

University Animal Care Committee Standard Operating Procedure		
<b>Document No:</b> 7.34	<b>Subject:</b> Treatment Protocol for Sick Mice	
<b>Date Issued:</b> November 27 <sup>th</sup> , 2024	<b>Revision:</b> Original	<b>Page No:</b> 1

**Location:** Queen's University

**Responsibility:** Principal Investigators, Research Staff, Veterinary Staff

**Purpose:** The purpose of this Standard Operating Procedure (SOP) is to describe the basic treatment protocols for sick mice. The standardization of treatment protocols will assist Veterinary staff in providing consistent care of sick mice and will assist researchers in understanding how and when their mice are being treated.

## 1. Introduction and Definitions:

**Abbreviations:** Animal Care Services **ACS**, Principal Investigator **PI**, subcutaneous **SC**, intravenous **IV**, intraperitoneal **IP**, intramuscular **IM**, per os **PO**, per rectum **PR**

## 2. Procedures:

### 1.0 General

- 1.1. All treatment protocols are to be developed in consultation with the veterinarian.
- 1.2. Animal care attendants will follow the workflow processes described in SOP 14.3 Clinical Health Reports in Rodents
- 1.3. Treatments are initiated by Animal Care Staff. Research personnel will be notified of the treatment plan.

### 2.0 Physical Exam

- 2.1. All sick mice should receive a physical exam, including an evaluation of eating, drinking, urination and defecation.
  - 2.2. Before removing the cage from the rack observe the mouse gait and activity level. Observe the respiration at cage level before handling.
  - 2.3. Check cage card for procedural information. If pain is suspected, the Mouse Grimace Scale (Appendix 2) can be used as an aid to determine the presence of pain.
  - 2.4. Check mucous membranes colour, teeth (are they wearing well? is there a malocclusion?)
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and look for and evaluate any lesions.

2.5. Check the hydration status by using the skin turgor.

2.6. Be sure to note the body condition (see SOP's 7.2 Humane Interventions in Mice or 10.2 Humane Interventions in Rats for scoring chart).

2.7. Palpate the abdomen and mammary area and check bladder function.

2.8. Check the skin for lesions/abscesses/tumours.

2.9. Observe perineal area for wetness or staining.

2.10. Check the eyes for any abnormalities.

### 3.0 Record Keeping

3.1. All exam findings, treatments and observations must be documented on the rodent health report as per SOP 14.3 Clinical Health Reports in Rodents.

