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CancerCare Manitoba COMMUNITY ONCOLOGY PROGRAM

UPCON Uniting Primary Care and Oncology

FOR Health Professionals

Parsing Out Platelets

How I Approach Thrombocytopenia

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Disclosures

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Objectives

1. Be aware of conditions commonly associated with thrombocytopenia in clinical medicine

2. Use an algorithm to guide investigation of a patient with thrombocytopenia

3. Be aware when urgent hematologic referral is indicated for a patient with thrombocytopenia

Referral to Hematology

Dear Dr.

Please assess this 35 year old female with thrombocytopenia, incidentally noted on bloodwork. She is otherwise asymptomatic.

Results:

WBC 6.0 x 10^9/L, normal differential	(4.5 -10)
Hb 135 g/L, normal indices	(120-160)
Platelet 40 x 10^9/L	(130-400)

Definition

- Thrombocytopenia- platelet count that is less than normal
- Normal is 130 to 400 x 10e9/L
- Clinical definition is a platelet count of less than 100 x 10e9/L
- Treatment usually not indicated until platelet count is less than 30 x 10e9/L
- Very important that the blood film is examined to ensure it is true thrombocytopenia

Pseudothrombocytopenia

- Platelets are recorded as falsely low by the hematology analyzer

- Causes include:

  - EDTA-induced platelet aggregation
  - Platelet satellitism
  - Familial Macrothrombocytopenia

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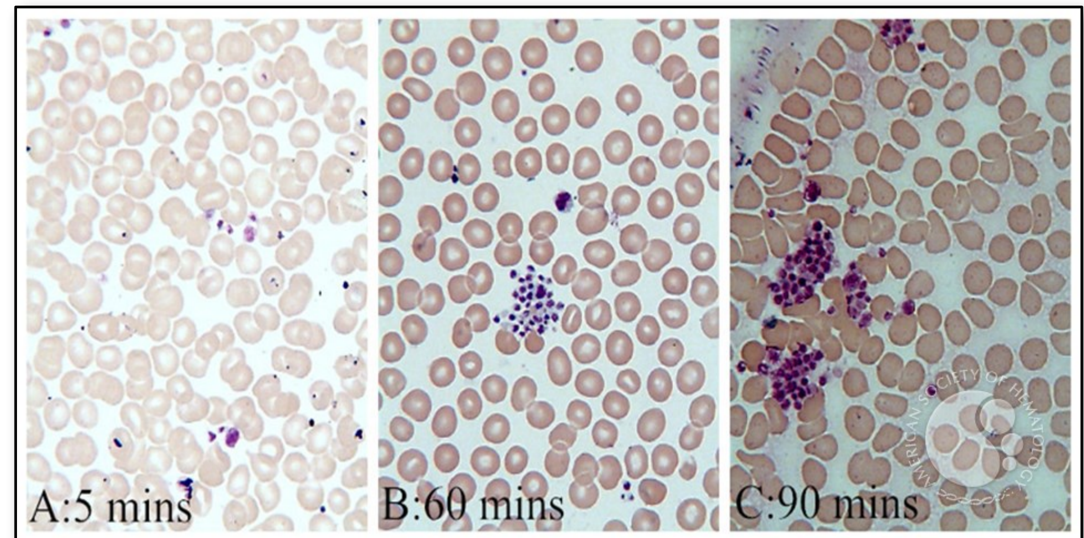
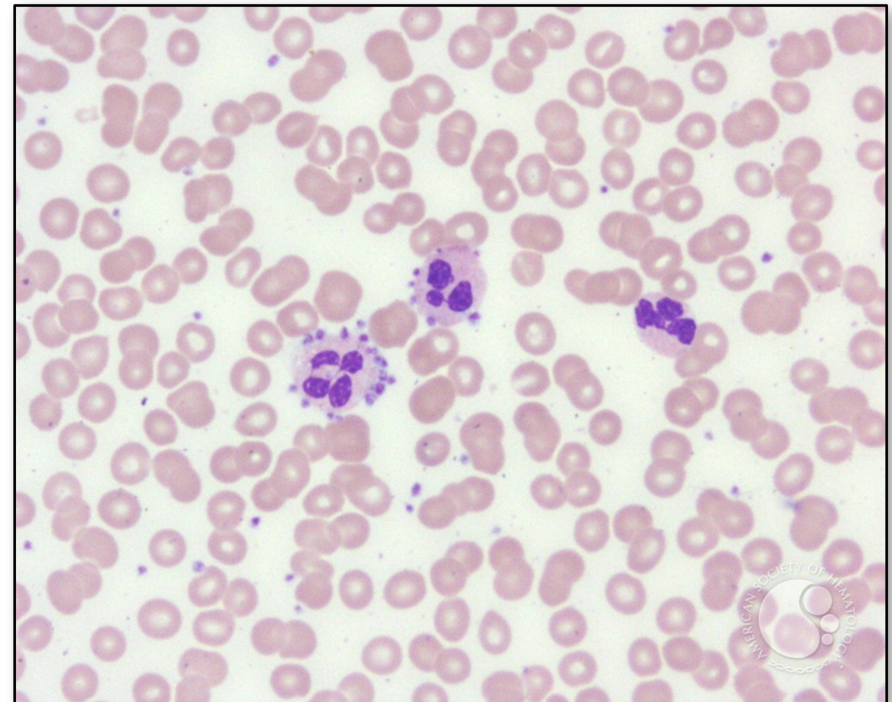
EDTA-Induced Platelet Aggregation

