



FOR
Health Professionals

Q with Ryan Z

Ask the expert

Blood Disorders Day May 14, 2021



Presenter Disclosure

- **Faculty / Speaker's name: Ryan Zarychanski and hematologists**
- **Relationships with commercial interests:**
 - **Grants/Research Support:**
 - **Speakers Bureau/Honoraria:**
 - **Consulting Fees:**
 - **Other:**

Mitigating Potential Bias

- Not Applicable

Referral to Hematology

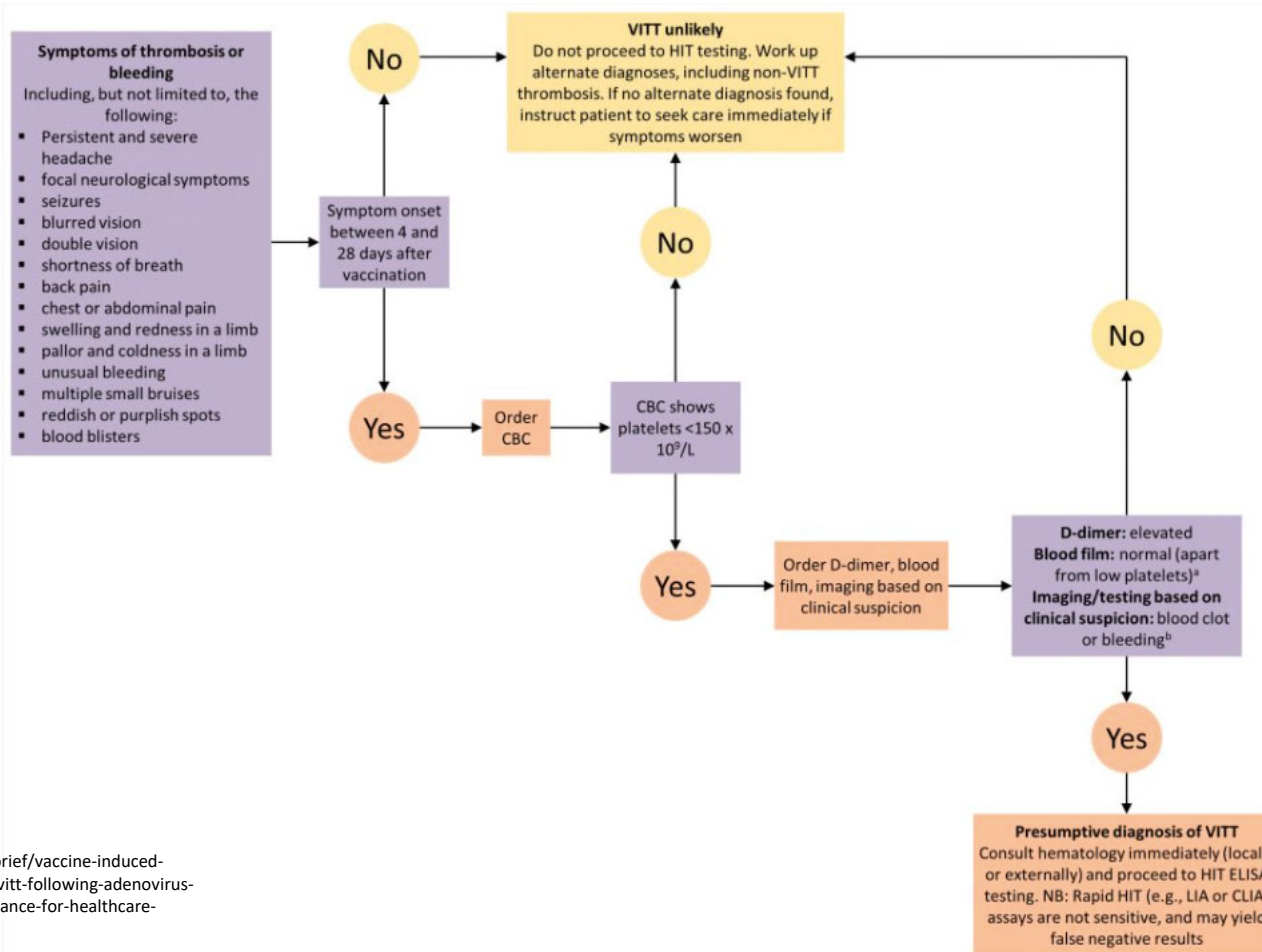
- A 62 yr old patient presented with swollen neck lymph glands. It was initially thought this was an infection but after two rounds of antibiotics, the lymph nodes have not resolved. Patient is asymptomatic other than enlarged nodes. US neck showed 4cm node in the left posterior cervical chain. Radiologist thinks this is lymphoma. What should we do next?

Referral to Hematology

- 45 year old women, AZ COVID vaccine 13 days ago
- Presents to ER with severe headache
- How do I know if this is VITT (vaccine induced thrombotic thrombocytopenia)?

Additional bloodwork

- WBC 7.8, hemoglobin 127, **platelet count 17 x 10⁹/L**
- D-Dimer 27000 (N <230)
- INR 1.2
- PTT 36 sec (normal)
- Fibrinogen 1.1 (N 2-4.7 g/L)



<https://covid19-sciencetable.ca/sciencebrief/vaccine-induced-immune-thrombotic-thrombocytopenia-vitt-following-adenovirus-vector-covid-19-vaccination-interim-guidance-for-healthcare-professionals-in-the-outpatient-setting/>

Question for Hematology

- What to do with decreased beta globulins or decreased alpha-1 or alpha-2 on SPEP?

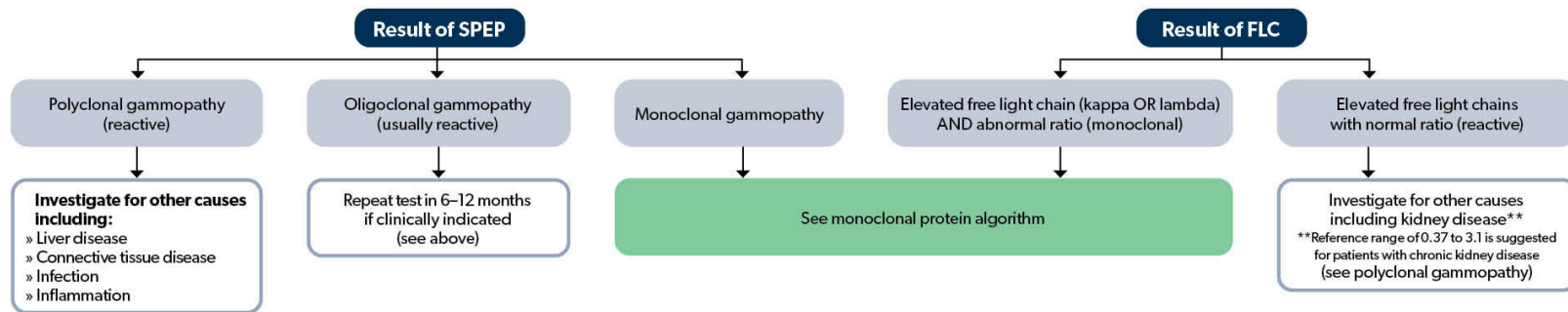
Protein Electrophoresis Serum		
Albumin	45.1 g/L	38.0 - 54.0
Alpha-1	1.6 g/L	1.0 - 3.0
Alpha-2	6.8 g/L	5.0 - 9.0
Beta	↓ 5.1 Below Low Normal g/L	6.0 - 11.0
Gamma	5.4 g/L	5.0 - 12.0
Decreased Beta globulins.		
Total Protein	64 g/L	60 - 80

Question for hematology

- Why do SPEPs sometimes get reported as IgG, IgA and IgM levels, and what do we do with that when one is low?

When to order an SPEP and FLC:

- » Unexplained anemia
- » Osteopenia, osteolytic lesions, spontaneous fractures, unexplained back pain
- » Renal insufficiency with bland urinary sediment
- » Heavy proteinuria or Bence Jones proteinuria
- » Hypercalcemia with low PTH
- » Hypergammaglobulinemia
- » Immunoglobulin deficiency

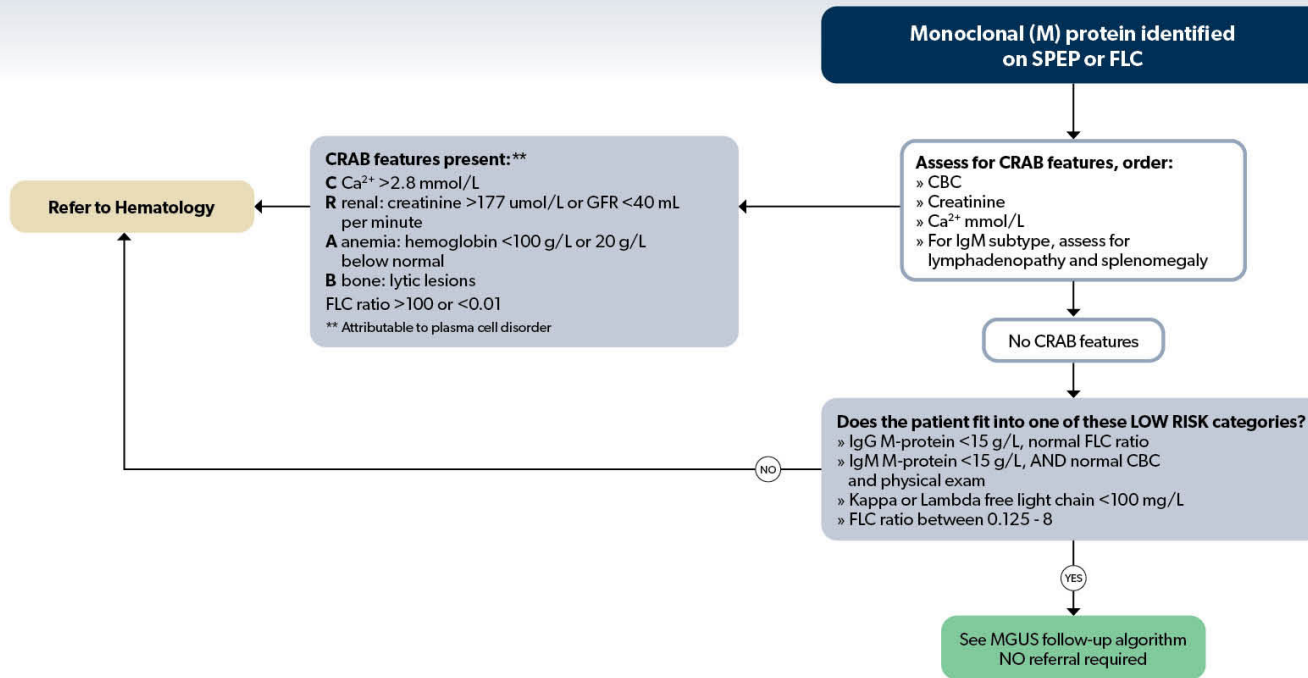


SPEP = Serum Protein Electrophoresis
FLC = Free Light Chains

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Question for hematology

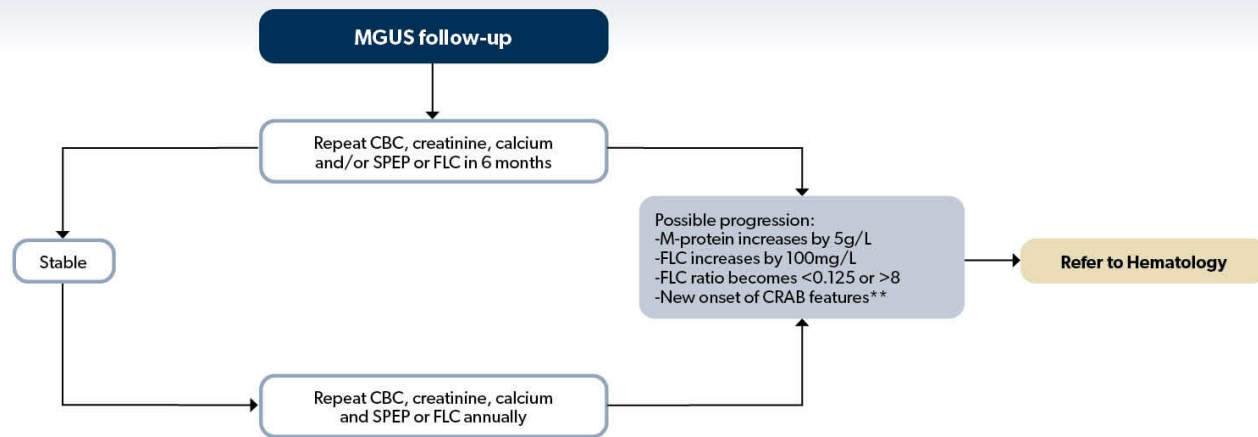
- When there is a small Monoclonal Ig concentration e.g. 3 in this report, with normal FLC ratio, what value, specifically are we following on repeat as per the algorithm?



