RAW
RABBIT AWARENESS WEEK

Advice for Veterinary Surgeons Treating Rabbits in Practice

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Contents:

New rabbits checks and "MOTS": a checklist

- The first or new rabbit consult/rabbit "MOT"/RAW consult, is a really important one in the rabbit's life.
- Problems may be identified early on: many new, young rabbits have problems such as congenital dental abnormalities and poor body condition due to coccidia.
- Older, newly rescued rabbits, or those which have not seen a vet for some time, may have an even wider number of problems, such as obesity, acquired dental abnormalities, skin and eye problems and many more.
- It is rare to see such a rabbit in perfect health, and advice and interventions at this stage can be potentially life-saving, and so a full clinical examination is vital, including an intra-oral evaluation, and palpation around the skull to detect dental and ear-based problems. Swelling around the bones of the upper and lower jaws, and around the base of the ears, can indicate dental abscessation and ear cartilage deformities, +/- infection, respectively. Lops, in particular, can have gaps between the ear canal cartilages, through which ceruminous gland material can infiltrate, causing local reactions. Secondary bacterial infections can follow.
- This is an ideal opportunity to discuss current diet and other husbandry, preventative health care and any other aspects of general health and welfare. Such consults can be too short to get across all the information required, and factsheets, booklets and advice sheets may be helpful (the RWAF's "Hop to it" is one option).
- If your practice runs a pet health scheme, this is an ideal opportunity to mention it.
  - Such schemes can include neutering, vaccination (against Myxomatosis, RVHD1 and RVHD2, E. cuniculi testing and treatment, and flystrike prevention, but are most useful if they include an additional health check as well as an annual vaccination one).
- It's worth thinking about how "rabbit friendly" your practice is before rabbits come in! Are all your front of house and clinical staff trained to recognise that prey species such as rabbits are more susceptible to stress and may present much later in the course of disease than dogs and cats. They may need seeing more urgently and need to "jump the queue" in some cases.

Neutering

- Neutering can be carried out in males as soon as the testes are descended (or even before, if using an intra-abdominal approach, which is not typically recommended unless the testes are overdue to descend). There is little difference in outcomes between prescrotal and scrotal castration, but castrations should be closed, and ligated using a hydrolysable monofilament.
- Neutering is often advised from 6 months onwards in females, but from approximately 16 weeks may be preferable, to avoid early sexual maturity, and to minimise the amount of fat present in the mesometrium, making surgery easier and less traumatic. Hydrolysable monofilament suture of the smallest size is preferred, along with gentle tissue handling and the use of sterile, wet swabs rather than dry ones, to minimise the risk of adhesions.
- Multimodal analgesia should be provided as standard, with several days NSAIDS being advised both for pain management but also to mitigate adhesion formation.
- From general anecdotal feedback, a mixed sex pair is the easiest to bond and keep together. However, all rabbits kept together must be neutered, and it is much easier to bond them initially if they have already been neutered.
- Mixed sex groups which have not been neutered will breed. This is a strain on the doe, may result in cannibalism of the kits, if unexpected and she does not have an area to make a nest, and contributes to the huge number of unwanted pet rabbits out there.
- Un-neutered males will fight if kept together. They may be fine initially, especially if siblings, but will almost inevitably fight once they hit puberty. This may result in very serious injuries, typically to the penis and scrotum, which can, in extreme cases, be fatal.
- Un-neutered females may physically attack each other and do not tend to form the close companionship bonds that neutered females do and may be grumpy with each other throughout their life
- Un-neutered males will usually try to mate with neutered females, and this may be tolerated or may result in the male receiving potentially very serious injuries.
- Neutered male: un-neutered female combinations may result in compatible sexual behaviour also but are not recommended mainly due to the health advantages of neutering, especially for female rabbits.
- Female rabbits who are not neutered are at a very high risk of developing mammary, and especially, uterine problems.
- Castrating male rabbits is mainly advised to allow them to live in socially compatible groups, for good welfare, but there are health advantages too, preventing testicular and prostatic tumours, although these are rarer and more easily treatable than the tumours female rabbits may get.

