



STANDARD OPERATING PROCEDURE 1000 COMMON RODENT TREATMENTS

1. PURPOSE

This Standard Operating Procedure (SOP) describes common treatments used in the Rodent Veterinary Care Program. It provides a support tool for the principal investigator (PI) and their research staff when treating the most frequent rodent medical conditions.

2. RESPONSIBILITY

Principal investigator (PI) and their research staff.

3. GENERAL CONSIDERATION

- 3.1 Veterinarian's approval **must** be given before establishing any treatment plan given.
 - 3.1.1 Standard treatments can be pre-approved by the Veterinarian.
 - 3.1.2 If a treatment is not available or emergency euthanasia is required, the PI staff must be notified before commencing treatment or euthanasia by the animal care staff.
- 3.2 Each medical case can be subject to individual differences. This SOP should not replace the veterinarian evaluation and should only be used as a general overview of the most common treatments. All medical conditions that differ from the ones described below or fail to improve after treatment should be discussed with the Veterinarian.
- 3.3 Constantly evaluate the possible pain that can accompany the clinical condition. Refer to Rodent Analgesia SOP for Pain Grimace Scale.
- 3.4 In cases where the PI or their research staff disagrees with the Veterinarian, the Veterinarian has the authority and the responsibility to make determinations concerning animal wellbeing. This includes removing an animal from a study, test, or teaching activity and using appropriate treatment or control measures, including euthanasia if indicated, following an animal disease or injury diagnosis.

4. FREQUENT RODENT MEDICAL CONDITIONS AND TREATMENTS

Diagnosis	Clinical Signs	Treatment	Clinical Endpoint
Abdominal Distention	Marked abdominal distension present in an animal that is not pregnant.	Monitor the animal twice weekly if it is doing poorly with no other clinical signs.	If the animal shows any signs of distress (lethargy, hunched, weight loss, Body Condition Score (BCS) < 2, dehydration), if an abdominal mass is palpable, euthanasia is recommended.
Conjunctivitis	Closed or partially closed eyelid(s), the ocular or the periocular tissues redness, and the presence of ocular discharge.	<ul style="list-style-type: none"> • Cut the front and hind nails 1x week. • The affected eye can be treated with antibiotic ophthalmic ointment once a day for 5-7 days. • If there is no improvement after a week, daily treatment can be changed to an antibiotic ophthalmic ointment containing a corticosteroid for 5-7 days. • For strains with chronic conjunctivitis, consider not treating it. 	If corneal ulceration is present, enucleation or euthanasia is recommended.
Dehydration	Animals are often less active and hunched and will have a persistent skin fold lasting > 2 seconds.	<ul style="list-style-type: none"> • Verify that the water bottle has water. • Administer saline subcutaneously. • Provide wet food daily. • Monitor the animal daily until the condition has resolved. 	If the animal does not improve despite treatment, BCS < 2, or shows signs of lethargy, euthanasia is recommended.
Dystocia	Usually, the pups are delivered every 30 minutes. If retained pups are present and no pups have been born within 1 hour, the animal is in dystocia. The animal will usually be hunched and in poor general condition.	<ul style="list-style-type: none"> • If pups are more valuable than females, the female can be euthanized for a cesarean section, and another available lactating female can foster pups. Note that in most cases, pup survival is poor. • Systemic antibiotics can be administered if the female is in good condition following dystocia but still has retained pups. • If the female recovers and no more retained pups are palpable, the female can be bred again in 3-4 weeks. 	If the animal is hunched and weak and has been in dystocia for an unknown amount of time, euthanasia is recommended.
Ear Tag Ulceration	The presence of an ear tag causes skin ulceration on the ear.	<ul style="list-style-type: none"> • Cut nails of hind paws • Consider removing the tag with hemostatic forceps or pliers, if possible. • If not possible, apply 1-2 drops of a local anesthetic around the ear tag and wait a few minutes. • Incise the ear as little as possible to remove the ear tag. • Clean with disinfectant solution, e.g., chlorhexidine 0.2%. • Consider administering systemic anti-inflammatories to help reduce the associated inflammation and pain. • Monitor a few days later to evaluate the progression of the condition 	

