

## **SOP: Canine Intravenous Fluid Administration**

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 & Goal**

Describes procedures for the administration of intravenous fluids.

### Considerations

Having a basic knowledge of the animal's current hydration status is essential in determining a proper approach to fluid administration. This can be determined through the use of a proper physical examination.

## **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. IV fluid bag
- b. IV line (micro, macro) +/- extension set
- c. Fluid pump or syringe pump (infuse smaller amounts)
- d. T-port (optional)

## **IV. Detailed Procedure**

- a. IV Fluid Administration Preparation
  1. Before administering fluids venous access should be obtained. Refer to the catheter placement SOP.
  2. Fluid type should be based on the state of the animal. This selection should concentrate on where the fluid deficit is.
    - i. Isotonic crystalloid options include LRS, Plasmalyte, 0.9% saline, normosol-R.
    - ii. Colloids include hetastarch, Vetstarch, oxyglobin, hypertonic saline, albumin concentrates and blood products.
  3. Fluid Additives
    - i. Glucose can be used at 2.5% solution (add 50 mL of 50% dextrose to 1 liter of fluid) and 5% solution (add 100 mL of 50% dextrose to 1 liter of fluid)
    - ii. Potassium should supplement the intravenous fluid with a minimum of 20-40 mEq/L. No more than 0.5 mEq/kg/hr should be supplemented.
  4. Once the type of fluid is selected, the bag should be prepared and the IV line should be primed. This includes any additional supplies such as T-port and extension set. The line should be placed on a fluid pump otherwise a manual administration will be done utilizing the micro vs. macro drip set.
- b. Fluid Calculations
  1. Maintenance Fluid Requirements

- i. 40 mL/kg/day for larger animals
  - ii. 60 mL/kg/day for smaller animals
2. Fluid Losses
  - i. Dehydration can be calculated based on the clinical dehydration of the animal. Parameters for this can be determined in physical exam findings. Semidry oral mucous membranes, normal skin turgor with normal moisture of the eyes indicates approximately 4-6% dehydration. Dry oral mucous membranes, mild loss of skin turgor and appropriately moist eyes indicate 6-7% dehydration. Dry mucous membranes, considerable loss of the skin turgor, retracted eyes, weight loss and weak rapid pulses indicate approximately 8-10% dehydration. Very dry mucous membranes, complete loss of skin turgor, severe retraction of the eyes, alteration of consciousness, weight loss, thread, weak pulses indicate approximately greater than 12% dehydration.
  - ii. Calculation of the fluid replacement volume – body weight in kg x percent dehydration = fluid deficit in mL
  - iii. On going fluid loss can be calculated using the urine and fecal output of the animal as well as the vomitus volume. Insensible losses can increase fluid amounts by 15-20 mL/kg/day.
3. Shock Fluid Therapy
  - i. Not covered by this SOP.
4. Rate of fluid administration
  - i. Maintenance fluids should be administered at volume calculated/24 hours for a per hour rate.
  - ii. Losses should be added to the maintenance fluid rate and provided over 6-12 hours.
  - iii. Fluids provided to an animal under general anesthesia should be given at the rate supplied in the anesthesia SOP.
- c. Assessment of Fluid Administration
  1. The animal should be monitored for any signs indicating fluid overload. These include pitting edema, chemosis, pulmonary edema, tachypnea, pleural or other effusion, loose/gelatinous skin, and serous nasal discharge.

## **V. Variations**

None

## **VI. Potential Adverse Effects, Mitigation, or Treatment**

- a. Fluid overload
  1. Pitting edema, chemosis, pulmonary edema, tachypnea, pleural or other effusion, loose gelatinous skin, serous nasal discharge
  2. Contact veterinary staff

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

Not applicable

## **VIII. References**

"Drug Dosage Guidelines for Dogs and Cats." Saunders Manual of Small Animal Practice (2006): 1943-959. Web.