

GASTROINTESTINAL STASIS, THE SILENT KILLER

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It's an all too familiar story. "My bunny stopped eating, and then she just died." When we ask for details, we often learn that not only did the bunny stop eating, but she had been producing extremely small or even no fecal droppings, or showed symptoms of "runny stool." True diarrhea (unformed, liquid fecal matter) is uncommon in rabbits. The runny stool sometimes misdiagnosed as "diarrhea" in rabbits is often simply unformed, almost-liquid cecotropes.

Rabbits produce two types of pellets: fecal pellets (left in the litterbox) and cecotropes (soft, pungent, normally shaped like a cluster of grapes and reingested by the rabbit to obtain essential nutrients). Liquid or mushy cecotropes are usually caused by an imbalance of the normal bacterial and fungal flora of the cecum (the bunny's intestinal "fermentation vat"). The floral imbalance can be caused by a number of factors, such as the wrong antibiotic (oral penicillins can be deadly to rabbits for this reason!) or a diet too rich in digestible carbohydrates and too low in crude fiber. Often, however, it is caused by a slowing of the normal peristaltic muscular contractions which push food and liquids through the intestines. The slowdown or cessation of peristalsis of the intestine is known as gastrointestinal (GI) stasis or ileus.

What Causes GI Stasis?

A rabbit's intestine can become static for a variety of reasons, including (1) stress, (2) dehydration, (3) pain from another underlying disorder or illness (such as gas, molar spurs, bladder problems or infection) (4) an intestinal blockage or, most commonly, (5) insufficient dietary crude fiber (which is why unlimited grass hay is so essential in the rabbit diet). Left untreated, the slowdown or complete cessation of normal intestinal movement (peristalsis) can result in a painful death, in a relatively short period of time. If your rabbit stops eating or producing feces for 12 hours or more, you should consider the condition an EMERGENCY. GET YOUR BUNNY TO A RABBIT-SAVVY VETERINARIAN IMMEDIATELY.

An intestinal slowdown can cause ingested hair and food to lodge anywhere along the GI tract, creating a blockage. Also, because the cecum is not emptying quickly enough, harmful bacteria such as *Clostridium* spp. (related to the ones that cause botulism and tetanus) can proliferate, their numbers overwhelming those of the normal, beneficial bacteria and fungi in the cecum. Once this overgrowth occurs, gas emitted by the bacteria can cause extreme pain. Some *Clostridium* species produce deadly exotoxins. It is the liver's job to detoxify these harmful poisons, at a terrible cost to that all-important organ. Often, the ultimate cause of death from GI stasis is damage to the liver.

How Can GI Stasis be detected?

Symptoms of GI stasis include very small (or no) fecal pellets, sometimes clinging to the bunny's bottom. In some cases, very small

fecal pellets will be encased in clear or yellowish mucus. This indicates a potentially serious problem (enteritis, an inflammation of the intestinal lining) which must be treated as an emergency.

With GI stasis, the normal, quiet gurgling of the healthy intestine is replaced either by very loud, violent gurgles (gas blopping around painfully!) or a desolate silence. The bunny may become lethargic, have no appetite and may hunch in a ball, loudly crunching his teeth in pain.

GI Stasis and the "Hairball" Myth

Too often, a rabbit suffering from GI stasis is diagnosed as having a "hairball." In reality, an apparent hairball usually is a result of GI stasis--not the cause. A vet who has not palpated many rabbit abdomens may be unfamiliar with the normal, sometimes doughy feel of the healthy rabbit stomach. A doughy stomach is cause for concern only when accompanied by an empty lower GI and symptoms of abdominal discomfort.

Like those of most herbivores, the stomach and intestines of a healthy rabbit are never empty. A rabbit may eat relatively normal amounts of food, almost up to the time the GI shuts down. Because of this, the stomach may retain a large bolus of food when stasis occurs. Unlike the typical cat hairball, which usually consists completely of hair, the mass misdiagnosed as a "hairball" in a rabbit is usually composed mostly of food held together by hair and mucus. Unless it is allowed to dehydrate into an impassable mass, this bolus of ingested material can be slowly broken down with enzyme supplements and plenty of oral fluids. However, treating a mass this way without addressing the problem of GI stasis will generally be unproductive.