MGUS = monoclonal gammopathy of undetermined significance
SPEP = serum protein electrophoresis

FLC = free light chain

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MGUS = Monoclonal Gammopathy of Undetermined Significance

FLC = Free Light Chain

CRAB features present:**

C $Ca^{2+} > 2.8$ mmol/L

R renal: creatinine > 177 μ mol/L or GFR < 40 mL per minute

A anemia: hemoglobin < 100 g/L or 20 g/L below normal

B bone: lytic lesions

FLC ratio > 100 or < 0.01

** Attributable to plasma cell disorder

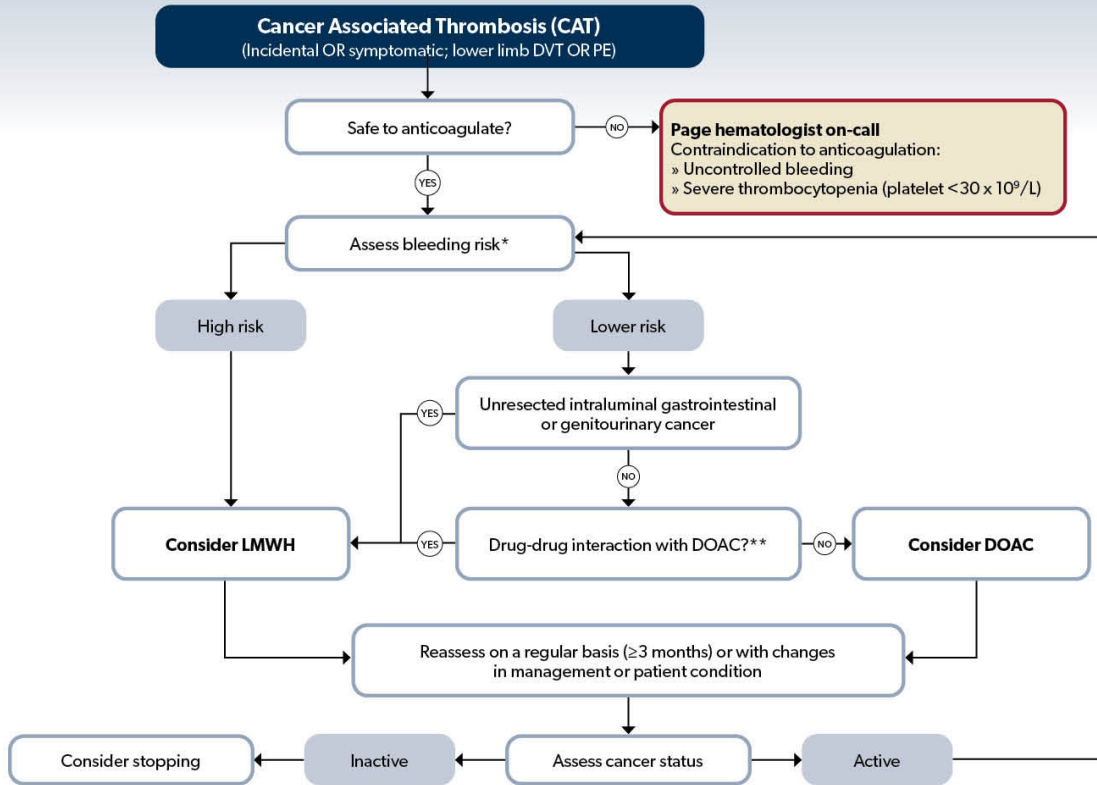
ANNUAL RISK OF PROGRESSION FOR MGUS SUBTYPES

MGUS Subtype	Risk	Associated disorders
IgM MGUS	1% per year	Waldenstroms macroglobulinemia
Non-IgM MGUS	0.5% per year	Multiple myeloma, plasmacytoma, amyloidosis
Light chain MGUS	0.3% per year	Light chain myeloma, amyloidosis
Low risk MGUS (IgG, < 15 g/L, normal FLC)	2% lifetime risk	

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Thrombosis case



***Risk factors for bleeding (any of):**

1. Acute recent and/or life-threatening bleeding
2. High risk of GI bleeding [e.g., previous variceal bleed, angiodysplasia, treatment-associated toxicity]
3. High risk intracranial lesion [e.g., glioma]
4. Functional hepatic impairment [Child-Pugh class C]
5. Thrombocytopenia [$< 50 \times 10^9/L$]
6. Use of antiplatelet agents

Other factors to consider:

- » Patient preferences, after discussion of risks and benefits
- » Drug coverage and cost
- » Body weight (consider LMWH in patients with weight > 150 kg and agent with weight-adjustable dosing in patients with weight < 50 kg)
- » Burden of cancer (e.g., recurrence or progression) and burden of VTE (consider LMWH for patients with severe symptoms, e.g., iliofemoral DVT, submassive PE, any thrombolysed patient)
- » Significant GI surgery or absorption disorders (consider LMWH for patients with impaired GI absorption)

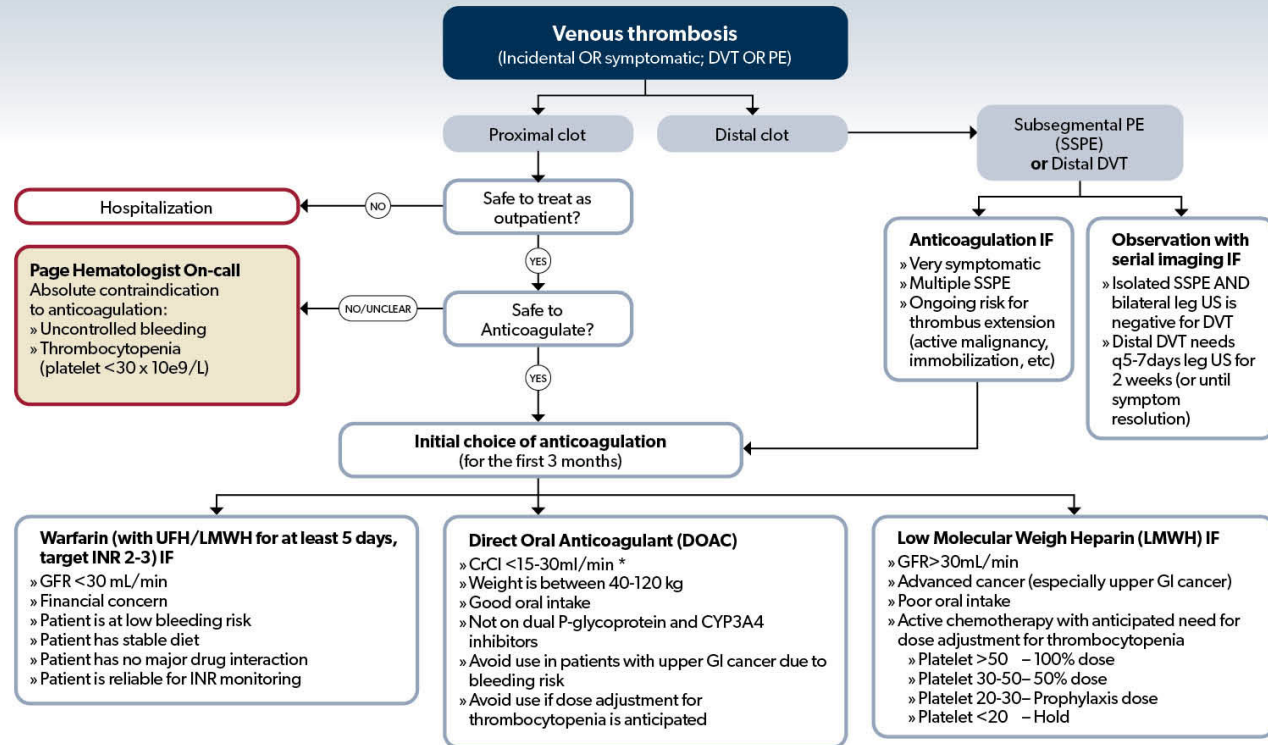
** Pharmacist led pharmacokinetic review
DVT = deep vein thrombosis

PE = pulmonary embolism
LMWH = low molecular weight heparin

DOAC = direct oral anticoagulant

Initial Management of VTE

***Dabigatran**: Avoid if CrCl <30 ml/min
Rivaroxaban/Apixaban: Caution for CrCl 15-30 ml/min; Avoid use if CrCl <15ml/min

