Veterinary Recommended Anesthetic Plans for Rodents

**GOAL:** To provide recommendations for anesthetic plans for procedures or survival surgery in rodents. Consultation with the Veterinary Staff during the project design phase is highly encouraged.

**DEFINITIONS:**
- **Anesthesia** – A state characterized by a loss of sensation due to the pharmacologic depression of nerve function
- **General Anesthesia** - a state of unconsciousness with the absence of pain sensation over the entire body. Depth of anesthesia must always be verified (e.g. lack of deep pain response in the limb) prior to creating a surgical incision or performing a painful procedure.

**FORMULARY**

| ISOFLURANE | inhalant anesthesia for rodent procedures is the **METHOD OF CHOICE** due to its wide safety margin, reliability, ease of administration, and rapid return to consciousness for animals after exposure has ended. |

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Frequency</th>
<th>Route</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isoflurane (PREFERRED)</td>
<td>Mouse or Rat: 4-5% induction, 1-2 % maintenance</td>
<td>Continuous</td>
<td>Inhalant</td>
<td>The use of an Isoflurane vaporizer is strongly recommended as it allows for ease in control of the anesthetic depth. Additionally, the system provides for appropriate scavenging of residual anesthetic required to minimize personnel exposure.</td>
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</tbody>
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**Injectable anesthetic cocktails** such as ketamine/xylazine may also provide effective general anesthesia but the animal’s response can be variable based on strain, size and gender. Verification of surgical depth is needed throughout the procedure. Recovery from injectable anesthetics can be lengthy and personnel must be available cage side until animals are moving normally. Maintaining body temperature via an external heat source is important in speeding up recovery and minimizing post-operative death due to hypothermia. If additional anesthetic is needed to reach a sufficient surgical plane, re-dosing should consists of **ketamine alone** to minimize cardiovascular effects (e.g. respiratory and cardiac depression) and subsequent death of animals.

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<td>Atropine/ Ketamine/ Xylazine</td>
<td>Mouse or Rat 0.05/80-110/5-10 mg/kg</td>
<td>Once, re-dose with 1/3 to ½ of the original Ketamine dose ONLY*</td>
<td>IP</td>
<td>Atropine is given to counteract the cardiac and respiratory depression caused by xylazine and to minimize the possibility of heart block</td>
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Ketamine/Xylazine
Mouse or Rat
80-110/5-10 mg/kg
Once, re-dose with 1/3 to ½ of the original Ketamine dose ONLY*
IP
1ml Ketamine (100mg/ml) 0.5ml Xylazine (20mg/ml) 8.5ml sterile saline
Mice: 0.1ml per 10 gm of body weight will provide a 100 mg/kg Ketamine/ 10 mg/kg Xylazine dose

Ketamine/Acepromazine
Rat
75/2.5 mg/kg
Once, re-dose with 1/3 to ½ of the original Ketamine dose ONLY*
IP

Ketamine/Xylazine/Acepromazine
Mouse
50/5/0.5 mg/kg
Once, re-dose with 1/3 to ½ of the original Ketamine dose ONLY*
IP

Telazol/Butorphanol/Dexmedetomidine
Mouse
22 – 33/ 0.05 – 0.08/ 1.1 – 1.7 mg/kg
Once
IP
To make: use 2.5 mL dexmedetomidine (0.5 mg/mL) and 2.5 mL butorphanol (10 mg/mL) to reconstitute 100 mg telazol, THEN dilute 1:10 (0.1 mL drug mixture +0.9 mL sterile water.
Mice: 0.1 mL per 30 – 45g animal will provide the correct dose range. Reverse with atipamezole.

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RESOURCES:

  - Approved Analgesia Plans for Rodent Survival Surgery
  - Rodent Survival Surgery Best Practices