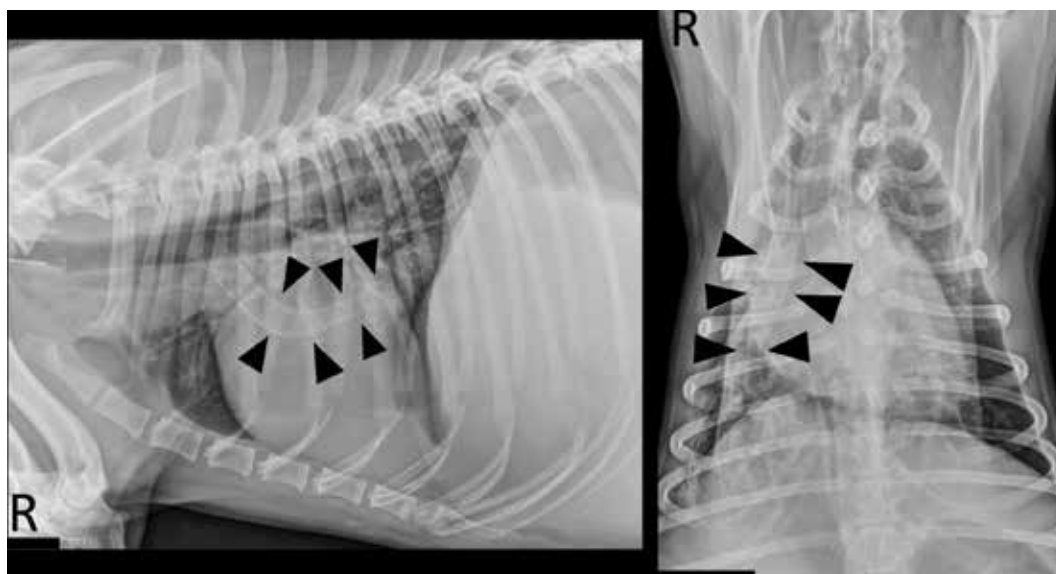


Figure 9. Lateral and dorsoventral radiographic projections of Finley, immediately post operatively after placement of a trans-atrial stent to relieve caudal vena caval obstruction. The stent can be seen, compressed at its caudal aspect by the presence of the large heart base mass (arrowheads). Radiographs nine months later showed no change in stent position and the dog was non-clinical because caudal caval inflow remained patent.

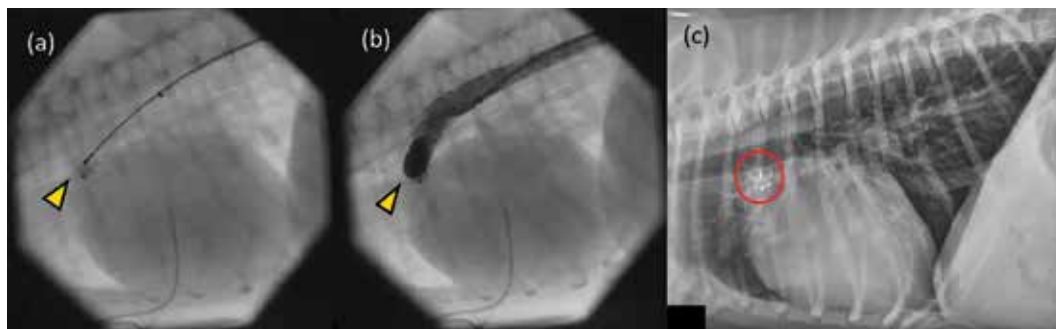


Figure 10. Situation of an Amplatz Canine Duct Occluder (ACDO) to occlude a patent ductus arteriosus via a trans-arterial approach. (a) The device was placed in the ductal ostium (arrowhead) via a femoral artery approach, and the delivery sheath and wire can be seen in the descending aorta. (b) Post-deployment angiogram shows complete ductal occlusion within seconds of device release. (c) A post-operative radiograph demonstrates an appropriate ACDO location and conformation (circle).

Further reading

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Samantha Bloomfield

BSc MA VetMB GPCert(SAS) MRCVS

Samantha has a Degree in Nutrition from King's College, London, and qualified as a veterinary surgeon from Cambridge University in 2005.

Since then she has worked in mixed and small animal practice in the UK and abroad.

Although now working in general practice, she has over 30 years of experience of hand-rearing sick and premature animals starting with her time running a referral clinic for puppies and kittens.

Samantha has a website offering help and advice to breeders and to the veterinary profession, www.puppyandkittenclinic.com and her book, Bloomfield's Manual of Puppy Hand Rearing, is available from the website and from www.amazon.co.uk



**Suggested Personal & Professional Development (PPD)*



PUPPIES

Housing sick and immature newborn puppies for hand rearing

Puppies may need to be hand reared because the bitch has died or is unwell, she may not have sufficient milk or because she has rejected a puppy. In case of rejection, unless there was a traumatic birth or Caesarean section, it is important to note that bitches will often reject an individual puppy that has a serious abnormality or health issue. A puppy may need to be hand reared if it cannot feed from the bitch owing to an anatomical abnormality such as a cleft palate, an illness such as septicaemia, or through being immature.

Puppies can be born 'to term' – at the correct gestational date – but are, in fact, very immature as a consequence of adverse factors inside the uterus, such as infection, during their development. This immaturity can cause problems feeding from the bitch because of a lack of lung surfactant that makes it difficult for the puppy to suck and causes diarrhoea through a lack of gut maturation.

Unless 'top-up feeding' is being instigated to help a bitch with a large litter, sick and immature puppies are best nursed completely away from the bitch and from the rest of the litter to enable accurate monitoring of their condition and progress. Individual nursing prevents exhaustion as the puppy spends less time – and, therefore, energy – trying to compete with litter mates and negotiating a large whelping box. In the event of rejection by the dam, removal of the puppy prevents potential attack by the bitch.

If hand rearing more than one puppy, it is best to house it separately until weaning for similar reasons to those stated above. Also, hand-reared puppies tend to suck each other in the first few weeks of life leading to skin, gastrointestinal and urinary tract infections. Once weaning commences – which can be as early as 18 days if needed – then the sucking problems tend to abate and puppies of

similar sizes from the same litter can be re-introduced to each other.

It is important to socialise puppies back with their litter mates as soon as possible. If this is not possible because there are no siblings, then supervised, slow introduction to a carefully considered, healthy, fully vaccinated adult dog is important for social development. In doing this, the author has never experienced the negative behaviours often cited as a result of hand rearing.

Incubators

Ideally, healthy newborn and immature puppies are nursed in an incubator for the first 24 to 48 hours after birth. Immature puppies often benefit from an incubator for up to seven days. Some veterinary clinics may have one, but it is probably not practical for most to keep one on standby.

Individual bench top laboratory incubators are ideal for single newborn puppies with space for a small soft toy to cuddle up to (**Figure 1**). Healthy newborn puppies can be nursed at 29.5°-32°C with immature puppies nearer 31°-32°C gradually reducing to 30°C after a few days. The incubator temperature must be monitored constantly because overheating can be a problem and easily kill a puppy.

The incubator must be thoroughly disinfected on

a twice-daily basis as the warmth and humidity is an ideal environment for the multiplication of yeasts and bacteria. Bedding can comprise a piece of veterinary bedding (woven-backed synthetic fleece) cut to size or a folded cotton cloth. Once soiled, this must be changed immediately and washed at a temperature of 90°C.

Housing healthy and older puppies

In the absence of an incubator and for moving on from using an incubator, a suitable environment can be set up with the following equipment (**Figures 2 and 3**).

Plastic box with a heat source

Warmth can be supplied from either a covered electric heat pad (not a pressure-dependant one) or a covered microwaveable heat-retaining gel heat pad. Many heat pads are far too hot for newborn puppies and can cause burns.

Figure 1. Individual 'bench-top' laboratory incubator.





Figure 2. Equipment needed for housing a newborn puppy. If using a microwaveable heat pad, purchase two as they need to cool completely before re-heating.

Check the surface temperature by placing a thermometer on the proposed bed with the heat pad underneath for an hour. If it is too hot, wrap the pad in another layer of cotton towel and test again. A hot water bottle can be used in an emergency, but is not ideal for safety reasons and loses heat too quickly. Infrared lamps tend to dehydrate puppies and they cannot move away from the heat source easily.

The heat source must provide warmth at a constant rate, because puppies that are too cold tend to nestle up under the bedding, while those that are too hot move off the bed to a cooler part of the box. If the environmental temperature keeps fluctuating the puppy will waste valuable energy trying to stabilise its internal body temperature.

A thermometer

This should be attached to the inside of the box, with the bulb of the thermometer at the same level as the puppy. Immature puppies should be kept at 30°-32°C for the first few days then treated as mature newborns. Newborn mature puppies should be kept at an environmental temperature of 29.5°-32°C for the first week of life, then 26.5°C up to three weeks of age.

After three weeks, the temperature can be gradually

reduced to 21°C – the exact temperature depends on the maturity, body fat and hair coat of the puppy. Puppies that are too cold will curl up and huddle. Puppies that are too warm will try to lay out flat and have an increased respiratory rate or pant. Humidity should be around 60 per cent.

Appropriate bedding

This may simply be a towel or blanket that can be pulled across the top of the box – half way during the day and fully at night in order to create the correct temperature in the box. Clothes pegs or bulldog clips are useful to keep this in place.

Bedding may include:

- a towel or cotton sheet to place on the bottom of the box for insulation
- veterinary bedding cut to size for the bed area
- absorbable paper or puppy training pad/incontinence pad.

An area of the box should be free of the heat pad and bed for use as a toileting area. The puppy will start to use this area by 10-14 days of age.

It is a good idea to provide a soft toy for the puppy to nestle up to and a ticking clock to simulate the mother's heart beat for comfort.



Figure 3. Place a cuddly toy in with the puppy to nestle up to and provide a background rhythmic noise such as a ticking clock or watch close to the box. During the day, a low-volume radio provides useful background noise and stimulation. The blanket should be pulled fully over the box at night for additional warmth.

Once a puppy is more mobile, it may try to climb out of the box. An effective way to prevent this is to place a fine net (such as a net curtain) over the box secured with elastic. Clothes pegs or bulldog clips help secure the net in place.

Hygiene

The box should be thoroughly disinfected on a daily basis with a standard veterinary disinfectant. The bed may need changing two or three times a day if the puppy has diarrhoea; otherwise, once a day is sufficient, with the bed being washed at 90°C. The absorbent paper toilet area should be replaced as soon as soiled.

If the puppy becomes dirty from faeces and food, then it can be cleaned with fragrance-free newborn baby wipes. It is usually necessary to wipe around the mouth after each feed if feeding from a teat to remove milk from the coat, which will harbour bacteria and cause infection. If the puppy develops skin 'scalding' from diarrhoea, then zinc oxide cream applied after every clean is recommended. ■

Summary of key housing points

Provide a stable environment:

- immature puppies 30°-32°C for the first few days, then treated as mature newborn puppies
- newborn mature puppies 29.5°-32°C for the first week of life, then reducing to 26.5°C by three weeks of age
- keep the environment clean
- keep the puppy clean
- nurse puppies separately if sucking each other (put back together at weaning).

National Veterinary Data service

The new microchipping legislation has increased the demands on pet owners and breeders and highlighted the importance of secure and reliable data storage, registration and updating of pet owner details.

The National Veterinary Data service (NVD®) is a new facility that offers seamless registration on its national database via registered veterinary practices, for newly microchipped pets. Registration also includes an on going automatic renewal of contact information via the client's registered vet.

Once registered on the system, pet owners need only keep their veterinary practice informed of any changes of address or contact numbers.

NVD® goes a long way to address the problem of incorrect data held about a large percentage of microchipped pets. Indeed, in 2015, startling research conducted by the charity, Dogs Trust, revealed that 46% of British dog owners did not keep their microchip contact details updated. This figure was particularly alarming, as 22% of owners admitted their dog had gone missing within 48 hours of moving house. With a brief reunification period of seven days before a lost pet is rehomed or put to sleep, it is essential for all contact information to be kept up-to-date.

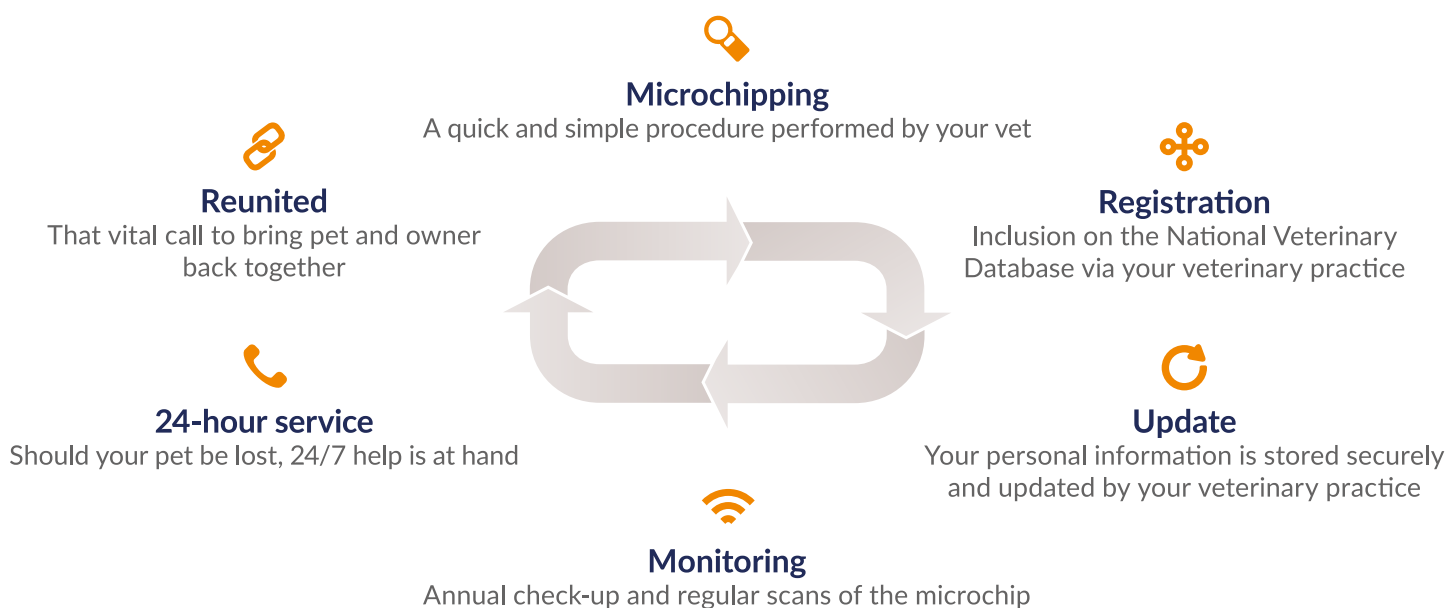
The introduction of a synchronised system that coordinates modern practice management systems with the National Veterinary Data service, means pet owners need only keep their details up-to-date with their veterinary practice.

“NVD® – the database that actively promotes microchipping by veterinary practices”

NVD® reinforces the relationship clients have with their vets and helps to ensure that as well as being microchipped, every pet is registered with a veterinary practice that can help with successful reunification.

In addition to being a database that is continually updated through regular contact, there are further advantages of focusing the service around veterinary practices. The





benefit of a vet's local knowledge (pet owner's local friends and relatives for example) and detailed understanding of the pet's medical history, allows them an advantage when working to reunify a lost or found pet.

NVD® has initially been implemented with AT Veterinary Systems a long established and leading provider of management systems to the veterinary profession. The service is also being made available through other management systems upon request. ■

“The introduction of a synchronised system that coordinates modern practice management systems with the National Veterinary Data service, means pet owners need only keep their details up-to-date with their veterinary practice”

Any practice looking to implement this service should contact:
Central Veterinary Services Ltd on **0330 123 9924** or email **enquiries@nvds.co.uk**
www.nvds.co.uk

For further information:

The Microchipping of Dogs (England) Regulations 2015. www.legislation.gov.uk/uksi/2015/108/contents/made

The Microchipping of Dogs (Scotland) Regulations 2016. www.legislation.gov.uk/ssi/2016/58/contents/made

The Microchipping of Dogs (Wales) Regulations 2016. www.legislation.gov.uk/wsi/2015/1990/contents/made

The RCVS Guidance 'Microchips, microchipping and animals without microchips'. www.rcvs.org.uk/microchipping

The BSAVA Information on best practice for microchipping. <http://www.bsava.com/Resources/Microchipping.aspx>



**NATIONAL VETERINARY
DATA SERVICE**



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Claire is an ASAB-accredited clinical animal behaviourist and lecturer in companion animal behaviour. She has a referral practice taking cases from throughout Wales.

Living life to the full

Ageing is an inevitable part of life. With an increased array of medication and services to support the ageing pet, practices are seeing substantial benefits from engaging in proactive support of the older companion animal – with some estimating that care of the geriatric pet accounts for 60 per cent of their practice income. However, with an overall intention of 'do none harm', we must ask whether such health support is truly enhancing the lives of our geriatric patients?

This article considers some extra support that should be part of every dog and cat's geriatric support package if life is to continue to be lived to 'the full'.

Increased affluence, improved nutrition, better general health care and increased owner expectations mean that our pets now live longer (Watson, 1996). Consequently we are seeing more animals showing age-related changes in their behaviour that can make the companion animal's geriatric years problematic for both pet and owner (Gunn-Moore, 2011; Landsberg et al, 2012).

When is a dog or cat old?

Studies of longevity in different breeds have replaced the previously accepted adage that one 'dog year' is equivalent to seven 'human years'. With more meaningful data, it is now reasonable to assume that dogs will show signs of old age by eight and cats by 11 (Overall, 2013). Ageing, however, will also be dependent upon genetics, size, breed, hybrid vigour, family characteristics, individuality, lifestyle, nutrition and the environment (Landsberg et al, 2013).

Human twin studies have shown that heritable influences result in 25 per cent of the variation in life span and that the environment and lifestyle of an individual result in 75 per cent of the variation (Herskind et al, 1996).

The ageing process

Despite its universal application, the ageing process remains little understood; but we know that it affects the cells of all body systems. However, it is

recognised that during ageing 'the inevitable changes in biological processes within the body result in a progressive reduction in the animal's ability to cope with internal physiological and external environmental stressors' (Heath, 2002).

One well-accepted theory related to ageing is that associated with free radicals – the unstable, reactive 'oxygen species' that are produced naturally, endogenously, in our cells from energy production and as a result of infection and

inflammation; and that occur exogenously in our environment as air pollution and ionising radiation, for example.

The rate at which these 'oxygen species' affect an animal's body will be dependent upon how efficiently the body's internal and external defence mechanisms are functioning. The efficiency of such systems inevitably decreases with age, so the susceptibility of the ageing pet to free radical damage increases.

As free radicals react with protein, fat and DNA –



"Too many owners still assume that many of the cognitive and physical changes associated with their pet's old age are simply part of 'getting old', that they are inevitable and that nothing can be done about them"



*Suggested Personal & Professional Development (PPD)



GERIATRICS

and older animals have a decreased capacity to produce antioxidant enzymes – the results in affected pets will be cell damage, cell dysfunction, neoplasia and cell death. This, in turn, leads to physical deterioration and a greater susceptibility to infection,

particularly in those individuals exposed to a lifetime of negative environmental factors (Overall, 2013). With its concentration of protein, fat and DNA, the brain is particularly targeted by free radical activity in the ageing animal.

Old age doesn't come alone

A behavioural change in any elderly pet should be a source of concern and should be mentioned to the veterinary team – if there is no obvious external stimulus to initiate the change, the alteration in

behaviour is likely to be caused by internal stressors associated with illness or old age.

Typical of the physical deterioration observed in older animals are lower energy levels, sensory deficits (sight, hearing, taste and smell),

Table 1. Behavioural signs of neurological and sensory changes associated with ageing

Sign	Result
Confusion	<ul style="list-style-type: none"> ■ loss of recognition of social and environmental stimuli
Attitude or personality change	<ul style="list-style-type: none"> ■ decreased/loss of interest in people and/or other pets ■ out-of-character 'neediness' ■ social hierarchy changes ■ inter-dog aggression provoked by individual's bizarre behaviour
Decreased activity – apathy/depression	<ul style="list-style-type: none"> ■ decreased exercise tolerance ■ decreased interest in play ■ reduced interest as a social companion to family ■ increased weight ■ chronic stress increasing 'negativity' ■ increased daytime sleep
Increased activity – pacing, repetitive activity	<ul style="list-style-type: none"> ■ reduced night-time sleep <ul style="list-style-type: none"> ■ wakefulness ■ agitation ■ vocalisation ■ demands for attention ■ destructive behaviour ■ increased irritation of family, leading to punishment and increased anxiety
Increased frequency of normal behaviours – barking, whining, drinking, licking	<ul style="list-style-type: none"> ■ agitation in owner ■ frustration if behaviour interrupted ■ anxiety if behaviour punished
Loss of learned associations	<ul style="list-style-type: none"> ■ disorientation ■ house training breakdown ■ social breakdown
Increased anxiety or irritability	<ul style="list-style-type: none"> ■ increased likelihood of: <ul style="list-style-type: none"> ■ anxiety related conditions (e.g. separation problems) ■ social anxieties (especially cats) ■ noise fears and phobias ■ aggression if disturbed/need to move to avoid stimulus
Appetite change	<ul style="list-style-type: none"> ■ increased ■ decreased ■ bizarre – pica
Memory loss	<ul style="list-style-type: none"> ■ social confusion ■ environmental confusion and possible toileting issues ■ aggression to family and other pets
Inability to cope with change	<ul style="list-style-type: none"> ■ anxiety ■ irritability ■ aggression
Loss of house training	<ul style="list-style-type: none"> ■ loss of learned appropriate associations ■ loss of ability to communicate needs ■ loss of inhibition
Disorientation	<ul style="list-style-type: none"> ■ getting lost in familiar places ■ failure to recognise familiar people ■ failure to recognise familiar objects (e.g. barking at furniture) ■ inappropriate reactions to familiar objects/situations (e.g. waiting at wrong side of exit door)

Table 2. Essential advice to convey to the owners of elderly pets during clinic visits