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Fighting Lesions	Seen primarily in male mice. Usually, fighting wounds are seen on the rump, base of the tail, tail, penis, and sometimes on the limbs.	Minor: <ul style="list-style-type: none"> • If new lesions are seen, separate the dominant animal. • Treat wounds with antibiotic ointment. • Add extra environmental enrichment, extra hut, extra nesting materials, etc.) • Monitor for the next few days for new lesions. • Once lesions are dry and healing, monitor them as needed until wounds have completely healed. 	
		Severe: <ul style="list-style-type: none"> • Separate dominant animal if easily identifiable (animal with no wounds). • Treat wounds with disinfectant, e.g., chlorhexidine 0.2%, and antibiotic ointment • Consider administering systemic anti-inflammatories to help reduce the associated inflammation and pain. • Add environmental enrichment, extra hut, and extra nesting materials Monitor for new lesions for the next few days and readminister analgesia as needed. Once lesions are dry and healing, monitor them as needed until wounds have completely healed.	If wounds have exposed the muscle or have penetrated a body cavity or if there is severe hemorrhage, infection, lameness, loss of limb function, severe lesions to the penis, and enlarged bladder, euthanasia is recommended.
Flooded Cage	Animals are wet from a leaky water bottle.	<ul style="list-style-type: none"> • Place animals into a clean, dry cage, providing extra nesting material and environmental enrichment. • Assess the animal's general condition (hypothermia, hydration, mobility, etc.) • If animals are wet or dirty from the flood, clean them with sterile water, sterile paper towels, and soap. • Place half the cage on a heating pad or under a heat lamp • Monitor for a few hours • Recheck the next day 	If animals are dehydrated, weak, and hypothermic, euthanasia is recommended.
Head Tilt	The Head is tilted to one side. If severe, the animal can spin in circles in the cage or when picked up by the tail.	<ul style="list-style-type: none"> • If regular, check body weight or BCS, and monitor the animal's progression and general condition. • Wet food or dry food pellets in the cage can be provided. • Consider administering systemic antibiotics and analgesics. 	If the animal is spinning and the expected behavior is compromised, euthanasia is recommended.

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Hydrocephaly	Dome-shaped Head with possible ataxia and lethargy. Usually with abnormal growth and development (runt)	<ul style="list-style-type: none"> This condition cannot be treated, resulting in rapid decline and death. Change the parental breeders. 	In all cases, prompt euthanasia is recommended.
Malocclusion	Misaligned incisor teeth that do not wear down normally and overgrow.	<ul style="list-style-type: none"> Do not breed; change the parental breeders. Treatment: Cut teeth weekly or bi-monthly Give wet food daily until BCS = 3 and saline subcutaneously if needed. 	If teeth have penetrated soft tissues and BCS < 2, euthanasia is recommended.
Mass	Mass on various parts of the body. It can be spontaneous, strain-related or induced experimentally.	<ul style="list-style-type: none"> Assess the animal's general condition: (hydration, mobility, etc.) Measure mass with a caliper Inspect mass for ulceration, infection, and necrosis. Monitor tumor size regularly (2x/week). 	If the mass is ulcerated, infected, necrotic, or impairs normal functions (eating, moving), or if the mass exceeds guidelines, euthanasia is recommended. Refer to SOP Tumor Volume Chart for mass dimensions
Microphthalmia or Anophthalmia	An animal with a missing eye or an eye smaller than normal can be unilateral or bilateral.	<ul style="list-style-type: none"> This is a congenital condition related to some strains, e.g., C57BL/6. Treatment is not necessary. Replace the parental breeders. Do not breed the affected animal 	
Ocular Opacity	White, opaque spot on the eye (corneal opacity) or in the eye (lens opacity or cataracts).	<ul style="list-style-type: none"> If the eye/eyelids are not swollen and there is no discharge, monitor 1x/a month for conjunctivitis, skin ulcerations around the affected eye, or corneal ulcerations. 	If corneal ulceration is present, euthanasia or enucleation is recommended.
Pododermatitis	The animal's hind paws are red, swollen, and ulcerated. The treatment will only decrease the rate of pododermatitis progression.	<p>When the condition has just started, and the paw is not ulcerated:</p> <ul style="list-style-type: none"> Change the bedding 2x a week Apply a protective balm to lesions daily Consider administering systemic anti-inflammatories to help reduce the associated inflammation and pain. 	When the lesion(s) progresses to ulceration and bleeding, euthanasia is recommended.

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Preputial gland swelling or abscess	<p>Preputial glands are accessory glands of the reproductive system of the male mouse and play a role in reproduction and dominance behavior</p> <p>Inflammation and infection of these glands can lead to abscess formation.</p>	<ul style="list-style-type: none"> • If the abscess is small, monitor 1x/a week. It may remain small after lancing (fibrosis/scartissue). • If the abscess is mature and ready to be lanced: <ul style="list-style-type: none"> • Clean the area with disinfectant (chlorhexidine 0.2%) • Pierce the abscess with a needle (18-21G) and extract as much exudate as possible • Flush the abscess pocket and surrounding area with disinfectant (chlorhexidine 0.2%) • If possible, fill the abscess pocket with triple antibiotic ophthalmic ointment using a 1ml syringe 	
Prolapsed penis	<p>Swelling and redness of the prepuce (balanoposthitis) and prolapse of the penis (paraphimosis). The exteriorized penis will be red and swollen.</p> <p>Usually, as a consequence of bite wounds.</p>	<ul style="list-style-type: none"> • Examine the area for preputial gland abscesses, bite wounds, and entrapped debris in prepuce. • Palpate the abdomen daily to make sure the animal can urinate. • Administer systemic anti-inflammatories to help reduce the associated inflammation and pain. • Do not breed • Separate from other males 	<p>Animals unable to urinate with enlarged bladder should be euthanized</p>
Rectal Prolapse	<p>The distal portion of the rectum is prolapsed exterior to the body presenting as a small red mass at the anus. The rectal tissue may bleed or become dry and necrotic.</p>	<ul style="list-style-type: none"> • Monitor for signs of lesions and tissue necrosis. • 	<p>If the prolapse is over 3mm, bleeding, and necrotic, euthanasia is recommended.</p>
Sebaceous abscess		<ul style="list-style-type: none"> • If the cyst is small, monitor it. • If the cyst is mature and ready to be lanced: <ul style="list-style-type: none"> • Clean the area with disinfectant (chlorhexidine 0.2%). • Pierce the abscess with a needle (18-21G) and extract as much exudate as possible. • Flush the abscess pocket and surrounding area with disinfectant (chlorhexidine 0.2%). • If possible, fill the abscess pocket with antibiotic ophthalmic ointment using a 1ml syringe 	<p>If the animal shows signs of debilitation – recumbency, lethargy, hypothermia, BSC < 2 ' euthanize it.</p>
Seizures	<p>Often induced by a cage or animal manipulation. The animals can freeze, fall over, and lie on their sides while paddling their legs.</p>	<ul style="list-style-type: none"> • Handle with care and as little as possible • Place cages in low-traffic areas in the room. • Monitor the general health and BCS of the animal (1x/week or as needed) 	<p>If the animal's general condition is deteriorating, euthanasia is recommended.</p>

