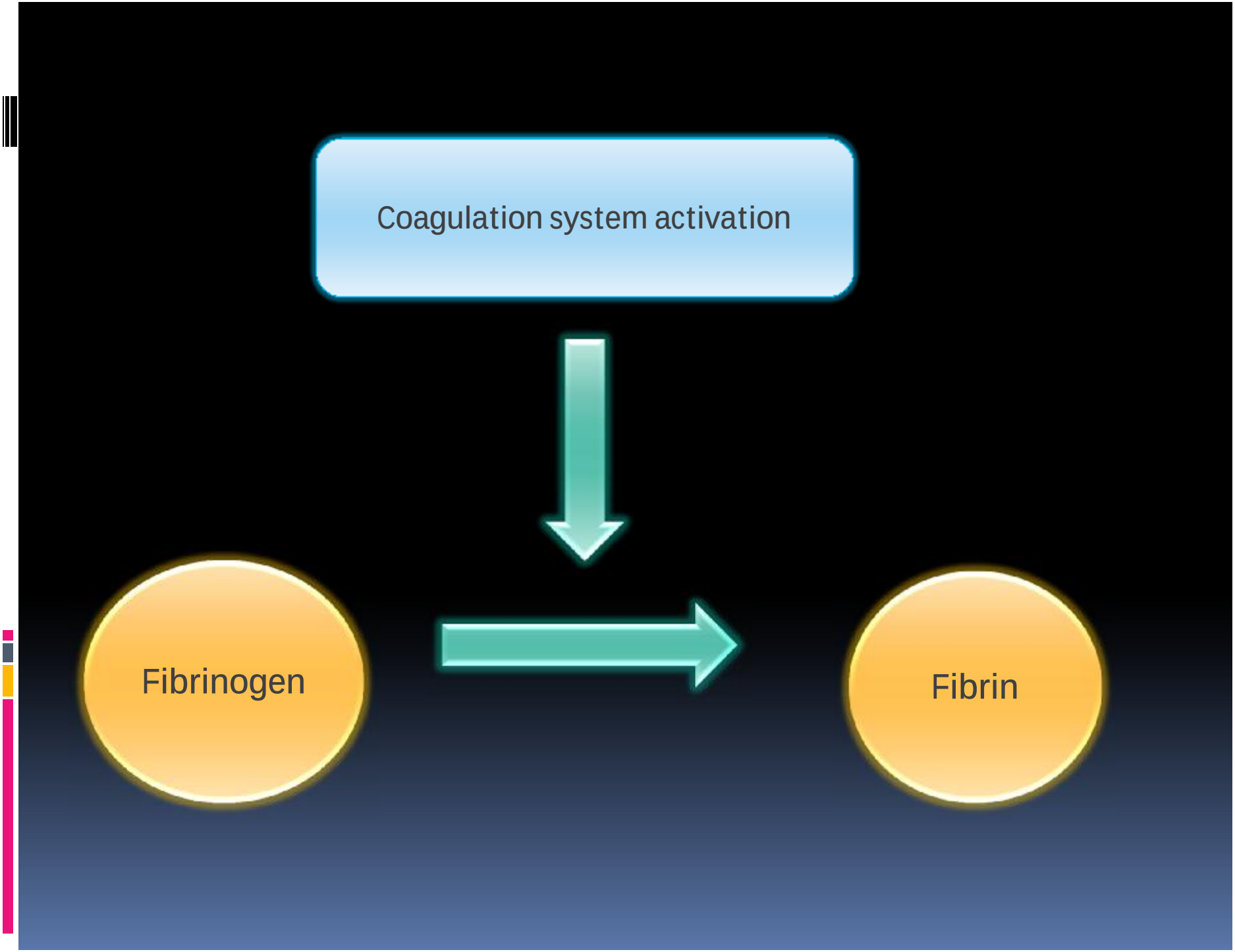
VON WILLEBRAND DISEASE
DISSEMINATED INTRAVASCULAR COAGULATION

- A 12-year-old boy is noted to bleed excessively during an
- elective dental extraction. Following the procedure, examination reveals petechial skin haemorrhages. Blood results show:
- Hb 12.3 g/dl
- Plt 255 * 109/l
- WBC 7.9 * 109/l
- PT 13.3 secs
- APTT 39 secs
- Factor VIII activity 87%
- What is the most likely diagnosis

