



2019 RWAFF/ Burgess Rabbit Essentials Conference

Non Clinical Stream

Welcome to what is now our 16th conference, which we are thrilled to be hosting in Birmingham. This year we are once again pleased to be able to bring you a variety of lectures, all chosen carefully to keep you up to date with the latest research and techniques.

We are hugely grateful to our team of Educators today, and as ever, thanks to our sponsor, Burgess Pet Care.

Thanks therefore go to the following people:

Dr Richard Saunders
Dr Livia Benato
Dr Molly Varga
Dr Guen Bradbury
Dr Craig Hunt
Dr Jane Tyson
Katie Frimston & Finn McCully
Debbie Goodwin

Moreover, of course, huge thanks to all of you for coming along and supporting this event, it would not have been possible without you. We hope you have a useful and educational day.

Alan, Emma, Rae, Richard & Ros
Team RWAFF



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Richard Saunders BVSc DZooMed MRCVS European Veterinary Specialist in Zoo Health Management

Richard graduated from the University of Liverpool in 1994, also obtaining an intercalated degree in Zoology. He worked in general small animal practice for 2 years before joining the RSPCA at Norfolk Wildlife Hospital, working with British wildlife. After that, he worked in increasingly exotic animal practice, obtaining his CertZooMed in 2001, and his DZooMed (Mammalian) in 2010. He joined Bristol Zoological Gardens as a resident in 2008, and Staff Vet in 2011. He works part time for Bristol Zoo, consults in private referral practice in Bristol and teaches at the University of Bristol. He is the RAAF Veterinary Adviser contributed 4 chapters to the BSAVA manuals of Rabbit Medicine, and Surgery, Dentistry and Imaging and co wrote "Notes on Rabbit Internal medicine" and "Rabbits: Behaviour, Health and Care". He has 2 rabbits, Leela and Pongo. Richard has just recently obtained European Specialist status with his European Diploma in Zoo Health Medicine which is part of the European College of Zoological Medicine.

Craig Hunt BVetMED DZooMed Cert Sam RCVS MRCVS

Craig qualified from the Royal Veterinary College in 1997 and proceeded to work in mixed-species practice in East Sussex for 5 years. A subsequent move to Gloucestershire for 3 years followed, before settling at Chine House Veterinary Hospital in November 2005. He obtained the RCVS Certificate in Small Animal Medicine in 2000 and the RCVS Certificate in Zoological Medicine in 2002. In 2013, he was awarded the RCVS Diploma in Zoo & Wildlife Medicine and became an RCVS recognised specialist in 2014. Rabbits and rodents comprise approximately 40% of his clinical caseload with dental disorders being a common and significant presenting problem.

Molly Varga - BVetMed CertZooMed DZooMed (Mammalian) MRCVS

Molly gained her RCVS Certificate in Zoological Medicine in 2001 and her Diploma (Mammalian) in 2007. Her special interests are rabbit medicine and surgery. Molly has contributed to several books including the BSAVA Manual of Reptiles, Nursing Exotic Pets and Wildlife, Rabbit Medicine and Rabbit Surgery and volumes on rodent/rabbit medicine and surgery. Molly's update on the Textbook of Rabbit Medicine has recently been published. Molly also reviews articles for other authors and Journals, and has been involved in reviewing the WildPro volume on Lagomorphs. She is an examiner for the RCVS Diploma in Zoological Medicine. Molly heads the Exotics Referral Service at Rutland House Veterinary Referrals, St Helens, Merseyside.

Livia Benato European Specialist DVM CertZooMed ECZM MRCVS diplomate in small mammal medicine

Livia Benato has worked with rabbits and exotic animals since she graduated in 2002. She works at City Vets in Exeter as Small Mammal and Exotics Veterinary Associate and she is studying towards her PhD in Rabbit Pain and Stress at the University of Bristol. Livia is a RCVS and European Recognised Specialist in Small Mammal Medicine.

Guen Bradbury MRCVS

Guen is a veterinary surgeon, a pharmacologist, and an innovation consultant with Innovia Technology. She also lectures at the University of Cambridge and runs a teleconsultancy service giving advice on behavioural problems in pet rabbits. Guen is also on the RWAf Team as a the Rabbiting On Vet Advisor, and she has recently published the excellent book 'Behavioural Problems in Rabbits'.

Katie Frimston

Katie Frimston has a BSc (Hons) in Animal Behaviour and Welfare, which she gained at the University of Chester on the Reaseheath College campus. Her dissertation research was focused on the effects of indoor and outdoor accommodation on domestic rabbit behaviour, the results presented significant findings. Since then, Katie has written 3 magazine articles on various topics including rabbit behaviour. Katie has an array of experience working with various animals, including working on an orangutan sanctuary in Borneo as an Education Officer and Orangutan Carer. She also enjoys travelling around the world observing animals in their natural environment in places like Australia and South Africa. Katie also holds a PGCE in Further Education, as she was inspired to become a lecturer after experiencing the power of Further Education herself. She now works as a Further Education Lecturer/Course Manager at Reaseheath College in the Animal Management department.

