

SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr MGR Medical University, Chennai

DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE TECHNOLOGY

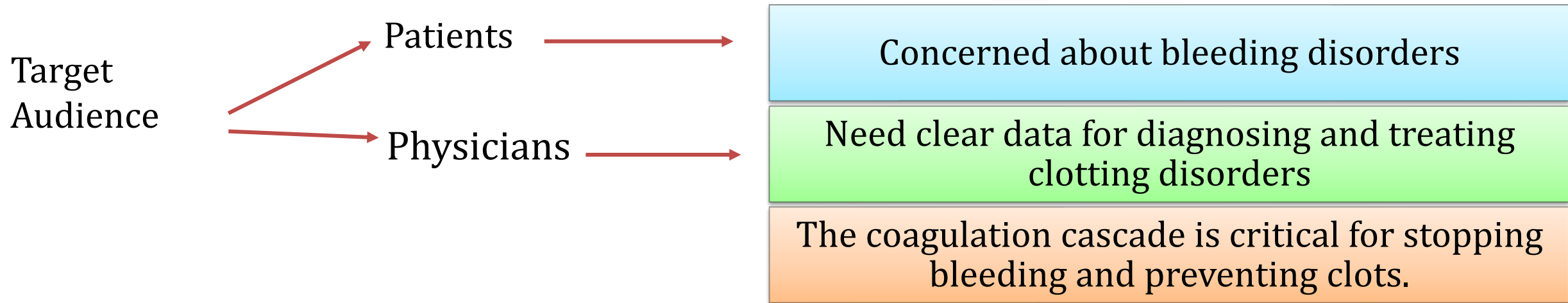
COURSE NAME: Physiology

UNIT I : Blood

TOPIC: Coagulation cascade

FACULTY NAME: Mrs. Saranyaa Prasath

Empathize - Why the Coagulation Cascade Matters



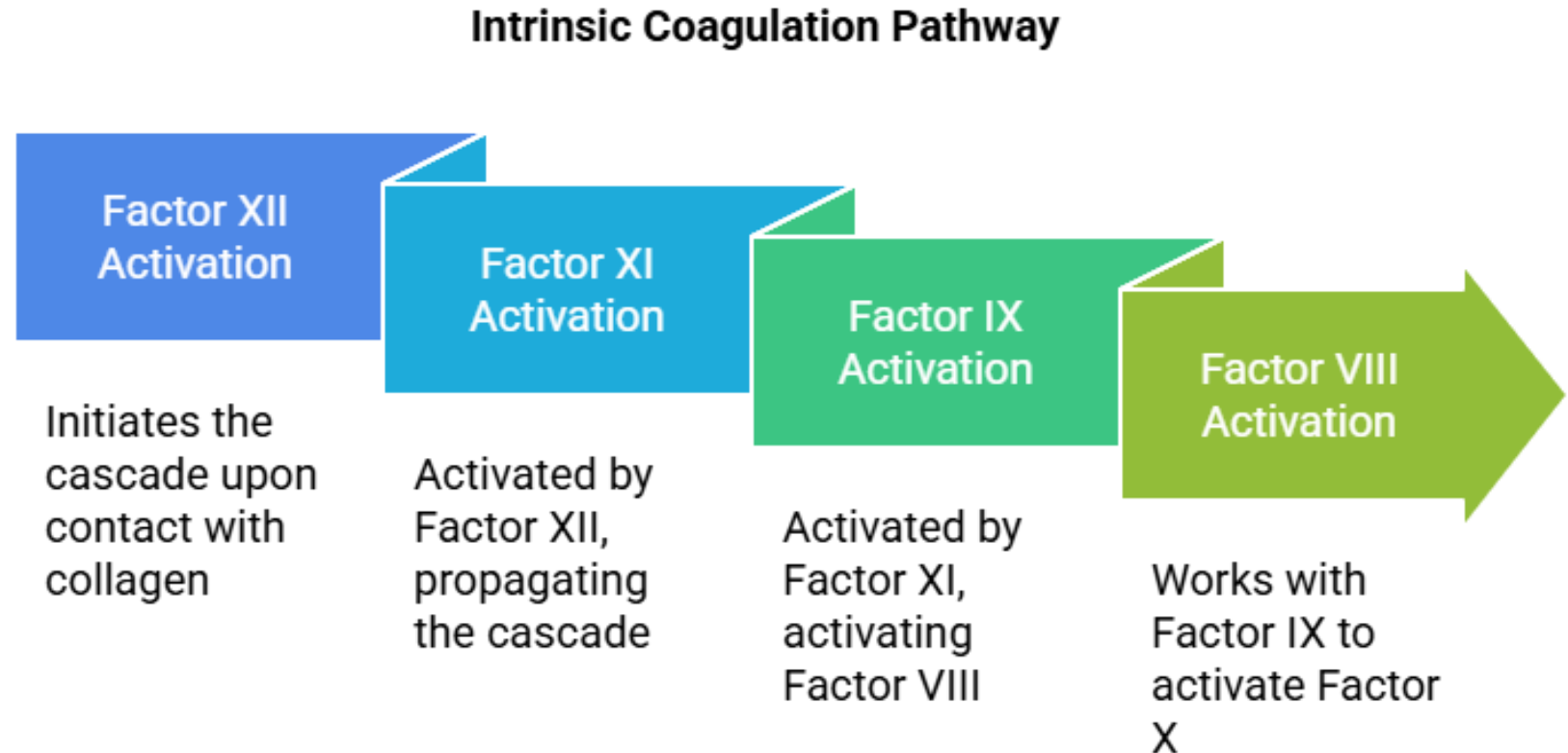
Case Study:

A 10-year-old boy is brought to the emergency department with swelling and pain in his right knee after a minor fall. He has a history of frequent nosebleeds and prolonged bleeding after minor cuts.

Define - What Is the Coagulation Cascade?

What is Coagulation?

- Coagulation is the process by which blood forms a clot to stop bleeding after vessel injury.
- A series of enzymatic reactions that form a blood clot to stop bleeding.

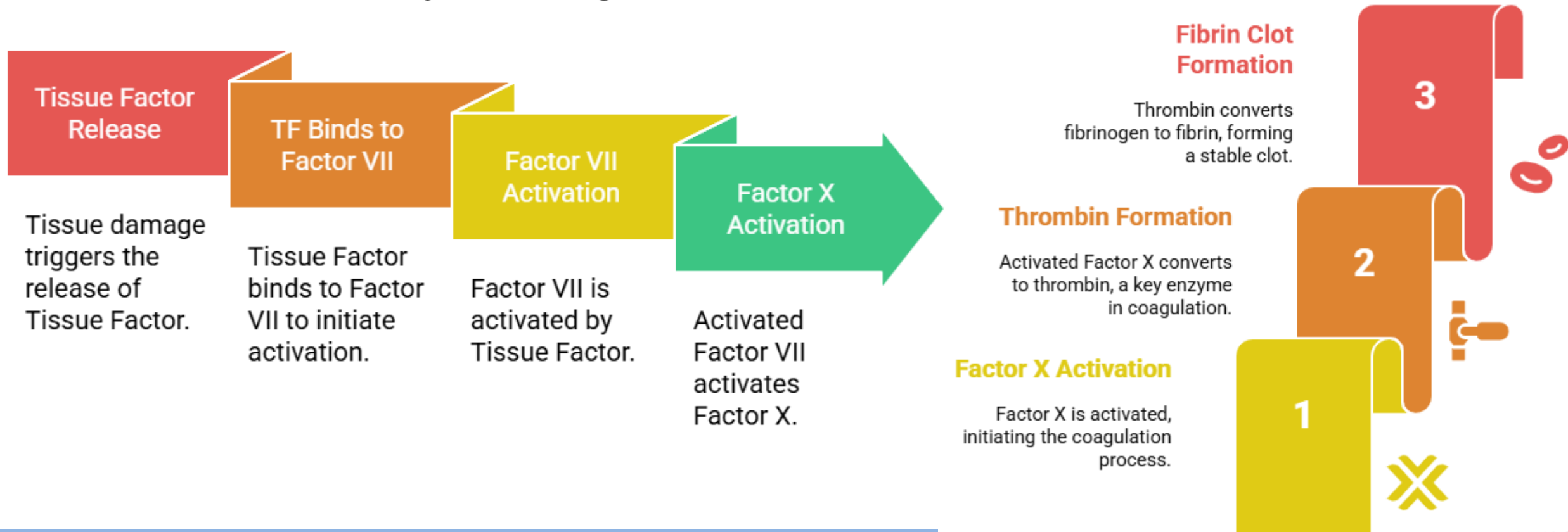


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Define - What Is the Coagulation Cascade?