Vaccination

- There are 3 viral diseases of rabbits endemic in the UK, which are fatal, but can be vaccinated against.
- Myxomatosis has been present in the UK since it was introduced from South America in the 1950s. It killed a very high percentage of the wild rabbits, and still kills many every year, although there is some immunity present in the population. As it is in the wild population, and domestic rabbits can easily catch it, it is an ever-present worry for pet owners.
- Myxomatosis is spread partly by direct contact between rabbits, but mainly by biting insects. Rabbit fleas are its tradition vector, but flying biting insects can spread it, even to indoor rabbits. Vaccination with Nobivac Myxo-RHD PLUS is therefore vital and should be given from 5 weeks of age and takes 3 weeks for immunity to develop, which lasts for 1 year. Note that if given at 5 weeks, there may be interference with MDA and a further vaccine should be given later. Alternatively, vaccinate from 7 weeks to obtain a full 12 month immunity. Also note that any rabbits which have previous exposure to myxomatosis, either wild virus

or a vaccine, may not respond fully to the RHD2 component of the vaccine, and will require an additional, non vectorised, RHD2 containing vaccine 2-4 weeks later (Eravac or Filavac).

- Rabbit Viral Haemorrhagic Disease 1 and 2 are spread by direct contact, but mainly by inanimate objects. Vaccination with Nobivac Myxo-RHD PLUS is required annually, as above. Additional protection is by good biosecurity: changing footwear after walking in the countryside in areas with wild rabbits present; using a disinfectant footdip if changing footwear is not possible; ensuring that any foraged wild foods are from RVHD free areas, i.e. those without rabbits present, or above the reach of rabbits, in hedgerows etc. Rabbit Viral Haemorrhagic Disease 2 is now the dominant strain of the virus throughout the UK.
- Rabbit Viral Haemorrhagic Disease 2 is spread as above and is now the dominant strain of the virus throughout the UK. Vaccination is with Eravac or Filavac, or Nobivac Myxo-RHD. Biosecurity is also important, as above. Vaccination should be carried out every 6-12 months depending on local risk, the health status of the rabbit, and vaccine used.

Preventative health care

- An ideal diet, neutering and regular veterinary checks including vaccination are the main methods of minimising the risk of health problems in rabbits.
- As a general rule, rabbits do not need regular preventative treatment for external parasites such as fleas. Mites are an occasional problem in rabbits, and need treatment when they are found, but note that mite infestations often suggest an underlying health problem that requires veterinary investigation, rather than dispensing medication.
- Flystrike (laying of fly eggs on the rabbit, typically around the rear end, which then hatch into maggots which eat the flesh of the rabbit) is only seen in rabbits with some health problem leading to wet fur, faecal or caecotroph accumulation around the back end, or mobility problems. These rabbits may benefit from regular treatment with insecticides or repellents designed for rabbits, e.g. Rearguard (Advise owners NOT to use products designed for other species i.e. those containing Fipronil).

- Internal parasites include worms, coccidia and E. cuniculi. Worms are uncommon in rabbits, and regular worming is not necessary. If in doubt, carry out a faecal sample. Rabbits may carry the encysted form of some tapeworm species, in swellings under the chin, around the shoulders, in muscles and within the abdominal cavity.
- Coccidia may be seen in young rabbits or those rescued from poor conditions. Many non-pathogenic species of Eimeria exist, and treatment should be carried out if combined with clinical signs, using TMPS (licensed in rabbits) or toltrazuril. This is a consideration with any rabbits suffering from diarrhoea.
- Encephalitizoon cuniculi is not uncommon in rabbits, with approximately 20-50% of rabbits infected (note that the higher figures are those seen in studies on ill and in contact rabbits). It can cause kidney and brain issues, including excessive thirst, head tilts and paralysis.
- EC should, ideally, be tested for by using combined IgG and IgM serology. A negative to both indicates that the rabbit either does not have EC or was only exposed to it within the last week. (IgG rises approximately 4 weeks post infection, IgM approximately 1 week).

- Titres stay elevated with IgM for a few weeks, but with IgG for months, and so it can be challenging to determine whether the rabbit has an active infection.
- If a positive titre is seen along with suspicious clinical signs, treatment with fenbendazole is advised. The standard dose regime is 20mg/kg sid for 28 days. In contact rabbits should also be treated.
- Recurrence is possible, and, due to the relatively high cost of testing vs treatment, routine "prophylactic" dosing at 20mg/kg sid for 9 days, is often suggested. Whilst 1 paper showed this to protect against experimental infections at the time of dosing, there is no evidence to suggest this helps in a clinical setting. However, anecdotally, in rescues, this approach does appear to improve rabbit's general health, and so may at least supress infection, if not eliminate it.