- Time-dependent
- *In vitro*
- Antibody crosslink



Platelet Satellitism

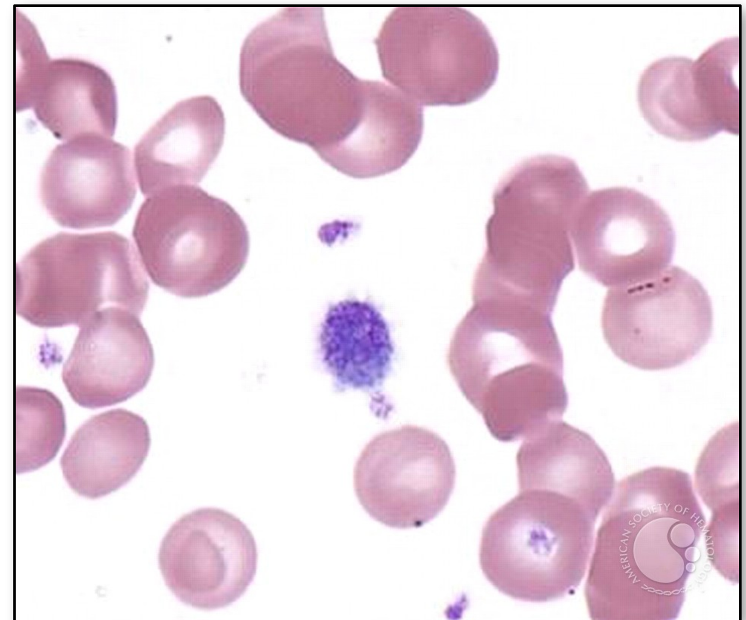
- Platelets adhere to WBC leaving the automated platelet count low
- Also the result of EDTA



Macrothrombocytopenia

- Most are familial

- Large platelets counted as red cells by the hematology analyzer



Causes of True Thrombocytopenia

- Decreased bone marrow production of platelets
- Sequestration of platelets
- Increased destruction of platelets
  - Immune
  - Non-immune

Decreased Bone Marrow Production

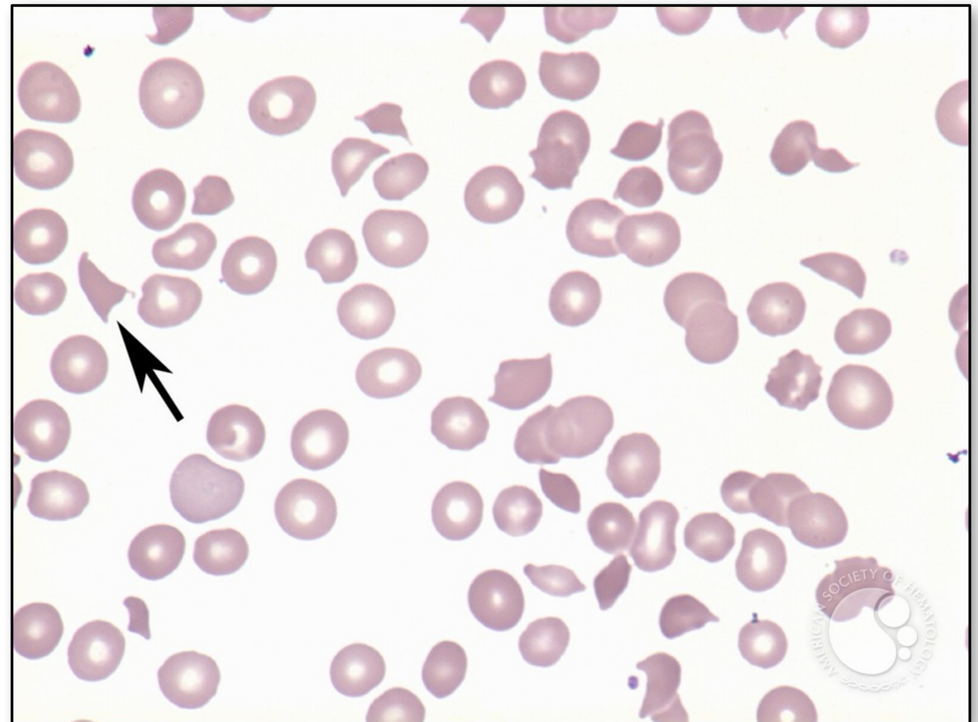
- Rare cause of isolated thrombocytopenia- alcohol
- Usually associated with leukopenia, anemia, and/or abnormal bone marrow pathology- pancytopenia algorithm
- Referral to hematology consideration of bone marrow examination