Resource	Dogs	Cats
Food and water	<ul style="list-style-type: none"> ■ help dogs with joint and spinal problems to eat and drink more comfortably by raising bowls ■ prevent slipping with non-slip matting, extend to regular walkways on lino or parquet 	<ul style="list-style-type: none"> ■ raise bowls off ground by a few centimetres to ease joint and spinal discomfort and separate the drinking and eating locations ■ many cats feel more secure eating on raised surfaces (windowsills/worktops) – provide a ramp or steps (Gunn-Moore, 2014)
Activity feeding	<ul style="list-style-type: none"> ■ relieve behavioural frustration and lack of mental stimulation with purchased and home-made puzzle feeding ■ many small meals, in quiet places, will enhance digestibility and can be timed to coincide with times when the dog might otherwise be anxious or uncomfortable ■ activity can replace lost exercise (Landsberg et al, 2012) 	<ul style="list-style-type: none"> ■ cats benefit from many small meals ■ gentle puzzle feeding games encourage movement, enhance investigation and encourage cognitive activity (Ellis, 2009)
Home environment	<ul style="list-style-type: none"> ■ once the dog's sensory system begins to decline it is important that the layout of the home environment remains as consistent as possible (Warnes, 2015) 	<ul style="list-style-type: none"> ■ the cat's capacity to cope will benefit from a consistent map of the physical environment, but its olfactory map will also be very important ■ using products such as Feliway (Ceva) can assist, as can ensuring that sleeping and resting places smell of the cat ■ pheromones can be harvested from the cat's facial area with cotton gloves and rubbed over novel items brought into the home
Toileting	<ul style="list-style-type: none"> ■ sensitivity and tolerance may be required – e.g. an outside latrine close to the door or puppy pads in a large tray inside the home ■ owners will need to be extra observant of subtle signs of requiring help to leave a room as dogs may forget which side of the door opens ■ owners may need to take their dog to their latrine regularly, particularly after food or sleep 	<ul style="list-style-type: none"> ■ need an area separate to eating and drinking areas (unless the cat is very incontinent) ■ use larger trays with lower sides to improve access for cats with mobility problems ■ if cats have previously toileted outside, they may no longer be able to manage a cat flap, so a tray with fine-grained, sand-like litter may be preferred (Warnes, 2015)
Resting areas	<ul style="list-style-type: none"> ■ the dog will require comfort and support (memory foam) ■ bed size may need to increase to prevent the dog being forced to curl a painful spine ■ sides should be low for ease of entry and exit ■ areas should be draught-free and warm because the dog may not be able to move to keep warm ■ bedding would benefit from smelling of the owner, but care must be taken that the dog doesn't become 'tangled' in items ■ Adaptil diffuser and collar (Ceva) may help the dog to settle overnight 	<ul style="list-style-type: none"> ■ although beds should be easy for the cat to access, the cat will feel exposed if sides are too low, so select an easy entrance facing away from activity with higher sides in other areas ■ bed should be large enough for them to lie out flat if they wish ■ cats prefer to rest in raised places, so older cats will benefit from ramps or steps in order to access both beds and observation areas ■ help elderly cats to keep warm using fleece and consider electrically heated beds. Don't wash bedding too often and replace bedding with pre-used items – cats rely on items that smell familiar and hence a pheromone diffuser can reduce anxiety when plugged close to the bed (Gunn-Moore, 2014)
Social interaction and play	<ul style="list-style-type: none"> ■ owners may assume the dog needs to rest, when it is actually withdrawn through discomfort ■ once pain is controlled, owners should encourage gentle social interaction and simple games – particularly those encouraging movement to 'puzzle-solve' for small portions of food ■ use remaining olfactory capacity in food searching ■ keep other family pets busy in other areas of the home during these activities 	<ul style="list-style-type: none"> ■ owners often think that elderly cats become "lazy" rather than appreciating that they are reticent to move owing to discomfort ■ once this is resolved, simple puzzle-feeding exercises and short periods of interaction with toys (e.g. fishing rod toys) or a slowly moving laser beam from a pen can provide entertainment and exercise ■ end games on very small portions of tasty food to complete the behavioural sequence and reinforce for future use

>>>

Resource	Dogs	Cats
Moving around (inside and outside home)	<ul style="list-style-type: none"> in addition to non-slip matting, consider non-slip ramps to aid access to the home, car and sofa 	<ul style="list-style-type: none"> cats can also benefit from non-slip matting and ramps – particularly to feeding, resting and observation platforms (Gunn-Moore, 2014)
Exercise	<ul style="list-style-type: none"> dogs with reduced exercise tolerance can receive substantial gentle exercise from numerous, small, puzzle-solving feeding exercises in the house and garden to replace set meals short walks that give the dog time to sniff around can replace longer walks, as can sniffing games to find food in the garden 	<ul style="list-style-type: none"> cats will also benefit from puzzle feeding to compensate for a reduced inclination for extensive exercise in addition, as cats may become confused whilst outside the home, owners should consider withdrawing access to the cat flap and if cats are to go into a garden they should be accompanied by the owner (Warnes, 2015)

musculo-skeletal degeneration and a compromised immune system. Consequently, many geriatric pets present with reduced mobility, reduced exercise tolerance, disorientation, increased risk of infection across organ systems and a decreased rate of recovery. As a result – but less often considered – many geriatric cats and dogs experience chronic pain; and the combination of this and a decreased capacity to escape from the pain or anxiety inducing stimulus (internal or external) will lead to anxiety or fear (Blackwell et al, 2013), irritability – and often – aggression towards family

members and other family pets (Cory, 2013; Landsberg et al, 2013).

The urino-genital and digestive systems are often affected by infection in the geriatric pet too. Whether these systems are infected, whether the animal is confused regarding learning associated with toileting behaviour, environmental cues, or whether the animal is simply too uncomfortable to be able to move in sufficient time, old age is often associated with a loss of toilet training in the elderly cat and dog (Bowen and Heath, 2005).

With so many older pets experiencing ageing changes associated with neurological and sensory changes, behavioural signs are often the first indication of geriatric changes (**Table 1**).

Use it or lose it

If elderly pets are to continue to live a full life – despite physical and sometimes cognitive challenges – and if families are to continue to perceive their elderly pets as fulfilling companions, it is essential that both pet and family play as full a role as possible in each other's lives. To ensure this, families need to make provision to maintain their pet's cognitive and physical function.

Too many owners, however, still assume that many of the cognitive and physical changes associated with their pet's old age are simply part of "getting old", that they are inevitable and that nothing can be done about them (Landsberg et al, 2010). Particularly at risk of exposure to this attitude are the many elderly pets whose owners have allowed their annual vaccinations and regular preventive parasite control to lapse.

It is the owners of these pets who will need significant inducement to re-engage with preventive strategies for their ageing pet. Consequently, it is the concept of the 'free' nurse clinic for the elderly pet that will often entice such owners to re-engage with medical care for their pet (**Table 2**).

In addition to these suggestions, owners should be encouraged to consider dietary supplementation. Supplementation with enzymatic and non-enzymatic antioxidants may benefit geriatric cats and dogs; and older dogs receiving a combination of dietary antioxidants showed better retention of learned behaviour compared to age-matched controls (Milgram et al, 2002).

Studies have shown that such supplemented diets can both reverse and prevent some of the behavioural changes associated with old age (Heath et al, 2007). Caution should be used, however, when supplementing the diet of the cat because some antioxidants found to be safe in dogs may be toxic – or potentiate toxic reactions – in cats.

Medium chain fatty acids have been found to have beneficial effects on cognitive function and may provide an alternative energy source for damaged brain cells with altered glucose metabolism (Landsberg et al, 2012); but, although likely to benefit cats, such diets have been found to be unpalatable. Elderly animals are often loath to accept dietary changes and the use of supplements that can be added to an existing diet, may be better accepted.

Supporting cognitive decline with medication

In addition to the medication required to control medical conditions and associated

"The veterinary profession has a responsibility to encourage the owners of geriatric pets to take advantage of the life-enhancing opportunities provided by behavioural and environmental enrichment"



discomfort, the behaviour of some elderly pets may be such that they will benefit from support from psychotropic medication (Landsberg et al, 2013). Such medication should be selected with the aim of improving cognitive function, reducing anxiety and encouraging the pet to sleep at night (Landsberg et al, 2011). The medication of choice will depend on compatibility with existing pharmaceutical regimens (Warnes, 2015).

Conclusion

There is increasing evidence to suggest that timely pre-emptive nutritional support can delay the ageing process and there can be no doubt that early medical intervention in age-related disease processes is crucial to maximising health. However,

if elderly dogs and cats are to 'live life to the full' the veterinary profession has a responsibility to encourage the owners of geriatric pets to take advantage of the life-enhancing opportunities provided by behavioural and environmental enrichment that can turn a life prolonged into a long life well lived. ■

PPD Questions

1. When should owners alert the veterinary team to a behaviour change in their elderly cat or dog?
2. When should veterinary staff enquire about old-age changes?
3. If consistency is important in the environment, should owners be advised to make no changes?
4. There is no cure for old age – why should owners be encouraged to consider treatments?
5. When should treatment strategies for cognitive dysfunction be implemented?

Answers

1. As early as possible. The earlier behaviour changes are recognised the sooner the underlying medical or behavioural condition can be treated, improving both the prognosis for treatment and the animal's welfare.

2. Owners of elderly animals will not always mention behaviour changes during practice visits, so veterinary staff should be asking owners about any changes in their pets' behaviour whenever they see dogs from eight years of age and cats from 10 years at the latest.

3. Environmental management strategies, aimed at improving accessibility to the environment and important resources, can significantly improve the quality of life of elderly cats and dogs with mobility problems, sensory loss or cognitive dysfunction.

4. Treatment strategies, such as increasing mental stimulation, encouraging physical activity, dietary supplementation and medication, can be effective in improving the signs and slowing progression of cognitive dysfunction in elderly animals.

5. The earlier these treatment strategies are implemented, the better the prognosis for improving the signs of cognitive dysfunction.

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*Suggested Personal & Professional Development (PPD)



POISONS

Dangers of dietary supplements

The past few years have seen an exponential rise in the number and variety of dietary supplements, some of which are medically valid and some of which promise easy alternatives to weight loss or achieving a healthy lifestyle. As always, there is potential for companion animals to access or be exposed to these preparations, which, depending on the class of compound involved, will have varying consequences.

There is a vast range of dietary supplements – some of the most common groups are multivitamins, vitamin D preparations, weight-loss preparations including bulking agents, joint supplements, omega-3 fatty acids and bee products, such as pollen or royal jelly.

Multivitamins

Multivitamins, even when taken acutely in large quantities, do not pose a significant risk to the health of the animal, as the quantities of each component vitamin are so small. Dogs ingesting large amounts of over-the counter (OTC) vitamins may experience some mild self-limiting gastrointestinal effects, but generally, no treatment will be required.

The vitamin D content of these OTC multivitamins is commonly between 1µg to 20µg per tablet, but the treatment dose of vitamin D in these preparations is 500 tablets/kg bodyweight (for a 1µg preparation), so even for a higher strength (20µg), a dog would need to ingest over 25 tablets/kg for there to be cause for concern.

Vitamin D analogues

On the other hand, vitamin D analogues – which are almost exclusively prescribed medications rather than OTC dietary supplements – have a really bad reputation in toxicology; with good reason. Some of the vitamin D analogues are extremely toxic – tacalcitol has a potentially lethal dose of <4µg/kg in dogs.

So, when dealing with vitamin D, you must be certain whether you are dealing with 'plain' vitamin D (as above) or with the common analogues of vitamin D₃ (colecalfiferol or cholecalciferol) or less commonly D₂ (calciferol or ergocalciferol). D₃ is frequently found in combination with calcium.

The dangerous dose of D₂ or D₃ is >0.5mg/kg (or 21,000 IU/kg) – given that tablets often contain around 400IU or less, it would be unlikely to be acutely dangerous.

Calciferol and colecalfiferol are rapidly absorbed and metabolised by the liver and kidney. The parent compounds and the intermediate metabolites have some limited pharmacological action but the major toxic effects are a consequence of the major metabolite, calcitriol, which enhances resorption of calcium from bone, absorption of calcium from the gut, intestinal calcium transport and proximal renal tubule reabsorption of calcium in the kidney. This gives rise to hypercalcaemia and toxicity.

Calcipotriol produces similar effects by the same mechanism.

If sufficient tablets were taken, the onset of clinical effects for calciferol and colecalfiferol would usually be within 12 to 36 hours. Initially polydipsia might occur in the absence of any other signs; subsequently, anorexia, depression, weakness, lethargy, recumbency, polyuria,

polydipsia, profuse vomiting and diarrhoea could all develop.

As the calcium concentration rises above 3mmol/L (12mg/dL – usually 24 to 36 hours) there may be severe vomiting, anorexia, constipation, ataxia, dyspnoea, tachypnoea, arching of the back, muscle spasms, twitching and convulsions.

In severe cases, hypercalcaemia and hyperphosphataemia may be present from 12 to 72 hours, and deposition of calcium in tissues may cause initial tachycardia, then bradycardia and renal insufficiency (polyuria, azotaemia and hyposthenuria) or renal failure. Haematemesis and haemorrhagic diarrhoea may occur as a result of calcification in the gastrointestinal tract, and pulmonary haemorrhage has also been reported.

Metabolic acidosis and leucocytosis and thrombocytopenia are occasionally seen too, and the commonest causes of fatality are shock and fulminant pulmonary oedema.

Cardiac abnormalities may also be seen on ECG and hypercalcaemic cardiac failure can occur if the serum calcium concentration exceeds 3.5mmol/L (14mg/dL).

These effects are all the result of raised calcium levels following vitamin D-mediated release from bone.

Treatment

Initial treatment will include emesis – if the dog or cat was

seen within a few hours – and activated charcoal probably has no real value. The main aim of therapy is to ensure adequate hydration and urine output and to control calcium concentrations and reduce phosphorus concentrations.

Drug therapy includes intravenous saline with furosemide, steroids, antiemetics, gastroprotectants, a phosphate binder and a bisphosphonate. Although lipid emulsion therapy should work (as vitamin D is lipophilic), the half life of vitamin D is too long for this to be practical.

Weight loss medications

This group of preparations has, over recent years, increased and diversified, with each new addition giving the hope of effortless weight loss. Amongst the most commonly ingested formulations are those containing orlistat – they are available both on prescription and OTC.

Orlistat

Orlistat is a potent, specific, long-acting inhibitor of gastrointestinal lipase, which leads to unfortunate leakage of fatty diarrhoea. Most animals, however, remain asymptomatic following ingestion. Other gastrointestinal effects reported in humans include increased defecation, oily/fatty evacuation, soft/liquid stools, faecal incontinence, flatulence with discharge and abdominal pain.

Gastrointestinal decontamination is not required, but it would be prudent to recommend a low fat diet for at least 24 hours. Rehydration is rarely needed.

Raspberry ketones

Raspberry ketones are sold as weight loss agents even though there is little evidence of their efficacy – they are the aroma from raspberry and are either extracted from



raspberry and other soft fruits or – more likely and cheaper – are synthesised. At very high doses in animal models, they may reduce weight gain in animals eating high fat diets (Morimoto et al, 2004).

The few cases the Veterinary Poisons Information Service (VPIS) has on file – and where follow-up is available – suggest that there is no stimulant effect. This fits with studies that show they are safe, acutely, unless very large amounts are given (Gaunt et al, 1970).

However, these compounds are often found mixed with:

- caffeine – which will clearly be a potential problem, causing stimulation, tachycardia, hyperthermia, restlessness; and
- more worrying, 5-HTP.

5-HTP

5-HTP (5-hydroxytryptophan or oxitriptan) is a naturally occurring amino acid

and chemical precursor, as well as being a metabolic intermediate in the biosynthesis of the neurotransmitters serotonin and melatonin from tryptophan. In addition to its role as an appetite suppressant, 5-HTP is used as an OTC antidepressant (and indeed as a prescribed antidepressant elsewhere in the world).

The risk is that some animals – and we have several severe cases in dogs – develop a serotonin syndrome after ingesting even small amounts.

It is available as 100mg tablets and a 30kg Labrador retriever – that reportedly ate 50 to 60 tablets – developed hyperthermia, tachycardia, tremor and convulsions. This is a not uncommon picture and the onset of clinical signs may be rapid (<30mins), with recovery taking in his case two days, but sometimes longer.

Treatment, other than early emesis and activated charcoal – if safe to do this – is aimed at controlling the hyperthermia and convulsions. Ideally, diazepam (or barbiturates) can be used to calm agitation, tremors or convulsions, and it should not be necessary to scale up; although propofol constant rate infusion could be considered, if required.

Intravenous fluids may be needed to maintain hydration and to assist, when cool fluids are used, in controlling hyperthermia.

Cyproheptadine (Periactin, Auden Mckenzie) is a non-specific serotonin antagonist that has been used in dogs (Wisner, 2000). A suggested dose of 1.1 mg/kg orally or rectally every one to four hours should be used until signs resolve. The dose should be given rectally if there is vomiting or activated charcoal has been given recently.

Bulking agents

'Bulking' agents are also claimed to aid weight loss. Fibre complex of plant origin, contains various forms of cellulose – microcrystalline cellulose, hydroxypropyl methylcellulose (HPMC) and others, for example. The mode of action of these agents is to make the gut 'feel fuller' – which, in fact, it is!

As these products are of plant origin, they work in part by holding additional water in the colon. This is likely, when taken in quantity, to produce diarrhoea. Treatment will only be supportive with additional fluids and control of diarrhoea.

Other supplements Fish oils

Fish oils are used as nutritional supplements and have high concentrations of omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The most common oil is cod liver oil (derived from liver of cod fish) which also contains vitamin A and vitamin D. Halibut oil, salmon oil and shark oil are also used. Krill oil is similar and made from a species of krill (*Euphausia superba*), a small crustacean.

Typically, capsules containing fish oil are available in various strengths (500 mg, 1,000 mg, 1,200 mg) and there is little information on toxicity in animals (Anon, 2011). They are, however, generally considered to be of low acute toxicity, because their content of vitamins A and D is low and insufficient to cause acute toxicity, even if a very large quantity of capsules has been ingested. No treatment is likely to be required.

Joint supplements

Joint supplements commonly contain chondroitin – a glycosaminoglycan that is a structural component of cartilage – and glucosamine, which is a naturally occurring amino-sugar that is a precursor for the biosynthesis of the glycosaminoglycans and proteoglycans of the cartilage matrix.

It is widely used for the relief of joint pain and stiffness, and to improve joint movement and flexibility. There may be a variety of other ingredients present, including green-lipped mussel extract – a rich source of nutrients, including glycosaminoglycans, such as chondroitin, vitamins, minerals and omega-3 triglycerides.

There is insufficient information to determine the toxic dose of a joint supplement. Liver toxicity has been reported after 20 to 240 tablets (Khan et al, 2010) and an emetic and/or activated charcoal should be considered, particularly after a large ingestion.

Gastrointestinal signs – usually only diarrhoea (often watery), sometimes accompanied by vomiting and abdominal discomfort – can occur within one to three hours, with recovery invariably occurring within 12 to 48 hours.

Liver damage (Khan et al, 2010) and multi-organ dysfunction has been reported in dogs after ingestion of joint supplements (Khan et al, 2010; Nobles and Khan, 2015). The onset of elevated liver enzymes has been reported as 24 to 48 hours in most cases but occurred within 10 to 12 hours in two cases. The cause of hepatotoxicity is unknown

and liver toxicity has not been reported in any VPIS cases with follow up.

Bee products

Bee products – such as pollen, propolis and royal jelly – are claimed to do wonders for our complexions, vitality and overall health, and can be considered non-toxic, even when ingested in large quantities by overenthusiastic pets. The VPIS has numerous cases where dozens of tablets or capsules caused no clinical signs at all.

Conclusion

Always ensure the correct identification of any dietary supplement, obtaining the packaging or manufacturer's information if possible and check that nothing has been consumed with it. ■

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"The past few years have seen an exponential rise in the number and variety of dietary supplements..."

Pets continue to gain the pounds

Pet weight clinics have been around for a long time, most having a varied degree of success and it's more than likely that they mirror the success of human diet programmes.

Losing weight for most of us is a tedious and depressing activity yielding only a marginal degree of success and it would seem that this is reflected in our attempts to help our pets do the same.

It has been reported that one in five dog owners have been advised to put their dog on a diet because they are overweight (Dog Obesity Survey, 2015).

Although some owners simply feed their pets too much – and what dog or even cat will refuse more tasty morsels in their bowl – there is a growing tendency to feed pets treats or extra tidbits either on demand or just as commonly, because the owner takes pleasure in doing so. The proliferation of small, but expensive packets of treats has done nothing to curb this trend.

The PDSA Animal Wellbeing Report for 2015 reported that over 3.3 million dogs receive a daily treat from their owners. In general, owners were most influenced to give their pet a treat because they wanted to make them happy and provide variety for them; but it was noteworthy that about 20 per cent of owners gave treats because it made them themselves feel happy. Alongside these treats, dogs are also being fed toast, human biscuits, takeaways, milk, chips, cake, human chocolate and alcohol – despite the fact that some of these foods are toxic to pets.

In an interesting feature article in the *Veterinary Record* (Sandoe et al, 2014, *Vet Rec* 175: 610-616), the authors point out the importance of studying the human-animal bond in relation to obesity and argue that it is, 'probably the most important health issue of man and pets in Western countries, is a shared epidemic, often directly related to aspects of this shared human/pet lifestyle'. The One Health approach has until now concentrated very much on the benefits companion animals may offer human health, but in the case of obesity, there can be two-way benefits.

By adopting a two-way approach and looking at the link between owner and pet obesity, both medical and veterinary professions may begin to have more success in tackling what is now a serious health problem for both humans and animals.



In the case of owners, obesity is linked to Type 2 diabetes as well as a myriad of other weight-related illnesses and conditions. In the case of pets, obesity can increase the risk of other health problems, such as orthopaedic and cardiorespiratory disease and reproductive disorders.

So what role do the medical and veterinary professions have to play in the obesity epidemic? Perhaps the major role is in more education about the hazards of being overweight and, in the case of pets, showing how what may be perceived as a kindness, indulgence or treat, could in fact be another nail in the coffin of a much-loved pet. For a long time it has been said anecdotally that overweight pets tended to have overweight owners; and that these were the owners who had the most difficulty in helping their pets to lose weight. Sandoe et al point out that 'It may be necessary for people to be able to recognise and tackle their own unhealthy lifestyles before they can recognise and address the problems related to the overfeeding of their animal companions'.

From a medical point of view, it is only when someone is able to accept that they are overweight and they understand the adverse effects on their health, that they will begin to attempt to lose weight. If an owner is unable to accept that they themselves are overweight, what chance is there for their overweight pet?

The One Health approach should enable both vets and doctors to transfer the health

implications of obesity from human to animals – and vice versa – in such a way that both owner and pet are able to enjoy healthier lifestyles.

Nurses' weight clinics can play an important part in reducing pet obesity once owners have either been referred to them or sought help themselves for their overweight pet. One of the challenges such clinics have always had is that encouraging owners to restrict their pet's diet is potentially taking away from them a great deal of the pleasure of owning the pet. This is why it is imperative that the nurse pulls no punches when it comes to explaining the dangers of a pet being overweight.

We are in danger of becoming a nation of overweight, unhealthy individuals and it would be cruel of us to force this upon our pets as well.

Perhaps we should also consider the five welfare needs set out in The Animal Welfare Act 2006 to which all our pets are entitled:

- the need for a suitable environment
- the need for a suitable diet
- the need to be able to express normal behaviour
- the need to live with or apart from other animals
- the need to be protected from pain, suffering, injury and disease.

The owner of an obese pet is almost certainly not complying with the second, third and fifth of these needs. ■



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Ins and outs of equine housing

Generally, horses are stabled for human convenience; however, stabling is also sometimes essential for medical management of sick or injured individuals. Whatever the reason for stabling, horses have specific requirements of which Registered Veterinary Nurses (RVNs) must be aware.

Along with normal stable requirements, accommodation in an equine hospital warrants specific fittings, fixtures and cleaning protocols in order to maintain the health of the patients and the biosecurity of the practice.

Medical reasons for stabling

Stabling is an essential factor in the management of sick or injured horses, for example in the following situations:

- orthopaedic problems requiring box rest
- monitoring of sick patients requiring the horses to be stabled
- as a preventive measure for certain conditions such as laminitis, insect bite hypersensitivity or horses suffering from mud fever or rain scald
- in situations requiring isolation. (Linnenkohl and Knottenbelt, 2012)

General considerations

Size

Stabling can come in many forms and variations – from one or two loose boxes to large barns. There are some minimum requirements regarding dimensions that are standardised by the British Horse Society (BHS) and these are displayed in **Table 1**.

Walls

Walls can be made out of several materials. Wood may be the cheapest material, but



Figure 1. Brick is the most desirable stable building material.

it has disadvantages. It is:

- prone to being chewed by horses and rodents
- susceptible to damp
- invariably harder to disinfect
- a fire risk
- difficult to eradicate contagious pathogens – ringworm or infectious causes of diarrhoea, such as *Salmonella spp.*, from wooden structures. (Monsey & Devaney, 2012)

Brickwork is more expensive but is easier to keep clean and can be treated with antifungal paint or rubber (Monsey & Devaney, 2012) (**Figure 1**).

A cheaper option is to build up a brick base to prevent vermin and damp and put wooden sections on top. Breeze blocks are

the cheapest type of brick available (Scorer, 2006).

Floors and drainage

Floors are usually made of concrete as it is hard-wearing and relatively cheap. When laying concrete it is important to roughen the surface to prevent the horse from slipping.

