University Animal Care Committee Standard Operating Procedure		
Document No: **10.9.1**	**Subject: Subcutaneous Injection (Rats)**	
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Location: Queen's University

Responsibility: Principal Investigators, Research Staff, Veterinary Staff

Purpose: The purpose of this Standard Operating Procedure (SOP) is to describe the subcutaneous injection in rats.

1. Introduction and Definitions:

Abbreviations: Animal Care Services **ACS**, Principal Investigator **PI,** subcutaneous **SC**, intravenous **IV**, intraperitoneal **IP,** intramuscular **IM**, per os **PO,** per rectum **PR**

Recommended Needle Sizes and Volumes *Length of needle: ½ to ¾ inch*	
	Subcutaneous SC
Recommended Gauge (maximum)	25
Good Practice Volume (Max per site)	5 ml (10ml)

The injection methods described within an Animal Use Protocol (AUP) must be followed at all times. The following guidelines provide recommended injection sites, needle sizes and maximum dose volumes. "Good Practices" include:

- All animals securely and safely restrained prior to injecting.
- Only three attempts per site should be practiced. If unsuccessful, allow another (trained and competent) person to complete the injection.
- Use the appropriate gauge needle and volume for the injection site based on the size of the rat.
- Before injecting any substance, aspirate first to ensure appropriate placement of the needle.
- Always inject with the bevel up on the needle.
- Always ensure the substances you are injecting are sterile, and use sterile technique.
- Every animal requires a new sterile syringe and a new sterile needle. With small volumes, it is preferable to dilute the injectable agent to a 50% or less solution to

ensure accurate dosing.

- Disinfecting the skin with alcohol is recommended but not mandatory for subcutaneous injections.
- Choose the appropriate administration route for the substance to be injected.

2. Materials:

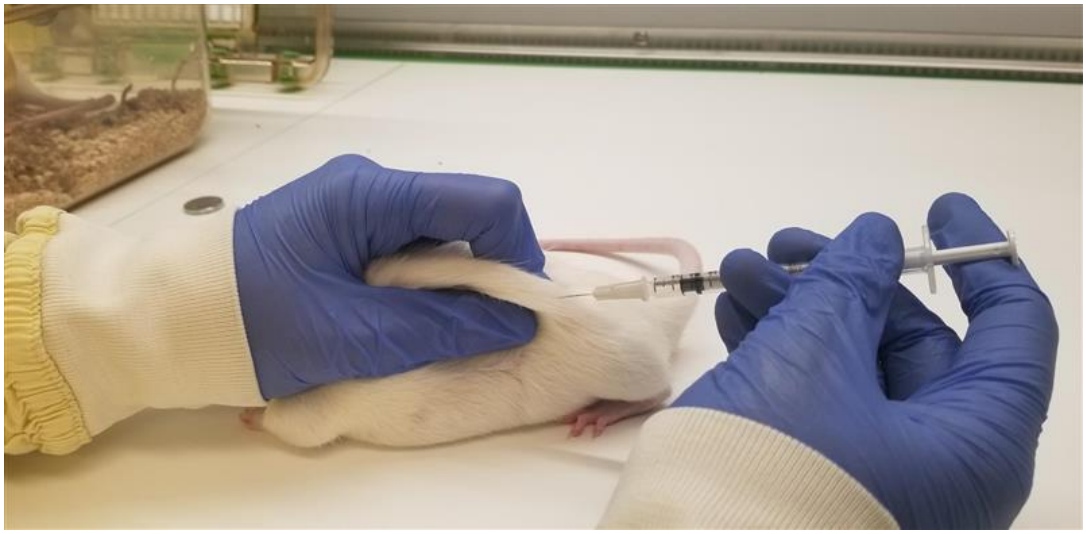
- Sterile syringes
- Sterile needles (25 gauge)
- 70% alcohol
- Injectable solution

3. Procedures:

Anatomical Terms of Location

- Every animal requires a new sterile syringe and a new sterile needle.
- Load the syringe and needle with appropriate volume to be injected.
- Safely restrain the animal on the table.
- The most common injection site is the loose skin around the neck and shoulder area. Grasp the scruff and tent the skin upward. Depending on the volume to be administered, other SC sites include the dorsolateral thorax and flank.
- Palpate toward the bottom of the tented skin to ensure interstitial space is exposed.
- Insert the needle (bevel up) into the base of the tented region.
- Aspirate to ensure the placement of the needle is correct. Proper placement should yield negative pressure and no aspirate in the hub of the needle. If any fluids are seen; stop, reload with new syringe and needle, check injection site for trauma, reposition needle and attempt again.
- After ensuring proper placement, inject.
- If resistance is felt during the injection, stop and (slightly) reposition the needle.
- When injecting larger volumes or viscous substances, use the largest acceptable gauge needle for the animal. The use of a butterfly catheter may facilitate the procedure.

- If injecting a biohazard (RG2), the skin must be wiped with alcohol upon completion of the subcutaneous injection.



References:

SOP Revision History:

Date	New Version
January 24, 2012	Annual Review
September 22, 2015	Triennial Review
February 28, 2019	Triennial Review
February 28, 2022	Triennial Review
December 12, 2022	Triennial Review, split apart separate injection methods, updated format and reviewed/updated maximum injection volumes
April 22, 2026	Triennial Review