Finn McCully

Finn McCully gained a BSc (Hons) in International Wildlife Biology at University of South Wales, before proceeding to an MSc Animal Behaviour at the University of Exeter. Finn's theses focused on the behaviour of birds including the red-billed chough and multiple flamingo species. Finn has field experience in South Africa and Borneo, and has also worked on conservation and behaviour projects in the UK. Finn is currently a Higher Education Lecturer/Course Manager at University Centre Reaseheath, Cheshire, where she regularly teaches subjects such as animal welfare, animal behaviour and research methods, alongside dissertation supervision. She will soon be commencing a PhD at the University of Liverpool on seabird ecology.

Dr. Jane Tyson

Jane is the rabbit behaviour and welfare expert in the RSCPA Science & Policy Group, based in Horsham, and has been there for 6 years. She has a Doctorate in Biomechanics and an MSc in Applied Animal Behaviour & Welfare from Edinburgh, and so has a special interest in improving animal welfare and understanding behaviour with a focus on rabbits and rodents.

How should we keep rabbits in the 21st Century?

Katie Frimston and Finn McCully







Lecture notes: What should you know about handling your rabbits?

Guen Bradbury MRCVS

Over the last few centuries, humans have come to view rabbits as pets that are frequently lifted and held, partly because their fear response of 'freezing' means that they may not try to escape, and partly because their size means that humans need to crouch on the floor to interact with them at their level. Children's books and media materials have helped to perpetuate this societal attitude, with most images of interactions between humans and rabbits depicting rabbits being held.

Animals that themselves have dextrous 'hands' (like monkeys, apes and humans) are likely to have instinctive positive feelings about being picked up. This is because, when they are infants, members of their own species frequently pick them up. Humans interact with their world primarily with their hands: mothers lift their children to show affection or protection; friends greet each other with a hug. Rabbits don't have hands, so are therefore not picked up in this way by other rabbits – being lifted off the ground is extremely stressful. This creates a discord between how humans and rabbits want to interact.

It can be hard to see that lifting your rabbits causes stress. The signs of stress can be very subtle and may not be noticed: rabbits, unlike dogs, cannot kill or badly injure humans when stressed or scared. This can make the problem of inappropriate handling seem less pressing. Some rabbits may show fear through growling, lunging or biting; others may freeze or learn to tolerate being picked up. Some owners may interpret the 'freezing' behaviour when lifted, as acquiescence or willingness, rather than fear or learned helplessness. Subtle signs of fear or discomfort (facial tension, pupil dilation, abdominal flattening response) are often overlooked. However, a pet rabbit that is frequently picked up is less likely to voluntarily approach the owner.

There are two ways to reduce the stress caused by picking up rabbits. The first method is mostly under the control of the owner; the second method involves breeders, pet shops, owners and veterinary staff.

- ***Decrease the number of times that the rabbit is picked up***

There are two major reasons for owners to pick up their rabbits: practical reasons (putting the rabbit into the hutch, checking the rabbit's health) or emotional reasons (to show affection for the rabbit).

If you are to stop picking up rabbits for practical reasons, you will have to change the rabbit's environment so they no longer need to catch the rabbit. Runs attached to hutches (as advised by the RWAFA) eliminate the need for rabbits to be lifted up. Rabbits can be easily trained to recall to a whistle, to go into their cage or hutch on command and to do simple tricks for food rewards. Together, these allow the rabbit some freedom of movement while reducing stress, not only for the rabbit, but also for the owner, who no longer has to catch the rabbit to return it to its enclosure. Many owners would prefer not to have to catch their rabbit frequently!

Owners also lift rabbits to perform important regular health checks, as recommended by vets. However, there are much less invasive ways of checking health that do not require lifting. Observation of normal behaviours, such as feeding, activity and resting postures, provides information as to the general state of the animal. Health can also be assessed by trained behaviour. Changed responses to commands may indicate pain. The claw length can be visually assessed, the head can be palpated for injuries, lumps or pain, all during normal interaction and without lifting. You can visually check the anogenital area after using a food reward above the animal's head to encourage it to stand up on its hind legs. Needless to say, this should be done on the floor. In this situation, it is education that is the key to reducing the frequency of the rabbit being picked up.

If you pick up the rabbit to demonstrate or to receive affection, then it can feel difficult to change this. You will have to learn different, mutually satisfying ways of interacting with your rabbit. Try soliciting interactions by putting your hand in front of the rabbit's face, waiting for the rabbit to

lower its head, and then stroking it around the eyes, ear base, and top of the head. Also hand feed and train the rabbit to come to you when you call it, and enjoy other interactions with the rabbit like encouraging it to play with toys.

