

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 II : Blood

TOPIC: Platelets: formation, normal level, and functions

FACULTY NAME: Mrs. Saranyaa Prasath

Empathize - Why Platelets Matter

Patient Concerns:

Fear of bleeding disorders
(e.g., bruising, slow clotting)

Clinician Needs:

Accurate platelet data for
diagnosing conditions
(e.g., thrombocytopenia)

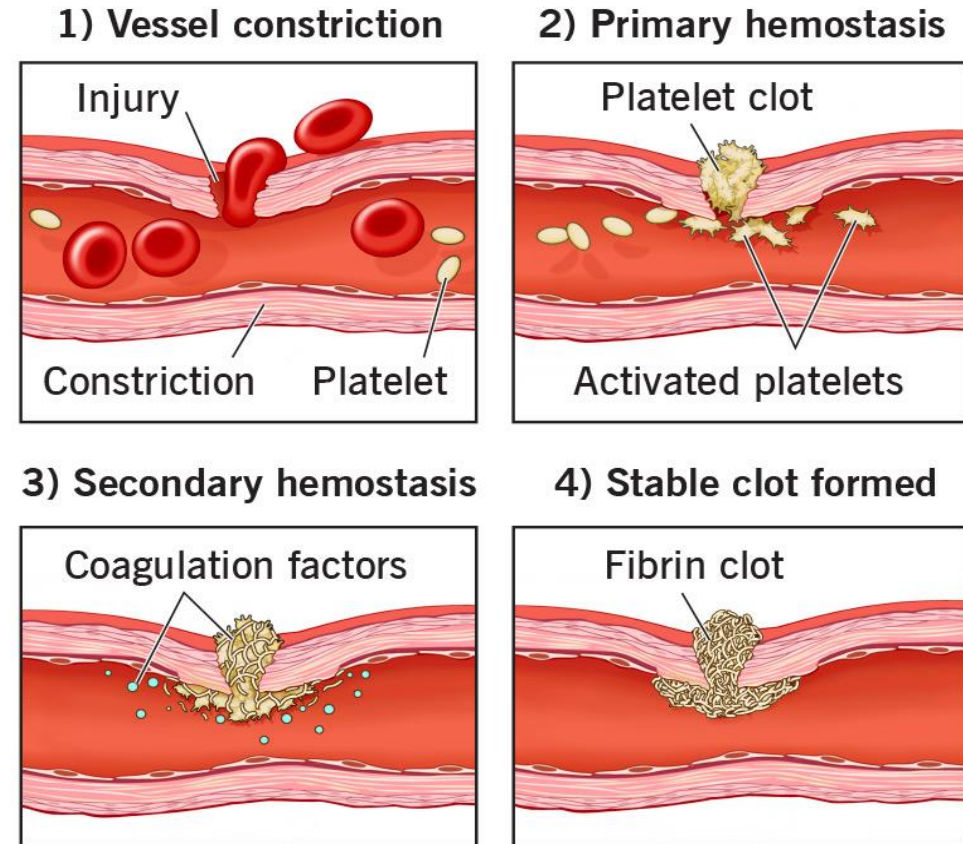
Why It Matters:

Platelets are vital for
clotting and preventing
excessive bleeding.

Define - What Are Platelets?

