Hemophilia

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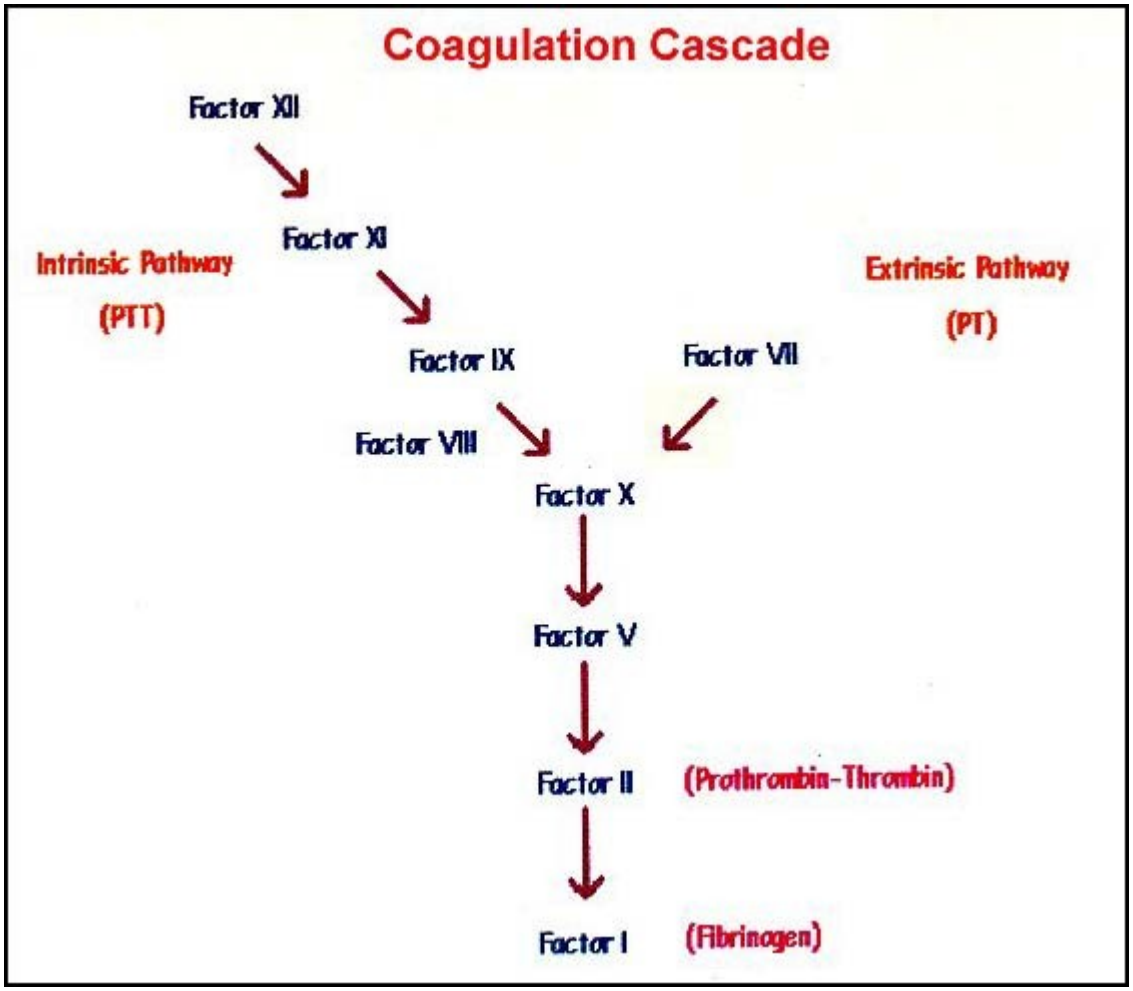

Coagulation Cascade
Factor XII
Factor XI
Intrinsic Pathway
(PTT)
Extrinsic Pathway
(PT)
Factor IX
Factor VII
Factor VIII
Factor X
Factor V
Factor II
(Prothrombin-Thrombin)
Factor I
(Fibrinogen)