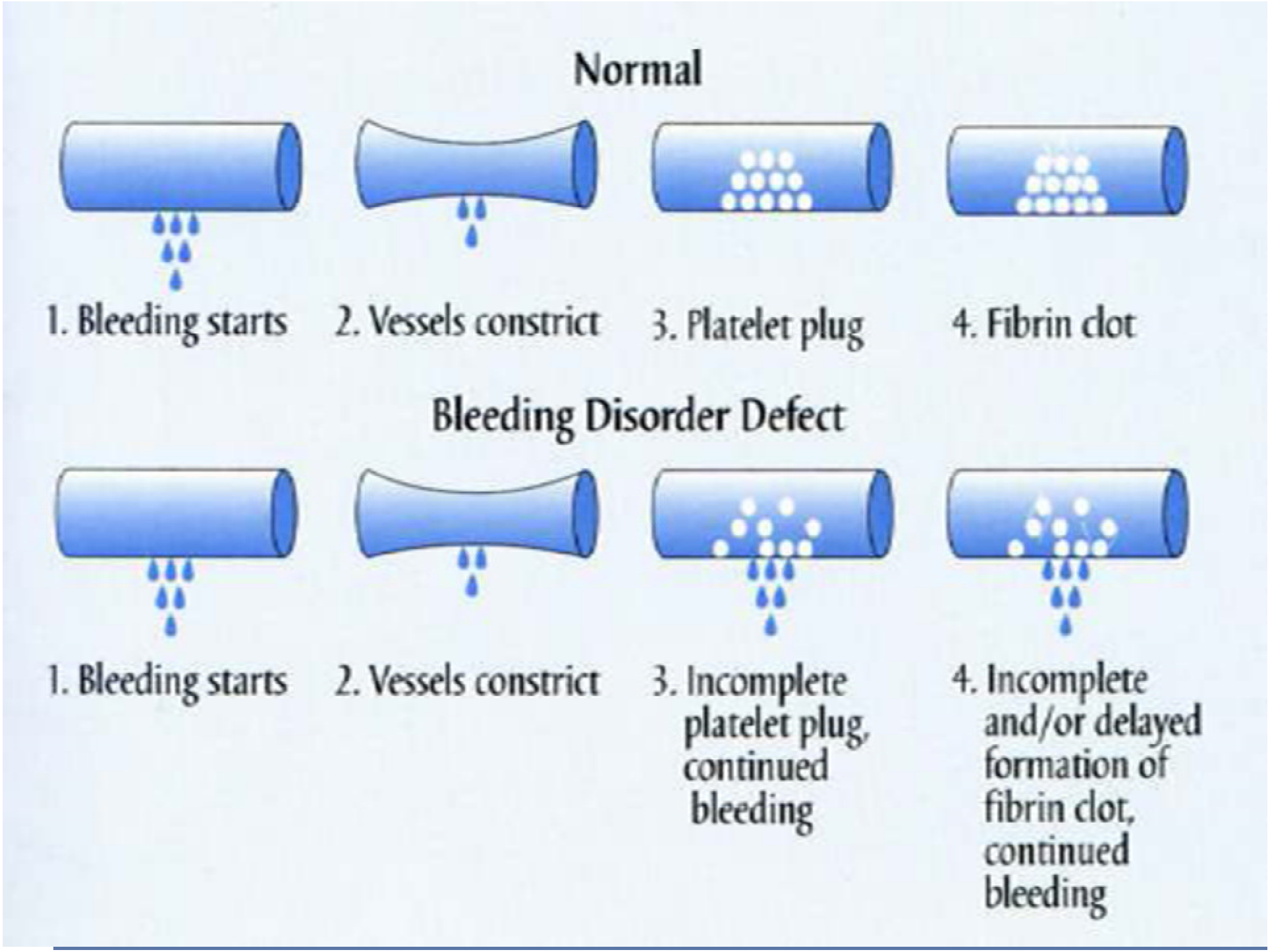


Von Willebrand disease (vWD)

- vWD is a common, inherited, clinically heterogeneous hemorrhagic disorder caused by a deficiency or dysfunction of the protein termed von Willebrand factor (vWF).
- vWD is inherited in an autosomal fashion.

- vWF is released from platelets and endothelial cells.
- It performs 2 major roles in hemostasis.

1. It mediates the adhesion of platelets to sites of vascular injury.
2. It binds and stabilizes factor VIII, therefore results in a secondary reduction in the plasma factor VIII level.



Types of vWD

Type	Percentage	Inheritance	Type of defects
Type I	75-80%	AD	Quantitative deficiency of vWF
Type II (A, B, M, N)	20%	AD, AR	Functional deficiency of vWF activity
Type III	Very rare	AR	Complete deficiency of vWF

Clinical features

- Hemorrhagic manifestations similar to those in individuals with reduced platelet function:
  - Superficial bruising,
  - Epistaxis
  - Menorrhagic and
  - Gastrointestinal hemorrhage

- Bleeding episodes are usually much less common than in severe hemophilia
- Severe hemorrhage after major surgery is less common but prolonged bleeding after minor trauma to skin or mucous membranes
- Within a single family the disease can be of very variable.

Investigations

- Prolonged APTT.
- Reduced level of factor VIII
- Reduced level of vWF and or activity
- Prolongation of the bleeding time