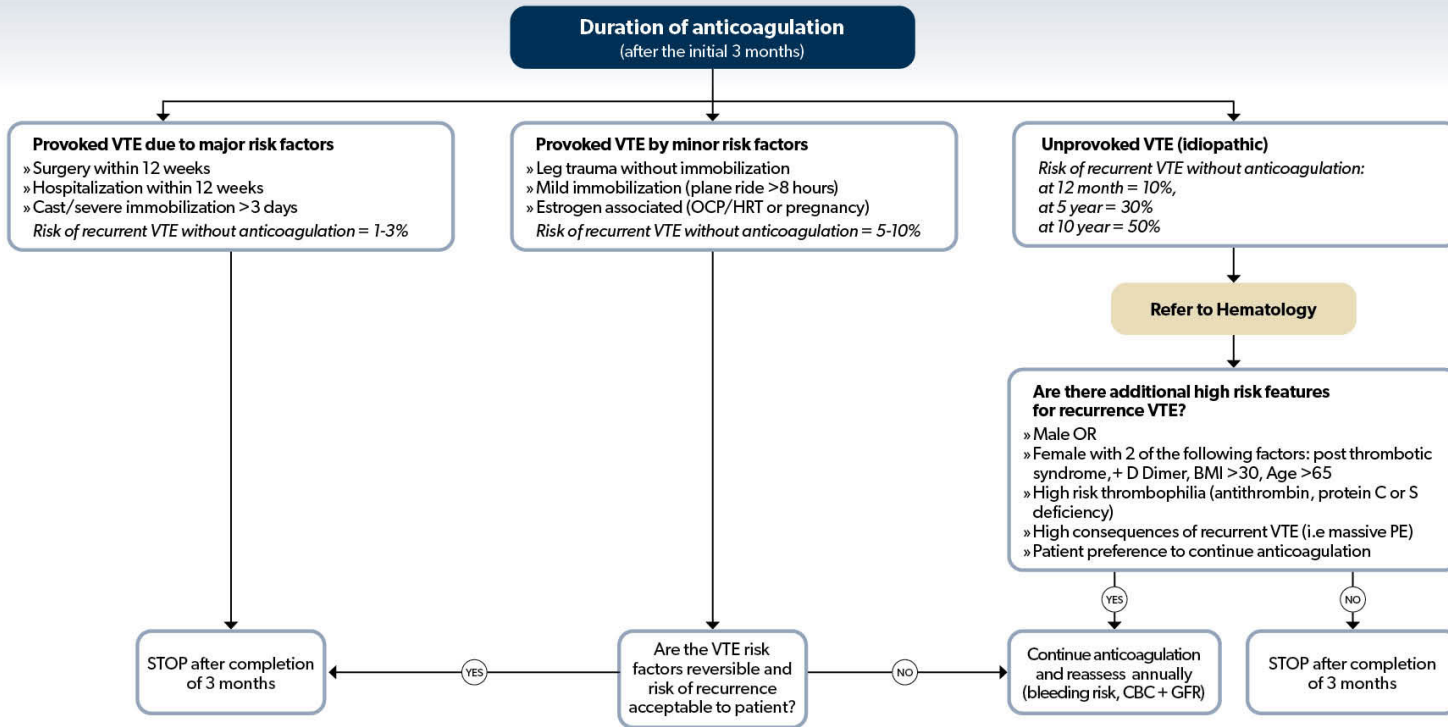


US = Ultrasound
DOAC = Direct oral anticoagulant

VTE = venous thromboembolism
UFH = unfractionated heparin

LMWH = low molecular weight heparin

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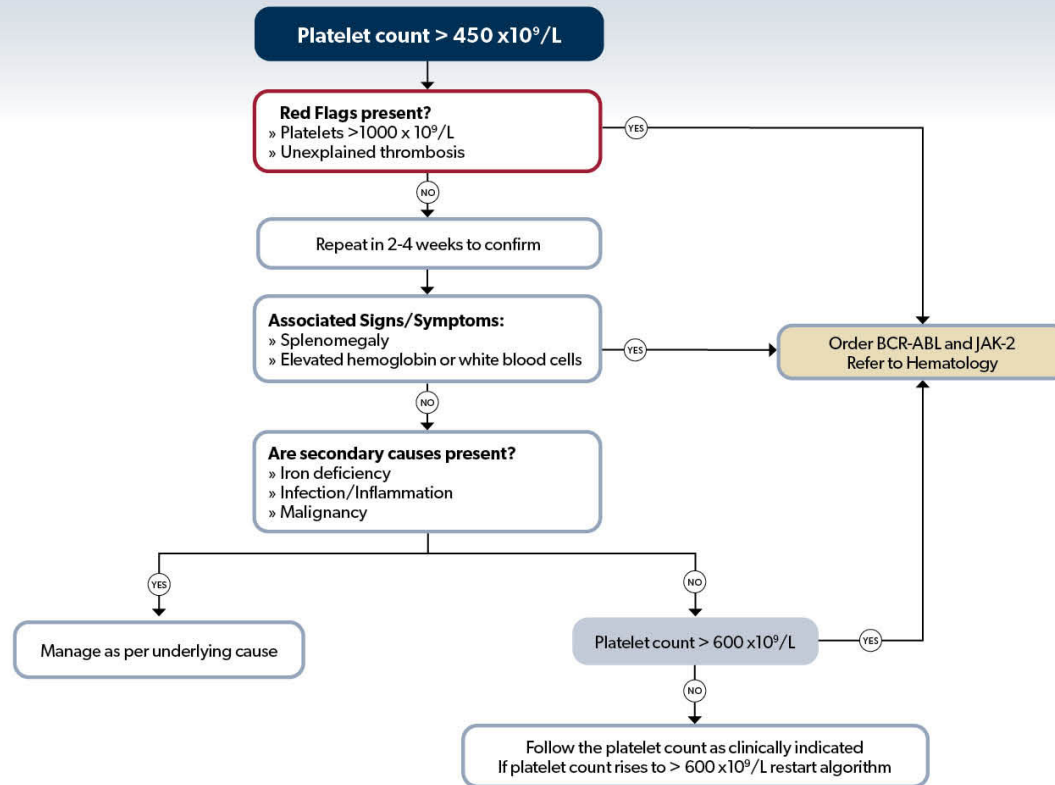
OCP = Oral contraceptive pill
HRT = Hormone replacement therapy

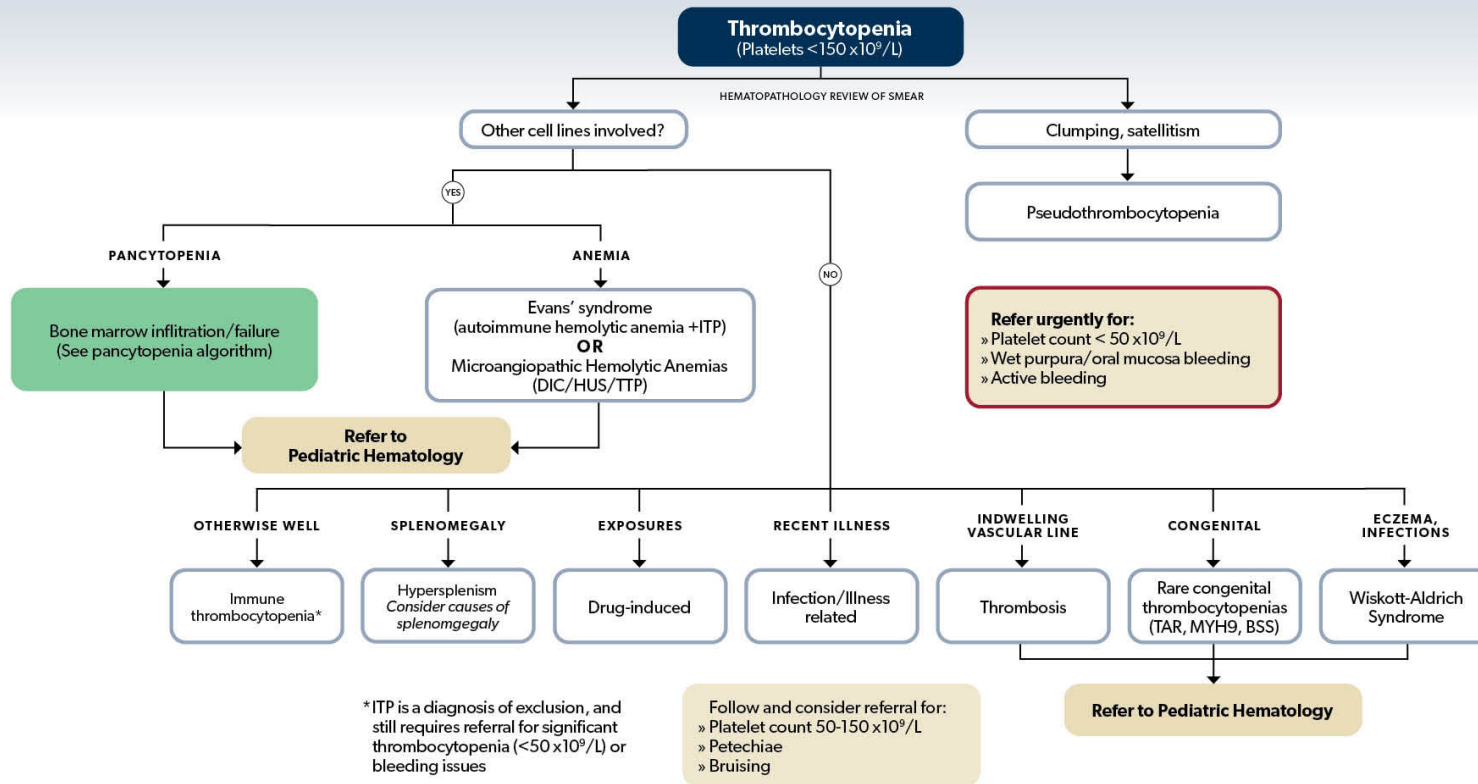
VTE = venous thromboembolism

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High and low platelets



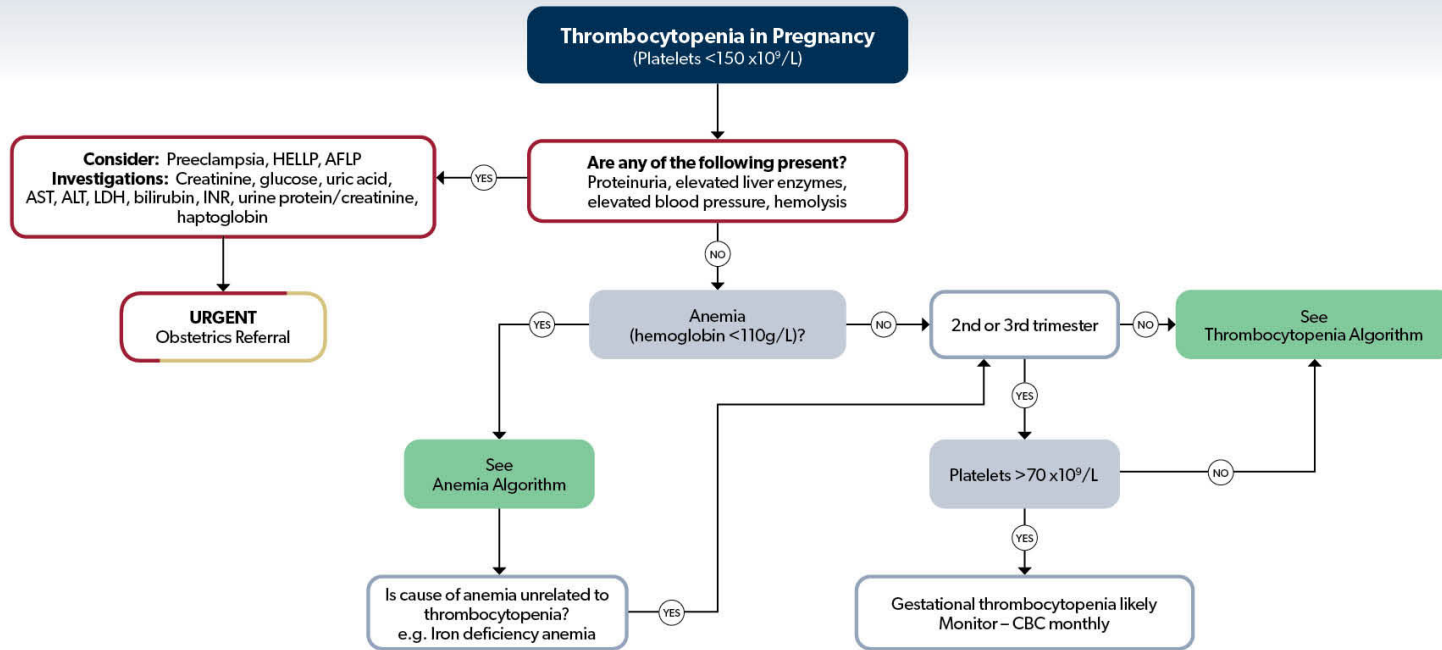


DIC = Disseminated intravascular coagulation
HUS = Hemolytic uremic syndrome

TTP = Thrombotic thrombocytopenic purpura
TAR = Thrombocytopenia with absent radii

