

INPATIENT NONMALIGNANT HEME

CLOTTERS

- 1) Prox DVT <70yo
 - a) Arixtra 5/7.5/10 daily in hosp if nl creat
 - b) Lovenox 1mg/kg bid if bad symptoms
 - c) Xarelto "starter pack" or 20mg daily after disch
 - d) TED hose "aware of DVT"
 - e) Decide whether thrombolysis needed
 - f) Consider PF-4, consider argatroban or arixtra
 - g) Thrombophilia testing mutations OR sickle
 - h) Thrombophilia testing cardiolipin Ab
 - i) Decide about cancer imaging by S/Sx
 - j) OK to walk while receiving anticoag
 - k) Consider IVC filter only if cannot receive any anticoag
- 2) Prox DVT >70yo
 - a) Lovenox 1 mg/kg daily "custom dose"
 - b) Eliquis 5mg bid after discharge
 - c) TED stockings "aware of DVT"
 - d) Consider PF-4, consider argatroban
 - e) Decide about cancer imaging by S/Sx
 - f) OK to walk while receiving anticoag
 - g) Consider IVC filter only if cannot receive any anticoag
- 3) Distal DVT, any age
 - a) Decide whether symptoms due to DVT vs. gout
 - b) If symptomatic then lovenox bid or daily
 - c) If "asymptomatic" then low dose lovenox in hosp
 - d) Decide home maintenance X/E
 - e) Consider TED stockings "aware of DVT"
- 4) Prox or distal DVT >90yo
 - a) Lovenox 30mg daily "custom dose"
 - b) Eliquis 2.5 bid after discharge
- 5) h/o DVT still on anticoag maintenance
 - a) Decide about "reversal"
 - b) If anticoag >3mo consider stopping altogether
 - c) If needs procedure then inject lovenox 30-40mg subq daily pre-op
 - d) Plan post-op/post-partum lov/Arixtra in hosp and decide outpt
 - e) If anticoag is continued after disch, consider switching from warfarin to X/E
 - f) If "chronic-appearing" DVT established or presumed, continue anticoag maint
- 6) h/o DVT, no longer on anticoag maintenance
 - a) Lovenox 30-40mg subq daily in hospital
 - b) While Plan post-op/post-partum anticoag in hosp
 - c) Decide whether to resume maintenance anticoag
 - d) If "chronic-appearing" DVT established or presumed, plan anticoag maintenance
- 7) IVC filter-associated thrombosis
 - a) Lovenox 1mg/kg bid
 - b) Lovenox 1mg/kg daily if age >75 or creat 1.5-3

- c) Heparin IV only if creat>3
 - d) TED hose “aware of DVT”
 - e) Consider PF-4, consider argatroban
 - f) Decide whether thrombolysis needed
 - g) Thrombophilia testing mutations OR sickle
 - h) Thrombophilia testing cardiolipin Ab
 - i) Plan anticoag maintenance after discharge: Lov/Arixtra/X/E (not warfarin)
- 8) “Asymptomatic” PE
- a) consider “full-dose” anticoag lov->X/E
 - b) consider “prevention” anticoag is full-dose too risky
 - c) if proximal DVT then “full-dose” per DVT plan
- 9) “Symptomatic” PE
- a) Arixtra 5/7.5/10 daily in hosp if age<75 and creat<1
 - b) Lovenox 1mg/kg bid if borderline creat 1-1.5
 - c) Lovenox 1mg/kg daily if age>75 or creat 1.5-3
 - d) Heparin IV only if creat>3
 - e) Xarelto “starter pack” or 20mg daily after disch
 - f) Leg ultrasound only if leg symptoms
 - g) Decide whether pulm thrombolysis needed
 - h) Consider PF-4, consider argatroban
 - i) Thrombophilia testing mutations OR sickle
 - j) Thrombophilia testing cardiolipin Ab
- 10) “Submassive” PE: hypotension, abn echo
- a) Lovenox 1mg/kg bid if age<75
 - b) Lovenox 1mg/kg daily if age>75 or creat 1-3
 - c) Heparin IV only if creat>3
 - d) Xarelto “starter pack” or 20mg daily after disch
 - e) Leg ultrasound only if leg symptoms
 - f) Decide whether pulm thrombolysis needed
 - g) Consider PF-4, consider argatroban
 - h) Thrombophilia testing mutations OR sickle
 - i) Thrombophilia testing cardiolipin Ab
- 11) Arterial thrombosis
- a) Consider PF-4, consider argatroban
 - b) Decide whether thrombolysis needed
 - c) Lovenox 1mg/kg bid if age<75
 - d) Lovenox 1mg/kg daily if age>75 or creat 1-3
 - e) Heparin IV only if creat>3
 - f) Coumadin if possible after discharge
 - g) Xarelto/Eliquis maint if Coumadin not possible
- 12) Distal digital ischemia
- a) Consider PF-4, consider argatroban
 - b) Consider testing for endocarditis, vasculitis, cryoglob, cold agglutinin
- 13) Arm/chest DVT non-HD
- a) Decide whether thrombolysis needed
 - b) Consider PF-4, consider argatroban
 - c) If symptomatic Lovenox bid if age<75 and creat<1
 - d) If symptomatic Lovenox 1mg/kg bid if borderline creat 1-1.5

- e) If symptomatic Lovenox 1mg/kg daily if age>75 or creat 1.5-3
 - f) If symptomatic Heparin IV only if creat>3
 - g) Eliquis 2.5/5 bid after discharge
- 14) Arm/chest DVT HD
- a) Consider PF-4, consider argatroban
 - b) Consider eliquis 2.5/5mg bid
- 15) Mesenteric thrombosis
- a) Lovenox 1mg/kg bid if creat<3
 - b) Heparin IV only if creat>3
 - c) Change to "low dose" arixtra/lov after symptoms improve
 - d) Xarelto "starter pack" or 20mg daily after disch
 - e) Consider thrombophilia testing
 - f) If HCT>45 test JAK2 mutation
 - g) Consider testing PNH screen (only sent Mon-Weds)
- 16) Portal vein thrombosis
- a) If pain related to PVT then Arixtra 5/7.5/10 daily or lov bid → X/E
 - b) If "asymptomatic" then lovenox 40mg daily in hosp only
 - c) Consider thrombophilia testing if not obvious cirrhosis
 - d) If HCT>45 test JAK2 mutation
- 17) Splenic infarction
- a) Diagnosis based on imaging and clinical scenario
 - b) No special vascular testing needed for most cases
 - c) Consider echocardiogram in special circumstances to r/o endocarditis
 - d) Consider thrombophilia testing including hemoglobin electrophoresis
 - e) Anticoag with lovenox, treating pain, then transition to warfarin or X/E
- 18) Renal infarction
- a) Diagnosis based on imaging and clinical scenario
 - b) No special vascular testing needed for most cases
 - c) Consider thrombophilia testing
 - d) Anticoag with lovenox, treating pain, then transition to warfarin or X/E
- 19) Dural sinus thrombosis
- a) Lovenox 1mg/kg bid
 - b) Lovenox 1mg/kg daily if age>75 or creat 1.5-3
 - c) Heparin IV only if creat>3
 - d) Consider thrombophilia testing
 - e) Stay in hospital until HA controllable
 - f) f/u Brain MRI/MRV on Day 4
- 20) HIT suspected post-op
- a) Consider PF-4, consider argatroban
 - b) If clotting found or Atrial fib and HIT likely then arixtra or argatroban
 - c) If clotting not found/no A fib/HIT likely then low dose arixtra or argat
 - d) If clotting not found, no A fib, HIT unlikely then low dose lov or arixtra
 - e) If PF-4 pos then arixtra/argatroban
 - f) Decide home X/E
- 21) HIT suspected ICU non-surg
- a) Consider PF-4, consider argatroban
 - b) If clotting found or Atrial fib and HIT likely then arixtra or argatroban
 - c) If clotting not found, no A fib, HIT likely then low dose arixtra or argat

- d) If clotting not found, no A fib, HIT unlikely then low dose lov or arixtra
- e) If PF-4 pos then arixtra/argat
- f) Decide home X/E
- 22) HIT suspected HD pt
 - a) Consider PF-4, consider argatroban then home eliquis 2.5/5 bid
- 23) h/o heparin antibody
 - a) decide whether arixtra/artatroban/eliquis needed in hosp
 - b) consider f/u PF-4, consider SRA for pre-op cardiac surgery
- 24) anticoag maintenance “needs reversal” not bleeding
 - a) decide whether OK to wait 1 day after X/E, 3 days after Coumadin
 - b) decide whether bleeding, see bleeding reversal section
 - c) decide whether liver dysfunction likely
 - d) consider changing or stopping maintenance anticoag

BLEEDERS

- 25) ICH in ICU
 - a) Decide whether anticoag needs “reversal”
 - b) Consider Novoseven 1-2mg IV q2h x 2 doses
 - i) If brain surgery done or planned, then consider Novoseven
 - ii) If brain surgery not planned because futile, then no Novoseven
 - iii) If brain surgery not planned because not nec, then no Novoseven
 - c) Consider amicar IV 1 gm/hr or amicar 1000mg po q6h in hosp
 - d) Consider PFA, fibrinogen, Factor XI assay
- 26) ICH not in ICU
 - a) Decide whether anticoag needs “reversal”
 - b) Decide whether procoagulant Novoseven/amicar IV needed
 - c) Decide amicar 1000mg po q6h in hosp
 - d) Consider PFA, fibrinogen, Factor XI assay
- 27) GI tract bleeding acute
 - a) If abn PT INR then consider Factor V assay, fibrinogen, Vitamin K 10mg IV
 - b) Consider FFP 2 units x 6 hrs x 24hrs for severe bleeding
 - c) Parameters for RBC and plt transfusions
 - d) Consider Novoseven 2mg iv q2h x 2 doses for severe bleeding
 - e) Consider Praxbind for Pradaxa or KCentra for Coum/X/E
- 28) GYN bleeding acute
 - a) Labs: iron, TIBC, PFA, fibrinogen
 - b) Transfusion parameters
 - c) Consider cryo for bleeding or low fibrinogen
 - d) Decide RBC vs. iron infusion
 - e) Provera 5mg po daily in hosp, 2.5mg daily after disch
- 29) Hemophilia bleeding
 - a) Factor 8/9 infusions q8h x 3 days
 - b) Consider testing Fe, TIBC
 - c) Consider factor levels pre-factor infusion on Tues/Fri
- 30) Post-op bleeding
 - a) “presumed liver dysfunction”
 - b) parameters for RBC and plt transfusions

- c) Consider Novoseven 2mg iv q2h x 2 doses for severe bleeding
- 31) High PT INR/Cirrhosis bleeding
 - a) Consider Factor V assay, fibrinogen
 - b) Consider Vitamin K 10mg iv once (po second choice)
 - c) FFP 2-3 units pre-procedure
 - d) FFP 2 units x 6 hrs x 24hrs for severe bleeding
 - e) Parameters for RBC, plt, cryo transfusions
 - f) Consider Novoseven 2mg iv q2h x 2 doses for severe bleeding
- 32) Anticoag-associated bleeding
 - a) Vitamin K 10mg iv once (po second choice)
 - b) FFP 2-3 units pre-procedure
 - c) FFP 2 units x 6 hrs x 24hrs for severe bleeding
 - d) Consider Novoseven 2mg iv q2h x 2 doses for severe bleeding
 - e) Consider Praxbind for Pradaxa or KCentra for Coum/X/E
- 33) High PT INR not bleeding not on anticoag
 - a) Consider Factor V, X assays; fibrinogen, Factor XI assay
 - b) FFP 2-3 units pre-procedure
 - c) Consider Fe, TIBC
- 34) High PTT "isolated"
 - a) Cardioliipin Ab
 - b) If not on anticoag >24 hr then circulating anticoag test and lupus anticoag
 - c) For pre-op, say "OK for procedure even though abn PTT"
 - d) If bleeding Factor VIII assay, circulating anticoag test, consider novoseven
- 35) Presumed or proven abn platelet fxn
 - a) consider plt transfusion for bleeding or procedure

SEVERE IRON DEFIC (Fe sat<15% or Ferr<30)

- 36) Pregnant/postpartum, bloodless, IBD, gastric bypass
 - a) IV iron infusion (400mg iv daily x 2)
 - b) Consider GI or GYN eval
 - c) Consider UA to r/o hematuria
- 37) Presumed chronic bleeding or iron malabsorption with MCV<82
 - a) IV iron infusion (400mg iv daily x 2)
 - b) Consider GI or GYN eval
 - c) Consider UA to r/o hematuria
- 38) Iron defic s/p RBC transfusion
 - a) Consider iron infusion (100mg IV daily x 3)
 - b) Consider GI or GYN eval
 - c) Consider UA to r/o hematuria
- 39) Other iron defic proven or suspected
 - a) Consider iron infusion (100mg IV daily x 3)
 - b) Consider GI or GYN eval
 - c) Consider UA to r/o hematuria

ABNORMAL BLOOD COUNTS

- 40) Pancytopenia AIDS
 - a) CD4 count

- b) Decide likelihood of MAI vs. lymphoma
 - c) Consider BM biopsy
 - d) Consider Aranesp inpt/outpt
- 41) Pancytopenia cirrhosis
- a) Decide whether acute bleeding
 - b) Low plt "due to ITP/cirrhosis"
 - c) Consider nuclear liver/spleen scan or spleen u/s
 - d) Consider IVIG 1gm/kg for tpenia only if needs surgery
- 42) Panctopenia not AIDS/cirrhosis/chemo
- a) Decide if recent meds likely the cause
 - b) Consider testing Vitamin B12
 - c) Consider BM biopsy
- 43) Pancytopenia after chemo
- a) Determine disease process, age, functional status, chemo meds, timing
 - b) Determine whether neulasta was injected, start GCSF if no neulasta given
 - c) Set custom transfusion parameters for RBC and platelets
 - d) If WBC<1 and no infection then consider levaquin, fluconazole
 - e) If WBC<1 and fever or suspected infection then IV Abx and fluconazole
- 44) Anemia not iron defic
- a) Confirm iron testing is interpretable
 - b) Labs: retic, LDH
 - c) Labs: if age>50yo or abn creat then consider SPEP
 - d) Labs: if AA or Hispanic then consider Hgb electrophoresis to r/o sickle variant
 - e) Labs: Consider Hgb electrophoresis in others to r/o beta thalassemia
 - f) Decide whether each of these tests is warranted:
 - i) Vitamin B12, TSH, Direct Coombs, Haptoglobin
 - g) Decide whether blood smear is warranted
 - h) Decide whether BM biopsy is warranted
- 45) Anemia obvious hemolysis
- a) Labs: LDH, Retic, Haptoglobin, Direct Coombs
 - b) Folic acid 1mg po daily
 - c) If Direct Coombs pos or hard to type for RBC transfusion then start Solumedrol 1mg/kg IV daily (age>70) or 1mg/kg IV bid (age<70)
- 46) Low WBC AIDS
- a) Test CD4 count, decide likelihood of opportunistic infection
 - b) Decide whether low WBC could be due to ART
 - c) Decide whether CT scans and LN biopsy warranted
 - d) Decide whether BM biopsy warranted
 - e) Consider GCSF only if ANC<1 and infection proven or suspected
- 47) Low WBC not AIDS
- a) Review recent medications, confirm no chemotherapy
 - b) Test fibrinogen to r/o APL
 - c) Decide whether BM biopsy warranted
 - d) Consider GCSF only if ANC<1 and infection proven or suspected
 - e) Consider PCR for T cell gene rearrangement from blood
- 48) Tpenia chronic
- a) Determine whether pt is a clotter or a bleeder
 - b) Determine whether plt clumping ever reported, review consistency of plt counts

- c) Determine whether bone marrow dysfunction is likely, look at WBC differential
 - d) Determine whether liver dysfunction is likely, look at PT INR
 - e) If liver dysfunction likely then consider FFP or cryo, set plt transfusion parameters for bleeding prevention, bleeding treatment, and invasive procedures
 - f) Labs: Platelet function analysis to determine look for ITP/hypersplenism
 - g) If plt<100 and invasive procedure is needed, assess need for higher plt count for procedure and consider IVIG trial
 - h) If bleeder or bone marrow dysfunction suspected then consider BM biopsy
- 49) Tpenia acute not obvious ITP
- a) Review recent meds, confirm no chemotherapy
 - b) Consider fibrinogen to r/o APL
 - c) Consider PF-4 antibody to r/o HIT, assess 4T score
 - d) Determine whether bone marrow dysfunction is likely, look at WBC differential
 - e) Consider BM biopsy to r/o heme malignancy
 - f) Whenever plt<10 transfuse 1 dose plt
 - g) Set transfusion parameters for bleeding prevention, bleeding treatment, and invasive procedures
- 50) Tpenia with ARF r/o TTP/HUS
- a) Determine accuity and associated symptoms, likelihood of TTP
 - b) Labs: LDH, Retic, haptoglobin, same day
 - c) Review blood smear
 - d) Consider ADAMTS13 testing
 - e) Consider plasmapheresis or FFP transfusion
 - f) Eval for Soliris
- 51) Tpenia suspected ITP exacerbation
- a) Eval HCT, WBC count, WBC differential to r/o heme malig
 - b) If plt<10 with visible bleed/bruise then transfuse 1 dose plt
 - c) If plt<20 and hospitalized start solumedrol 1mg/kg IV bid
 - d) On third hospital day decide among IVIG, Nplate, Rituxan, Winrho
 - e) Plan discharge with frequent blood counts
 - f) Labs: HBV, HIV, Direct Coombs, Cardiolipin Ab
- 52) Tpenia pregnancy
- a) Eval chronicity to determine whether ITP likely
 - b) Eval recurrence to determine whether gestational Tpenia likely
 - c) Eval HCT, WBC, WBC differential to r/o heme malig
 - d) If plt<80 consider IVIG trial to enable spinal anesthesia
 - e) If plt<50 then C-section likely, consider IVIG trial to plan C-section
 - f) If plt<20 then infuse IVIG to prevent bleeding
- 53) Low WBC/low ANC
- a) Eval differential, determine ANC
 - b) Review meds, r/o tapazole/methimazole exposure
 - c) Consider fibrinogen to r/o APL
 - d) Consider HIV antibody
 - e) Consider Vitamin B12 testing
 - f) Decide whether to do BM biopsy
- 54) High WBC neutrophils
- a) Determine likelihood if infection including C. diff colitis
 - b) If infection unlikely then consider JAK2, BCR-Abl testing

- c) If PCV or CML likely then consider hydroxyurea
- 55) High WBC immature myeloid
 - a) Determine likelihood of AML or AML/MDS or CMML
 - b) If AML or AML/MDS suspected then consider BM biopsy
 - c) If CMML suspected then consider flow cytometry and BM biopsy
 - d) If WBC>20 and immature myeloid then consider hydroxyurea
 - e) If WBC>100 and immature myeloid then consider WBC pheresis
- 56) High WBC lymphs
 - a) Determine likelihood of CLL or NHL (follicular, mantle cell)
 - b) Consider flow cytometry and BM biopsy
 - c) Labs: SPEP, quant IgG
- 57) High HCT (erythrocytosis)
 - a) Determine chronicity
 - b) Determine whether chronic hypoxia is likely
 - c) Labs: JAK2, erythropoietin
 - d) If HCT>60 or (JAK2 pos AND erythropoietin low) then PCV established
 - e) Consider JAK exon 12 test if JAK2 mutation neg and PCV still suspected
 - f) Decide whether BM biopsy needed to look for myelofibrosis
 - g) Determine whether ischemic events presumed or proven
 - h) Decide whether phlebotomy needed for “events” or definite PCV
- 58) High Plt
 - a) Determine chronicity
 - b) r/o severe iron defic or splenectomy
 - c) MPD may be presumed if not severe iron defic or splenectomy
 - d) Decide whether BM biopsy needed to look for MDS 5q- or myelofibrosis
 - e) Determine whether ischemic events presumed or proven
 - f) Decide whether hydroxyurea justified for high plt count
 - g) Decide whether aspirin or other anticoag justified for ischemia prev/treatment
- 59) High Eos
 - a) Determine chronicity if possible; assume chronicity if not acutely ill
 - b) If definitely acute, consider drug allergy or HIT
 - c) If not definitely acute then presumed HES or malig (no parasites in US)
 - d) Consider C/A/P CT, BM biopsy, CEA to r/o solid tumor or heme malig
 - e) Labs: FIP1L1/PDGF-alpha FISH for HES variant
 - f) