

Pet Rabbit Basics and Techniques

Karen L. Rosenthal, DVM, MS, Diplomate ABVP-Avian
Director, Special Species Medicine
Clinical Studies-Philadelphia
University of Pennsylvania
School of Veterinary Medicine
Philadelphia, PA, 19104

Rabbits are commonly kept as pets in the United States. There are over 50 breeds of rabbits. Rabbits differ from dogs and cats and rodents in a number of aspects that have important, clinical implications. Rabbits are classified as lagomorphs due to an extra set of upper incisors called "peg" teeth. Both the incisors and molars grow continuously. The body temperature range in rabbits is relatively high at 101-104°F. They have a delicate skeleton which comprises only 8% of their body weight. Females have a dewlap below their chin. It is reported that rabbits cannot physiologically vomit. They are hindgut fermenting herbivores with a large cecum. Two types of fecal pellets are produced. The hard pellet is produced during the day and night. The softer pellet, called a cecotroph, is normally only produced at night and is sometimes referred to as "night feces."

Rabbits are monogastric, hindgut fermenting herbivores. Adult, non-gestating, non-lactating rabbits require a diet of 20-25% fiber. Most pet rabbits are fed a diet too low in fiber. One recommended diet regimen for adults consists of high fiber pellets (at least 18%) limited to 1/8 to 1/4 cup pellets/5 lb. of body weight and ad lib leafy, green vegetables and grass hay. Rabbits should not be allowed high fat or high carbohydrate treats. Also, fruits should be greatly limited in the rabbit's diet. Some rabbits cannot eat even this limited amount of pellets in the diet and will have gastrointestinal disease unless fed nothing but grasses and hay. Recommended hays include Bermuda or timothy. Alfalfa hay, commonly given to rabbits, may be too high in calcium and protein for most pet rabbits. Young rabbits, gestating rabbits, pregnant rabbits, and rabbits produced for the meat industry may be given food that is lower in fiber and higher in other ingredients.

When carrying rabbits or when performing a procedure, it is always important to handle rabbits with proper restraint. This includes support of the body and legs. Without suitable support, severe spinal injuries can occur. The strong, muscular hindlegs can "kick out" and put enough stress on the vertebra to actually fracture the bone. If the rabbit is held on the table, it can either be held or wrapped in a towel, "burrito" style. If held or carried, the important aspect of handling is restraining the rearlegs so that the rabbit cannot kick while being transported. The physical examination usually requires minimal restraint. Perform the physical examination in the same manner each time so each system is thoroughly assessed. Check the incisor and cheek teeth for malocclusion. The ears should be assessed for both bacterial and arthropod infections. Auscultate the heart and lungs as thoracic disease is common. Palpate the abdomen for organomegaly and auscultate for gut sounds. Check feet and legs for signs of pododermatitis. The basic examination is not very different as those used on other mammals.

The most common diagnostic procedure to perform in rabbits is venipuncture. The average blood volume of most rabbits is 6-8% of the body weight in kilograms and since it is safe to withdraw 6-10% of that blood volume in milliliters. Therefore, it is possible even in dwarf breeds to have enough blood for a hematology and biochemistry profile. The most common sites for venipuncture are the jugular, cephalic, lateral saphenous, and marginal ear veins. With experience, certain venipuncture sites will become preferable to others. Although the marginal ear vein may seem the most accessible, improper technique can cause pinna necrosis which is unacceptable. The jugular and lateral saphenous veins are better choices for large volume venipuncture. The jugular vein, as in other mammals, lies in the jugular furrow. The vein is typically superficial but in obese rabbits, may lie under a substantial amount of fat. One technique is to hold the rabbit at the edge of the table with the forefeet pulled down and the head held upwards. In dyspneic and stressed rabbits, this technique can lead to respiratory arrest, therefore respirations should be monitored closely. Use a 25 gauge needle attached to a 1 or 3 cc syringe. In female rabbits, due to the dewlap, the jugular vein may be difficult to find. Another easily accessible site is the lateral saphenous vein. Place the rabbit on its side and grasp the scruff. Hold off the vein by encircling the proximal thigh area. Increase visualization by removing a small amount of fur in the lateral side of the leg. Pluck rather than shave the hair due to the delicate, thin nature of rabbit skin and the likelihood that shaving may tear the skin. Use a 25 gauge needle attached to a 1 cc syringe to collect blood. The key for good stabilization and therefore successful venipuncture is to hold the leg steady with your free hand. Put pressure on the venipuncture site once the procedure is over as large hematomas form quickly. The cephalic vein is used for venipuncture when only small volumes of blood are needed. Use either a 1 cc syringe attached to a 25 gauge needle or an insulin syringe and small gauge needle for venipuncture. Hold the rabbit in sternal recumbency and encircle the front leg near the elbow. Wet the fur on the foreleg to better visualize the vein.