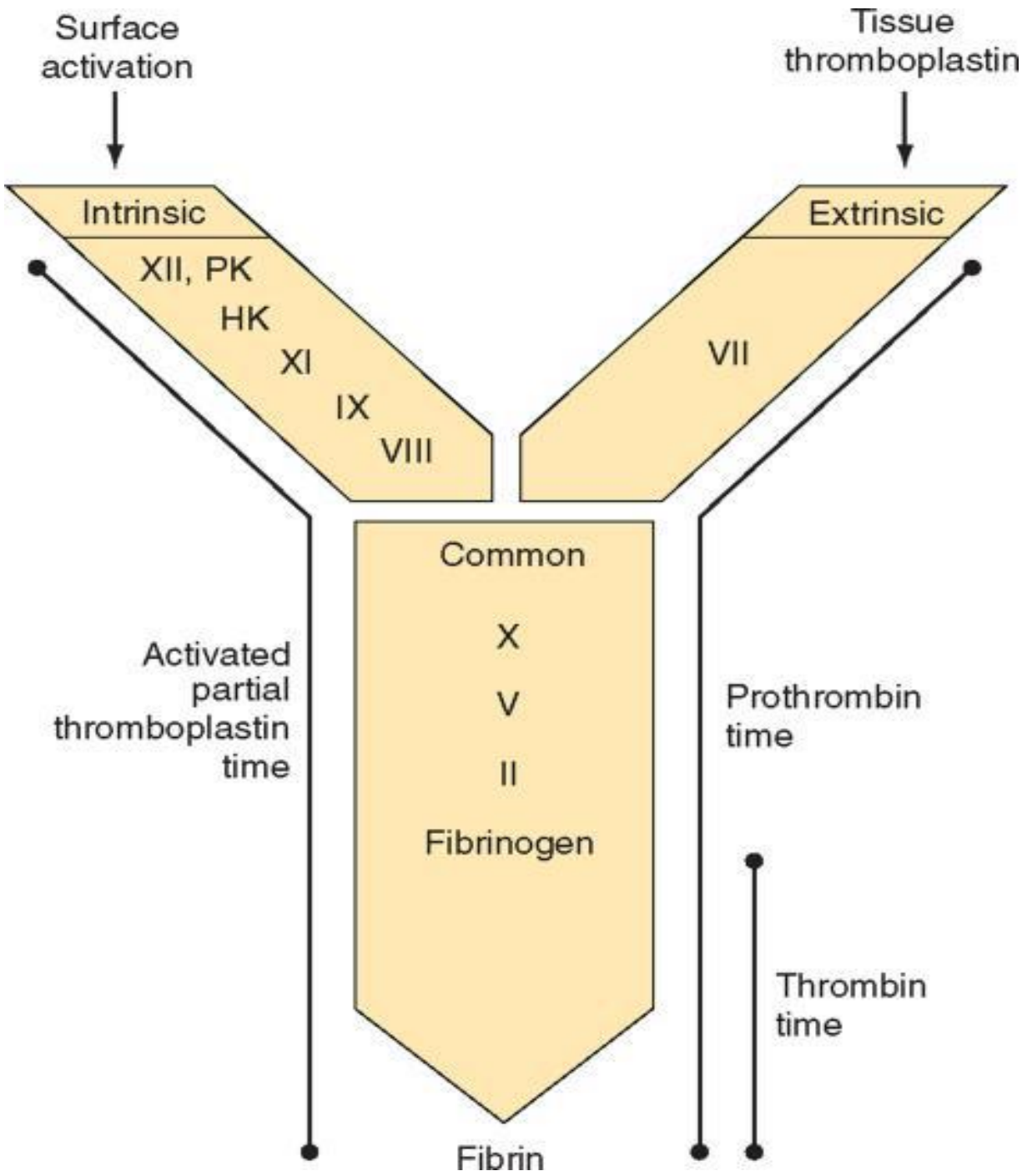
Treatment

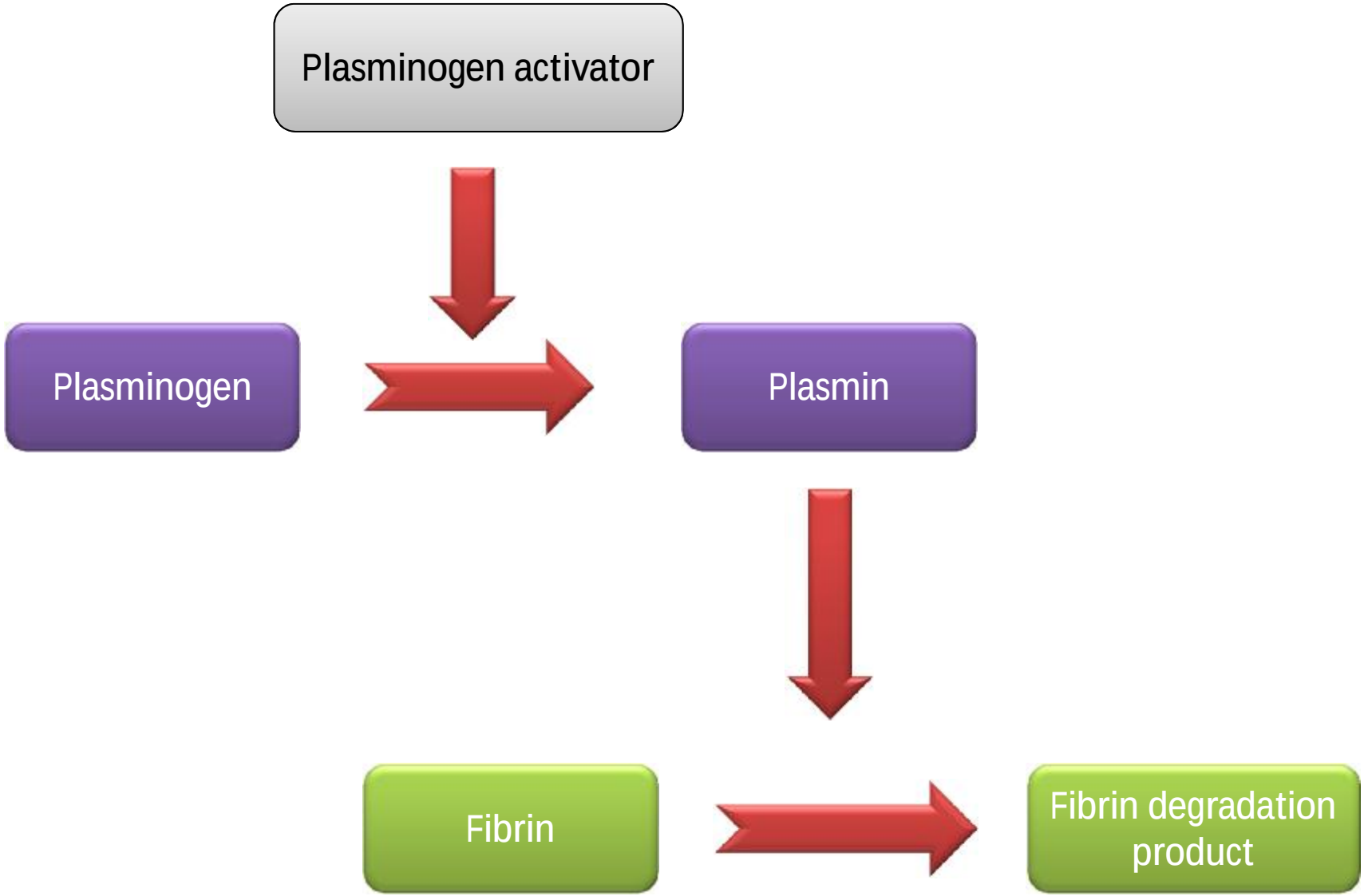
- The mainstay of treatment for type I VWD and some patient of type II (A and M) is desmopressin, which results in release of VWF and FVIII from endothelial stores.

