



HEMOPET

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TREATMENT OF BLEEDING DISORDERS

VON WILLEBRAND'S DISEASE (VWD)

For short-term control of bleeding or prophylaxis for dogs at risk to bleed from vWD (vonWillebrands disease):

1. For elective procedures, assess bleeding potential first with a toenail or mucosal bleeding time. Normal values for dogs are 2-5 minutes.
2. Use **L-thyroxine** therapy at 0.1 mg per 10 pounds body weight twice daily for 7-10 days. Start 48 hours prior to elective surgery where applicable. Continue thyroid replacement if patient is still bleeding or has thyroid disease. Thyroid supplementation promotes hemostasis by improving platelet function, stimulating thrombopoiesis in bone marrow and other sites, and enhancing protein synthesis of von Willebrand factor (vWF) and other coagulation factors.
3. Transfuse **Fresh-Frozen Plasma with High vWF** at 3-5 mL per pound of body weight once or twice daily. For elective procedures (e.g. surgery on Doberman pinchers with vWD), transfuse first and then perform surgery **within 4 hours** to maximize the bleeding time correcting effect of transfused vWF.
4. For patients with PCV at or below 15%, transfuse **Packed Red Blood Cells** in saline at 3-5 mL per pound given once or twice daily. The packed cells can also be given sequentially or mixed with **Fresh-Frozen Plasma with High vWF** and transfused as reconstituted whole blood (see Product Inserts for detailed options).
5. **Avoid drugs or biologics** that impair hemostasis and/or induce thrombocytopenia. These include:
 - trimethoprim – sulfonamides
 - ormetoprim – sulfonamide
 - aspirin
 - promazine tranquilizers
 - phenylbutazone
 - modified-live virus vaccines
 - estrogens
 - heparin
 - warfarin
 - furacin

RODENTICIDE TOXICOSIS (Vitamin K Deficiency)

1. Identify toxicant and manage case to induce vomiting as indicated.
2. Use **vitamin K₁** by subcutaneous, intramuscular, or oral routes at 1 mg per pound body weight once or twice daily for 7-10 days; taper dosage gradually each week over the next 30 days depending on the potency and half-life of the rodenticide involved. (When in doubt, assume that toxin is one of the long-acting more potent compounds). Do **not** give vitamin K by intravenous route as anaphylaxis can occur. Several hours are required to correct the coagulopathy once vitamin K is incorporated into synthesis of prothrombin complex coagulation factors.
3. Transfuse **Fresh-Frozen Plasma** at 3-5 mL per pound of body weight once or twice daily.
4. For patients with PCV at or below 15%, transfuse **Packed Red Blood Cells** along with **Fresh-Frozen Plasma**, each to be given at 3-5 mL per pound once or twice daily, either sequentially, or after premixing to reconstitute as whole blood (see Product Inserts for additional details).

THROMBOCYTOPENIA

1. **Identify underlying cause** (e.g. immune-mediated, infectious, neoplasia, drug-induced, etc.) and treat as appropriate.
2. Use **L-thyroxine** therapy at 0.1 mg per 10 pounds body weight twice daily for 7-10 days. Start 48 hours prior to elective surgery where applicable. Continue thyroid replacement if patient is still bleeding or has thyroid disease. Thyroid supplementation promotes hemostasis by improving platelet function, stimulating thrombopoiesis in bone marrow and other sites, and enhancing protein synthesis of von Willebrand factor and other coagulation factors.
3. For patients with PCV at or below 15%, transfuse **Packed Red Blood Cells** in saline at 3-5 mL per pound (or equivalent volumes of fresh whole blood) given once or twice daily. There are insufficient numbers of platelets in freshly collected whole blood to achieve hemostasis in severe thrombocytopenia or thrombopathia (platelet dysfunction). However, the plasma component and platelets present can provide some thrombopoietic and hemostatic benefit to sustain the patient until the underlying problem and requisite therapy have been managed.
4. For control or prophylaxis in special situations of severe, chronic thrombocytopenia (e.g. oncology patients on chemotherapy) or acute life-threatening bleeding from thrombocytopenia, fresh **Platelet-Rich Plasma** (PRP) can be provided. This treatment is **not** recommended routinely for immune thrombocytopenia as platelets are rapidly destroyed. Repeated use of PRP is **not** advised as immune sensitization (alloimmunization) to platelets and white blood cells is likely to develop. To reduce alloimmunization, PRP should be processed after collection through a special filter set that removes most of the white blood cells. Only filtered PRP should be used for sustaining the platelet needs of chemotherapy or other patients with severe platelet disorders.
5. **Avoid drugs or biologics** that impair hemostasis and/or induce thrombocytopenia. These include:
 - trimethoprim – sulfonamides
 - ormetoprim – sulfonamide
 - aspirin
 - promazine tranquilizers
 - phenylbutazone
 - modified-live virus vaccines
 - estrogens
 - heparin
 - warfarin
 - furacin

OTHER BLEEDING DISORDERS

1. Follow general directions for treatment or prophylaxis of von Willebrand's disease. Continue therapy as long as needed to control bleeding. See Product Insert for more details or call Hemopet for further case consultation.
2. For **disseminated intravascular coagulation** (DIC), identify underlying cause and remove or ameliorate. Give **Fresh-Frozen Plasma** and/or **Packed Red Blood Cells** as needed to sustain PCV at or around 15%. Use plasma only when fibrinogen level is below 75 mg/dL or patient is experiencing life-threatening bleeding. Use antiplatelet drugs (e.g. aspirin) and/or heparin as indicated at standard therapeutic dosages. Call Hemopet for further consultation on case management.