- ***Ensure that, when it is absolutely necessary to pick up the rabbit, the stress is minimised.***

There are two strategies for minimising stress during handling: better socialisation of rabbit kits, and more humane handling of adults.

- **Better socialisation of rabbit kits**

Rabbit kits below the age of seven or eight weeks have a much reduced fear response, and can learn to tolerate human handling. At this age, the rabbit is with the breeder rather than the new owner. Rabbit breeders can help to reduce later stress in two ways. First, by selectively breeding from rabbits that are calm and confident around humans: Second, by ensuring adequate socialisation of young rabbits: either by gently picking up the kits, or even by exposing the neonatal (newborn) rabbits to the scent of humans. Both of these methods will mean that in adulthood, if there is no option but to pick up the rabbit, it will experience less fear and will suffer less.

- **More humane handling of adult rabbits**

If a rabbit must be lifted, the handler should support the rabbit so it feels secure. This includes supporting the paws to allow the rabbit to brace and stabilise itself against the movement. Rabbits should never be lifted by the ears, or by the scruff alone: neither part of the anatomy is strong enough to take a rabbit's weight without causing pain and injury. Supporting the rabbit's thorax and forelimbs with one hand while holding the hind paws in the other, or supporting the rabbit's back end, with all of its paws on your chest seem to be the least-worst solutions. When lifting is required, containing the rabbit in a towel prevents direct contact of human hands with the paws, which seems to be especially distressing.

To give the rabbits more control over their situation, you can train rabbits to voluntarily enter a box or sit on a towel to be moved. It requires a lot of trust from the rabbit in the owner, and so represents an advanced level of training. Only try it if you have already trained several behaviours so your rabbit understands the process!

However, regardless of correct lifting styles and socialisation, know that if you want to improve a rabbit's welfare, pick it up as infrequently as possible!

Rabbit Dermatology

Livia Benato DVM MScR CertZooMed Dip ECZM (Small Mammals) MRCVS

These days, pet rabbits are seen for a variety of problems and dermatological cases are very common: 25% of all rabbit cases seen in UK (Nielsen et al 2014). The aetiology varies but problems such as pododermatitis and infections with parasitic and bacterial aetiology constitute the higher percentage of these cases while viral infections are considered less common. Stress and pain also play an important part and should be taken in consideration during the initial consultation. These notes are an introduction to rabbit dermatology and the most common presentations are here described.

Mites are found on the skin of rabbits as part of the normal flora. Immunosuppression due to chronic stress or pain, inability to groom properly and poor hygiene can increase the number of mites and lead to the clinical signs. Mite infestation is generally secondary to an underlying problem that should be therefore addressed and treated.

Fur mite infestation, also known as 'walking dandruff', is caused by *Cheyletiella parasitovorax*, a superficial mite that lives on hair and fur and feed on keratin. The clinical signs consist of excessive scaling, clumps of hair falling out and superficial perivascular dermatitis. It is generally found dorsally on the back of the neck and between the shoulders. However, in severe cases it can affect other areas of the skin. After physical examination, acetate tape cytology is the main diagnostic test. Treatment consists of topical application of ivermectin (Xeno[®]) every 10-14 days up to 3 times or selamectin (Stronghold[®]) at 6-12 mg/kg repeated every 2-4 weeks or until the resolution of the clinical signs.

Ear mite infestation is caused by *Psoroptes cuniculi*, a non-burrowing mite that is found in ears and pinnas. In severe cases can also affect the ventral abdomen, legs and perineal area. The main clinical signs are pruritus, head shaking, and well-adhered crusts. If untreated can lead to secondary bacterial infection and *otitis interna*. The condition is very painful and if the crusts are manually removed the skin can bleed profusely. The mites can be seen by the naked eye and a presumptive diagnosis can be made during physical examination. A definitive diagnosis can be made by microscopic examination of the crusts. Treatment consists of topical application of ivermectin and selamectin. The crusts will start falling within days. In the mean time analgesia and antibiotic therapy should be started if necessary. The mites are very resistant in the environment and the hutch and bedding where the rabbit lives should be clean thoroughly.

Rabbit flea, *Spilopsyllus cuniculi*, can be found on both wild and pet rabbits. However, it is more common for pet rabbits to be affected by *Ctenocephalides felis* and *Ctenocephalides canis*, cat and dog fleas. The owner generally notices the animal scratching and at physical examination fleas and flea dirt are found dorsally on the back. Treatment consists of topical application of imidoclopramid (Advantage[®]) at a dose of 0.4 ml for rabbits that weight less than 4 kgs and 0.8 ml for rabbits heavier than 4 kgs body weight, once a month. Selamectine (Stronghold[®]) is also effective. Fipronil should be avoided as it can be toxic in rabbits and they can develop seizing and ataxia. As preventive measure, cats and dogs living in the same household should be treated regularly.

