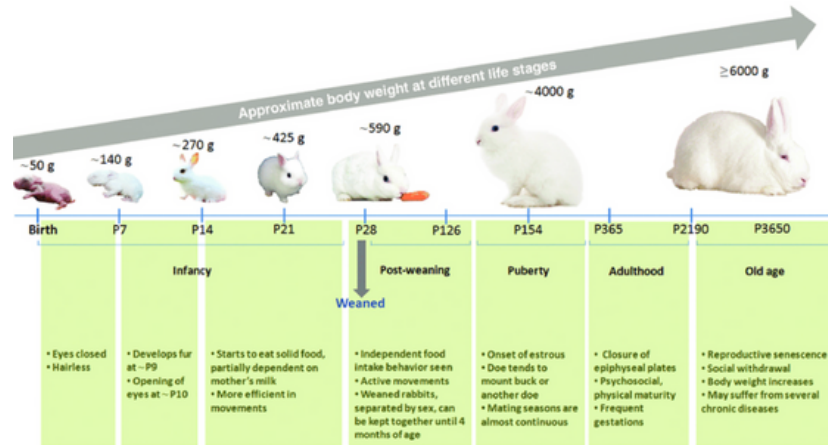




Archie's Exotic Pet Rescue

www.archiesrescue.ca

Rabbit Stages Of Development



Young Rabbit Stages

Bunnies nurse once every 24 hours until they are 8 weeks old, at which time, they can be separated from their mother. Bunny sexual organs start to mature as early as 10 weeks, which means boys and girls need to be separated at this time! Small rabbit breeds usually reach sexual maturity from 3 to 4 months. Medium to large breeds will be able to reproduce at 4 to 4.5 months. Giant rabbit breeds reach reproductive age at around 6 months. Regardless of size, separation between 2-3 months is important to avoid surprise litters.

Baby bunnies get along well with each other. This is called the "baby bond" and does not last once their hormones start coming in. You will notice males humping females, males being aggressive with others, and females being aggressive with other females.

Teenage Rabbit Behavior

Female rabbits have estrous cycles, rather than menstrual cycles. Unlike menstruation, females reabsorb the inner lining of the uterus if no conception occurs. At this stage, female rabbits may become aggressive and territorial. Intense curiosity and excessive chewing is common at this age. Male rabbits will also begin to court females by spraying urine. Both genders may start to spray urine in all areas of the house to claim their territory. Sometimes their pee will even start to smell more during this phase. Male rabbits, in particular, will start

to hump objects or other rabbits they share a space with. Some rabbits, especially females, will start to display aggressive behaviors. They will lunge and bite at anyone who tries to enter their space, protecting their territory. As female rabbits enter sexual maturity, they might also exhibit nesting behaviors. Even if the female hasn't been in contact with a male, she might experience false pregnancy. During a false pregnancy, she'll collect nesting material and pull her fur to make a nest even when she is not pregnant.



Rabbits will also begin to develop an increased desire to chew and dig into everything during their teenage years. They are also likely to become more hyperactive and curious, causing them to find new ways to get into trouble all the time. These behaviors decrease with neuter/spay and age. It's important to take the steps to rabbit-proof your home, to prevent your rabbit from causing too much damage.

Teenage moodiness will manifest itself most

specifically as:

- aggression (biting, boxing, etc.)
- potty accidents
- laid back ears
- teeth grinding
- grunting
- spraying urine

The teenage stage in a rabbit typically lasts until they are 1-2 years old. Rabbits, at this point, will be fully mature.

Teenage Rabbit Diet

As with most stages of rabbit development, teenagers should have access to unlimited pellets and unlimited hay. Acceptable hay for rabbits is Timothy, orchard, or meadow/grass hays. Alfalfa hay is acceptable until a rabbit reaches 6 months old (or is pregnant or nursing). Alfalfa has higher levels of calcium and protein which helps with growth; however, high levels of calcium and protein are not desirable past 6 months. If using alfalfa hay with babies, it is recommended to mix it with some Timothy/orchard/meadow/grass hay so they can transition away from alfalfa more easily.

As rabbits reach 3 months old, you should also start to introduce fresh, leafy greens into their diet. Introduce the greens slowly, one type at a time, to make sure your rabbit's



digestion can handle the new foods. You can find a list of appropriate greens on our website here: aarr.ca/foods.