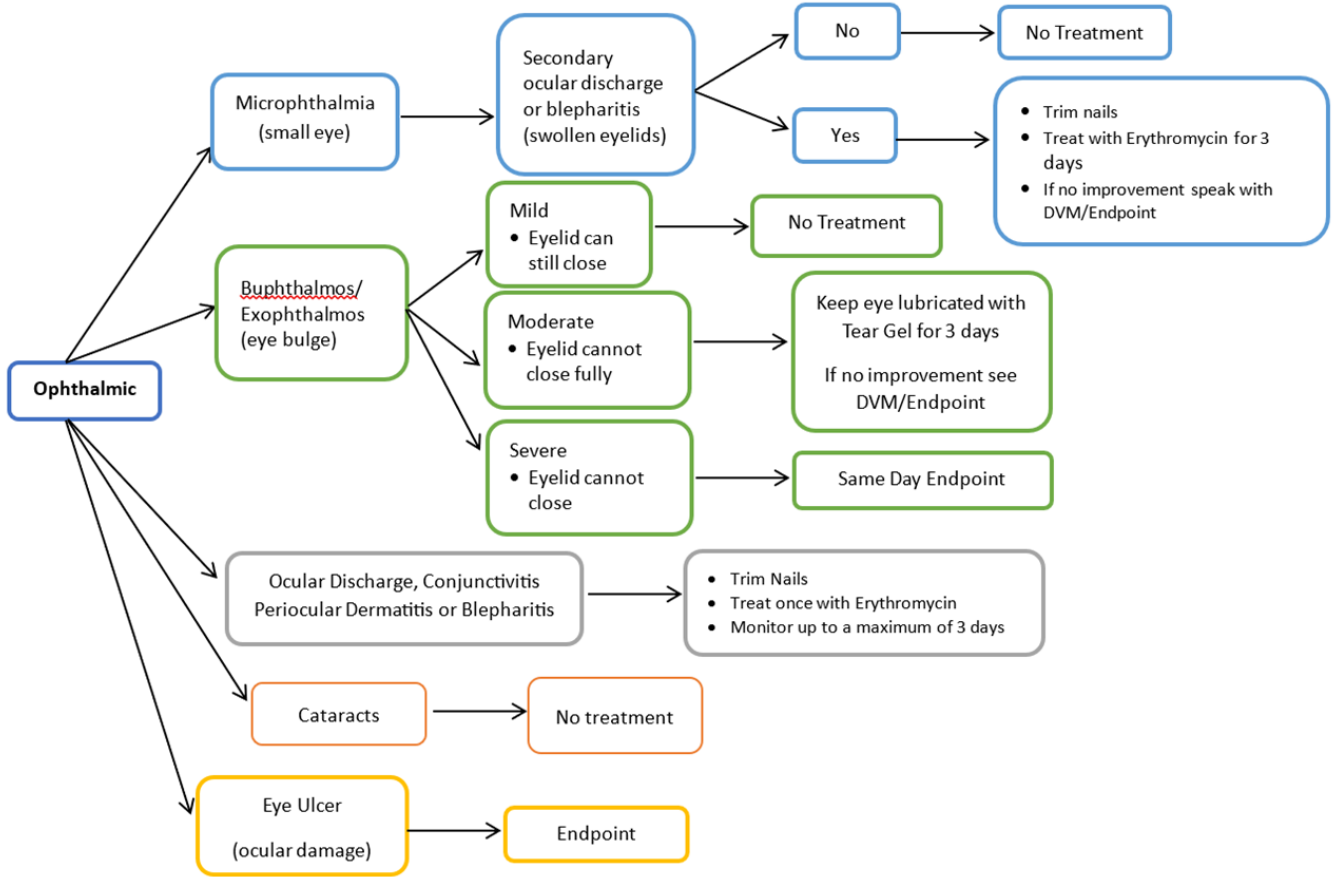
### 4.0 Treatment Protocols

4.1. Upon completion of the physical exam, refer to the standardized treatment algorithms (Appendix 1) for specific instruction pertaining to health concerns in the following categories:

1. Ophthalmic
  2. Gastrointestinal
  3. Respiratory
  4. Abscesses
  5. Musculoskeletal
  6. Neurological
  7. Reproductive
  8. Dystocia
  9. Dermatologic Lesions
  10. Ulcerative Dermatitis
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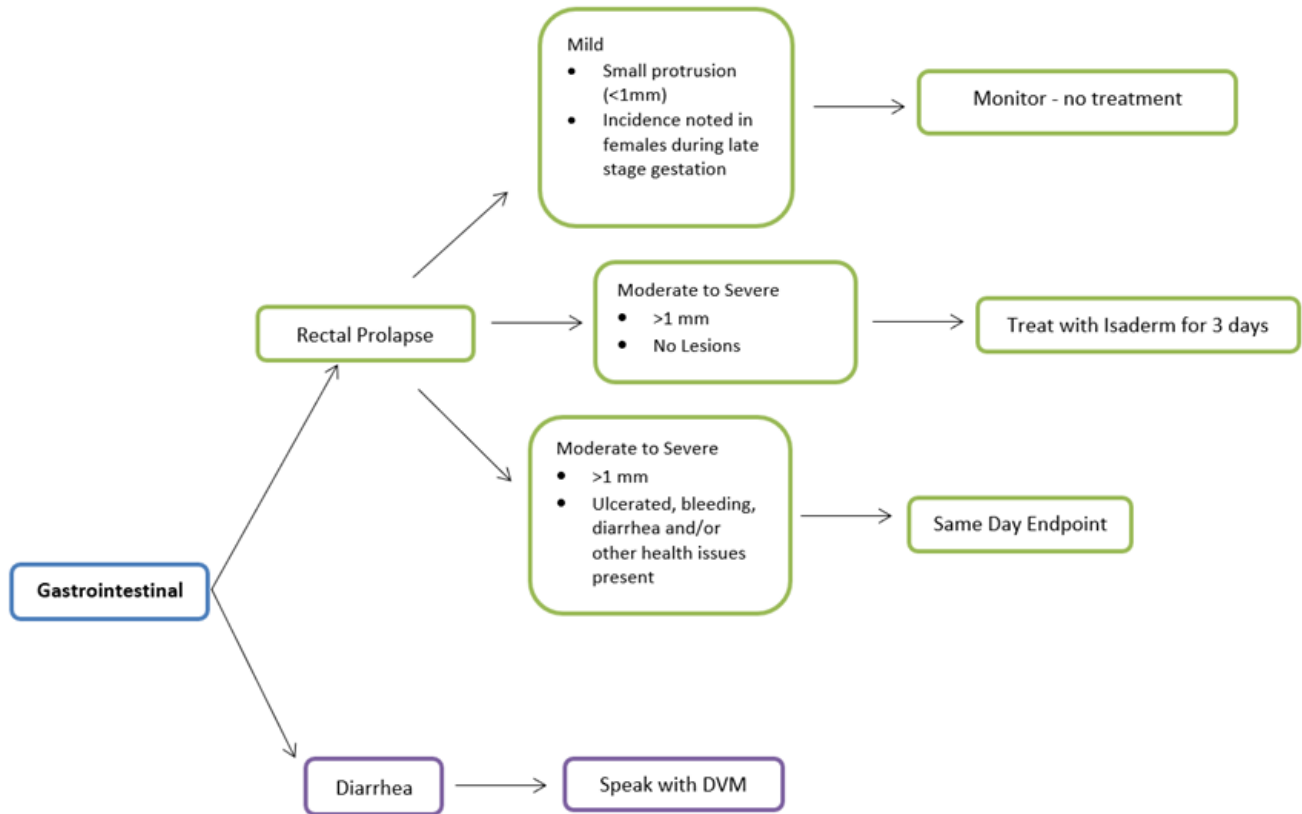
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**APPENDIX 1:**  
**Ophthalmic:**



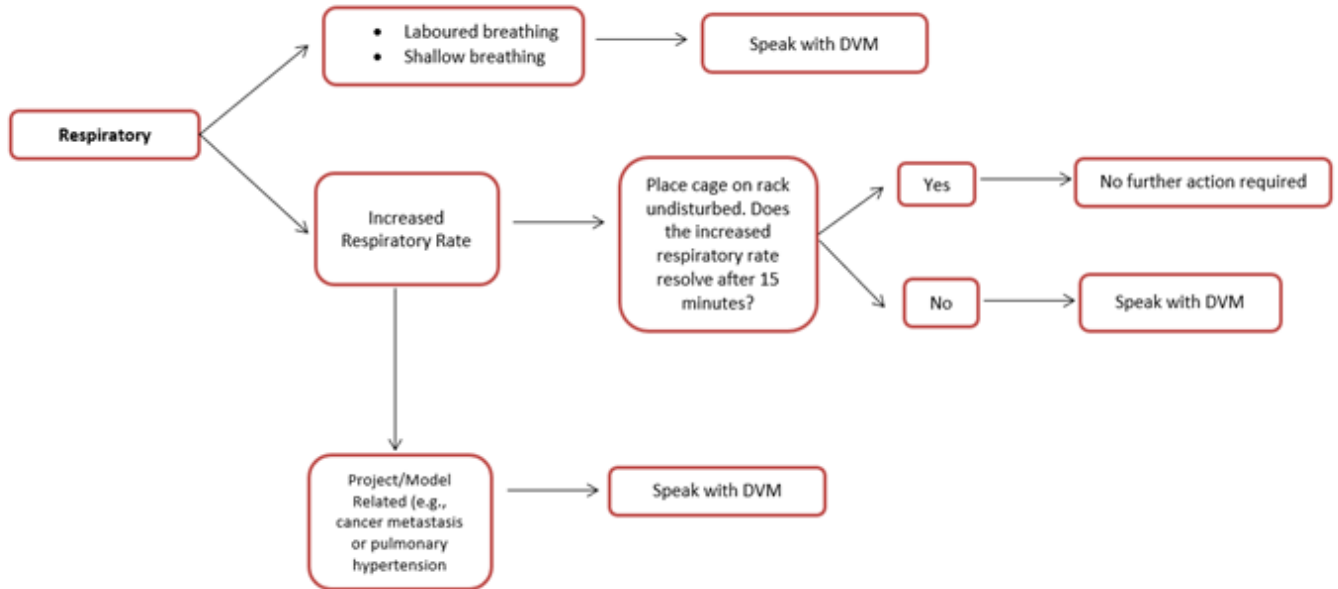
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**Gastrointestinal:**

