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Treating GI Stasis in the Herbivore Patient

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Gastrointestinal (GI) stasis, also known as functional or mechanical ileus, is a common complaint for many herbivores in exotic animal practices, such as rabbits, guinea pigs, and chinchillas. This should not be looked at as a disease but rather a symptom or complex of symptoms. Treatments vary depending on the cause, the determination to treat the patient as an inpatient versus outpatient, and clinician preference. Determining a cause for GI stasis can be tricky, and in many cases, a definitive cause is not identified. Common causes can include low-fiber diets, dental disease, pain, environmental stress, outflow obstruction, liver lobe torsion, neoplasia, and organ dysfunction or failure.

Diagnosis of this condition should involve both physical exam findings and appropriate diagnostics. Body temperature can be a vital tool in determining the severity and prognosis of an animal in stasis. A body temperature under 100.5 F can indicate hypothermia. A low body temperature has been proven to correlate with a statistically worse prognosis. It should be addressed quickly using reheatable discs, a hot water blanket, a Bair hugger, or a combination of these. Severe hypothermia, <97.9 F, or marked lethargy may require warm IV fluids rapidly rehydrate as well as help increase the body temperature. Radiographs can help rule out an outflow obstruction and allow evaluation of the lung field and cardiac silhouette. Sedation may be needed, based on the patient, and proper positioning should always be the goal. When stable, a CBC and chemistry panel should be evaluated. Published reference ranges, or lab reference ranges, should

be used to assess these values. Hepatic enzymes should be used to identify a potential torsion, and blood glucose, specifically hyperglycemia (>360mg/dL), can help determine prognosis.

Treatment should be tailored to the specific cause, but general supportive care such as hydration, pain management, and supplemental nutrition is often indicated. Lactated Ringer's solution can be given both subcutaneously or intravenously. The maintenance dose of 100mL/kg/day can be adjusted to correct dehydration. Analgesia is often indicated in cases of GI stasis due to the perceived discomfort of changes in GI motility. Buprenorphine can be used for mild to moderate pain, while hydromorphone is often used for more severe pain. Other drugs, such as fentanyl or lidocaine, should be considered based on presenting complaint. Meloxicam can be used as an adjunct to these drugs after ensuring adequate hydration and renal function. Supplemental nutrition is often required for patients that present with hyporexia for several hours or more. Several products provide a high fiber, syringe feeding formula, such as Oxbox Critical Care Herbivore and Emeraid IC Herbivore. Nasogastric tubes can be placed, but in the author's experience, these are rarely required. Antibiotics are not routinely required but may be used on a case-by-case basis, especially if the patient presents hypothermic. Oral medications may be slower to be absorbed due to decreased GI transit time. Subcutaneous or intravenous antibiotics should be considered when appropriate.

Based on presentation, additional treatments such as prokinetics, lubricants, and surfactants may also be indicated. Prokinetics such as metoclopramide and cisapride are often listed in textbooks and proceedings as a treatment for GI stasis. Despite that, there is very little evidence to support their use, and a recent study involving cisapride use in New Zealand white rabbits showed no change in GI motility in the treatment group. Doses are often extrapolated from small animal medicine. Radiographs should be used to rule out an outflow obstruction before use. Oil-based lubricants are not indicated for functional ileus but may be beneficial in cases involving mechanical ileus caused by a trichobezoar. This condition does not commonly occur in exotic companion mammals. Anti-foaming agents such as simethicone are used in large animal medicine to treat frothy bloat. This product is generally thought to be safe in these species, although a specific benefit has not been identified at this time.

Appropriate Antibiotic Use in Rabbits

Rabbits are classified as monogastric herbivores, as well as hindgut fermenters. They have a large GI tract that makes up 10 to 20% of the total body weight. The stomach and cecum are large organs that are easily palpated and can be identified on radiographs. Hindgut fermentation occurs in the cecum, and the end product is several volatile fatty acids used for energy. The indigenous microflora is not fully known, although anaerobes and facultative anaerobes make up the majority of the organisms. Disruption of this flora is known as dysbiosis. It can be caused by several things, including inappropriate antibiotic use, toxin exposure, or a diet chronically low in fiber. Dysbiosis can allow the overgrowth of potential pathogens in the GI tract, which is fatal.

Antibiotic use in rabbits can be indicated for several conditions. Respiratory pathogens such as *P. multocida* and *B. bronchiseptica* are commonly identified using aerobic bacterial cultures. Treatment should be based on culture results but often involves penicillin (SC or IM only), chloramphenicol, or fluoroquinolones. The culture may indicate penicillin (SC or IM only), chloramphenicol, or

fluoroquinolones based on the result. Dermatological conditions requiring antibiotic therapy may include abscesses, pyoderma, or pododermatitis. Periapical abscesses can often cause dental malocclusion. While not frequently treated with medical management alone, antibiotic use is beneficial in treating this condition. Penicillin (SC or IM only), chloramphenicol, metronidazole, and fluoroquinolones can be used, while topical treatments involving antibiotic-impregnated beads or topical povidone-iodine can also be considered. Topical treatments are often implemented after surgical debridement or extractions. Urinary tract disease can involve bacterial infection, cystic uroliths, or sterile cystitis. When indicated, commonly used antibiotics include trimethoprim-sulfamethoxazole and fluoroquinolones.

While all antibiotics carry a risk of GI side effects, these should be explicitly avoided: clindamycin, lincomycin, ampicillin, amoxicillin, amoxicillin-clavulanic acid, cephalosporins, erythromycin, and penicillin if given by mouth. If one of these drugs is given to a rabbit, treatment should be initiated early as possible. The main concern with using these antibiotics is destroying the normal GI flora rapidly after ingestion. The only treatment is supportive care, and despite intervention, many of these cases can still die. Affected animals should be admitted to the hospital to be monitored for changes in body temperature, activity, food intake, or a change in stool consistency. IV fluids should be started, regardless of hydration status. Cholestyramine may help to bind to certain antibiotics, and a high fiber nutritional supplement can help support the GI flora while the animal recovers. Analgesia, heat support, and probiotics can be administered when needed. The benefits of probiotics are still not known at this time.