Abscesses, especially those with an odontogenic aetiology, can be considered a challenge and a medical approach can often be unrewarding due to the thick capsule that stops the penetration of antibiotics. Moreover, rabbits lack the lysosomal enzyme that transforms pus into the liquid form making it more difficult than a simple incision and drainage. In a recent study, the most common organisms detected in odontogenic abscesses were anaerobic bacteria such as *Fusobacterium spp*, followed by *Peptostreptococcus spp*, *Bacteroides spp*. and aerobic bacteria such as *Pseudomonas Aeruginosa*, *Pasteurella spp*, *Streptococcus spp*, *Staphylococcus spp*. (Gardhouse et al. 2017). A combination of medical and surgical treatment is considered the treatment of choice with a higher rate of success. The choice of the surgical technique e.g. removal of the entire abscess or marsupialisation, depends on the location and severity of the abscess. For culture and sensitivity test, a sample of both capsule and pus should be taken, as the pus alone sometimes can be sterile. Antibiotics such as penicillin G, metronidazole and enrofloxacin proved to be effective in most cases and could be started while awaiting the bacteriology results.

Pododermatitis is one of the most common dermatological conditions in pet rabbits and in a recent study it was found in 93.8 % of the cases presented (Mancinelli et al. 2014). The clinical signs consist of inflammation of the hocks. If not treated or if the underlying causes such as obesity, poor husbandry, and hard flooring are not corrected, painful pressure sores and infection can then develop. A 0-6 rating score has been recently developed where '0' represents no lesions and '6' represents loss of pedal function (Mancinelli et al. 2014). A diagnosis is made during clinical examination. In severe cases, a radiologic examination should be carried out to assess the involvement of bones and tendons. In mild cases, Sudocrem® can be used to reduce inflammation. However, in moderate and severe cases, the area should be thoroughly debrided and cleaned and medical treatment using antibiotics and analgesia started.

Urine scalding is a painful condition that affects the skin of the ventral abdomen and thighs. This is caused by a prolonged contact with urine that irritates the skin causing inflammation and secondary infection. It is caused by several factors: the animal is unable to assume a correct stance to urinate due to debilitation or musculoskeletal problems such as arthritis. The rabbit presents with polyuria due to renal problems such as nephritis or cystitis. It can also be seen due to suboptimal husbandry such as infrequent cleaning and small hutches, where the rabbit cannot move properly. The treatment consists in shaving the matted fur and cleaning the skin with diluted chlorhexidine or povidone-iodine. A barrier cream such as Flamazine® cream is then applied. Analgesia should also be started while antibiotic therapy can be prescribed in severe cases. While treating the skin condition, the underlying cause should be addressed.

Skin tumours are generally rare. However these days, rabbits tend to live longer and tumours such as lipomas, papillomas, cutaneous lymphoma and squamous cell carcinoma are now more commonly seen in clinical practices. Treatment and prognosis depend on the aetiology of the tumour. In most cases, surgical removal and histological examination are considered the gold standards. Chemotherapy in rabbits is rarely effective as protocols reported for this

species are generally anecdotally and extrapolated from other species. Sebaceous adenitis, an exfoliative dermatitis reported in rabbits, can be seen secondary to thymomas.

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Gut Diseases in Rabbits

Molly Varga BVetMed DZooMed MRCVS

Gut stasis is one of the most common and potentially life-threatening reasons that owners present their rabbits for veterinary treatment. Gut stasis is defined as a reduction or lack of appetite and a reduction or lack of the production of faeces. There are many potential causes.

For most rabbit owners, gut stasis is one of the most worrying conditions their animal could have, and it deserves to be taken seriously by both the owner and veterinary staff. It is important to remember that 'Gut Stasis' is a symptom -not a diagnosis- in the same way that a sneeze is a symptom and the diagnosis could be a cold. With any rabbit that presents in gut stasis a full clinical examination and husbandry review is vital. My preference is to see rabbits that have stopped eating within 12 hours of this happening, Prompt examination and comprehensive treatment allow stabilisation of your pet and enable an improvement to the immediate welfare of the patient. In addition, early treatment facilitates getting him/her well enough to undergo diagnostic testing to determine the cause of the gut stasis. In the longer term, treatment of gut stasis alone is insufficient and a diagnosis of the underlying cause will allow prevention of further episodes of gut stasis, or at least better long-term control.

