GUINEA PIG AND CHINCHILLA BASICS

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Guinea pigs (Cavia porcellus) and chinchillas (Chinchilla laniger) are hystricomorph rodents, native to South America. Both species are popular pets, and the clinician must know normal characteristics of each prior to assessing what may be abnormal. These animals are similar in a number of respects but have some unique differences.

NATURAL HISTORY

Wild guinea pigs are currently found in several South American countries where they occupy grasslands, forest edges, swamps, and rocky terrain. Originally, the 3 recognized breeds of domestic guinea pigs were the American (English), which has short smooth hair; the Abyssinian, with short coarse hair arranged in whorls; and the Peruvian, which has long silky hair. However, other recently recognized breeds include the Teddy, which has short, dense, kinked hair; the Silkie (Sheltie), which is similar to the Peruvian but without hair on its face; the Texel, which has long hair in ringlets over its body; and 2 hairless breeds.

The native habitat of the chinchilla species seen in the pet trade is the Andean mountains stretching the length of South America, where these animals inhabit burrows and crevices in rocky, dry slopes at elevations of 10,000-16,000 feet above sea level. As the history well known to chinchilla enthusiasts goes, 13 chinchillas were transported from South America to California by a private individual in the 1920’s, and most chinchillas in the pet trade today are considered to be descendents of this original group. Chinchillas are now considered by some to be extinct in the wild, but others describe certain species in this group being rarely seen. Numerous color types have been developed in captivity.

BEHAVIOR

Guinea pigs and chinchillas become responsive pets if handled frequently when they are young. When frightened, guinea pigs tend to either freeze or bolt to escape. They have a broad range of vocalizations, which include a high-pitched “weep” emitted when the guinea pig is alarmed and a guttural “rumble,” which seems to have a variety of meanings. They are social animals but can pull hair or nibble ears of their cage mates if stressed. Guinea pigs tend to go off feed if stressed or uncomfortable, both of which can occur during hospitalization. Sick guinea pigs can acutely decompensate during clinical procedures, so these must be carefully prioritized. The goal for the practitioner while working on a diagnosis for an ill guinea pig should be to provide a quiet, stress-free environment, supportive care, and adequate nutrition.

Chinchillas are very gregarious as well. In stressful situations, they prefer to flee instead of turn and bite. When frightened, they can lose hair, a condition known as “fur-slip.” Handlers and clinicians should keep this in mind, and chinchillas should never be scuffed. Likewise, trying to capture a chinchilla by the tail is not recommended in order to avoid a degloving injury. Chinchillas are most active at dusk and night in the wild but can be very active during the day in captivity. They eat and produce most of their feces mainly at night.

ANATOMY AND PHYSIOLOGY

Male guinea pigs are generally larger than females, but the reverse is true with chinchillas. The lifespan for guinea pigs is 5-7 years, shorter than the average of 10 years reported for chinchillas. The oldest chinchilla the author has treated was 22 years old.

Guinea pigs have white teeth, but as with other rodents, iron deposition results in the normal yellow color of the chinchilla’s teeth. All teeth in the guinea pig and chinchilla are open-rooted (i.e., grow continuously), and each species has a diastema. The dental formula is the same for guinea pigs and chinchillas: 2(l 1/1 C 0/0 PM 1/1 M 3/3). Upper incisors grow faster than lower incisors. Overgrown maxillary cheek teeth grow toward the buccal surface, and mandibular ones grow toward the lingual surface. The mandibular premolars often tip substantially inward in guinea pigs, and overgrown teeth can grow across the tongue. The clinician should carefully examine the oral cavity in any anorexic guinea pig or chinchilla. This can be complicated by the very narrow oral cavity in these animals. A fibrous ridge in the caudal oral cavity of the chinchilla can obstruct visualization of the caudal molars and makes access difficult. Chinchillas are prone to overgrowth of premolar and molar roots, which present as painful bony swellings on the ventral mandible. One theory is that inadequate amounts of indigestible fiber in the diet allow for overgrowth of the premolar and molar crowns. The occlusal surface is subjected to increasing pressure as the teeth elongate but cannot erupt, and that pressure is transferred down to the roots.5 Maxillary roots can also overgrow and obstruct the nasolacrimal duct, resulting in constant epiphora. Guinea pigs and chinchillas both have a palatal ostium, which is a hole in the soft palate that connects the oropharynx with the rest of the pharynx. Care must be taken when any object is passed through the pharynx (e.g., an endotracheal or feeding tube), which can traumatize the soft palate on either side of the ostium.

Guinea pigs and chinchillas are hindgut fermenters with a large cecum, and both species practice ceotrophy. The guinea pig’s cecum contains approximately 44%-65% of the gastrointestinal contents, but the chinchilla’s cecum typically holds less. Middle-aged to geriatric guinea pigs, primarily boars, develop fecal impactions at the anus, presumably due to a loss of muscle tone. The guinea pig may strain periodically to push out a compacted mass of feces. The area can be evacuated periodically by gentle manual expression.