Drainage must be considered when laying a floor in a stable. It may consist of a slope leading to a drainage hole at the base of the wall or the use of 'porcupipes', which are holes embedded in the floor leading into a system of pipes that carry fluid away (Scorer, 2006). If the floor slopes into a drainage hole, it is important to position it in a place where the horse cannot stand in it and injure itself. Drains are essential within and outside a stable to facilitate effective cleaning. They must always have covers on and these should be cleaned out daily to reduce the build-up of waste products.

Ventilation

Ventilation is important to avoid draughts at ground level – which can cause a chill – yet maintain a through-flow



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HOUSING

Table 1. Recommended stable dimensions (Monsey & Devaney, 2012)

Type/size of horse	Minimum dimensions
Ponies (up to 14.2 hands)	3.05m x 3.05m
Horses (up to 16.2 hands)	3.65m x 3.65m
Large horses (>16.2 hands)	3.65m x 4.25m
Foaling boxes	4.25m x 4.25m

of air to prevent a build-up of bacteria and reduce the transmission of airborne infection (Scorer, 2006). There are two types of ventilation – passive and active.

Passive ventilation:

- can be achieved by keeping the top door of the stable open to allow air to pass through and up into the apex of the roof
- air vents allow the air to pass out and fresh air is then drawn in through the door, maintaining a cycle
- the heat from the horse rises upwards and further encourages this cycle – this is called the ‘stack’ effect
- windows should be located on the same side as the door to prevent through draughts but provide light

- windows should be hinged at the bottom and open outwards. There should be a wire mesh or iron bars covering the glass to prevent the horse from injuring itself on the glass (**Figure 2**)
- the glass itself should be wired safety glass. (Scorer, 2006)

Active ventilation:

- pulls air mechanically into and/or out of the stable, usually by the use of an extractor or air-conditioning system (Scorer, 2006)
- is expensive and, as a consequence, rarely seen in equine accommodation.

Recurrent airway obstruction (RAO)

This condition is relevant to RVNs as horses are often admitted to the hospital

with RAO as a secondary condition. It is very important for RVNs to be able to recognise and manage horses with RAO as part of a holistic nursing approach.

RAO is a chronic respiratory condition where the horse develops a sensitivity to dust antigens in the environment (Scorer, 2006). When horses with RAO are exposed to allergens, a complex inflammatory cascade is initiated which results in:

- airway inflammation
- increase in the volume and viscosity of airway discharge
- increased numbers of inflammatory cells (neutrophils) in the airways
- Bronchospasm. (Slater & Knowles, 2012)

Typically RAO is seen in stabled horses and is often



Figure 2. There should be a wire mesh or iron bars covering glass in stables to prevent horses from injuring themselves.

linked to moulds in hay and straw. Horses at grass can also develop sensitivity to pollen – known as summer pasture-associated obstructive pulmonary disease (SPAOPD) – with similar clinical signs to

Table 2. Types of bedding [Scorer, (2006) and Linnenkohl & Knottenbelt, (2012)]

Type of bedding	Comments	Advantages	Disadvantages
Straw	Barley straw may be eaten so wheat straw is more commonly used as it is less palatable	Good insulating properties. Inexpensive to buy. Easily disposed of and recycled	Dusty, therefore can increase the risk of RAO. May harbour spores. Barley and oat straw can be eaten and may cause impactions
Shavings	Used as an alternative to straw Bought in bales	Absorbent and can be bought dust-extracted so better for horses with RAO. Provides warmth	More expensive than straw. More difficult to dispose of waste. Will compost down in time
Sawdust	Used as an alternative to straw Bought in bales	Absorbent and provides warmth	More expensive than straw. More dusty than shavings. More difficult to dispose of waste. Will compost down in time
Paper	Can buy in bales or shred newspapers yourself	Absorbent and dust free. Reasonably warm	More expensive than straw. More difficult to dispose of waste. Will compost down in time
Peat moss	Used as an alternative to straw Bought in bales	Inedible. Dust free. Easily recycled. Reasonably warm	More expensive than straw. Can soften the feet. Environmental issues – becoming less readily available
Hemp	Used as an alternative to straw Bought in bales	Dust and mould free. Warm	Expensive and can be eaten
Rubber matting	Surface is anti-slip and lower Surface has drainage channels Buy as mats	Cheap to maintain after initial purchase. Good drainage and supports horse's feet. Can provide warmth	Initial cost is expensive. Little warmth if used alone; therefore, will need to purchase additional bedding

horses suffering from RAO. Good stable ventilation is particularly important to help reduce the risk of horses developing RAO.

Symptoms

The horse will develop a cough and display poor performance when ridden. Mucus is brought up, but there should be no elevation in temperature. Eventually the horse will begin to have difficulty breathing and will wheeze as the airways in the lungs narrow (Scorer, 2006).

Affected horses may also develop a 'heave line' (hypertrophy of abdominal muscles resulting from chronic and severe dyspnoea) (Slater & Knowles, 2012).

Treatment

Treatment for RAO includes environmental management – keeping the horse turned out as much as possible, using dust-free bedding and soaking hay or feeding haylage. Bronchodilators are used to reverse bronchoconstriction and improve ciliary clearance (Slater & Knowles, 2012). These agents can be given as an oral medication in feed or used as an inhaled drug.

Corticosteroids are also used to block the inflammatory cascade; however, there is a risk of laminitis associated with the use of these drugs (Slater & Knowles, 2012). Overall prevention is – as always – much better than cure with RAO and this can be achieved if close attention is paid to good ventilation, and use of dust-free bedding and dust-free forage.

Bedding

Bedding is used to provide warmth and comfort to the horse. A bank of bedding should be built up around the edge of the stable (Figure 3) to reduce draughts, provide comfort and to help prevent the horse getting cast (stuck against the wall).

The ideal bedding should be:

- warm
- absorbent

- soft
- easily managed
- non-toxic
- dust/damp free
- readily available
- easily disposed of and recycled (Scorer, 2006).

Table 2 shows the types of bedding available and the advantages and disadvantages associated with each.

Bedding for special cases

Patients often have specific bedding requirements according to the condition from which they are suffering. It is important to understand the different requirements of these patients, in order to be able to prepare appropriate accommodation quickly and effectively.

RAO

The most important aspect of treating RAO is to remove the cause of the problem – the dust, mould and/or pollen usually found in hay and straw (Scorer, 2006). These horses should be fed haylage or soaked hay. However, the more moisture that is contained in the bedding, the more likely it is to become mouldy.

Straw should be substituted with hardwood dust-extracted shavings, paper, peat or rubber matting.

Laminitis

This is inflammation of the laminae of the foot. The feet receive an inadequate supply of blood and this in turn damages the blood vessels, causing inflammation and pain (Scorer, 2006).

Horses with laminitis need to be stabled and will require soft, supportive bedding such as shavings. As these horses also like to lie down a lot, rubber matting should be used with a deep bed on top (Scorer, 2006). The bedding should be continued all the way up to the door and food and water situated close together.



Figure 3. A bank of bedding should be built up around the edge of the stable to reduce draughts, provide comfort and to help prevent the horse getting 'cast' (stuck against the wall).

Colic

It is vital that these patients do not have access to edible bedding, as they may need to be starved. Shavings, peat or paper can be used; and a deep bed should be supplied, with banks as the horse is likely to want to get down and roll (Scorer, 2006).

The patient should be put in a part of the hospital where it can be monitored easily.

Lighting

Lighting may be natural or artificial. Natural lighting is achieved by using windows, skylights and leaving the top half of the stable door open; but to ensure that owners and staff can see adequately, some form of artificial lighting must also be available (Scorer, 2006).

The most common form of artificial lighting is a fluorescent strip light attached to the eaves of the roof; and hanging light bulbs are not advised as the horse may be able to reach them with serious consequences. Light switches should be placed outside the stable and protected from moisture with a waterproof cover; and all cables inside or outside the stable should have sufficient waterproof coverings (Scorer, 2006).

Heating

Healthy horses can tolerate a wide range of temperatures as long as the air remains dry and draught free. Sick or

injured horses, however, and neonatal foals may require the use of supplementary heating, examples of which are listed below:

- rugs and bandages – indoor and outdoor rugs are available for all shapes and sizes of horse, pony or foal. Bandages should be applied securely and the use of 'gamgee' underneath will reduce the risk of the patient developing bandage sores
- duvets – commonly put under a stable rug to add extra warmth. Ensure the duvet is secured correctly to prevent slipping
- central heating – effective but very expensive, so rarely used. Heating units should be kept out of the horse's reach
- electric fans – can be noisy and create dust. Ensure that the unit is kept out of the horse's reach.
- infrared heat lamps – can be small, portable or permanent fixed to the wall (Figure 4). Either must be a safe distance away from the horse (Scorer, 2006).

Fittings

Some fittings are required for all stables. However, equine hospitals will need some more specific fittings and equipment. Care should be taken to ensure that all fittings are secure and placed in an area that is convenient for staff but will not endanger the horse:



Figure 4. Permanent heat lamps are a good source of supplementary heat for sick horses.

- hooks are required on the top and the bottom of the stable doors to hold them open and prevent them from slamming, which will frighten horses
- bolts on both doors – one on the top door and two on the lower door. A kick bolt is advised for the lower bolt to prevent clever horses who undo their top bolts to escape!
- metal strips are required on the horizontal part of the lower door to prevent the horse from chewing the wood
- tying rings should be placed at the front of the stable at the horse's eye level. Hay nets can be tied straight on to the tie ring. When tying a horse up the horse must always be attached to bailing twine, not the tie ring. If the horse panics the bailing twine will snap and release the horse
- automatic water bowls are not usually used in an equine hospital. Whilst they do save on labour, the main disadvantage is that it is not possible to monitor how much the horse is drinking (Scorer, 2006). This is not ideal for RVNs when monitoring sick patients. Usually a large water bucket is supplied as horses will drink approximately 20-40 litres of water per day under normal circumstances (Scorer, 2006). Water should be changed frequently as it does absorb ammonia from the bedding, and the water bucket should be emptied and disinfected at least once daily for every patient
- feed troughs and mangers may be concrete, wooden or plastic. These fittings are useful for patients that cannot have a hay net –

Figure 5. Fluid hangers are hooks attached to the ceiling used for suspending intravenous fluid bags.



The mucking out process

- the horse should be removed from the stable and either tied up outside or put in another box. This is safer for the person mucking out and for the horse as it can't injure itself on any of the equipment
- water buckets should be removed and disinfected before being refilled and put back once the stable has been mucked out
- hay nets and discarded/uneaten hay should be removed
- starting at the front of the stable, any droppings should be removed and put on the wheelbarrow
- the remaining bedding should be forked up so that any further droppings can fall down. These should be removed
- any urine soaked bedding should then be removed. Clean bedding should be put to one side to be re-used
- the floor should be swept and left to dry before the clean bedding is spread back on to the floor. Fresh bedding should be applied on top, if required
- banks can be built if needed and the front of the bed should be swept back into a straight line. The bed should be thick enough so that if a fork is stabbed in to it, the floor cannot be felt
- the clean water bucket and fresh hay net can then be replaced (Monsey & Devaney, 2012).

foals and patients with eye ulcers. Feed troughs and mangers must be placed high enough for the horse to feed comfortably but not so high that they can't reach the food and they must be cleaned out and disinfected regularly to reduce contamination (Scorer, 2006)

- fluid hangers are hooks attached to the ceiling for suspending fluid bags for intravenous (IV) administration and other medications (**Figure 5**). Ideally, an overhead pulley system is used to raise and

lower the fluids when the bags need changing, and a spiral giving set allows the horse to move freely around the stable (Scorer, 2006)

- door grills are used to prevent the horse from being able to get its head over the stable door (**Figure 6**). These are used for patients with indwelling IV catheters. As the jugular vein is most commonly used for catheters in horses, the grill is used to prevent the horse from rubbing the catheter on the door and/or pulling it out.

Figure 6. Door grills are used to prevent the horse from being able to get its head over the stable door and damage indwelling intravenous catheters.



Cleaning stables

It is very important that stables are 'mucked out' regularly and *correctly* to preserve the health of the in-patients and to prevent the spread of disease. As a general rule, stables are mucked out properly once daily in the morning and then 'skipped out' (all the faeces are removed but none of the urine) in the afternoon.

Each yard should have designated equipment such as a wheelbarrow, fork, yard brush and 'skip' and these can be colour coded for easy identification. This equipment should be disinfected on a daily basis.

Disinfecting stables

After each horse is discharged, its stable should be emptied of all bedding and then disinfected with an appropriate solution. In the case of horses with an infection, the stable should then be swabbed for culture, and cleaning repeated as necessary. (Monsey & Devaney, 2012)

All rugs, brushes, head-collars and lead-ropes, hay nets and water buckets used by the horse should be thoroughly washed and disinfected. It is very important that protocols are in place for the mucking out, maintenance and disinfection of stables and equipment in the hospital. Creation and implementation of these protocols would normally fall under the responsibility of an RVN.

Conclusion

Horses require specialised housing in general, and requirements are even more specific for equine hospital accommodation. Therefore, an RVN should have a good working knowledge of the requirements for accommodation in an equine hospital, including the size of the stable, bedding type and ventilation together with more specific requirements, such as access to a fluid hangers and heat lamps.

A broad knowledge of equine veterinary conditions is also required so that the correct accommodation can be prepared for each patient to suit their individual requirements.

RVNs are also required to produce protocols for the cleaning, disinfection and maintenance of equine

hospital accommodation. These protocols will help ensure that the health of the in-patients and the biosecurity of the equine hospital are both maintained effectively. ■

PPD questions

1. How large should a foaling box be?
2. What does RAO stand for?
3. Which type of bedding is not suitable for a colic patient?
4. Why are automatic water bowls not generally used in equine hospitals?
5. How often should a stable be cleaned out every day?

Answers

1. 4.25m x 4.25m
2. Recurrent airway obstruction
3. Straw
4. Water intake cannot be accurately monitored with automatic water bowls
5. At least twice – they should be mucked out in the morning and skipped out in the afternoon

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Creating the next generation of veterinary nurses

Veterinary nurse training has evolved to become a multidimensional learning experience, preparing prospective veterinary nurses for successful careers in practice. Whilst practical training is a key component when preparing individuals for their career in veterinary nursing, their personal and professional development while training is paramount in generating a well-rounded and successful nurse.

The responsibilities of the modern veterinary nursing team are extremely varied and creating resilient, competent and caring professionals that thrive in practice is the goal of the national college for veterinary nurse training, Central College of Animal Studies.

Direct and ongoing close contact and communication between the college and practices facilitate tailored and flexible training programmes designed to produce graduates who contribute effectively at all levels within the practice.

The college is an advocate for small group training where dialogue and collaborative processes become the foundation of the learning experience. With careful planning and structured sessions, small group learning turns teacher into facilitator, and redirects the emphasis on teaching to the group as a whole.

By employing a range of different strategies when addressing nurse training, such as problem-based learning, discussion, workshops and seminars, the college can best meet the needs of all the individuals within the group. The added bonus is that by adapting and varying course delivery methods on a small group basis, every member of the teaching group will develop a variety of skill sets to match those of their peers.

Varying teaching methods to incorporate both practical and theoretical methods addresses the issue of maintaining levels of engagement in course material by assigning so much of the discussion and practical work to the group as a unit. Preparing the trainees for their subsequent life in the workplace in this way also instills teamwork values and a strong work ethic.

Being able to react, adapt and interact appropriately are key skills imperative for the successful career as a veterinary nurse in practice.

“Small group based learning provided by Central College proves invaluable in promoting interactivity and reflexivity in the workplace”

Having training centres located close to or within practices creates both an easy and convenient access to current case loads but also helps to instill professional values in the learning process. Offering student nurses the opportunity to train on site with access to state of the art equipment and facilities encourages responsibility and creates a natural progression from student to professional employed nurse and valued team member.

Central College tutors are experienced and regularly work in practice enabling them to pass on current techniques while recent and current case loads help generate discussions, contextualise learning and ensure deeply embedded skills that can be used in the future.





Teaching staff who work in practice offer a realistic view of what life in practice can offer, and advise accordingly when certain topics or situations arise. With the veterinary industry forever developing and progressing, the teaching and learning experience becomes a shared one, with staff developing their teaching methods and skills as an on going process.

With kinaesthetic learning at the heart of nurse training, student nurses can develop the skills and techniques in a controlled and monitored setting that they can then apply their theory based learning to. When delivering course material assessors can best assess when students are ready to make the transition with their learned skills and theory into a practical environment.

Generating confidence in students and their practical skills is vital in ensuring that they are assertive, decisive and competent when they enter the work place. The unrivalled benefit of working on a small-group basis means that the process of mentoring extends beyond the assigned individual in practice to the training provider.

This pioneering approach to veterinary nurse training by Central College of Animal Studies extends the teaching and assessment experience into an opportunity for students to grow into a well-rounded, adaptable and versatile individual by instilling core values and cultivating creativity, passion and enthusiasm.

With its centres based close to – or within – practices and with access to high-calibre facilities, teaching spaces, the latest technologies and a varied caseload, students of Central College are promised a great learning experience and introduction to the veterinary nursing profession. ■

Practices looking to develop their veterinary nursing teams or experienced nurses looking for careers as tutors should contact Central College of Animal Studies by phone on 01359 243405. For further information or for online enquiries visit www.ccoas.org.uk



**CENTRAL COLLEGE OF
ANIMAL STUDIES**



John G Matthews
BVMS BSc MRCVS

John qualified from the University of Glasgow in 1975. He then spent three years in the biochemistry department of the Central Veterinary Laboratory, Weybridge, before entering general practice – and becoming a partner in mixed practice in Essex, until retiring in 2013.

John is honorary veterinary surgeon for the British Goat Society and a past president of the Goat Veterinary Society. He is also a visiting lecturer at the University of Cambridge; and, with his wife, he has a pedigree herd of high-yielding British and British Saanen goats, having also kept Angora and Cheviot goats in the past.



**Suggested Personal & Professional Development (PPD)*

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GOATS

Management of the periparturient goat

Management of the doe during pregnancy and between kidding and peak lactation is essential for the health of the animal and the economic success of the goat farmer. This is the critical period in the goat reproductive cycle and the period during which most problems occur.

Goats should remain fit but not fat – a body condition score of 3 is ideal. Body condition at kidding plays a pivotal role in determining subsequent health, production and reproductive performance. Both overfeeding and underfeeding in late pregnancy increase the risk of metabolic disorders. In the United Kingdom over-fat does and multiple foetuses – rather than underfeeding – cause most periparturient problems (**Table 1**).

The gestation period for the goat is approximately 150 days, but 80 per cent of foetal growth occurs during the last six weeks of pregnancy, so additional nutrients are not required until this time. During the third trimester of pregnancy, the nutritional requirements of the doe for crude protein and energy increase above those required by a non-productive adult by about one and a half times for does carrying a single kid and two times for those carrying twins (**Figure 1**).

Breeds such as the Anglo-Nubian, that often produce three or more kids, face a greater challenge than breeds

where singles or twins are the norm. In addition, many animals will still be growing and/or lactating. Their requirement for calcium and phosphorus is similarly increased. At this time of increasing nutritional demand, dry matter consumption is depressed because the growing kids restrict abdominal space and rumen fill.

Abdominal volume is further reduced in goats carrying large amounts of abdominal fat. A similar – or even greater – increase in nutritional requirement occurs during the transition from late gestation into lactation. A goat at peak lactation can produce its own weight of milk in 10 days.

The dry period

As with cows, a six- to eight-week dry period is generally recommended before parturition; although some research work indicates that this is not necessary. However, short dry periods may have a negative impact on the quantity and quality of colostrum produced, as well as affecting the subsequent lactation.

Milking should be stopped abruptly – stopping production

of prolactin and reducing milk secretion. Pressure of milk causes an inflammatory response, so leucocytes collect in the udder helping to prevent infection. Udders should never be partially milked out as this increases the susceptibility to infection. Teat dipping for a week after stopping milking will help prevent infection during drying off.

Routine use of dry goat therapy is not recommended, unless there is a history of mastitis during the previous lactation. There are no intramammary preparations licensed for goats, so dry cow products must be used in accordance with the cascade. Drug withholding times for intramammary preparations may be much longer than in the cow and drug residues may persist for some time into the next lactation.

Table 2 shows the routine husbandry tasks that need undertaking in the dry period.

Feeding during late gestation

Both underfeeding and overfeeding in late pregnancy increase the risk of metabolic and other problems (**Table 3**).

Table 1. Problems with over- and underfeeding

Obese goats	Thin goats
<ul style="list-style-type: none"> depressed appetite pregnancy toxaemia vaginal prolapse? rectal prolapse ruptured uterine artery 	<ul style="list-style-type: none"> pregnancy toxaemia abortion
<ul style="list-style-type: none"> maternal dystocia from reduced pelvic size foetal dystocia from oversized kids 	<ul style="list-style-type: none"> kids with reduced birth weight
<ul style="list-style-type: none"> inappetence/anorexia postparturient toxaemia (fatty liver syndrome/ketosis) 	<ul style="list-style-type: none"> lower milk yield ketosis/acetonaemia kids with reduced weight gains



Figure 1. 'Dog-sitting' is normal in late pregnancy.
(Photo: Peter Jackson)



Figure 2. Good forage is an important part of the periparturient diet.

It is essential to supply good quality roughage *ad libitum* during this time to maximise dry matter intake, whilst at the same time increasing the amount of concentrates fed to about 0.5 to 1.0kg/day by parturition.

The lactation ration should be introduced before kidding (**Table 3**). A gradual increase in the amount of concentrates fed allows time for the rumen micro-organisms to acclimatise, minimises the move towards negative energy and protein balances, reduces the potential for rumen acidosis and avoids food refusal associated with a sudden diet change.

If foetal numbers have been determined by ultrasound scanning, the goats can be grouped and fed according to the litter size. Angora goats have higher protein and energy requirements than dairy goats at the same stage of pregnancy and lactation, so the dry and transition periods can be critical.

Offering goats a choice of forage at this time, coupled with clearing and refreshing racks and troughs regularly, will promote an increase in roughage intake (**Figure 2**). High forage intake during late pregnancy appears to stimulate high forage intake during lactation, whereas

overfeeding concentrates in late pregnancy confers little benefit and may even be detrimental to future milk yield.

Feeding in early lactation

On a bodyweight-for-weight basis, goats are much heavier producers than cows. All heavily lactating goats – particularly young first kidders – will lose weight despite the availability of an adequate diet. Peak milk yield (about four to six weeks after parturition) occurs before peak appetite (about 10 weeks after kidding). A positive energy balance is not reached until six to eight weeks after kidding. These changes are

not mirrored by changes in condition score as goats carry little subcutaneous fat.

High yielding does require roughage and concentrates of good quality because the demand for energy and protein is high. Despite the increased demand for nutrients, the dry matter intake is likely to be limited and similar to late pregnancy, particularly during the first two to three weeks. Ideally long roughage should still comprise 50 per cent of the total dry matter intake (**Table 4**).

Periparturient toxemia

Pregnancy toxemia occurs in the last four to six weeks of pregnancy when energy intake

Table 2. Routine husbandry tasks before kidding

Action	Benefit
Maintain fixed groupings	■ avoids undue stress on less dominant goats
Move to the kidding area at least 2 weeks before the kidding date	■ maternity areas should be clean, well ventilated, well bedded, quiet and provide secure footing
Kidding area should be cleaned and rested between kiddings	■ reduces the incidence of mastitis, metritis and kid septicaemia
Clostridial vaccination: tetanus + enterotoxaemia	■ 4 to 6 weeks before kidding to ensure maximum transfer of immunity to kids
Hoof trim	■ promotes increased mobility ■ less stressful than after kidding
Anthelmintic treatment	■ avoids need to throw milk away ■ reduces burden on dam ■ reduces exposure for kids
Check for external parasites: lice + chorioptic mange	■ lice are a common problem in winter and can cause anaemia in kids ■ chorioptic mange is common in housed goats in winter

is insufficient to meet the increasing demand (**Table 5**).