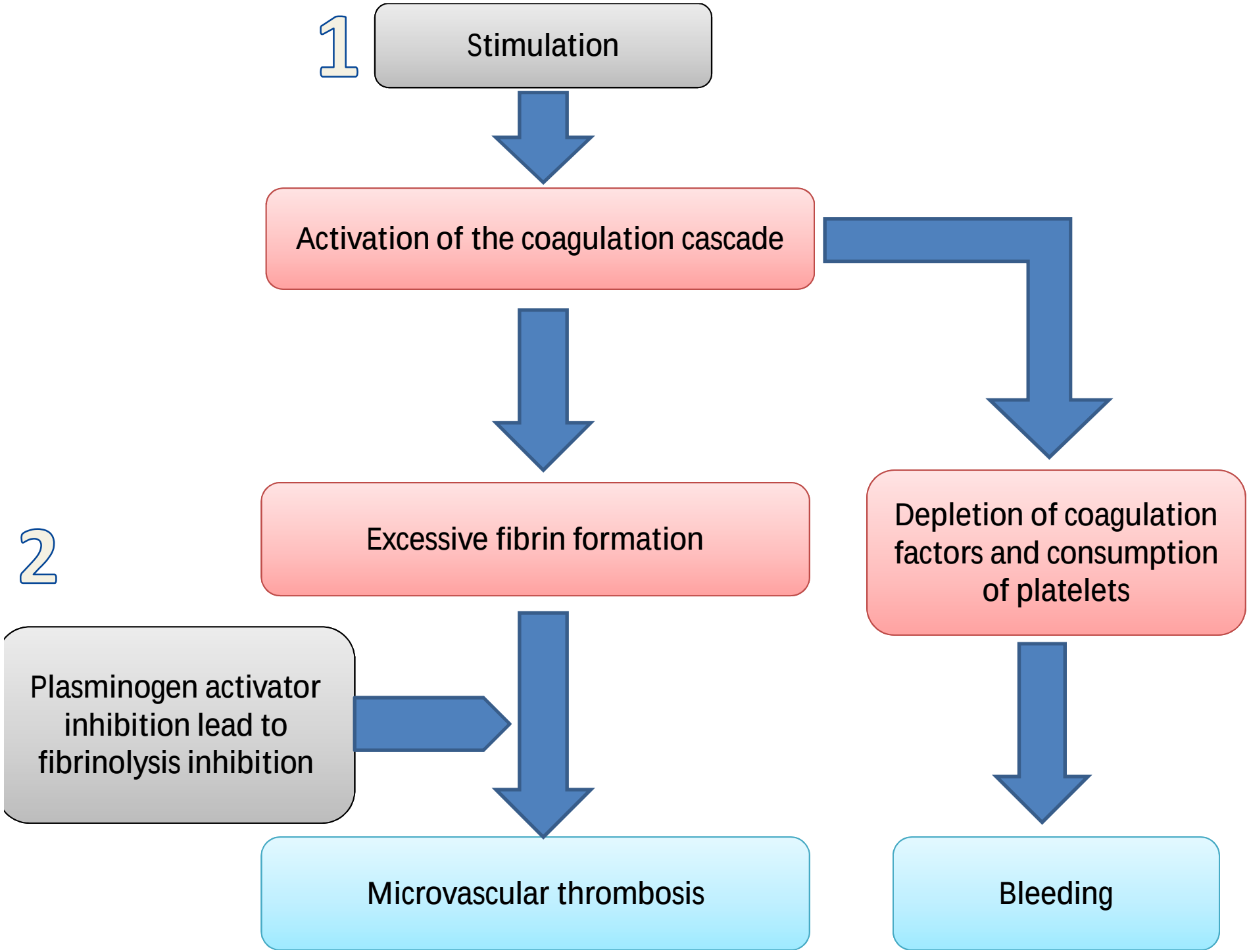
- VWF-containing factor concentrates or cryoprecipitate
  - Type IIB, IIN, and for type 3 disease,
  - For major procedures requiring longer periods of normal hemostasis.
- Antifibrinolytic is an important therapy, either alone or in an adjunctive capacity, particularly for the prevention or treatment of mucosal bleeding.