Guinea pigs have sebaceous glands on the caudal dorsum and around the anus, which are androgen dependent. Excessive greasy secretions from this gland can be cleaned with alcohol. Horny flaps of skin are common on the palmar aspect of the front feet and can be gently clipped if they are uncomfortable to the animal.

Male guinea pigs have prostate, vesicular, coagulating, and bulbourethral glands and an os penis. Vesicular glands (seminal vesicles) are long, blind-ended tubular structures. When performing castrations, the clinician should close the open inguinal rings to prevent these large glands from herniating through this site.

Female guinea pigs have a single cervix, and chinchillas have 2 cervices. The female chinchilla has a large urinary papilla, which some may confuse with a penis, and the vulva lies in a transverse position immediately caudal to the papilla. Puberty in guinea pigs occurs at the age of 2 months in females and 3 months in males, but both male and female chinchillas average 8 months of age at puberty (although the
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dystocia, and a cesarian section should be performed.
the first time when 7 months or older. These animals are at risk
symphysis in the guinea pig separates approximately 1.5 cm
2.5 cm at parturition. The
at 2 days prior to parturition and
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fully furred, able to stand, and with their eyes open. Guinea
pups have a poor prognosis for survival if they do not
receive sow's milk for the first 3-4 days of life. Newborn
guinea pigs and chinchillas need to be handfed for a
minimum of 7 days if the sow has died or is incapable of
nursing and if no other lactating conspecific is available.
A handfeeding formula can be made by mixing evaporated
milk with water in a 1:1 ratio. Guinea pig and chinchilla
young begin to nibble solid food at 2 and 7 days,
respectively.

Guinea pigs normally pass an alkaline urine that is thick
and cloudy white or yellow. The urine may normally contain
many crystals. They have large adrenal glands, which can
be considered pathologic if the clinician is not aware of
normal anatomic characteristics.

ENVIRONMENTAL CONSIDERATIONS

Guinea pigs and chinchillas are susceptible to
hyperthermia, and they do best in a dry environment with a
temperature in the range of 65°-79°F (18°-26°C) and 50°-
68°F (10°-20°C), respectively. Healthy guinea pigs produce
large amounts of feces that can accumulate anywhere in their
environment, including water and food dishes. Therefore,
water bottles are preferable to bowls, and water should be
d changed daily. Guinea pigs tend to retain masticated ingesta
in the oral cavity, which can pass into the sipper tube of
bottles, so the tube should be tested frequently for patency.
Caging needs to be designed to provide optimal ventilation
while protecting the guinea pig’s delicate feet. Aquarium
tanks are not recommended, because ammonia levels from
urine can build up, and all-wire cages may traumatize the
animal’s footpads. The author prefers a cage with a solid
plastic bottom and a removable wire top. Guinea pigs do not
jump high or climb, so the top does not need to be enclosed if
the sides are at least 10” high. Guinea pigs and chinchillas
should always be offered a hiding spot, which may be a box
for guinea pigs or a PVC tube, clay pipe, or box for
chinchillas. As a bedding substrate, the author recommends
recycled shredded or pelleted paper pellets that have low
dust content. Hay used for feeding can be provided for
bedding as well. Guinea pigs should be provided with ample
floor space in the cage and should frequently be allowed
access to an even larger area for exercise.

Chinchillas have long hind limbs and feet designed for
leaping, so housing needs to be designed accordingly. In
general, caging space needs to be larger than that for guinea
pigs in order to provide space for jumping and other chinchilla
acrobatics, and animals should have access to several
levels. Chinchillas love a large open space where they can
leap off the walls! Access to a dust bath should be provided
daily for optimal fur condition. Commercial chinchilla dust (or
silver sand and Fuller’s earth mixed in a 9:1 ratio) is added to
a plastic dishpan to a depth of 2.3 cm in which the chinchillas
rolls and fluffs its fur. The bath may last up to an hour; longer
periods of bathing may predispose to conjunctivitis.

NUTRITION

Both guinea pigs and chinchillas require large amounts of
fiber in their diets, but the percentage fiber recommended for
chinchillas in particular is as high as 15%-35%. Chinchillas
differ from rabbits and guinea pigs in that their GI transit time
is not slowed by reducing the dietary fiber level. The
recommended diet in captivity for both guinea pigs and
chinchillas is large amounts of grass hay plus smaller
amounts of vegetables. This can be supplemented with
commercial guinea pig or chinchilla pellets, respectively.
Chinchillas often hold food with their forepaws, and pellets
manufactured for chinchillas are longer than other pellets so
they can be held easily. With guinea pigs, Fruits can be
offered in very small quantities as treats to guinea pigs, but
foods high in carbohydrates (e.g., cereals, grains) should be
avoided. Chinchillas can be offered up to 1 teaspoon of
“treat” foods daily, which can include grains, dried fruits, nuts,
and seeds.

