Isolated Thrombocytopenia: ITP? IDK!

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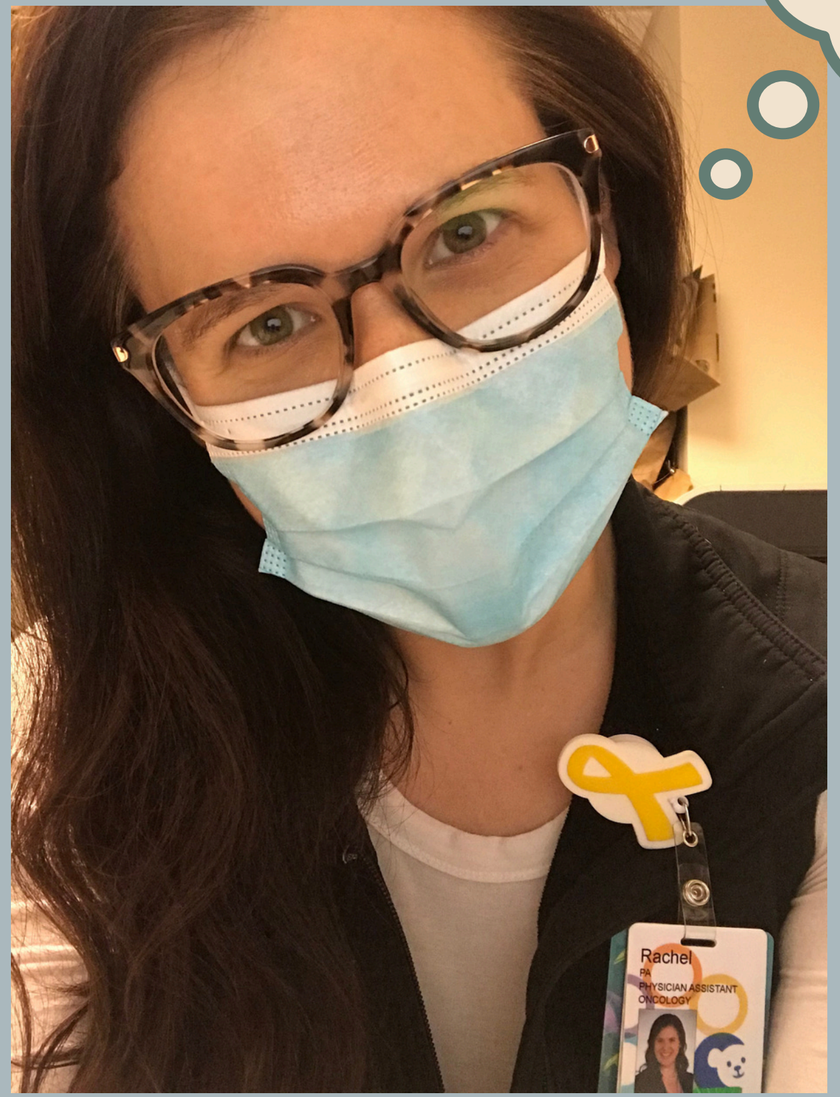
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Rachel
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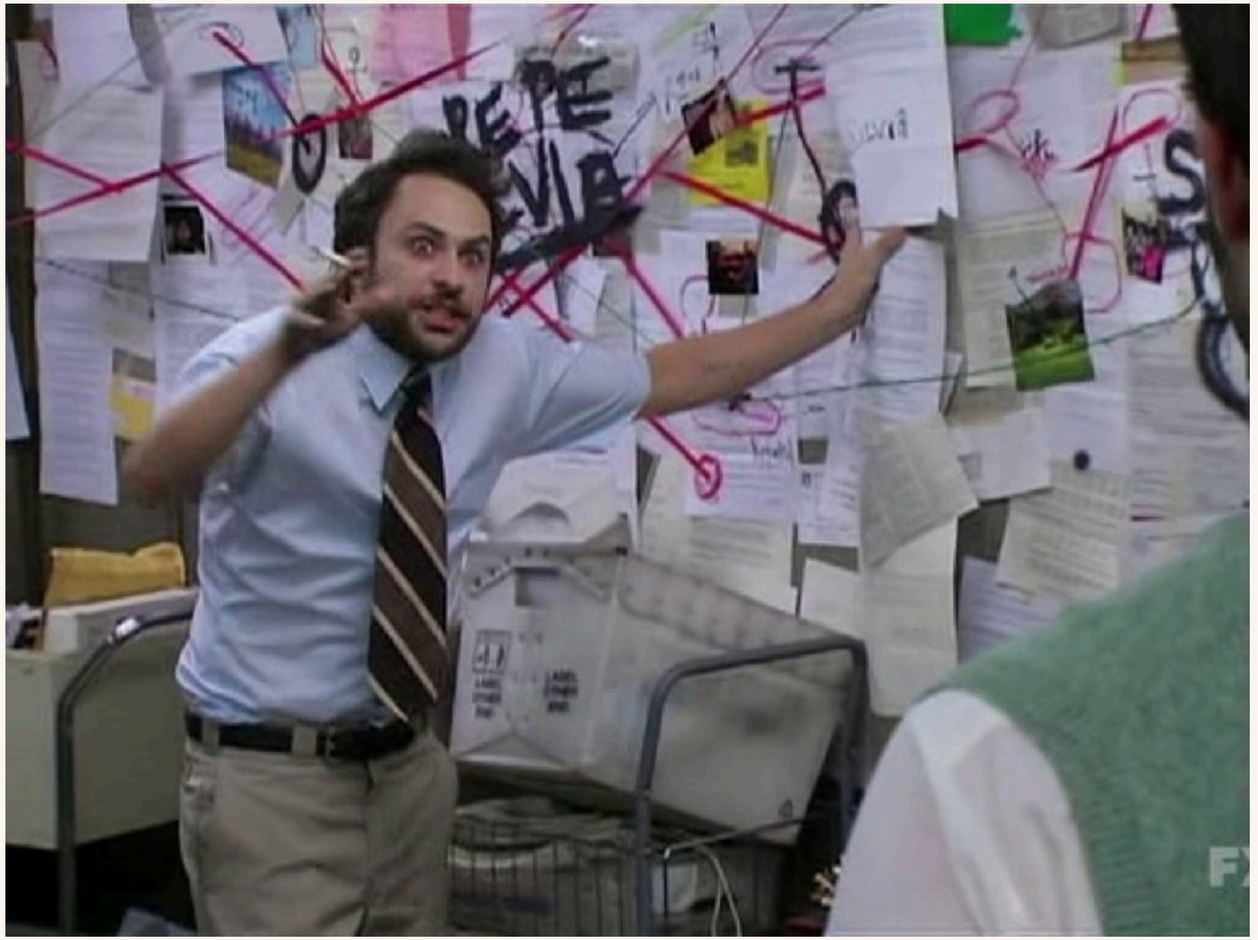