MYH9 = Myosin heavy chain 9-related thrombocytopenia
BSS = Bernard-Soulier syndrome

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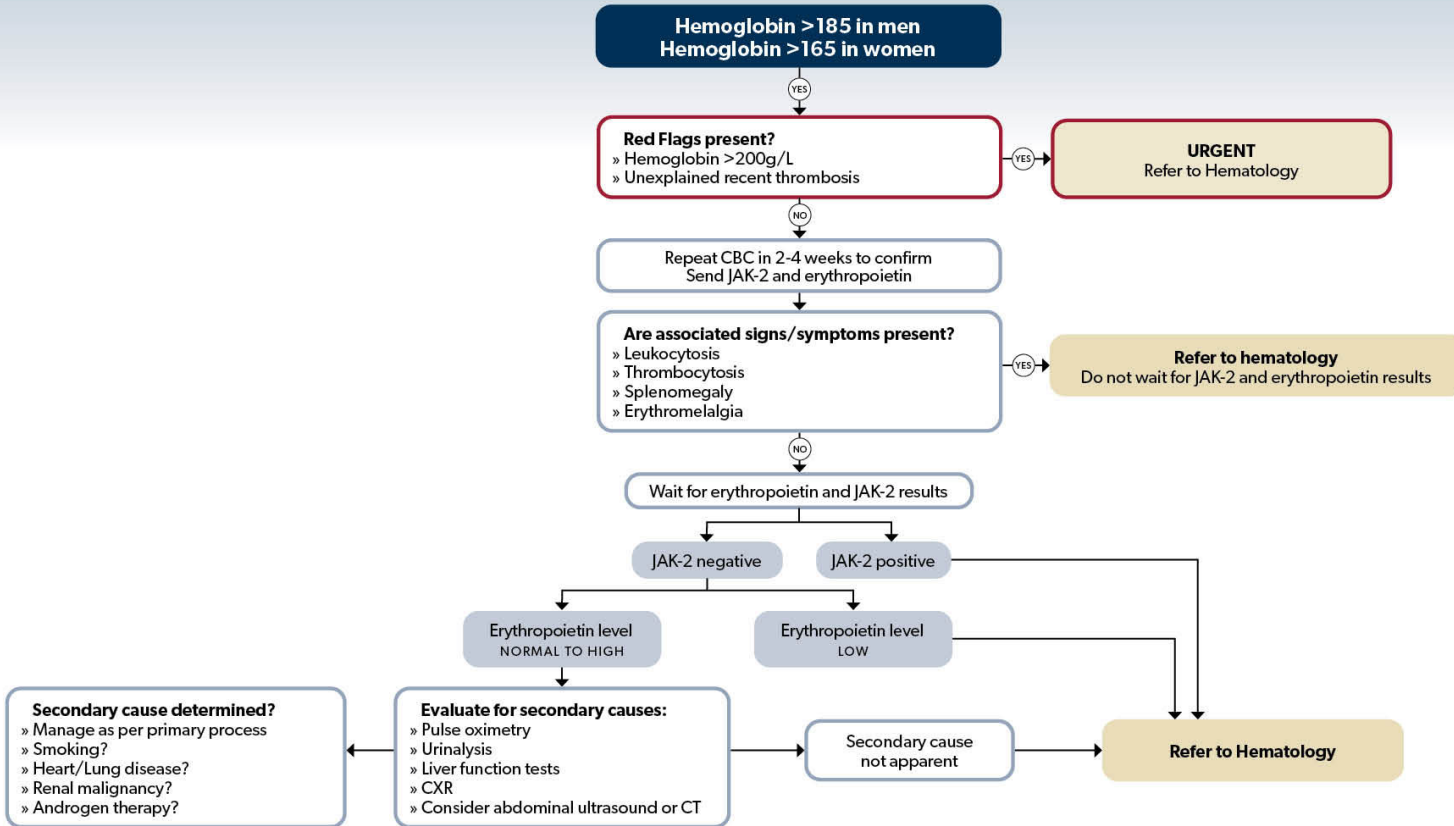


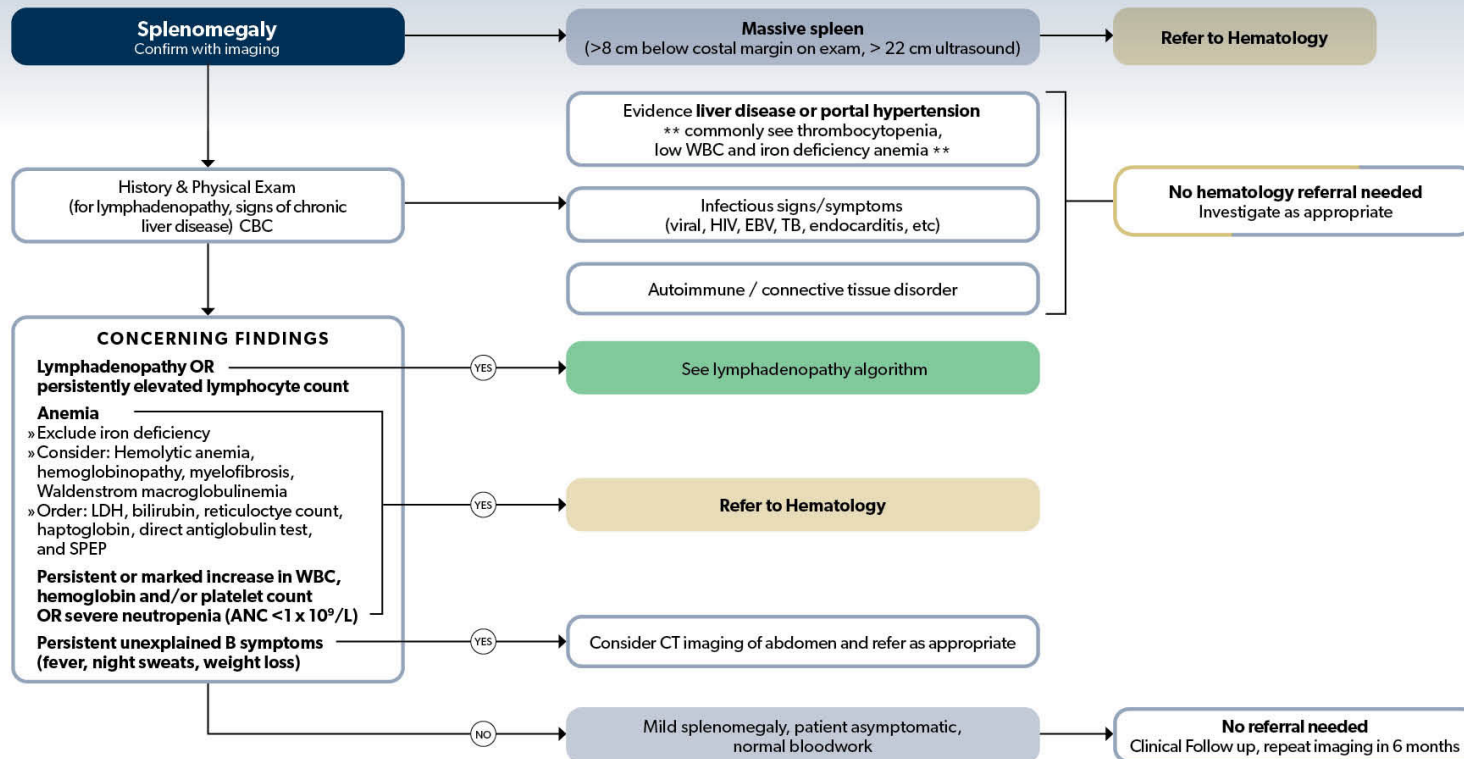
HELLP: Hemolysis, elevated liver enzymes, low platelets
AFLP: Acute fatty liver of pregnancy

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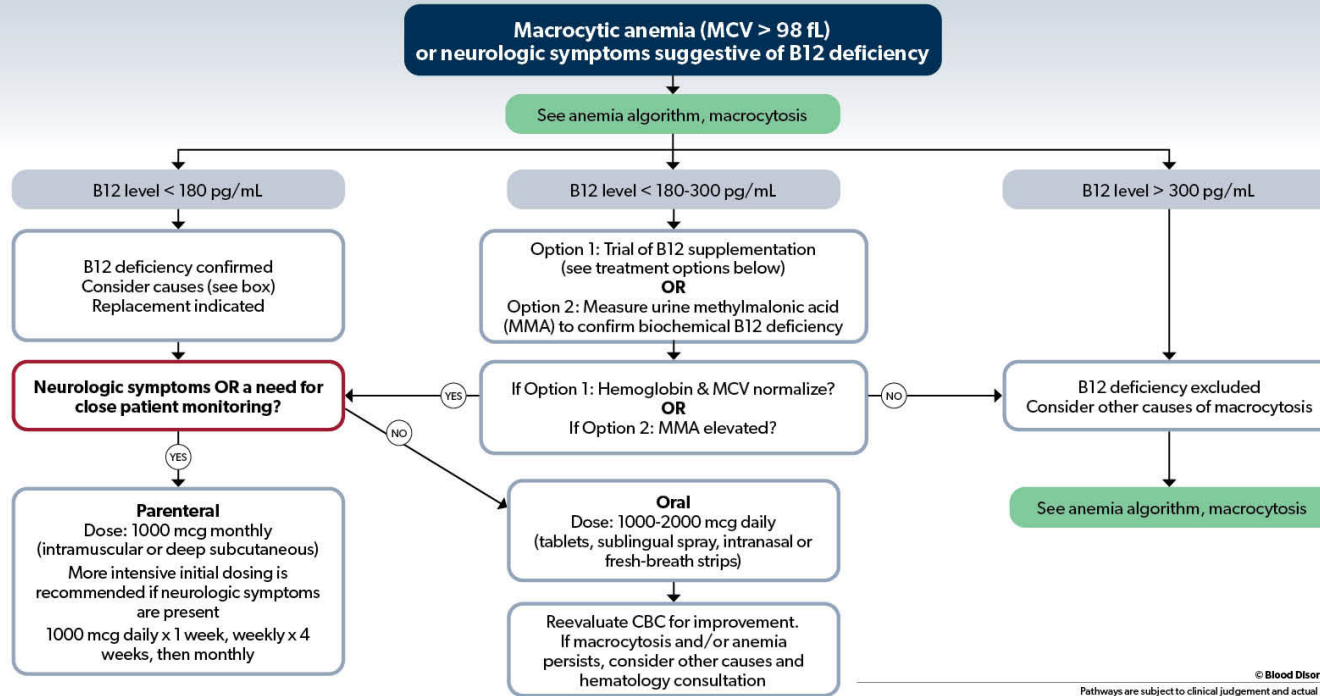
Thank you

rzarychanski@cancercare.mb.ca





Definition of Splenomegaly: Palpable, > 13 cm on ultrasound
Platelet count < 75 x 10⁹/L, or WBC count < 3 x 10⁹/L may be less likely attributed to portal hypertension



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Causes of vitamin B12 deficiency

Gastric

- » Pernicious anemia (autoantibodies)
- » Gastrectomy/ bariatric surgery
- » Gastritis

Pancreatitis

Pancreatic insufficiency

Strict vegan diet

Small bowel disease

- » Malabsorption syndrome
- » Ileal resection or bypass
- » Inflammatory bowel disease
- » Celiac disease
- » Bacterial overgrowth
- » Blind loop
- » Fish tapeworm

Agents that impair B12 absorption

- » Biguanides (e.g. metformin)
- » Proton pump inhibitors
- » Histamine-2 receptor antagonists
- » Nitrous oxide gas