If you suspect that your bunny is experiencing GI stasis, you must take him/her to your rabbit-experienced veterinarian without delay. Tell the vet your suspicions. S/he will probably listen for normal intestinal sounds and palpate the bunny's abdomen. The vet also may wish to take radiographs (x-rays) to see whether the various parts of the digestive tract contain normal ingested matter, feces or foreign objects--or are empty and gassy. The appearance of the digestive tract will help the vet determine whether there is an obstruction and, if so, where it is located.

If a true intestinal obstruction (almost always accompanied by severe bloating and acute pain) is present, the use of intestinal motility drugs (described later) could make the situation worse by pushing it into a narrow area where it completely obstructs the intestine, resulting in intestinal rupture. However, if the mass is not causing a complete blockage, it is best to consider medical alternatives to surgery. A gastrotomy--surgical opening of the stomach--may be performed to remove an obstruction, but rabbits who undergo this procedure have an abysmally low survival rate. It is very difficult to get a rabbit's intestines moving normally again post-operatively. Those who survive the surgery itself often succumb a few days later to peritonitis or other complications, even when under the care of the most practiced, skillful rabbit surgeon. Surgery on the rabbit GI tract should be considered only as a last resort.

Can GI Stasis Be Successfully Treated?

If your vet has determined that there is no intestinal obstruction, there are several treatments s/he may wish to use to help your bunny in distress. As always, do not perform any of these procedures or try to administer any of these medicines without the supervision of a veterinarian experienced with rabbit disorders and treatments.

I. Mechanical Treatments

A. Abdominal massage. One of the single most effective ways to stimulate a lazy gut into action is with gentle massage. Place the bunny on a secure countertop on a towel (or in your lap, if the bunny feels secure there), making sure he can't jump down and hurt himself. With your hands and fingertips, gently massage the abdomen. Knead as deeply as the bunny will allow, but back off immediately if he expresses pain. We have found that gently lifting the rabbit's hindquarters a few inches (with the bunny's head safely tucked into the massager's elbow) helps gas to pass more easily, and seems to be comforting to the bunny. Once s/he gets over the initial surprise of being held this way, a rabbit will often allow his/her legs to droop in comfort and relief as the massage helps gas pockets move towards the exit.

A rabbit's internal organs are very delicate; care must be taken to avoid bruising them and making the situation worse. After a bit of manual massage, try an electric vibrating massager. This seems to be even more effective than manual massage, and it's worthwhile to invest in some type of massager with a large, flat surface that can be held against the bunny's tummy for relatively long periods. Press the massager firmly against the abdomen, start on low and work your way up. The bunny may be a bit taken aback at first, but almost every bunny on whom we've tried massage has settled down and enjoyed the soothing vibrations. In addition to stimulating the muscles, the massage seems to help break up gas bubbles and ease colic. Massage as long and as often as the bunny will allow and enjoy.

B. Simethicone (liquid, pediatric suspension or tablets) is essential for the relief of gas pain which usually accompanies ileus. For relief of acute gas pain, 1-2 cc (20mg/ml suspension) can be given as often as every hour for three doses, then 1 cc every three to eight hours. This substance has no known drug interactions, is not absorbed through the intestinal lining and acts only on a mechanical principle: it changes the surface tension of the frothy gas bubbles in the gut, joining them into larger, easier-to-pass bubbles. Simethicone is practically inert, and is safe to give, even as a precaution. (Note: liquid suspensions of simethicone are relatively expensive. Less expensive versions, such as 125mg gel capsules are equally effective. A bunny can safely receive the contents of half a capsule at the rate described above.) A flatulent bunny is a happy bunny!

C. Petroleum-based laxatives: use with caution. (laxative-grade mineral oil or commercial products Products such as Laxatone or Petromalt) do not affect intestinal motility. Some veterinarians prescribe them in the hope that they might help to slide dry, impacted matter through the intestine more easily.

