

Spaying and Neutering

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A spay is actually an ovariectomy; the uterus, ovaries and the two cervixes of the rabbit are surgically removed. A castration, or orchidectomy is the removal of the testicles. Both spaying and castration can be referred to as "neutering," although many people use the word "neutering" when referring to only male animals.

Why should rabbits be neutered?

There are multiple reasons to neuter:

Prevent pregnancy

The most obvious reason to spay or castrate a rabbit is to prevent pregnancy and reproduction.

Reduce the risk of diseases of the reproductive system

Diseases of the reproductive system can be prevented through spaying or castration. Many of these diseases can be life-threatening.



- Uterine cancer: Rabbits of certain breeds have a high risk of uterine cancer, with 50-80% of them developing uterine adenocarcinoma after reaching 4 years of age. This is a slow-growing but malignant cancer which can spread to other organs including the lungs and bones.
- Ovarian disease: Ovarian cancer and cystic ovaries can occur in unspayed females.
- Mammary disease: Mammary glands can become cystic in unspayed females. Although these swellings are benign, they can be painful. Unspayed females over 2 years of age can develop mammary cancer, often associated with uterine cancer.
- Endometrial hyperplasia and uterine polyps: As a rabbit ages, the uterus normally undergoes changes. The lining of the uterus may thicken (endometrial hyperplasia) and polyps or cysts may form. This may result in anemia, blood in the urine, and a decrease in activity.
- Pyometra and endometritis: The uterus of an intact (unspayed) doe may become infected or inflamed. In the case of pyometra, the uterus is actually filled with pus. This can be a life-threatening condition.
- False pregnancy: As in dogs, rabbits can exhibit false pregnancies. This occurs when the hormone levels "trick" the rabbit's body into believing the rabbit is pregnant. The rabbit will build a nest, become aggressive over territory, and even produce milk. This stressful condition can be eliminated through spaying.
- Orchitis/epididymitis: The testicles or the epididymis can become infected in male rabbits. This is often a result of injury caused by fighting among male rabbits. The rabbit will generally have a fever, be listless, and not eat.

Prevent or control behavior problems

Many behavior problems in rabbits are related to "sex" hormones. If neutered early, these problems can be prevented. In older rabbits, many of these problems will be controlled or disappear after neutering. It will take several weeks to months post-surgery, however, for the hormone levels to diminish, and changes in behavior observed. Problem behaviors which can be influenced by neutering include:

- Urine spraying and problems with litter box training: Both male and female rabbits will mark their territory by spraying urine on vertical surfaces. Although a sexual behavior, if it continues for a long period of time it can become a habit which may not be corrected through neutering.
- Aggression and fighting: Most aggression and fighting is territorial. Both males and females (especially pregnant does) will establish a territory and defend it forcefully from other rabbits. Fighting is very stressful, can result in serious injuries, and the aggression can be extended to humans as well as other rabbits.
- Chewing: Some have observed that problem chewing behaviors resolve within several weeks or months of neutering.

Provide opportunity to have multiple rabbits

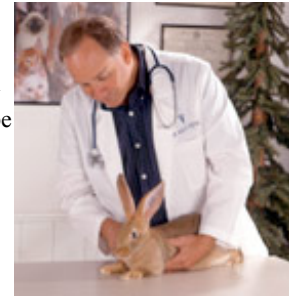
Neutered rabbits not only make better companions for people, they make better companions for other rabbits as well. Multiple rabbits can often be housed together very happily, if neutered, since there is less fighting over territory and mates.

Reduce odor

The stronger smell of urine in uncastrated rabbits can be eliminated by neutering.

When should a rabbit be spayed or neutered?

Rabbits are generally spayed or castrated when they are 4-6 months of age. Neutering should be performed before the rabbit is 2 years old to get the benefit of prevention of disease. If a rabbit which is 2 years or older is to be neutered, a more extensive pre-operative work-up, including some laboratory tests, is recommended. Adult rabbits have much more abdominal fat, especially around the uterus. This increases the difficulty of surgery and the length of time the rabbit will be under anesthesia. Rabbits over 6 years of age have a greater risk of complications from anesthesia.



What are the special considerations for anesthesia and surgery in rabbits?

Rabbits have their own unique anatomy and physiology which can present potential complications during anesthesia, surgery, and recovery. Taking special precautions can greatly decrease the incidence of these problems.

Reaction to suture material

Rabbits tend to have more tissue reaction around suture material. This can result in adhesions (scar tissue between two surfaces which are normally separate). For this reason, special absorbable sutures are used internally.

Chewing out skin sutures

More than most animals, rabbits will chew at and pull out stitches in the skin. Therefore, staples or intradermal sutures which do not show above the skin are used. Tissue glue may be used, but rabbits tend to remove that as well. Elizabethan collars may be tried in an effort to prevent the rabbit from chewing on sutures, however, rabbits resent the collars, may become stressed, and/or not eat, so collars are not the best option.

Sensitivity to pain

Rabbits in pain become stressed and will not eat, which can result in serious complications. The use of analgesics (pain relievers) in rabbits is important to reduce the recovery time.