And, of course, rabbits should have access to unlimited fresh water.

Teenage Rabbit Health Concerns

It is important to get your rabbit spayed or neutered as soon as they reach sexual maturity. In males, this is when the testicles drop, typically 3 months old. Females should wait until 6 months old. Getting your rabbit fixed can correct behavioral concerns with rabbits, and it can also prevent the rabbit from developing reproductive disease. Female rabbits, in particular, are extremely susceptible to developing uterine cancer. There is an 80% chance of female rabbits developing a reproductive cancer in their lifetime if they have not been spayed. Male rabbits also have a high chance of developing prostate cancer if they have not been neutered.

After the rabbit has been spayed or neutered, their behavior will start to improve as their hormone level slowly starts to decrease over the next 1-6 months.

Adult Rabbit 18 Months – 7 Years

Your rabbit will calm down a little and settle into their own personality. This is when a rabbit settles down to be part of the family and may trust you more. Adult rabbits will spend time with you more and enjoy being pet for longer periods of time. They will still be very active and require a lot of exercise and toys to play with. They will likely still have chewing and digging habits, but they might not be quite as persistent as they were before.

Senior Rabbit 7-10+ Years

A rabbit's average life expectancy is 10-12 years. They may start to be considered elderly at 6+ years old. However, some larger size rabbits may have shorter life spans making them elderly anywhere from 4-10 years old. Every rabbit slows at their own pace, but in this stage he/she will start slowing down. The rabbit will lose energy as he/she ages and sleep more often. Fur will start to thin and there will eventually be loss of muscle mass which results in difficulty in zooming around and climbing. Some will lose weight while others may gain weight from being less active.

QUANTITIES OF FOOD TO FEED SENIOR RABBITS (OVER 6 YEARS)

- If sufficient weight is maintained, continue adult diet
- Frail, older rabbits may need unrestricted pellets to keep weight up. Alfalfa can be given to underweight rabbits, only if calcium levels are normal. Annual blood workups are highly recommended for geriatric rabbits.



You might think that your rabbit will remain healthy and active for its entire life. Over time, however, your rabbit will start to slow down and sleep more. This is just one symptom of old age. Signs that your pet rabbit is getting old may include a greying coat, cataracts/loss of sight, hearing loss, or sleeping more often. You may also notice mobility problems, trouble grooming, weight loss, frequent avoidance of the litter box, or temperature change sensitivity. Age can also bring a range of illnesses, such as dental disease, heart disease, respiratory problems, kidney problems, or urinary tract infection. Your rabbit might even get dementia or cancer.

Some of these signs will not manifest if your senior rabbit has received high-quality care for most of its life. Other signs will be unavoidable, so you will also need to adjust your rabbit's lifestyle. The older your rabbit gets, the more it will rely on you to remain happy and healthy.

Coat Color Changes

A rabbit's fur can go grey or whiter due to old age. The hairs on its coat may also become thinner and finer, or opposite to that, much coarser than before. You will be able to spot these greying hairs around and behind its ears.

Of course, a greying coat can be more difficult to pick out on a rabbit that already has a grey or white coat. You might have to look out for other signs that your rabbit is aging on top of this.

Vision Issues

As rabbits age, their sight may begin to deteriorate. Certain ocular issues may develop, such as:

- Glaucoma
- Blocked tear ducts
- Conjunctivitis
- Cataracts
- Blindness

Glaucoma

Glaucoma is a broad medical term that indicates any condition in which an abnormally high pressure is forced on the eye. It is rare for a rabbit to have glaucoma on its own.

Rather, a rabbit is more likely to suffer from ocular-related conditions that may cause glaucoma, namely blocked tear ducts and conjunctivitis. Left untreated, this could eventually lead to blindness.

When a rabbit's tear ducts are blocked, its eyes will become watery. Excess tears may also run down its face, which can dampen the fur and skin and cause a bacterial infection that worsens the condition. This can later lead to inflammation, fur loss, and a steady build-up of pressure in the eye that causes glaucoma.