Note, however, that if the intestinal contents are severely dehydrated and brick-hard (yes, we have seen this!), a coating of vaseline-like substance over them will merely impede their re-hydration and make it more difficult for the mass to break up and begin passing. For this reason, it is probably wise to concentrate on re-hydrating the intestinal contents *before* using petroleum-based laxatives, if they are to be used at all.

Note also that whereas malt-flavored remedies in a tube are often preferred by the bunny, some vets believe that their higher viscosity may actually contribute to holding a mass of impacted food together, especially if the intestinal contents are dehydrated. Unscented, laxative grade mineral oil is less viscous, and may be more effective. Petroleum-based laxatives should not be given daily or long term, as they can impede the absorption of important, fat-soluble vitamins.

D. Enema. It may be helpful to administer an enema of warm, clean water and a very small bit of unscented, laxative grade mineral oil. The addition of epsom salts to the enema liquid (at a rate of about 1 tablespoon per 30-40 cc's of water) may help draw fluid from surrounding tissues into the intestine, helping hydrate impacted matter. If you use epsom salts, however, you must be certain that the bunny is generally well hydrated with subcutaneous fluids so the reservoir of fluids in the bunny's body will not be depleted.

Before you attempt to perform an enema on your rabbit, please ask your veterinarian to instruct you in this process during a regular office visit. Don't wait for an emergency to learn how to do this. If you cannot reach your vet when your bunny is in stasis, you are out of luck!

We administer the enema with a pediatric rubber ear bulb/syringe. A 5 lb rabbit can safely be given 10-15 cc's of liquid enema. Mix the water and oil well. Place the bunny on her back, well supported so she doesn't kick. Gently insert the lubricated tip of the syringe into the anus, no deeper than 1/2 - 3/4 inch. (Note: if you're not sure which orifice is the right one, the anus is the one that winks back at you when touched.) Be gentle. NEVER FORCE ANYTHING! Slowly empty the bulb and let the bunny remain on her back for at least 30 seconds, to allow the liquid to travel up the tract a bit. You may need to gently hold the anus closed to avoid a fountain.

WE DO NOT RECOMMEND THAT A CATHETER BE USED TO DELIVER AN ENEMA. The rabbit's lower GI tract is extremely delicate and fragile, and it is distressingly easy to perforate the rectum or small intestine. The ear syringe works very well, and is far safer than inserting a catheter deep into the lower GI tract.

An enema delivers liquid to the source. It can help hydrate hardened, dehydrated fecal matter in the lower GI, even when subcutaneously administered fluids don't seem to help.

II. Non-prescription supportive measures

A. Oral fluids (administered at a rate of 100cc per kg of body weight per day--or about an ounce per pound of body weight per day) are essential for hydrating intestinal contents which may have formed a

hard mass and be nearly impossible to pass. Water is fine, but unsweetened Pedialyte, an electrolyte drink designed for human infants (and available in the infant section of the grocery store), is even better. Avoid any fluids containing large amounts of sugar (even Gatorade), as these can exacerbate the overgrowth of harmful bacteria in the cecum.

B. Force feeding. Anorexia can rapidly cause gastric ulcers and hepatic lipidosis (fatty liver disease) in rabbits. Even 12 hours without eating is cause for concern. As long as your vet has determined that there is no actual blockage, and that there is enough slow movement of the GI to keep the stomach from becoming overly full, keep the bunny eating! An excellent, ready-to-mix emergency food for compromised rabbits is Critical Care, available from Oxbow Hay Company (www.oxbowhay.com). However, if you do not have ready access to Critical Care, one quick and easy recipe is to soak about 2 - 3 tablespoons of pellets in about 1/2 cup of Pedialyte or chamomile tea until soft and fluffy. The pellets will fluff more quickly in slightly warmed solution, but overheating may destroy some of the nutrient content of the pellets. Mix the pellet fluff with vegetable baby food or canned pumpkin until it forms a somewhat liquid paste (you may need to add more liquid). Allow to cool before using a large-bore feeding syringe (available at most pharmacies) to deliver the goods.

Insert the tip of the syringe into the space behind the incisors and squeeze gently sideways to avoid squirting food down the trachea (windpipe). Give only 1-2 cc at a time, allowing the bunny a chance to chew and swallow. Aspiration of food can be life threatening, so do this with great care!

