Epsilon aminocaproic acid (EACA) is an antifibrinolytic that can prevent excessive bleeding post-operatively, post-trauma, and in relationship to neoplasia. It is a synthetic lysine that targets the lysine binding site of plasminogen, preventing its binding to fibrin and conversion into plasmin (and therefore halts fibrinolysis). In humans a similar product called tranexamic acid has been shown to reduce bleeding episodes, all-cause mortality, and mortality due to bleeding in patients with severe trauma (CRASH-2 trial collaborators. Lancet 2010). There is growing evidence that EACA may also be helpful for patients with thrombocytopenic hemorrhage secondary to malignancy or chemotherapy (Kalmadi. Cancer 2006).

The published uses in dogs are to prevent post-operative bleeding in greyhounds, who are known to have a higher than normal fibrinolytic activity. Use of EACA in these patients led to fewer and less severe bleeding episodes (Marin JVECC 2012, Marin Vet Surg 2012). A pilot study conducted at Michigan State showed that dogs with immune-mediated thrombocytopenia treated with intravenous EACA infusions had reduced hyperfibrinolysis (compared to placebo). The medication was well-tolerated (Ralph et al. IVECCS proceedings 2013). Dogs in liver failure have shown an increased incidence of hypercoagulability and hyperfibrinolysis on TEG tracings. This may explain clinically relevant post-liver biopsy bleeding in those patients who have normal PT/PTT levels (Webster C. ACVIM Proceedings 2014). An in-vitro study with injectable EACA given orally in dogs showed that the minimum dose required to improve clot strength and reduce fibrinolysis was 50 mg/kg (Brown et al. ACVS abstract). There is evidence that dogs likely require higher doses than humans to adequately reduce fibrinolysis (Fletcher AJVR 2014).
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Dosing Recommendations:

Any use of EACA in dogs is considered Off-Label. There are no reports regarding usage in cats.

- For greyhounds undergoing surgery
  - 500-1000mg PO per dog q8 hours, the night of surgery; continue for 5 days post-op OR
  - 15-40 mg/kg IV immediately after surgery, then 500-1000mg total PO q8 for 5 days
- For dogs with acute hemorrhage suspected to be due to hyperfibrinolysis (severe trauma, uncontrolled bleeding with or without alterations in coagulation profile, thrombocytopenia)
  - 50-100 mg/kg IV immediately, then 50 mg/kg IV or PO q8 for 5 days
- Perioperative management of dogs with liver disease or dysfunction (not published)
  - Oral EACA 500-1000mg per dog q8 hours, starting prior to the procedure and continued for 5 days after
  - 50 mg/kg IV immediately after procedure, then 50 mg/kg IV or PO q8 for 5 days
- For hemorrhage associated with thrombocytopenia (Abstract presentation IVECCs 2013)
  - 30 mg/kg/hr for 2 hrs then 10 mg/kg/hr until platelets were ≥ 30,000/µL (Ralph 2013)

Dosage Forms:

- 20mL vial; 250 mg/mL - Single-dose vial
- Commercial tablets 500mg, 1000mg
- Commercial oral solution 250mg/mL
- Compounded capsules

Preparation and Administration:

- Store at room temperature
- Add contents of 1 vial (20mL) to 230mL 0.9% NaCl to make a 20mg/mL solution
- Give single dose IV over 30 min. or as CRI
- Unused portion must be discarded
- Injectable formulation can be administered orally
- Should not be delivered in the same line/catheter as other medications

Pharmacodynamics/kinetics (human):

- Water soluble and excreted by the kidney
- Can be eliminated by hemodialysis

Precautions/contraindications:

- Rapid infusion may cause hypotension, bradycardia, or arrhythmia
- Dose-reduce with severe renal impairment – can cause hyperkalemia and acute renal failure
- Safety in pregnancy is unknown
- Oral formulation may cause GI upset
- Active intravascular clotting is an absolute contraindication (ex. hypercoagulable form of DIC)
- Overdosage may result in acute renal failure, transient hypotension, and seizures. A lethal dose of 2.3g/kg has been reported in the dog.
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References:
6. Webster CRL. To bleed or to clot: Management of hemostatic disorders in small animals with liver disease. ACVIM 2014 proceedings.
8. Aminocaproic Acid Increases Clot Strength and Reduces Clot Lysis in an In Vitro Canine Model of Hyperfibrinolysis. Jamie C. Brown, Ben Brainard, Chad Schmiedt, Daniel Fletcher. ACVS Abstract.