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Skin Ulceration	Flaky, bloody skin lesions typically start around the ears and between the shoulder blades.	<ul style="list-style-type: none"> Apply antibiotic ointment (as needed) Monitor 2x / week for scarring, BSC, and ambulation. <p>If skin ulceration is on the underside of the neck or the face, the lesions usually do not heal as well:</p> <ul style="list-style-type: none"> If the lesion is moist, apply topical analgesic and antibiotics 3*daily (as long as needed) Monitor daily until the condition resolves 	If the lesion is not improving or worsening, or if the lesion is covering a substantial portion of the animal's body, euthanasia is recommended.
Small pups or runt	Small litter compared to age-matched animals of the same strain or one animal smaller than littermates (runt).	<ul style="list-style-type: none"> Assess the general condition of the animal(s): malocclusion, hydrocephaly, dehydration, etc. Assess the general condition of the mother If otherwise active with no other observable conditions and if no other litter is present in the cage, keep the animal(s) with the mother until body weight is adequate for weaning (8-10g in mice, 40-50g in rats). If animals are weaned, put food pellets on the cage bottom and a long sipper tube for the bottle. Monitor progression 2x/week 	If poor general condition (weak, dehydrated), recommend euthanasia.
Thin	BSC<2	<ul style="list-style-type: none"> Assess the animal's general condition: (BCS, presence of masses, malocclusion, hydration, mobility). Monitor animal 2x/week or more if needed Measure the body weight to evaluate additional weight gain/loss objectively 	If the animal is severely debilitated, has a BCS < 2, and weight loss >20% of the original weight, euthanasia is recommended.
Vaginal Prolapse	The vaginal or uterine mucosa wall protrudes from the vaginal area. The tissue may bleed or become dry and necrotic.	<ul style="list-style-type: none"> Small prolapses < 5mm may be treated with antibiotic ointment with corticosteroid for 2- 3 days. The mucosa can be reduced manually with a probe. Administering systemic anti-inflammatories to help reduce the associated inflammation and pain. If unable to reduce, monitor for signs of tissue necrosis. The prolapse can also be surgically removed to allow the female to complete lactation, and the animal cannot be bred again. 	If the prolapse is significant, bleeding, and necrotic, euthanasia is recommended.

5. RODENT DRUG FORMULARY

5.1 For more information, please refer to other SOPs (Rodent Analgesia, Rodent Anesthesia).

LOCAL ANESTHETICS	DOSE (mg/kg)		ROUTE	FREQUENCY
	MOUSE	RAT		
Lidocaine 2%	apply with an applicator	Apply with an applicator	Topical	TID
Localine 1%	1 drop dilution of 1:10	1 drop	Topical (ocular)	TID

ANTIBIOTICS	DOSE (mg/kg)		ROUTE	FREQUENCY
	MOUSE	RAT		
Enrofloxacin 50 mg/ml	50	10	SC	BID
Enrofloxacin 100mg/mL ³	0.25mg/mL H ₂ O	0.05mg/mL H ₂ O	Oral in drinking water	Replace every 4 days
Trimethoprim 8mg /Sulfamethoxazole 40mg ⁴	1mL/250mL H ₂ O	1mL/500mL H ₂ O	Oral in-drinking water	Replace every 4 days
Antibiotic ophthalmic ointment	1 dab (1mm)	1 dab (1mm)	Topical (e.g., ocular)	TID
Antibiotic & corticosteroid ophthalmic ointment	1 dab (1mm)	1 dab (1mm)	Topical (e.g., ocular)	TID

Abbreviations:

SC = subcutaneous, IM = intramuscular, IP = intraperitoneal, IC=intracardiac q= every, SID= every 24 hours, BID= every 12 hours, TID= every 8 hours.

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Approved by the BGU Animal Policy and Welfare Oversight Committee