The rabbit is a hind gut fermenter adapted to a poor nutrient dilute diet: The digestive system of the rabbit is unlike any other mammal, and is a good example of adaptation to a fairly hostile environment, in particular one where food resources can be limited at certain times of year. In the wild rabbits eat leaves and grass. This fibrous diet varies seasonally. The incisor teeth are used for food prehension and the cheek teeth grind this up disrupting cell walls and allowing nutrients to be released. All teeth within the rabbit mouth are open rooted and grow throughout life. The rabbit is dependent on the dentition to initiate digestion, and is also dependent on a fibrous diet to keep the teeth adequately worn down and avoid dental problems. While some amylase is present in the saliva, rabbits are not adapted to a high starch diet and the levels are much lower than other species. The ingesta passes to the stomach, which has a pH of between 1 and 2, and further digestion occurs here in a similar way to other species. The small intestine also functions in a similar way to cats and dogs, and during the passage through, anything within the ingesta that can be absorbed will be. The interesting portion of the gut is the hind gut, which starts at the ileocaecocolic junction. This is a muscular valve-like structure that separates the small intestine from the caecum and colon. Initially ingesta moves from the ileum to the proximal colon. It is here that the non-digestible and digestible particles are separated out. The non-digestible particles are formed into faecal pellets (hard faeces) and these then move to the distal colon and are passed. The digestible particles are sent back to the caecum, using the haustrae. These are sac-like evaginations of the proximal colon that act almost like an elevator and at certain cycles of digestion (controlled by the gut pacemaker or fusus coli), they act retroperistaltically and move digestible particles back into the caecum. The ileocaecocolic valve prevents regurgitation of ingesta back into the ileum. Once in the caecum the bacterial microflora (multibiota) work their magic and break down the digestible fractions of the diet. Once digestion has progressed (and again under the control of the gut pacemaker or fusus coli) the digesta passes into the proximal large intestine and through the fusus coli, is covered in a mucus layer, then passes rapidly through the distal colon and then passes out through the anus, from where it is eaten directly. This process is known as

caecotrophy (NOT coprophagy). The caecotrophs then pass into the stomach, where the mucus layer protects them to a degree from the low pH, and once in the small intestine, the digested substrates can be absorbed into the blood stream.

DIARRHOEA

Rabbits:

Diarrhoea in rabbits is potentially life threatening. It may be categorised as caecal in origin (normal large intestinal faeces will also be passed) or large intestinal in origin and in this case no normal droppings will be seen.

Coccidiosis: Infection with various species of *Eimeria* is common in young rabbits particularly where overcrowding and poor hygiene are risk factors. Different strains of *Eimeria* have different areas of predilection as well as varying pathogenicities. Many cause diarrhoea, and this can be fatal in some cases, but is usually associated with high morbidity particularly if overcrowding and poor hygiene are factors. One species of *Eimeria*, *E. steidiae* causes liver dysfunction, poor growth, ascites and is commonly fatal. The life cycle of this parasite particularly the migration after oral intake, is poorly understood. When getting faecal evaluations done it is important to get the species of *Eimerian* found identified so that suitable treatments and prognosis can be given.

Gut blockages, while causing gut stasis, are not always directly part of the gut stasis syndrome we regularly see. Blockages are often secondary to the rabbit eating something silly, for example nuts, fake straw bedding, wallpaper or cardboard. Occasionally over-grooming (either of itself or its companion) can lead to blockage with fur. Often the rabbit is observed eating something inappropriate. Sometimes gut blockage can be due to internal disease such as a mass either within or adjacent to the gut that leads to blockage. Sometimes the blockage is seen as part of gastrointestinal stasis, in particular where there is gas build up in the stomach, which leads to bloating. The pressure and size of the stomach cause the gastric outflow to block, causing obstruction. Any potential gut blockage is an emergency situation- these rabbits need to be seen as soon as possible as treatment for gastrointestinal blockage often requires surgery.

Signs your rabbit may have gut stasis

- Change in food preference
- Reduced appetite/stopping eating at all
- Fewer or no faeces being produced
- Belly pressing
- Shifting position, unable to get comfortable
- Appears depressed, lethargic or hiding

Consequences of gut stasis

- Pain- gut stasis hurts

- Electrolyte imbalances- these can affect the safety of anaesthesia, and this is why your rabbit should be stabilised before an anaesthetic if he/she has gut stasis
- Fluid loss into the gut causing dehydration
- Lack of nutrient absorption

Medications commonly used in gut stasis

- Metoclopramide- a 'prokinetic' that encourages stomach emptying- this tends to encourage more normal movement of food through the gut
- Ranitidine- an antacid that also has 'prokinetic' properties- ie it helps the gut move normally
- Cisapride- prokinetic that encourages gut motility in the upper gut- usually reserved for more serious cases
- Domperidone- prokinetic that works on more of the gut, encouraging normal peristalsis
- Meloxicam- a non-steroidal anti-inflammatory drug that can be useful for mild abdominal pain.
- Opioids- strong pain-killers- indicated for severe abdominal pain. Contrary to popular belief, these drugs do not cause gut stasis when used appropriately and can be very useful to treat gut stasis when severe pain is the cause.

