



Blood Day for Primary Care

How do I approach and work up a patient with pancytopenia?

Catherine Moltzan MD FRCPC

*Department of Medical Oncology & Haematology,
CancerCare Manitoba*

*Dept. Internal Medicine, Section of Hematology/
Medical Oncology, University of Manitoba*



UNIVERSITY
OF MANITOBA

Disclosures

1. Received funding from Novartis Feb 2014 for Leadership seminar - no pharmaceutical treatments discussed here



Objectives

1. Define pancytopenia
2. Identify some causes of pancytopenia
3. Identify situations where urgent referral to the hematologist is necessary



Which of the following is not true in patients with pancytopenia?

- a. Bone marrow examination is always necessary
- b. Alcohol can be a contributing cause
- c. Megaloblastic anemia can be a cause
- d. Hypothyroidism can be a cause



Referral to Hematology

Dear Doctor, Re: Patient X

TEST NAME	VALUE	UNITS	REFERENCE RANGES	ABNORMALITY
WBC	1.2	x 10 ⁹ /L	4.5 - 11.0	L
RBC	3.36	x 10 ¹² /L	4.4 - 5.9	L
HGB	106	g/L	140 - 180	L
HCT	0.325	L/L	.40 - .52	L
MCV	96.7	fL	80 - 98	
MCH	31.5	pg	26 - 34	
MCHC	326	g/L	320 - 365	
SEDIMENTATION RATE	65	mm/Hr	Ped:0-10, Adult:0-15H	
SEGMENTED NEUTROPHILS	6	%	34 - 68	L
BAND NEUTROPHILS	3	%	0 - 6	
LYMPHOCYTES	69	%	22 - 52	H
MONOCYTES	12	%	5 - 12	
EOSINOPHILS	9	%	1 - 4	H
BASOPHILS	1	%	0 - 1	
MORPHOLOGY01				
	Essentially normal			
MORPHOLOGY02				
	Platelets appear slightly decreased			
ABS. NEUTROPHIL COUNT	0.07	x 10 ⁹ /L	1.8 - 5.4	L
PLATELET COUNT	107	x 10 ⁹ /L	140 - 440	L

Sending App: LABSTREAM3 Sending Facility: UNICITY LABS ST. BONIFACE
Receiving App: MEDIFILE Receiving Facility: ST. BONIFACE CLINIC
Time Stamp: Nov 18, 2013 14:35 Disk File:

***** Legend *****

Abnormal Flags: N = Normal; H = High Value; L = Low Value
- = Not Specified; * = Abnormal Alpha;
Result Status: C=Corrected; F=Complete;



Pancytopenia

- Definition: Two or three cell lines abnormal (WBC, Hb, Platelets)
- Almost always a bone marrow production problem
 - Malignancy, fibrosis, dysplasia, aplastic anemia
- Exceptions: cirrhosis, paroxysmal nocturnal hemoglobinuria, connective tissue disease