Objectives

- At the conclusion of this session, participants should be able to:
  - Define immune thrombocytopenia (ITP) based upon the patient's complete blood count.
  - Identify pertinent past medical history details that may suggest ITP.
  - Identify pertinent physical exam findings in a child with ITP.

Meet Liam, a 4 y/o male

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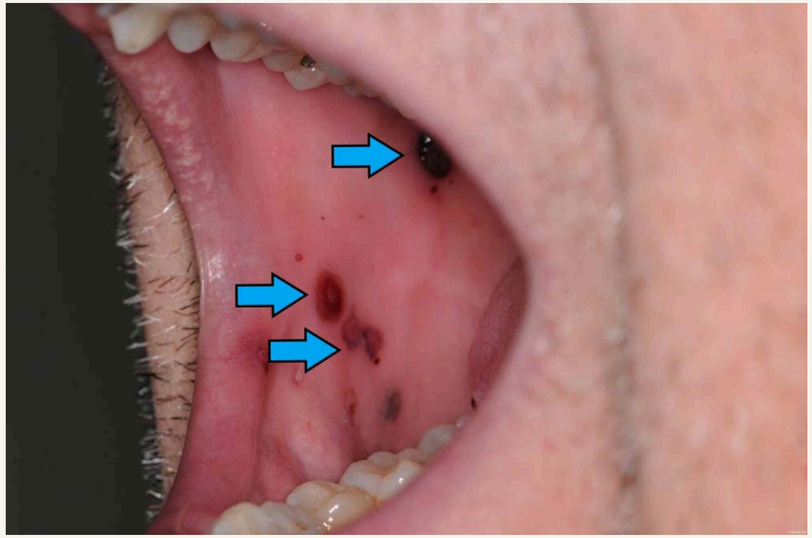
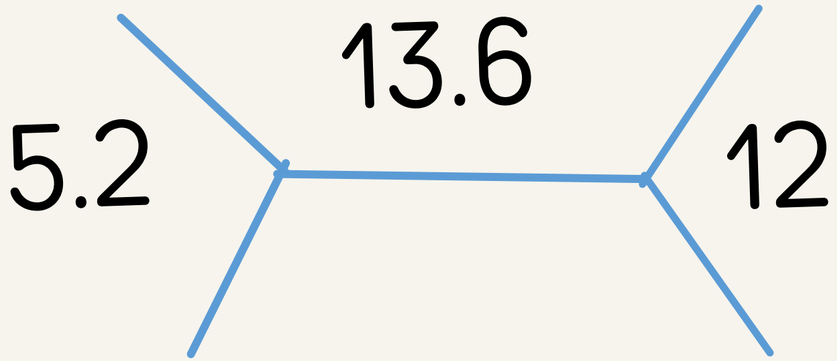