Support feeding your rabbit

- if your rabbit is not eating, and its certain there is not a gut obstruction, then it will need support feeding.
- There are several proprietary foods made for support feeding rabbits and small mammals (Supreme Recovery/Recovery Plus, Oxbow Critical Care, Emeraid Herbivore IC and Maintenance
- As a guide I try to aim for 20ml per kg of rabbit 4 times daily- not all rabbits will tolerate this, and may respond better to smaller volumes more frequently
- Support feeding will not stop your rabbit eating independently when it feels well enough to do so, so continue to offer favourite foods as well
- Always make certain your rabbit is swallowing the food you syringe into his/her mouth- sometimes they will hold food in their cheeks. And never put too much in at a time- 1-2ml is plenty.
- Syringe feeding can take a long time, make certain that your rabbit is not becoming stressed- if he/she is then take a break and come back to it later.

The rabbit is dependent on the efficient functioning of its gut to be able to obtain energy and nutrients from a relatively poor diet. The gut volume is large compared to the body size, and the caecum acts as a fermentation vat that allows the smaller particles from the diet to undergo bacterial digestion. This means that if the guts are distended or painful, then there is a significant impact on the rabbit in terms of ability to adequately digest food. As soon as the gut's motility is reduced the composition of the bacteria in the caecum rapidly changes, meaning that the ability to digest food is altered. Often when the gut is not normally motile, then food matter that would ordinarily be sent to the caecum for additional fermentation is lost as diarrhoea. Therefore, when the gut is not moving normally, the rabbit patient can very rapidly experience significant shifting of fluid into the gut, electrolyte changes (calcium, sodium, potassium and chloride are all electrolyte molecules that can be affected by gut stasis) and negative energy balance (because little energy is being extracted from what little food is being taken in).

If your rabbit has a reduced appetite or stops eating/passing faeces then a trip to your rabbit savvy vet is likely required. Some owners, with agreement from their vets may have medications that can be started in these situations, in order to provide relief whilst organising the vet visit. It may also be sensible to consider support feeding at this point, however if your rabbit doesn't swallow this support feed or seems very reluctant/distressed, do not pursue it, there may be a good reason why- your vet will be able to check. If possible take both the unwell rabbit, as well as its companion together, and provide fresh tasty treat foods for the journey- often a car-ride and some fresh herbs will get a rabbit starting to eat again.

Once at the vets, your rabbit will have a thorough clinical examination in order to identify what may be causing the gut stasis. The cause may not be immediately evident, and your vet may suggest some testing in addition to giving your rabbit treatment. It is at this point that your vet may suggest checking your rabbit's blood glucose. This involves a tiny blood sample and can usually be done while you wait. Rabbits that have very high blood glucose when in gut stasis are more likely to have a gut obstruction. If your rabbit's blood glucose is high, then x-rays of your rabbit may be required, to check for a blockage. At this time, depending on how your rabbit is doing, and how confident you as an owner are with treating your rabbit, your vet may suggest that your pet is admitted to hospital for more specialised care. At this point, your vet will give you a detailed plan of how that care will be provided in hospital, and what the criteria are for sending your rabbit home when it's ready.

In most cases however where your vet is comfortable there is no evidence of a blockage, some medications will be administered during the consultation, and some may also be sent home for you to continue. Support feeding may be necessary if your rabbit doesn't start eating voluntarily fairly quickly.

Most rabbits are less stressed and more likely to eat voluntarily at home. However, if your rabbit once on treatment has not started eating within 24 hours, or if you feel that he/she is getting worse, becoming more lethargic or is painful then a repeat visit to the vets is needed. A failure to improve with medications may be a sign that there is something going on that hasn't yet been identified and addressed.

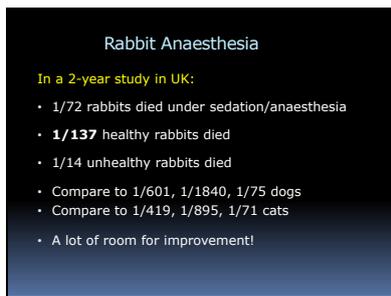
If your rabbit is diagnosed with a gut blockage, then surgery is really the only option other than euthanasia. This may sound harsh but the reality is that this condition will worsen rapidly with very little potential for it to correct itself, without intervention. This means that the animal in question is likely to suffer significantly. Most owners are very concerned about surgery, and certainly gut surgery particularly if the rabbit has not been eating for a couple of days, carries a significant risk. Gut stasis medications (the prokinetics) are contraindicated where there is a gut blockage, as they can lead to rupture of the gut. With stabilisation, fluids, good pain relief and good nursing care, rabbits with gut blockages can survive and go on to thrive, surgery is definitely worth considering.

All in all, a rabbit that is not eating, or passing droppings is in a potentially serious condition. A combined effort between yourself and your vet will bring about the best results.