Pancytopenia

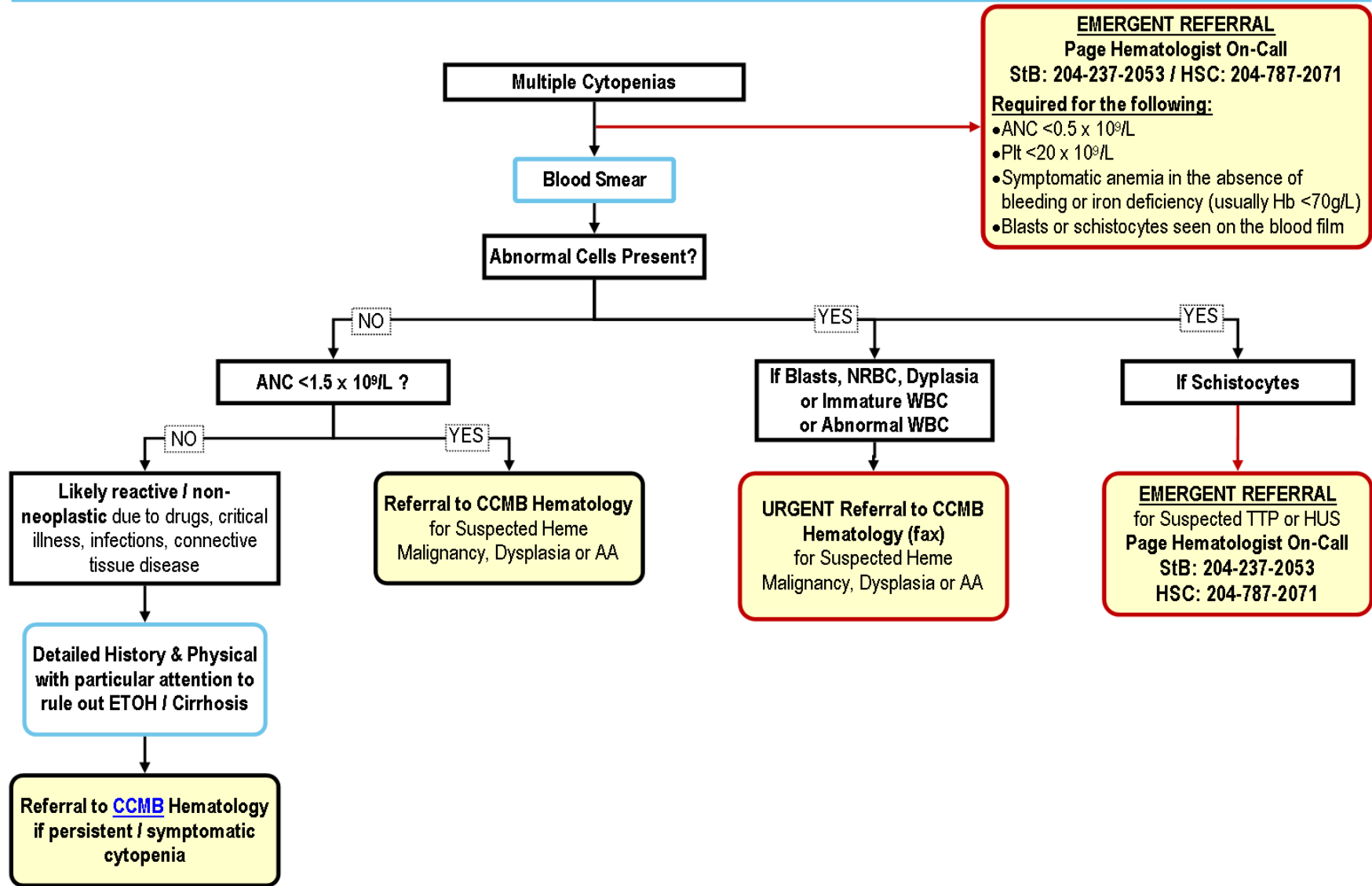
- If abnormalities are mild- repeat bloodwork before evaluating further
- If MCV elevated ensure that a blood smear is looked at and a Vitamin B12 level done to rule out megaloblastic anemia
- If the counts are done in a patient with known cancer on chemotherapy then it is likely expected with the treatment, although consult with the oncologist as required



Pancytopenia

- Urgent referral if ANC less than $1.0 \times 10^9/L$, Hb less than 70 g/L and/or platelet count less than $50 \times 10^9/L$ send consult and order more bloodwork concurrently
- Emergent referral if the above and ANC less than 0.5 and/or platelet count less than 20- page the hematologist on-call
- Emergent referral if blast cells or schistocytes seen on the peripheral blood film

Work-up of PANCYTOPENIA





Pancytopenia – Work Up

- CBC and differential, retic count, blood film
- INR, Vitamin B12 level
- HIV, Hepatitis B and C serology
- Liver enzyme panel, bilirubin, Renal function
- ANA, Rheumatoid factor
- Direct antiglobulin test



If urgent referral is NOT required

- Review history- drugs, autoimmune disease, infectious risks, fevers, night sweats, unexplained weight loss, alcohol/liver disease, hypothyroidism, symptoms related to counts
- Review physical exam- lymphadenopathy, splenomegaly, petechiae, stigmata of liver disease, signs of connective tissue disease



Drugs causing pancytopenia

- Note that most drugs will not cause severe pancytopenia and consult should not be delayed
- Some drugs known to cause pancytopenia
 - Anti-neoplastic drugs (expected effect)
 - Anti-convulsants
 - Anti-thyroid drugs



Take Home Messages

- A patient with marked pancytopenia should be referred to the hematologist without delay
 - Include history and physical assessment, list of medications, and all bloodwork
- Can use algorithm to help determine timing of when to consult the hematologist



Questions?

Catherine Moltzan
cmoltzan1@cancercare.mb.ca