In early lactation, most does suffer a mild ketonaemia as the energy demands of lactation are not met adequately by the diet. In most animals, an equilibrium is established and the ketosis remains subclinical, although a more severe energy deficit may lead to an acute clinical ketosis or acetonemia.

About two to four weeks after kidding, goats that have large fat deposits at kidding may develop a postparturient toxemia similar to pregnancy toxemia or fatty liver disease of cows.

Although goats can use products from rumen fermentation (such as volatile fatty acids) for most of their energy requirements, the nervous system, kidneys, mammary gland and foetus have a direct requirement for glucose. Glucose requirement peaks during late pregnancy and early lactation. If a glucose deficiency occurs, excessive fat breakdown begins in an attempt to maintain blood glucose levels, resulting in abnormally high levels of ketones and fatty degeneration of the liver.

Does with pregnancy toxemia and post-parturient toxemia show similar clinical signs – initially inappetence, eating browns and hay but refusing concentrates, and then complete anorexia and rapid weight loss. Terminally nervous signs are evident – tremor around the head and ears, reduced vision or blindness, head pressing, ‘stargazing’, and eventually the goat becomes recumbent, comatose and dies. Ketones can be detected in urine or milk by using reagent, and β -hydroxybutyrate will be present in the blood.

In the absence of abortion or parturition, treatment for pregnancy toxemia is generally unsatisfactory, particularly when fat animals are involved. Pregnancy can be terminated by inducing parturition or removing the kids by Caesarean section or by rapid removal of the kids by non-sterile Caesarean section under local anaesthesia, followed by euthanasia of the doe.

Using dexamethasone rather than prostaglandins to induce parturition may be beneficial to improve the survival rate of the kids, as well as having a gluconeogenic effect in

the dam; but is slower. A compromise is to give the corticosteroid injection, followed by a prostaglandin injection 24 hours later.

The owner and veterinary surgeon are often faced with a dilemma – terminate pregnancy early to save the dam or wait until the kids are nearer to full-term to try to rescue live kids. Delay, of course, carries the risk of losing both dam and kids. If there is doubt concerning the viability of foetuses, foetal movement can be demonstrated during the last month of gestation by ultrasonography although, near to term, foetal heartbeats can be more difficult to detect.

There is evidence that hypoglycaemia might indicate that the foetuses are alive and hyperglycaemia that the foetuses are dead. It is postulated that foetal death removes the suppressing effect of the foetus on hepatic gluconeogenesis. Marked hyperglycaemia occurs terminally in goats with pregnancy toxemia.

The general treatment for pregnancy toxemia and post-

parturient toxemia is the same. The goat needs encouragement to continue eating (anything!). Goats that continue to eat may survive; but totally anorexic animals will die. Appetite stimulants include B vitamins, rumen stimulants and proprietary ‘twin-lamb disease’ remedies. Glucogenic agents include 20 per cent glucose solution, glycerine (glycerol), propylene glycol and proprietary products based on these; and gluconeogenesis can be stimulated by administering dexamethasone.

In severe cases, aggressive fluid therapy – including dextrose and bicarbonate for ketoacidosis – is necessary. Hypocalcaemia can occur concomitantly with pregnancy toxemia, so calcium borogluconate should be given routinely. Other possible supportive treatment includes multivitamins, particularly A and D, and vitamin E/selenium preparations, which may help hepatic metabolism. Giving natural yoghurt or probiotics or drenching with the rumen contents from a healthy animal can help restore normal rumen microflora.

Adding flunixin to the standard protocol for the treatment

Table 3. Feeding in late pregnancy

	Actions and rationale
Aim	<ul style="list-style-type: none"> ■ to avoid over-fat or over-thin does ■ to maintain body condition score 3
Forage	<ul style="list-style-type: none"> ■ feed high quality forage <i>ad libitum</i> ■ hay intake will be approximately 1.5 to 2.5 kg/100kg bodyweight ■ offer fresh forage several times daily ■ allow for 20+ per cent wastage to encourage maximum intake ■ dry matter intake can be increased by offering green forage ■ woody browse will help maintain rumen function
Concentrate	<ul style="list-style-type: none"> ■ increase concentrate part of ration gradually over the 8 weeks before kidding ■ introduce the lactation ration before kidding to avoid feed refusal and to allow rumen bacteria to adapt ■ high energy diets enable requirements to be met with a lower dry matter intake
Minerals and vitamins	<ul style="list-style-type: none"> ■ ensure the concentrate ration is correctly supplemented with minerals and vitamins ■ home-mixed rations may need a suitable supplement ■ check calcium/phosphorus balance if large amounts of brassicas or sugar beet pulp are being fed ■ 70kg doe requires 6g calcium and 4.2g phosphorus/day ■ excess calcium intake increases the risk of milk fever ■ offer suitable mineral lick



Figure 3. Prolapsed vulva. (Photo: Peter Jackson)

although some goats prolapse only once (**Figure 3**).

Most goats generally kid normally without subsequent prolapse of the uterus. The presence of multiple foetuses, the conformation of the dam (musculature, pelvic anatomy) and a possible hereditary component appear to be more significant than over-fatness.

No treatment is necessary for minor prolapses if the vagina is clean, untraumatised and returns to its normal position when the doe stands up. Larger prolapses will need replacing after thorough cleaning. NSAIDs and caudal epidural anaesthesia to provide analgesia and control straining are essential before replacement of the prolapse is attempted. Intravaginal

retainers often cause vaginitis and further straining and are difficult to attach to short-coated dairy breeds.

Where retaining sutures are inserted, these must be released to allow kidding to take place, so the doe needs regular checks once the pelvic ligaments relax. Induction of parturition with prostaglandin allows the retaining suture to be removed at the optimum time.

Rectal prolapse

Rectal prolapse is rare, but may occur on its own or follow vaginal prolapse if straining continues. Effective caudal analgesia often allows the rectal tissue to return to its normal position. Larger prolapses may need manual reduction and a retention



Figure 4. Goat eating its placenta.

purse-string suture. Very large rectal prolapses may need amputating under caudal epidural anaesthesia.

Rupture of the prepubic tendon

This is rare, but can occur in older multiparous goats during the last few weeks of pregnancy or occasionally following trauma. The rupture occurs on the left side and presents as a swelling immediately cranial to the pubis. Affected does are unlikely to kid naturally and will need manual assistance at kidding or a Caesarean section. The doe should be euthanised if it survives kidding.

Uterine torsion

Uterine torsion – which is very uncommon in the doe – may

need distinguishing from incomplete dilation of the cervix. Attempted correction by rolling is invariably unsuccessful and correction is usually made after removal of the kids by Caesarean section.

Prolonged gestation

This can be caused by:

- non-pregnancy(!)
- false pregnancy (hydrometra)
- a single large kid
- dead kids, and
- hypocalcaemia.

The average gestation period of the doe is 150 (145-156) days. Single kids are often carried longer than multiples. If parturition has not occurred by 155 days, parturition should be induced with prostaglandins and will result in kidding within about 36 hours.

Table 4. Feeding in early lactation

	Actions and rationale
Aim	<ul style="list-style-type: none"> ■ to obtain a high nutrient intake to minimise loss of bodyweight and promote a high milk yield ■ to formulate the ration to supply adequate nutrients to enable the genetic potential of the goat to be expressed ■ to avoid metabolic problems such as laminitis and ruminal acidosis
Forage	<ul style="list-style-type: none"> ■ feed high quality forage <i>ad libitum</i> ■ offer fresh forage several times daily ■ allow for 20+ per cent wastage to encourage maximum intake ■ maintain 50 per cent forage in total diet dry matter
Concentrate	<ul style="list-style-type: none"> ■ increase level gradually by about 0.1kg/day during the first weeks of lactation ■ 0.5kg concentrate (16-18% CP) for each litre of milk produced ■ high energy, high protein (18-22% CP) in heavy milkers ■ split concentrate feed into 3 or 4 feeds a day if possible ■ avoid giving >0.5kg at a single feed to prevent rumen acidosis and maintain a stable population of rumen micro-organisms
Minerals and vitamins	<ul style="list-style-type: none"> ■ as for late pregnancy

A light, odourless, reddish vaginal discharge (lochia) is normal for about 14 days or more after kidding and should not be confused with metritis. The discharge sticks to the tail and many owners clip and wash the tail to make the doe more comfortable. Metritis – which is most likely to follow manual kiddings, dystocia, retained foetal membranes, retained kids and abortions – is indicated by a dark, sticky, usually smelly, discharge that may contain pus.

Retained placenta

Retained placentae are much less common than in the cow. Many reportedly 'retained placentae' have, in fact, been eaten by the goat! (**Figure 4**).

Foetal membranes should normally be passed within four hours of kidding and veterinary attention should be sought if they are not passed within 12 hours. In many cases, membranes that are hanging from the vulva, are easily removed by slow, gentle traction; but forced manual removal should not be attempted. Oxytocin or prostaglandin injections may aid removal.

Retained kids

Retained kids after parturition are more common and potentially more serious than a retained placenta. The kid may be delivered normally after a few days, but most affected does will become lethargic and anorexic, with a dramatic drop in milk yield, and eventually die if the condition is not recognised. Vaginal examination of a sick doe post-kidding should be carried out routinely.

Top tips

- adequate analgesia and control of straining should be primary considerations when dealing with problems around kidding
- vaginal examination of a sick doe post-kidding should be carried out as a routine measure
- prostaglandins will terminate pregnancy at any stage of gestation
- consider early induced parturition with prostaglandins if a goat is distressed
- a 'retained' placenta may have been eaten by the doe!

Rupture of the uterus

This usually occurs dorsally in the body of the uterus just cranial to the cervix. Repair of a dorsal tear is extremely difficult either by a left-flank abdominal incision or vaginally. However, in many cases, contraction of the uterus will seal the defect and the doe may not only survive, but also breed and kid satisfactorily in subsequent years.

The main dangers are shock and peritonitis – the foetal membranes should be removed as completely as possible and high levels of intravenous antibiotics and pain relief given. Intravenous fluid therapy will increase the goat's chance of survival.

A ruptured uterine artery is rare but may accompany a ventral tear of the uterus or occur during a difficult kidding. It may also occur spontaneously during late pregnancy, particularly in overweight does. Fatal intraperitoneal haemorrhage can occur without obvious vaginal haemorrhage.

Uterine prolapse

Uterine prolapse is also rare, but may occur a few

hours after kidding – often subsequent to a retained placenta or as a result of continued straining because of pain and inflammation in the reproductive tract. If the placenta is still attached, it should be removed gently before thorough cleaning and replacement of the uterus under epidural anaesthesia.

The horns of the uterus must be fully extended when replaced. Retention sutures are not generally necessary if the replacement is complete, but a purse-string suture is sometimes used. A doe that prolapses her uterus is unlikely to do so the following year.

Mineral disorders

Frank hypocalcaemia (milk fever) is relatively uncommon in goats compared to sheep and cattle and is more likely to be seen in primiparous, high-yielding animals a few weeks into the lactation. Subclinical hypocalcaemia may be more widespread and many goats will benefit from calcium therapy when presented with other periparturient diseases such as mastitis and metritis.

Hypomagnesaemia is uncommon in goats, but

Table 5. Periparturient toxosis

	Pregnancy toxemia	Pregnancy toxemia	Postparturient toxemia fatty liver syndrome
When	Last 4 to 6 weeks of pregnancy	Last 4 to 6 weeks of pregnancy	2 to 4 weeks postpartum
Which animals	Fat goat	Thin goat	Fat goat
Predisposing factors	<ul style="list-style-type: none"> ■ pet goats in small pens ■ over-conditioned show goats ■ goats on maize silage ■ multiple fetuses ■ lack of exercise 	<ul style="list-style-type: none"> ■ Angora, Cashmere ■ extensively grazed ■ multiple fetuses ■ stress – fear, weather, housing, shearing 	<ul style="list-style-type: none"> ■ high milk production ■ over-conditioned show goats ■ goats on maize silage ■ pets
Aetiology	<ul style="list-style-type: none"> ■ decrease in voluntary food intake ■ rapid mobilisation of fat reserves and subsequent hepatic lipidosis 	<ul style="list-style-type: none"> ■ starvation 	<ul style="list-style-type: none"> ■ decrease in voluntary food intake ■ rapid mobilisation of fat reserves and subsequent hepatic lipidosis
Biochemical findings	<ul style="list-style-type: none"> ■ metabolic acidosis ■ hypoglycaemia ■ ketonaemia ■ hyperglycaemia terminally with dead fetuses 	<ul style="list-style-type: none"> ■ metabolic acidosis ■ hypoglycaemia ■ ketonaemia 	<ul style="list-style-type: none"> ■ metabolic acidosis ■ hypoglycaemia ■ ketonaemia

occasionally occurs early in lactation in goats grazing rich pasture. Pregnant goats on poor pasture may also develop the disease. Transit tetany, a combination of hypocalcaemia and hypomagnesaemia, can occur in stressed animals in late pregnancy.

Laminitis

Acute laminitis may occur after any toxic condition, such as mastitis, metritis and retained foetal membranes, but also a few days after kidding without one of these conditions (**Figure 5**).



Figure 5. Goat with laminitis.

It presents as a sudden onset tenderness of a foot or feet – generally both front feet but occasionally all four – with a disinclination to walk, prolonged recumbency or walking on knees, a shifting of weight distribution when standing to spare the affected

feet, teeth grinding and other signs of pain, pyrexia and a fall in milk yield. The coronet of the affected foot feels hot, but the toe cold.

Acute cases should be placed on a reduced protein/

energy diet – hay with a very reduced or no concentrate ration – and a deep bed provided. Antibiotic cover should be given to combat any infectious or toxic cause of the condition. Pain relief with an NSAID is essential. ■

PPD Questions

1. What are the main problems likely to be encountered in an obese doe?
2. What routine management tasks are necessary before kidding?
3. What are the predisposing causes for pregnancy toxemia in the doe?
4. What are the aims of feeding does in the last third of pregnancy and how can this be achieved?
5. What are the aims of feeding the doe in early lactation and can this be achieved?

Answers

1. Depressed appetite; pregnancy toxemia; vaginal prolapse(?); rectal prolapse; ruptured uterine artery; maternal and foetal dystocia; fatty liver syndrome/ketosis.

2. Check for external parasites, especially lice and chorioptic mange; trim hooves to improve mobility; give clostridial vaccine four to six weeks before parturition; treat with an anthelmintic during the dry period; move to the kidding area at least 2 weeks before the kidding date.

3. Obese does – pet goats in small pens, over-conditioned show goats, goats on maize silage; starvation; multiple foetuses; lack of exercise; decrease in voluntary food intake.

4. To provide enough protein and energy to meet the requirements of the rapidly growing kid; to avoid overfat or over-thin does; feed high quality forage *ad libitum* – fresh forage several times daily; woody browse will help maintain rumen function; increase concentrate part of ration gradually over the eight weeks before kidding – introduce the lactation ration before kidding to avoid feed refusal and to allow rumen bacteria to adapt; feed high energy diets to enable requirements to be met with a lower dry matter intake.

5. To obtain a high nutrient intake to minimise loss of bodyweight and promote a high milk yield; to formulate the ration to supply adequate nutrients to enable the genetic potential of the goat to be expressed; to avoid metabolic problems, such as laminitis and ruminal acidosis; feed high quality forage *ad libitum* – offer fresh forage several times daily, maintain 50% forage in total diet dry matter; to increase level gradually by about 0.1 kg/day during the first weeks of lactation; 0.5 kg concentrate (16–18% CP) for each litre of milk produced, high energy, high protein (18–22% CP) in heavy milkers, avoid giving >0.5 kg at a single feed to prevent rumen acidosis and maintain a stable population of rumen microorganisms.

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Sonya Nightingale

MCSP Cat A ACPAT

Sonya is a chartered animal physiotherapist who qualified in 1985 in the human field but upgraded to treat animals in 1988. Her career highlights included working at London 2012 Summer Olympics as a headquarters veterinary physiotherapist and chairing the Association of Chartered Physiotherapists in Animal Therapy (ACPAT) for four years during that period. Although her main caseload is human and equine, Sonya has always included a healthy number of farm animals and their owners! She lives and works in Highworth, Wiltshire.



**Suggested Personal & Professional Development (PPD)*



PHYSIOTHERAPY

Physiotherapy for the 'downer' cow

Secondary bovine recumbency is a poorly understood and all too common occurrence in modern farming. Once the obvious pathologies have been addressed – and failed to resolve the situation – the animal is often just given nursing support and time to see what happens. Many are ultimately destroyed on humane grounds. Does physiotherapy have anything to add in these situations? Although there is little controlled research to support this intervention, there is a growing body of anecdotal evidence accruing as to its benefits.

Bovine recumbency is a relatively common consequence of parturition and a prompt differential diagnosis is essential. A cow that has been down for over six hours will start to develop secondary pressure ischaemia to muscle and nerve tissue, especially in the pelvic limbs. This may prevent – or severely restrict – optimum results from treatment of the primary cause (Giudice et al, 2010; Lambert et al).

Metabolic and toxæmic causes of recumbency are well outside the physiotherapist's remit and are the issues normally addressed by veterinary surgeons in this time frame, alongside the major differential diagnoses of pelvic or limb fracture among others. However, for those cattle with no obvious pathology, or for those who fail to rise in spite of treatment, a physiotherapy assessment may well be of value. I include a definition of physiotherapy here to explain this conclusion.

'Physiotherapy is a profession concerned with ensuring higher standards of animal welfare through promotion of animal function and movement and maximising potential. It uses physical approaches to promote, maintain and restore physical, psychological and social well-being, taking account of variations in health status. It is science based, committed to extending, applying, evaluating and reviewing the evidence that underpins and informs its practice

and delivery. The exercise of clinical judgement and informed interpretation is at its core' (CSP, 2015).

In short, physiotherapy is aimed at restoring normal function and movement whilst not necessarily treating the pathology. For example, in human medicine physiotherapy is used to help restore function and movement in victims of stroke, while not actually treating the brain injury directly. In instances of spinal pain, it is well documented that mobilisations and other physiotherapeutic techniques relieve pain and restore mobility while not altering the underlying pathology (Cyriax, Maitland). Physiotherapy may, therefore, be utilised to help the animal regain movement, thereby enabling recovery without treating the source of pathology.

For this approach to work, a sound understanding of normal movement patterns is paramount – at both global and segmental levels. The following is a system that has resulted from personal experience, combined with sound clinical reasoning.

Case assessment

Initial assessment involves the taking of a full history including, perhaps most importantly, the duration of

the recumbency. Recumbency duration of over seven days has a much poorer prognosis owing to the degree of soft tissue ischaemia and high levels of joint stiffness. Objectively this is followed by an attempt to rouse the animal to assess how much active movement she is prepared to attempt. Those patients that attempt to rise but fail have a better prognosis than those who will not make any effort.

Objective examination consists of a full body palpatory examination as far as is possible. It is occasionally not practical or possible to move the animal from side to side to expose all the limbs. However, the cows that respond most successfully are those with palpable spinal signs. These signs may include:

- fasciculation paraspinally on palpation of the spinous processes and/or paravertebral musculature
- grunting/verbalisation as a response to pressure over affected vertebrae
- change in coat texture and/or skin moisture from cranial to caudal
- palpable loss of smooth continuity of alignment of spinous processes
- trigger points paravertebrally
- localised areas of increased muscle tone or spasm.

"Physiotherapy provides a cost-effective method of easing the problem, and improving animal welfare"



Figure 1. Sonya Nightingale using Maitland mobilisation techniques.

In addition, those individuals that maintain sternal recumbency, whose hind limbs are flexed and who are on a surface of deep straw or outside on grass fare better.

Formulating a plan

A physiotherapy treatment plan is devised using clinical reasoning from the objective findings. This will usually follow broadly the Maitland concept of rehabilitation planning. Geoffrey Maitland was seen as a pioneer in musculoskeletal physiotherapy and developed his model, alongside colleagues in Australia, to modulate pain and restore function.

The Maitland Concept of Manipulative Physiotherapy emphasises a specific way of thinking, continuous evaluation and assessment and the art of manipulative

physiotherapy – ‘know when, how and which techniques to perform, and adapt these to the individual patient’. It can be applied to peripheral or spinal joints, but in the case of downer cows, it is the spinal mobilisations that are of interest.

Mobilisations or manipulation are passive techniques where the therapist applies a force to a joint taking it through its normal physiological range of movement. In these cases, there is often a loss/restriction to normal range which accompanies and results in some of the objective signs listed above. In addition, mobilisations utilise accessory movements of the joints, defined as those joint movements that cannot be performed by the individual.

These movements include roll, spin and glide which accompany physiological movements of a joint. The two are inextricably linked and both impact joint function. Restoring normal range to physiological and accessory movements is, therefore, essential for success (Maitland, 2005).

Mobilisation principles

In the downer cow, this involves mobilisations of the spinal joints with pressure directed at either the spinous or transverse processes (**Figure 1**).

These are mainly accessory movements of the vertebrae.

The type of mobilisation and the depth/pressure that is used is chosen as a result of the palpatory examination and is too large a subject to be covered here, and I would recommend the various textbooks written by Geoffrey Maitland to anyone who is interested.

Broadly, mobilisations are graded into five levels or depths and named after the direction of movement (**Figure 2**). The direction is clinically reasoned and appropriate for the specific joint dysfunction; the grade used is influenced by the effect required – for pain relief or to stretch a restricted range, for instance.

Figure 2. The five levels of movement.

- | | |
|--------------------|--|
| Grade I – | small amplitude movement at the beginning of the available range of movement |
| Grade II – | large amplitude movement at within the available range of movement |
| Grade III – | large amplitude movement that reaches the end range of movement |
| Grade IV – | small amplitude movement at the very end range of movement |
| Grade V – | small amplitude high velocity thrust at and of range of movement. |

“Although there is little controlled research to support this intervention, there is a growing body of anecdotal evidence accruing as to its benefits”

The start position chosen is influenced by accessibility and patient comfort, and also by how forces applied can have the most effective localised reaction.

Other considerations include the rhythm, range and amplitude of the technique, plus its duration, frequency and expected treatment soreness.

As a rough guideline most treatments are concluded within approximately 45 minutes. On re-examination there should be a marked improvement in the palpable signs listed above; but, in addition, continuous reassessment takes place during the treatment process with the techniques used being modified as the treatment session progresses.

Extensive follow-up advice is then given to the owner/farmer. This may include turning, sling standing, passive movements, massage and overall good nursing care, with bedding down on a surface with good grip and warmth.

Giudice and Giansella (2010) also note success with hydrotherapy using deep water to support the cow's weight in standing enabling easier movement and fewer complications of recumbency. However, this is not a practical option in most cases owing to the lack of suitable immersion tanks/pools.

Summary

Most downer cows, with no other pathological diagnosis, respond very well to physiotherapy input and, anecdotally, farmers who use it believe that their survival rates and lactation volumes are far better since they have been using physiotherapists to help care for these animals. Downer cow syndrome is a common event in modern farming with large financial implications. Physiotherapy provides a cost-effective method of easing the problem, and improving animal welfare. ■

PPD Questions

1. List four objective palpable signs that would indicate a good outcome from physiotherapy treatment.
2. Why would a physiotherapist be considered an option in the treatment of downer cows?
3. Name and define the two main types of movement available within normal joints.
4. How are mobilisations/manipulation graded?
5. What other techniques may be utilised by the farmer to help with a good prognosis?

Answers

1. Fasciculation paraspinally on palpation of the spinous processes and/or paravertebral musculature. Grunting/verbalisation as a response to pressure over affected vertebrae. Change in coat texture and/or skin moisture from cranial to caudal. Palpable loss of smooth continuity of alignment of spinous processes. Trigger points paravertebrally. Localised areas of increased muscle tone.

2. Physiotherapy is aimed at restoring normal function and movement whilst not necessarily treating the pathology. When other pathologies have been excluded as causative factors, an expert in movement and its restoration may have valuable input.

3. Physiological and accessory. Physiological is the range of movement that the animal can perform for itself under its own volition. Accessory movements are those ranges that cannot be performed independently as a result of voluntary movement.