Liam, 2 y/o male



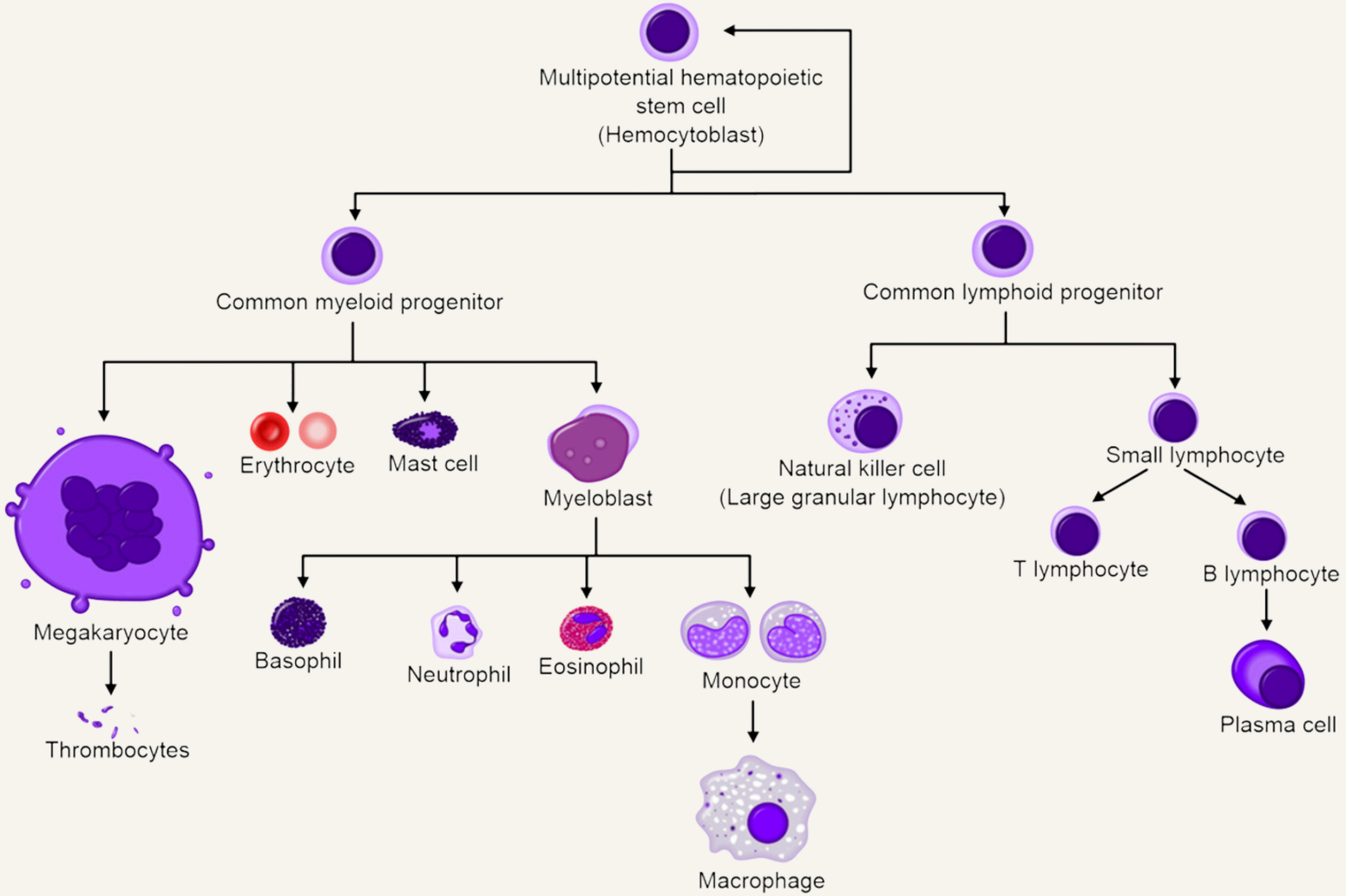
	Lab Value
Ferritin	normal
Fibrinogen	normal
PT/INR	normal
PTT	normal
Reticulocyte count	normal

Liam, 2 y/o male

Next step?

a. Admit to the hematology floor
b. Send an outpatient referral to pediatric hematology
c. Schedule a bone marrow aspiration and biopsy
d. Schedule a follow up with the pediatrician in one week