Conjunctivitis occurs when the tissues around the eye become inflamed. Not only can this cause the eyes to water, but it may also cause glaucoma and blindness if left untreated. A rabbit will develop cataracts at birth due to bacterial or parasitic infections. A rabbit can also develop **Cataracts** over time, leading to a slow loss of sight as it ages and eventual blindness. Cataracts can be surgically removed to restore your elderly rabbit's sight close to what it once was.

This is not to say that blind rabbits live unfulfilling lives. A blind rabbit will learn to adjust to its newfound disability given time, relying on its sense of hearing and smell to get around. You should always make sure you announce that you are close by or let your rabbit smell you, so it does not get scared when you approach.

Likewise, put food, water, and its litter box in roughly the same area of its play pen. This helps your rabbit know where to go for these things.

Hearing Loss

Rabbits have a keen sense of hearing that can pick up sounds even human ears cannot detect. In fact, a rabbit can swivel its ears 270 degrees independently from one another to detect multiple noises from up to 2 miles away.

Unfortunately, this sharp hearing can start to dull as your rabbit grows older and it may even become deaf. Some rabbit breeds are also more likely to develop ear problems later in life. A lop-eared rabbit is more prone to ear problems due to how its skull is shaped. Because its ears automatically flop down rather than stay up, a lop-eared rabbit is more likely to suffer from narrowed ear canals, excess ear wax build-up, ear infections, and ear pain.

These may eventually lead to permanent hearing loss if left untreated. You need to take a lop-eared rabbit to the veterinarian more often for cleaning and check-ups to ensure its ears remain clean and healthy.

Unless your rabbit was born deaf, it will rely heavily on its sense of hearing. Not only does it help the rabbit detect potential predators, but it also helps it to learn and understand commands and its environment. You will know if your rabbit is losing its hearing if it does not react to loud or strange noises, or if its ears do not flick in the direction of where a noise emits.

Hearing loss can make a rabbit deeply distressed, so you will need to be even more gentle and patient with its care than before. A deaf rabbit may become aggressive towards humans.

Do your best to approach your rabbit slowly and within its field of vision. You should also let it smell you so it is reassured that you are not a threat. Outside of this, its behavior will not change all that much.

Sleeping Habits

When a rabbit enters middle age, its once seemingly endless energy will begin to wane. Your



rrabbit may sleep more or longer than it used to, or it may not feel up for playing with you as much as before. Reduced activity is simply a sign of its older age.

It is best to just let your rabbit relax and sleep when it wants. There are times of the day when it will feel more energized, though, so you should encourage your rabbit to exercise and play during these times.

The rabbit is a crepuscular animal, which means it is most active at dawn and dusk. If your rabbit does not want to move around all that much during the times it should be more active, however, then it may be having rabbit mobility problems.

Mobility Problems

Arthritis, particularly osteoarthritis, is a common condition for a senior rabbit. A rabbit that has arthritis will have inflamed joints, which can inhibit movement and be painful.

Signs of rabbit arthritis include:

- Strange, stiff gait
- Difficulty hopping or moving
- Difficulty jumping over small objects or onto high surfaces
- Reduced activity
- Losing balance on its back legs
- Reduced grooming, particularly around its bottom
- Difficulty eating cecotropes
- Ear wax build-up
- Aggression and/or refusal to be touched or handled

Cartilage aids in smooth movement of the joints and can wear down or tear over time, leading to arthritis. This constant wearing in itself can be caused by several different factors.

If you do not encourage your rabbit to exercise and play, then it will likely become overweight or obese. Too much weight on the joints can cause them to wear down or even tear, which in turn causes arthritis. Additionally, a rabbit may also get arthritis from a joint injury or infection. Left untreated, arthritis can also cause muscle loss. If you suspect your rabbit has arthritis, it is best to take it to see your veterinarian. The vet may prescribe non-steroidal anti-inflammatory drugs (or NSAIDs) to relieve your rabbit's joint pain or give your rabbit's joints a massage. The vet may also suggest ways to adjust your rabbit's diet so it can lose weight. A low-fat, high-fiber diet is crucial for optimal health.

Fortunately, not all elderly rabbits will have mobility problems. Some will remain just as active and spry as they were when they were younger. It is still a good idea to watch your rabbit to make sure it will not develop any mobility issues later on.