4. Graded 1 to 5 (I - V).

5. Turning, sling standing, passive movements, massage but overall good nursing care with bedding down on a surface with good grip and warmth.

Grade V – small amplitude high velocity thrust at end of range of movement.

Grade IV – small amplitude movement at the very end of range of movement.

Grade III – large amplitude movement that reaches the end range of movement.

Grade II – large amplitude movement at within the available range of movement.

Grade I – small amplitude movement at the beginning of the available range of movement.

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Declan O'Rourke
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Declan graduated from University College, Dublin in 1979. Following a couple of years in practice in England and Canada, he worked for over 20 years in the animal health industry. In 2006, he set up Ortec Consultancy specialising in pharmacovigilance, marketing and technical support and clinical trial management.

He holds a Diploma in Marketing, a Master of Business Administration and a Fellowship of the Royal College of Veterinary Surgeons; and is an honorary associate professor at Nottingham veterinary school, past president of the British Cattle Veterinary Association and a member of the Veterinary Products Committee (VPC).



*Suggested Personal & Professional Development (PPD)



Adverse events in livestock

In the second article of this three-part series, adverse events (AEs) in livestock (cattle, sheep, pigs and poultry) are reviewed.

Pharmaceuticals

Swelling and inflammation at the site of injection can occur both with antimicrobials and products for the treatment and prevention of parasites. On very rare occasions, anaphylactic shock and death can occur in cattle and sheep treated with antimicrobials. In these cases it may be the result of:

- sensitisation to the excipient in the formulation
- the needle penetrating a vein on injection, resulting in intravenous administration rather than via the recommended subcutaneous or intramuscular route
- the fact that the animal is in very poor health.

Vulvar swelling in cattle and oedema of the rectal mucosa, partial anal protrusion ('rosebudding'), erythema and pruritus in pigs have been observed following injection of tylosin.

Neurological signs, such as blindness, ataxia, and recumbency, may occur following topical application of a closantel plus ivermectin formulation in cattle – anorexia and diarrhoea may also be seen in these cases.

Drowsiness, depression, lethargy, apathy and weakness may occur following injection of moxidectin in cattle (**Table 1**).

Blindness can occur in sheep following the use of closantel. This usually occurs following overdosing with the drug which, can be commonplace as farmers tend to give the same dose to all sheep treated. Closantel is known to have relatively low toxicity in sheep.

Vaccines

The most common adverse events with vaccines are injection site reactions – with swelling and pain, for example – and anaphylaxis or anaphylactic type reactions that can on occasions lead to death (**Table 2**).

Table 1. Adverse events involving pharmaceutical products in cattle (Source: IMB* Annual Report 2014)

Active substance	Route	Number treated	Number reacted	Number died	Clinical signs	Speed of onset
cloprostenol sodium	IM	1	1	1	sudden death	<= 2 mins
closantel and ivermectin	topical	28	3	0	anorexia, dullness, depression, disorientation, impaired vision	<= 7 days
closantel and ivermectin	SC	40	6	0	anorexia, dullness, depression, recumbency, impaired vision	<= 24 hours
closantel and ivermectin	topical	7	7	0	allergic reaction, hyperexcitation, trembling, ataxia	5 mins
moxidectin	SC	38	1	1	ataxia, death by euthanasia	<= 48 hours
moxidectin	SC	29	1	1	collapse, death	<= 12 hours
moxidectin	SC	50	1	1	death	<= 24 hours
moxidectin	SC	150	1	1	injection site abscess, death	> 30 days
oxyclozanide	oral	1	1	0	recumbency	<= 24 hours
procaine benzylpenicillin and dihydrostreptomycin	IM	1	1	1	involuntary movement, collapse, death	<= 2 mins

Time between treatment and adverse event

The most common signs seen in suspected adverse events with pharmaceuticals and immunological products vary across species and the speed of onset can range from minutes to weeks (**Tables 1 and 2**).

In the majority of cases, a reaction occurs within hours of treatment; thereby leading to the suspicion of a link between treatment and the clinical signs (AEs) seen. However, one should keep in mind the possibility of a drug-drug interaction that can lead to an adverse event some period after the initial treatment with the product.

Vaccine-pharmaceutical reaction

The Dutch Authority received 11 reports (170 cattle) of anaphylactic reaction to injection of tetracyclines and penicillins. The cattle had been inoculated previously with an inactivated bovine respiratory syncytial virus (RSV) vaccine. Following

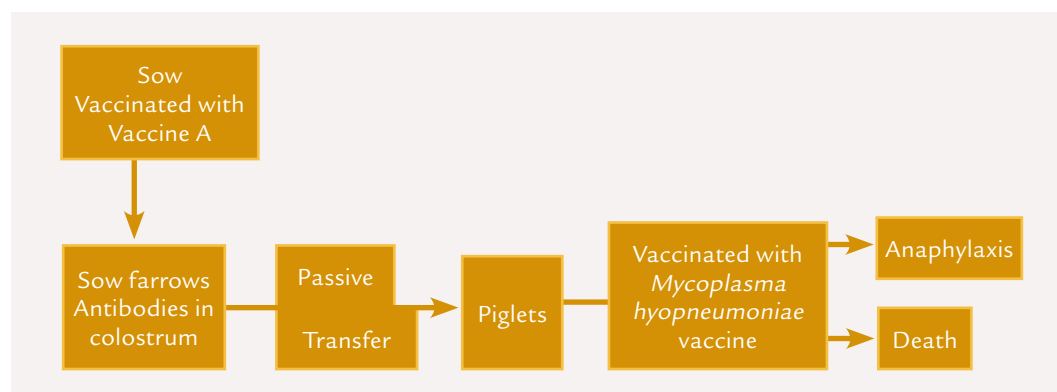


Figure 1. Flow chart of the sequence of serious adverse events in piglets following the administration of a *Mycoplasma hyopneumoniae* vaccine [Source: Irish Medicines Board (IMB)*].

investigation, it was found that the vaccine contained saponin, apparently contaminated with povidone, which had sensitised the cattle.

A hypersensitivity reaction to an inactivated bovine RSV vaccine occurred in the UK when parenteral antibiotics were given to calves. On investigation, it was found that the cause of the reaction was sensitisation to a compound erroneously present in identified batches

of adjuvant which was similar to an excipient in some antibiotic formulations.

The Veterinary Medicines Directorate (VMD and the Irish Medicines Board (IMB)*) identified that sheep which had at any time previously been vaccinated with any brand of foot rot vaccine should not be injected with moxidectin. In animals that reacted, one, or a number, of the following effects were noted: difficulty in breathing, poor co-ordination, depression, abortions or death.

Vaccine-vaccine reaction

The IMB received reports of serious adverse events in piglets following the administration of a *Mycoplasma hyopneumoniae* vaccine. The clinical signs reported ranged from drowsiness to convulsions and death (**Table 3**).

Subsequent investigation indicated that the vaccine had a component in the excipient that was also present in other types of vaccines with which sows had been immunised.

Table 2. Adverse events involving vaccine products in cattle (Source: IMB* Annual Reports 2012 & 2014)

Active substance (antigen)	Route	Number treated	Number reacted	Number died	Clinical signs	Speed of onset
bovine rotavirus, bovine coronavirus and <i>E.coli</i>	IM	25	17	0	Injection site abscess, injection site swelling	<= 30 days
<i>C. chauvoei</i> whole culture, <i>C. haemolyticum</i> , <i>C. novyi</i> type B toxoid, <i>C. septicum</i> toxoid, <i>C. tetani</i> toxoid	SC	3	1	1	Collapse, anaphylaxis, death	minutes
Inactivated bovine RSV, inactivated Parainfluenza-3-virus inactivated <i>Mannheimia</i> (Pasteurella) <i>haemolytica</i> A1	SC	15	1	0	Hyperaesthesia, collapse NOS, anaphylactic type reaction	<= 1 min

Table 3. Details of adverse events with a *Mycoplasma hyopneumoniae* vaccine (Source: IMB*)

Active substance (antigen)	Number treated	Number reacted	Number died	Clinical signs	Speed of onset
<i>Mycoplasma hyopneumoniae</i> vaccine	284	unknown	9	drowsiness, convulsions, death	minutes
<i>Mycoplasma hyopneumoniae</i> vaccine	600	unknown	6	drowsiness, convulsions, death	minutes



As a result, the piglets had become sensitised via ingestion of colostrum from the dam (**Figure 1**).

Off-label use Maladministration

Maladministration of bolus products can lead to tracheal or oesophageal obstruction or perforation resulting in death or euthanasia.

Poor teat preparation

Incomplete or poor teat preparation prior to infusion of a dry cow tube or a teat seal can lead to post infusion mastitis. Coliform bacteria present on the skin of the teat are forced into the teat canal during the infusion of the product.

If adverse events caused by either maladministration or poor teat preparation do occur, it is important that veterinary surgeons act to educate their farmers and milking personnel in the correct technique in order to avoid such occurrences in the future.

Lack of efficacy

The majority of adverse event reports in livestock relate to suspected lack of expected efficacy (SLEE). In 2014, just under 55 per cent of the reports for livestock, received by the VMD concerned SLEE (45% related to pharmaceuticals and 55% to vaccines).

Sixty-one per cent of adverse event reports for livestock

received by the IMB during the period 2012 to 2014 concerned SLEE (23% related to pharmaceuticals and 77% to vaccines).

It is vital that these reports are investigated because they can lead to identification of key issues in relation to the benefit-risk assessment of a product.

Pharmaceuticals

In 2007, the VMD received 67 reports (out of a total 166 SLEE reports) that involved ectoparasiticides indicated for the control of blowfly in sheep. A heavy blowfly challenge in 2007 and product misapplication appeared to have been factors involved in treatment failure. Climatic conditions that prevailed in 2007 may also have had an influence.

The number of reports received by the VMD involving suspected lack of efficacy to products containing triclabendazole increased from 15 in 2008 to 48 in 2009. Of these 48 reports, 16 were confirmed as a lack of efficacy by the use of faecal egg count reduction tests, compared

with only one report in 2008. A similar finding occurred in Ireland.

In 2009, the IMB received eight reports where it was suspected that triclabendazole was ineffective for the treatment of fascioliasis in sheep. Resistance to triclabendazole was suspected in four reports and, for two of these reports, this was confirmed by a positive faecal egg count reduction trial. In 2010, the IMB received six reports where it was suspected that triclabendazole was ineffective for the treatment of fascioliasis in sheep and, for a further two reports, it was suspected that the same substance was ineffective for the treatment of liver fluke in cattle.

Vaccines

In 2007, the VMD received 11 SLEE reports relating to Marek's disease vaccines. No reports involving Marek's disease vaccines were received in 2006.

Investigations suggested that early or heavy challenge, together with husbandry factors, led to incomplete

Table 4. Livestock adverse event reports as a percentage of total AE reports (2008-2014)

	VMD	IMB
Cattle	11.5	48.1
Sheep	6.6	13.2
Pigs	0.4	2.1
Poultry	0.3	0.3
TOTAL	18.8	63.7

protection against Marek's disease in vaccinated birds.

The VMD noted that there was an increase in the number of reports of suspected lack of efficacy involving a vaccine for ovine enzootic abortion in 2010. In 2009, only 14 reports – involving 270 animals – were received; whereas 36 reports – involving 618 animals – were received in 2010. Twelve of these reports had already been reported to the VMD during 2010 by the company responsible for the product. However, even if these cases were excluded, there was still an increase in the number of reports between 2009 and 2010.

A study carried out in Scotland (Wheelhouse et al, 2010) found the vaccine strain of *Chlamydophila abortus* in the placentas of some aborted fetuses from cases of ovine enzootic abortion. In these cases, no other cause for the abortions could be identified. Based on these findings, it was considered that 'in very rare cases abortions may occur where the vaccine strain can be identified'. The overall incidence of reports involving cases of abortion following the use of Enzovax (MSD Animal Health) was very low.

There are often reports that point to apparent failure to establish immunity following vaccination, resulting in the development of the disease. In some cases, the vaccines may have not been used in accordance with label recommendations; while in other cases, vaccinated animals may have been exposed to infection before immunity had properly developed.

Reports are also received of vaccine breakdown or failure to protect – for example, calves vaccinated for respiratory disease. Investigations often reveal that the cause of the respiratory disease is a virus or

bacteria that were not in the vaccine(s) used.

In a field study of outbreaks of bovine respiratory disease in vaccinated (mainly beef) cattle, bacterial pathogens were commonly detected – the most common pathogen being *Pasteurella multocida* (Crawshaw and Caldwell, 2015).

Reporting of livestock AEs

During the period 2008 to 2014, livestock adverse event reports accounted for only 18.8 per cent of all the AE reports received by the VMD. Cattle and sheep accounted for the majority of these reports with 11.5 per cent and 6.6 per cent respectively (Table 4).

Whilst the total number of adverse event reports received by the IMB during the same period was only five per cent of that received by the VMD, it is interesting to note that livestock AE reports accounted for 63.7 per cent of all AE reports received by the IMB. Cattle and sheep accounted for the majority of these reports with 48.1 per cent and 13.2 per cent respectively.

This is a concern and suggests/indicates that there is under-reporting of livestock adverse events in the UK. Of equal concern is the very low number of reports relating to pigs and poultry. Veterinary surgeons should report all AEs of which they become aware as it is only then that the benefit-risk profile for a product can be fully assessed and determined. ■

* The IMB changed to HPRA (Health Products Regulatory) in 2014. However, for the sake of continuity, IMB is used throughout this article.

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23 Mar 2016	Adverse events	Vet Community article		0.75
29 Mar 2016	Home visiting service for cats	Vet Community article		0.25
29 Mar 2016	Rabbits in practice	Vet Community article		0.50
2 April 2016	Setting up a dermatology clinic	Vet Community article		1.00
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**Emily Gascoigne**

MA VetMB MRCVS

Emily qualified from the Cambridge veterinary school and is currently a farm animal vet with Synergy Farm Health in Dorset. She is also a small ruminant alternative resident with the Royal Veterinary College, London, and a member of the Rare Breeds Survival Trust and the Hebridean Sheep Society, and has her own flock of Hebrideans.

**Peter Siviter**

BVetMed MRCVS

Pete qualified from the London veterinary school and is a production animal vet at Synergy Farm Health, spending much of his time with rare breeds, especially pigs.



**Suggested Personal & Professional Development (PPD)*

**RARE BREEDS**

On being a vet for rare breeds

Veterinary surgeons in mixed and farm animal practice come into contact with rare breed varieties of farm animal species. The Rare Breeds Survival Trust (RBST) was founded in 1973 and since its inception has seen the resurgence of many native British breeds.

As a veterinary surgeon, having an understanding of the genetic and phenotypic value of these breeds will lead to greater appreciation and understanding of the production goals for many flocks and herds and can lead to positive working relationships and opportunities for progressive flock/herd planning.

The RBST and the Rare Breeds Movement

The Rare Breeds Survival Trust is a charity founded in 1973 with the ambition of conserving British native breeds of livestock species. Intensification of the global farming industry and modern farming methods following World War II accelerated the extinction of many British breeds, with heavy horses outcompeted by automation.

Relative inability to compete on a commercial scale and to meet commercial targets had led to this reduction, but the rare breeds movement recognises the alternative importance of retaining national breed diversity. It acknowledges the social importance of these diverse and historic breeds as part of the British farming legacy, their ability to utilise and perform in non-favourable conditions – North Ronaldsay sheep on their native island, for example – and their importance for preventing genetic constriction of their species.

Maintaining this bank of non-improved animals, where little selection pressure has been applied, protects the genetic library available to the commercial sector in the

future with potential global significance. For example, there is evidence that some of the primitive rare breeds of sheep have increased endoparasite tolerance, so maintaining the gene frequency may be crucial in the future as genomics is explored and the sector looks for animals with these genes (Golding and Small, 2009).

The RBST monitors the number of breeding animals of each species and breed on its register and additional threats to the long-term survival of each population. Whilst breeds may be added to the register based on breeding females, geographical vulnerability is also identified, together with relative risk analyses for each breed – as was the case with the Herdwick in the 2001 foot-and-mouth outbreak with the majority of the breeding flock within the Cumbrian National Parks heavily affected.

In addition, the Trust manages the 'Gene Bank' – a frozen semen bank of embryos and semen straws of critically

endangered bloodlines of cattle, sheep, goats, pigs and horses.

Crucially, the movement aims to optimise the health and diversity within the recognised breed catalogues, limiting inbreeding and loss of diversity and managing these small populations. The Trust also provides marketing advice and a selling forum for rare breed owners with national shows and sales, where buyers can source pedigree animals on the register. In addition, it also co-ordinate national shows for rare breed animals.

Why do people keep rare breeds and what do they do with them?

Rare and native breeds are found on smallholdings, in commercial herds and flocks, in registered premises – herds/flocks under the management of the RBST, for instance – in open farms and in conservation grazing schemes (Figure 1).

Some stewardship schemes encourage the usage of native British breeds in grazing management schemes, so

Figure 1. Many of the rare breeds are used in conservation grazing systems often requiring low input but high health strategies.



vets should expect to see these breeds outside of the smallholding. This is typically a consequence of their different grazing behaviours (Newborn et al, 2000) and often as a public attraction. Furthermore, the traditional characteristics of their carcasses make them popular with premium meat outlets – even some UK supermarkets are marketing meat from rare breeds, including Gloucestershire Old Spot pork and Dorset lamb.

Studies have looked at the comparative production of rare breeds with no conclusive disadvantage emerging with regards to meat sales in terms of yield and retail value in comparison with other breeds (Hall and Henderson, 2000).

The variety of breeds within the rare breed catalogue is appealing to smaller flocks, as is the perceived importance of conservation whilst breeding animals. There is also a large showing movement, with classes across the UK for rare breed animals.

What is a rare breed?

Having an understanding of the definition of a rare breed is helpful in appreciating the relative importance of each individual animal. The RBST defines threshold targets as part of its conservation policy and aims to identify those breeds at most risk to enable targeting of resources. The RBST maintains the registrations for the majority of breeds on the Watchlist through the Combined Flock Book (their annual registration).

Breeds are defined in risk categories on a progressive scale:

- Critical (e.g. the Suffolk horse)
- Endangered (e.g. the original population of Aberdeen Angus cattle, prior to Canadian/USA genetic introduction)



Figure 2. A Red Poll calf in Canterbury, New Zealand. The rare breeds community is large with global resource pooling and knowledge transfer for vets and farmers.



Figure 3. Working with rare breeds can facilitate the development of novel services.



Figure 4. Establishing high health strategies can be crucial for flocks. Here is a four-horned Hebridean ram being bled as part of an infectious disease screen.

- Vulnerable (e.g. the Middle White pig)
- At risk (e.g. Irish Moiled cattle)
- Minority (e.g. Dorset Horn sheep)
- 'Native', no longer on the register (e.g. Red Poll cattle) (**Figure 2**)

The relative number of breeding females necessary per category varies between species – 3,000 breeding ewes are necessary for a breed to move to category 6, but just 1,000 breeding sows are necessary for a pig breed to move to 'native' recognition. A critically endangered breed of cattle – such as the Northern Dairy Shorthorn, a former commercial cow capable of yielding >6,000 litres per lactation – has fewer than 150 breeding females left on the register.

Although the 'native' breeds list is extensive and they are popular animals, commonly seen on farms – Shetland sheep, Belted Galloway cattle and the Jacob sheep, for instance – they are not considered at significant threat.

Key opportunities for veterinary intervention

Because of the relative importance of individuals within a flock or herd of rare breed animals, there is increased opportunity for progressive veterinary intervention (**Figure 3**).

Optimising reproductive performance and youngstock survival rates are key drivers of conservation success and are opportunities for veterinary input and health planning. Management of infectious diseases affecting these two key sectors are critical for the success of a rare breeds programme and, where possible, disease eradication should be an aspiration (**Figure 4**).

Given the high level of movements to shows and sales within this sector, and the movement of breeding



Figure 5. Working with rare breeds can be very rewarding for both vet and keeper.

animals across the county to maintain genetic diversity and limit inbreeding, biosecurity strategies are essential. With evidence of increasing key production-limiting diseases in sheep – Maedi visna (Ritchie and Hosie, 2014) and contagious ovine digital dermatitis (CODD) (Duncan et al, 2014), the emergence of new diseases such as porcine endemic diarrhoea virus in pigs, and the perpetual challenge of bovine tuberculosis – a robust prevention strategy is essential.

Diseases considered endemic in the respective species – such as enzootic abortion in sheep, infectious bovine rhinotracheitis in cattle and enzootic pneumonia in pigs – may have disastrous consequences at both a commercial and conservation level for these businesses. This should be considered.

Additional conservation strategies include the use of artificial insemination and embryo transfer in maintaining a genetic resource and maximising its spread nationally – both of which necessitate veterinary input. Complementary strategies

have included the export of breeding males away from the highest densities of stock to reduce the risk from epidemic diseases in a geographically dense population and to maintain diversity outside the main epicentre of the breed. The North Ronaldsay Sheep Fellowship has piloted a project removing rams from the island for this purpose.

Alternative applications

There are key examples of application of rare breeds in advancing human and veterinary medicine.

GM2 gangliosidosis was diagnosed in Jacob sheep in 2010 and has subsequently been identified in the UK sheep population. This condition is homologous with the neurodegenerative disease of children, Tay-Sachs disease. Genomic work in the USA has identified the genetic mutation in Jacob sheep associated with the expression of the condition (G444R mutation).

Work on the American genetic pool suggests that the genetic bottleneck created from a high co-efficient of inbreeding has led to a high frequency of

the gene and presentation of the disease. The Jacob sheep is now used as an animal model for human disease.

The RBST regularly analyses inbreeding coefficients with their 'Geneped' analysis, based on relatedness of individuals within the population; but clinicians should be aware of the risks associated with small populations and aware of novel presentations of diseases.

Common pitfalls involving legislation

Whilst most pedigree breeds are interested chiefly in selling replacement livestock, the main objective for many is to target the food chain directly with a niche product that commands a premium. Many of these breeders are not commercial farmers, so it is important that their veterinary surgeon understands the legislation surrounding such an enterprise.

Using an approved slaughterhouse

Remember that a 'home kill' – an animal not slaughtered at an approved abattoir by

trained slaughtermen – can only be used for private consumption and may not be sold to the general public. If pigs or ruminant species are intended for sale, then the approved slaughterhouse route must be used.

The producer should contact the Food Standards Agency (FSA) for advice and further certification if they wish to perform any meat processing at home or on the farm.

Choosing places to sell

Many smallholders feel that the best way to gain a premium for their product is to sell through farmers markets, local butchers or farm shops. In order to do this, the animals must be slaughtered as described above, and the place of sale must be known to the local council and comply with guidelines set down by the Food Standards Agency and Trading Standards Institute.

Product labelling

Product labels must not only be accurate, but also conform with the requirements dictated by the Trading Standards Institute (details on its website), which prevents the misuse of specific product descriptions such as ‘pedigree’ or ‘free range.’

Producers should also be aware that certain foodstuffs, such as Parma ham and Wensleydale cheese, have an EU-recognised ‘protected designation of origin’ (PDO) and as such can only be sold by those names if produced within a specific geographical area. A list of the product names included in these schemes can be found on the Database of Origin and Registration (DOOR) online.

Conclusion

Rare breed flocks and herds often have different targets to typical commercial herds and engagement with these clients can mean there are

opportunities for progressive health management. Health and welfare strategies are essential for optimising both production of replacements and production of premium meat products, often with an emphasis on sustainability.

Whilst individual animals often have a high value for a population – and although their economic value may not apparently reflect this – owners frequently engage with veterinary practitioners. These premises provide a unique opportunity for veterinary surgeons to engage in individual, flock and national health and breeding strategies and can be highly rewarding (**Figure 5**). ■

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Torres PA et al (2010). Tay-Sachs disease in Jacob sheep. *Molecular genetics and metabolism*, 101(4), pp.357-363.

