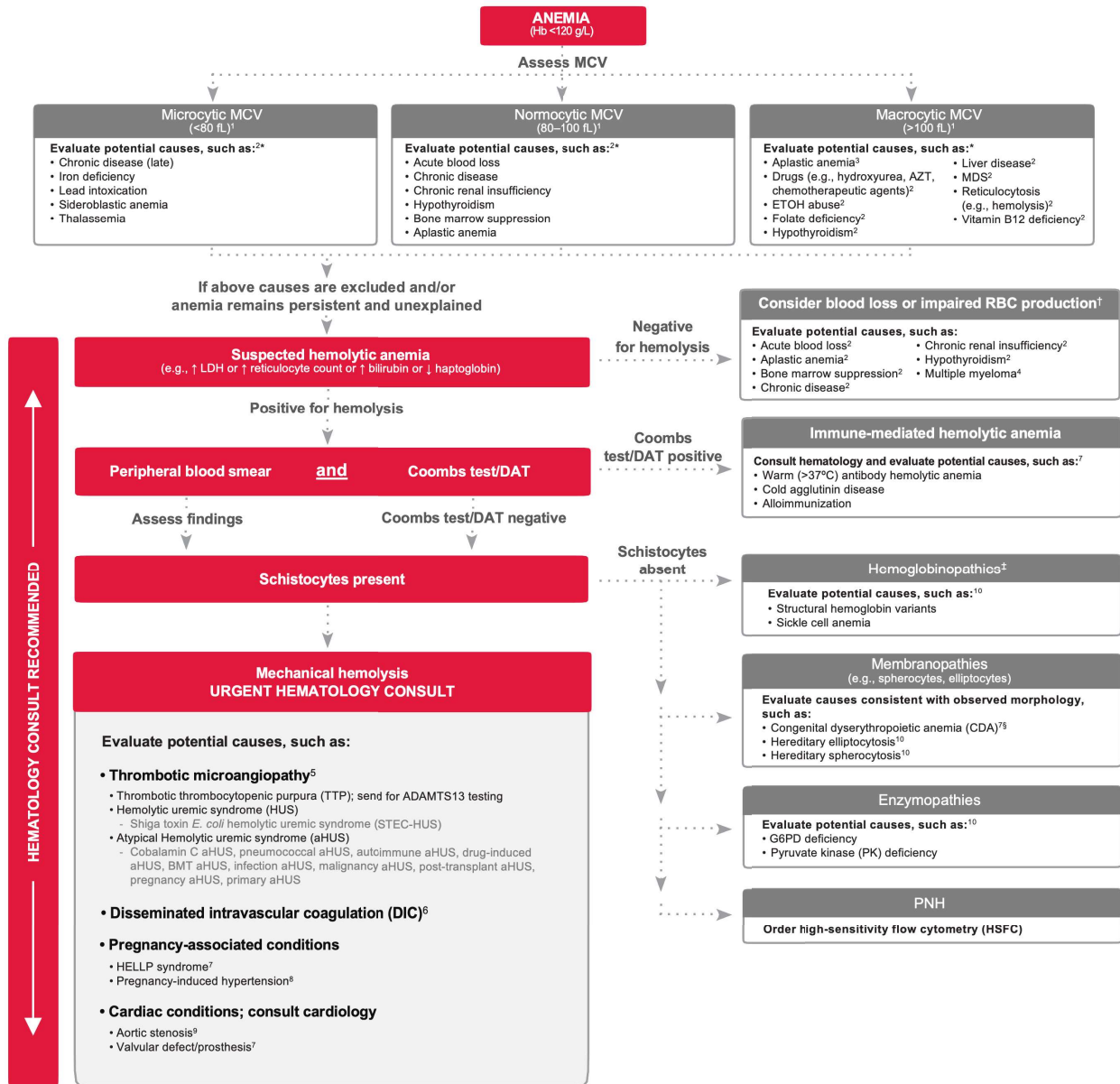


A practical approach to patients with anemia and hemolysis

Differential diagnosis algorithm for the evaluation of anemia¹⁻¹²



AZT=azidothymidine; BM=bone marrow; BMT=bone marrow transplant; DAT=direct antiglobulin test; ETOH=ethanol; G6PD=glucose-6-phosphate dehydrogenase; HELLP=Hemolysis + Elevated Liver enzymes + Low Platelet count; LDH=lactate dehydrogenase; MCV=mean corpuscular volume; MDS=myelodysplastic syndrome; PNH=paroxysmal nocturnal hemoglobinuria.

* Please note that there are regional variances on which healthcare professionals can order testing.

† PNH can occur concurrently with bone marrow failure, including aplastic anemia, hypocellular MDS, and unexplained cytopenias.¹¹

‡ RBCs may appear hypochromic and microcytic because of iron deficiency resulting from hemoglobinuria.¹²

§ Not specifically a membranopathy but may result in abnormal erythrocyte morphology.⁷

Markers of hemolysis in different hemolytic diseases^{6,7}

Laboratory parameters	PNH	AIHA
Coombs test (DAT)	Negative	Positive
PNH cells (flow cytometry)	Present	Absent
LDH	↑	
Haptoglobin	↓	
Indirect bilirubin	↑	
Reticulocyte count	↑*	
RBC morphology	No specific abnormalities	
Hemoglobinuria	Sometimes	

	PNH	AIHA	Membrane/enzyme defects	CDA	TMA	Intravascular devices
Hemoglobin (Hb)	---/----	- to ----	-/---	---/----	---/----	-
Reticulocytes	- to ++	- to +++	+ to +++	-/=	+	+
Schistocytes	=	=	=	=	++	+
LDH	+++	+ / +++	+	+	++	++
Haptoglobin	----	----	----	----	-	---
Bilirubin	+	+	++	+	+	+
Ferritin	- to +	= / +	++	+++	= / +	= / +
Platelets	= / -	= / ---	= / -	=	---	= / -
WBC	= / -	=	=	=	=	= / -
Hemosiderinuria	+ to +++	= / +	=	=	= / +	= / +

Adapted from Barcellini W et al., 2015. Values are expressed in a semi-quantitative style to indicate the different intensity of alteration in the various hemolytic syndromes, as follows: +/++/+++ indicate an increase from mild to severe, -/- -/- - - indicate a reduction, and = indicates values within the normal range.

* In PNH, reticulocyte counts may be normal or decreased in patients with concurrent bone marrow failure.¹²

AIHA, autoimmune hemolytic anemia; BM, bone marrow; CDA: congenital dyserythropoietic anemia; DAT, direct antigen test; LDH, lactate dehydrogenase; PNH, paroxysmal nocturnal hemoglobinuria; RBC, red blood cell; TMA, thrombotic microangiopathies; WBC, white blood cells.

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