

DOSING TECHNIQUES AND LIMITS

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1. Purpose

Administration of experimental materials must comply with the investigator's Animal Use Protocol (AUP) as approved by the Animal Care and Use Committee (ACUC). The AUP must include the name of the compound(s), dose range in mg/kg, total volume to be administered, route of administration, frequency of administration, solvent/vehicle if applicable, and any potential effects of the compound or vehicles. Administration of experimental materials must also comply with the investigator's Biological Use Authorization (BUA), if applicable. Please refer to ACUC Policy on [Use of Non-Pharmaceutical Grade Compounds](#) for additional requirements regarding administration of non-pharmaceutical grade compounds.

The veterinary staff may administer substances for veterinary care purposes using accepted clinical techniques ensuring volumes administered do not adversely affect animal health.

2. Administration Routes and Volumes

Routine routes for administering substances vary by species and include oral, subcutaneous (SQ), intramuscular (IM), intravenous (IV), and intraperitoneal (IP). Routine dosing limits are outlined in Table 1. Doses exceeding these limits must be described and justified in the ACUC-approved AUP.

Table 1. (Maximum dose from Dielhl et al. 2001)

Species	Oral (ml/kg)		SQ (ml/kg)		IP (ml/kg)		IM (ml/kg)		IV rapid bolus (ml/kg)		IV slow infusion (ml/kg)	
	GP	MD	GP	MD	GP	MD	GP	MD	GP	MD	GP	MD
Mouse	10	50	10	40	20	80	0.05*	0.1*	5	N/A	N/A	25
Rat	10	40	5	10	10	20	0.1*	0.2*	5	N/A	NA	20
Rabbit	10	15	1	2	5	20	0.25	0.5	0.5	N/A	NA	10
Dog/Cat	5	15	2	5	1	20	0.25	0.5	2.5	N/A	NA	10
Macaque	5	15	2	5	N/A	10	0.25	0.5	2	N/A	N/A	N/A

*Values in milliliters per site
 GP = Good Practice
 MD = Maximal Dose

3. General Procedures

- Sterile needles and syringes should be used, and changed between each dosing group or cage.
- Clean gavage needles or feeding tubes should be used for each oral dosing group.
- Needles must not be recapped prior to placing in sharps containers.
- Substances to be injected must be sterile or filtered and must not cause long lasting irritation at the site of injection unless approved by the ACUC.
- Hamilton syringes and needles should be autoclaved or sterilized using ethylene oxide prior to use. If dosing multiple mice or rats with a Hamilton syringe within the same day, the syringe and needle should be disinfected between animals with 70% ethanol or a quaternary ammonium compound with a minimum contact time of 10 minutes, and then sufficiently rinsed with at least three rinses of sterile water.

4. Training

The OLAC veterinary staff and training coordinator offer training for dosing in all laboratory species. In addition, the OLAC veterinary staff provides dosing services for investigators for a nominal fee.

5. References

- Diehl, K.H., Hull, R., Morton, D., Pfister, R., Rabemampianina, Y., Smith, D., Vidal, J.M., & van de Vorstenbosch, C. (2001). A Good Practice Guide to the Administration of Substances and Removal of Blood, Including Routes and Volumes. *Journal of Applied Toxicology*, 21, 15–23.
- ACUC Policy on [Use of Non-Pharmaceutical Grade Compounds](#).
- [EH&S Fact Sheet, "Sharps: Disposal and Safe Handling"](#).