Causes of Folate deficiency

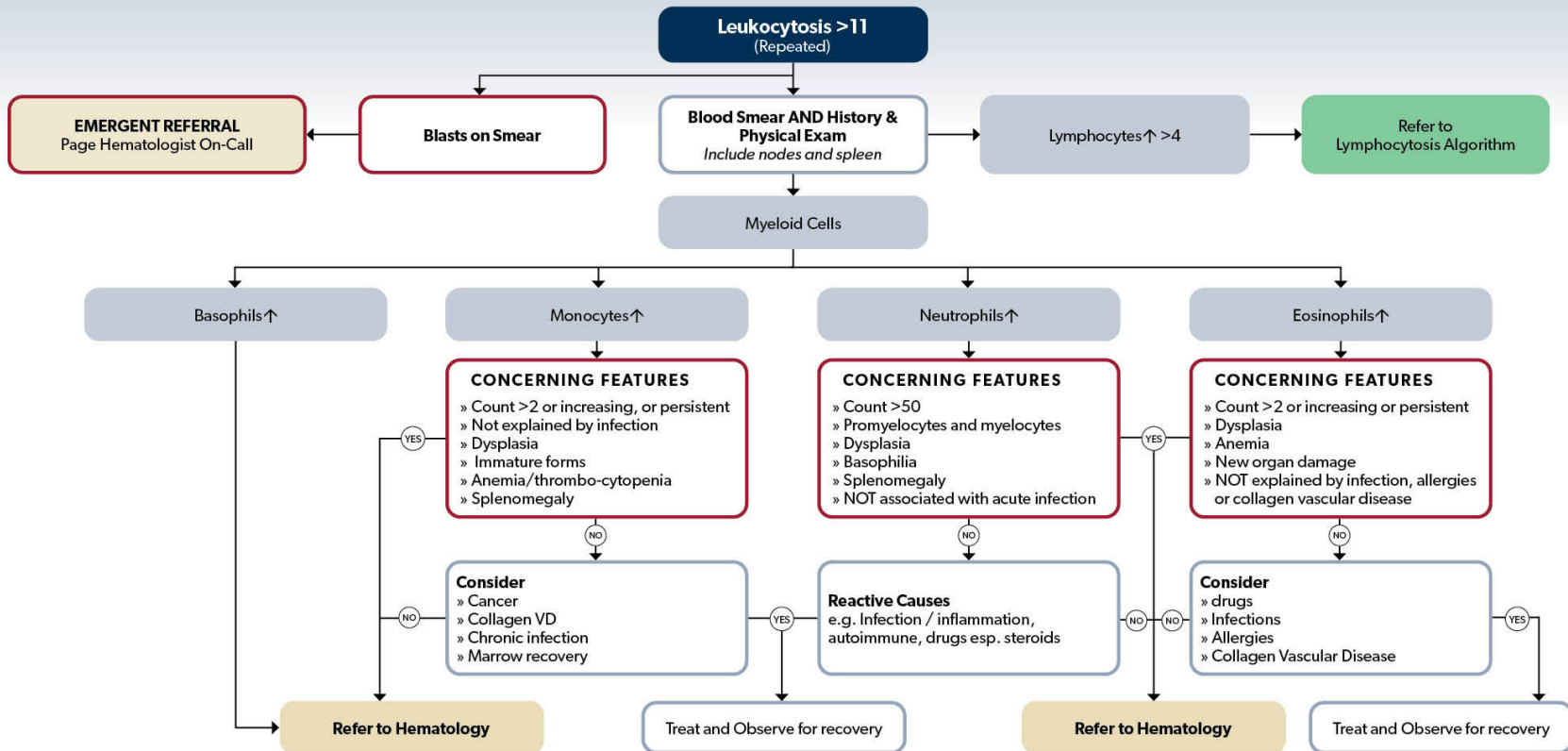
Malabsorption

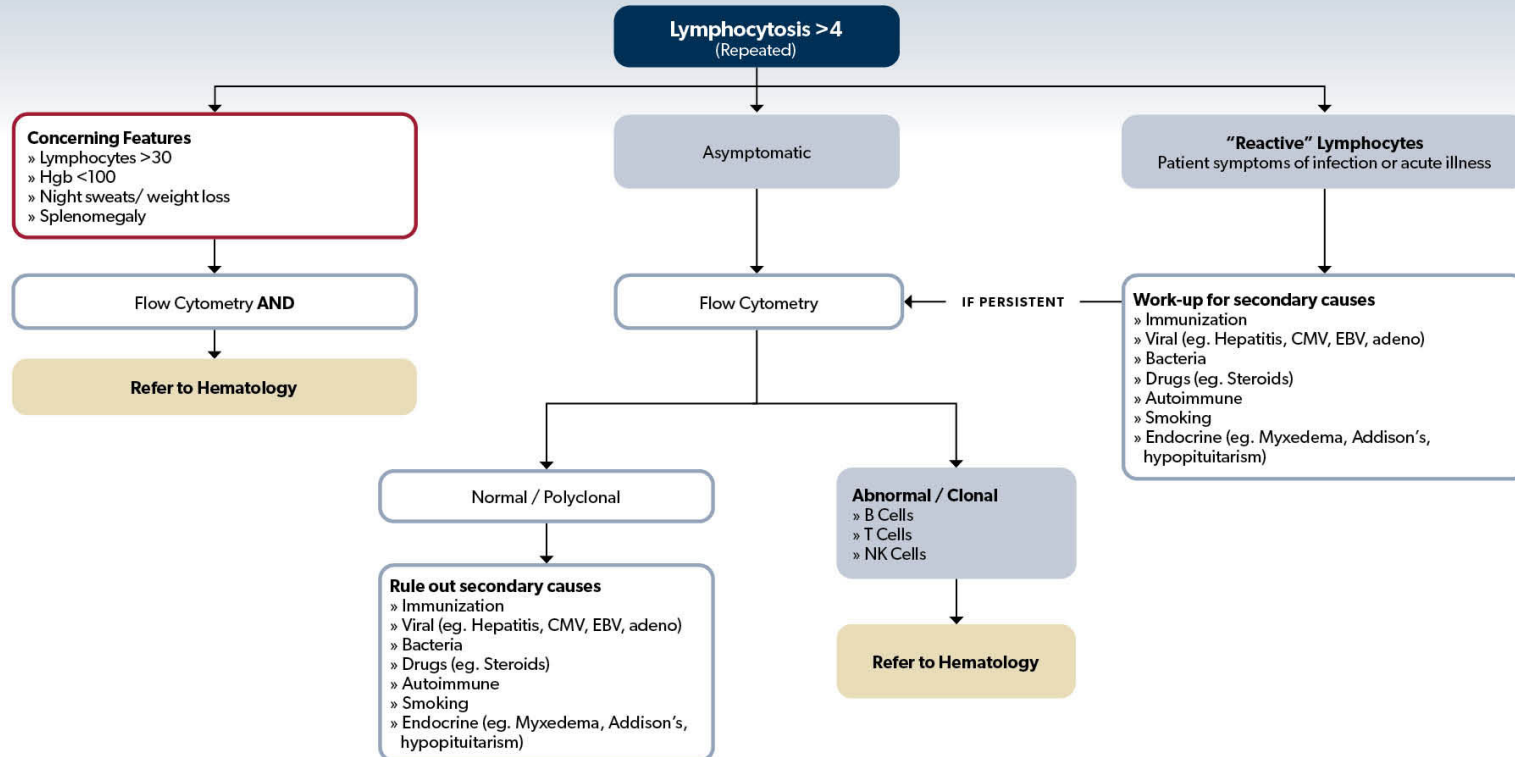
- » Celiac disease
- » Inflammatory bowel disease
- » Intestinal bypass

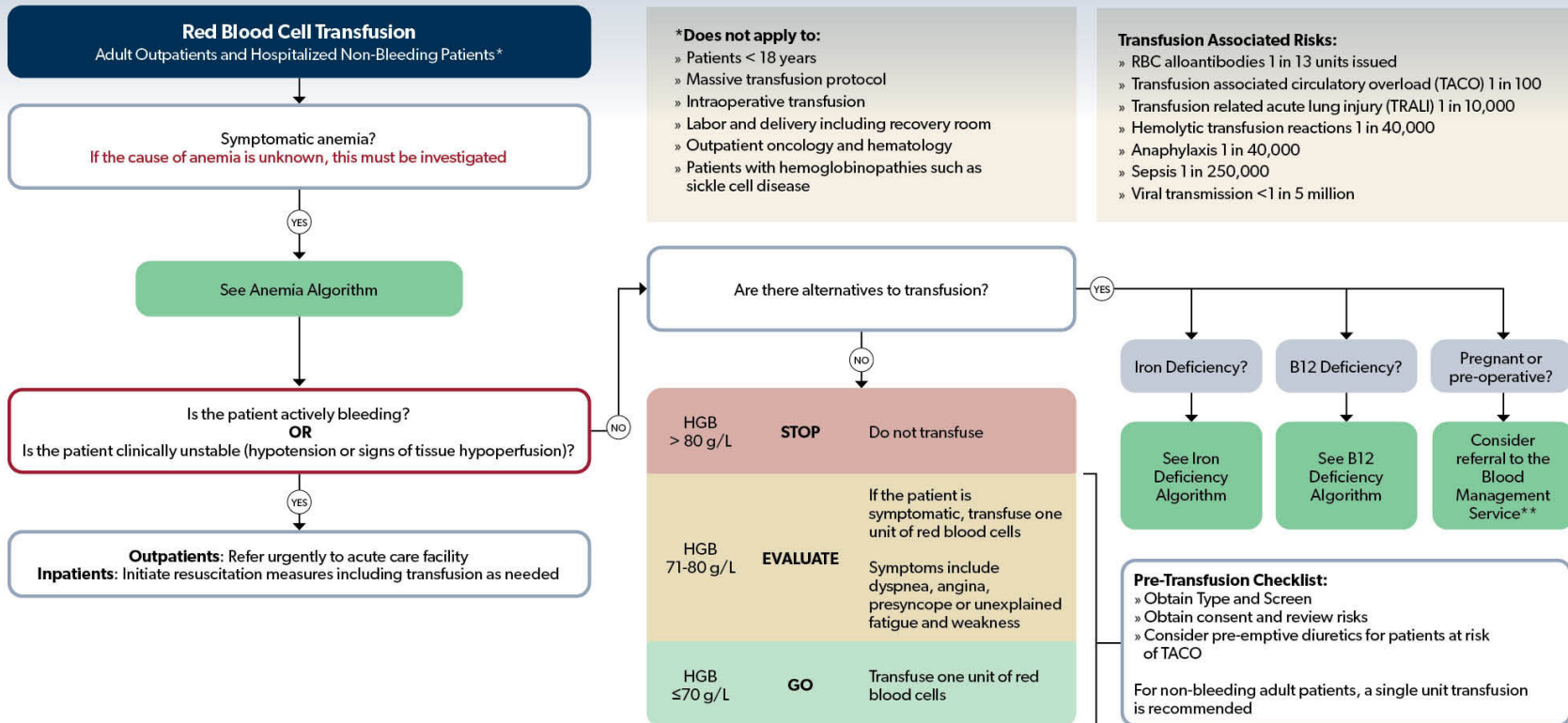
Folate inhibition

- » Methotrexate
- » Dilantin
- » Alcoholism

Patients with any of the above should receive folate supplementation. No need to measure folate level. NOTE: mandatory staple food fortification has eradicated dietary folate deficiency







TACO = Transfusion associated circulatory overload

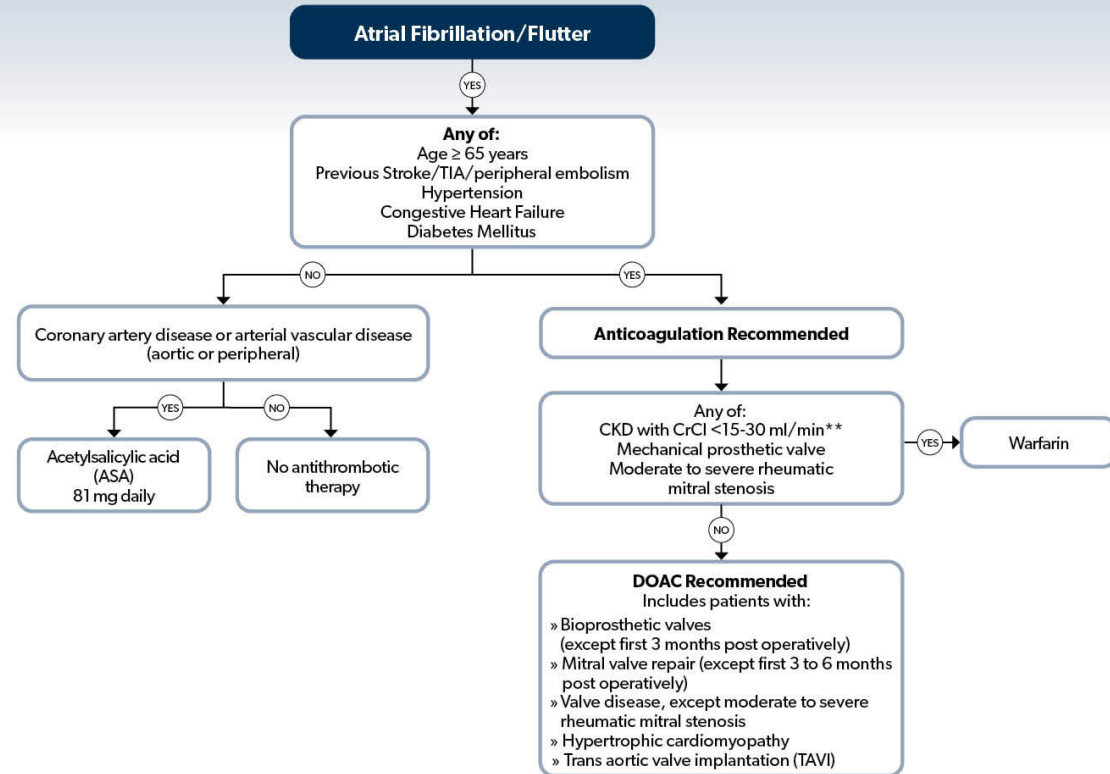
Transfusion Medicine physician is available through Health Sciences Centre paging at 204-787-2071 for clinical consultation
**Blood Management Service: <https://bestbloodmanitoba.ca/clinical-groups/blood-conservation-service>

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Consider Referral to Cardiology in Patients with:

- » Cardiomyopathy
- » Moderate to severe valvular disease
- » Symptoms (dyspnea, presyncope)
- » Difficult to control ventricular rates
 - » Especially those over age >75 on 2 or more rate controlling agents (for possible AV node ablation/pacemaker insertion)
- » Age less than <60
- » Recurrent atrial flutter (for possible ablation)
- » Recent myocardial infarction and stent insertion
- » High risk for bleeding
- » Professional driver's/pilot's licenses

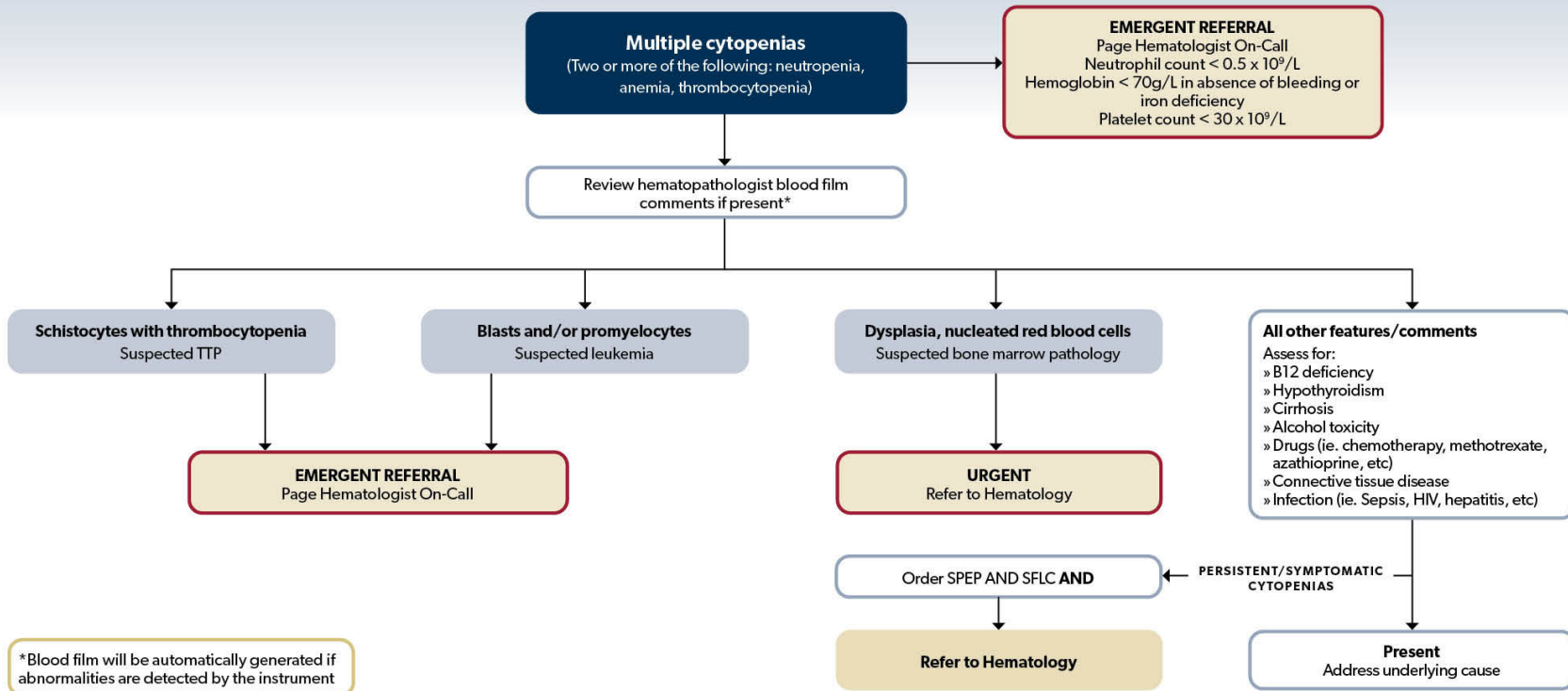
***Dabigatran:** Avoid use if CrCl <30ml/min
Rivaroxaban/Apixaban: Caution for CrCl 15-30 ml/min; avoid use if CrCl <15ml/mi
 Confirm dosing for renal function



CKD = Chronic kidney disease
 DOAC = Direct oral anticoagulant

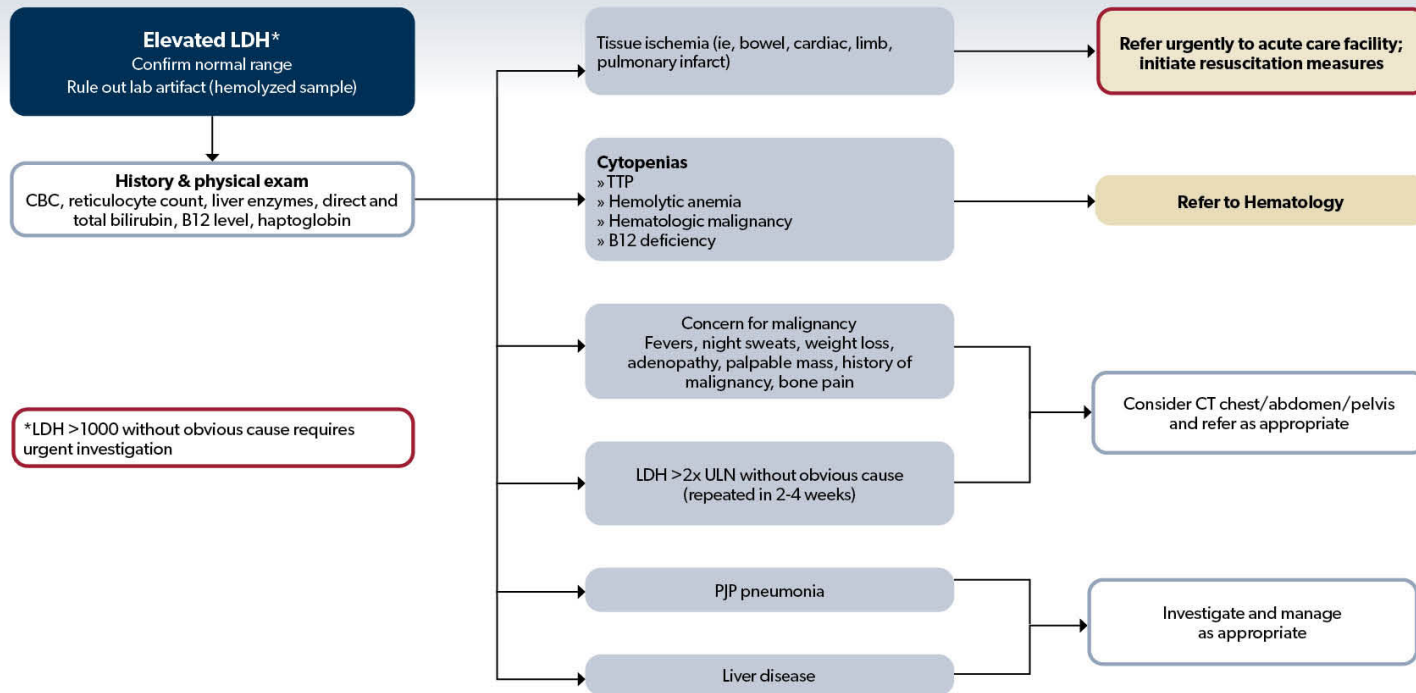
TIA = Transient ischemic attack

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SPEP = Serum protein electrophoresis
SFLC = Serum free light chain