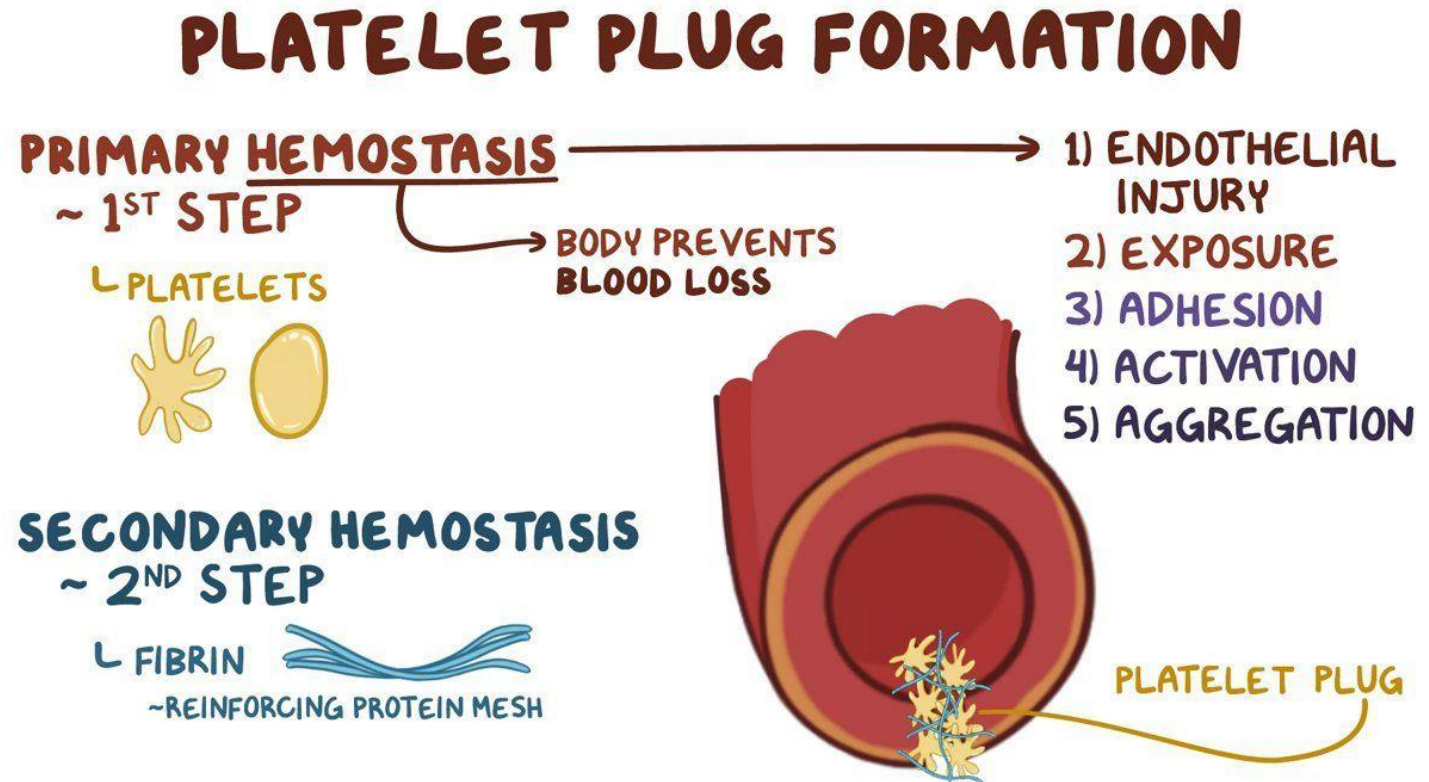
- **Formation:**
 - Produced in bone marrow by megakaryocytes.
 - Small, disc-shaped cell fragments (not true cells).
 - Life Span – 7 to 10 days
- **Normal Level:** 150,000–450,000 platelets per microliter of blood.
- **Functions:**
 - Form clots to stop bleeding.
 - Release chemicals to promote healing.
 - Support blood vessel repair.