Grooming Difficulties

Oftentimes, you may spot your rabbit licking its paws and cleaning its ears, or craning its head to lick itself clean. A rabbit cannot stand being dirty, and it can be quite thorough in cleaning itself to ensure this will not happen.

If your rabbit is having trouble grooming itself, however, then it may have developed arthritis. It is especially important that a rabbit's bottom stays clean to prevent urine scalding, which is when urine soaks into the rabbit's fur, bladder sludge, and other digestive complications.

Usually, you should never give your rabbit a bath, but in this case, you should wash your rabbit's bottom every so often so it does not have to strain itself to do so. You should also make sure to regularly clean any soft blankets or other pads it lies on as well.

Arthritis can make even the smallest of jumps difficult for a rabbit to make. This can make it hard or impossible for your rabbit to use its litter box.

Litter Box Habits

An elderly rabbit not using the litter box anymore can be yet another sign that it may have arthritis. This problem is quite simple to fix.

It will help to lay out an absorbable bathroom pad flat on the floor for your rabbit to use instead of a box the rabbit has to jump into. This will allow your rabbit to relieve itself without having to jump or hop over any obstacle in its path. You can simply sweep or pick up the pad to throw out at the end of the day and replace it with a new one.

Weight Loss

A rabbit's weight may fluctuate when it grows older. Change your rabbit's diet according to its change in weight. If it has become overweight, reduce its pellet intake.

If your rabbit has become underweight, on the other hand, increase the portion of pellets you feed it daily. Alfalfa pellets contain more calories, so you might want to give your rabbit these until it gains enough weight back.

If your rabbit still seems to be losing weight after all this, then you should take it to see your veterinarian. This could be a sign of some severe dental or digestive condition.

Temperature Sensitivity

Rabbits tend to be quite sensitive to sudden temperature changes, and this



temperature sensitivity only increases as rabbits age. Rabbits tend to fare quite well in cold weather, though they will tend to eat more during this season to stay warm.

Excess heat, on the other hand, can stress rabbits out. Rabbits cannot sweat, and their only method of cooling off is by panting. This panting is not that effective, either, so they might overheat and even die without cool shade, water, and proper air flow. It is best to keep an elderly rabbit in an indoor hutch where you have more control over these temperature changes. You can provide a rabbit with enough heat and food in winter and cool shade, water, and proper air ventilation during the warmer months.

Other Health Problems

An elderly rabbit will also be more susceptible to other health problems, especially if owners have neglected some, if not most, aspects of their rabbit's health. However, even the most involved rabbit owners might find that an underlying condition may have developed without their notice.

This is why it is important that you take your pet rabbit to your veterinarian for a check-up at least once every two years—once every year once it reaches seniority. Here are just a few serious health conditions your rabbit could develop if not caught in time.

Dental Disease

A rabbit's teeth are constantly growing. This is why it is important to provide your rabbit enough hay, toys, or other roughage throughout its life to wear its teeth down to a more manageable level. This wear can also help prevent painful dental diseases from cropping up later in its life.

Dental disease is one of the most common reasons a rabbit needs constant veterinary care. An elderly rabbit is more predisposed to dental disease due to the progressive changes in its skull shape and structure over time.

This can lead to malocclusion, which is when misalignment of the rabbit's teeth can cause them to grow out-of-control, and root elongation. These conditions are very painful for a rabbit and can even interfere with its eating and grooming.

Fortunately, most dental diseases work in identifiable stages and can be caught early enough to prevent the worst. Dental disease cannot be cured on its own. If your rabbit exhibits the following symptoms, take it to your veterinarian immediately:

- Refusal to eat
- Weight loss
- Drooling constantly
- Producing less feces
- Swelling around its mouth or jaw



tore Hocks (Pododermatitis)

Pododermatitis, more commonly referred to as sore hocks, is a condition many older rabbits tend to get on their back legs. More specifically, it affects the bottom of its feet and its hocks, which are basically like the heels of a rabbit. Sore hocks are characterized by:

- Hair loss on the affected foot
- Tougher skin on the hock
- Swelling
- Redness
- Open wounds
- Scabs

Sore hocks can be quite painful for a rabbit and cannot be cured without treatment. Your veterinarian may clean out any wounds and prescribe mild painkillers.

