



Standard Operating Procedure: Equine Intramuscular and Subcutaneous Injections

These SOPs were developed by the Office of the University Veterinarian and veterinarians at the VMCVM 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 or instructional activity. 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 procedures for intramuscular and subcutaneous injections in horses.

Considerations:

Having a basic knowledge of the animal's behavior is important in safe and humane handling. When approaching a horse, assess the horse's reaction and adjust accordingly. Avoid loud noises or quick movements; use minimal restraint necessary.

Intramuscular and subcutaneous injections require an understanding of anatomical landmarks as well as precise technique.

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.
- b. Always wash your hands after handling an animal.

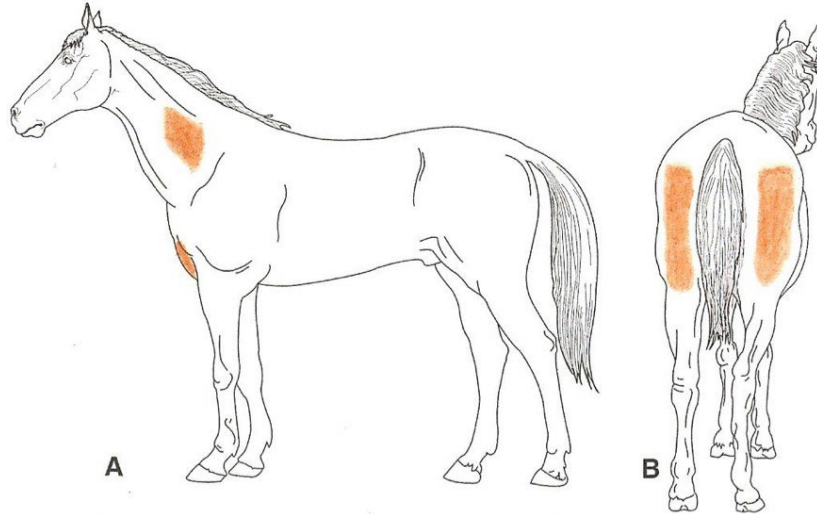
III. Supply List

- a. Halter and lead rope
- b. Needles (18-25 gauge 5/8th - 1.5 inch)
- c. Syringe
- d. Small square of gauze (alcohol soaked)

IV. Detailed Procedure

- a. Restraint
 - i. A halter and lead rope should be placed on the horse. This will help to appropriately hold the animal for the procedure allowing complete control of the animal and the head. Depending on horse temperament/location of injection/volume to be injected, additional restraint may be necessary. Reference the equine restraint SOP.
- b. Intramuscular (IM) Injection
 - i. Locations for IM injections (see graphic below)
 1. Cervical musculature
 - a. Within the triangle formed by the cervical vertebra (ventrally), cranial border of the scapula (caudally), and the nuchal ligament (dorsally).
 - b. Volumes less than 15ml in one location
 2. Semitendinosus and semimembranosus muscles

- a. The uppermost landmark is the tuber ischia and the distal landmark is at the location where the muscle begins to merge with the tendons.
 - b. Volumes <20ml in one location.
3. Pectoral muscles
- a. In center of muscle between front limbs
 - b. Volumes <20ml in one location



<https://anokaequineblog.files.wordpress.com/2014/02/im-injections.jpg>

ii. Procedure

1. Clean site with alcohol soaked gauze until gross dirt is removed, or leave dry
2. Quickly stick the needle through the skin up to the hub.
 - a. The skin may be pinched firmly adjacent to the needle site prior to insertion
 - b. The skin may be firmly tapped prior to insertion
3. Attach the drug-filled syringe to the needle and aspirate to ensure that inadvertent venipuncture did not occur.
 - a. If blood is present at aspiration, redirect the needle and aspirate again.
4. Inject drug.
5. Remove needle.
6. If repeated dosing is necessary, rotate between sites to avoid repeated injury to any one muscle.

c. Subcutaneous injections

- i. Locations for subcutaneous injections

1. Distal limb over peripheral nerves for local anesthesia
2. Others
- ii. Procedure
 1. Clean site with alcohol soaked gauze until gross dirt is removed.
 2. Small needles (5/8th inch 25 gauge) are typically used.
 3. Quickly stick the needle through the skin at low angle approximately ¼-1/2 inch.
 4. Attach the drug-filled syringe to the needle and aspirate to ensure that inadvertent venipuncture did not occur.
 - a. If blood is present at aspiration, redirect the needle and aspirate again.
 5. Place a finger over the skin where the drug will be deposited. Inject drug.
 - a. The injection should be easy – if not, redirect the needle slightly deeper.
 - b. The finger should feel a ‘bleb’ under the skin.
 6. Remove needle from skin

V. Variations

Alternative procedure for injections is to have the drug-filled syringe already attached to the needle when the needle is inserted.

VI. Potential Adverse Effects, Mitigation, or Treatment

- a. Abscess formation
 - i. The skin should be cleaned thoroughly prior to placing a needle
 - ii. If an abscess forms, contact veterinary staff.
- b. Muscle soreness
 - i. Avoid repeated injections at the same site to minimize this complication
 - ii. If soreness affects the horse’s ability to normally function (graze, walk comfortably), contact veterinary staff.
- c. Swelling
 - i. If accompanied by tenderness and/or stiffness, contact veterinary staff.

VII. Suggested Literature Search for Pain Category D and E Procedures

Not applicable

VIII. References

Orisin JA and Divers TJ. Equine Emergencies, Treatment and Procedures. 3rd edition. Saunders Elsevier. St. Louis. 2008.