Mechanisms of bleeding

- Vascular Integrity
- Platelets
- Clotting factors
- Fibrinolysis

- Any derangement of of these factors can cause abnormal bleeding

Key to diagnosis

- History
- History
- History

Bleeding history

- Epistaxis
- Gingival hemorrhage
- Mucosal Bleeding
- Heavy Menses
- Child birth
- Easy bruisability
- Bleeding following tooth extractions
- Hematomas
- Bleeding following surgery
- Hemarthrosis

Clinical Characterisitc	Platelet defect	Clotting factor deficiency
Site of bleeding	Skin, mucous membranes (gingivae, nares, GI and genitourinary tracts)	Deep in soft tissues (joints, muscles)
Bleeding after minor cuts	Yes	Not usually
Petechiae	Present	Absent
Ecchymoses	Small, superficial	Large, palpable
Hemarthroses, muscle hematomas	Rare	Common
Bleeding after surgery	Immediate, mild	Delayed, severe

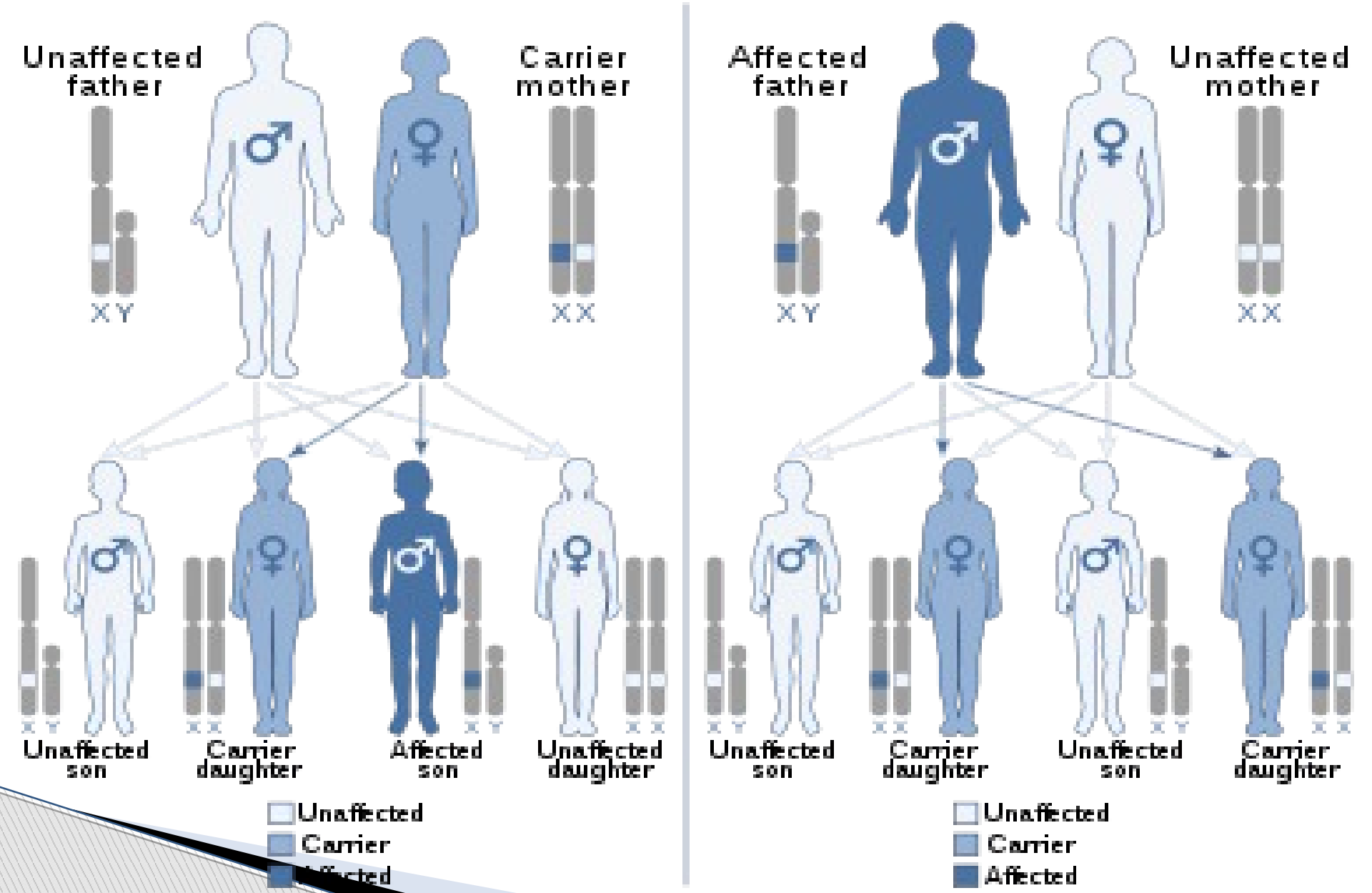
Hereditary Coagulation Disorders

- Hereditary deficiencies of each of the Coagulation factors have been described.
- Haemophilia A (Factor **VIII** Deficiency).
- Haemophilia B (Factor **IX** Deficiency).
- Von Willebrand Disease.

Haemophilia A

- Most common hereditary clotting factor deficiency.
- Most common hereditary cause of serious bleeding.
- It is an **X-linked** recessive disorder caused by reduced factor VIII activity.
- Primarily affects males but females also (unfavourable Lyonization)

X-linked recessive



Note: a few [illegible] may be mildly affected due to skewed X-inactivation.