Sensitivity to anesthetics

Rabbits cannot tolerate some of the more commonly used anesthetics. In general, a combination of pre-medications and gas anesthesia will be the best option. In addition, because of their size, special gas anesthesia delivery systems need to be used.

Difficulty in intubation

Normally, when gas anesthesia is administered to animals (and people), an endotracheal tube is placed through the mouth and into the trachea to deliver the anesthetic to the lungs. Because of their anatomy, placing an endotracheal tube in rabbits is more difficult than in dogs and cats.

Propensity towards hypothermia

Because of their smaller size, rabbits are prone to hypothermia during surgery and recovery. To prevent this problem, pads which circulate warm water can be placed under the rabbit during surgery and the rabbit can be placed in an incubator during recovery.

Sensitivity of the digestive system:

Digestion in the rabbit significantly depends upon having the correct types of bacteria living in the intestine. If these bacteria die, or the wrong bacteria overgrow, significant problems can develop. For this reason, it is recommended that food and water not be withheld before surgery. These are generally withheld in other animals to prevent vomiting, however, rabbits do not vomit. It may be reasonable to withhold food for an hour or so before surgery to make sure the mouth is empty of food and there is an unobstructed airway. The diet should not be changed prior to or after surgery, although, some recommend giving a rabbit a probiotic ("good bacteria") several days before and after surgery to maintain the proper bacteria in the intestine. Antibiotics are not necessary after a routine spay or neuter; they may be recommended if the surgery was done because of a disease process. If so, only use the antibiotics and the dose as prescribed by your veterinarian. The wrong antibiotic or the wrong dose could kill the beneficial bacteria in the intestine.

How is a spay performed?

Prior to surgery, the abdomen will be shaved and scrubbed with a skin disinfectant. Sterile material will be placed over the rabbit except for the head and surgical site. Using sterile technique, the veterinarian will make an incision through the skin, subcutaneous tissue, and muscle to enter the abdomen. Blood vessels to the reproductive tract will be ligated (tied off) with suture. Ligatures will also be placed caudal to (after) the cervix and the reproductive tract will be removed. The muscle wall will be sutured closed, and then the subcutaneous tissue. A third set of sutures will be placed in the skin.

How is a castration performed?

During castration, the testicles will be removed. As with a spay, the hair will be shaved from the surgical site, and the area will be surgically prepared. An incision will be made in the scrotum. The testicle will be brought through the incision, the spermatic cord will be ligated, and then the testicle will be removed. The second testicle may be brought out through the same incision or a second one, and the procedure repeated. Depending upon the size of the rabbit, the site of the incision, and the

exact procedure performed, the incision may be left open, closed with tissue glue, or sutured.

How should the rabbit be cared for post-operatively?

Recovery from anesthesia

The rabbit should be allowed to recover in a warm, quiet environment where its vital signs can be monitored. Appropriate analgesics should be given.

Feeding

Food and water should be offered when the rabbit is awake. Because the castration is a less extensive surgery, males will often start eating the same day as the surgery, while females may not eat until the next day. If the rabbit does not eat after 24 hours, it may need to be fed a mixture of pellet and water through a syringe. Do not change the diet of the rabbit, although, a probiotic may be given as directed by your veterinarian.

Incision monitoring

The incision should be checked daily for signs of swelling, redness, or drainage. After a castration, it is normal for the scrotum to remain swollen for 10-14 days. For both a spay and a castration, skin sutures are usually removed after 10-14 days. If the rabbit chews at the sutures, a bandage may need to be placed around the abdomen to protect the incision site.

Monitoring stool

The rabbit may have soft stool or irregularly shaped stool for several days after surgery.

Housing



At home, the rabbit should be kept in a warm, clean area until the sutures are removed. The cage should be cleaned regularly. The area should be quiet and as stress-free as possible. The rabbit should be housed by him or herself. It is especially important that male rabbits be kept by themselves. The level of the male hormone, testosterone, which is made by the testicles will remain relatively high for several weeks to 2 months post-castration, and the rabbit may display sexual behavior during that time. Most complications after castration occur because this behavior resulted in opening of the incision site. Live sperm will also remain in the portion of the male reproductive tract that was not removed for up to 3 weeks. After that time, they will die and no more will be produced because the testicles were removed.

Monitoring behavior

Sexual behaviors are influenced by the hormone levels in the blood and these can remain relatively high for 2 weeks to 2 months post-surgery. Therefore, sexually-related behavior problems will not resolve immediately, but will slowly diminish over time. The rabbit should be watched for signs of pain, loss of appetite, depression, lethargy, or other abnormal behavior.

Contact your veterinarian if any of the following occur:

- The rabbit is chewing at the incision.
- The incision opens; becomes red, swollen or painful; or has a discharge.
- The rabbit has not started to eat after 24-48 hours.
- The stools are very soft or the rabbit has diarrhea.
- The rabbit is depressed, remains by him or herself in the back of the cage, will not move, or is weak.