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# Imaging Guide

Vevo® Imaging Systems:
**Suggested Animal Preparation and Anesthesia Techniques**

**System Compatibility**: This guide contains instructions and suggestions for work on the Vevo2100, VevoLAZR, Vevo 3100 and transducers from the MS, MZ and MX series.

## Objective

This guide is designed to aid the user to:

- Effectively prep and monitor the animal for and during ultrasound imaging
- Recognize and understand the importance of maintaining physiological parameters during ultrasound evaluation.

***NOTE*** The following document contains suggested animal prep and anesthesia techniques. You must have approval and adhere with the Institution's Animal Care and Usage Committee (IACUC) as each Institution's IACUC may have different policies.

**Anesthesia in Rodents**

Anesthesia is used frequently in laboratory animal research to alleviate pain/and or discomfort in an animal during procedures, yet their vital functions are maintained. However, due to the large surface area to body weight ratio in rodents, anesthesia makes rodents highly susceptible to hypothermia and will depress other vital functions. Therefore, it is very important to properly induce and maintain the animals' anesthetic state during your imaging procedure.

The recommended anesthetic while using Vevo systems is isoflurane in oxygen or medical air (depending on your study goals). Isoflurane is used because it is an inhalant, it is easier to sustain a uniform anesthetic state, and its effects can be reversed rather quickly, therefore allowing the animal to recover faster.

Isoflurane anesthetic dose should be kept between 1-4% for rodents (Reference: S.K Wixson & K.L. Smiler, *Anesthesia and Analgesia in Laboratory Animals*, 1997). Isoflurane will be delivered to the animal in a mixture of oxygen or medical air (21% oxygen). Specific recommendations are in **Figure 1**; *it is best to use the lowest dose to effectively anesthetize the animal.* An induction box can be used initially for anesthesia, then the animal can be transferred to a nose cone delivering anesthesia for imaging (**Figure 2**).

| Procedure | Drug | Dose | Route |
|---|---|---|---|
| Induction | Isoflurane | 3-4% | Inhalation |
| Maintenance | Isoflurane | 1-2% | Inhalation |
| **Oxygen or medical air should be maintained between 0.6 and 1.0 mL/min | | | |

**Figure 1**- recommended anesthetic doses for rodents

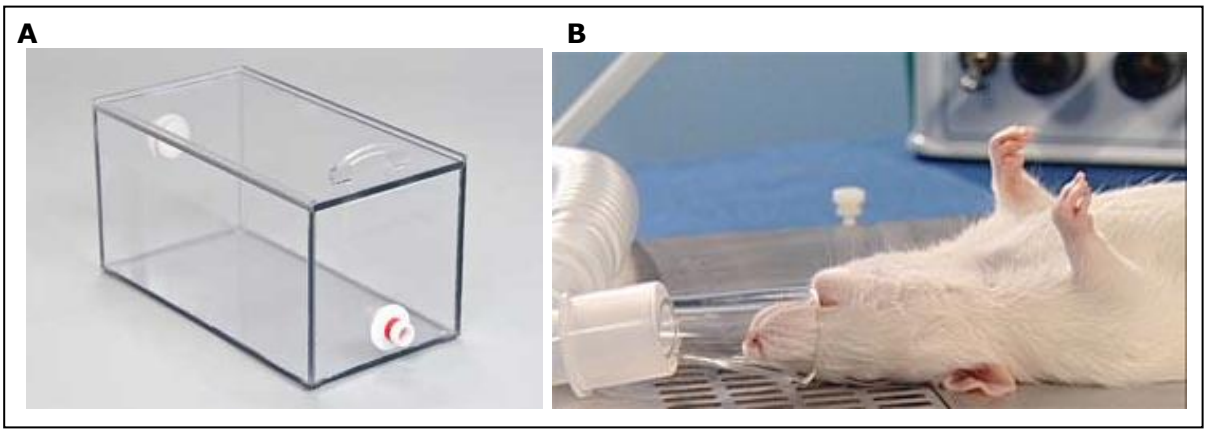


**Figure 2 –** (a) induction box (b) animal maintained under anesthesia using a nose cone www.kentscientific.com and www.aalaslearninglibrary.org

## Animal Preparation

*Hair Removal*

- Use a depilatory cream (example: Nair™) to remove hair around the region to be imaged.
- Wipe the area clean with a warm water after hair has been removed; depilatory cream can cause skin irritation

*Maintenance of Body Temperature*

Minimizing heat loss to the environment will ensure easier, faster recovery for your animal.

- Use a heated platform or thermal blanket during imaging
- Use a rectal thermometer to constantly monitor body temp
- Heating lamps can be used during imaging as an additional source of heat
- Warm gel before placing it on the animal's skin

Normal Body Temperatures:
Mouse……98.8-99.3°F (37-37.2°C)
Rat……..99.4°F (37.5°C)

*Heart Rate*

Heart rate is important to maintain in all studies, but especially in cardiology and perfusion studies. Maintaining consistent heart rates will help ensure reproducibility throughout experiments.

- Resting mouse heart rate can be between 450-750 (+/-) bpm
- Resting rat heart rate is between 300-490 (+/-) bpm

Recommended heart rate range while imaging:
Mouse……400-500 bpm
Rat……..300-400 bpm

*Ocular Care*

Rodents lose the ability to blink, and therefore lubricate their eyes, under

anesthesia. Lack of blinking can result in dry eye and risk of corneal ulceration is increased. It is highly recommended to use an approved eye lubricant during all anesthetic procedures.

*Post-Imaging Care*

- Wipe gel off the animal
- Place animal on a heating source or in a recovery cage on top of a heat source
- Make sure the animal responds to stimuli and is moving before placing them back into their original cage

**References:**


- Animal Care and Use in Research and Education: **www.aalaslearninglibrary.org**
- S.K Wixson & K.L. Smiler, *Anesthesia and Analgesia in Laboratory Animals*, 1997
- www.merckmanuals.com/vet


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