

FREQUENTLY ASKED QUESTIONS SERIES

Center for Companion Animal Studies

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What is the outpatient treatment protocol utilized for the treatment of parvoviral enteritis at Colorado State University?

Introduction

- Funding to evaluate the study developing this outpatient treatment protocol was provided by Zoetis Animal Health.
- This randomized clinical study will be presented as an oral abstract at the American College of Veterinary Internal Medicine Forum, Seattle, WA in June, 2013.
- The treatment guidelines provided within this protocol are only to be used under the knowledge and supervision of a licensed veterinarian.
- This protocol is not intended to be a substitute for the gold standard of care (hospitalization and administration of fluids/medications intravenously), but rather used as an alternative for clients that cannot afford the recommended treatment protocol.
- In the previous study, the survival rates for the standard of care protocol and the outpatient protocol were 90% and 80%, respectively.
- Standard of care treatment should be offered and refusal to follow that protocol documented in the medical record prior to offering this as an alternative.
- The faculty associated with this outpatient protocol will not assume any responsibility for the outcome or complications associated with the use of this protocol.

Initial Stabilization

- Upon presentation to the hospital, all dogs should have an IV catheter placed for intravascular volume resuscitation.
- An initial electrolyte panel should be obtained to determine the presence or severity of hypokalemia or hypoglycemia.
- Use the standardized chart (Table 1) to determine the intravascular volume loss to be replaced
 - Isotonic crystalloid boluses should be delivered over 15-20 minutes, with subsequent reevaluation of cardiovascular parameters.
 - Additional IV fluid resuscitation should be performed at the discretion of the veterinarian.
 - Based on the electrolyte concentrations, 25% dextrose can be supplemented IV (1-2 ml/kg) based on the presence and degree of hypoglycemia.
- After cardiovascular resuscitation and restoration of normoglycemia, the outpatient portion of the study is entered.

Basic outpatient protocol

- Start subcutaneous crystalloid fluid therapy immediately after IV fluid resuscitation.
 - Normosol-R (120 ml/kg/day) divided TID (40 ml/kg/dose)
 - In addition, replace dehydration over 24 hours
- Use the standardized chart (Table 2) for determination of hydration status.

- Divide the amount of fluids needed to rehydrate the patient by 3, and add that amount onto the maintenance SQ fluid dose for the next 3 doses.
- Do not add additives (such as dextrose or KCl) to the crystalloids.
- Provide aggressive external warming to help promote absorption of the SQ fluids.
- Monitor rectal temperature to maintain $\geq 99^{\circ}\text{F}$.
- If part or all of the previous dose of SQ fluids remains at the next treatment, only give partial dose of SQ fluids (subjectively determined) or withhold additional SQ fluids that treatment period.
- Cefovacin is administered once at 8 mg/kg SQ once while at hospital.
- Maropitant is administered once at 1 mg/kg SC q24h for the duration of treatment period.
- Syringe feed small amounts of Hill's a/d q6h (1 ml/kg PO), as tolerated by patient.

Rescue protocols

- Rescue analgesia
 - In dogs with visceral pain that is deemed "uncontrolled," buprenorphine 0.02 mg/kg SQ should be administered as frequently as q6-8h.
 - In the previous study, about 20% of dogs required buprenorphine.
- Rescue antiemetic
 - In dogs with nausea that is deemed "uncontrolled," ondansetron 0.5 mg/kg SQ should be administered as frequently as q8h.
 - In the previous study, about 20% of dogs required ondansetron.

Electrolyte supplementation

- Ideally, blood glucose and electrolytes should be checked once daily by the veterinarian.
- Glucose supplementation should be provided for dogs that have a BG < 80 mmol/L.
 - Dogs should be administered simple syrup (Karo) 1-5 ml buccally, every 2-6 hours.
 - In the previous study, about 75% of dogs required glucose supplementation.
- Potassium supplementation should be provided to dogs that have a serum $\text{K}^+ < 3.4$ mEq/L.
 - Dogs should be administered oral Tumil-K (0.5-1 tsp per 10 lbs, every 4-6 hours).
 - In the previous study, about 60% of dogs required potassium supplementation.
- Glucose and/or potassium supplementation should be continued until the electrolyte abnormalities have resolved and the patient is eating enough on their own to maintain these values within the normal range.
- In addition to having their electrolytes checked once daily, dogs should also have a cursory physical examination performed by the DVM once daily.

Failure of the Outpatient protocol

- In dogs receiving the outpatient protocol, worsening clinical symptoms warrants that treatment will be switched to hospitalized treatment protocol (to allow for IV catheterization). Criteria for "worsening symptoms" may include the following:
 - Progressive dehydration, defined as loss of $\geq 10\%$ of body weight from admission or $\geq 8\%$ dehydration on two serial measurements, based on physical examination findings.
 - Hyperlactatemia, defined as ≥ 4 mmol/L.
 - Decline in mentation to stuporous/obtunded.
 - Fever, defined as $> 104^{\circ}\text{F}$.
 - Other subjective criteria that sway the attending clinician towards transition to the Inpatient protocol are the discretion of the attending veterinarian.
 - In the previous study, 5% of dogs on the outpatient protocol were transitioned to the inpatient protocol.

Table 1. Determination of volume of crystalloids fluids required for IV fluid resuscitation and normalization of cardiovascular parameters. If required, 6% Hetastarch (5-10 ml/kg) can also be provided as a bolus over 10-15 minutes. Additional isotonic crystalloid boluses can be administered as indicated by the clinical status and at the discretion of the overseeing veterinarian.

Class	Intravascular volume loss to replace (BV = Blood Volume)	Clinical Signs
I	≤ 15% BV loss (15 mL/kg IV fluid bolus)	Mild ↑ HR
II	15-30% BV loss (25 mL/kg IV fluid bolus)	↑ HR, ↑ RR
III	30-40% BV loss (35 mL/kg IV fluid bolus)	↑ HR, ↑ RR, pale mucous membranes, ↑ CRT
IV	> 40% BV loss (45 mL/kg IV fluid bolus)	↑ HR, ↑ RR, pale mucous membranes, ↑ CRT, cold extremities, mental dullness

Table 2. Determination of dehydration to be replaced over the first 24 hours. Liters of crystalloid to be replaced are determined by multiplying % dehydration by body weight (in kg). As an example, a 12kg dog that is 5% dehydrated would need 0.6L (600 mL) replaced over the first 24 hours. This 600 ml would be divided into three doses (200 ml each), and added onto the maintenance SQ fluid dose to be administered (480 ml + 200 ml = 680 ml), for the next three doses.

% Dehydration	Clinical Signs
< 5	Not detectable
5-6	Subtle loss of skin elasticity
6-8	Delay in return of skin to normal position, dry mucous membranes, slight prolongation of CRT
8-10	Tented skin stands in place, very dry mucous membranes, definite prolongation in CRT
> 10	All of the above, with definite signs of shock (tachycardia, hypotension, weak pulses)

This protocol has yet to undergo the peer review process or journal publication. The information provided within this document is simply guidelines under which a licensed veterinarian may construct their own outpatient treatment protocol, while taking into consideration the clinical indication and financial situation of a particular pet and owner. Any specific questions regarding this protocol can be directed to Dr. Sullivan at lauren.sullivan@colostate.edu.

Lauren A Sullivan, DVM MS DACVECC
 David C Twedt, DVM DACVIM
 Pedro L Boscan, DVM MSc PhD DACVA