C. Unlimited grass hay. Even if the rabbit won't eat timothy, oat, brome or other grass hays, it is probably best to avoid giving more than a few strands of alfalfa hay, especially if the rabbit is unused to eating it. A sudden change in the diet can exacerbate Clostridium overgrowth (and alfalfa is an excellent food for certain species of Clostridium) and cause severe, potentially fatal bloat. For this reason and others, grass hay is always better than alfalfa.

D. Fresh, wet, leafy herbs. The fiber and moisture in fresh vegetables will also help stimulate the intestine. Kale is a good choice. If the rabbit refuses to eat, try fragrant, fresh herbs such as mint, basil, dill, cilantro, tarragon, sage, fennel, parsley and others. Sometimes it helps to nip off the ends of the stems with your fingernails and wave the fresh, juicy stems under the bunny's nose or even gently insert the stem into the corner of the bunny's mouth. You can even lightly pat the herbs against the bunny's face until she gets annoyed with you and grabs the offending sprig. Sometimes all it takes is a little taste to get the bunny nibbling. Try a variety until one of them gets the bunny to eat. You never know which herb will stimulate the appetite, so it's best to have a variety on hand.

E. Lactobacillus acidophilus is not normally a member of the rabbit's intestinal ecosystem, but we have noticed that a good dose of dried Lactobacillus powder (available at health food stores in powder or capsules) seems to help the rabbit survive the crisis until the intestine starts moving again. No one knows why, but it seems to help.

Use nondairy powder--NOT yogurt. The milk sugars and carbohydrates in yogurt may promote harmful bacterial overgrowth.

Probiotic pastes such as Benebac are available at feed stores, and might also be helpful. Products designed for horses are generally safe and possibly effective for rabbits.

F. Cecotropes Some veterinarians believe that cecotropes from a healthy rabbit, although difficult to obtain, can be used to re-establish normal cecal flora in a compromised rabbit. However, other veterinarians and experienced rabbit caretakers are of the opinion that administering cecotropes to a sick rabbit may do more harm than good for two reasons: (1) force feeding cecotropes is very stressful to a sick rabbit, since no one likes being force-fed someone else's poop and (2) even a known, healthy donor rabbit could harbor microorganisms in the cecotropes that could become pathogenic in an already compromised rabbit.

Also, because the normal cecotropes is coated with mucus that protects the bacteria while they travel through the stomach, mashing the cecotropes into a pellet mush or baby food might well render them useless. Given time and the proper supportive care, your rabbit will be able to reestablish a healthy cecal flora on his own, without the stress of being force fed foreign cecotropes.

However, if you and your vet absolutely insist on trying this, you can obtain cecotropes from a donor rabbit by diapering the donor, or briefly placing an E-collar on him/her during the late afternoon when cecotrophy usually occurs. Don't use the E-collar if the donor rabbit seems very stressed or upset by it! You don't need *two* rabbits suffering from GI stasis!

III. Prescription/veterinary treatments

A. An intestinal motility agent, such as cisapride (Propulsid) or metaclopramide (Reglan) will help get a static intestine moving again. Both of the aforementioned drugs are safe and effective for rabbits. Cisapride, a more recently developed drug, has fewer potential nervous system side effects with long term use than Reglan. We have used it long term (for several weeks at a time) without apparent adverse side effects. However, as with any drug, your veterinarian should be aware of any potential drug interactions between cisapride/metaclopramide and any other medications your rabbit may be taking.

For example, narcotic painkillers should never be given with Reglan due to the potential for dangerous interaction between the two.

It may take as long as two weeks on metaclopramide and/or cisapride before the intestine is fully motile again, and patience and careful nursing for the duration are essential. In severe cases of GI stasis, both drugs can be used simultaneously. Because they work on different areas of the digestive tract (Reglan on the upper GI and cisapride primarily on the lower GI), they may have a synergistic effect.