Hemostasis



Platelet Functions - Simplified

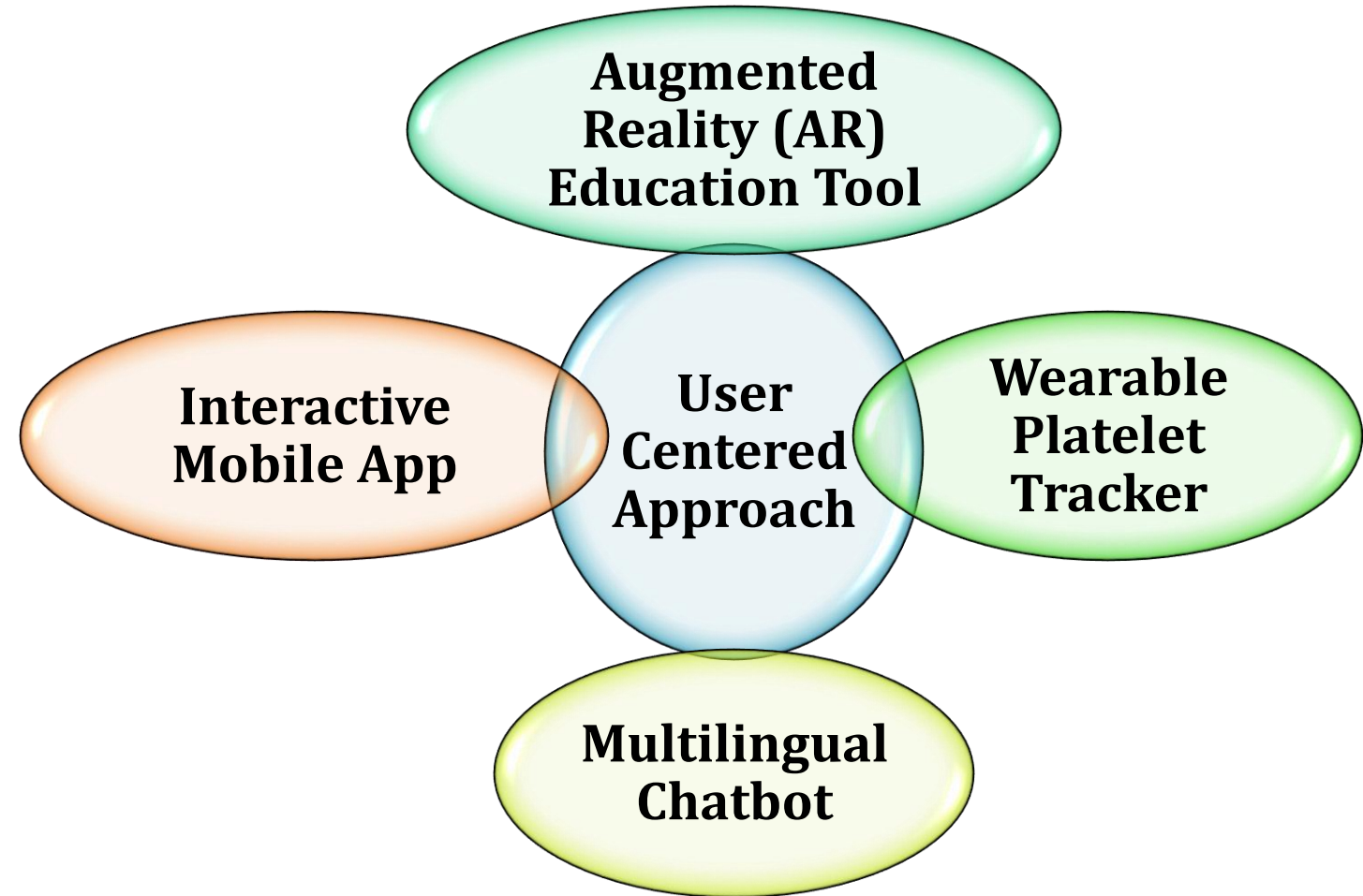
- **Wound Healing** - Release growth factors that help repair and regenerate damaged tissue
- **Immunity** - Participate in immune responses and inflammation by interacting with white blood cells and releasing cytokines



Ideate - Making Platelet Info Accessible

How to communicate the values of platelet information ?

