

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: Erythropoiesis

FACULTY NAME: Mrs. Saranyaa Prasath

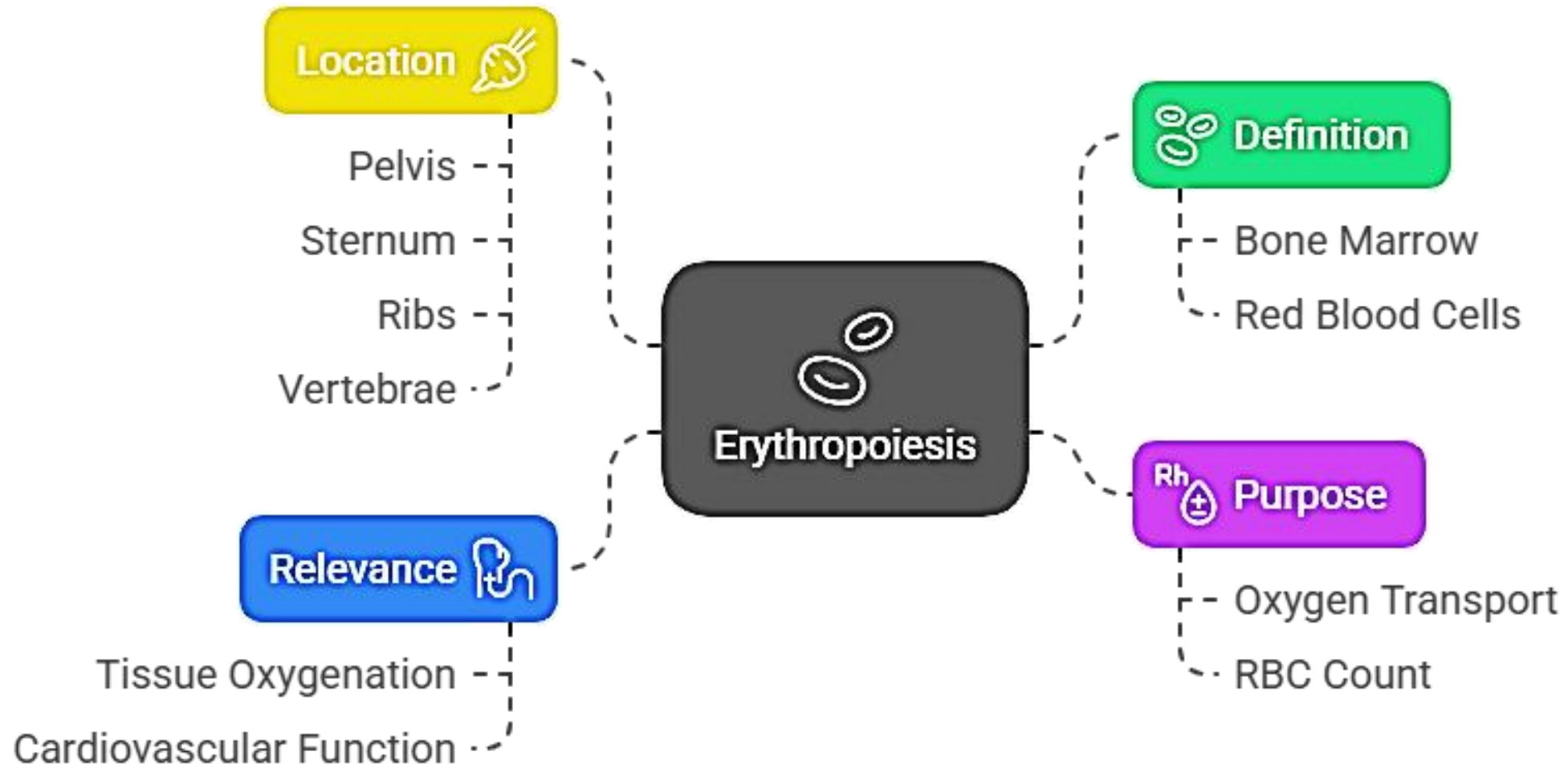
Empathize - Why Erythropoiesis Matters

Patient Concerns: Worry about fatigue, anemia, or oxygen shortages (e.g., post-CPB).

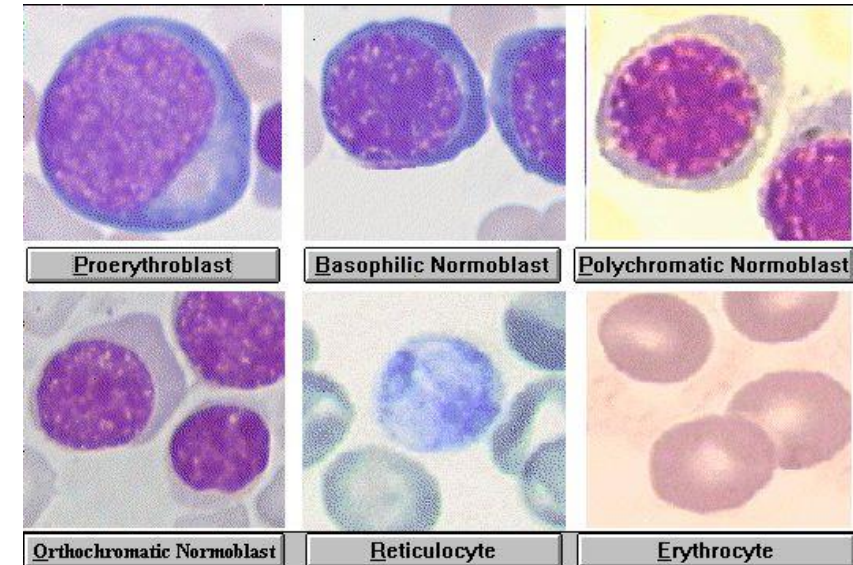
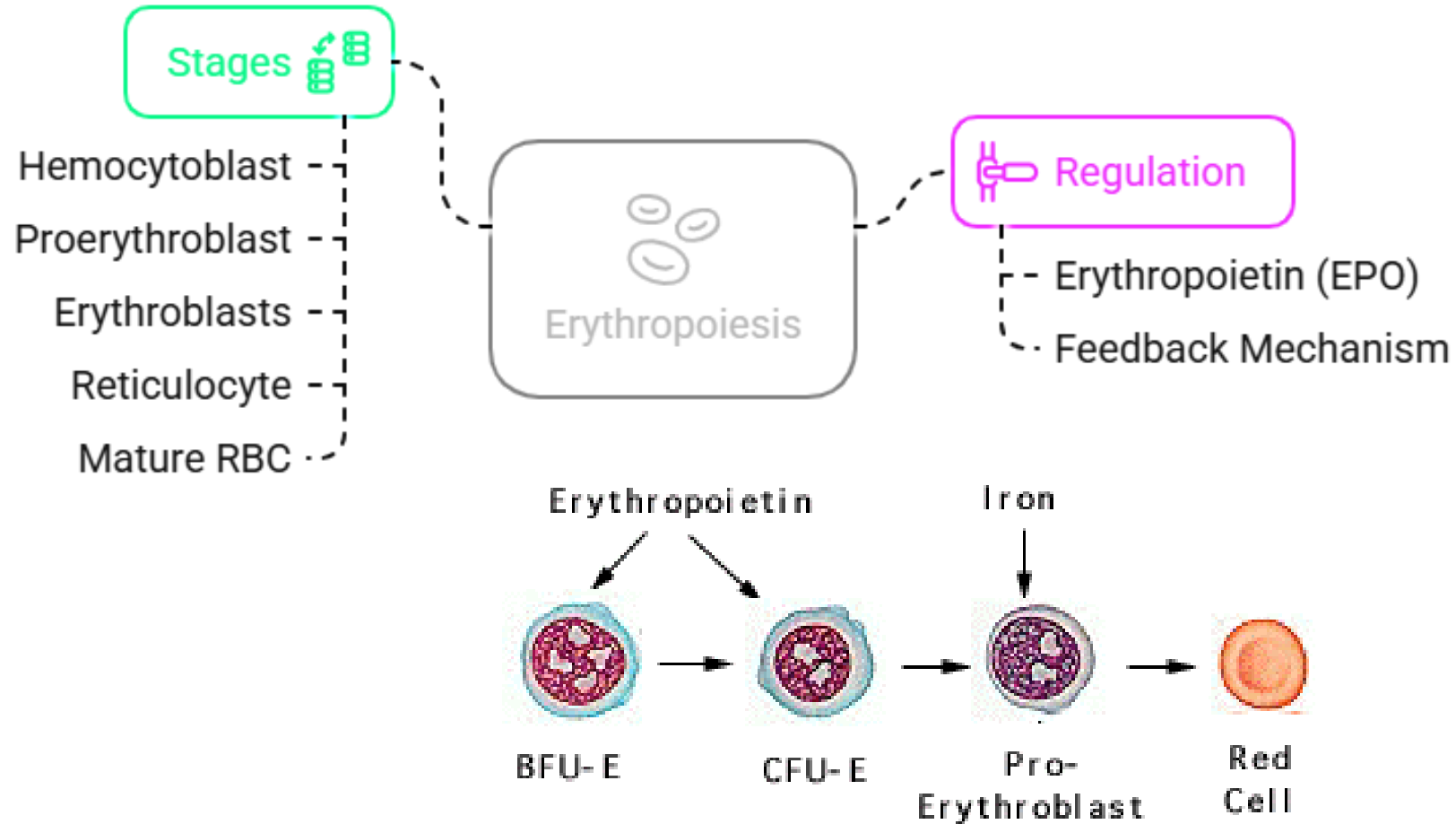
Clinician Needs: Monitor RBC counts to ensure perfusion and oxygenation.

Why It Matters:
Erythropoiesis ensures oxygen delivery, critical for cardiovascular health and CPB.

Define - What is Erythropoiesis?

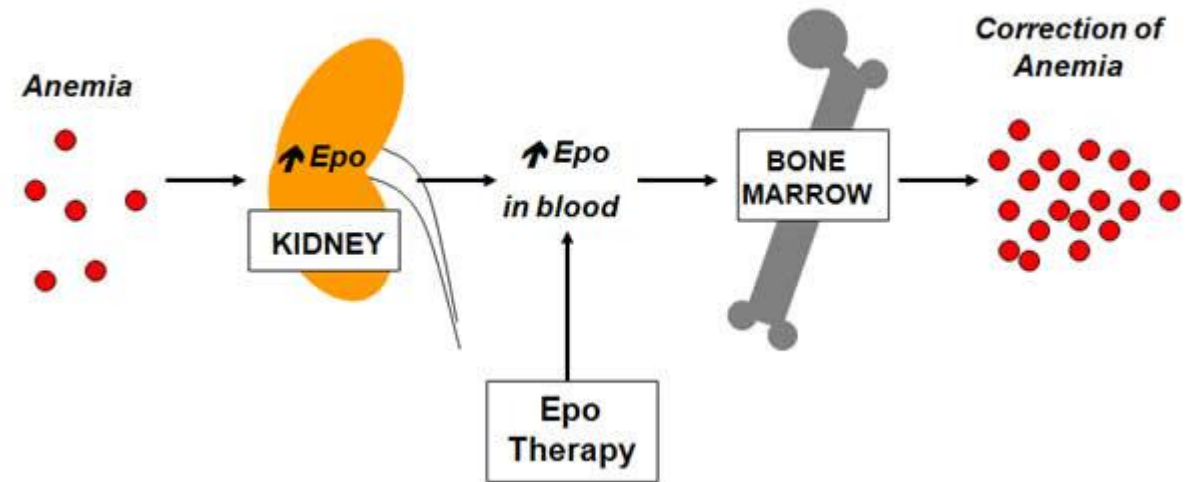


Define - Stages and Regulation



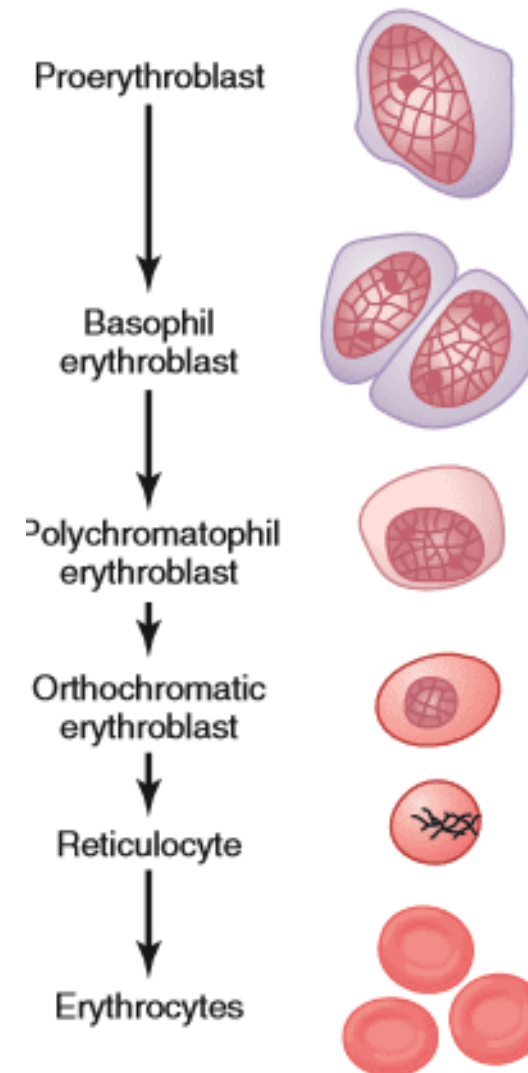
Regulation of RBC Production

- **Main Hormone: Erythropoietin (EPO)**
- Produced by kidneys in response to low oxygen (hypoxia)
 - Stimulates bone marrow to increase RBC production
- Other Requirements: **Iron, vitamin B12, folic acid**



Characteristics of Maturing RBCs

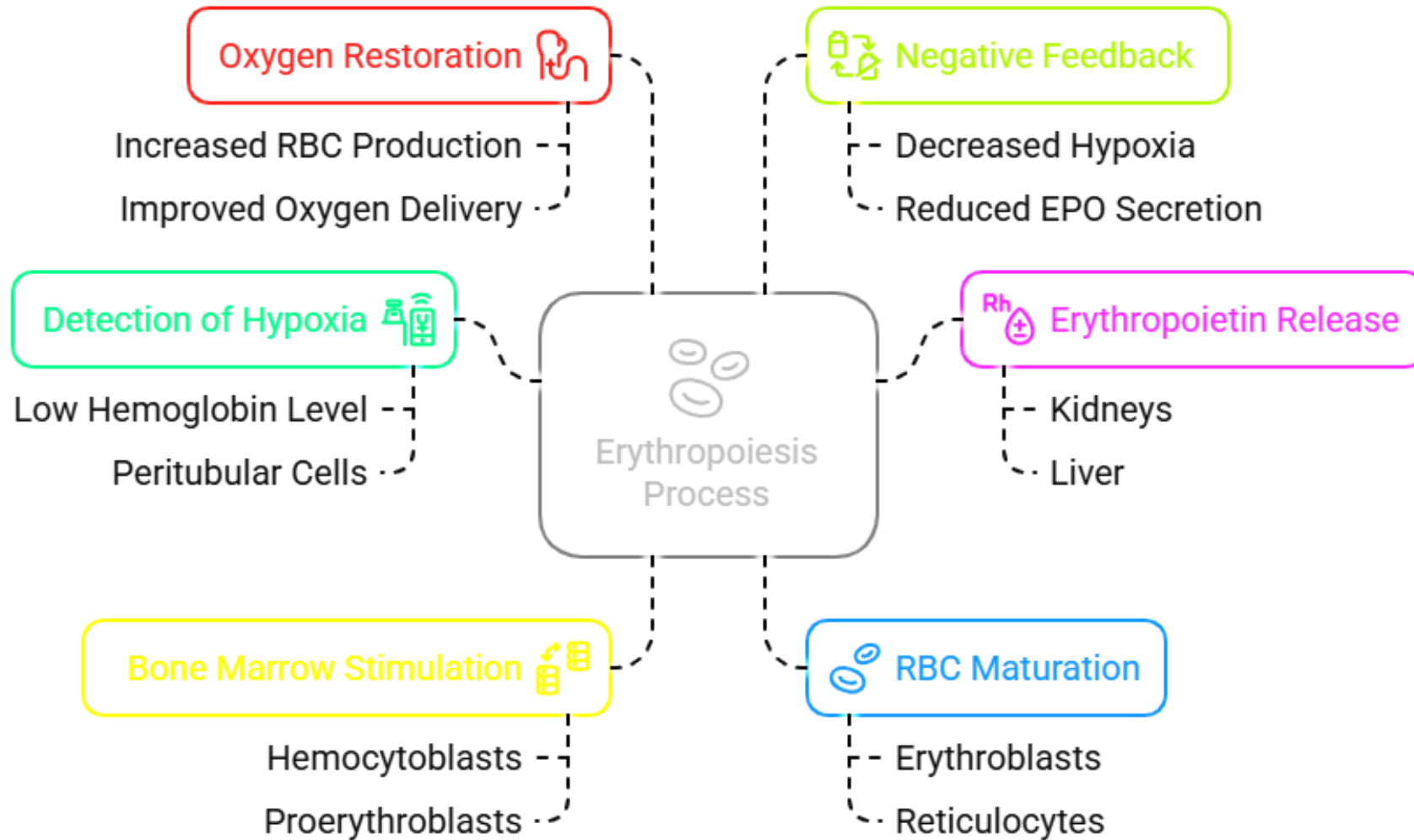
- Cell size decreases
- Nucleus condenses and is eventually expelled
- Hemoglobin content increases
- Cytoplasm color changes from blue to pink



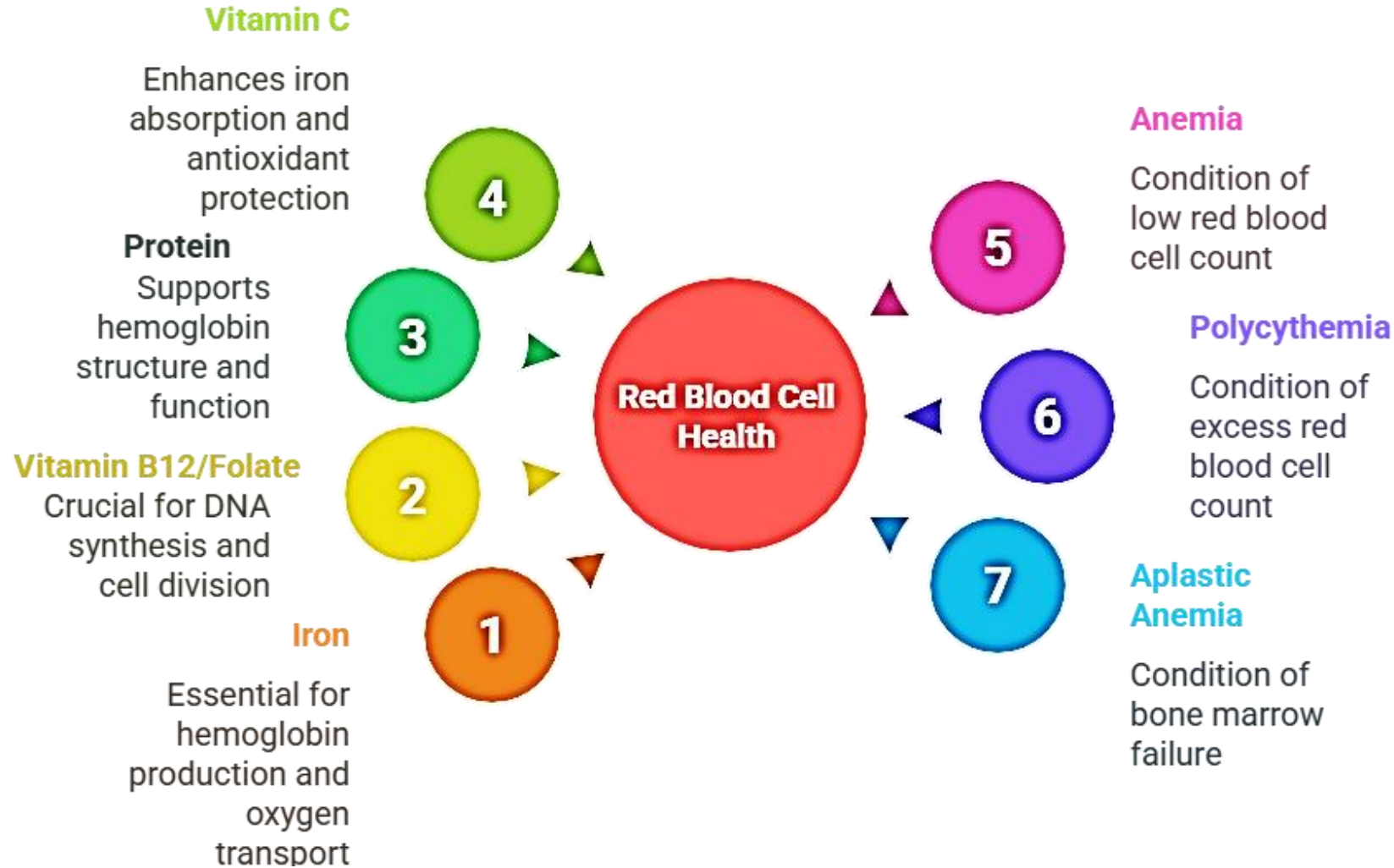
Case Scenario

- A 60-year-old female undergoes coronary artery bypass grafting (CABG) using CPB. Post-surgery, her hemoglobin level drops to 8 g/dL (normal: 12–15 g/dL for females), and she reports fatigue and shortness of breath. Routine hematological tests confirm anemia, likely due to hemodilution and hemolysis during CPB. The clinician considers erythropoietin (EPO) therapy to support recovery.
- **What is the physiological mechanism by which the body responds to this patient's anemia to restore normal RBC levels?**

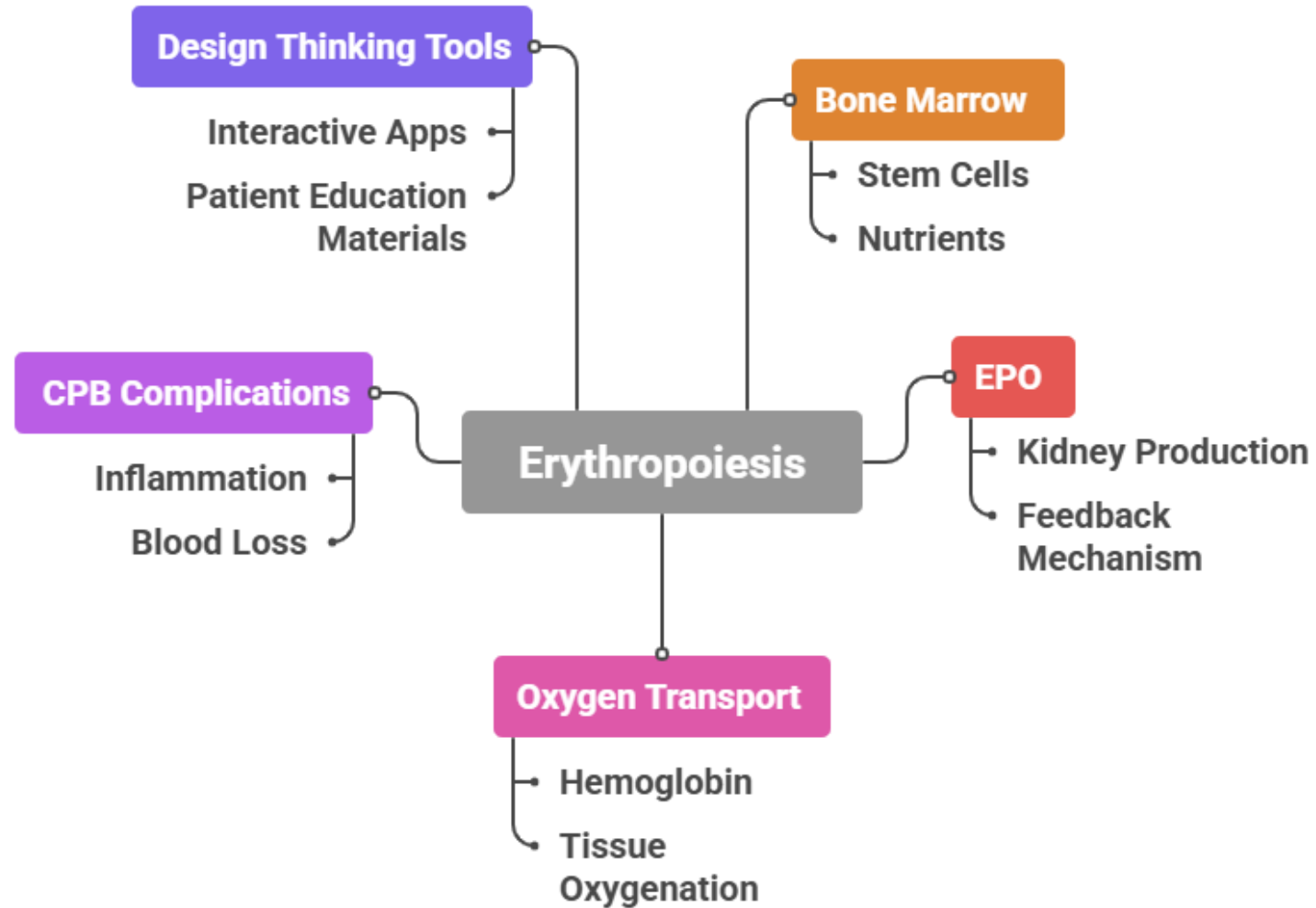
Prototype



Nutritional Requirements & Disorders



Summary



References

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- Ross and Wilson (2018). *Anatomy and Physiology in Health and Illness*. Elsevier.
- Hall, J. E. (2015). *Guyton and Hall Textbook of Medical Physiology*. Elsevier.
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THANK YOU