To aid in the healing process, lay out blankets, mats, carpets, or other soft surfaces in its hutch and play area to alleviate the pressure it puts on its hocks. You will also have to clean these blankets and soft things more often to ensure its injuries stay clean. If your rabbit is also overweight, you should adjust its diet to help it lose weight.

Heart Disease

Age can stiffen the aorta, which is the main artery that supplies oxygenated blood to the heart, and the heart of the rabbit itself. This can increase incidences of cardiac arrhythmias (or irregular heartbeats) and even cause sudden cardiac death. A rabbit can even suffer from a heart attack if stressed enough.

If your senior rabbit has a heart condition, you might notice it coughing more, eating less, having trouble moving around or breathing, and losing weight at an alarming rate.

You must take your rabbit to the veterinarian immediately if you notice any of these symptoms or it could die. Keep in mind that a rabbit will tend to hide signs of pain until its condition becomes severe.

Your veterinarian will inject isotonic saline as a treatment alongside other medications to ease pain and improve cardiac contraction. The vet will also advise you on how best to change your rabbit's diet. Oftentimes, poor heart health can be prevented by feeding your rabbit a low-fat, high-fiber diet.

Respiratory Problems

A rabbit with respiratory problems will have similar symptoms to one with heart conditions, which makes watching its behavior and health all the more important. Your rabbit may sneeze or produce nasal discharge.



A rabbit that lives in a dirty or dusty hutch or has been exposed to an already infected animal might develop respiratory problems. Do your best to keep your rabbit's hutch and its play area clean and free from any drafts for a while. Your veterinarian may also prescribe antibiotics if its respiratory issues were caused by infections.

Kidney Problems

The presence of kidney stones or high concentrations of urea and creatinine in the blood are telling signs of renal (or kidney-related) disease.

Typically, these symptoms in turn are caused by high amounts of calcium in the rabbit's diet. Therefore, it is imperative that your rabbit is fed a low-calcium diet to prevent this.

If you spot your old rabbit drinking a lot of water, peeing a lot, losing weight, or being depressed, then it might be suffering from renal disease. Renal disease in a rabbit can be a life-threatening emergency, so you must take it to your veterinarian immediately.

Urolithiasis (Urinary Sludge and Stones)

Urolithiasis (stones or sludge) within the urinary tract of rabbits, has been a 'hot topic' in the veterinary profession and amongst owners for several years. Many theories have been put forward and researched as to why rabbits seem to readily develop these deposits...but sadly there is still no hard facts as to exactly what causes these problems and how best to treat and prevent them from happening.

What is known, is that it is a complicated condition with many potential predisposing factors, treatment is life-long and often multi-tiered, and will frequently fail to prevent the condition reoccurring.

This article aims to discuss the latest thinking on the condition, what is thought to cause it and how to treat it.

- How Do Rabbits Metabolise Calcium?

Rabbits are unique in the way that they metabolise calcium. The vast majority of mammals will only absorb the amount of calcium that they require from their diet and excrete less than 2% through their urinary tract. However, rabbits adopt a different approach, and absorb ALL the calcium from their diet, relying upon urinary excretion as the major route of getting rid of any excess (approx 44%).

The urinary tract in rabbits is identical to that of other mammals and exists of two kidneys, each with a ureter running from it to the urinary bladder. The urethra is the exit tract from the bladder, which enables the rabbit to pass urine out of their body. As with all mammals, calcium is primarily required for muscle and nerve function, so the reason why rabbits have adopted this unique calcium metabolism is not fully understood, but may be linked to the constant growth of the rabbit's teeth, which require a good source of calcium to ensure they grow correctly and the sparse diet that wild rabbits exist on.



Urolithiasis is the term used to describe calculi (stones) within the urinary tract. Calculi and sludge are slightly different things. They can develop in any area of the urinary tract but seem most common in the kidneys or urinary bladder.

What Are the Symptoms?