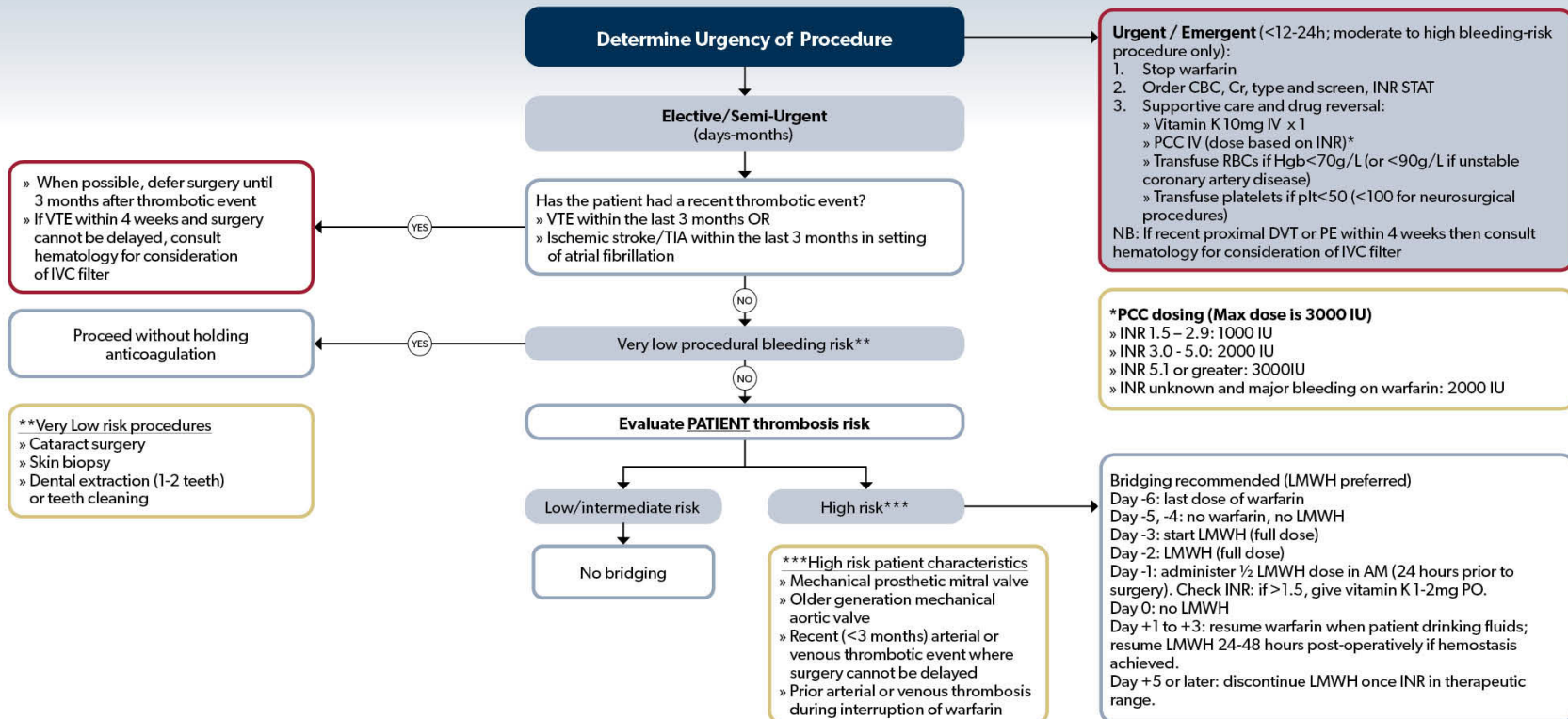
TTP = Thrombotic thrombocytopenic purpura



TTP = Thrombotic thrombocytopenic purpura
PJP = Pneumocystis jirovecii pneumonia

LDH = lactate dehydrogenase

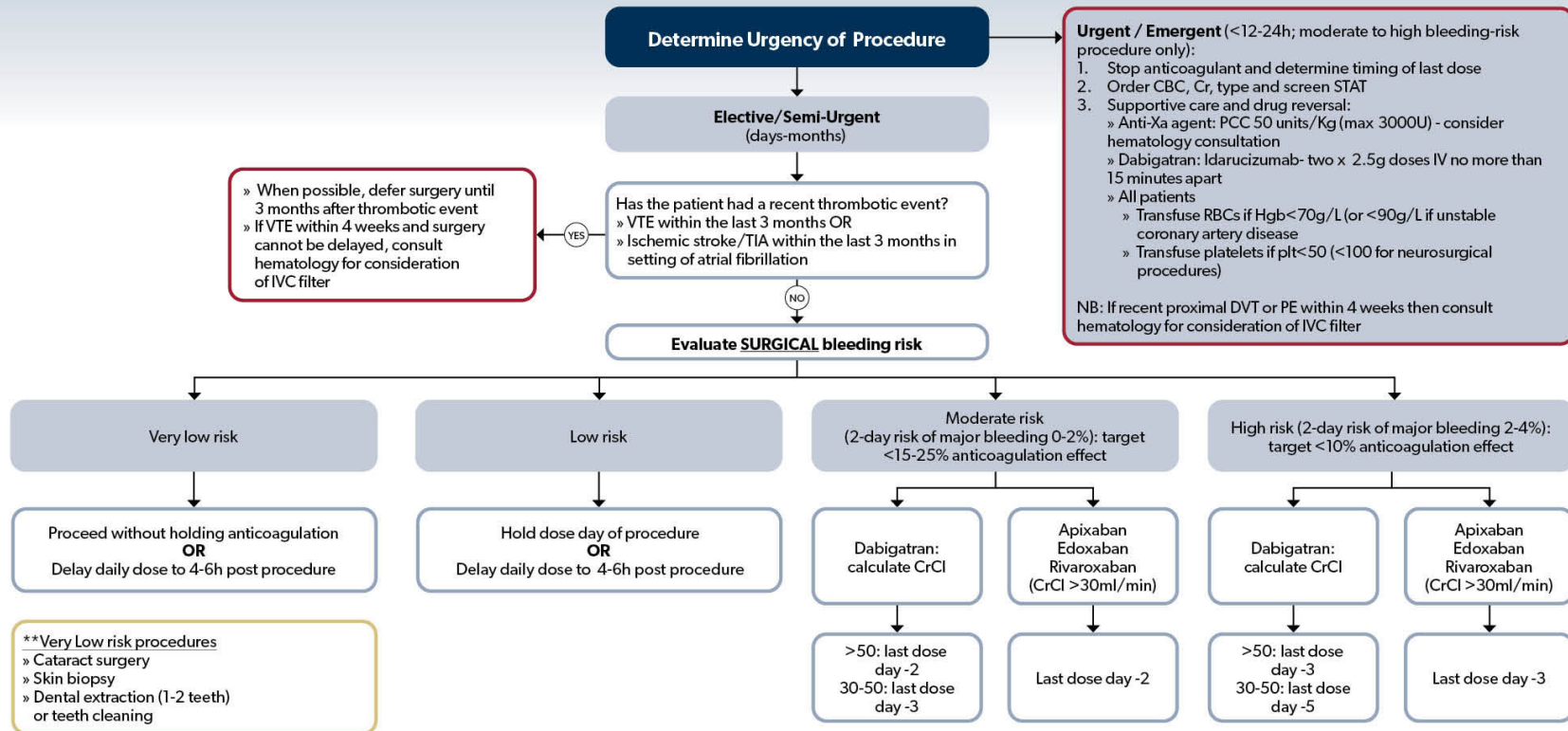
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LMWH = Low molecular weight heparin
PCC = Prothrombin complex concentrate eg. Octaplex® or Beriplex®

INR = International normalized ratio
Refer to www.thrombosiscanada.ca for further information

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LOW/VERY LOW RISK

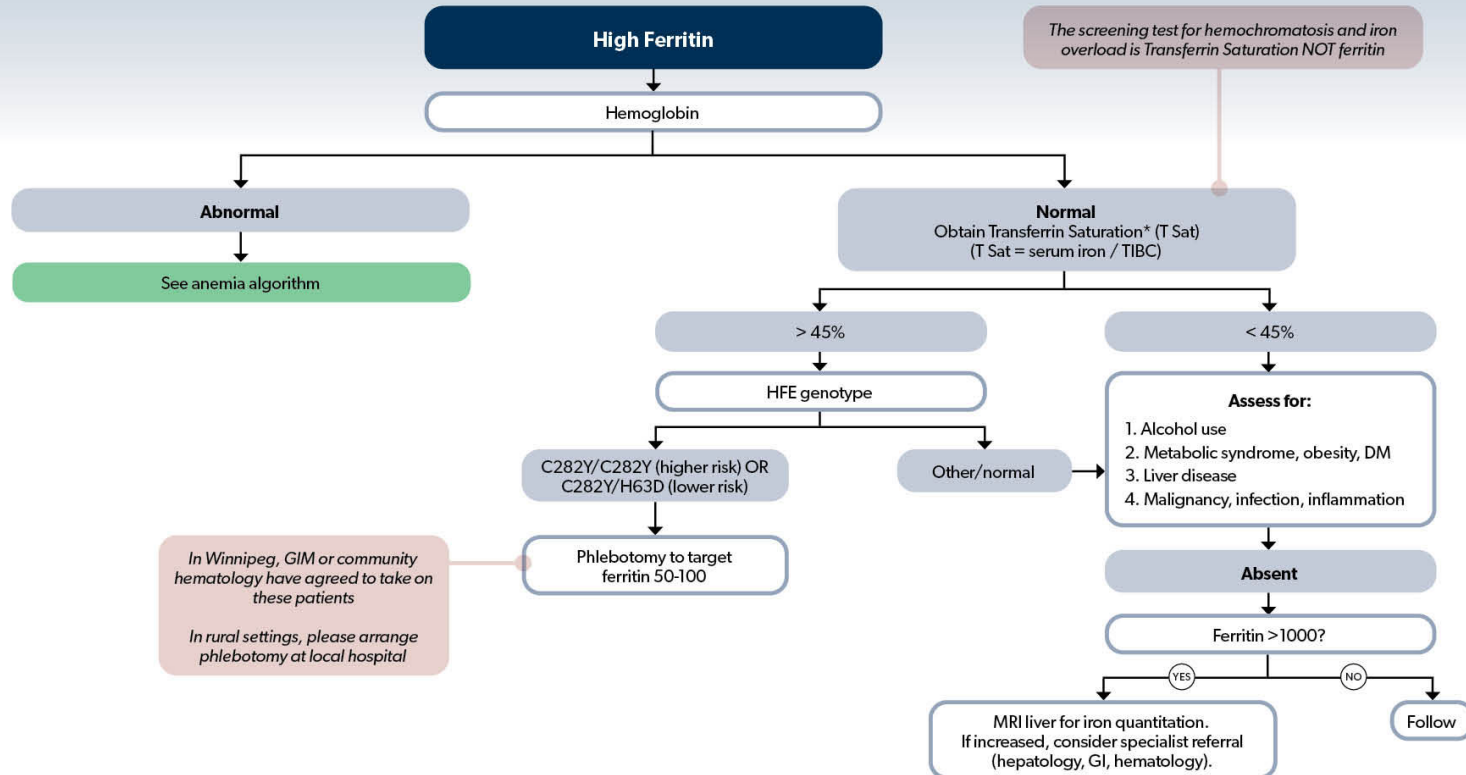
- » Cataract surgery
- » Dermatologic procedures (e.g. biopsy)
- » Gastroscopy or colonoscopy without biopsies
- » Coronary angiography (using radial arterial approach)
- » Permanent pacemaker insertion or internal defibrillator placement (if bridging anticoagulation is not used)
- » Selected procedures with small-bore needles (e.g. thoracentesis, paracentesis, arthrocentesis)
- » Dental extractions (1 or 2 teeth)
- » Endodontic (root canal) procedure
- » Subgingival scaling or other cleaning
- » Use of antiplatelet agents

MODERATE RISK

- » Abdominal surgery (e.g. cholecystectomy, hernia repair, colon resection)
- » Other general surgery (e.g. breast)
- » Other intrathoracic surgery
- » Other orthopedic surgery
- » Other vascular surgery
- » Non-cataract ophthalmologic surgery
- » Gastroscopy or colonoscopy with biopsies
- » Coronary angiography (using femoral artery approach)
- » Selected procedures with large-bore needles (e.g. bone marrow biopsy, lymph node biopsy)
- » Complex dental procedure (e.g. multiple tooth extractions)