Refresher: Platelet Physiology



Refresher: Blood Clotting

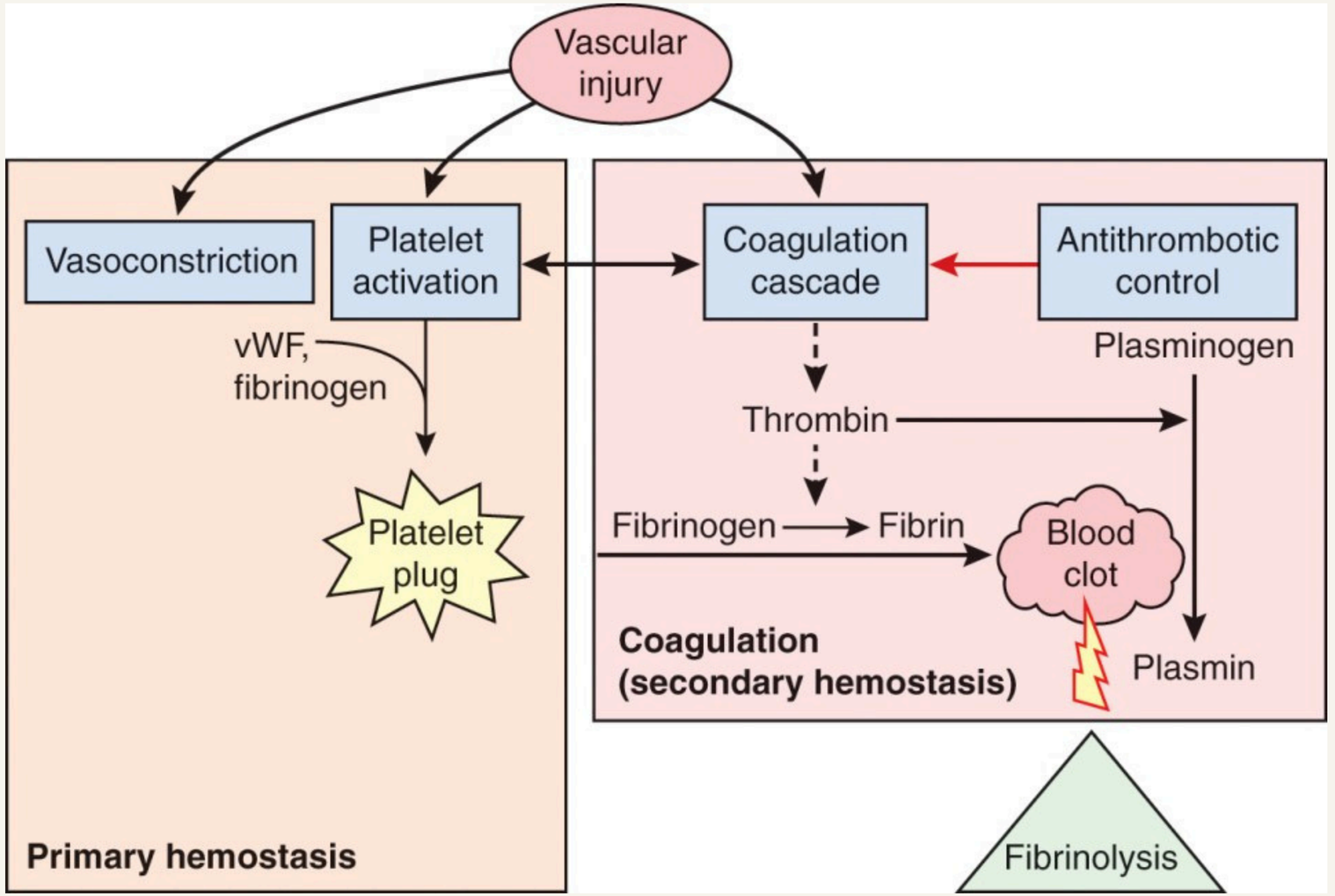


Table 2. Mechanisms of Thrombocytopenia

Diminished Platelet Production

- Marrow infiltration
- Marrow injury
- Ineffective thrombopoiesis

Shortened Platelet Life Span

- Immune (antibody or immune complex)
  - —Idiopathic thrombocytopenic purpura
  - —Neonatal alloimmune thrombocytopenia
  - —Infection
  - —Heparin
- Nonimmune (mechanical)
  - —Disseminated intravascular coagulation
  - —Hemolytic-uremic syndrome
  - —Thrombotic thrombocytopenic purpura
  - —Infection

Platelet Sequestration or Pooling (Hypersplenism)

Platelet Loss or Dilution

Buchanan GR. *Pediatr Rev.* 2005;26(11):401–409.

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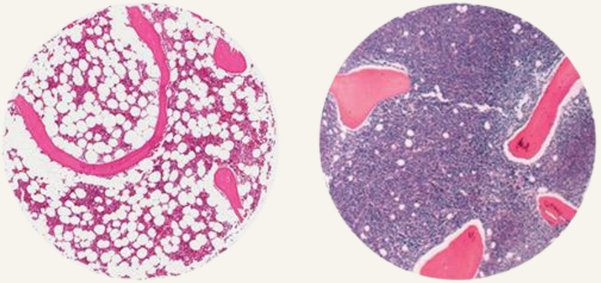
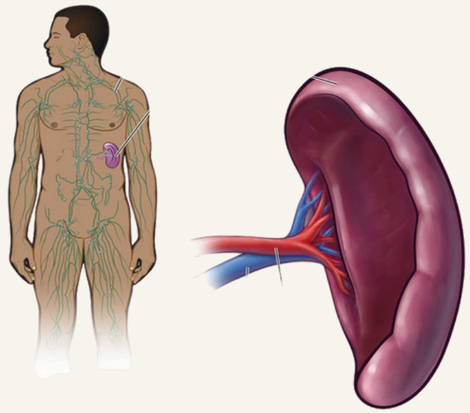
Platelet Sequestration or Pooling (Hypersplenism)