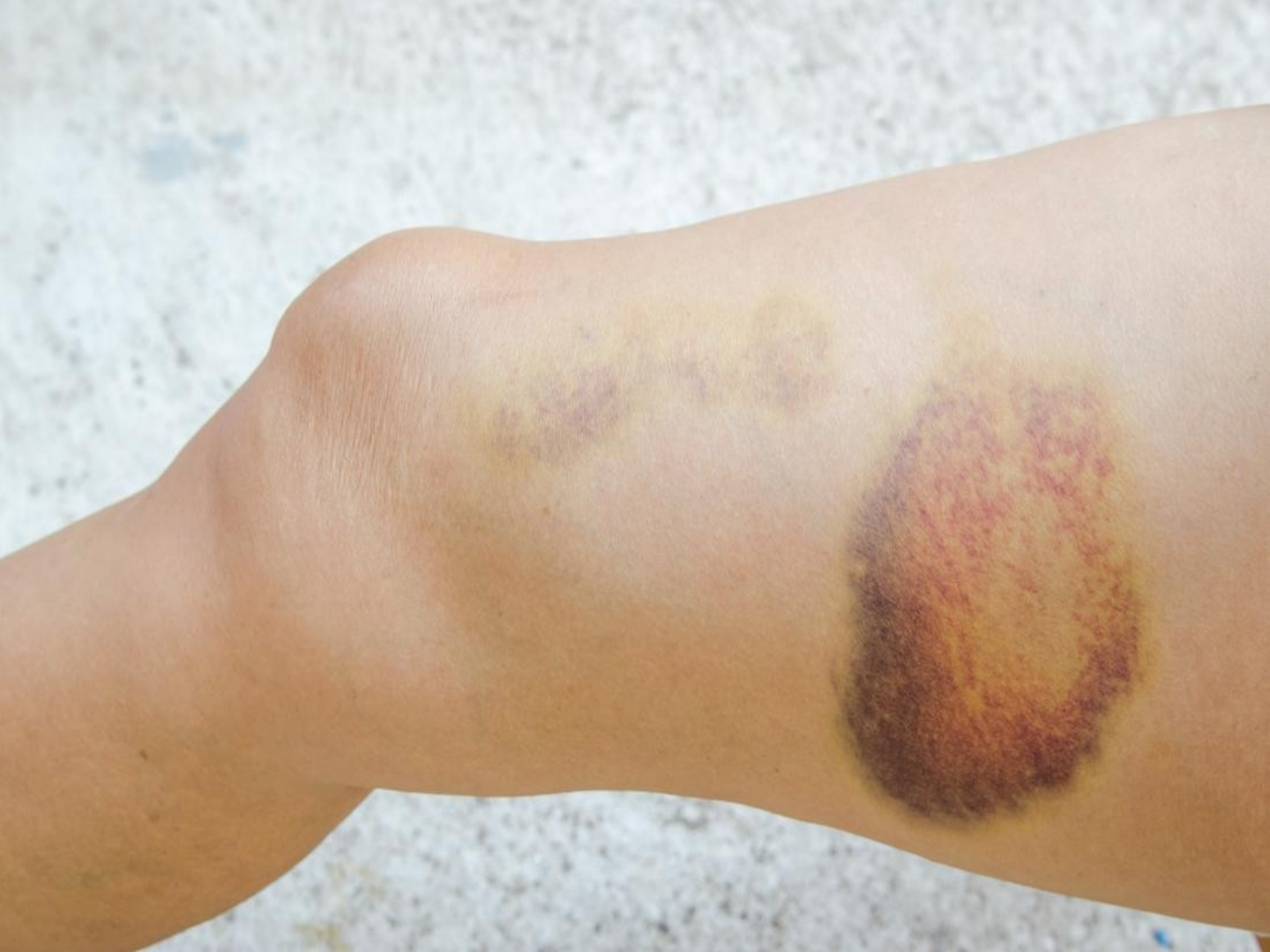
Molecular Genetics

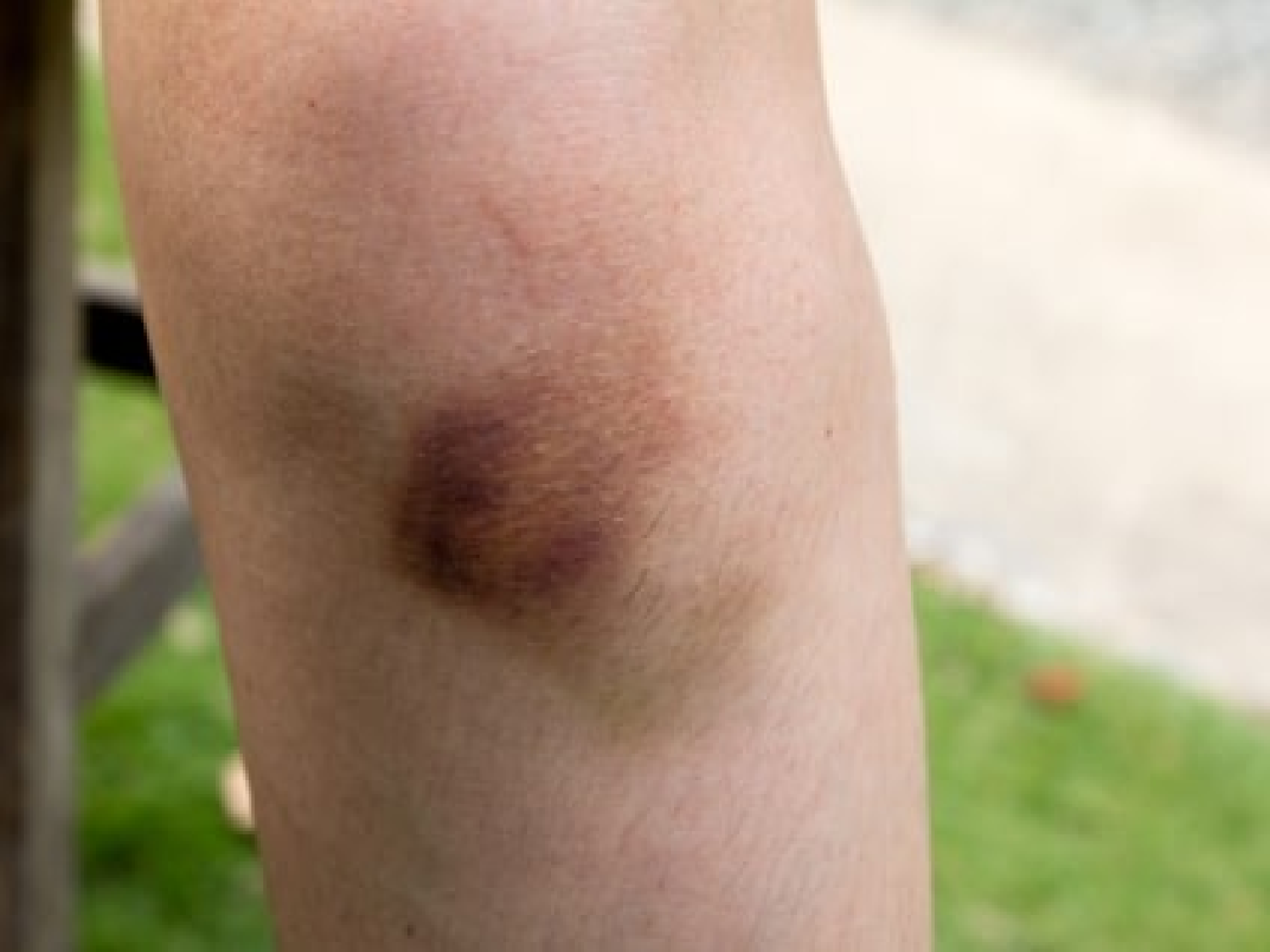
- The factor VIII gene is situated near the long arm of X chromosome.