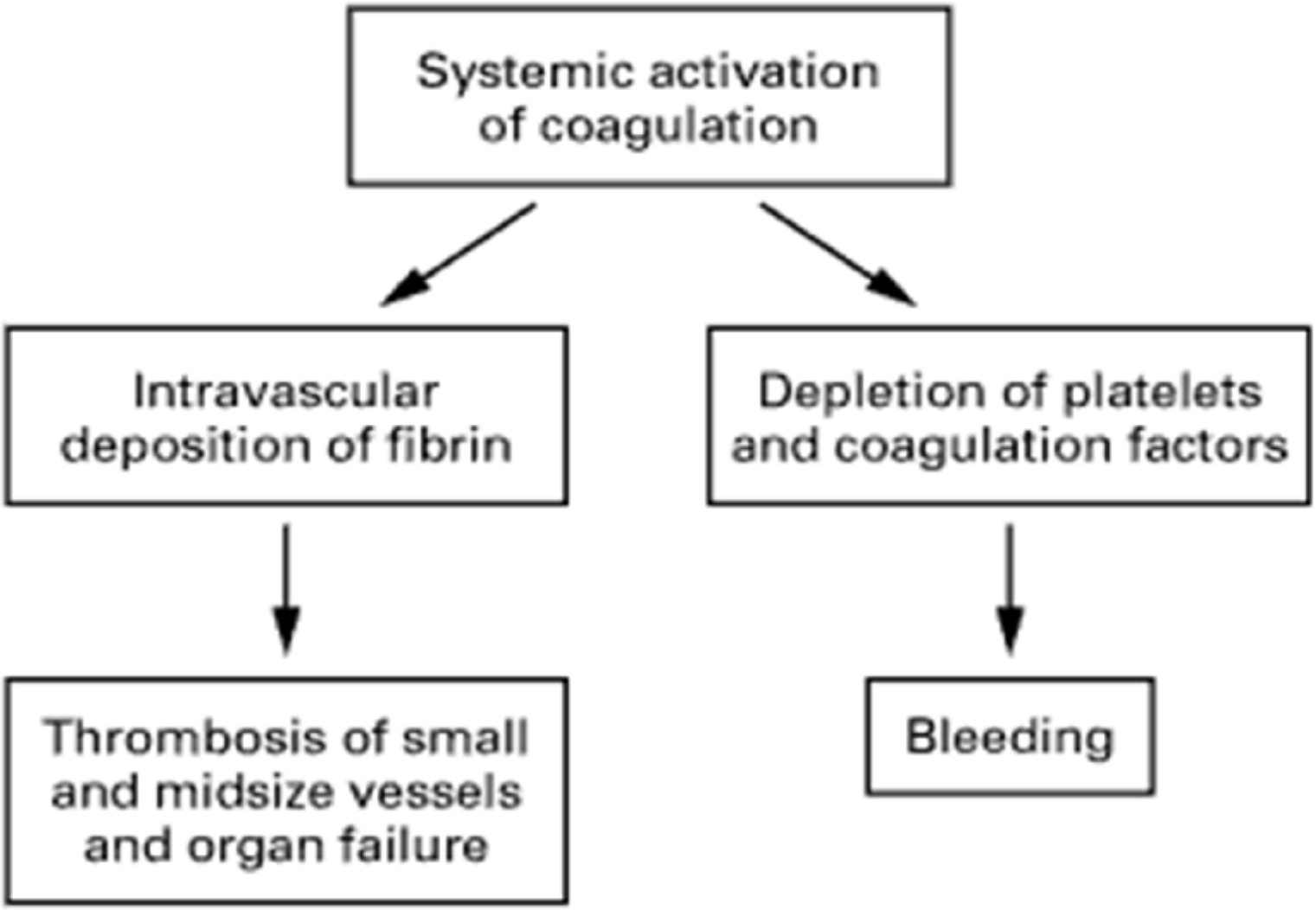
Disseminated Intravascular Coagulation (DIC)

- It is a systemic process producing both *thrombosis and hemorrhage* caused by systemic activation of blood coagulation, which results in generation and deposition of fibrin, leading to microvascular thrombi in various organs and contributing to multiple organ dysfunction syndrome.









