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EQUINE NECK VENIPUNCTURE IM INJECTION MODEL

Care, Operation, and Maintenance

The Neck

The core neck structure of this model is constructed of a flexible urethane foam supported by an internal steel armature. An exposed bracket on the cranial plane acts as the receiver for the male bracket of the horse head. An exposed male fitting on the transverse plane allows the model to be fit to the adjustable stand or onto the equine body. Square tubing on the neck model slides into corresponding larger square tubing (from the top down) on the adjustable stand. The fitting can be further stabilized by tightening the hex-head set screw. The assembly and operation of the stand is dealt with in another document.

When installing the equine head/neck assembly onto the equine body, the hose coming from the neck to the reservoir should be passed through the tube located on the right side front of the body. Square tubing on the neck model slides into corresponding larger square tubing (from the top down) on the body. Care must be taken not to pinch the hose while installing the neck on the body. Once the neck is in place the hose can be connected to the reservoir bag inside the body cavity. There is a "D" ring located on left side of front interior bulkhead for hanging the reservoir bag.

A cavity in the jugular groove region receives a thick, soft silicone rubber open-sided tube which acts as a backing for the jugular vein.

The jugular vein is represented by a replaceable, latex tubing which, in turn, fits into the tubular cavity of the silicone backing. The latex hose is connected at the caudal transverse plane of the neck to a fluid reservoir via a one-way valve/connector. A small latex band stripped over the hose and the connector clamps the hose tightly to prevent leaks. The same is true at the cranial plane of the neck, where the latex hose is attached to a reduced connector that has a plastic barbed fitting. A short piece of clear vinyl tubing is attached to the barbed fitting and is closed at the cranial end with a push-type air relief/bleeder valve. The caudal end of the vein is reduced via the one-way valve/connector to clear vinyl tubing which is joined with a barbed 'T' fitting to a single line from the reservoir.

The reservoir is a vinyl bag with a built-in connector for the single feed-line. This connector contains an automatic shut-off valve, allowing the single feed-line to be disconnected without spillage or emptying the reservoir.

The reservoir also has a pump that can pressurize the reservoir to allow the veins to fill. Only pump enough to overcome gravity and create a natural venous pressure. Too much pressure can cause the veins to leak. When not in use the pressure should be released by depressing the release button on the pump. The reservoir hangs from a hook that inserts and bolts on the adjustable stand in any of the adjustment holes.

The Veins

The jugular veins are represented by 50 cm (20 in.) lengths of thin-walled latex tubing. This tubing requires replacement when it has endured enough punctures to start causing leaks and weeping. This material is of a very specific dimension and is a replacement part available from VSI Ltd. The latex composition of the veins is UV sensitive, and any replacement veins should be protected from UV and stored in a cool, dry environment.

The veins are backed by thick silicone inserts that absorb punctures from needles that breach the medial vein wall. Although these thick, silicone backing inserts are replaceable, they will withstand hundreds of punctures before requiring maintenance. They are mechanically held in place and they are easily removed by simply stripping them out by hand.

To fill the veins with fluid, first fill the reservoir bag with the desired liquid and hang it on the provided hook at the top of the stand's main strut. Connect all lines, with the veins inserted in the jugular grooves. The tubing of the veins and the respective connecting tubes will air lock. With the horse head removed, open the relief/bleeder valves at the cranial end of the vein by pressing the ends of the valves and holding the valves open. If the hide covering is rolled forward at the transverse plane, the veins can be seen filling. Release the valves to stop the flow when the veins are full. If fluid does not start filling the veins when the relief valves have been opened, gently squeeze the reservoir bag, forcing liquid to flow through the lines to help start the siphoning action.

If the veins need to be drained, the latex tubing representing the vein can be removed from the connectors at either end, as the one-way valve/connector will impede draining. To remove or replace the veins, the hide covering needs to be removed and the latex tubing stripped from or rolled off the connectors at both ends.

Although tap water may be used to represent blood in the model, one liter container of simulated blood concentrate has been provided by VSI. This can be mixed with mixed to a maximum of 1 part concentrate to 3 parts water for use in the model. The contents of this simulated blood will mitigate leakage from needle punctures in the veins, especially if the vein is being occluded. This simulated concentrate is available from VSI as a replacement item.

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The Hide

A tailored, stretchable cloth represents the hide covering. The hide is oriented with Velcro patches running along the growth-line of the mane. The mane is a separate strip of hair material with Velcro strips to attach appropriately to the hide. The hide must be removed in order to insert and replace the veins or the intra-muscular injection pads.

The hide covering is best applied with the neck in place on the adjustable stand, with all of the components assembled, veins filled, and horse head removed. When adding the hide covering, it is best to start with a proper orientation, and pull the covering over the neck (horse head removed), as one would a pull-over sweater. The cloth material can be massaged into a close conformity and, when properly dressed, will have very little bridging or tenting in crucial areas. When using the neck on the equine body, the hide should be installed prior to installing the head/neck assembly onto the body.

The rubber and foam composition of the neck is sensitive to UV and oxidization, and can be partially protected from these elements if the hide covering is kept in place even when the model is not in use. The rubber covering of the neck core may yellow over time.

The Head

The head is constructed of a rubber-coated flexible foam and contains a metal armature with an exposed square-tubing bracket. This male bracket slips into the corresponding female receiver of the neck structure. The head features an open mouth for applying a bridal and also plays a role in helping secure the cloth hide covering to the neck. The head must be removed to activate the bleeder valves to fill the veins, and to remove the cloth hide covering.

Intramuscular Injection

Large, trapezoid-shaped rubber-lined cavities in both sides of the neck create receivers for right and left intra-muscular injection pads. The pads are absorbent foam with a rubber skin and will accommodate training IM injection with fluid. The foam will absorb the fluid, and can then be dried out and cleaned when if they become saturated. These are replaceable parts that will withstand hundreds of injections before breaking down.

General

Parts can be hand washed with mild soap and water. The foam construction of the neck will absorb water and other fluids, so care should be taken to not saturate the model with liquid. No parts should ever be cleaned with harsh solvents or abrasive tools. Many components can be easily replaced if they become damaged or faulty.

Please contact [Veterinary Simulator Industries Ltd.](http://www.vetsimulators.com) for specific repair instructions or any concerns or inquiries.

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