Achievable

USMLE STEP 1 DUMP SHEET

Hematology and oncology

Microcytic anemias

	Iron	Ferritin	TIBC
Iron deficiency	↓	↓	↑
Thalassemia	N/↑	N/↑	N
Chronic disease	N/↓	N/↑	↓
Sideroblastic	↑	↑	N

- **Mentzer** (MCV/RBC) <13 thalassemia, >13 iron deficiency
- **Sideroblastic:** ringed sideroblasts; ALAS2, lead, isoniazid

Thalassemias

- **α (chr 16, deletions):** 1 gene lost, silent; 2, trait; 3, HbH (β4); 4, Hb Bart (γ4), hydrops
- **β (chr 11, point mutations):** minor ↑HbA2; major ↑HbF, hair-on-end skull, iron overload
- Give folate; iron only if deficient

Macrocytic anemias

- **Megaloblastic:** hypersegmented neutrophils, macro-ovalocytes
- **B12, folate:** ↑homocysteine. **B12 only:** ↑methylmalonic acid, subacute combined degeneration
- **Pernicious anemia:** anti-parietal cell, anti-intrinsic factor; gastric cancer
- **Others:** alcohol, liver, hypothyroid, MDS

Thrombophilias

- **Factor V Leiden:** most common; resists activated protein C
- **Prothrombin G20210A:** second most common
- **Protein C, S lack:** warfarin skin necrosis
- **Antithrombin III lack:** heparin resistance
- **Antiphospholipid:** PTT prolonged yet clots; pregnancy loss

Bleeding disorders

	PT	PTT	Plt
Hemophilia	N	↑	N
von Willebrand	N	N/↑	N
Bernard-Soulier	N	N	Low
DIC	↑	↑	Low

- **Hemophilia A** (VIII), **B** (IX): X-linked; joint bleeds
- **von Willebrand:** most common; mucosal; desmopressin
- **Bernard-Soulier:** GPIb, big platelets. **Glanzmann:** GPIIb/IIIa

Platelet disorders

- **ITP:** IgG to GPIIb/IIIa; isolated low platelets
- **TTP:** ↓ADAMTS13 → large vWF multimers; fever, neuro, renal; plasmapheresis
- **HUS:** Shiga toxin *E. coli* O157:H7

Hemolytic anemias

Spherocytosis	Ankyrin, spectrin (mostly AD); ↑MCHC, DAT negative, osmotic fragility; gallstones; parvovirus aplastic crisis
Sickle cell	HBB Glu6Val; dactylitis, acute chest, autosplenectomy, *Salmonella* osteomyelitis; hydroxyurea ↑HbF
Warm AIHA	IgG, extravascular; spherocytes, DAT positive; SLE, CLL, methyldopa, penicillin
Cold agglutinin	IgM fixes C3; acrocyanosis; *Mycoplasma*, EBV. **Paroxysmal cold:** Donath-Landsteiner IgG
PNH	PIGA: no GPI anchor, CD55, CD59 lost; dark morning urine, Budd-Chiari; eculizumab (anti-C5)
Intravascular	Low haptoglobin, hemoglobinuria, schistocytes (TTP, HUS, DIC, valves). **Extravascular:** spherocytes

Leukemias

ALL	Children; TdT+ lymphoblasts; CNS; Down syndrome
AML	Adults; Auer rods, MPO+; benzene, radiation, MDS
APL	t(15;17) PML-RARα; DIC; all-trans retinoic acid
CML	t(9;22) BCR-ABL; basophilia, low leukocyte alkaline phosphatase; imatinib
CLL	Over 65; CD5, CD19, CD23; smudge cells; warm AIHA
Hairy cell	B cells with hairlike projections; BRAF; cladribine

Lymphomas

Hodgkin	Reed-Sternberg cells CD15+, CD30+
Follicular	t(14;18) BCL2; painless nodes
Burkitt	t(8;14) MYC; EBV; starry sky; jaw
Mantle cell	t(11;14) cyclin D1
MALT	*H. pylori*
Mycosis fungoides	Cerebriform T cells; Sézary in blood
Adult T cell	HTLV-1; hypercalcemia

Marrow neoplasms

- **Polycythemia vera:** JAK2; low EPO; pruritus; phlebotomy
- **Myelofibrosis:** teardrop cells, dry tap
- **MDS:** ringed sideroblasts; del(5q), trisomy 8; → AML
- **Waldenström:** B cells secrete IgM; hyperviscosity, neuropathy

Plasma cell neoplasms

- **Myeloma:** CRAB (hypercalcemia, renal failure, anemia, lytic bone); M spike; Bence Jones
- **MGUS:** M protein, <10% plasma cells, no CRAB