Useful links

Rare Breeds Survival Trust, www.rbst.org.uk

Foods Standard Agency, www.food.gov.uk



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John Hill
MVB MRCVS

John qualified from Trinity College, Dublin, in 1975, and recently retired as senior partner in a six-vet, mixed practice in County Antrim, Northern Ireland. He is currently a trustee of the Pet Blood Bank and is the founder president of the recently formed British Bee Veterinary Association set up to raise knowledge of bees within the profession. He also sits on the Bee Health Advisory Forum, which advises ministers and politicians on bee policy, and is an enthusiastic beekeeper himself.

About a bee

The second article in a two-part series on the natural history and management of bees.

In the first article, we covered the principles of eusociality, the three castes of honeybee, queen, worker and drone and the divisions of labour within the colony. Now we shall consider how a colony supports itself and how it divides with swarming.

A honeybee colony is an 'organism' that requires four main materials to be brought into the hive – namely, nectar, pollen, water and propolis.

Nectar

Nectar is a sweet, watery liquid produced by flowering plants in nectaries deep in the flower. The forager bees are attracted to the flower by smell and electrostatic charge and can be directed into the flower by colour lines only visible in the ultraviolet range. Using its extendable proboscis, the bee sucks up the nectar into the honey crop – a sac which is an extension of the oesophagus, just before its true stomach, the ventriculus.

The honey crop contains nectar from many flowers and the enzyme invertase is secreted to begin the conversion of sucrose to fructose and glucose. Flowers have a negative electromagnetic charge and bees are slightly positively charged. When a bee visits a flower, the electromagnetic charge is neutralised, so the next bee will ignore this flower because it will be empty of nectar. The flower needs time to replenish its nectar and electrostatic charge before becoming attractive to another bee.

The bee may visit many flowers in one trip, depending on the volume of nectar in each flower (**Figure 1**). When



Figure 1. The bee may visit many flowers in one trip – on any foraging trip, the bee will be faithful to one type of pollen from one flower species.

she returns to the hive, she transfers the nectar to a 'store' bee who takes it to a storage cell in the nest. Nectar has a high water content of between 40 to 70 per cent. The water content must be reduced to about 18 per cent and this is honey, one of the two main food stores the colony produces. Honey with a higher water content – of say 25 per cent – runs the risk of spoilage by fermentation.

The nurse bees have the task of reducing the nectar water content by two main means. Firstly by fanning their wings to create air currents and increasing evaporation. Secondly, they draw nectar into their honey crop and then regurgitate a droplet on to their outspread mouth parts to increase surface area and enhance evaporation. This swallowing and regurgitation process continues until the water content is reduced.

Once the honey reaches 18 per cent moisture, it is stored in a cell that is then sealed with a wax capping. A colony will produce up to 200kg of honey in one year, most of which is consumed as fuel. A productive hive may be able to allow the beekeeper up to 25 to 30kg of honey as a harvest.

Pollen

Pollen is the main protein source for the hive. It is the male gamete of flowers and is produced in quantity. During nectar gathering, the bee comes into contact with the anthers and becomes covered in pollen which sticks to the many plumose hairs on its body. This pollen is transferred to the style of the next flower and cross pollination is achieved.

A high proportion of the pollen is gathered off its hairy body by grooming with its legs. The pollen is transferred



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BEES

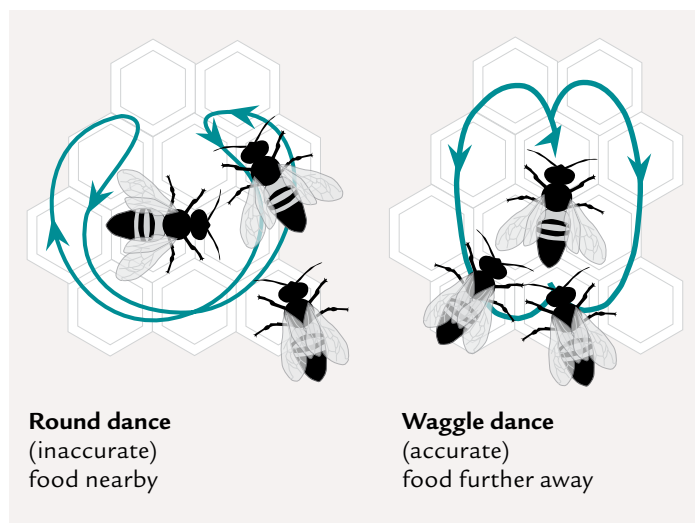


Figure 2a. The two types of bee dance.

to the tibial tarsal joints on its hind legs which have a 'pollen press' that compresses the pollen into a pellet. This is pushed into a structure of stiff hairs called the corbicula that stores the pollen to be taken back to the hive. A bee can carry up to 40mg of pollen.

On any foraging trip, the bee will be faithful to one type of pollen from one flower species. The beekeeper can identify the foraging source by the pollen colour on the hind legs of returning bees. The forager places the pollen directly into a cell with a droplet of nectar or honey, where it ferments and produces a reduced pH environment – effectively ensiling the pollen for storage. Pollen provides the protein source required to make the brood food fed to the bee larvae. It also contains the minerals and trace elements required. A colony needs about 25 to 30kg of pollen per year.

Water

As is the case with all living organisms, bees require water for metabolism and for thermoregulation, because a developing brood needs a constant temperature of 35°C. The temperature inside a hive is maintained at this constant temperature during any time when eggs and brood

are present. Evaporation of water by fanning is used for temperature regulation.

Propolis

Propolis is 'bee glue' and it is gathered from the sap of trees. The bees use it to seal any small gaps inside the hive and wild colonies will coat the whole of the inside of a tree hollow. Propolis inhibits the growth of fungi or bacteria within the hive and creates a more healthy environment for the occupants.

In winter bees do not hibernate but cluster into a ball with the queen in the middle. During this time the temperature may drop a few degrees and heat is generated by muscular activity. An individual bee is a poikilothermic or cold-blooded creature, yet the colony acts as a warm-blooded organism. Water is needed to dilute honey when required for consumption.

Navigation

One of the first facts that beekeepers learn is that forager bees are very good at finding their way home. They are also told that bees forage on average up to three miles from the hive, in any direction. If you wish to move a hive in an apiary, you can only move it three feet at most – more than this and the bees will not

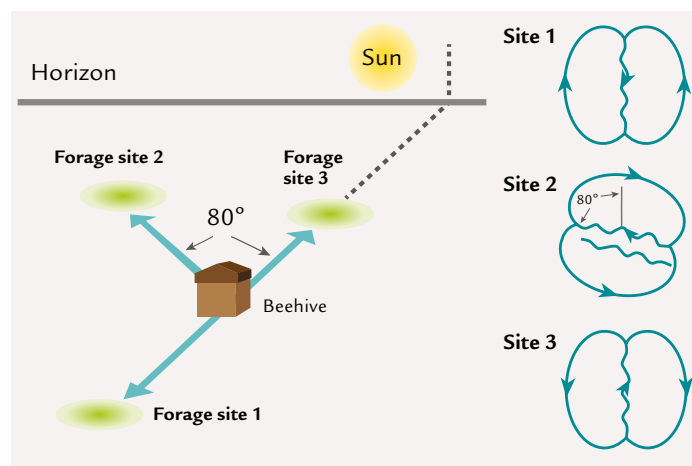


Figure 2b. The waggle dance. Site 1: Bee waggles down the comb as forage source is due south in relation to sun; site 2: bee waggles 80 degrees to west of sun; site 3: bee waggles up the comb towards the sun.

find it but just alight where the hive was previously sited.

If you close up a hive in the evening and move it less than three miles, you run the risk of bees following their old flight lines back to the hive's old position. So it must be moved more than three miles, such that they are outside their flight lines and will orientate themselves to the new position. The area potentially foraged by one colony is nearly 30 square miles, though most will forage closer to the hive.

How bees navigate was worked out by Karl von Frisch and won him a Nobel Prize. It had long been observed that some returning foragers performed one of two dances on the surface of the comb – known respectively as the 'round' dance and the 'waggle' dance – in almost complete darkness (**Figures 2a and 2b**).

A round dance is performed if the nectar or pollen food source is closer than 100 metres. It involves a repeating figure of eight movement exaggerated into a circle.

The waggle dance has a section in which the bee moves rapidly in a straight line, vigorously wagging her abdomen rapidly from side to side. She then turns and walks in a semi-circle back to where

she started her waggle and repeats it. At the end she turns back to the starting point in the opposite direction.

The *direction* of the waggle is in the direction of a source of forage in relation to the position of the sun at that time.

The *length of time* wagging indicates the distance the forage is away – the longer the waggle, the further the distance. The dance is a communication to recruit other forager bees to where there is a good source of food. The forager bees could be flying up to three miles away and visiting many hundreds of flowers over a period of time and are able to adjust for the change in position of the sun to navigate back to the hive.

Bees are able to utilise polarised light so as they can still 'see' the sun on cloudy days. The concern about use of neonicotinoid pesticides on flowering crops, such as oil seed rape, is that it interferes with the bee's navigation ability.

Swarming

Swarming is the means by which a colony reproduces itself to form two colonies or more. The main event involves the queen leaving the hive with about half the worker bees and some drones in one sudden, gigantic



Figure 3. A swarm of bees in a hedgerow.

exodus. The main swarming season is mid-May to mid-July and tends to occur when the hive population is at a maximum. There is variation with the swarming period and swarming behaviour depending on climate, the local region, the honeybee subspecies and local strain.

The principal reason for the preparation for swarming is thought to be a reduction in the transmission of 'queen substance'. This can occur if the hive box is very crowded and/or the queen produces less of the pheromone as she gets older.

Swarm preparations are initiated by the workers, not the queen. They begin by producing queen cells – a few or many – that hang vertically from the comb. These are much bigger cells and they look like monkey nuts. An egg is laid in each cell and it receives a much higher level of nutrition which, in turn, affects the larval hormones to produce a queen rather than a worker.

When the first queen cell is sealed at eight days, this acts as a signal for the old queen to leave with between 10,000 to 20,000 other bees. She will have been 'slimmed down' by workers so she is able to fly. Just before flight, all the bees take in plenty of honey – stored in their honey crops – for the journey to their new home. They sometimes fly only a short distance and cluster together in a ball, perhaps in a hedge or branch (**Figure 3**). They cling to each other in this cluster protecting the queen in the centre.

'Scout' bees travel from the cluster in search of a suitable new nest. Tree hollows, roofs, chimneys, old fridges are all candidates. The scout bee measures the internal dimensions by repeated flights backwards and forwards through the space – thereby mapping it. The ideal volume is 20 to 30 litres. When she returns to the cluster she does a waggle dance to recruit more scouts to her site, and these new recruits visit her site and return and may dance in its favour.

Several sites could be acquiring scout bees and the site that recruits the most will be the site to which the swarm will depart. A site that was popular with recruits at the start may be superseded by another site that more recruits found more suitable later. This is a remarkable and democratic method of new home selection and could take a few hours or a few days to achieve.

Once the decision has been made, the swarm takes flight again and the scouts control the mass and direct it to the new nest site at speeds of over 20 miles per hour. How the scouts make the swarm slow down is still a mystery. In their new abode, the workers set about the task of constructing comb for the old queen to begin laying in and forming a new colony.

Meanwhile, back in the original hive, the new virgin queens are metamorphosing into adults. The first to emerge will seek out the other queens and either kill them in their cells by stinging through the cell wall or fight to death on comb until only one virgin queen is left. The triumphant virgin will do orientation

flights and then fly out to be mated by 10 to 15 drones. One colony becomes two.

There is a system called supersedure where an old queen may be replaced in a colony by her daughter without swarming occurring. The two may co-exist for a short period before the old queen is eliminated. This means that a colony will keep a younger more vigorous queen.

Summary

A honeybee colony is a remarkable entity ruled by a highly complex system of communication in the form of chemical smells, food transference, vibrations, sounds and temperature. This complexity is so elaborate that we are only just beginning to understand a little of how it works and its potential benefits for mankind. ■

PPD Questions

1. What is the ideal water content of honey?
2. What is propolis?
3. When is the queen most likely to swarm?
4. What is the constant temperature inside a hive in spring, summer and autumn?
5. Why do bees collect pollen?

- Answers**
1. 18%
 2. Propolis is resins from trees used to seal small gaps in hives and has anti-microbial properties
 3. When the new queen cell(s) are sealed at Day 8
 4. 35°C
 5. Pollen is the main protein source



Emma Purnell
BSc MSc RVN CertNut

Emma qualified as a Registered Veterinary Nurse in 2008 and works full time as head nurse and clinical coach at The Stocks Veterinary Centre in Worcestershire. She also has a BSc in Zoology with Animal Ecology and an MSc in Ecology, helping to fuel her interest in more exotic species.

Emma has a particular love of 'small furrries' and nursing clinics and has just gained a Certificate in Canine and Feline Nutrition.

Wildlife in first-opinion practice

All first-opinion practices will see some wildlife cases, usually brought in by a client with little understanding of what to do and – on some occasions – what species is involved. Where do we stand in first-opinion practice and what can we do to give this animal the best chance of survival?

Initial triage should be carried out *before* the person bringing the animal leaves the practice. Much of the wildlife seen in spring comprises young animals, such as fledgling birds, that would actually stand a far better chance of survival if returned to where they were found, especially if adult birds have been seen feeding them.

Exclusions to this rule include the youngster that is in severe danger on a busy road, for example, or if they have been seen to be caught by a predator. If the animal is identified as a youngster with no injuries, the person bringing the animal in can be advised to return the individual immediately to where it was found, thereby increasing its chance of survival.

Fawns and leverets are visited very rarely by their parents and, if returned, will usually continue to be nursed. Despite the myths, handling most wild animals for a short period of time will not cause the parent to abandon them.

If there are cat-attack injuries that are very mild – maybe a few small scratches or even just knowledge that it may be a cat attack with no visible injuries – antibiotics should be given to help prevent septicaemia, before returning the creature to the wild.

Initial triage should take place by viewing the animal in the container or box in which it was brought into the practice – checking things such as general demeanour, movement and the level of shock. Be aware that fledgling birds and many young animals

instinctively huddle down in an attempt to hide, so it can be hard to distinguish this from lethargy and depression if you are inexperienced.

If the animal is to be admitted to the hospital, a consent form should be completed. This form should include the following questions and provide all the information needed both within the practice and if the animal is to be transferred to a specialist centre:

- client name, address and contact information
- date and time the animal was found
- where the animal was found (as detailed as possible)
- in what circumstances the animal was found
- species and approximate age (e.g. neonate, young, adult, elderly)
- what has been done since the animal was picked up (e.g. first aid or food offered/eaten)
- statement transferring 'ownership'
- client signature and date of admission.

Legal considerations

The statement transferring 'ownership' is advised as the legalities can be complicated. According to the Wildlife and Countryside Act 1981, an animal may be taken from the wild if sick or injured only for the purpose of tending it until it is fit for release. Once it is considered fit and well, it must be released – it is an offence

to keep captive any uninjured species protected by the Act.

Keeping any wild animal in a manner preventing its return to the wild – restricting birds from practice flights or imprinting young animals, for example – is an offence. While free-living wild animals do not usually fall into the category of being 'owned', if they are picked up and taken into captivity (in legal jargon, being 'reduced into possession') they become the property of the person taking it from the wild. Signing over this ownership allows treatment or euthanasia to be carried out without permission from the 'owner' of the wild animal.

While this is, thankfully, not a problem commonly experienced, it is good practice. Failing to provide appropriate treatment to a sick or injured wild animal which has been 'reduced into possession' can be classed as cruelty and may be an offence under the Wild Animals (Protection) Act 1996; while the Protection of Animals Act 1911 states that it is an offence to treat any species cruelly or cause it unnecessary suffering.

This can involve failure to provide necessary food, water, care and veterinary attention to wild animals. The Animal Welfare Act 2006 relates to both domestic animals and wild animals under veterinary or rehabilitation care and means that an offence may have been committed if a released

"Initial triage should be carried out before the person bringing the animal leaves the practice"



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A swift.



A young house martin.



This kingfisher had the unfortunate experience of flying into a window.



It is important to keep monitoring the bodyweight of hedgehogs.



Baby pheasants, a few days old.



A young grey squirrel.



A fledgling jay that had found its way into someone's house.



A rather hungry young blackbird.

rehabilitated wild animal does not have a chance of survival equivalent to that of other wild animals. This includes releasing animals at unsuitable sites, in wrong territories, not able to hunt (learned or physically), unable to behave normally, imprinted, in the wrong season and more.

As with any 'normal' pet, the basic needs of the animal must be met:

- a suitable environment
- a suitable diet
- the ability to exhibit normal behaviour
- the need to be housed with, or apart from, other animals
- protection from pain, suffering, injury and disease.

Clinical examination

Once the animal has been admitted, a thorough clinical examination can be carried out by handling and assessing it. Care should always be taken to ensure that handling is safe for both the handler

and the animal, using padded gloves and towels to help. The animal being handled *will* be scared, and is likely to make sudden fight or flight responses – so be prepared.

Keep birds' wings tucked in close to their bodies as they can cause damage to themselves or others by flapping when frightened. Teeth, beaks and claws can also leave lasting marks on handlers! Cover the head of the animal being examined, as the dark will help to calm them, keep the room quiet and calm – and secure in case of escape – and avoid eye contact.

Assess body condition, hydration and weight, as well as any signs of illness and injury. Record all findings.

The first thought when assessing any wild animal for injuries must be 'Will this animal be able to be released back into the wild?'. If a bird

has catastrophic wing injuries, this will not be compatible with release and euthanasia should be considered.

Wild animals will usually not demonstrate signs of pain – this is a survival response and *does not mean* they do not feel pain and do not need analgesia. If they have an injury that you or one of your pet patients would find painful – *they* are likely to be in pain.

Checking the inside of the container in which the animal arrived can also provide valuable clues – with blood and excretions sometimes giving invaluable information. Making comprehensive clinical notes of these findings can help a diagnosis and aid with referral.

Once initial triage and first aid is complete – and before further treatment or referral – house the animal in a suitable box or cage in a quiet place away from other individuals, ensuring no route for escape. Some animals have specialist needs – birds of prey, for example, struggle to behave normally if their tail feathers

are damaged and growing new tail feathers can take months, so providing a good size perch can be important to their rehabilitation and release. Treatment or referral should be arranged as soon as possible because time in a veterinary practice will be stressful.

Remember, certain species – including mink, grey squirrels and rabbits – cannot be kept or released without a licence under the Destructive Imported Animals Act 1932. Also, if any animal under your care is suspected of having a disease that is notifiable under an Order made under the Animal Health Act 1974 (including tuberculosis, Newcastle disease, foot-and-mouth disease, anthrax or rabies), the animal must be isolated and reports made to the police and Defra.

And finally...

Establishing a good relationship with your local wildlife centre is invaluable. Having the expertise of its staff to call upon and aid you with treatment plans and rehabilitation will give wild animals the best possible chance of survival and release. ■

"Establishing a good relationship with your local wildlife centre is invaluable"



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Anne-Marie qualified as a veterinary surgeon, has worked for many years in sales, marketing and training and now runs the company, PurpleCat Coaching.

Staying positive

We have all been there. We get out of bed, the sun is shining and it is looking to be a lovely day. Then we turn on the radio and listen to the news, we get stuck in traffic and by the time we arrive at work, the world is somehow less lovely. In short – we have been hijacked by ‘noise’.

Noise is information that is negative, false or unnecessary or that prevents you from perceiving a world where success is possible. Noise can be internal or it can be external.

Internally it is how you speak to yourself – “I’m stupid!” “Idiot” and so on; while externally it can be a flood of negative news from the media, it can be people telling you that you are not capable of something or it can be cultural beliefs around you – “In this family we work for a living – studying is not work” and “Boys are better at maths and science than girls”, for example.

Noise is usually dominant when we don’t understand how to create appropriate filters to choose what information is allowed through. Remember that with 11 million pieces of sensory information hitting our brain every second (Zimmermann, 1986), filters are what create our reality.

In order to carry on in the pursuit of a realistic, positive world, there is a series of steps that can be useful:

- differentiate between noise and meaning
- choose to reduce noise
- change your inner voice.

Differentiate between noise and meaning

Just because information is negative, it does not mean that it is noise. Negative information can be useful and important. So how do you differentiate between an unnecessarily negative world view – and a realistic and positive one?

In his book *Before Happiness*, psychologist Shawn Achor describes the following four criteria that can help you decide whether or not something is noise.

1. It is not usable information

Your behaviour will not change as a consequence of this information. If it is not going to inspire you or drive you to change something, then it is not valuable.

This criterion is one that will quickly make you realise that most of the information that you come across belongs in this category. One of the most significant places from which you gather unusable information is the news media; so a quick way to reduce this noise is to strictly limit your time spent

on television, newspapers, online news and radio.

2. It is the wrong time

You are not going to use the information immediately and it may have changed by the time you do decide to use it (Figure 1).

So you may be waiting to hear if you can have the vacation days that you have requested – and in the meantime you are constantly checking the price of air fares and worrying about travel and accommodation the closer you get to the dates.

3. It is hypothetical

Hypothetical information is based on what someone believes ‘could be’ rather than ‘what it actually is’.

Classical examples in this category include house prices, the long-term weather forecast

Figure 1. Sometimes information is noise, simply because the timing is wrong. (Image: Hartwig Kopp-Delaney)



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or whether the dog in the kennel is going to make it through the night.

4. It is distracting

This information distracts you from your goals.

So if your goal is to gain promotion, then listening to someone complaining about another team member is just noise – it isn't going to advance you further towards your goal and may, indeed, sap your energy.

Choose to reduce noise

We can become addicted to the noise. Just think of computer games, television series or having to check the news all the time – and our smartphones and emails are other examples of areas that drive our addiction to information (**Figure 2**).

The problem is, that in order to increase the amount that we can do, we need more than 2.9 positive experiences per negative experience to maintain high performance (Losada and Heaphy, 2004) and most of the noise to which we are exposed falls solidly into the negative category.

There are two strategies for cancelling noise – passive and active.

Passive noise cancellation

In 2008, an American study determined that, on a per capita basis, the daily time spent consuming information at home (*not* including work!) was 11.8 hours (Bohn and Short, 2010). And this is just the external noise.

So an easy way to cut down on the noise, is simply to reduce on your overall information assimilation. Even a mere five per cent reduction in overall intake can help refocus you away from a state of being overwhelmed into a place where you can focus on perceiving a realistically positive world.



Figure 2. Media, computers and smartphones are some of the worst offenders when it comes to generating noise. (Image: Bernard Goldbach)

Some of the ways of reducing the information are to:

- turn off the 'notifications' on your phone or on your computer. Choose when to look at what is there and swiftly delete anything that is either unusable, untimely, hypothetical or distracting
- force yourself to disengage from conversations that meet the above criteria. Purposefully move away from negative, energy draining situations whenever possible. Think about your friends and family – are there people who inadvertently drag you down that negative pathway? Choose to spend less time with them and purposefully direct conversations into more positive areas
- turn off your car radio or choose to listen to music that puts a smile on your face
- keep your car journeys sacred – purposefully focus on the good things on the way to and from work; noticing the leaves on the trees, funny details in shop windows and the courtesies of car drivers around you
- mute TV and internet commercials
- remove news links from your bookmark tool bar
- limit watching the news or stop watching it all together. If the stories are big and important enough, people will talk about them and you will find out!

- avoid reading articles or listening to conversations about tragedies that you cannot, or will not, affect with your behaviour
- avoid listening to songs with negative lyrics, especially if you are working.

Active noise cancellation

Think of noise-cancelling headphones. They do not just block out the sound the way ear plugs do, they actively replace the noise around you with silence. For humans, this translates into quietening down your internal noise by replacing it proactively with something more meaningful and positive.

Negative thinking, in the form of fear, anxiety, self-doubt, pessimism or worry, is the most dangerous form of noise around because it not only impairs our ability to hear the positive signals around us but it also undermines our other efforts to create positive change and an increased happiness.

There is a difference between appropriate learning from the past and planning for the future, and the constant churn of going over and over past events (known as 'ruminating') and worrying constantly about the future (known as 'catastrophising').