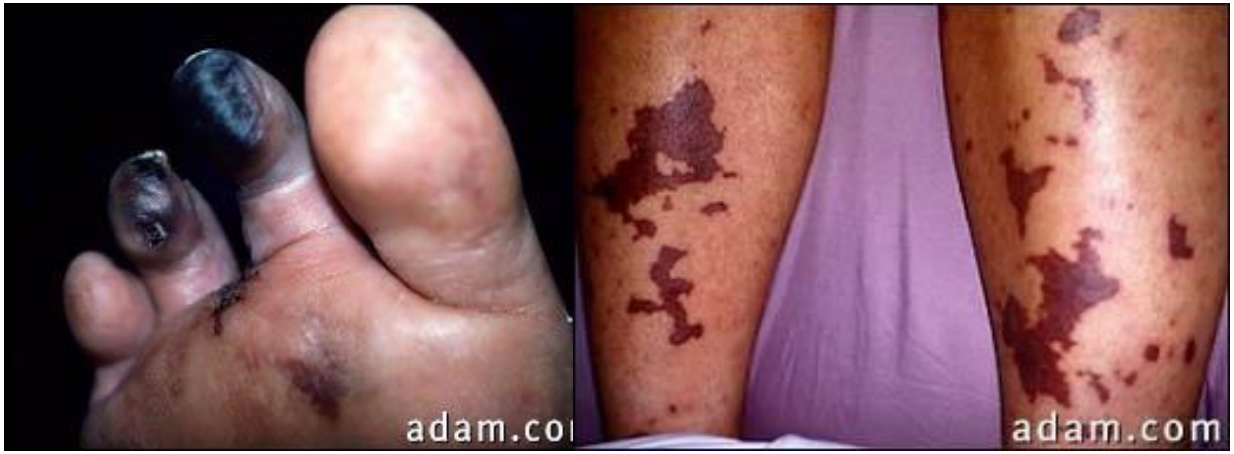
Etiology

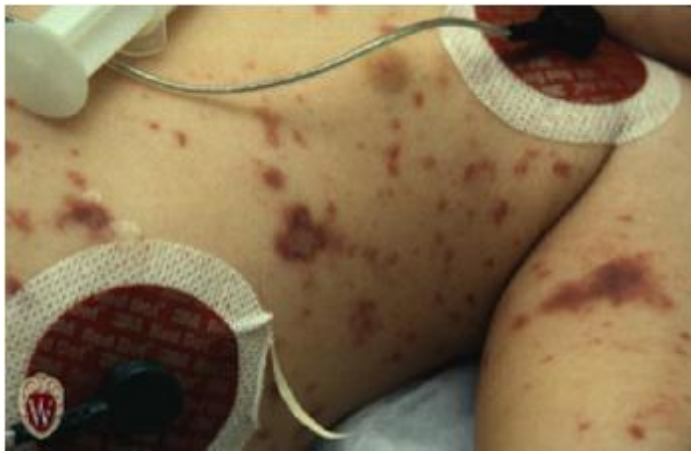
- Infection and sepsis
- Cancer
- Obstetric: placental abruption, retained dead fetus, pre-eclampsia, amniotic fluid embolism
- Liver failure
- Acute pancreatitis
- Immunological: snake bite, ABO incompatibility