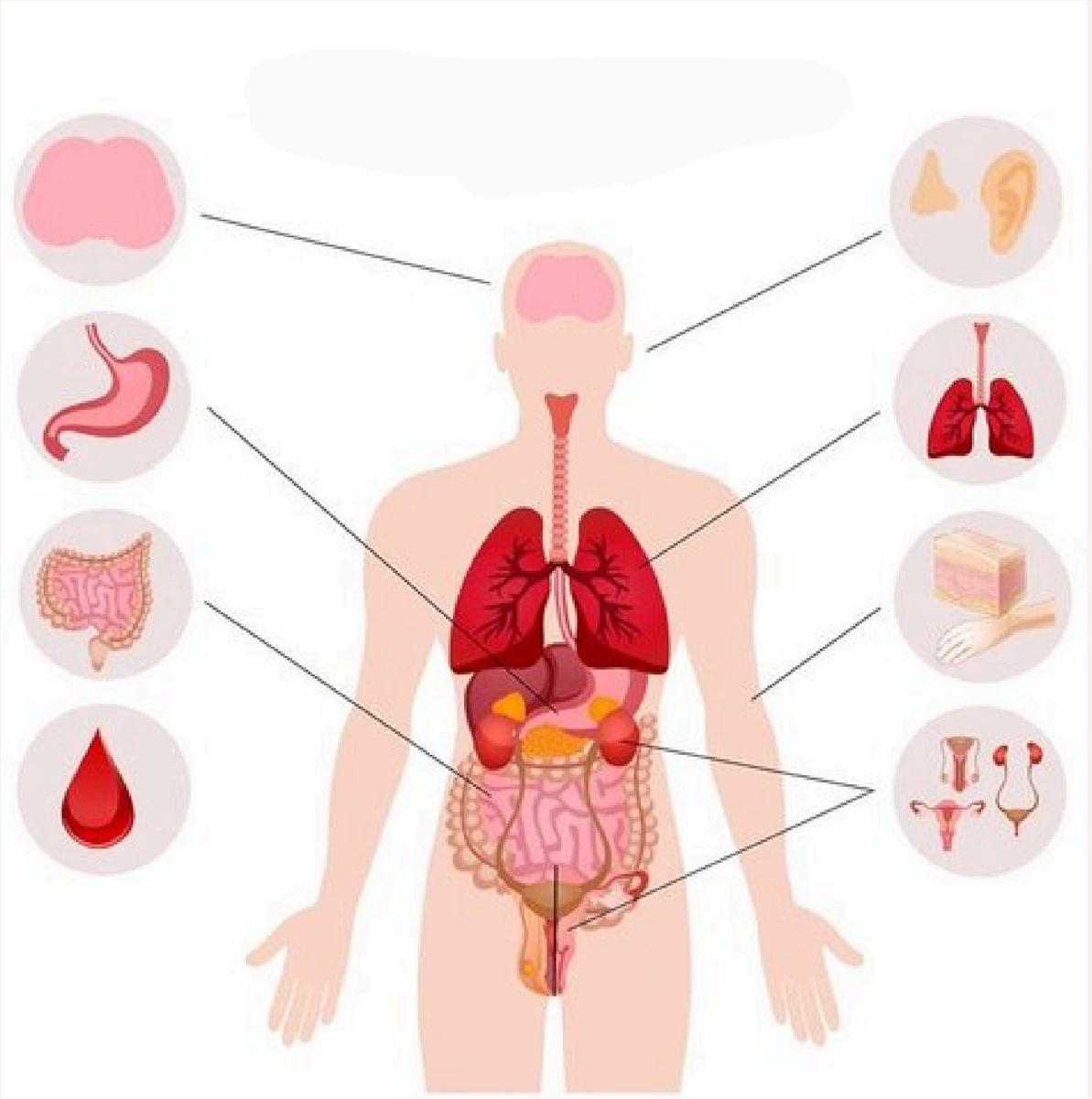
Platelet Loss or Dilution





Buchanan GR. *Pediatr Rev.* 2005;26(11):401–409.

Bleeding History



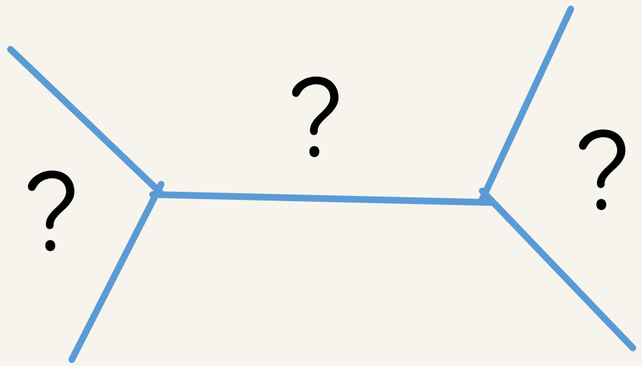
Bhattarcharjee S, Banerjee M. *SN Compr Clin Med* (2020) 2:2048–2058. *Williams Hematology* Ch. 116.

Is this bleeding a platelet problem?

Or a coagulation factor problem?

Bleeding: General Workup

- CBC with differential & peripheral smear
- Coags

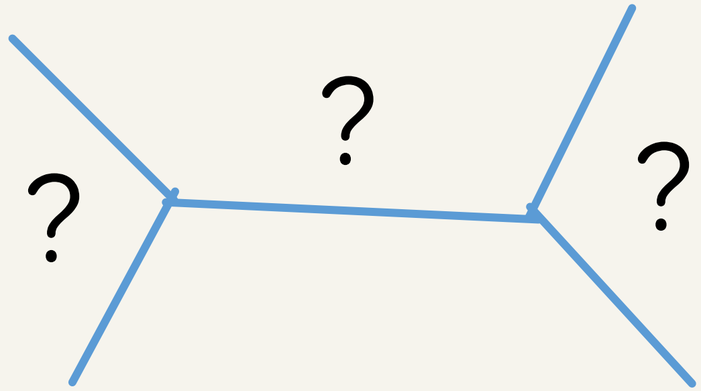


Here is my quick CBC analysis trick

Cell lines - is the bone marrow working?