Steps to Fibrin Clot Formation

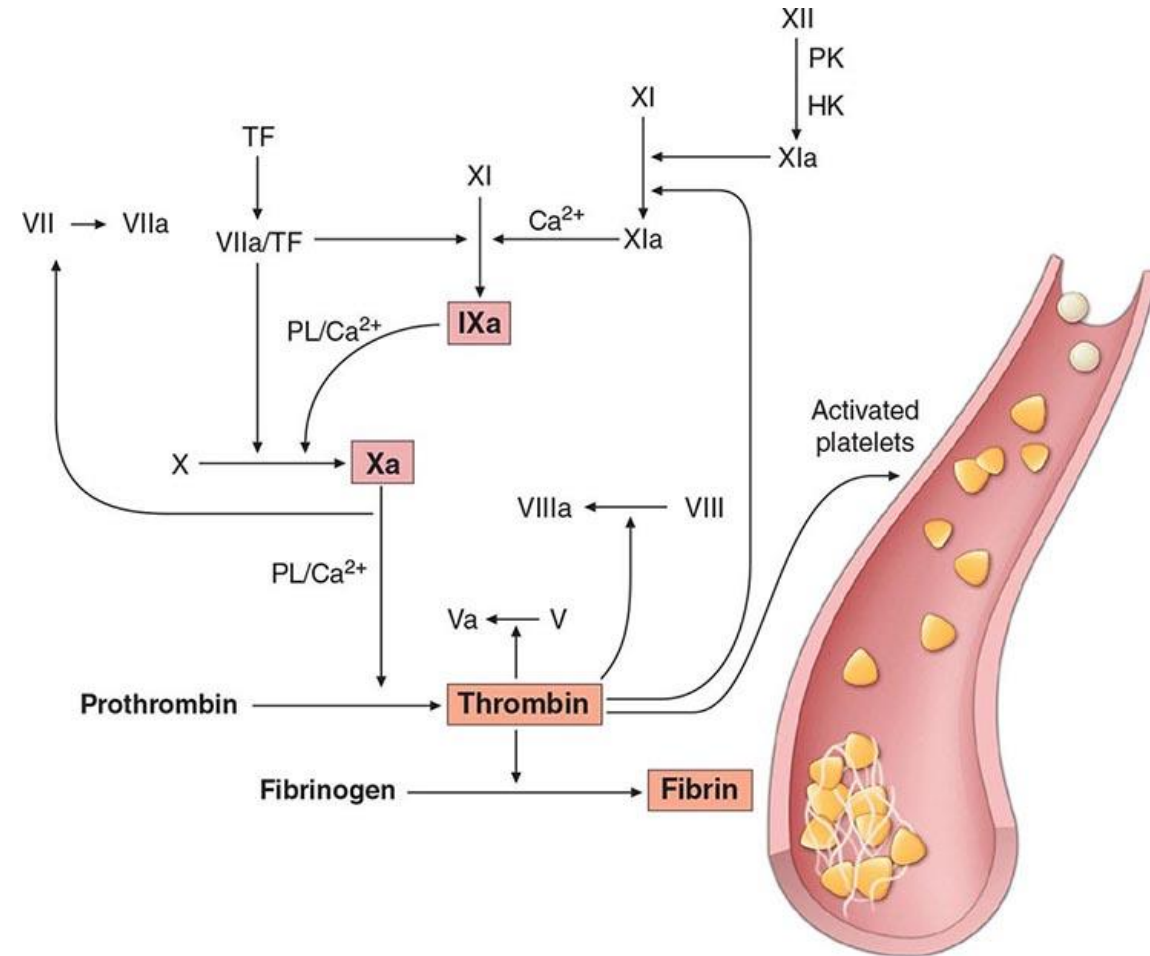
Extrinsic Pathway of Blood Coagulation



Ideate - Ways to Learn the Coagulation Cascade

Class room activity of learning the names of each clotting factors

Find the pathway of coagulation factor travels



Clotting Factors

Factor Number	Name (Common Name)
I	Fibrinogen
II	Prothrombin
III	Tissue Factor or Tissue Thromboplastin
IV	Calcium
V	Proaccelerin or Labile Factor
VI	(No longer used)
VII	Proconvertin or Stable Factor
VIII	Antihemophilic Factor A
IX	Plasma Thromboplastin or Antihemophilic Factor B, Christmas Factor
X	Stuart-Prower Factor
XI	Plasma Thromboplastin Antecedent
XII	Hageman Factor
XIII	Fibrin Stabilizing Factor

Test - Real-World Application

Laboratory Findings of Case Study:

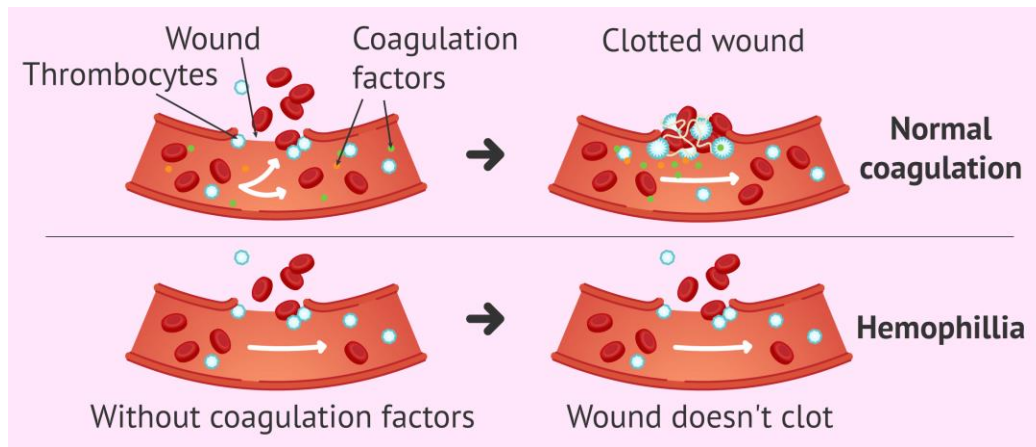
- Prolonged activated partial thromboplastin time (aPTT)
- Normal prothrombin time (PT)
- Factor VIII activity: markedly reduced

Diagnosis:

Hemophilia A (Factor VIII deficiency)

Impression: Factor VIII Deficiency

Hemophilia A demonstrates how a single missing factor in the coagulation cascade can disrupt the entire process, leading to significant bleeding even after minor injuries



Summary of Coagulation Factors

**Factor I
(Fibrinogen)**

**Factor II
(Prothrombin)**

**Factor III
(Tissue Factor)**

**Factor IV
(Calcium)**

**Factor V
(Proaccelerin)**

**Factor VII
(Proconvertin)**

**Factor VIII
(Antihemophilic
Factor)**

**Factor IX
(Christmas
Factor)**

**Factor X
(Stuart-Prower
Factor)**

**Factor XI
(Plasma
Thromboplastin
Antecedent)**

**Factor XII
(Hageman
Factor)**

**Factor XIII
(Fibrin-
Stabilizing
Factor)**

References

- Tortora, G. J., & Derrickson, B. (2017). *Principles of Anatomy and Physiology*. Wiley.
- Hoffbrand, A. V., & Moss, P. A. H. (2016). *Essential Haematology*. Wiley-Blackwell.
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GEN AI – Napkin AI, Grok, Perplexity