Conventional wisdom holds that if there is a possibility of an intestinal obstruction, these drugs should not be used. However, more and more rabbit-savvy veterinarians are noting that unless there is a

problem with the pyloric valve, motility drugs will not necessarily make the problem worse. So far, there is no consensus on this aspect of the problem, and it will be up to your veterinarian and you to determine the course that seems right for your bunny. Once again, it is imperative that you not take matters into your own hands. Have an experienced rabbit vet diagnose the problem and prescribe proper treatment!

B. Subcutaneous Fluid Therapy. Note that examining a rabbit's skin turgor (via "tenting" the skin) will often not give an accurate indication of the animal's hydration status. A more useful diagnostic procedure for rabbits is palpation of the intestinal tract, which will feel *very* "doughy" throughout if the rabbit is dehydrated. Because rabbits absorb large amounts of water from the intestine to fuel other bodily functions, a rabbit whose skin feels well-hydrated may still have an intestine packed with a dehydrated mass. Keeping the tissues well-hydrated via administration of subcutaneous Lactated Ringers Solution (LRS) will not only keep the bunny well hydrated, but will also assure that the electrolytes are balanced and make the bunny feel better in general.

A dehydrated rabbit will feel tired and ill, and may not have as much will to live as one who is well-hydrated. Rabbits in GI stasis tend to be unwilling to eat or drink, so it is a good idea to administer subcutaneous fluids as a precaution, unless the rabbit has known kidney or heart malfunctions.

As with the enema described previously, you should be able to do this procedure at home. But do not wait for an emergency to learn how to do it! Have your vet teach you how to administer fluids during a regular office visit. It could save your bunny's life.

C. Cholestyramine (Questran) is a granular resin with a high affinity for negatively charged, hydrophobic compounds, of which Clostridium spiroformes toxins are one type. This product is used primarily to reduce serum cholesterol in humans, and is available at most pharmacies. If the rabbit has mucous stool, there is a good possibility that Clostridium bacteria are proliferating and producing dangerous exotoxins. Questran will absorb these and be passed out harmlessly in the feces. Questran should be suspended in a generous amount of liquid (1/2 teaspoon of powder in at least 20 cc of water) and administered orally: because of its hydrophilic properties, it can dehydrate intestinal contents if given with insufficient water. Questran does not affect the action of the intestine; it is not absorbed by the body. Rather, it works directly upon the contents of the gut. We believe this substance has helped save the lives of many rabbits suffering from a severely inflamed intestine simply by sequestering toxins and buying time while gut motility medications and other treatments get the intestine moving again. It is very safe, used as directed.

D. Enzymatic digestive aids can be helpful in loosening and softening an impacted mass of food and hair (which, we remind you, is usually a symptom, not the cause of the problem!). Proteolytic (protein-dissolving) enzymes may be of either plant or animal origin. Papain (found in papaya) and bromelain (found in pineapple) may help to break down mucus binding an obstruction, thus allowing it to slowly break up and pass. However, there is no evidence to suggest that these enzymes

break down keratin, which is the main protein component of hair. Both papain and bromelain are available in powdered form at most health food stores, and should be reconstituted in water or Pedialyte shortly before use to ensure maximum potency. Papaya tablets are little more than a sugary treat: they contain very little active enzyme. Canned pineapple juice is useless, as it has been cooked, and its enzymes denatured and inactivated. Even fresh pineapple juice is not as desirable as powdered bromelain, since it is high in sugar, which is just about the last thing you want to add to a compromised rabbit's intestine!

Your vet may wish to try a more powerful, animal-derived enzyme product such as Viokase, which contains pancreatic enzymes to break down proteins, amylases to break down indigestible carbohydrates and lipases to break down fats. Although these enzymes may be better at breaking up an obstruction composed of ingested matter, they should be used with great caution, as they can burn the esophagus and cause temporary (two-three days) discomfort in an already sick bunny!

E. Appetite stimulants. B-complex vitamins, administered orally or injected, or Periactin (cyproheptadine) can be used to stimulate appetite. The former not only help stimulate appetite, but might also help supply what the bunny is missing by not producing or eating his cecotropes. Periactin is available in 4 mg tablets or a 1 mg/ml liquid suspension. An average-sized (4 - 6 lbs.) rabbit can be given 1mg by mouth, twice per day. It is vital to keep the bunny eating, even if you must force-feed. Anorexia can rapidly result in gastric ulcers and serious liver degeneration.

F. Antibiotics: Use with caution, if at all. Some vets routinely prescribe antibiotics for a rabbit suffering from GI stasis, either to combat the overgrowth of *Clostridium* spp. (metronidazole [Flagyl] is often used for this purpose) or to prevent secondary bacterial infection in the compromised rabbit (other rabbit-safe antibiotics such as the fluoroquinolones or sulfas might be used for this purpose.) While such cautionary measures may be taken, the practitioner should recall that unnecessary use of antibiotics is a prime reason that so many resistant strains of bacteria are evolving even as we speak. Unless the rabbit shows signs of bacterial infection (which may be the reason the intestine shut down in the first place), we urge a conservative approach: don't use antibiotics unless they are absolutely necessary. The above-mentioned medications and treatments should be enough to get the rabbit's intestine working again.

IV. Pain Relief: The key to keeping the bunny fighting to live!

The importance of analgesia to a rabbit's recovery cannot be overstated. A rabbit suffering from GI stasis will sometimes just seem to give up and die because of the sometimes extreme abdominal pain. Although officially approved only for use in horses, flunixin (Banamine) is one of the best NSAIDS non-steroidal anti-inflammatory drugs) for use in rabbits. Although this drug can produce gastric ulcers in some species (most notably, dogs), we have substantial anecdotal evidence (involving many hundreds of rabbits over a period of many years) to suggest that Banamine is tolerated quite well by rabbits even when administered daily for several weeks. We have observed no

adverse side effects from Banamine in our rabbits, some of whom have had to receive it daily for a week or longer.

Rimadyl is a newer anti-inflammatory drug which has been used with good results in rabbits.

Torbugesic, an opioid analgesic, provides excellent pain relief at relatively low doses. Although some practitioners fear that an opioid might contribute to GI slowdown, pain can certainly do the same. We have used opioids repeatedly in cases like this, with very good results. We also have had excellent success at relieving colic pain and inflammation of the intestinal lining with sulfasalazine, a combination sulfa antibiotic and non-steroidal anti-inflammatory compound. Sulfasalazine works topically to reduce intestinal inflammation.

Barium may also be useful as an intestinal tonic to relieve pain and help stimulate peristalsis, but its action is slow compared to that of the aforementioned analgesics. As always, your veterinarian is the one best able to decide which type of pain relief is best for your rabbit, given the specific conditions of his/her illness.

V. The Road to Recovery: Reduce Stress, and If it Ain't Broke, Don't Fix It.

It is absolutely essential that the caretaker faced with a rabbit in GI stasis be patient, allowing the treatments and medications to work. Rabbits are easily stressed, and excessive handling should be avoided. It may take several days before any fecal pellets are seen, and it may take two weeks or more on intestinal motility agents and therapy before the intestine is moving normally again. We have had one case in which a rabbit produced no fecal pellets for 14 days, but finally did respond to gentle, consistent administration of the above treatment regimen. Patience and persistence are key!

Do not make more trips to the veterinarian's office with the rabbit than absolutely necessary (the stress of travel can slow recovery), but DO contact your veterinarian frequently to report on progress and any changes. Whenever possible, administer medications at home, where the rabbit feels safe and secure.

While you are treating your sick bunny, NEVER separate him/her from his/her bonded partner(s). The stress of separation itself can make the problem worse. We have known bunnies who seemed at death's door to recover when they were provided with the love and constant attention of their bonded mate. If your bunny does not have a mate, it is even more important that you, his best friend, show him a great deal of attention and affection during his ordeal. Rabbits seem to understand when they are being fussed over, and it may help them recover more quickly to know that they are not being abandoned in their misery.

Every bunny parent should have a stethoscope (not necessarily an expensive one) to monitor intestinal sounds. The gradual return of gentle gurgling is a very good sign: once this begins, the rabbit is on the road to recovery, even if fecal pellets don't begin pouring out the chute. Administration of intestinal motility agents, gentle massage and supportive care as listed above should be continued, and gradually tapered as fecal pellets slowly begin to come through the system.