What are the red cells doing?
What are the white cells doing?
What are the platelets doing?

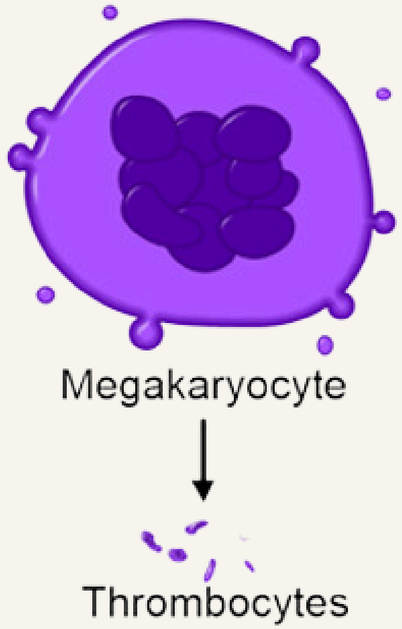
What do the cells look like?



Thrombocytopenia

- Normal platelet count: >150K
- Impaired hemostasis with platelets <50-75K
- ***Risk of spontaneous hemorrhage at <20K***
- Platelet life span: 8-10 days

Williams Hematology Ch. 3. Buchanan GR. *Pediatr Rev.* 2005;26(11):401–409.



Immune Thrombocytopenia

"Idiopathic thrombocytopenia"
"Idiopathic thrombocytopenic purpura"
"Autoimmune thrombocytopenic purpura"

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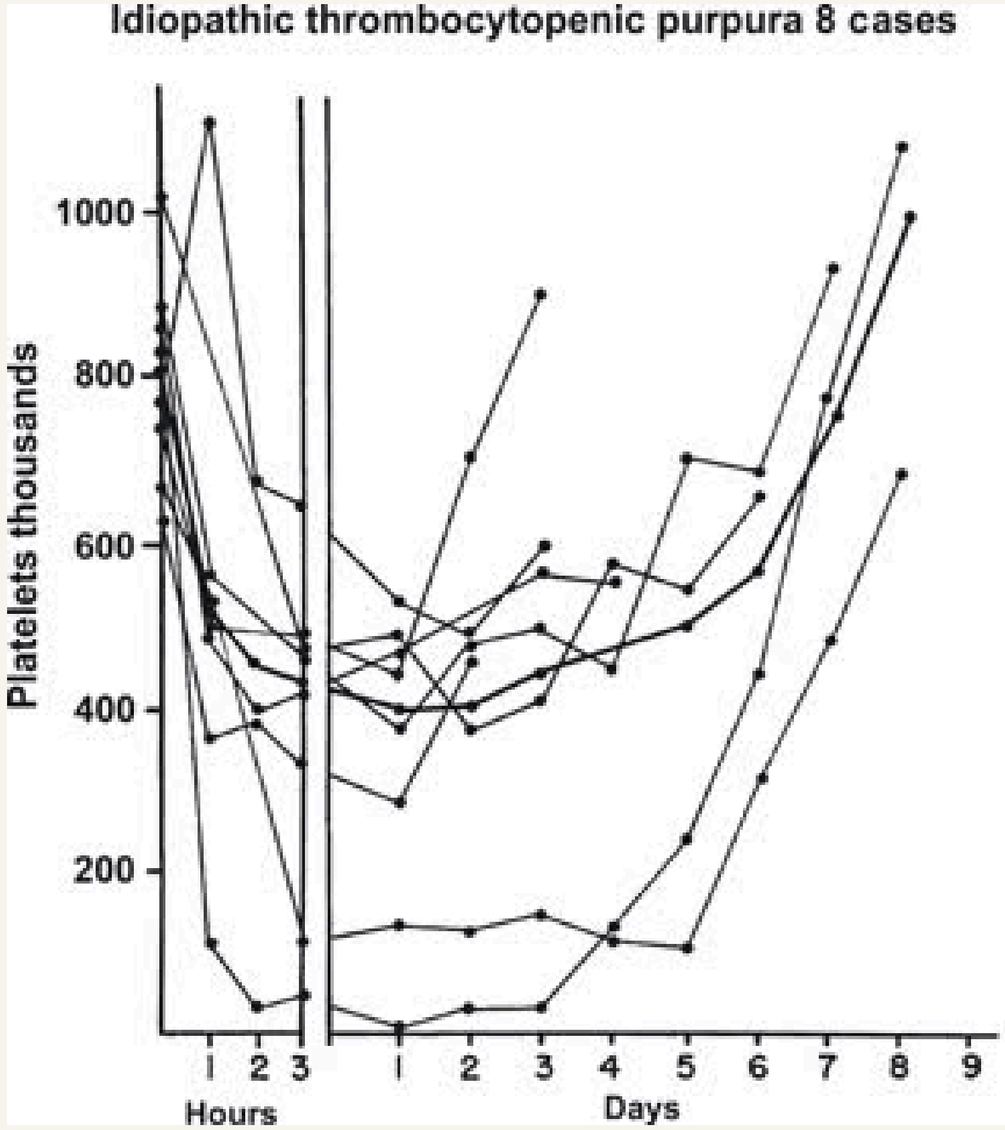
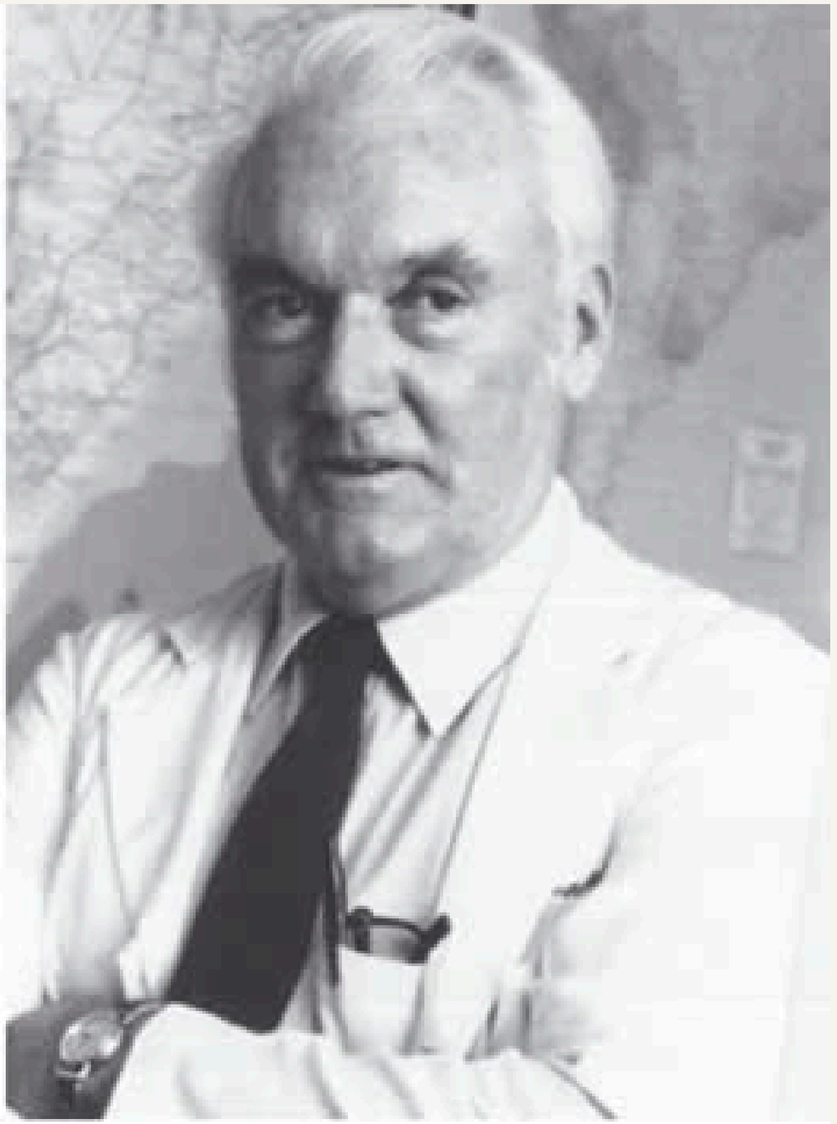
Listening • Learning • Leading