HIGH RISK

- » Any surgery or procedure with neuraxial (spinal or epidural) anesthesia
- » Neurosurgery (intracranial or spinal)
- » Cardiac surgery (e.g. CABG, heart valve replacement)
- » Major vascular surgery (e.g. aortic aneurysm repair, aortofemoral bypass)
- » Major orthopedic surgery (e.g. hip/knee joint replacement surgery)
- » Lung resection surgery
- » Urological surgery (e.g. prostatectomy, bladder tumour resection)
- » Extensive cancer surgery (e.g. pancreas, liver)
- » Intestinal anastomosis surgery
- » Reconstructive plastic surgery
- » Selected procedures involving vascular organs (e.g. kidney biopsy, prostate biopsy) or a high bleed risk intervention (e.g. pericardiocentesis, spinal injection, polypectomy)



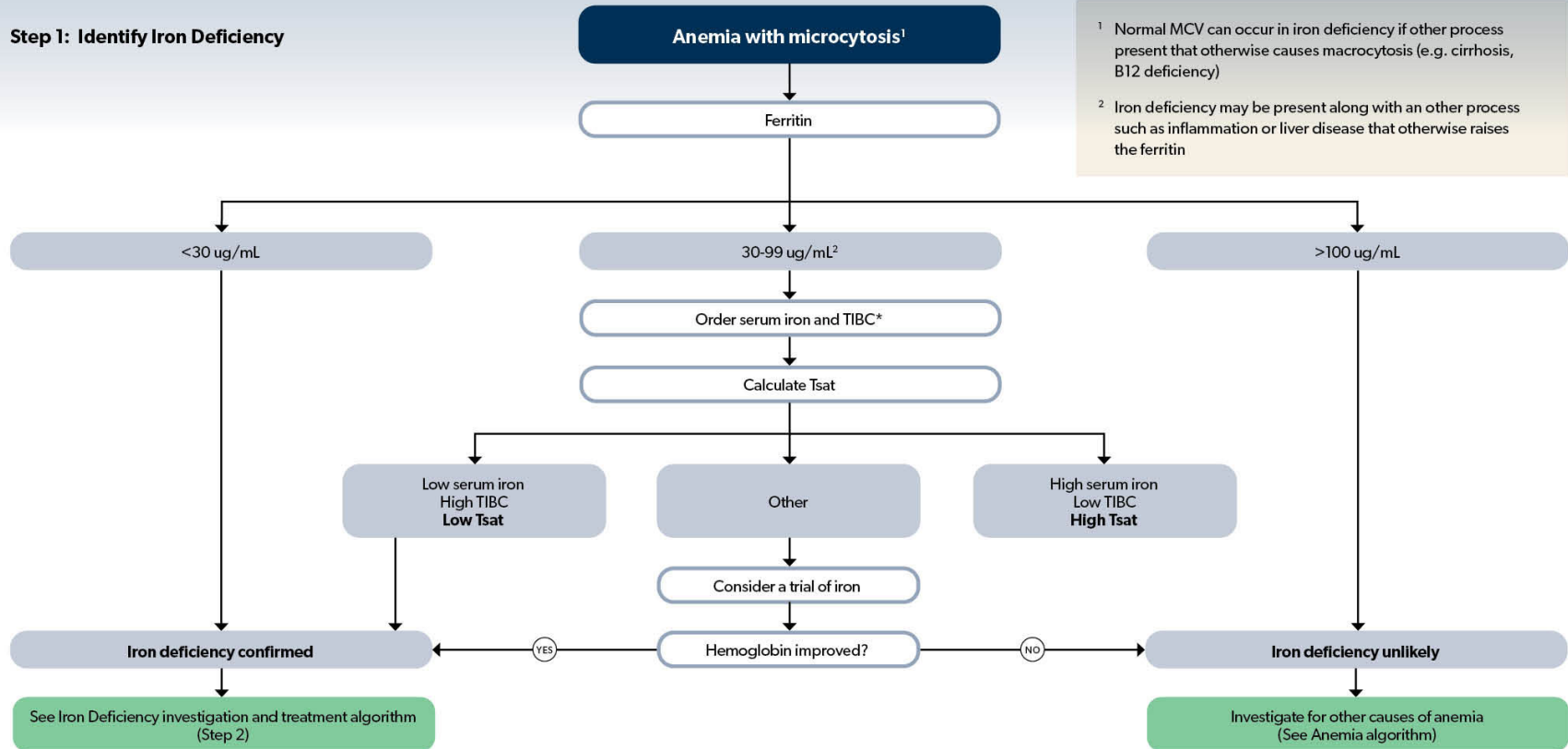
T sat = transferrin saturation (iron / TIBC)
TIBC = total iron binding capacity

GIM = general internal medicine
GI = gastroenterology

* Fasting sample required

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Step 1: Identify Iron Deficiency



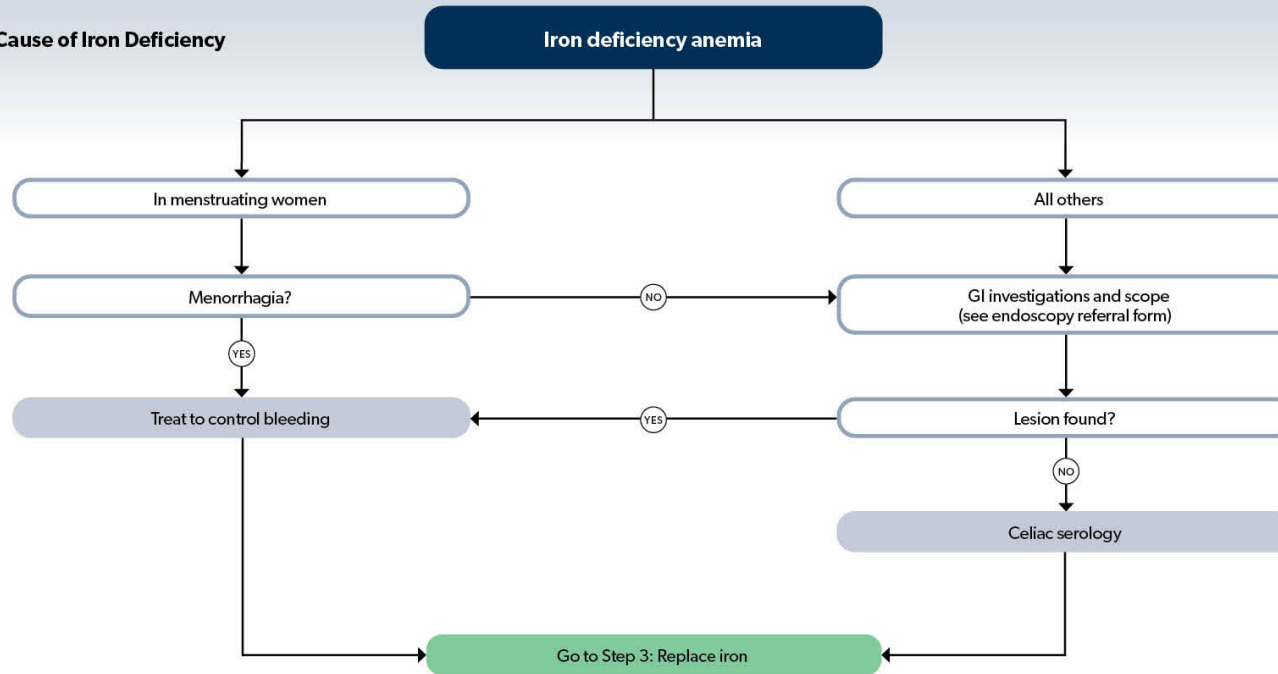
¹ Normal MCV can occur in iron deficiency if other process present that otherwise causes macrocytosis (e.g. cirrhosis, B12 deficiency)
² Iron deficiency may be present along with an other process such as inflammation or liver disease that otherwise raises the ferritin

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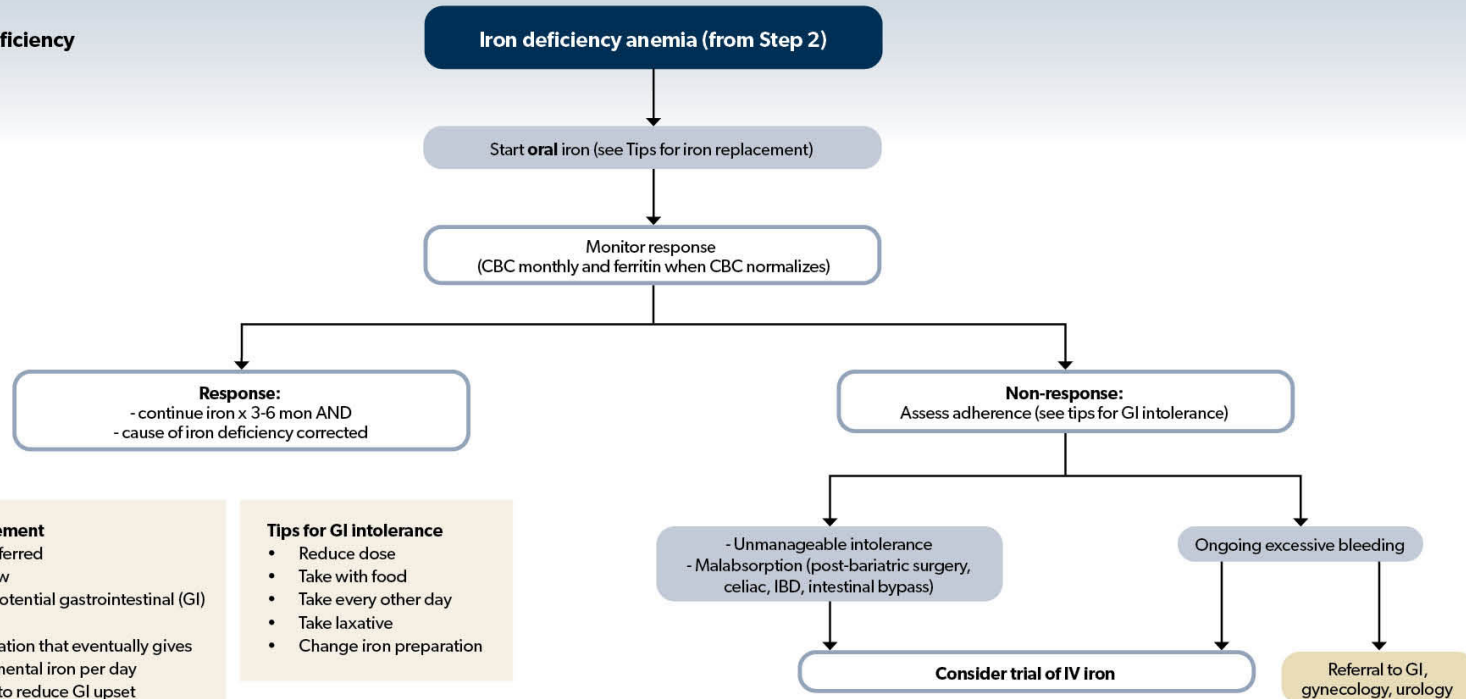
Step 2: Investigate Cause of Iron Deficiency



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Step 3: Treat Iron Deficiency



Tips for iron replacement

- Oral therapy preferred
- Start low; go slow
- Counsel about potential gastrointestinal (GI) side effects
- Give iron preparation that eventually gives 150-200mg elemental iron per day
- Take at bedtime to reduce GI upset

Tips for GI intolerance

- Reduce dose
- Take with food
- Take every other day
- Take laxative
- Change iron preparation

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