

EQU_003 Injections – Intravenous (IV) in horses

I. OBJECTIVE

To describe standards for administration of injectable solutions to horses via the intravenous (IV) route.

II. COMMENTS / RECOMMENDATIONS

- Relative to animal ethics applications, when using this SOP, the following must be described in the individual ethics application: relevant details of substances to be administered including justification for administration, dose, volume, frequency, and expected impacts
- Consideration must be made to ensure this route is necessary and most appropriate (e.g. less invasive routes, such as oral administration (in feed), are not more appropriate)
- Consideration must be made to ensure the injection solution is as innocuous as possible (e.g. the solution must be sterile, the pH should be relatively neutral and tonicity relatively isotonic)
- IV injection in horses should be considered a quick and minimally invasive procedure. Restraint techniques (e.g. a twitch) may be required. If a horse cannot be appropriately restrained (non-chemically) for this procedure the horse should not be used for scientific purposes without specific justification
- When using animals for scientific purposes all personnel must be competent in the procedures they perform or be under the direct supervision of a person who is competent to perform the procedure

III. EQUIPMENT

- PPE
Site and procedure specific. This may include overalls, boots, disposable gloves, hat, sunscreen.
- Appropriate animal restraint equipment
Site, procedure, and animal specific. This will at least include a halter and lead rope, but may include additional equipment such as horse stocks, rearing bits, a sideline, hobbles.
- Skin preparation material (fur clippers, gauge swabs, skin disinfectant)
- Local anaesthetic (e.g. 5mL lignocaine at 20mg/mL), only used if skin sutures are to be placed to secure an IV catheter (note: 20-25G needles and 5mL syringes are also required for administering the local anaesthetic subcutaneous/ intradermally)
- Syringe of required size (e.g. 1mL – 60mL), sterile and disposable
- 18-22G needle (or catheter), sterile and disposable
- Substance to be injected
- Cotton gauze
- Sharp's container

IV. PREPARATION

1. Ensure AEC approvals cover all procedures, personnel, and animal details for the planned work
2. If working with students, teachers must ensure that students have had the opportunity to discuss the ethical and social issues, and legal responsibilities, involved in the care and use of animals for scientific purposes, at a level appropriate to their learning ability and comprehension. This must occur before the use of animals commences.
3. Ensure good hygiene practices. This includes washing hands before and between horses of different epidemiological origins, and ideally wearing disposable gloves.

Conditions:

- Investigators named in an animal ethics application, relative to this SOP, must be competent to implement the SOP
- Any variation to this SOP must be described in the relevant animal ethics application
- If this SOP has not been reviewed and approved by a UQ AEC within the last three years it is no longer valid and cannot be used in animal ethics applications until reapproved (see "AEC Reviewed/Approved" date in this document's header).

V. PROCEDURE

1. The person performing the injection (the operator) ensures all required equipment is prepared and appropriate for use (e.g. substance to be injected is not expired, needle gauges are appropriate sizes etc).
2. Restrain the horse as appropriate for the procedure. If two people are present, the horse handler, holding the lead rope, should always stand on the same side of the horse as the operator.
Note: fractious horses, or horses sensitive to injections, may require additional forms of humane restraint such as a nose twitch, manual skin or ear twitch, a rearing bit, or sideline.
3. Prepare the skin at the site of injection, if required.
Generally specific skin preparation is not required unless the fur is visibly dirty (e.g. muddy), or unless specifically advised by the manufacturer of the substance to be administered. Skin preparation may include cleaning with disinfectant, then permitting the skin to dry (with or without prior clipping of the fur).
4. Occlude the vein and ensure you can appreciate its location, visually and or via palpation prior to attempting venepuncture.
 - a) Using a needle: insert the needle (individually or attached to the syringe) into the vein. This should be done bevel up, at approximately 25° angle to the skin. If using a needle individually (without a syringe yet attached), blood will flash through the needle once it enters the vein – swiftly proceed to step 5.
 - b) Using a catheter: insert the catheter needle into the vein, bevel up at approximately 25° angle to the skin. Once in the vein, blood should flash through the catheter needle into the catheter hub, advance the catheter over the needle, and withdraw the catheter needle. Secure the catheter in place with superglue, adhesive tape, or adhesive tape and a superficial skin suture (note: skin sutures will require prior local anaesthetic administration).
As a biological tissue, spilt blood must be treated with care. For example, if using a needle individually (without a syringe attached) the operator should consider wearing gloves and ensure excess blood is mopped up with gauze and disposed of appropriately as soon as possible.
5. Attach the syringe to the needle (or catheter), if not already attached.
6. When using a needle withdraw the syringe plunger slightly to ensure the needle tip remains within the vein.
7. Inject the substance. The rate of administration is somewhat dependent on the compound being administered. For example, hypertonic fluids, such as 5% glucose should be administered slowly to reduce the risk of associated phlebitis, whereas many drugs, are often appropriately administered via rapid bolus.
If injecting large volumes (e.g. >5mL) you may need to periodically repeat step 6 throughout the injection to ensure the needle tip remains within the vein.
8. Remove needle (or catheter) and syringe from vein and place the needle into the sharp's container at the earliest appropriate time.
9. Immediately as the needle (or catheter) has been removed from the vein use the gauze to apply gentle pressure to the venepuncture site to avoid perivascular haemorrhage (and haematoma formation).
10. Observe animals for signs adverse reactions to the injection (e.g. acute swelling at the site of injection or otherwise, hives, increased respiratory rate, depression, or agitation). If unexpected adverse reactions occur immediately seek veterinary advice, and follow the appropriate institutional procedures (see the [animal ethics webpage](#) for guidance).

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VI. REFERENCE INFORMATION

Table 1. Recommended values relative to IV injections in horses.

INJECTION PARAMETER	RECOMMENDED VALUE
Needle Gauge	18 – 22G (14G may be used for large volumes of viscous solution, and up to 10G for blood transfusion)
Needle Length	1 – 1.5 inches

Table 2. The two common sites for intravenous injection.

Jugular vein	Cephalic vein
 <p>(a)</p> <p>Image: Costa & Paradis, 2018.</p>	 <p>Image: Costa & Paradis, 2018.</p>

VII. BIBLIOGRAPHY

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- Costa, LRR. & Paradis, MR. (2018). *Manual of clinical procedures in the horse*. John Wiley and Sons, Inc. Wiley Online Library, <https://onlinelibrary-wiley-com.ezproxy.library.uq.edu.au/doi/pdf/10.1002/9781118939956>
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Version #	Reviewing AEC (note: all other relevant AECs ratify the approval)	AEC Review Date	Approval To Date
1	PCA	20/04/2022	20/04/2025

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