As with all conditions, symptoms will vary from rabbit to rabbit, with some exhibiting very subtle signs, and others showing severe discomfort and clinical signs. Symptoms will include; anorexia or lessening of appetite, fewer or cessation of droppings, blood may appear in the urine (haematuria), loud painful grinding of the teeth (bruxism), lethargy, unwillingness to move, hunched posture, pressing their abdomen on the ground, perineal scalding, straining or inability to urinate and passing thick, white, toothpaste like urine. One or more symptoms may be present and may be very discrete. Symptoms can also be intermittent as the rabbits pain may come in waves as the stones/sludge move around.

Diagnosis

Radiographs and ultrasound are both diagnostic since both calculi and sludge are radio-opaque due to the calcium content.

Treatment Options

The treatment will vary greatly due to the location of the calculi/sludge and the severity of the problems. Firstly, the rabbit must be stabilized and sufficient analgesia given, since the condition is so painful. Stabilization may consist of aggressive fluid therapy: intravenous (directly into the vein) or if this is not possible then intraosseous (into the bone marrow) (as long as there is no obstruction of the urinary tract). Subcutaneous fluids are not going to be absorbed sufficiently rapidly if the rabbit is shocked, but are sufficient in the early stages and it is impossible to get enough volume of oral fluid into a rabbit in such cases. The rabbit's gastro-intestinal (GI) tract must be kept moving, so prokinetic medication (Metoclopramide and Ranitidine) should be given and syringe feeding using a herbivore preparation (Oxbow Critical Care or Supreme Recovery) must be commenced at a rate of 50ml/kg/24hr if the rabbit is completely anorexic (less if the rabbit is still eating to some degree). If the rabbit will not tolerate syringe feeding then a naso-oesophageal tube should be placed for the purpose of providing nutrition.

Bloods should also be taken to assess the rabbits renal function (urea and creatinine) and the calcium level. This should be interpreted with caution as calcium levels will rise after meals,



especially if the foods were high in calcium. A manual PCV (packed cell volume) is also useful to determine dehydration and any evidence of lipaemia (fat within the blood), which may be apparent if the rabbit is going into hepatic lipidosis.

Urinalysis is useful to determine if there are any crystals within the urine. Rabbits who are well hydrated, have a good level of pain relief and whose gastrointestinal tract is working, have a much better chance of surviving major surgery. So, only once the rabbit is stabilized (which may take several days) should surgery be attempted. The only exception to this may be with urethral calculi in buck rabbits who are not able to pass urine and when the calculi can not be pushed back into the bladder, or a urinary catheter inserted. These rabbits are surgical emergencies, and may require immediate life saving surgery.

Calculi within the urinary bladder are usually the easiest to remove. A procedure called a cystotomy is performed to remove the calculi. Urethral calculi are usually removed by flushing the stone back into the bladder and performing a cystotomy to remove it/them from the bladder. If calculi are detected within one or both ureters (ureterolithiasis), they can often cause hydronephrosis (an enlargement of the kidney due to the blockage of the ureter). Unlike the liver, kidneys do not possess any regenerative powers so it is impossible to improve the kidneys function once it has been damaged, but kidney parameters will only rise on blood work once over 70% has been lost, so it is possible for a rabbit to live a normal life with some degree of renal impairment. Ureteral calculi can be removed surgically, but it is a difficult procedure to perform on a rabbit due to the small size of a rabbit's ureter, so referral is often required.

Those rabbits who present with calculi within their kidneys present a difficult dilemma. It is possible to perform a nephrectomy (removal of a kidney) in a rabbit, as long as the other kidney is free from disease. If both the rabbits kidneys are affected then it is often deemed unfair to put the rabbit through such a major procedure as a nephrectomy, since the other kidney is not likely to be capable of maintaining sufficient renal function. Attempts have been made to remove calculi from the kidney of a rabbit, but this surgery carries a very high risk of complications.

Many rabbits who have had calculi removed from a kidney, have sadly died shortly afterwards. And equally those who have gone on to live for several years on one kidney. The rabbits quality of life should always be the main consideration for the owner and the veterinary team.

Sludgy Bladder

Thick, calcium sludge seems to be a common and often incidental finding in rabbits, but IT IS NOT NORMAL. The problem is indicative of a diet too high in calcium, and/or poor hydration, and it is often a pre-disposing factor of cystitis, which may be a cause of urolithiasis. If the problem is causing clinical signs (the same as those which may



be shown with calculi), then it is possible to surgically flush the bladder. Although long term treatment should be aimed at reducing the calcium content of the diet and increasing the water intake.