- Approximately half of the patients have **missense** or **frameshift** mutations or deletions in the factor VIII gene.

Clinical Features

- Infants may develop profuse post-circumcision haemorrhage or joint and soft tissue bleeds and excessive bruising when they start to be active.
- Recurrent painful haemarthroses and muscle haematomas in severely affected patients.
- Prolonged bleeding after dental extractions, spontaneous haematuria & GIT Haemorrhage.

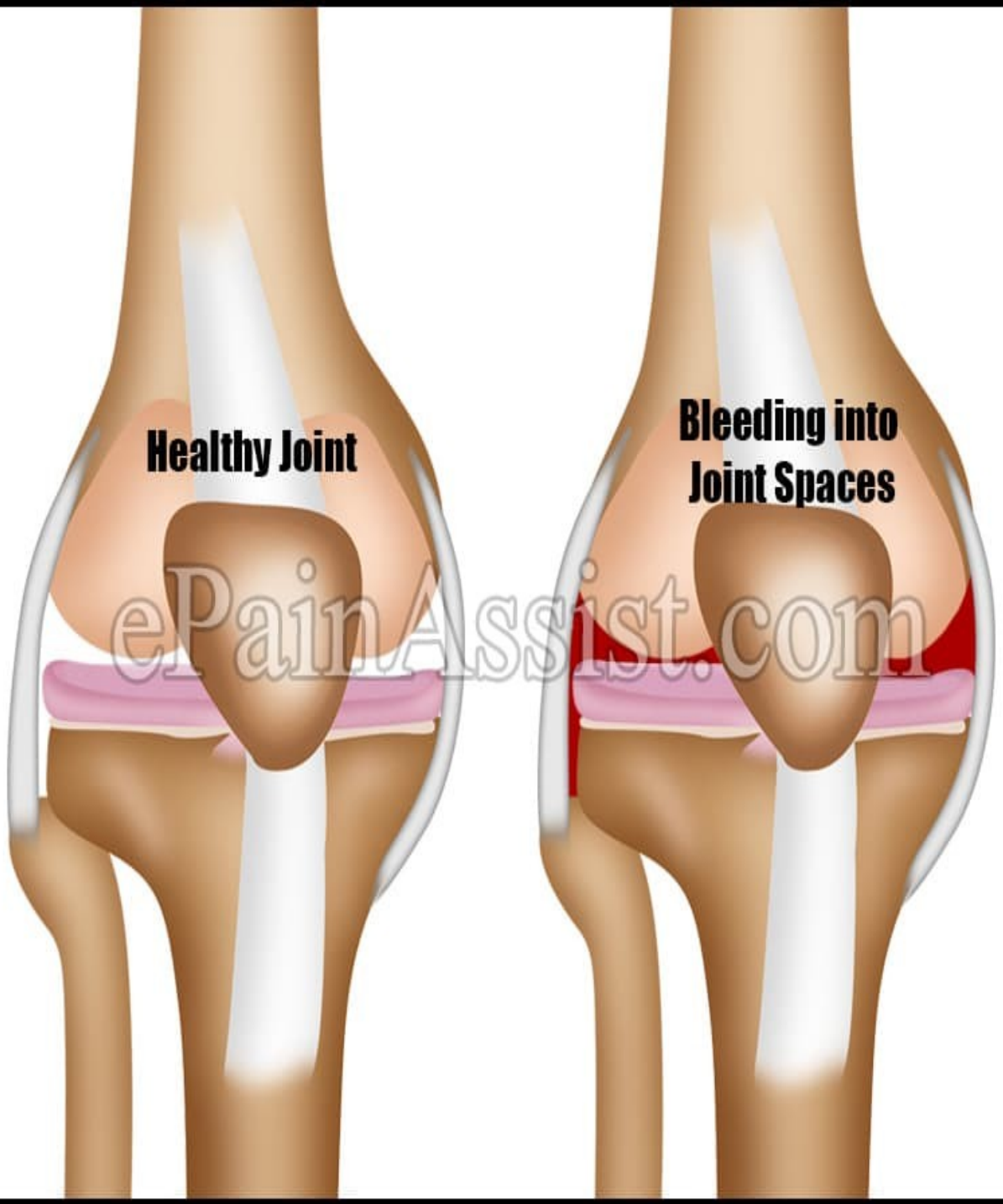




What is Hemarthrosis?

Hemarthrosis is a pathological condition of the joint characterized by bleeding into the joint cavity.

For More Information:
Visit: www.epainassist.com



Clinical severity

- Severe hemophilia - FVIII level less than **1%** of normal (< 0.01 IU/mL)
- Moderate hemophilia - FVIII level **1-5%** of normal (0.01-0.05 IU/mL)
- Mild hemophilia - FVIII level more than **5% but less than 40%** of normal (>0.05 to < 0.40 IU/mL)

Correlation of coagulation factor activity and disease severity in Haemophilia A or B .

Coagulation factor activity (percentage of normal)	Clinical manifestations
<1	Severe disease Frequent spontaneous bleeding into joints, muscles, internal organs from early life Joint deformity and crippling if not adequately prevented or treated
1–5	Moderate disease Bleeding after minor trauma Occasional spontaneous episodes
>5	Mild disease Bleeding only after significant trauma, surgery

Laboratory Findings

- The following tests are abnormal
- Activated partial thromboplastin time

