

*“Pearls”  
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Veterinary Medicine*



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**Critical Care**

**Disseminated intravascular coagulation**

Disseminated intravascular coagulation (DIC) arises from systemic inflammatory states such as sepsis, trauma, pancreatitis, or neoplasia. Triggered by endothelial injury and massive thrombin generation, the syndrome shifts the body from a balanced hemostatic state into a pathological cycle of widespread microthrombosis and paradoxical bleeding driven by the consumption of platelets and coagulation factors.

A lesser-known mechanism involves the role of histones which are highly conserved, positively charged nuclear proteins serving as the fundamental building blocks of chromatin. When released by damaged immune cells (such as neutrophils and mast cells) or via neutrophil extracellular traps (NETs) into the extracellular space, they exhibit potent toxic, pro-inflammatory, and pro-thrombotic effects. These proteins further promote vascular endothelial cell apoptosis

and trigger platelet aggregation, directly accelerating thrombus formation.

DIC presents as three clinical phenotypes: the **bleeding** type, characterized by hyperfibrinolysis; the **organ failure** type, marked by hypercoagulation and suppressed fibrinolysis; and the **massive consumptive** type, where intense activation of both processes leads to rapid clinical deterioration. Cats often display fewer overt bleeding signs than dogs, making clinical suspicion vital.

**Diagnosis** should not rely on a single test; instead it depends on the clinical context plus **at least one abnormality** from the following 4 coagulation groups: 1) thrombocytopenia <150,000, 2) prolonged PT/aPTT/ACT, 3) low antithrombin, protein C or protein S activity, or 4) low fibrinogen, and elevated D-dimer or fibrin degradation products (FDPs).

**Thromboelastography** is a useful tool because it can capture the evolving balance between clot formation and breakdown, sometimes detecting hypercoagulability before overt DIC is obvious; however this is not routinely available [\[ref\]](#) [\[ref\]](#) [\[ref\]](#) [\[ref\]](#).

Therapy prioritizes treating the underlying disease and maintaining organ perfusion. Supportive care includes administering **fresh or fresh-frozen plasma to replenish depleted factors (at least 30-50 ml/kg /day given initially at 10 ml/kg/hr and then at 2ml/kg/hr)** or fresh whole blood.

Antifibrinolytics such as **tranexamic acid** may reduce bleeding by inhibiting the breakdown of fibrin particularly if given early to bleeding trauma patients (within 3 hours for people). However, Plumb's notes that tranexamic acid causes emesis in most dogs within a few minutes of administration. [\[ref\]](#)

The benefit of heparin remains debated; however, low-molecular-weight heparins like dalteparin [\[ref\]](#) or