Do not be alarmed if the first batch of fecal pellets are small, hard and misshapen. This is to be expected. Also do not be surprised if the rabbit produces a small bunch of pellets, nothing for a day, and then a bit more. The intestine sometimes seems to regain its function in fits and starts, rather than all at once. Consistent, gentle nursing and reduction of stress are essential at this time.

PLEASE RESIST THE TEMPTATION TO FORCE ADDITIONAL, AGGRESSIVE TREATMENT ONCE THE RABBIT BEGINS TO RECOVER. RECOVERY FROM GI STASIS IS SOMETIMES MADDENINGLY GRADUAL. We know of one instance in which a rabbit was starting to produce fecal pellets and showing signs of recovery, but the veterinarian overseeing the case insisted on anesthetizing the rabbit to perform oral gavage, enemas with an extension tube and vigorous abdominal massage. Despite our advice to the contrary, this veterinarian believed that the mass in the stomach could not possibly pass without such treatment. Tragically, this rabbit died. The autopsy revealed a ruptured liver. We cannot help but wonder whether excessive handling and the unnecessarily aggressive treatments contributed to, or even caused this rabbit's demise.

VI. Backtracking to the Cause

Once you and your bunny have defeated the GI stasis threat, it's time to look for the cause of the problem. Does your rabbit get insufficient fiber in her diet? Are you giving her too many starchy treats? Does she have an underlying infection or illness that's causing enough stress to shut down her intestine? Does she have overgrown molars or an abscessed tooth? (NOTE: It is wise to check this possibility at the first sign of any change in your rabbit's eating habits. If your bunny has overgrown molars, this alone can cause an unwillingness to eat certain items, or even result in complete anorexia.)

A rabbit's intestine often responds to stress by shutting down. Hence, GI stasis may be your first clue that something else is wrong. If the rabbit does not seem fully normal, even after the GI is moving well again, its time to do some blood work, radiographs (don't forget the head!) and other additional diagnostics as deemed necessary by your rabbit-experienced veterinarian.

During recovery from GI stasis, careful monitoring of body temperature

(use a plastic thermometer, which cannot break off in the rectum) will allow the caretaker to tell whether the rabbit is homeostatically stable. Normal rabbit body temperature ranges from about 101o - 103o F. A higher temperature may indicate either stress or an infection, the latter requiring immediate veterinary attention. A temperature lower than 101oF is actually of greater concern than a mildly elevated temperature. Abnormally low body temperature may indicate shock or septicemia, a bacterial infection that has entered the bloodstream. A rabbit with a temperature lower than 100o F should be considered an extreme emergency. Pack the rabbit with warm water bottles wrapped in towels and get to your *rabbit-savvy* veterinarian immediately!

DO NOT wait for an emergency to find a veterinarian who is experienced and good with rabbits. Unfortunately, many emergency clinics will not even see rabbits, let alone know how to properly care for one in acute

distress. A veterinarian who treats a rabbit as if s/he were a dog or cat can do more harm than good. Plan now and avoid heartache later!

VII. Prevention: The Best Medicine

The best cure for GI stasis, of course, is prevention. Be sure your rabbit companion gets plenty of dietary fiber from fresh grass hay. Feed high fiber (22% or higher crude fiber) pellets. Be sure your rabbit is drinking sufficient water to keep ingested food hydrated and moving smoothly. It helps to offer at least 4 cups of fresh, wet leafy greens per 5 lbs. of rabbit daily. And don't forget that regular exercise not only keeps the skeletal muscles strong: it also keeps the smooth muscles of the intestines well-toned and active.

Regular visits to your rabbit-experienced vet will ensure that your bunny pal doesn't develop health problems that go undetected. Once such a problem becomes serious, it may manifest itself as GI stasis. So here's to healthy peristalsis! May your home be blessed with great, healthy piles of gorgeous bunny poops. All in the litterbox, of course.

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This article is dedicated to Alex, who died because no one attending him recognized the symptoms of ileus before it was too late. Alex, I wish I had known then what I know now. But your life and untimely passing inspired this article, which I hope will save the lives of other rabbits.

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The treatments included herein are subject to constant revision as new information becomes available.