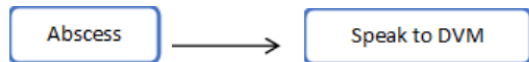


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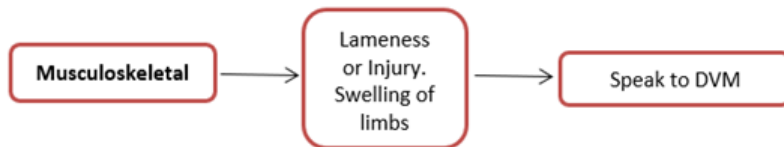
**Respiratory:**



**Abscesses:**

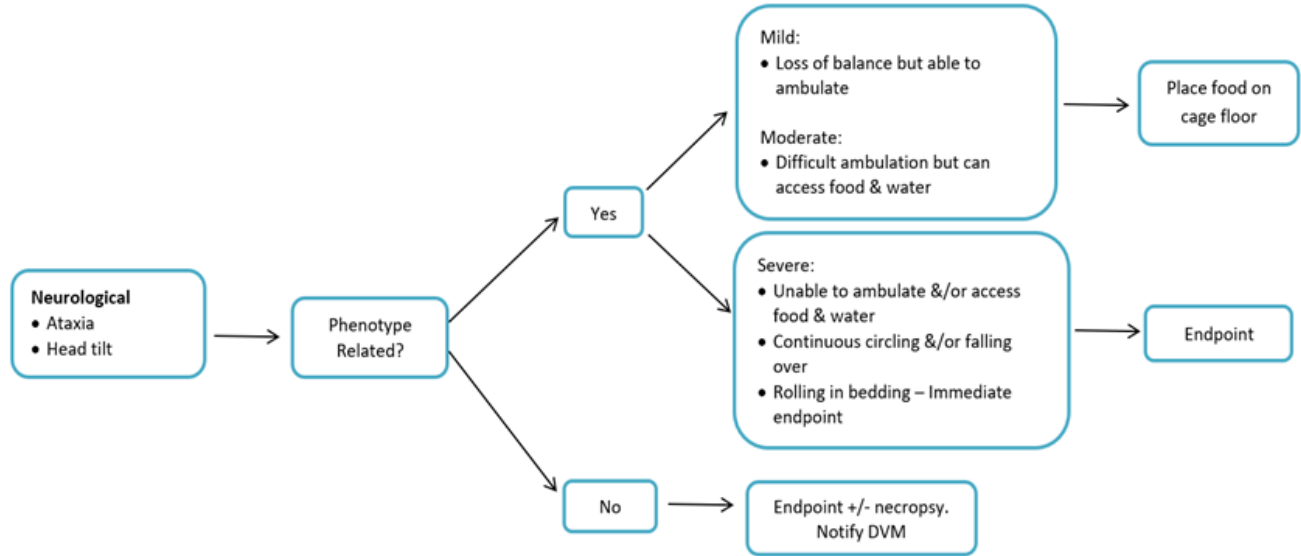