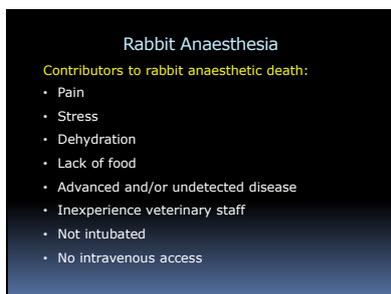
Slide 1



Slide 2



Slide 3



Slide 4

Rabbit Anaesthesia

- Prey species, hide illness very well
- Easily stressed
- Obligate nasal breather & small lungs
- Low grade respiratory infections
- Elderly → kidney, heart, liver disease
- At risk of **hyperthermia** and **hypothermia**
- Anorexia → fatty liver → liver failure → death

Slide 5

Rabbit Anaesthesia

- Rabbit ward
- Hospitalise with companion(s)
- Familiar bedding and toys etc.
- Familiar and favourite food
- +/- Pre-op blood screen??
- Recovery area and monitoring is vital → most deaths occur within 1-2 hrs of anaesthesia
- Keep up with **calories** and **pain relief**

Slide 6

Rabbit Anaesthesia

- Intravenous access → ear or leg
- Maintain an airway → ET-tube or a V-gel
- Angle so chest is raised
- Minimal fur clipping
- Warm prep fluid
- Gentle and meticulous tissue handling
- **Multimodal analgesia**

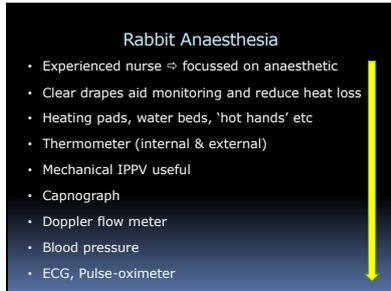
Slide 7



Slide 8



Slide 9



Slide 10



Slide 11

Rabbit Anaesthesia - Monitoring

- Eye position and reflexes
- Toe and ear pinch reflexes
- Observe breathing
- Listen to heart
- Check pulse
- Monitor body temperature
- Breathe for patient
- Anaesthetic monitoring machines

Slide 12

General Anaesthesia (GA) vs. Sedation?

Sedation

- Reduced awareness, consciousness & pain
- Mild, moderate or deep

General Anaesthesia

- Complete loss awareness, consciousness & pain
- More control over patient
- Relatively narrow margin of safety
- Mild/moderate sedation safer than GA
- Deep sedation similar or reduced safety than GA

Slide 13

General Anaesthesia (GA) vs. Sedation?

- Sedation preferred where possible
- E.g. blood sample, x-ray, scan, some dentistry

BUT!

- Sedation less controlled if something goes wrong
- No breathing tube
- Less predictable response to pain
- May convert to GA and/or combine with local
- GA ⇨ if significant pain, entering body cavity, fracture repair, many dentals, want no movement

Slide 14

What is the Best Anaesthetic?

There is no...

- 'Best Anaesthetic'
- 'Gold Standard' anaesthetic
- 'Safe Anaesthetic'

There are...

- Safe anaesthetists
- Relatively 'unsafe' anaesthetics

Choice depends on...

- Experience
- Procedure
- Age, health and demeanour of patient

Slide 15

Anaesthetic/Analgesic Techniques

- Injected under skin ⇨ subcutaneous
- Injected into muscle ⇨ intramuscular
- Injected into a vein ⇨ intravenous
- Nasal drops
- Inhaled ⇨ facemask or induction chamber
- Local anaesthetic to 'block' or 'numb' specific area
- Given as a continuous intravenous drip
- Given by mouth

Slide 16

Local Anaesthesia

Topical Application:

- Cream ⇒ IV placement, urine scald
- Spray/liquid ⇒ upper airway/ear canal
- Eye Drops ⇒ eye ulcer/flush tear duct
- Bonjela®/Orabase® ⇒ mouth ulcers

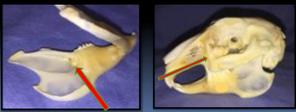


Slide 17

Local Anaesthesia

Injectable Techniques:

- Used to augment general anaesthesia/sedation
- Nerve block, line block, splash block...
- Epidural
- Dental nerve blocks



Slide 18

Local Anaesthesia

Epidural Anaesthesia

- Used to augment general anaesthesia
- May provide extra post-operative pain relief
- Local anaesthetic and or morphine-like drugs
- Conditions/procedures around rear end



Slide 19

Continuous Rate Infusions

- Used to augment general anaesthesia
- Provide post-operative pain relief
- Single or cocktail of drugs
- Require pump and 24hr monitoring
- Tend to be used during and after major surgery

Slide 20

Questions to Ask Practice

- Are rabbits regular patients?
- Any extra training/qualifications nurse/vet?
- Options for referral?
- Out of hours provision?
- Separate waiting areas/wards with monitoring?
- Regularly intubate rabbits?
- Routinely administer analgesia?
- Routinely go home with analgesia?...

Slide 21

Questions to Ask Practice

- Success rates/mortality rates of procedures?
- Have they performed procedure before?
- Use buried/invisible stitching?
- Routinely use buster collars?



Slide 22

When Things go Wrong!