Again, if it is unusable, untimely, hypothetical or distracting, then it probably falls into either one of those two categories (**Figure 3**).

Some of the ways of reprogramming your inner voice are to:

- notice what you are thinking about. Are you ruminating or catastrophising? If you are, develop the discipline to stop yourself. You may hold up a 'virtual' stop sign in your head; or maybe say to yourself: "You are ruminating/ catastrophising"; or you may devise another method that works for you
- if you are worrying – what is the likelihood that what you are worrying about is going to happen? If it is 10 per cent, limit yourself to thinking about it no more than 10 per cent of the time
- purposefully choose to focus on the positive – keep redirecting yourself by focusing on what your senses tell you. Think of it as a form of instantaneous mindfulness. By focusing on what you see, hear, touch, smell or taste, you are moving your head away from thinking and analysing and into being present in 'the now'



Figure 3. Catastrophising and ruminating can cause our minds to spiral down into negative noise and depression. (Image: Yogendra Joshi)

■ make sure that you understand the difference between being loving and caring – and worrying. Worrying is a form of active destructive communication. This is when someone shares a goal or a desire and you respond with “Yes; but have you thought about” and you then proceed to list all the things that can go wrong.

Active destructive communication is common in teams when you have one person constantly ‘pooh-poohing’ other peoples’ suggestions and coming up with reasons for why they won’t work. Make sure that you avoid doing it to yourself. When you truly care about yourself, you give yourself positive feedback and support – just as you would with any other person.

One of the most debilitating fears that a person can have, is the fear of being wrong. In some cases this leads directly to ‘decision paralysis’; while in other cases it simply drives underlying anxiety and passivity. It is important to realise that nobody is right all the time. Most people act

with the best of intentions, operating on the information they have to hand and the resources – practical, emotional and mental – that they have available at that time.

As long as we learn from any outcome in our lives; and realise that (even if we could have made a different decision) at the time we made it we thought that we were making the right one (even when subsequently things went wrong). Rather than beating ourselves up about what has happened (thus creating more noise), it is crucial that we focus on what we would do differently next time and on what we have learned from the situation.

Creating a lasting, realistic state of positiveness that translates into success in our personal and work lives requires that we constantly focus on gradual improvement. The brain is a flexible organ that grows and changes all the time. So no matter what attributes and attitudes we were born with, we *can* change things and move forward in a positive manner.

The most damaging noise of all is the ‘self talk’ that goes along the lines of: “I am bright, so this should be easy; and if it isn’t then I won’t go there” or “I am too stupid to do this” or “People are born different – some get it and some don’t”.

We can all learn. Learning happens when we take responsibility for what we think and say and choose to change, acknowledging that we can constantly improve – no matter who or where we are. ■

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Mark has been with Hazlewoods since 2003 and works solely with veterinary practices and their owners.

He enjoys advising on a wide range of business and accounting matters, helping veterinary practices make the most of their opportunities to be successful.

In his spare time, Mark is a keen runner, cyclist, tennis player and is also a fan of motorsport.

Practice financial reviews

You own or manage a successful practice. You know how much money is in the bank at any one time. Surely there is no need to carry out a financial review?

Whatever the size and nature of your practice, a financial review process will help you spot trends and act on them quickly. It is a useful, non-clinical tool for supporting cost-effective service and staying ahead of the game.

And further good news? It need not be complex or overly time consuming.

Financial review should not mean a one-off exercise after the year's end. Reviewing the 'financials' of your practice should be a continual process. Management accounts are often cited as being similar to year-end accounts but produced on a more regular basis. In reality, however, management accounts can help you to monitor key data from many other areas of your practice business.

These key data are commonly referred to as key performance indicators or KPIs.

Tools at your disposal

What does your practice have at its disposal to help with a financial review? Some key areas include:

- you and your team
- clients
- accounts and budgeting
- practice management system
- external advisers, e.g. your accountant.

All of these factors are interlinked and complement each other as part of the financial review process.

Profitable or not?

You need to decide what information will be most helpful to you as part of your practice's ongoing financial review. How do you decide that?

It is worthwhile at the outset to consider what you are trying to achieve. Clinical excellence first and foremost, no doubt. Somewhere high up the list is also likely to be a practice with happy staff, yet one that is profitable at the same time.

Let's run with striving to achieve a profitable practice being important to you. How can you tell a poorly performing practice from one that is flying?

There are, of course, no hard and fast rules. So, by way of example, let's consider a small animal practice that has 'below average' profitability against another small animal practice that has 'above average' profitability, based on our benchmarking data

(**Table 1**). Each practice has 5.5 full-time equivalent (FTE) veterinary surgeons.

EBITDA

EBITDA stands for Earnings (i.e. profit) Before Interest, Tax, Depreciation & Amortisation. It provides an indication of the underlying financial performance of a practice, irrespective of its structure (sole trader, partnership, LLP, Limited Company), debt levels, policies on writing off the values of assets (depreciation/amortisation) and exposure to tax.

Where necessary, EBITDA can be further adjusted to exclude private costs/income and exceptional items – one-off repairs, legal and professional fees, and so on. It also gives an indication of the amount

Table 1. A comparison of the financial performance of two small animal practices

	'Below average' practice (£'000)	'Above average' practice (£'000)
Turnover	1,150	1,500
Gross profit <i>Gross profit %</i>	800 69.6%	1,180 78.7%
Staffing costs (including market rate equivalent for owners)	(535) 46.5%	(575) 38.3%
Overheads	(320)	(310)
(Loss)/Profit before tax	(55)	295
Interest Depreciation Amortisation	5 25 35	5 15 25
EBITDA	10	340
<i>EBITDA % sales</i>	0.9%	22.7%



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of cash a practice generates before capital expenditure and drawings/dividends.

On a wider front, EBITDA is the key figure for assessing small animal practices when valuing their 'goodwill' or, increasingly, the Gross Enterprise Value – goodwill, equipment and practice vehicles. Historically, turnover has been the key driver of the goodwill value for large animal and equine practices; but market activity in the past few years has seen a move towards EBITDA becoming more important for assessing some large animal and equine practices too.

If ownership change is on the horizon and/or you are considering retiring, working closely with a specialist veterinary business valuer will help ensure the best outcome for you.

Of course, an owner may be happy with the performance of his or her practice, even if it does have supposedly 'below average' profitability. For most owners, maintaining a good work/life balance is very important. However, often no extra work is required to boost the health of a practice's

finances, it just needs a moment to stand back and consider what factors will make the most difference.

To really understand how your practice stacks up, benchmarking is needed. Comparing your practice data to pooled data from other practices (external benchmarking), as well as comparing your own internal practice data over time (internal benchmarking) will help you establish where the land lies. There may be very good reasons why your practice is above, at or below average against benchmarks. However, without reviewing these, how would you know?

Whilst helpful, benchmarking in isolation only provides value to a certain degree. So, having established where the land lies, setting targets as the next stage will provide a focus for you. Working with veterinary specific advisers in the target-setting process will help ensure that the targets set are realistic.

By way of example, there may be a very good reason why a practice's gross profit margin is slightly below average – perhaps because

it sells a high volume of pet food that has a lower gross profit margin than solely fee-based work. This is not bad per se, but demonstrates that understanding the drivers behind your practice's performance relative to the benchmarks is crucial to avoid setting targets that are unrealistic.

Targets, budgets and projections

Targets, budgets and projections – are they all the same? They are often talked about as being interchangeable.

Ultimately, if you prepare financial projections that set out expectations for your practice's profit and loss account, cash flow position and balance sheet for the future, you will also be setting targets. If you choose to try and adhere to those projections in terms of the projected expenditure, then you will be budgeting.

Targets set, now you need an action plan to try and achieve those targets. Involving your staff in setting the action plan process can be invaluable – both in setting it and following it through. Encourage your

staff to share their ideas about how to make the most of what your practice has to offer. It is human nature that someone is likely to be keener to take ownership of an idea and follow it through if they have come up with it themselves.

In setting your action plan, try to keep it manageable. It is worthwhile brainstorming yourself and with your staff – although trying to put in place too many new initiatives at once is likely to mean that none, or few of them, will receive the focus and energy that they really need to succeed. Instead, you can focus your action plan on those areas that are likely to make the most difference, set against the resources needed to achieve them. The old 80:20 rule.

Having come up with an action plan, monitoring actual financial performance against your targets as part of a monthly (ideally) or quarterly review will help you fine tune your action plan in those areas that would most benefit.

What sort of information should be considered?

There is no right or wrong answer to this question. The list is, in reality, endless and you need to try and narrow it down. So, looking at a practice's profit and loss account, key components include:

- turnover
- gross profit
- staffing costs
- overheads
- overall 'profit'.

Space dictates we do not explore the different definitions of profit here in any detail; but it is worth pointing out that – when comparing 'profit' – it is crucial to ensure that 'like-for-like' are being compared because differences in practice financial structure and how profit is defined will impact on what is being scrutinised. Many of the concepts discussed here

apply equally to farm and equine practices.

Turnover

It may sound obvious, but without a comparatively decent level of turnover for any given level of costs, profit and cash flow will suffer.

Your veterinary practice management system contains a wealth of information about turnover. Ensuring that it is set up to provide you with clear reports incorporating accurate information is critical. If there is information that you wish that your system could provide – and you are unsure how to report it – speak with your system provider as it will probably be possible to accommodate your request.

Monitoring, say, the top 10 or 20 turnover categories – not only by value (£) but also by the number of procedures/items sold – will help you identify trends. Looking at this for the practice as a whole and also by veterinary surgeon is worthwhile. It is accepted that work sometimes gets booked under a staff name other than the person who carried out the work – although over time this exercise should still help you identify trends.

Of course, more in-depth analysis can be carried out and the above should perhaps be a minimum starting point. Monitoring turnover in this way can help to identify staff who may be uncomfortable in certain clinical areas – hence their lower numbers – and who may benefit from training and mentoring. It will also help you to understand how small changes in pricing and charging behaviour can have a significant impact.

Let's consider a similar practice to the examples in **Table 1**, with 5.5 full-time equivalent veterinary surgeons who carry out 495 cat dental procedures during the year –

an average of 90 procedures per vet. If we said that the actual average *charged* price per dental procedure was £100 plus VAT, then these procedures are contributing £49,500 (excluding VAT) to turnover. If, however, the average 'cat dental' price should be £130 (excluding VAT), that would instead give a potential turnover of £64,350.

It might be then, that of the 5.5 veterinary surgeons, one of them performs a much lower number of 'cat dentals' than their colleagues – at say 30 procedures in that year. In this example, there is also scope to support that particular individual, with a consequent knock-on benefit to turnover. However, without actively monitoring the whole picture, it would be very difficult to pick up on this.

Some practices choose to share a wealth of financial information with their staff – others less so. There is no one-size-fits-all policy and you should do what works best for you and your staff. Your accountant should be able to help guide you here. Even if you prefer not to share certain information with your employees, that does not mean

your looking at the information is any less valuable.

Having identified trends in turnover and procedure/service numbers, some practices use these data to help them target their marketing campaigns. One example of this is through the use of visual healthcare handouts given to clients. These leaflets offer ratings – using a green, amber and red traffic light type system – that can be applied to key clinical health areas, such as dental health, renal function, coat condition and mobility.

The use of the word 'recommend' is often suggested to be powerful when talking with clients too. Backing this up with something visual for them to take away helps to consolidate your healthcare recommendations.

It is possible to take this concept a step further by having a corresponding numbered rating system for recording the healthcare ratings on the practice management system. This enables practices to then actively target their promotional efforts to the areas that are arguably most

important to the well-being of the individual animals under their care.

An example of this would be following up with personalised contact to clients whose pet had scored an amber or red on the rating scale for teeth, perhaps linking in with, say, a dental promotion. Such contact could be automated using the practice management system with text and emails, or through phone calls or using the post.

A key part of this – indeed in communicating with clients generally – is considering offering all clients the choice as to how they wish to be contacted when they are not at the practice. The easier and more tailored to their preferences each client finds their interaction with your practice, the more likely they are to remain bonded to you over the long term.

Lost income through undercharging is often cited as one the toughest areas to crack. Some management systems allow you to run 'exception reports' – based on certain user-defined charging parameters – to help identify where items should have been charged but have



	Value (£'000)
Turnover (sales)	X
Cost of sales	
■ drugs and consumables	(a)
■ laboratory fees	(b)
■ clinical/carcass waste disposal	(c)
■ referral fees	(d)
Gross profit	Y

Table 2. Calculating gross profit

not been. For example, say a client books their dog in for a follow-up consultation, you would expect a follow-up consult to be charged.

Using the management system to 'package up' common procedures can also be help, as can regular invoice reviews. Another idea is for all the veterinary surgeons to 'diagnose and manage' a sample case, to see how their charges might differ.

Gross profit

A practice's gross profit is driven by the mix of fee-based work compared with the sale of drugs/consumables, its buying terms with suppliers, pricing strategy and charging, as well as speed of work. It is calculated as shown in **Table 2**.

Small gains in any of these areas can, when combined with the overall financial picture, have a significant impact.

The average first opinion small animal gross profit margin based on our data is 73.1 per cent. Practices in the south-east of the UK tend to have a slightly higher margin because they tend to command slightly higher prices.

Staffing costs

We generally consider that an efficient proportion of small animal staffing costs (including employer's National Insurance and ensuring any the figures are adjusted to include equivalent market rate salaries for the owners) to sales is between 38 and 45 per cent – although there can be

exceptions outside this range. A percentage outside the range might well not be the consequence of staffing pay issues either, but could instead be linked to 'turnover per vet' levels. A useful exercise can be to compare individual turnover per vet to an individual vet's 'package' – namely, their gross salary plus the value of any benefits provided by the practice. A typical range is 16 to 25 per cent based on our data, with around 19 per cent being average.

Where turnover is booked to 'non-vets', this can be overcome to some degree by allocating this turnover to the veterinary surgeons based on their own 'turnover per vet'. Monitoring this can be very enlightening and the relative figures between vets are often not always what you might expect to see.

Overheads

An annual review of overheads is always worthwhile. This is not to say they cannot be monitored more regularly; it is just that rather greater opportunities for boosting practice performance tend to be available from more regular review of turnover and staffing costs.

Overall profit

We referred to EBITDA earlier. This is a key figure providing a guide to underlying profitability. Whatever profit is being considered, it is important to understand how it is defined and ensure that like-with-like is compared –

for example, when looking at external benchmarks or your own data over time.

Final word

Financial reviews are not just about historic accounts. Some practices manage their finances by their bank balance and find that the practice performs 'okay'. However, taking a more proactive look at your practice's 'financials', through benchmarking, target setting, devising action plans and monitoring targets against actual performance, ideally on a monthly basis, opens up many more opportunities to maximise your potential and stay ahead of the competition. ■

Managing your most valuable resource

When writing staffing rotas, the modern veterinary practice has to factor in a variety of considerations; including out-of-hours working schedules, varied staffing requirements and allocations, and the increasing need for flexible working hours. Practice managers, vets and veterinary nurses who have been given the responsibility for organising staff rotas are often faced with the juggling act of keeping everybody happy while ensuring that staff with the required expertise are in the right places at the right times.



Add to the mix regional shortages of veterinary and veterinary nursing staff, maternity and paternity considerations, holidays and CPD days coupled with the Working Time Directive and it can become a struggle for the management team in a veterinary practice to produce effective working rotas.

Know your staff

Being responsible for rota writing carries the fundamental requirement of knowing every staff member's capabilities and preferences as well as the varying workloads that naturally exist within the practice. In addition there are several guidelines and regulations that need to be adhered to. Creating a working environment where staff can thrive and be happy often starts with designing and implementing suitable staffing patterns. Healthy and happy staff will also reflect how your practice runs and projects itself to your client base.

Generating effective rota templates that work for clients, their animals, the practice and staff is an essential planning requirement of the modern practice. The '7Ps' military adage is commonly used to emphasise the importance of good planning.

Work in progress

Rota requests can often be last-minute and maintaining a 'working draft' of your next rota is a good way to accommodate requests as they come in. This strategy should ensure that reasonable demands can be met prior to distributing the rota to staff. The politics involved with subsequent rota alterations and reviews once a rota is published can generate discontent among staff who may question why certain requests were accommodated, so waiting until a designated request deadline can reduce the amount of visible revisions that may have to occur.

The family objective

With a large proportion of the veterinary workforce being female and the need to accommodate paternity leave, staffing a veterinary surgery can often require a degree of flexibility when accommodating part-time or family compatible working hours. Generating a stress-free return to work for staff after having children, or factoring in maternity and paternity leave and medical appointments can be complicated and time consuming.

A useful feature of the Rota Manager program is its ability to cater for part-time working hours, block time periods when employees have specified that they are unavailable and set up working patterns that meet the needs of all concerned.

Cost effective

Efficient rota management should significantly reduce or remove the requirement to use ad hoc staff and locums. Often expensive and without engrained knowledge and training of your practice's values and procedures, unnecessary employment of agency staff can be best avoided by ensuring current staff are suitably distributed where they are needed. Appropriate work patterns and jobs will also make for a happier and healthier work force.

Work spaces

Specifying locations and workspaces within your rota is a great way to ensure that on arrival your staff know their duties and area of work. Thinking ahead about how your practice uses spaces and specialist equipment, such as scanners or theatres, will enable the rota writer to ensure that when a certain room is needed there are sufficient staff levels within that space to make it best operational.



Engage with your staff

Involving staff in changes to their rota patterns will not only enable you to gain their perspective on how the rota currently works for them, but also create a sense of inclusion and teamwork. Where individual rota changes may only need addressing on an individual level, larger changes to shift patterns allocation and timing should ideally be done as a team and will often bring out some innovative solutions. As managers are often privy to personal information about individual team members they may be able to make rota amendments and allowances to ensure that as far as possible a fair and balanced rota is produced.

Own it

Implementing Rota Manager is about making the commitment to effective and efficient management of the most valuable resource of the practice – its staff.

Rota Manager has been designed specifically to take into consideration the numerous factors that exist in this complex process and has the flexibility to address the very varied needs of different veterinary practices.

Whilst many elements of the day in veterinary practice cannot be predicted, Rota Manager can best prepare your teams for success. ■





Emily Eudall

Having originally trained in equine management and equitation, Emily has over 20 years of experience working in a variety of equine-based roles. She spent eight years in equine practice, working in both nursing and customer-facing roles. Emily now combines motherhood with her work as marketing manager for Onswitch and has recently gained a distinction for the CIM Certificate in Professional Marketing.



*Suggested Personal & Professional Development (PPD)



DEMOGRAPHICS

Have demographics had their day?

Humans are, in the main, programmed to conform. Follow the crowd. Don't stand out.

As consumers, pet owners are no different – that's why we've always been able to say that the 'average' pet owner is female, middle-aged, lives within five miles of their practice and uses only one practice; whilst the 'average' horse owner is older (a third are aged 45 and over) and female (90%).

Conversely, when it comes to decision-making in the agricultural and mixed sectors, we know that men fundamentally drive this.

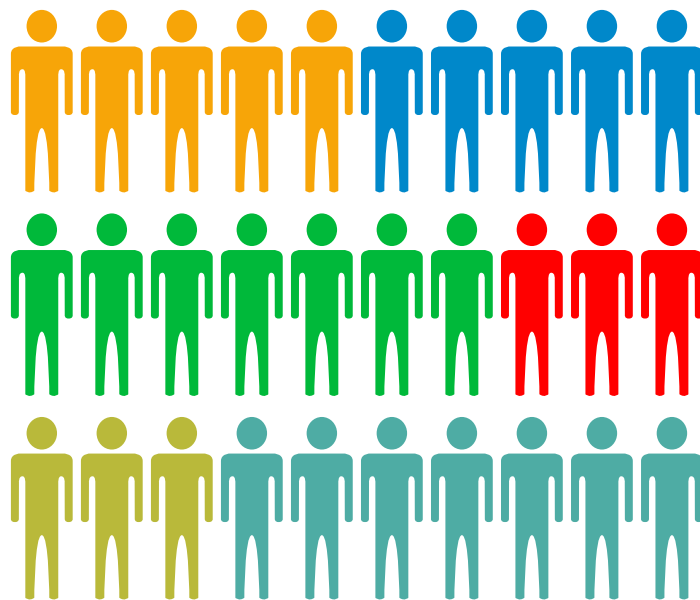
And yet 'average' by its very definition masks a whole multitude of factors – smoothing out the extremes to provide generalisations. Marketers, politicians and business owners have used these population classifications and generalisations (or 'demographics') for decades; providing a useful yardstick against which to target communications and allocate budgets.

You've probably used them yourself – if your practice is in a southern urban catchment, you may well target cat owners with added-value services and health plans; whereas, if your clients are elderly, you probably sell more accessories and treats than prescription diets.

But are such generalisations useful? Or are they patronising and pointless? In short, have demographics had their day?

Demographics are still a valuable business tool

Few would argue that there are some parts of the country where the local economy is struggling – in ex-mining areas, for example; just as there are others where industry is flourishing such as in the 'M4 motorway corridor'.



Common sense tells us that people are more likely to own horses in rural rather than in urban areas; just as it tells us that in rural areas pet owners are more likely to have to drive for more than 10 minutes to reach their nearest veterinary practice. Fundamentally, that is all demographics is – putting statistics into perspective with common sense. Because nature follows rules.

If you own a successful practice in Bath and personal reasons cause you to relocate to Margate, it is very likely that your business model no longer works. An ageing population with low incomes has replaced your wealthy, young, progressive clientele. Changing the focus of your offering to promote value-for-money health plans ahead of keyhole surgery is, perhaps, more in keeping with the needs of your new clients.

One thing, however, is not in question. Meeting the needs

of – whilst also exceeding the expectations of – your clients is always a given, wherever you are.

And if you're staying in Bath and looking to buy another practice in the area, then understanding the demographic make-up of local owners will confirm whether the right course of action is to leave the practice's established brand positioning alone, or bring it under the umbrella of your existing premium brand. Whilst if you're looking to open a brand new site, then identifying social trends and consumer behaviours amongst the people who live within 10 minutes of the building will determine how your practice should be branded, as well as which services you should offer. An understanding of local demographics will tell you, for example, that opening a new veterinary practice in central Leicester or Bradford faces a fundamental hurdle – a high proportion of residents

"...today's consumers want their brands to be more ethical, fair, responsible and inclusive"

with Asian heritage, means few pets.

Know your consumer

Demographics help you do just that. So let's look at another example.

Your new client registrations are stagnating. Close by, a large new housing development is being built, full of family homes. And where there are families, there are pets. Targeting mailings and door drops to these post codes allows you to put a £5 welcome voucher into the hands of hundreds of potential clients. You can tell them about your late-night opening for working owners, introduce your weekly puppy class and encourage them to 'like' you on Facebook. Targeted, effective advertising made possible because you understand the type of person moving on to your patch.

National 'vox pop' data find that 75 per cent of pet owners live within five miles of their chosen practice. Ongoing research consistently confirms that 'local' and 'convenient' are the key drivers when choosing a small animal practice. Most of your clients come from your town; so don't waste time and money advertising too far afield.

A quick look at your client database tells you that within your town there are undoubtedly some suburbs with an increased concentration of clients – so targeting your Friend-Get-Friend communication there makes sense. Likewise, vaccination offers will be more effective in some postcodes, just as gold standard annual care plans will be much more popular in others.

In short, demographics can certainly be a valuable tool in informing top-level business strategy. All the common sense in the world won't cut it in the business plan you submit to the bank, whereas a

detailed demographic analysis of your catchment area and target consumer will.

Demographics are dated and useless

According to the international think tank, Trend Watching, 'Demographics are dead. Adapt your strategy or perish'. Its November 2014 report, *Post-demographic Consumerism* declares: 'People – of all ages and in all markets – are constructing their own identities more freely than ever. As a result, consumption patterns are no longer defined by 'traditional' demographic segments such as age, gender, location, income, family status and more'.

They cite examples from global brands, such as Netflix, that are finding demographic profiling of customers increasingly pointless – the films we like are determined by so much more than how old we are and which part of town we live in.