Dentistry

- Rabbit dental disease can be categorised into congenital incisor disease and acquired cheek tooth disease with possible secondary incisor disease.
- Visual and palpable examination of the outside of the mouth, including the maxilla and mandible, is vital in planning treatment and a prognosis.
- An intraoral exam is extremely useful, using an otoscope with the widest cone possible, but is limited to visualising the anterior cheek teeth.
- Intraoral examination using a rigid endoscope gives a superior view.
- Examination of the mouth under GA, with it held open, and excellent lighting and magnification provided, gives the best view.
- Skull radiographs or, ideally, CT, provide valuable information about the health of teeth and surrounding bone, and are mandatory for surgery planning, including dental extractions and abscess treatment.
- Congenital incisor malocclusion results in an overlong mandible relative to the maxilla. The incisor teeth will never meet properly, and regular trimming or extraction is required.
- Rabbits cope well without incisor teeth and can eat better without them than with significantly overlong ones.
- Fast growing, healthy but maloccluding incisors are better candidates for extraction than malformed, poor quality incisors seen in acquired dental disease, which may be better candidates for regular trimming, as they grow more slowly and often partially meet and can be used by the rabbit.
- Cheek teeth develop a predictable lengthening and deviating pathology on being fed an incorrect diet (one too low in fibre, Calcium and Vitamin D, and with a mismatched Ca:P ratio). This results in overlong cheek teeth which deviate into the tongue, and who's apices migrate up under the eye, and through the mandibular periosteum, leading to abscess formation.
- Incisor teeth may be trimmed with high speed dental burrs or lower speed hobby tools driving cutting discs, but never with clippers, which can unpredictably shatter the teeth, exposing the sensitive pulp, and leading to infections.
- Incisor teeth may be removed by careful loosening of the attachments to the gum (there is no true periodontal ligament in these continuously growing teeth), elevation, luxation and gentle extraction. Owners should be warned of regrowth. Teeth which have developed pathology through trauma and infection are much more difficult to remove and may result in iatrogenic bone or tooth damage.

- Cheek teeth may be shortened by the very careful use of a low speed long shanked burr via a dental machine or hobby drill. Guards can be obtained to shield the soft tissues from 270 degrees of the cutting surface. Wooden or metal spatulas or tongue depressors may be used to hold soft tissues out of the way. The teeth should be burred back to anatomical normality, and no further, lest one expose sensitive dentine. If this cannot be achieved in one procedure, it may be staged.
- Great care should be taken not to traumatise soft tissues in this way: whilst tissues in the mouth may heal quickly (iatrogenic frenulum trauma is relatively easy to suture), deep thermal and traumatic injuries to the gingiva and gum may take a long time to heal and be painful throughout that time.
- The use of long handled, sharp clippers with a focused and precise cutting surface to clip narrow horizontal spurs of enamel directed towards the tongue is faster, and potentially less injurious than using burrs on those focal spikes. However, they should never be used to shorten the whole tooth, due to the risk of shattering and/or loosening the tooth.
- The use of files to push and pull across the occlusal surface of the cheek teeth takes a long time, extending anaesthetic times, generates drag which rocks the tooth in its socket, potentially loosening it, and, most dangerously, can traumatise the large blood vessels at the sides of the back of the mouth, with potentially fatal consequences.
- Extraction of cheek teeth is more complex than incisors. Exposure is more limited, the risks of post-operative food entrapment and infection are higher. It is generally only carried out if the tooth is involved in an odontogenic abscess.

GI stasis

- Low fibre, high carbohydrate diets predispose to slow moving GI tracts and support a more delicate and unbalanced caecal microflora.
- Low fibre diets predispose to low fluid intakes, and slower moving ingesta.
- Stress, pain, dietary change and interruption inhibit GI motility.
- Incorrect antibiotic use disrupts caecal microflora, inhibiting GI motility.
- NSAIDs rarely have significant negative GI side effects when used correctly.
- Opioids rarely have significant negative GI side effects.
- Foreign body obstruction is uncommon, compromising approximately 10% of GI stasis cases, but is potentially rapidly fatal if untreated.
- Supportive care, including warmth, fluids, supportive nutrition and analgesia, is indicated in ALL cases of GI Stasis.
- Obstructive cases are more rapid and total in onset, more painful, often produce hypothermia, are associated with blood glucose levels over 20mmol/l, and on x-ray reveal distinct gas bubbles in the stomach and relevant areas of the small intestine.
- Treatment is surgical, and outcomes are better if this is carried out promptly, and the obstruction is massaged down into the caecum, and left to emerge naturally, or up into the stomach and removed surgically. Enterotomy and particularly enterectomy are associated with much poorer outcomes.
- Non-surgical cases are slower, more gradual, and often incomplete in terms of inappetence and lack of faecal out-put. Rabbits are less painful, at least to start with. Blood glucose is typically less than 15 mmol/l. Radiography reveals a halo of gas around stomach contents, and mottled gas and ingesta in the intestines.
- Treatment is only surgical in chronic cases where food has slowed, desiccated and impacted in the GI tract, and is mainly as per supportive treatment, with the additional use of GI prokinetics, which should not be used in obstructive cases as they risk gut rupture.