- Factor VIII clotting assay.

- The platelet function analysis-100 and Prothrombin time are normal.

Haemophilia B

- Inheritance and clinical features are similar to Haemophilia A.
- Factor **IX** deficiency.
- Its synthesis is Vitamin K dependent.
- The incidence is one-fifth that of haemophilia A.

Laboratory Findings

- The following tests are abnormal
- APTT
- Factor IX clotting assay.
- BT and PT normal.

	Haemophilia A	Haemophilia B
Inheritance	X-Linked	X-Linked
Main sites of Haemorrhage	Muscle, joints, post-trauma or post operative.	Muscle, joints, post-trauma or post operative.
Platelet Count	Normal	Normal
PFA-100	Normal	Normal
Prothrombin time	Normal	Normal
Partial Thromboplastin Time	Prolonged	Prolonged
Factor 8	Low	Normal
Factor 9	Normal	Low

Haemophilia C

- **Factor XI** deficiency is a rare genetic bleeding disorder caused by reduced levels and insufficient activity of a blood protein called factor XI.

Management

- Bleeding episodes are treated with factor VIII replacement therapy, and spontaneous bleeding is usually controlled if the patient's factor VIII level is raised to 30-50% of normal.

- For major surgery, serious post traumatic bleeding or when haemorrhage is occurring at a dangerous site, the factor VIII level should be elevated to 100% and then maintained above 50%.

Management

- DDAVP provides an alternative means of increasing the plasma factor VIII level in milder haemophiliacs.

- Local supportive measures used in treating haemarthroses include
- RICE: Rest, Ice, Compression, Elevation.


thank
you