Potential Causes

Many factors have been sighted as causing urolithiasis in rabbits but no one single cause has been proved, and two rabbits fed identical diets, living identical lifestyles are both unlikely to develop problems, so the causes are liable to be numerous. No incidence of male/female, neutered/entire or breed incidence has been proven, but dwarf lop rabbits do seem to be affected more often. However, as they are one of the most popular breeds of rabbit kept within the UK, this may just be down to there being more cases as there are more of them.

Diets High in Calcium

Rabbits fed a high calcium diet, which consists of alfalfa hay, calcium supplementation and vegetables high in calcium (kale, carrot tops, spinach, parsley and spring greens) are thought to be predisposed. Never feed adult rabbits alfalfa hay, unless they have a need for an increased calcium diet (pregnancy, lactation or growth of young rabbits). Limit the amount of high calcium vegetables offered and never use a calcium/mineral supplement/block. A rabbit fed a good quality diet has no need for calcium supplementation.

A Low Water Intake

Less urine is produced when the rabbit has a low water intake, and calcium precipitates out when urine is saturated with calcium. In winter when water bottles or bowls may freeze over, the rabbit may have a period of time when it is without access to water, this may exacerbate over a period of time if the problem happens frequently. Rabbits with frequent bouts of gastrointestinal stasis will often not drink or slowly decrease their water intake. Rabbits drink more water when they are on a high hay or grass diet, and grass is additionally higher in water content as well.

Overweight Rabbits

Those rabbits who are overweight are often unable to adopt the correct position for urination or may have weak muscle tone around the bladder. This gives any calcium in the bladder a chance to settle since the bladder is never fully emptied.



Lack of Places to Urinate

Rabbits who hold urine in the bladder give any calcium sediment a chance to settle, so always ensure that the rabbit has access to the area/litter tray it uses to pass urine.

Kidney Disease

As aforementioned, kidney damage will only show up on blood work once over 70% has been lost, so those rabbits who appear healthy may have a degree of kidney disease. This can mean that the kidneys are not capable of processing the amount that is absorbed from the diet, enabling it to build up over a period of time.

Cystitis

Frequent bouts of cystitis often indicate a problem with the rabbits urination. They may not be able to completely empty their bladder due to back pain, being overweight, lack of places to urinate, painful scalding or sludge within the bladder. Any sludge within the bladder will irritate the bladder lining, causing cystitis, which may be a predisposing factor of urolithiasis.

Long-Term Management

Efforts must be made to remove all potential excess causes of calcium in the diet and try to rectify any of the other pre-disposing factors:

- Remove all commercial dried food from the diet and feed low/moderate calcium vegetables (celery, cauliflower, broccoli, carrots, brussels sprouts)
- Feed low-calcium hays such as timothy or oat hay ad-lib. Never feed alfalfa hay
- Sweeten water with apple/pineapple juice to try to get the rabbit to drink more
- Add water to vegetables to increase water intake
- Encourage your rabbit to exercise to lose weight and encourage more frequent urination
- Always ensure that your rabbit can get to it's litter trays/toilet areas, so place several litter trays in their environment to encourage more frequent urination
- Put your rabbit on a diet if they are overweight (consult your vet or veterinary nurse first)
- Be vigilant for clinical signs of re-occurrence
- If your rabbit has frequent bouts of cystitis, ensure they receive antibiotics but seek to find the route cause/s of the problem
- If your rabbit has reoccurring episodes of gastrointestinal stasis then try to ascertain if there is a common cause.



Even after all efforts are made to stop further formation of calculi, it does have a high rate of recurrence.

More research is needed into the condition, and new information is being gleaned all the time, which will enable us to enhance our understanding of these problems.

Urinary Tract Infections

Excess calcium can also cause urinary tract infection, which is a condition where a build-up of bacteria in the rabbit's bladder can cause painful, bloody urination. You can easily prevent this by letting your rabbit exercise often and feeding it a proper diet. This is why it is important for both a rabbit's hutch and its play area to be wide enough for it to be able to eat, sleep, and go to the bathroom in different spots. A rabbit confined to a smaller area will develop plenty of health issues.