**Musculoskeletal:**

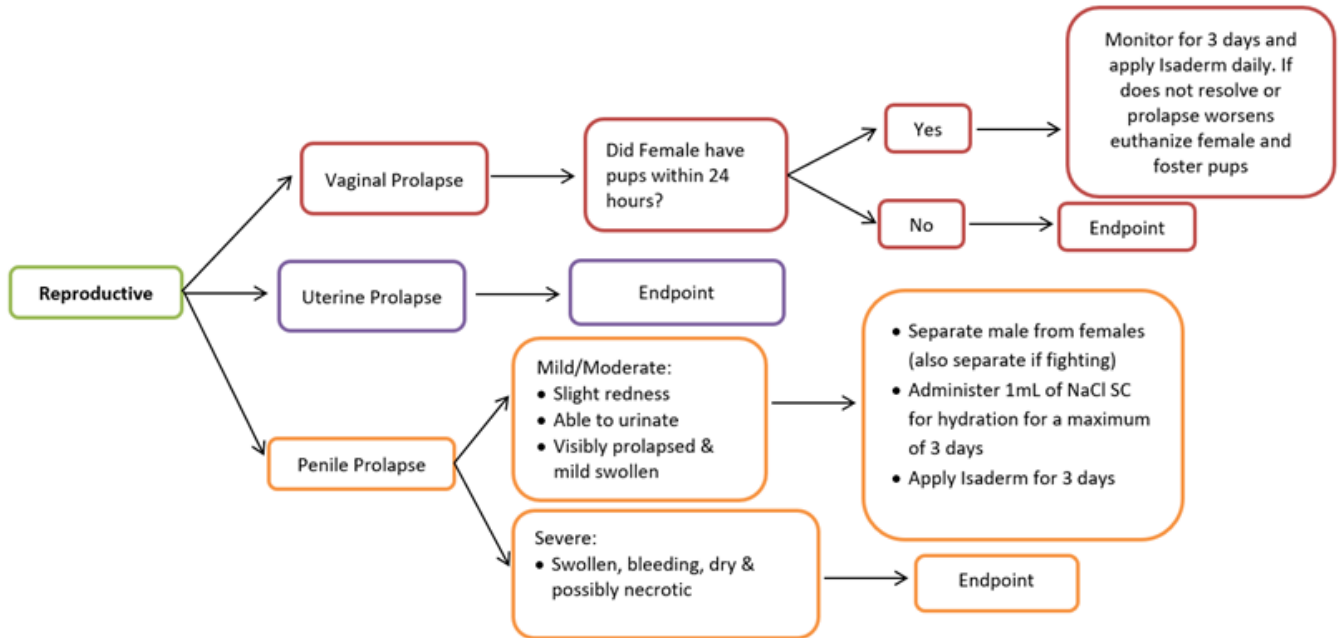


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**Neurological:**

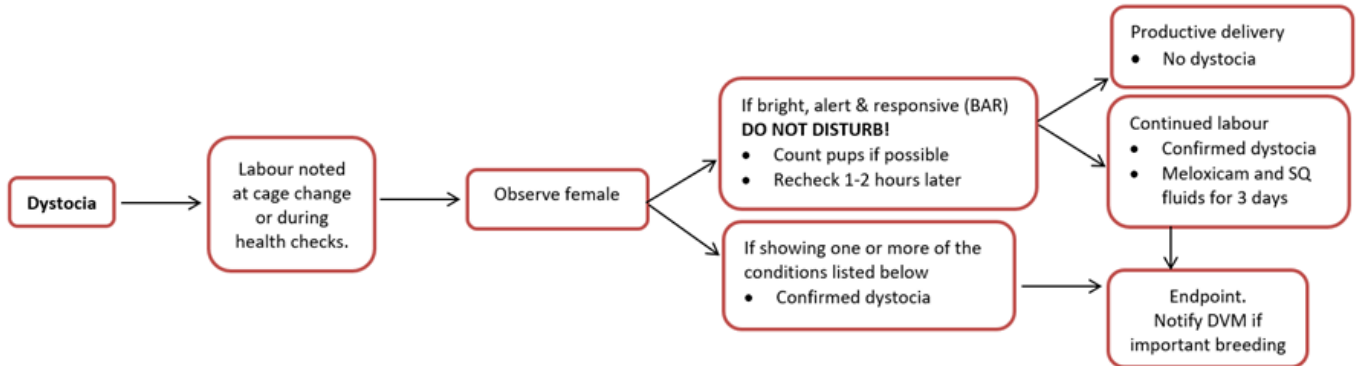


**Reproductive:**



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## Dystocia:

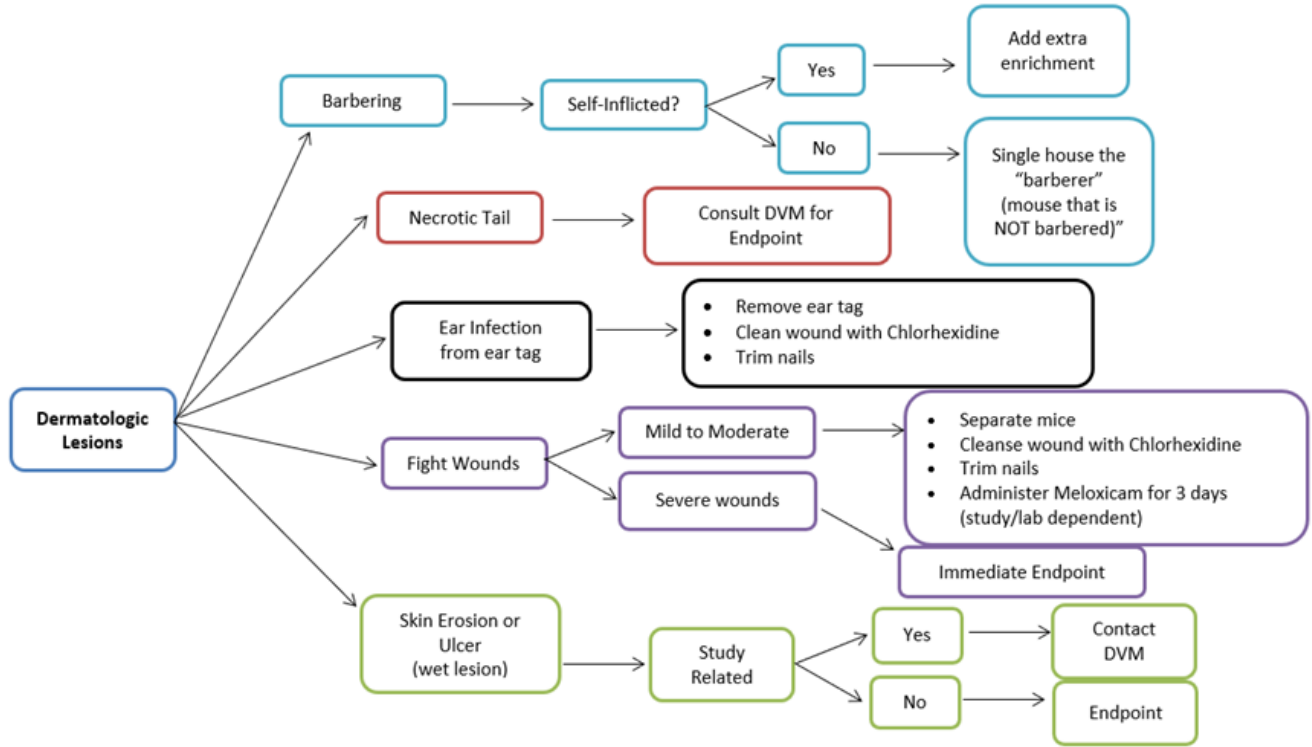


### Dystocia is diagnosed when one or more of the following are noted:

1. Extended labour (lasting more than 2 hours)
2. Active labour that does not result in another pup within 1 hour
3. Abnormal vaginal discharge; excessive blood; blood when pups are not actively being passed
4. Pup actively lodged in the vaginal opening
5. Obvious pain: see the Mouse Grimace Scale (Appendix 2)
6. Immobility of female
7. Dehydration of female
8. Distension of abdomen with little muscle tone