- GI stasis, prolonged recovery, pain, death
- May be expected/anticipated
- Occasionally not at all expected
- Normal to feel shocked, upset, angry
- Often best to talk after 'cooling-off' period
- Write questions down
- Ideally request/agree to post-mortem!

Slide 23

Preparation for Visit to the Vets

- Transport ⇒ secure, suitable carrier
- Check ventilation/temperature
- Companion(s)?
- Own food?
- Medications?
- Copy of any previous history
- DO NOT WITHOLD FOOD OR WATER



Slide 24

At the Veterinary Surgery

- Reception ⇒ quiet area
- Consultation
- Clinical examination
- Discussion
- Consent for procedure
- Consent to use non-licensed drugs?
- Admitted to the surgery

Slide 25

Post-Operative Care

- Discharge appointment
- Discuss wound care and monitoring
- Administration of drugs and/or syringe feed
- Monitor demeanour, appetite, faeces & urine
- Assess and monitor for pain...



Slide 26

The Rabbit Grimace Scale



Slide 27

Poorly-Controlled and Chronic Pain?

- NSAIDs → meloxicam; carprofen
- Tramadol?
- Gabapentin?
- Cartrophen (Pentosan polysulphate)
- Acupuncture
- Dressings/Splints/bedding/environment...
- Weight control

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Slide 29



Slide 30



Slide 31

Summary

- Rabbits can be difficult (anaesthetic) patients
- Relative high anaesthetic risk on average
- Experience greatly reduces risk
- Simple modifications can make big difference
- Observation, monitoring and attention to detail
- Discuss with your vet beforehand

Slide 32

Thank You For Listening



RSPCA Rabbit Housing Research - Putting it into Practice

Dr. Jane Tyson - Companion Animals Department, RSPCA Science and Policy Group

The RSPCA receive thousands of calls each year about rabbits for reasons such as concerns over their welfare and from those who may have found an individual. Many rabbits enter our centres across England and Wales where they receive veterinary treatment and rehabilitation if necessary, before finding a new loving home.

As well as investigating people who cause deliberate suffering to rabbits, RSPCA staff talk to owners who simply don't understand the welfare needs that rabbits have. Often in these cases it is ignorance and a lack of understanding that causes an animal to suffer. For many years rabbits have been viewed as the 'forgotten pet', kept in small hutches with relatively little contact with either other rabbits or humans.

The RSPCA commissioned the University of Bristol to undertake research in the form of two projects investigating:

1. The state of rabbit welfare in the UK¹, and
2. The spatial needs of socially housed pet rabbits.

'The state of rabbit welfare in the UK' recruited a broad spectrum of owners to answer surveys in print, online and over the telephone about their rabbits and how they were looked after. Findings indicated that over half of rabbits lived outside and about a quarter were reported to be house rabbits. Irrespective of where they were kept, the majority were housed in a single tier hutch/cage. Less than 25% had an exercise area attached to their hutch/cage which they had permanent access to. The more common method of providing exercise space was via the use of a run that was not attached to the hutch, meaning owners had to move their rabbits between these areas. However, rabbits were more

¹ Rooney, N.J., Blackwell, E.J., Mullan, S.M., Saunders, R., Baker, P.E., Hill, J.M., Sealey, C.E., Turner, M.J. and Held, S.D.E. (2014) The current state of welfare, housing and husbandry of the English pet rabbit population. *BMC Research Notes*, 7:942.

likely to be placed in exercise areas in the summer compared to the winter, and even in summer, the numbers of rabbits provided with access on a daily basis was not high.

'The spatial needs of socially housed pet rabbits' found that individuals kept in a small hutch with limited access to an exercise area had the highest levels of corticosterone in their faecal samples. These rabbits also engaged in more hopping, walking, running and binkying when given access to their runs, probably due to a rebound effect from their restricted access. When given permanent access, peak activity was noted around dawn and dusk. For rabbits housed in separate hutch/run setups or who are locked out of their exercise area overnight, they are unlikely to be allowed to exercise during their naturally active phases which may be stressful. Additionally, when allowed constant access to an exercise area the rabbits spent a distance of 2-5 body lengths apart for most of the time. This research has informed our housing guidance which, for a compatible pair of medium sized rabbits, we would recommend are kept in an enclosure comprising of a shelter and exercise area that is a minimum of 3m in length, 2m in width and 1m in height; they should be allowed constant access to all areas of their accommodation.

Ongoing areas of work includes the RSPCA collaborating with the University of Bristol and RWF to develop a 'Rabbit Welfare Strategy' and secondary legislation that can sit under the Animal Welfare Act 2006. The recommended housing dimensions are going to be incorporated into our existing and new information and guidance documents. We have created a rabbit welfare presentation specifically aimed at Key Stage 2 children which is delivered by members of staff and volunteers in the RSPCA Prevention and Education department. Working with Burgess Pet Care and other charities we participate in the annual Rabbit Awareness Week initiative and use our social media channels and other platforms to disseminate rabbit welfare advice to the public.