Stasi R, Newland AC. *Br J Haematol.* 2011;153(4):437–450.

Immune Thrombocytopenia (ITP)

Pathophysiology

Antiplatelet IgG autoantibody --> increased platelet ***destruction***

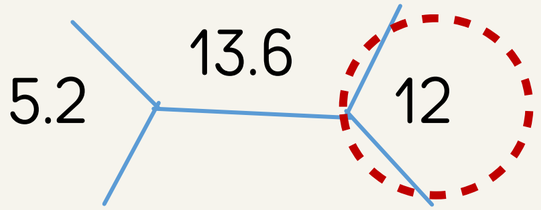
***Frequently follows 4-6 weeks after a viral infection**
or live virus vaccine (especially MMR)

Buchanan GR. *Pediatr Rev.* 2005;26(11):401–409. *Williams Hematology* Ch. 116.

Immune Thrombocytopenia (ITP)

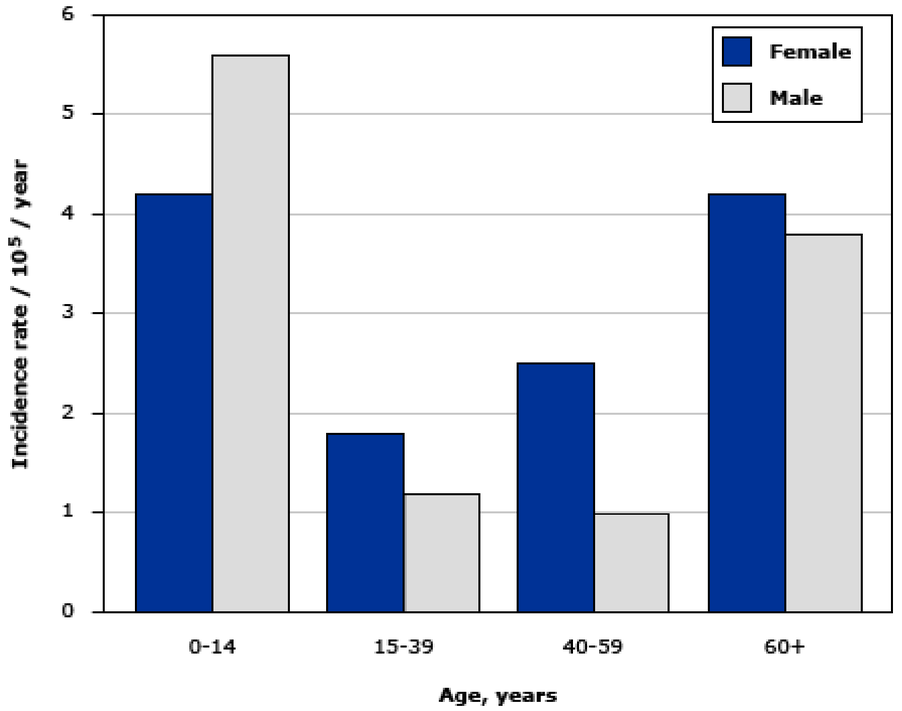
- Most common between ages 2-5 y/o

- Most common cause of **isolated thrombocytopenia** in children



Approximately 5 in 100,000 children annually

Incidence of immune thrombocytopenia (ITP) by age and sex



Data are presented for the incidence of ITP in females and males in different age groups. The incidence of ITP is highest in children, and may be greater in boys than in girls. In adults, the incidence increases with age. The incidence in women is greater than in men at younger ages, but in adults over age 60, the incidence of men and women is the same.

Data from:

1. Data for children from: Zeller B, Rajantie J, Hedlund-Treutiger I, et al. Childhood idiopathic thrombocytopenic purpura in the Nordic countries: epidemiology and predictors of chronic disease. Acta Paediatrica 2005; 94:178.

2. Data for adults from: Frederiksen H, Schmidt K. The incidence of idiopathic thrombocytopenic purpura in adults increases with age. Blood 1999; 94:909.

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Buchanan GR. *Pediatr Rev.* 2005;26(11):401-409.

Petechiae

Courtesy of Leslie Raffini, MD.

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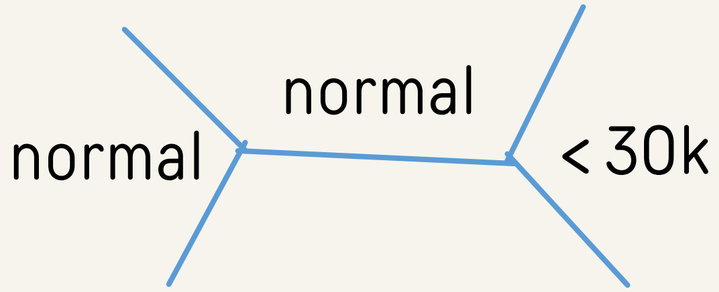
ITP Differential Diagnosis

- Leukemia
- Bleeding disorders (hemophilia, von Willebrand disease)
- Pancytopenia/bone marrow failure syndromes
- Viral suppression
- Medication
- Hemolytic uremic syndrome
- Non-accidental trauma

Immune Thrombocytopenia (ITP) Diagnosis

- **Isolated, severe thrombocytopenia with platelet count <30k**
  - CBC otherwise normal unless significant bleeding!
- No role for antiplatelet antibody testing (low yield)
- Bone marrow aspiration/biopsy usually not indicated

- *ITP is a diagnosis of exclusion!*



Current Ch. 14-04: Increased Platelet Destruction. Buchanan GR. *Pediatr Rev.* 2005;26(11):401-409.

ITP Treatment

- Consult/refer to pediatric hematology!
  - If platelet count is <20k, refer to ED.
- In children
  - *75-80% resolve spontaneously – watchful waiting may be indicated!*

- Treatment indicated for significant bleeding or wet purpura:
  - First line therapy: steroids, intravenous immunoglobulin (IVIG)
  - Refractory/Chronic ITP therapy:
    - Rituximab
    - Thrombopoitein receptor antagonists
    - Splenectomy

- **What about platelet transfusion???**

Current Ch. 14-04: Increased Platelet Destruction. Buchanan GR. *Pediatr Rev.* 2005;26(11):401-409.

Pediatric ITP Treatment

Platelet count <20k with no or mild bleeding	Outpatient management
	Observation *(rather than steroids, IVIG, rituximab)*
	Follow up with a hematologist within 24 to 72 hours
Non-life-threatening mucosal bleeding	Prednisone 2-4mg/kg/day, maximum 120mg daily, for 5-7 days *(rather than IVIG)*
Second-line therapy	Thrombopoietin receptor antagonists *(rather than rituximab > splenectomy)*

Neunert C et al. *Blood Adv*. 2019;3(23):3829–3866.

Supportive Care

- Avoid contact sports (boxing, rugby, football, martial arts)
- Avoid OTC platelet-inhibiting drugs
  - Aspirin
  - NSAIDS
- Menstrual suppression

Control of benign epistaxis

The child on the right is showing the correct way to stop a nosebleed. The nasal alae should be pressed together closing off the nasal airway. The incorrect way to stop a nosebleed is demonstrated by the child on the left.

Courtesy of Anna H Messner, MD.

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Take Home Points
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