

**Routes and Volumes of Administration in Mice**  
**IACUC Guideline**  
**Effective Date: January 2024**

**Scope:** These guidelines provide minimum standards for common administration routes and recommended volumes in the mouse.

**Investigator’s Responsibility:** The investigator is responsible for ensuring use of techniques and procedures that result in the least pain and distress while addressing experimental design needs. Consideration must be given to determine appropriate delivery routes including site, volume, frequency of administration and preparation method to be used. All individuals performing unsupervised administration techniques must be adequately trained.

**Considerations:** The volume depends on the administration route and the size of the mouse. Excessive volume can be harmful, therefore always use the smallest volume possible. The rate of absorption depends on the substance solubility and the route of delivery. In general, the absorption rate per route is arranged as follows: IV > IP > IM > SC > PO.

**Routes of administrations:**

- Oral administration: Gavage (PO); procedure refer to [Oral Gavage in Mice and Rats](#)
- Inhalant and nasal administration: Intranasal (IN) refer to [Intranasal Instillation in Rodents](#), and Intratracheal (IT)
- Parenteral administration: Refers to administering substance outside of the gastrointestinal tract.
  - Intravenous (IV); refer to [Lateral Tail Vein Injection in Mice and Rats](#) and [Retro-Orbital Injection in Mice](#)
  - Intraperitoneal (IP)
  - Intramuscular (IM)
  - Subcutaneous (SQ)
  - Intradermal (ID)
  - Intrathecal

**Quality and preparation:** Substances for parenteral delivery should be isotonic, sterile, delivered aseptically and pharmaceutical (USP) grade. For preparation of non-pharmaceutical (USP) grade compounds refer to the IACUC policy on [Non-pharmaceutical grade compounds](#).

Route	Adult mouse		Neonatal mouse	
	Volume	Needle size (≤)	Volume	Needle size
<b>Intravenous</b>	< 0.2ml (Tail vein or Retro-Orbital)	27-30 gauge	0.01ml Retro orbital 0.02ml Temporal vein	28-31 gauge
<b>Intraperitoneal</b>	< 2-3ml	25-27 gauge	0.02ml	28-30 gauge
<b>Intramuscular</b>	< 0.02 - 0.05ml	25-27 gauge	0.01ml	28-30 gauge
<b>Subcutaneous</b>	< 2-3ml (divide into multiple sites, max 1 mL per site)	25-27gauge (max 20 gauge)	0.025ml	28-30 gauge

	Adult mouse		Neonatal mouse	
Route	Volume	Needle size ( $\leq$ )	Volume	Needle size
Intradermal	< 0.05ml	26 gauge	NA*	NA
Intranasal	< 0.05ml		NA	NA
Intratracheal	< 0.07ml	23-20 gauge tracheal tubing	NA	NA
Oral	up to 10ml/kg	18-20 gauge bulb tipped feeding tube**	NA	NA
Intrathecal	10 $\mu$ L (up to)	30 gauge	NA	NA

\* NA – not appropriate for neonates.

\*\* If using feeding tubes without a bulb tip, only elastic flexible feeding tubes (18-22 gauge) are recommended.

### References:

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