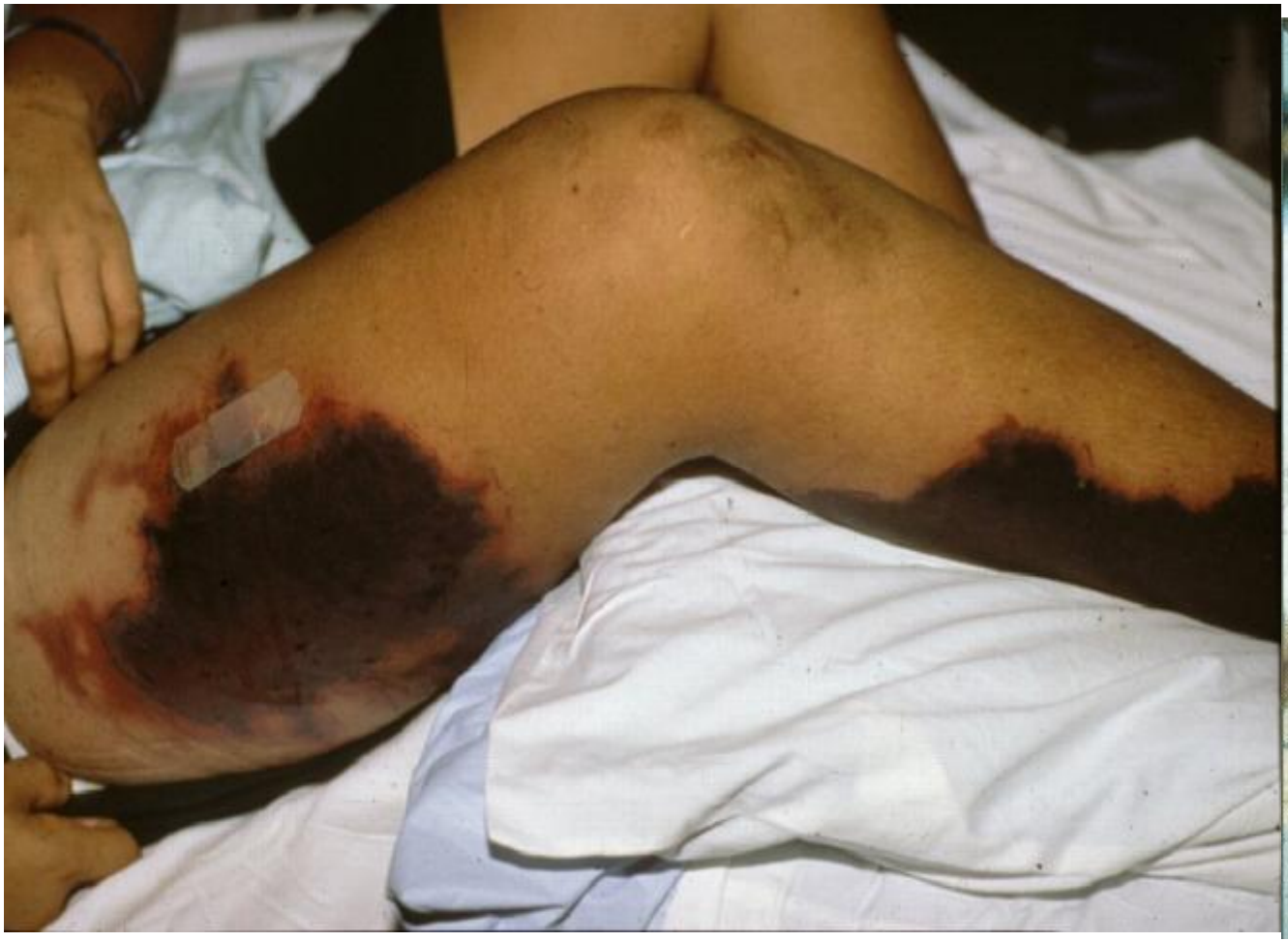
Clinical features

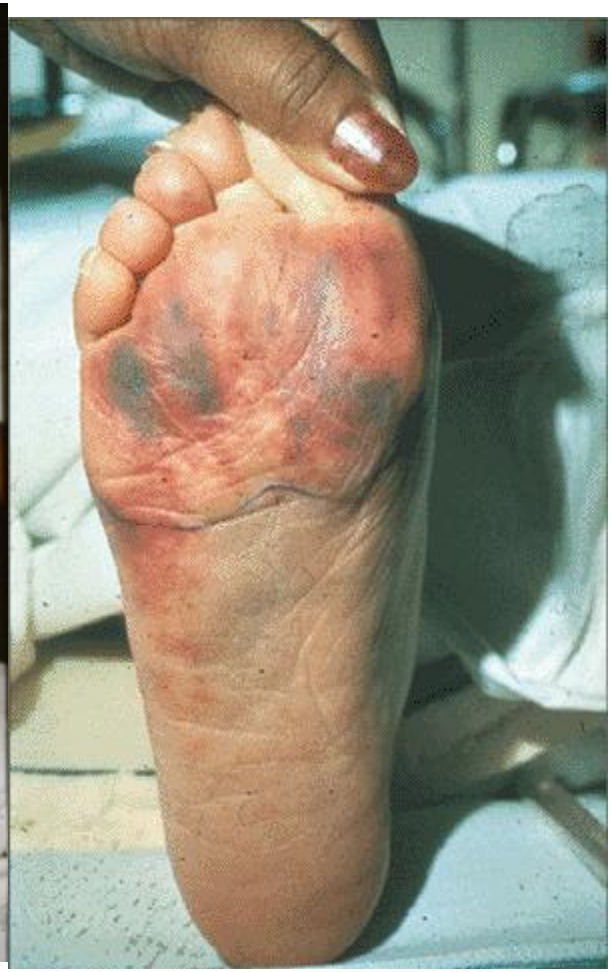
- The clinical manifestations of the underlying stimulus.
- Low-grade DIC is often asymptomatic.
- Bleeding:
  - Hemorrhage into the skin (petechiae, ecchymoses, and oozing from venipunctures).
  - Bleeding also may occur on mucosal surfaces (GIT, lungs, CNS, or orbit).

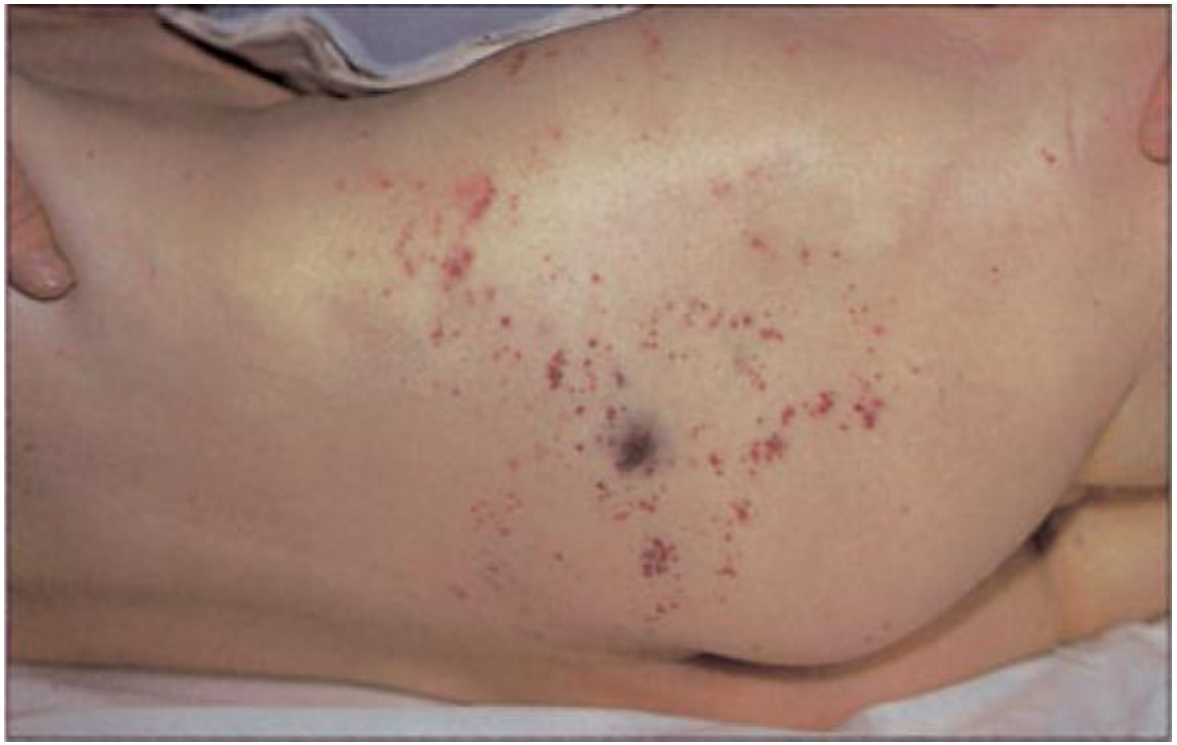
- Thrombotic complications of DIC :
  - Gangrene of the digits or extremities, hemorrhagic necrosis of the skin, or purpura fulminans.
  - Extensive organ dysfunction can result from microvascular thrombi or from venous and/or arterial thromboembolism.
- Shock