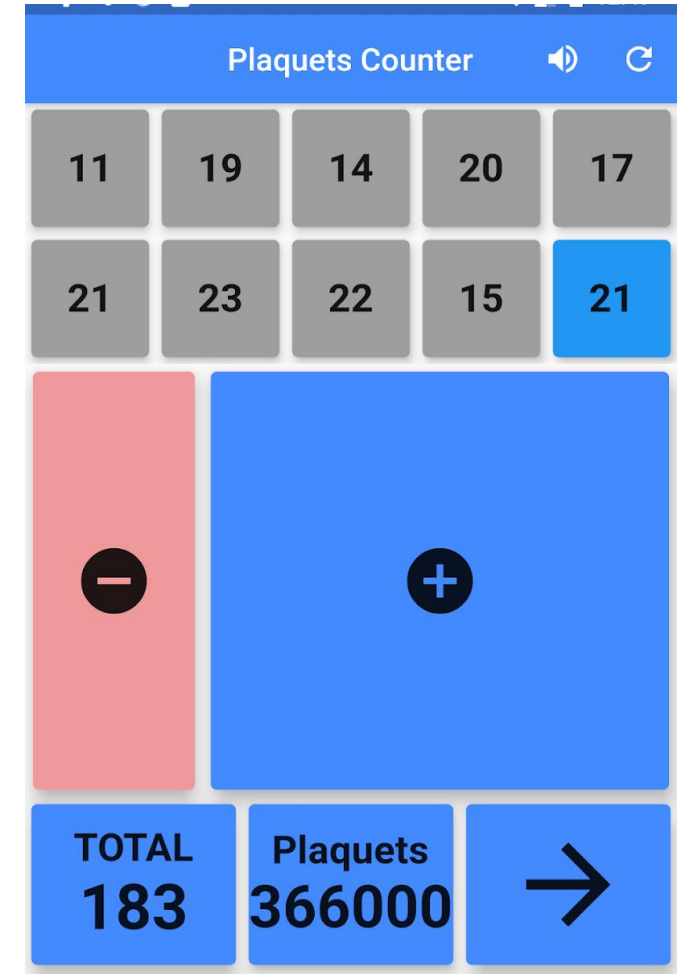
A medical report in hospital gives an accurate data on platelets



Prototype - A Patient-Friendly Tool

A designed app for platelet measurement

- Input: User enters platelet count (e.g., 180,000/ μ L).
- Output: Interpretation of Results



Test - Applying Platelet Knowledge

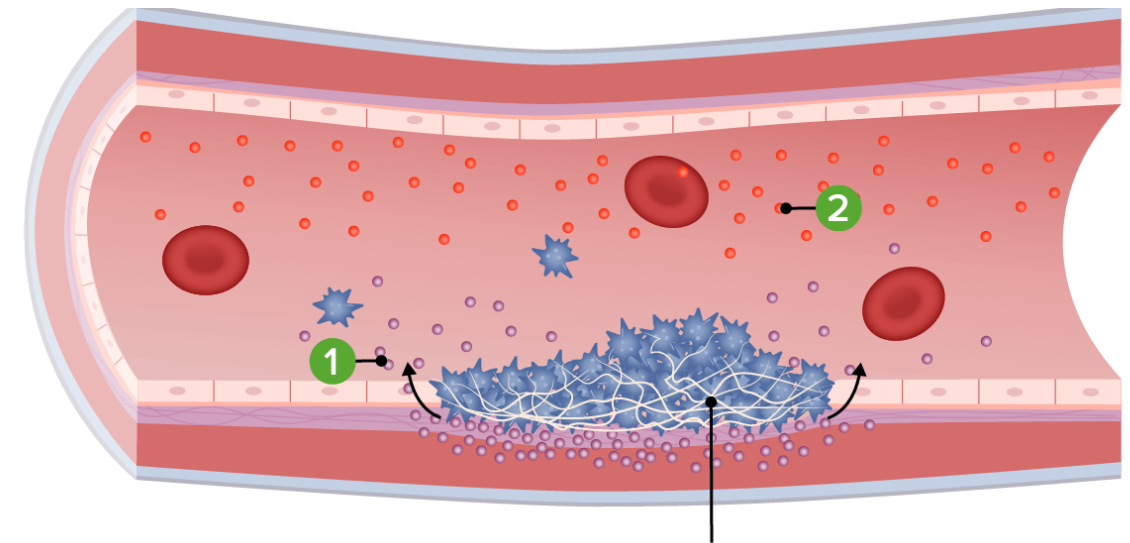
- **Case Study:** Patient with low platelets ($90,000/\mu\text{L}$).
 - **App Output:** “Low platelets may increase bleeding risk. Contact your doctor.”
 - **Patient Action:** Shares PDF report, books appointment, follows diet tips.
- **Feedback:**
 - Patients: Feel less anxious with clear explanations.
 - Clinicians: Save time with structured, patient-shared reports.