Guinea pigs require exogenous vitamin C, because they
are unable to produce L-gulono-gamma-lactone oxidase, the
enzyme that converts glucose to ascorbic acid. Although
commercial guinea pig pellets are supplemented with vitamin
C during the manufacturing process, the vitamin is labile and
has a relatively short shelf life. Therefore, the pellets should
not be relied upon as the sole source of vitamin C. Vitamin C
is labile in water, and intake cannot be quantified when it is
supplied in the drinking water. The author recommends
60 mg vitamin C daily for adult guinea pigs, preferably in the
form of fresh produce, such as red and green peppers, leafy
greens, broccoli, oranges, or kiwis. Alternatively, palatable
oral vitamin C supplements can be used. High quantities of
vitamin C have been linked to the exacerbation of arthritis
and possibly the development of certain types of urinary
calculi.

CLINICAL TECHNIQUES

Restraint

Textured cage paper, a rubber mat, or a towel is placed on
the exam table to provide a warm surface with some traction.
Guinea pigs and chinchillas can be held by supporting the
rear with one hand and encircling the thorax with the other
hand. On a flat surface, the cranial hand can be held over
the animal's dorsum. Chinchillas, in particular, resist
restraint, and the author often ends up placing a hand
dorsally over the animal's shoulders and holding the head
between the index and second fingers. The other hand can
be used to examine the animal while it is allowed to move on
the table surface.
Blood Collection
Venipuncture can be challenging in guinea pigs and chinchillas. The saphenous or cephalic veins may be accessible for collection of very small volumes of blood, but they collapse easily. A 28-gauge needle on an insulin syringe is usually required at these sites. Larger volumes of blood can be collected from the jugular vein or the vena cava. This is generally too stressful for the awake animal, so isoflurane or sevoflurane anesthesia is recommended. A 25-gauge needle is used on a tuberculin or 3-ml syringe. Shaving the fur over the jugular vein often facilitates access, and the approach is the same as for a cat. To collect blood from the vena cava via the sternal notch, place the animal in dorsal recumbency with the forelimbs extended caudally and separated by 2 fingers. The needle enters at the depression between the manubrium and the first rib and is directed at approximately a 30° angle to the skin and toward the caudal rib of the opposite side. Guinea pigs and chinchillas have very small chests, so the needle entry should be kept as shallow as possible to avoid trauma to the heart. The blood volume that can safely be collected from most nonanemic guinea pigs and chinchillas is 7 ml/kg.

Hematology and serum biochemistry reference ranges for guinea pigs and chinchillas are available in the references.3,5,7

Cystocentesis
Cystocentesis can be performed in guinea pigs and chinchillas as it is in other animals. The author prefers to anesthetize the animal to perform this procedure due to the possibility of lacerating the very thin-walled bladder if the animals struggles. The normal pH of guinea pig and chinchilla urine is 8.5-9, and the specific gravity may be greater than 1.045 at least in part due to the presence of crystals.

Intravenous Catheters
Small (24-ga or smaller) peripheral catheters can be placed in either the cephalic or saphenous veins. A tourniquet applied to the shaved area as well as application of a warm compress may help to visualize the vein. Jugular veins usually require a cutdown for placement. Venous access ports can be placed if venous access is needed for long-term therapy.6 Injection pumps should be used when administering intravenous fluids to achieve accurate dosing.

Administration of Fluids and Medication
Fluids are usually administered subcutaneously over the dorsum. Daily fluid requirements for both guinea pigs and chinchillas are estimated to be 100 ml/kg, and the author prefers to divide that into complements administered every 8 hours with a butterfly catheter. Intramuscular injections are given in the quadriceps muscle, but the epaxial muscles can also be used. Oral medications should be given as liquids or crushed and mixed into a soft palatable food such as vegetable baby food. Chinchillas may eat medications hidden in raisins. The diastema on either side of the mouth facilitates administration using a small oral dosing syringe.

Support Feeding
Anorexic small mammals are at risk of developing hepatic lipidosis quickly; this is especially true with guinea pigs. No matter what the primary cause of the anorexia, these animals need to be syringe fed at least 2-3 times daily with a formulated gruel, crushed soaked pellets, pureed vegetables, baby food, or a combination of the above.

Antibiotic Use
Guinea pigs are particularly susceptible to antibiotic-induced enterotoxemia, but this can occur with chinchillas as well. Antibiotics reported to be associated with this syndrome should be avoided; these include ampicillin, bacitracin, cephalosporins, clindamycin, erythromycin, gentamicin, lincomycin, penicillins, and tetracyclines.

REFERENCES