Let us consider the facts in **Figure 1**.

We can all recognise that in our modern society, barriers, conventions and stereotypes are crumbling. It is no longer enough to ask, "Are you married or single; straight or gay?" when there are infinite shades in between. Indeed, when it comes to defining the very essence of a person – such as the ethnicity or gender with which they identify – is it even OK to ask? And does it really matter anyway?

We have all heard of generations X and Y. Most commentators agree that we're now living through the birth of generation Z – the 'Millennials'. Coming of age at the start of the 21st century, Millennials live in a brave new world.

Whilst those of us born before 1980 appreciate that

- in the UK, women now account for the majority of video game players, and there are more gamers aged over 44 than under 18 (Internet Advertising Bureau, September 2014)
- 31 per cent of UK Aldi and Lidl shoppers are from the AB demographics (The Grocer, March 2015)
- 32 per cent of The Sun readers are from the ABC1 demographics (www.newsukadvertising.co.uk)
- every generation and every income band uses social media regularly (Pew Research Center, September 2014)
- "If you look at the list of the 1,000 favourite artists for 13-year-olds, there is a 40 per cent overlap." (Head of Music, BBC Radio 1, May 2014)

Figure 1. Some pertinent facts.

Who uses social networking sites

Percentage of internet users within each group who use social networking sites.

All internet uses	74%
A. Men	72%
B. Women	76%
A. 18-29	89% ^{CD}
B. 30-49	82% ^{CD}
C. 50-64	65% ^D
D. 65+	49%
A. High school graduate or less	72%
B. Some college	78%
C. College+	73%
A. Less than \$30,000/year	79%
B. \$30,000-\$49,000	73%
C. \$50,000-\$74,000	70%
D. \$750,000+	78%

Pew Research Centre's Internet Project January Omnibus Survey, January 23-26, 2014. Note: Percentages marked with a superscript letter (e.g.,^{CD}) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g., age).

Figure 2. Who uses social media?

YouTube and mobile phones haven't always existed, the younger generation (who will increasingly make up a larger proportion of your client base) live differently. To them, searching for information online – instantaneously and on the move – is simply the norm. But crucially, this new classification transcends demographic constraints – it doesn't matter which part

of the country you live in, or what colour your skin is, all Millennials have similar expectations about how the world works, about what they need from the businesses they use and the brands to which they aspire.

Because the wheel is turning full circle, today's consumers want their brands to be more ethical, fair, responsible and inclusive – using models of

all shapes and sizes in their advertising, making honest claims, demonstrating a sense of humour and an insight into normal life. This is not driven by demographics.

Uniqlo's mission statement embodies perfectly how a business can successfully abandon demographics: 'We consistently provide fashionable, high quality, basic casual clothes that anyone can wear anytime anywhere – and always at the lowest possible market prices.' And it is working. Ten years ago, Uniqlo had just 100 stores, all in Japan. By the end of 2015, it had 840 in Japan plus another 1,170 around the world, with many more planned.

Which is all very interesting, but what relevance does it have for the veterinary sector?

Well, for a start, the implications for your client communications are huge. There is no longer such a thing as an 'average' owner – your clients can be young, old, male, female, black or white but they'll still have the same needs. There's no requirement to pay large sums of money for a report telling you what sort of people live around your practice. Save yourself the money and know this – as long as you focus your business on delivering a truly excellent customer experience, shaped by an understanding of what pet and horse owners expect, your business will grow.

Your practice mission statement (you have one, right?!) and your branding are universal truths, declaring that you provide superior care for both companion animals and their owners. There's no need to print things in pink for your predominantly female clients (honestly, we've heard this

happens). There's no need to dismiss social media because lots of your clients are old – those silver surfers are on Facebook just as much as their grandchildren (**Figure 2**).

Just communicate clearly and consistently. One message, for everyone.

We talked earlier about the role of common sense in business decisions. Why not undertake your own (free) demographic analysis by looking out of your window? If there's a Waitrose, a Fairtrade coffee house and a nail bar, you can probably ditch the £10 microchip offer; whereas a Poundland, a launderette and a corner shop might suggest adding in a vaccination offer too.

Then there's equine practice. With catchment areas often covering hundreds of miles, it's hard to imagine a demographic grouping that would be valid for such a large area. In the equine world, owners do their research; they talk to fellow owners and equine businesses, they go online and find out who is the expert on the particular condition from which their horse is suffering. Then they travel as far as they have to. And if their chosen vet moves to another practice, most owners will follow. Once more, reality doesn't fit the demographic model.

And if you need more proof that demographics has had its day, let's take a look at the thorny issue of consulting prices. A 2015 Society of Practising Veterinary Surgeons (SPVS) survey plotted average consult prices across the UK and found only a £3 difference between the lower and upper quartile average prices in the north of England and the south east. When it comes to

consult prices, it seems there is no real north-south divide, even though the principles of demographics would have us believe differently.

We could just as easily apply the 'looking out of the window' test here. If your practice is on a 'Waitrose street', it doesn't matter whether that street is in Newcastle or Newhaven, your clients will expect to pay a fair price for excellent care.

And the verdict is...

My colleagues and I at Onswitch believe that demographics have had their day. We think that veterinary practices have enough to worry about without adding

in the funding and utilisation of demographic profiling. We know that you are sensible enough to understand your clients' needs and we think the time has come to acknowledge that they don't depend on whether those clients fit into a box marked AB₁ or C₂DE.

It might seem controversial, but it shouldn't be. Far greater minds than ours have been saying for years that demographics are no longer relevant, and some of the world's biggest brands and the UK's most successful companies are embracing that fact wholeheartedly. Perhaps it's time veterinary practices did too? ■

PPD Questions

1. What percentage of pet owners live within five miles of their practice?
2. How can you undertake your own (free) demographic analysis?
3. What was the average consult price difference between both the lower and upper quartile in the north of England and the south east?
4. Are men or women the highest percentage of internet users who use social networking sites?

Answers
 1. 75 per cent
 2. Apply the 'looking out of the window' test; then focus your business on delivering a truly excellent customer experience, shaped by an understanding of what pet and horse owners expect.
 3. £3
 4. Women (76%)

Sources

Onswitch National Vox Pop data

Mintel data

SPVS survey data

British Horse Society research

"There is no longer such a thing as an 'average' owner"



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Maggie Shilcock

Maggie is a zoology graduate from Imperial College, London University. She has worked in the management field of veterinary practice for the last 20 years both as a practice manager and as a veterinary management and training consultant and course provider.

Maggie has contributed management articles to many of the major veterinary journals and has spoken at UK and international veterinary management conferences and meetings. She has written three veterinary management books and contributed chapters to three BSAVA Manuals and was president of the Veterinary Practice Management Association in 2003. She is now one of the editors of Veterinary Practice Today.

Performance appraisals – why they matter

Look in any good management book and you will find the 'hows, whys and wherefores', of staff appraisals and how to carry them out. This article concentrates on why the appraisal is so important to the success of a veterinary practice and on some of the things that can affect its success.

The performance appraisal – also referred to as performance review, employee appraisal, performance evaluation, development discussion, employee appraisal, to name but a few terms – is the way in which the job performance and development of an employee is documented and evaluated.

Appraisal systems are central both to human resource management and performance management. They improve organisational efficiency by ensuring that individuals perform to the best of their ability and develop their potential. The performance appraisal is an effective means of ensuring that managers and team leaders meet with their staff on a regular basis to discuss performance issues, training and development needs; and to make sure that all is done to make the best of the human resources the practice has at its disposal.

Why appraisals matter to employees

Appraisals are important because all employees need reassurance about how well they are doing their work, what is expected of them and whether they are meeting the required standards. Most employees want to improve and develop their performance, skills and knowledge and to progress – a good appraisal system will help them to do this.

The appraisal is equally good for a member of staff who may be struggling with some



aspect of their work as it provides a good opportunity to formally discuss what help and support they can seek from the practice. The appraisal can also be very motivating as well as reassuring. Everyone needs to feel motivated and valued if they are going to work well and really enjoy their job.

Why appraisals matter to the team leader/manager

Appraisals provide a 'window' for team leaders and managers into the success, development and needs of their staff and enable them to plan – not just the training they need to provide, but also how they will be able to use this person to the best of their abilities in the team.

Appraisals help managers find out how well the employee is doing, if there are any problems, and whether or not they are encouraging the best from their staff. They enable the manager to assess how a member of staff's work

could perhaps be improved and the best way the practice can help this happen. They also provide an opportunity to talk in depth about an employee's job and their future with the practice.

Why appraisals matter to the practice

The practice needs happy, motivated employees if it is going to operate effectively and efficiently. Motivating and developing employee skills and potential will have a positive impact on the service the practice provides to its pet and human clients. Well-trained, motivated staff will provide the very best service.

On a less positive – but very practical – note, the lack of formal recorded appraisals for staff is very much frowned upon if a staff member should take the practice to any kind of industrial tribunal or dispute. The provision of appraisals for all staff is now widely accepted as 'good practice'.



*Suggested Personal & Professional Development (PPD)

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APPRAISALS

Some points to remember

"Everyone should be appraised if the scheme is to be seen to be fair"

'Appraise all'

It can be a big mistake to appraise only a section of your staff. It's tempting when starting an appraisal system to "just try it out on the receptionists or the nurses". Equally, vets quite often get left out of appraisals because "it doesn't apply to them" or "it's different for vets", or other such excuses.

Everyone should be appraised if the scheme is to be seen to be fair.

Don't tie appraisals in with pay

It is probably inevitable that a good appraisal is likely to have some influence on financial reward if staff are measured and rewarded in this way. However, appraisals should not be tied in directly with pay and it is important to keep them separate from salary review time.

The easiest way to do this is to spread appraisals throughout the year – easy to do if you have a system of induction appraisals

where new members of staff have one-, three- and six-month 'mini' appraisals before they slot into annual appraisals. If staff think that their appraisal is going to influence any salary review, they are unlikely to give totally frank answers to questions, or be particularly relaxed at the interview.

Avoid a moaning session

Most managers have been here. It is when a member of staff has strong feelings about an issue and uses their appraisal to voice them. This is OK up to a point; but appraisals are not a time for moaning, so it's vital to halt this flow of conversation early on and point out that the appraisal is for positive discussion and for looking forward. If there is a problem, then it should be discussed at a different time.

Appraisals are not for disciplinary issues

Disciplinary issues should always be dealt with as a separate matter and as

soon as they arise – never at an appraisal interview.

Don't criticise

There may well be deficiencies in an employee's work, but the point of the appraisal is to see how the employee can be helped to overcome these. It is not the time for direct criticism. This should be addressed at a separate interview.

Don't promise what you cannot deliver

It is very easy to make off-the-cuff promises at the appraisal interview – maybe to provide more training, give more responsibility, or allow a staff member to develop a particular interest. This is fine so long as you are able to make it happen. The commonest criticism of appraisals by staff is that they were promised things that never actually happen; so, at the end of the appraisal, have an action plan listing what you and the employee have agreed.

Appraisal follow up

The whole appraisal will fail if the follow-up process is poor – this includes good feedback to ensure that promises are kept and targets are met and any support needed during the year is provided. Follow up the action plan by agreeing a time by which you will deliver what was promised. Make sure this happens.

Appraisals should be a continuous process

Once begun, appraisals should take place on a regular basis – ideally every six months. If it is possible to hold short informal one-to-one quarterly meetings, all the better. Twelve months is a long time if things are not going well, so regular contact is important. ■

"At the end of the appraisal, have an action plan listing what you have agreed"

Pet insurance – necessity rather than luxury?

The Spring Budget increased the insurance premium tax (IPT) from 9.5 per cent to 10 per cent – a small increase, but one which will noticeably increase the cost of all insurance policies, including pet insurance. However, alongside this tax increase came a personal tax allowance increase of £500, starting from 2017/2018. So it would seem very much a case of taking with one hand and giving with the other.

The increase in IPT will indeed raise the cost of insuring a pet, but it really is important to keep a sense of proportion. For the average pet owner who is insured, the annual payment pales into insignificance compared with all the other costs of pet ownership.

As the cost of veterinary care increases to a very large extent owing to the new and developing medical procedures that can now be performed – it becomes ever more important that pets are insured. Sadly, this message does not yet seem to have hit home with the general pet-owning public, as it is estimated that over half of the nation's dogs and over two thirds of its cats are still uninsured.

Choosing pet insurance is no easy task and depends not only on an owner's finances, but also on the type of policy they want or need. Choosing from 'lifetime', 'maximum benefit', 'time-limited' or 'accident-only' and other similar policies is complicated enough before even beginning the process of comparing the policies of the many different insurance companies and, of course, reading the small print.

Clearly the cost of insurance is a significant financial factor in pet keeping, but when we realise that in 2015 UK pet owners spent £4.6bn on their pets, it brings into perspective the £25-£30 per month that the average pet owner might spend on pet insurance. £4.6bn is an awful lot of money and it is important to understand that a significant proportion of this is not spent on food, insurance or vets bills, but on pet accessories, gifts and treats.

Research results show that in Britain almost 90 per cent of pet-owners spend up to £50 on extravagant gifts for their pets – with one of the more extreme gifts cited being a £1,400 doggy treadmill. Birthday gifts are given to 27 per cent of the pet population and pet fashion is also on the rise, with hundreds of pounds sometimes being spent on fur coats for dogs and cats, not to mention the jewellery and the rhinestone- (or even diamond-) encrusted collars. Over the last

two years, spending on pet presents has grown by £3 million, which says a great deal about our willingness to spend on our family friends.

Sadly, these facts do not translate into a significant increase of spending on pet insurance. In some ways this should not come as any great surprise as spending £30 for a present for your pet is something tangible that gives you pleasure, while spending £30 on pet insurance feels – as with any other insurance – like money lost with no return. It's only when the pet is ill or injured that spending on pet insurance becomes a more attractive proposition and of course, by that time it is usually too late.

There is probably no easy way to encourage the insuring of more pets. Emphasising the growing cost of veterinary bills only serves to fuel the criticism of veterinary charges rather than encouraging or highlighting the need for pets to be insured. Veterinary practices can certainly do more to encourage pet insurance, but the cynical owner may simply see this as a way for the practice to make sure that their bills are paid. Insurance companies can-and-do cite the possible costs of unexpected vets bills and how being insured will cover such costs; and dog and cat magazines can encourage and advocate the advantages of insuring a pet. However, at the end of the day, choosing to insure one's pet is a personal decision and there are many

reasons why people do not take out insurance including:

- It won't happen to my pet – yes it could and if it does it could be very expensive
- I'll have my own savings account for any extra veterinary costs – but what if the big bill comes only a few months into the start of the savings account?
- I'll still have to pay the excess – yes but that is a lot cheaper than the £1,000 bill
- My pet is now too old/too ill to be insured – this is a fair point because it can be very difficult to find insurance for such pets
- I'll take my chance – be it on your head, but sadly it will be your pet that may be the one who suffers
- I can't afford pet insurance – this is a very fair point in some cases and, hopefully, if faced with a big bill, the owner will be able to receive some form of animal charity help. However, perhaps a slight tweaking of the budget and priorities – such that less is spent on treats and presents and more on insurance – might put affordability in a different light.

There is no easy answer. All we as veterinary professionals can really do is to advocate insurance as impartially as possible in the hope that more pet owners become willing to spend money on future possibilities rather than present pleasures. ■



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Industry Profile



Your name: Jane Howorth MBE
Position: Founder
Company: British Hen Welfare Trust
 (www.bhwt.org.uk)

What inspired you to start rescuing battery hens?

I watched BBC *Panorama's* Down on the Factory Farm as a teenager in 1979; and finding out that commercial laying hens never had an opportunity to experience the outdoors at any point in their lives had a big impact on me. I started writing to my local MP as well as various institutions, such as the Meat & Livestock Commission, to try to improve awareness of how laying hens were kept and increase consumer choice through better food labelling.

How did the British Hen Welfare Trust evolve from a one-woman enterprise to what it is today?

My parents died within a year of each other – too young – and there is nothing that brings the value of life into focus more sharply. That fact, together with my growing passion for the pet hens I had begun saving from slaughter, led me to advertise for homes for 'spent' hens – much as the RSPCA seeks homes for cats and dogs. My first advertisement read:

'We've never seen the sunshine and never tasted grass. Is there anyone out there who can offer us a second chance to enjoy a better life? We're spent battery hens due to go to slaughter. Please help us if you can. Call etc.'

My telephone didn't stop ringing; so following some regional and then national media coverage I was able to build a network of like-minded volunteers, all of whom understood the ethos of the charity. It was very important to me from the outset that all stakeholders within the egg industry were treated with respect and not berated for how they kept laying hens in cages – systems which, ultimately, were designed to meet consumer demand for cheap eggs.

The Trust now has 500 volunteers – how do you organise them?

I have a small and very capable team here at 'Hen Central' in Devon. Gaynor Davies, RVN, heads up the operational side of the charity, which includes the recruitment and management of volunteers in over 30 regional teams nationwide. The volunteers are given training on farm visits, bird handling and care. Each team has a structure covering transportation, equipment disinfection, bird handling, 'poorly' care, administration and, of course, re-homed liaison.

What does your role within the Trust now involve?

I'm still very 'hands on' in that I am involved in hen 'collection' days; but I also do more in terms of building a bridge between welfare and commerce, which I believe is key to high welfare. My work involves writing articles for backyard hen keeper publications, wider consumer-based coverage through regional and national PR highlighting how consumers can influence hen welfare through their shopping basket.

There are also industry-related communications, such as the joint leaflet covering avian influenza that I am currently working on with the NFU and British Free Range Egg Producers Association.

The Trust produces a magazine three times a year. It has a circulation of nearly 60,000 households and includes a mix of new stories, information, special features, major retailer and celebrity interviews. Our readership profile includes those people who enjoy keeping hens – whilst appealing to a broader audience of 'foodies', encouraging consumers to think about welfare and food, and to promote British free-range eggs.

Similarly I want to see progression in veterinary support for backyard flocks – keeping hens as a hobby is here to stay and currently there is a lack of knowledge, experience and licensed treatments available for poultry as a whole. Being awarded Charity of the Year status by the BVNA has given me a wonderful opportunity to highlight these areas, and work towards improving support for the increasing number of households that keep hens as pets.

The last few months have been an exciting time for you, how do you feel about being awarded an MBE?

It certainly has been an exciting time! News of the MBE was a huge surprise, and apart from giving me a lovely sense of achievement, it is enabling the charity to open more doors and explore more ways in which keeping hens as pets can benefit society.

Being awarded the BVNA Charity of the Year status was just perfect timing for us, and I'm deeply grateful to Sam Morgan for putting us forward; the possibilities for improving veterinary support for poultry are exciting! And, of course, our half a millionth hen, Dee, was re-homed in January of this year too.

When I started helping hens, my target was a lorry load (around 4,000) and sometimes I have to pinch myself that we have now saved over 500,000 from slaughter. I could not have achieved what I have without the support of the wonderful volunteers though, and the goodwill of the farmers with whom we work. That is certain.

How do you work to raise public awareness of battery hen keeping?

As well as achieving lots of media coverage – and promotion through our own publication *Chicken & Egg* – the Trust also attends events such as *The Edible Garden Show*, county shows and, for the first time this year, *Gardener's World Live* and *Countryfile*.

We have a small number of volunteers who give talks to schools, the WI and other groups, and we want to develop this side of our educational campaign. We are also very active on social media, where people from all walks of life can enjoy communicating about a common passion, and learn about the charity and its aims. All our educational work has a positive stance and we avoid shock tactic style campaigning.

"It was very important to me from the outset that all stakeholders within the egg industry were treated with respect..."



How do you make sure hens are re-homed to suitable owners?

Every single person who adopts our hens must speak directly to a member of our staff so we can assess their knowledge and the facilities they offer to birds. We also offer bespoke advice on merging flocks, common health issues and nutrition requirements. We do not re-home hens where there is a high expectation of continued egg production.

Do you see a day when there will be no battery farms?

I hope so, but that will depend on consumer demand. We encourage support for British free-range farmers, especially those who keep their birds in small flocks of up to 4,000. The free-range sector has grown considerably since the charity began (32% free-range in 2008 to 52% in 2014), but free-range eggs are potentially in danger of becoming a commodity product; so we need to be mindful of what we are asking farmers to do, and what consumers are willing to pay for.

Huge flocks of 32,000 free-range hens arguably would not offer birds the lifestyle that consumers expect from a free-range, egg-producing chicken, so attention to range enrichment and adequate protective cover is vital to ensure the quality of a free-range system that meets consumer expectation.

Do you think that the general public's attitude to animal welfare is changing?

I think there is more awareness of food provenance generally. We appeared with Hugh Fearnley-Whittingstall and Jamie Oliver in a high profile Channel 4 programme in 2008, called Jamie's Fowl Dinners and that brought the entire poultry industry to the fore. Certainly it is our experience that when someone adopts our hens, it changes their shopping habits in that they become more discerning and supportive of the free-range movement.

How do the RSPCA's Five Freedoms relate to battery hen farming?

Caged hens have access to food and water. A good stockman will also ensure birds are free from discomfort, pain, injury and disease as none of these are conducive to a productive flock. I would agree that birds can also behave 'normally' within a caged environment, but I don't consider that they can behave 'naturally'.

It is normal to perch, preen and scratch – all of which can be done within a caged environment; but birds are unable to behave naturally in that they cannot dust bathe or enjoy the stimulation that an outdoor environment offers. I would argue that their well-being is compromised by limiting their *natural* behaviours.

The Trust celebrated its 10th birthday during 2015, how do you see it developing over the next 10 years?

Hopefully, the next 10 years will see:

- improvements in veterinary support
- the charity reaching a much wider audience, such that we appeal to those who eat eggs rather than simply those who enjoy keeping hens
- development of an educational programme targeting schools and other groups
- widening our educational reach to include vets and vet nurses,
- research work – working more closely with the industry to bridge the gap between welfare and commerce so that consumers have a clear knowledge of laying hen welfare.

We are also currently planning our first flagship re-homing and educational centre at our Devon base, which is very exciting!

How do you educate owners, who keep just a small number of hens, on chicken welfare?

We educate through our publications, and social media activity. We cover serious subjects – such as what to do in the event of an outbreak of avian flu, the value of registering with APHA (part of Defra), the implications of a ban on beak trimming and much more – but in an entertaining and engaging way.

As more hens are kept as family pets, how do you think this might effect the need for veterinary care?

There is no doubt that the need for wider veterinary support is growing. The kind people who adopt hens from us are primarily driven by compassion and, therefore, they treat their hens as family pets and require veterinary advice provided in a similar way to that available for companion animals.

We see a gap in the market here and would like the knowledge and experience of the current handful of forward-thinking avian vets to spread and become the national norm.

What relationship does the Trust have with the veterinary industry?

I would say the relationship is growing nicely. When I started there was no substantial veterinary support – in fact, I recall several hens that had been written off by local vets that subsequently enjoyed a good quality life as a result of my homespun remedies!

When the charity was established, it became the norm for vets to call us, asking our advice on hen treatment; that still happens and is welcomed today. Obviously, we cannot offer technical support, but we are knowledgeable through experience and have access to innovative and highly respected avian vets. We are delighted to partner with Chicken Vet (www.chickenvet.co.uk) – part of the St David's Poultry Team based in Devon – who have developed CPD courses for vets and vet nurses.

How do you think the veterinary industry can help improve the welfare of hens?

I think there is much that can be done to improve the welfare of backyard flocks and would encourage vets and vet nurses to learn about these increasingly popular pets – voted sixth in the 'Top Ten' by the Pet Food Manufacturers' Association. There are a handful of common health problems that recur and broad knowledge of these will ensure a happy client and a happy hen. ■

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Wound Management	7 July	Ipswich, Suffolk
CT Imaging in First Opinion Practice	13 July	Ipswich, Suffolk
Pain Recognition and Effective Analgesia	19 September	Ipswich, Suffolk
OSCE Preparation Day	24 September	Ipswich, Suffolk

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