

Guidelines on administration of substances and blood collection in GUINEA PIGS

Procedure	Maximum volume range ^a	Needle size ^a	Sites	Anaesthesia ^{a,b}
ADMINISTRATION OF SUBSTANCES (Adults)				
Intradermal	0.05 - 0.1 mL/site Maximum of 6 sites	25-30G x 13mm	Shaved skin over dorsal thorax, back	Yes
Intramuscular	0.2 ^c - 0.3 ^d mL/site No more than 2 sites per day ^b	25-30G x 13mm	Quadriceps muscles / Posterior thigh ^d	No/Yes
Intraperitoneal	10 - 14 mL/kg* Maximum bolus volume is 1% of BW	23-26G x 25mm	Lower right abdominal quadrant	No
Intravenous	1 - 5 mL/kg bolus (injected in 1min) ^{b,c,f}	25-30G x 13-25mm	Ear vein ^{d,e} , Saphenous vein ^{d,e}	No/Yes
Oral Gavage	10 ^a - 20 ^f mL/kg	16-18G x 70-100mm with rounded ball end; soft rubber or flexible plastic tube 1.5-6 mm in diameter ^g ; consider voluntary intake /syringe feeding	Oral (may be necessary to restrict food intake before dosing of larger volumes) ^b	No (gavage needle) Yes (gastric tube)
Subcutaneous	2 - 5 mL/kg* Maximum of 4 sites per session	23-26G x 13mm	Loose skin over the intrascapular (scruff), neck, shoulder, back, flank	No
Topical - dermal		NA	Apply test substances uniformly covering no more than 10% of body surface (e.g., 7 cm x 10 cm). Prepare site 24 h previously to allow recovery ^{c,**}	No/ Yes
BLOOD COLLECTION (Adults)				
Intravenous – single bleed	up to 7% of TBV weekly	23-25G x 16mm	Ear Vein (puncture method) ^h Saphenous vein ^h , Tarsal vein ^h Jugular vein ^{i,j} Anterior vena cava ^{i,j}	Local
	10% of TBV Every 2 weeks			No
	15% of TBV Every 3 weeks			No/Yes Yes
Intravenous – daily bleed	0.05% of BW every 24 hours	23-25G x 16mm	Ear Vein (puncture method) Saphenous vein, Tarsal vein (puncture method)	No No
Intra-cardiac	Once, Terminal bleed	20-25G x 25-38mm	Cardiac puncture	Yes

* Volumes/kg adapted from References d, k, and l

General Considerations for substance administration:

- ** Skin area of application for highly toxic substances should be reduced. Avoid eyes and genital areas. Potential welfare impact of tight or adhesive dressings.
- Consider absorption time for non-aqueous or irritating substances before re-dosing.
- Divide large doses and inject into multiple sites.

Abbreviations: TBV = total blood volume; BW = body weight; NA = Not Applicable; min = minute

Techniques: Examples of tutorials on various procedures for blood collection
<https://www.nc3rs.org.uk/3rs-resources/blood-sampling>

Normative data for the guinea pig^m

Heart Rate	230 - 380 beats/min
Respiratory rate	42 - 104/min
Rectal temperature	37.2 ^o - 39.5 ^o C
Food Consumption	6.0 gm /100 gm BW / day
Water Consumption	10.0mL /100 gm BW/ day
Urine Volume	0.5-2.5 mL/24 hr
Total blood volume	69 -75 mL / kg BW
Gastrointestinal transit time	13 - 30 hr

References:

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