Give parenteral fluids in rabbits either intravenously, subcutaneously, or intraosseously. Usually, administer a physiologically balanced solution. Specific diseases may require other fluid solutions or the addition of ingredients such as dextrose, B vitamins, potassium. Give fluids at a rate of 50-75 ml/kg/day. Increase the fluid rate to compensate for losses and dehydration. Commonly, catheters are placed in the cephalic or the lateral saphenous vein as these are the most accessible to place a catheter in. In the small rabbit use 24 or 26 gauge peripheral catheters and 22 gauge peripheral catheters in larger rabbits. Usually it is necessary to anesthetize the rabbit for catheter placement. Secure the catheter with

a minimal amount of tape to lessen the likelihood of the skin tearing when the catheter tape is removed. Use jugular vein catheters when it is important to have central venous access. Typically, though, jugular catheters are not placed in rabbits because of the difficulty of visualizing the jugular vein and wrapping the catheter to the neck of a rabbit. Marginal ear veins can be used for catheter placement but are used only when no other sites are possible. The risk of pinna necrosis due to marginal ear vein catheters makes this a less than desirable location. Reserve intraosseous catheterization for severely ill rabbits when venous catheterization is not possible. Use a spinal needle with a trocar to prevent bone fragments from entering the needle. Sites of intraosseous catheterization include the proximal tibia or greater trochanter of the femur. The administration of antibiotics to cover catheter placement is controversial but since rabbits appear to be prone to bacterial infections, one may want to place the rabbit on anaphylactic antibiotics if a catheter is placed without regard to aseptic technique. Subcutaneous fluids are given along the dorsum where there is a large amount of loose skin. Rabbits rarely object to placement of fluids in this area.

Give injections to rabbits just as is done in dogs and cats. Administer most intravenous injections in the cephalic or lateral saphenous veins. Typically, use a 25 gauge needle although insulin syringes with needles as small as 28 gauge are acceptable. Place intramuscular injections most commonly in the triceps or lumbar muscles. Intramuscular injections in the semimembranosus and semitendinosus muscles may damage the sciatic nerve and are not recommended. Give subcutaneous injections just under the skin on the dorsal surface near the nape of the neck. A large subcutaneous space is present in this area.

Pills are difficult to administer to rabbits; liquid medications are easier. Hiding pills in food such as strawberry jam or jelly may aid in administration. If a rabbit will eat banana mash, this is also a common method to get a rabbit to take medication in pill form. Liquid calorie supplementation or assist feeding is given through syringes placed in the mouth. There are a number of solutions that can be used for liquid calorie supplementation. These include vegetable baby food, blended vegetables, mashed rabbit pellets or liquefied powdered alfalfa. Or an alternative is a liquid calorie supplement designed for people or equine nutritional supplements. If syringe feeding is too stressful, place a naso-esophageal tube. Use a pediatric feeding tube. Measure the tube from the mouth to the last rib. Place a small amount of lidocaine jelly on the end of the tube and around the nostril. Thread it through the nasal cavity into the esophagus. Secure the tube to the head with the butterfly tape method and place an E-collar. Take radiographs to check tube placement.

Torticollis or head tilt is a frequent disorder in pet rabbits. Along with the head tilt, the rabbit may show signs of ataxia, rolling, and nystagmus. Anorexia maybe present. Diagnose this problem with the same diagnostic tests that are used in other mammals. Torticollis is usually caused either by neurologic disease or otitis. *Pasteurella multocida* is commonly linked to otitis but other bacteria are likely involved, too. Treat otitis with antibiotics and appropriate supportive care. If middle or inner disease is present, a bulla osteotomy may be indicated. The prognosis is usually good unless severe disease is present. Other causes of head tilt include vestibular disease, cranial nerve lesions, and other brain lesions. This can be a challenge to determine the etiology but bacterial infections are frequently assumed to be the cause.

Anorexia, not a disease itself, but rather a sign of disease, is common in rabbits. Determine the cause of anorexia by doing a minimum data base including a physical examination, CBC, plasma biochemistry panel and radiographs. During the oral examination, closely observe the teeth for malocclusion. Proper examination may not be possible in an awake rabbit. Anesthetize the rabbit for a full oral examination and skull films. Treatment depends on age, degree of malocclusion, and etiology. Gastrointestinal tract (GIT) disease is a common cause for anorexia. Gastrointestinal ileus or GIT stasis is a better term for the disorder that some call "hairballs" (trichobezoar). Hair in the rabbit's stomach is a natural and common occurrence. If there are signs of anorexia and low stool production along with a history of a diet too low in fiber, then GIT stasis is suspected. This is even more likely if the CBC and plasma biochemistry panel do not point to another etiology and radiographs show gas in the GIT. Treat GIT stasis with supportive care and a high fiber diet. Gastrointestinal obstruction is rare. Obstruction is an acute illness characterized by a depressed, hypothermic rabbit. Treat a true gastric obstruction with surgery. Gastric obstructions can be caused by hair mixed with material such as carpet fibers or other foreign objects.

Pasteurella multocida infections are assumed to be an important cause of morbidity and mortality in pet rabbits. This bacteria does cause significant disease in pet rabbits but it is unknown if it is responsible for as many infections in rabbits as people seem to affix to it. *Pasteurella multocida* is transmitted by does to kits as they are being born. The nasopharynx is a major site of colonization. Other diseases frequently assumed to be caused by *P. multocida* infections include conjunctivitis, subcutaneous abscess, osteomyelitis, rhinitis, and pneumonia.

Another controversial organism in rabbit medicine in terms of the incidence of pathogenicity is *Encephalitozoon cuniculi*. This is a protozoon that is shed in urine. It may or may not be one of the causes of renal and neurologic disease in pet rabbits. If this organism is a source of clinical disease in rabbits, it is likely to cause problems in older rabbits with chronic lesions as opposed to younger rabbits. Serology is only suggestive of disease, no ante-mortem definitive test is yet available, and there is no proven treatment.

Vertebral fractures typically occur because of improper restraint. Fractures are most common in the caudal lumbar spine. The prognosis is poor although some rabbits do recover partial or full function.