Anaesthesia and analgesia

- In a study carried out over 15 years ago, rabbit anaesthesia was considerably more dangerous in terms of mortality up to 48 hours after induction (an almost 10 times higher risk than in dogs). The likely reasons for this were post-operative respiratory and gastrointestinal complications, and the relative lack of airway and vascular access compared to today.
- Hopefully, these are standard now: the use of excellent pain relief, provision of a low stress environment, continuous feeding and prokinetics to avoid GI complications.
- The careful assessment of the cardiorespiratory system and potential pre-emptive treatment of any suspected respiratory tract disease may minimise the anaesthetic risks associated with elective or semi-elective anaesthesia.
- The use of an ET tube or supraglottic airway device permits better airway management, IPPV, more accurate capnography, and protects the airway.
- The presence of vascular access throughout permits iv fluids, reversal agents or drugs to increase respiratory drive or blood pressure, as needed.
- Pre-emptive use of NSAIDS is relatively safer in rabbits than in cats, as it rarely leads to renal issues, but pain is a huge factor in developing potentially fatal GI stasis. Doses may need to be much higher than in dogs and especially cats, with perioperative doses of meloxicam of up to 1.5mg/kg suggested, reducing over time, but often needing a minimum of 0.6mg/kg/day.
- Pre-emptive use of opioids is another method of reducing wind up, reducing perioperative pain and stress, and has a volatile sparing effect.
- The choice to use a total intramuscular or intravenous protocol such as (dex) medetomidine/ketamine/opioid, or to premedicate with an opioid and an additional agent such as a benzodiazepine or alpha-2, followed by alfaxalone, is up to the veterinary surgeon in charge. The former is easier to administer but is less controllable. The latter is technically slightly more demanding, requiring IV access and airway management (as apnoea is more common), but allows more flexibility and control.

Respiratory disease

- Respiratory disease is common in rabbits, often, but not always, due to Pasturella multocida.
- Other bacteria may be present, and multifactorial issues such as poor ventilation, overheated enclosures play a role.
- Upper respiratory tract disease may be linked to maxillary dental disease and penetration of the nasal cavity by tooth apices.
- Respiratory tract disease is challenging to treat, and systemic antibiotics alone may not be sufficient.
- Nebulisation of antibiotics, disinfectants, and adjunctive treatments such as bronchodilators and mucolytics, may be very helpful.
- Non-bacterial respiratory disease can occur, with pulmonary metastasis of uterine adenocarcinoma, and allergic pathology both occurring.

Therapeutics

- Rabbits have several challenges to successful medical therapy.
- GI flora disturbance can occur, and can be fatal, with oral penicillins, cephalosporins, and lincosamides.
- Dose sizes of many drugs in solid oral forms are simply too great, requiring division of tablets or capsules and inaccurate dosing.
- Tablet administration can be challenging: although as long as a tablet or capsule is placed gently, far enough back into the mouth, it is perfectly achievable, and if anything, easier than in cats.
- Very few drugs are specifically licensed for rabbits. This can be advantageous, as it permits selection of appropriate human drugs, in palatable paediatric formulations, under the Cascade.
- However, there is a dearth of pharmacokinetic and pharmacodynamic data for many drugs in rabbits, and so dose regimes may depend on less scientifically robust data and anecdotal information. The formularies produced by BSAVA and Elsevier are very useful in this regard.
- Concerns regarding oral treatments mean that parenteral administration is often preferred. Owners generally find subcutaneous injection easier in rabbits than cats, as the former have more loose skin in the scruff area.
- Nebulisation is a practical method of administering drugs that may have fatal consequences when given enterally, into the upper and lower respiratory tracts. Nebulisers are relatively inexpensive (approximately £50 via online retailers), and antibiotics, mucolytics, bronchodilators and F10 disinfectant can be given via this route.

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