Platelet Functions - Simplified

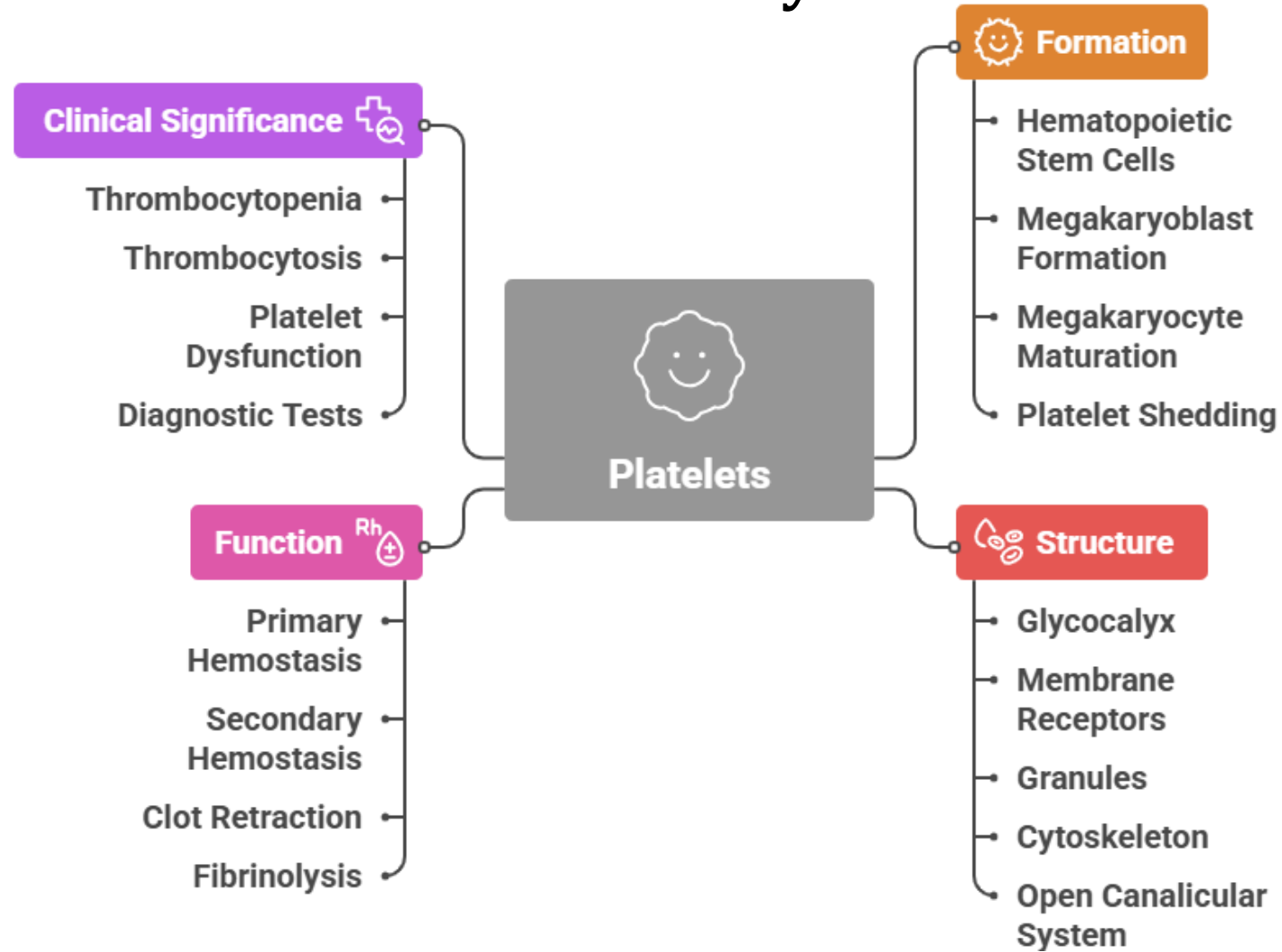
Hemostasis (Stop Bleeding)

- First responders to blood vessel injury.
- Stick to exposed vessel walls (adhesion), change shape, and clump together (aggregation) to form a plug
- Release chemical signals to activate more platelets and start the clotting cascade, leading to fibrin mesh formation for stable clotting



The fibrin mesh secures the platelet plug.

Summary



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.
- Mayo Clinic. (2023). *Platelet Count*. Retrieved from www.mayoclinic.org.
- Brown, T. (2008). *Design Thinking*. Harvard Business Review.

THANK YOU