Dementia

Dementia is a broad medical term that covers memory loss, problem-solving skills, and other cognitive abilities necessary to function on a day-to-day basis. It differs from Alzheimer's disease in that Alzheimer's is just one of the causes of dementia. A rabbit that is fed a cholesterol-enriched diet is more likely to develop sporadic Alzheimer's disease and symptoms of dementia. It may help to adjust your rabbit's diet to try and combat this development.

Unfortunately, because little is known on how to treat dementia and related conditions in humans in the long-term, there is even less research regarding treatment for a rabbit with dementia.

All you can do is try to create a consistent space for your rabbit where it can find its food, water, litter box, and other amenities in the same places to make it feel comfortable and safe.

Cancer

Young adult female rabbits are especially at-risk for several different types of cancer. Uterine cancer is the most common type of cancer a female rabbit can develop, especially if you do not get it spayed in time.

Around 70% of all unspayed female rabbits that are 3 years old or older will develop uterine cancer. It is best to get your rabbit spayed when it reaches 6-months-old to completely prevent this cancer from forming.

If your female rabbit has bloody urine, then it may have uterine cancer. Uterine cancer is quite easy for veterinarians to treat if detected early enough. All the vet needs to do is surgically remove the uterus and ovaries (effectively spaying it) before cancer has spread too far.



A female rabbit can also develop mammary cancer, which is comprised of tumors found within the mammary gland. Much like with uterine cancer, mammary cancer can be treated fairly easily if detected early.

Your veterinarian will advise you to limit your rabbit's movement until it fully heals from surgery. This means you need to confine it to a smaller play area that discourages jumping and provides limited to no obstacles.

Once your rabbit becomes 6 years old or older, certain rabbit old age symptoms may start to manifest. You need to pay closer attention to its health and behavior at this stage in its life to catch these signs early on.

There are also several things you can do to help ease your rabbit's transition into old age. It is crucial that you feed your rabbit a diet full of fiber, dark leafy greens, and limited pellets to ensure it remains healthy. You will also need to increase vet visits from once every 2 years to once a year so your vet can catch any signs of serious health conditions early on.

Ovarian cysts

Ovarian cysts are rare in rabbits but can occur, and may be mistaken for other conditions, since the clinical signs can be non-specific and similar to other conditions.

- Why do they occur?

They may be spontaneous (develop for no apparent reason), congenital (inherited from the breeding line) or due to impaired ovulation. Follicular, cystic rete ovarii and paraovarian cysts can develop. Some are caused by hormonal influences, others are not.

- What rabbits are affected?

Only unspayed female rabbits can be affected and age increases the risk. Spaying, whereby the ovaries are removed, will eliminate the risk of them occurring, and is another reason, along with preventing uterine adenocarcinoma (cancer) and behavior and welfare reasons, why spaying of female rabbits is strongly recommended.

- What signs will my rabbit show?

The signs are non-specific, so may be mistaken for other conditions, but may include anorexia, gastrointestinal stasis, abdominal pain, discharge from the vulva or failure to breed. The rabbit may be asymptomatic, so show no signs at all.

- How will my vet diagnose the condition?

As the clinical signs are generally non-specific, your vet may need to perform a variety of tests to rule out other conditions and help get a diagnosis. These may include: an abdominal ultrasound to view the ovaries, CT or MRI scans, blood tests to evaluate hormone levels, and exploratory surgery if indicated.



- What is the treatment?

Your vet will need to remove the ovarian cyst/s and ovary, as well as spay your rabbit to help stop it from happening again. If your rabbit is clinically unwell, they will be stabilised with hospitalisation for fluid therapy, nutritional support, pain relief and medications to keep the gastrointestinal tract moving prior to surgery taking place. This helps to make the surgery and anaesthetic safer for your rabbit.

- Can they be prevented?

Getting your rabbit spayed when they are young and healthy will prevent ovarian cysts from occurring, as well as other reproductive diseases, such as uterine adenocarcinoma. It will also ensure your rabbit can live with a companion, which is much more likely to succeed if both rabbits are neutered and prevent unwanted litters. Two female rabbits that are unspayed are highly likely to fight and serious injuries can be inflicted.