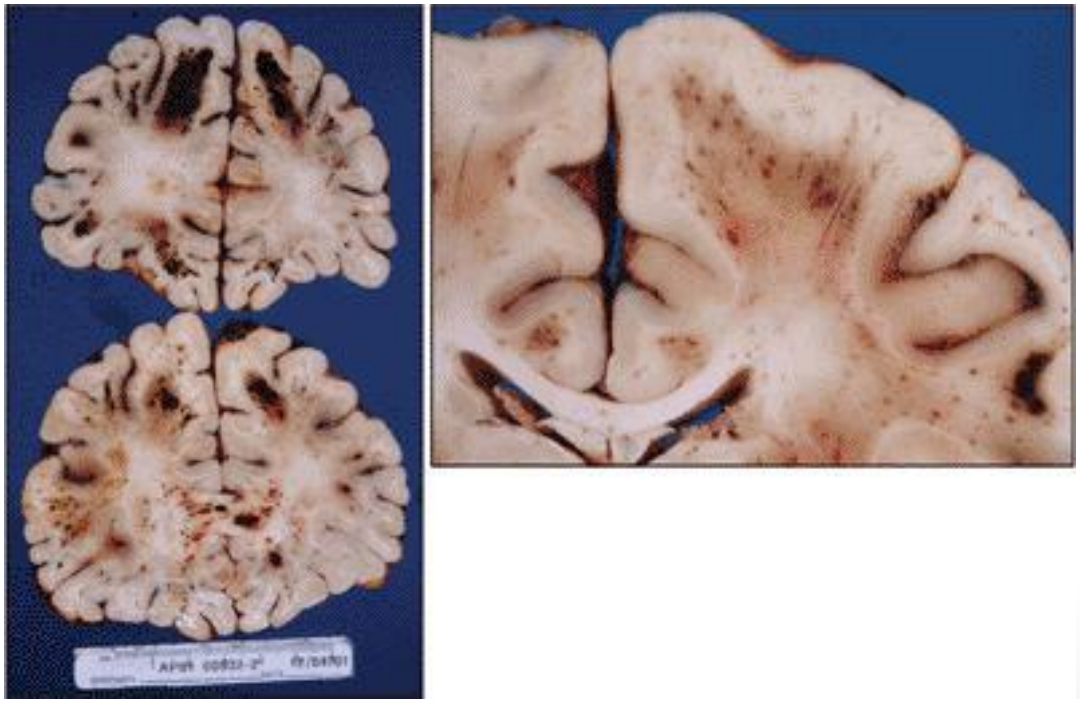






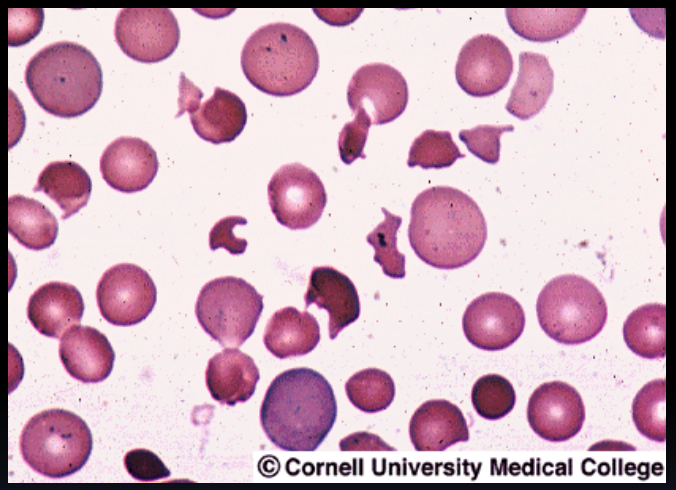






Investigations

- Thrombocytopenia (<100,000 * 109) or a rapid decline in the platelet count
- Prolongation of the PT and APTT
- Low fibrinogen, and increased fibrinogen degradation products and D-dimer levels



Management

- The underlying cause
- Hemodynamic support
- Blood component therapy: active bleeding or high risk for bleeding (Fresh-frozen plasma, Platelets, Cryoprecipitate)

- Drug therapy
  - Heparin for DIC manifested by thrombosis or acrocyanosis;
  - Antifibrinolytic agents generally contraindicated except with life-threatening bleeding and failure of blood component therapy

Thrombotic thrombocytopenic purpura (TTP)

- TTP is a life-threatening disorder characterized by platelet aggregation and thrombosis in the microvasculature; it results in thrombocytopenia, hemolytic anemia, organ ischemia.

- Clinically there is a pentad of diagnostic features: thrombocytopenia, microangiopathic hemolytic anemia, fluctuating neurological signs, renal impairment and fever.
- Treatment with fresh frozen plasma given during daily plasma exchange.