



Standard Operating Procedure: Subcutaneous Injections in Swine

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols.

However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

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I. Procedure Summary and Goal

Describes procedure for the administration of substances via subcutaneous (SQ or SC) injections.

Considerations:

Refer to SOP: Swine Restraint

Can be performed without general anesthesia, but proper restraint required.

Pigs have fixed-skin and therefore SQ injections are not as easy to administer as in other animals with loose skin (such as the rabbit or dog). Preferred locations (Figure 1) in small pigs include the axillary area caudal to the elbow or in the inguinal region in the flank area (Figure 2); and the loose skin behind the ear in larger pigs (Figure 3).

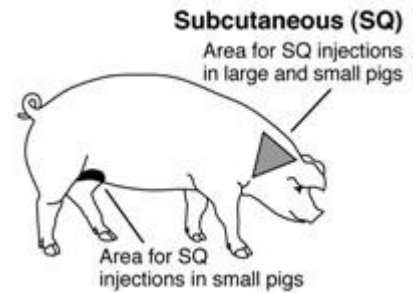


Figure 1. Subcutaneous Injection Sites

No more than 2ml per injection site in baby pigs, or 3ml in larger pigs (from Large Animal Clinical Procedures).



Figure 2. Locations for SQ Injections in Small Pigs: Axillary and Inguinal Regions



Figure 1. Subcutaneous Injection for Larger Pigs – Behind the Ear

II. Personal Protective Equipment (PPE) and Hygiene

- a. Ensure appropriate PPE is used to protect handler from accidental injury or exposure to blood and other body fluids, such as:
 - i. Scrubs or coveralls
 - ii. Steel-toed shoes or boots
 - iii. Optional
 1. Disposable gloves (e.g., latex, nitrile)
 2. Eye protection

- iv. Other PPE as required by protocol/facility
- b. Ideally, hands should be washed and/or gloves changed between animals.
- c. Pigs are extremely vocal and volume can well exceed 85 decibels; therefore, it is recommended that ear protection be used when handling or working with pigs.
- d. Promptly dispose of used sharps in the provided leak-proof, puncture resistant sharps container.

III. Supply List

- a. Restraint (e.g., snare, sling, crowd board)
- b. Needles or butterfly catheters (size is dependent upon size of pig and viscosity of solution to be administered; use the smallest gauge and shortest length possible)

Needle Selection Guide for Subcutaneous Injections (adapted from National Hog Farmer)		
SIZE OF PIG	GAUGE	LENGTH
Baby Pigs (up to 25kg)	16 to 18	1/2 inch
Grower (25 to 70kg)	16	3/4 inch
Finisher/Breeders (>70kg)	14 to 16	1 inch

- c. Prefilled syringes

Extension set (optional)

- d. Antiseptic
- e. Gauze

IV. Detailed Procedure

- a. Anesthesia
 - i. No anesthesia needed, but adequate restraint required.
- b. Procedure
 - i. Restrain animal with snare, securely contained against a wall or corner; alternatively, swine can be placed in a sling, or smaller pigs can be held (Figure 4).



Figure 4. Restraint Methods

- ii. Clean skin with antiseptic gauze to remove superficial dirt and debris.
- iii. Insert needle at a 45° angle using looser skin behind the ear of large pigs, and the inguinal or axillary areas of smaller pigs. Extension set may be connected to the needle to allow pig to move freely while substance is being injected.
- iv. Should a needle break during injection, follow procedures for recording broken needles, which typically include identifying animal, needle size, location, and person performing injection.

V. Variations

None

VI. Potential Adverse Effects, Mitigation, or Treatment

- a. Hematoma/bruising at injection site
- b. Pain or redness at injection site
- c. Abscess
 - i. Contact veterinary personnel for treatment options
- d. Induration at injection site
- e. Hypersensitivity to injected substance
 - i. If you notice a rash or hives, fever, difficulty breathing, vomiting, facial swelling, contact veterinary personnel immediately

VII. References

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