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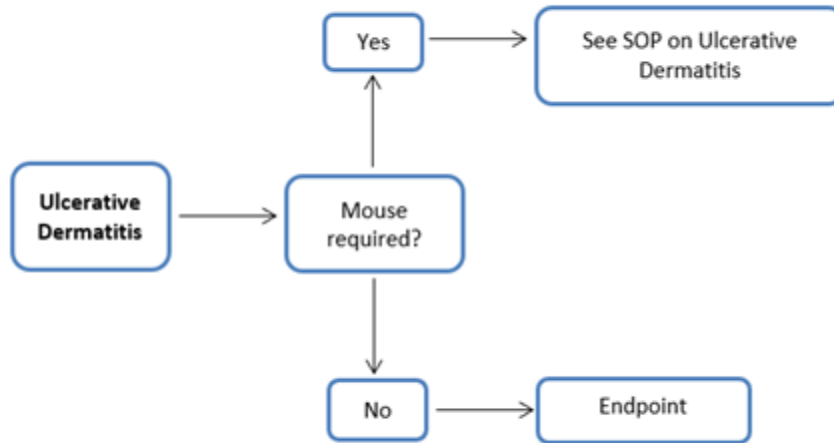
### Dermatologic Lesions:





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**Ulcerative Dermatitis:**



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**APPENDIX 2:**

**THE GRIMACE SCALE - Image courtesy of National Centre of 3 R's:**


















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Refinement & Reduction  
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## The Mouse Grimace Scale

Research has demonstrated that changes in facial expression provide a means of assessing pain in mice.

The specific facial action units shown below have been used to generate the Mouse Grimace Scale. These action units increase in intensity in response to post-procedural pain and can be used as part of a clinical assessment.

The action units should only be used in awake animals. Each animal should be observed for a short period of time to avoid scoring brief changes in facial expression that are unrelated to the animal's welfare.

	Not present "0"	Moderately present "1"	Obviously present "2"
<b>Orbital tightening</b> <ul style="list-style-type: none"> <li>• Closing of the eyelid (narrowing of orbital area)</li> <li>• A wrinkle may be visible around the eye</li> </ul>			
<b>Nose bulge</b> <ul style="list-style-type: none"> <li>• Bulging on the bridge of the nose</li> <li>• Vertical wrinkle on the side of the nose</li> </ul>			
<b>Cheek bulge</b> <ul style="list-style-type: none"> <li>• Bulging of the cheeks</li> </ul>			
<b>Ear position</b> <ul style="list-style-type: none"> <li>• Ears rotate outwards and/or backwards, away from the face</li> <li>• Ears may fold to form a "puckered" shape</li> <li>• Space between the ears decreases</li> </ul>			
<b>Whisker change</b> <ul style="list-style-type: none"> <li>• Whiskers are either pulled back against the cheek, or pulled forward to "stand on end"</li> <li>• Whiskers may clump together</li> <li>• Whiskers lose their natural "downward" curve</li> </ul>			

Read the original paper:  
LePore DJ, Griffin AC, Cheslock M, Clark BE, Thompson TS, Smith S (2003) Signs of Pain in Mice. *Journal of the American Veterinary Association*, 274(12):1648-1652. doi:10.2460/javma.274.12.1648

Visit [www.nrc3r.org](http://www.nrc3r.org) for more information on the 3Rs and animal welfare.

For guidance on using the Mouse Grimace Scale, research papers that compare the technique and for grimace scales in other species, visit [www.nrc3r.org](http://www.nrc3r.org).

The Mouse Grimace Scale is a registered trademark of the National Centre for the Replacement, Refinement & Reduction of Animals in Research.

Images kindly provided by Dr. Jeffrey Mogk, McGill University.

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**References:**

*The Centre for Phenogenomics Standard Operating Procedure AH003*

**SOP Revision History:**

Date	New Version
November 27 <sup>th</sup> , 2024	SOP Created