Increased Sequestration of Platelets

- Rare cause of isolated thrombocytopenia
- Usually associated with leukopenia (and normal hemoglobin)
- Causes are those of hypersplenism
  - Portal hypertension
  - Other causes of splenomegaly
- Need imaging of liver/spleen

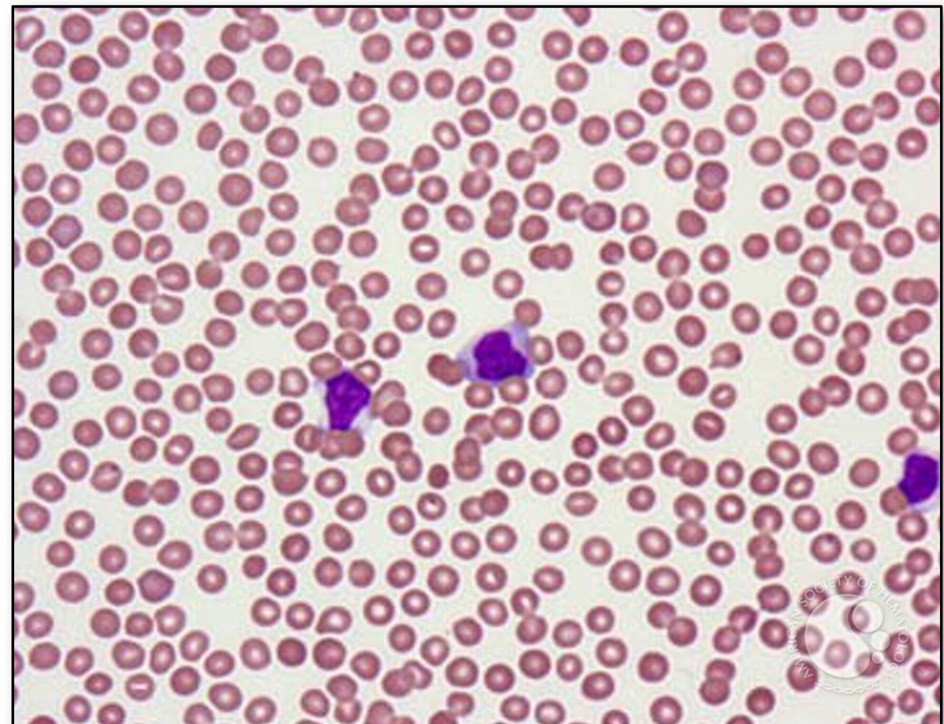
Non-immune Destruction of Platelets

- Causes of microangiopathic hemolytic anemia
- TTP, HUS, DIC
- Urgent hematology consult



Immune Destruction of Platelets

- Primary
- Secondary
  - Autoimmune diseases
  - Lymphoproliferative Diseases
  - Infections
    - HIV
    - Hepatitis B and C
    - EBV, CMV



Workup of Isolated Thrombocytopenia

- **History:** viral illness, autoimmune disease, LPD, bleeding
- **Medications:** amiodarone, beta lactams, carbamazipine, GpIIb/IIIa inhibitors, heparin, ibuprofin, mirtazepine, phenyoin, rifampin, quinidine, quinine, TMP/SMX, vancomycin- need to stop offending drugs
- **Physical Exam:** hepatosplenomegaly, lymphadenopathy, autoimmune disease, peteciae/bleeding

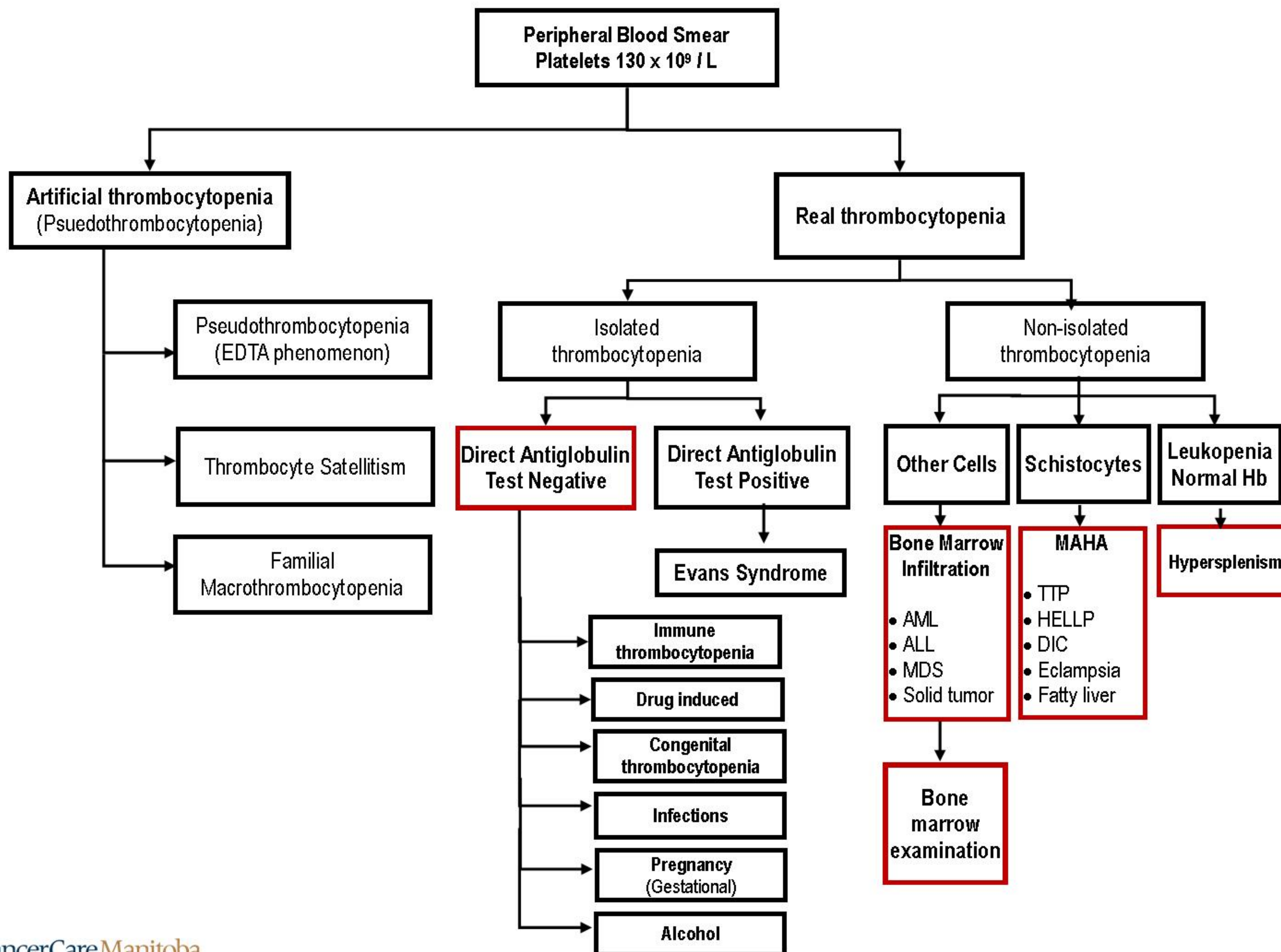
Workup of Isolated Thrombocytopenia

- If results do not make sense, repeat CBC first
- CBC, retic count, INR, direct antiglobulin test, ABO and Rh
- Review of peripheral blood smear
- Renal function, liver enzymes, (ANA/autoimmune panel)
- HIV, Hepatitis B and Hepatitis C serology (EBV, CMV)

Referral of Immune Thrombocytopenia

- Emergent referral if platelet count less than 30 x 10e9/L and/or platelet count less than 50 x 10e9/L with bleeding
- Urgent referral if platelet count between 30 and 50 x 10e9/L
- Routine referral if platelet count between 50 and 100 x 10e9/L
- Referral not required if platelet count greater than 100 x 10e9/L

Work-Up of THROMBOCYTOPENIA



Modified from Erkurt, Kaya, Berber, Koroglu, Kuku (2012) ©Hematology DSG FINAL (Moltzan)

Pathways are subject to clinical judgment and actual practice patterns may not always follow the proposed steps in this pathway.

Take Home Messages

- Peripheral blood film review rules out pseudothrombocytopenia and the presence of other abnormal cells
- Most cases of isolated thrombocytopenia are immune
- Need to think about medications as the cause but relatively few medications cause significant thrombocytopenia
- Urgent referral required if platelet count less than 30 x 10e9/L and/or platelet count less than 50 x 10e9/L with bleeding

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Questions?

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2. Which of the following drugs is not likely to cause thrombocytopenia?

A. Quinine

B. Acetaminophen

C. Ibuprofen

D. Amiodarone

E. Heparin

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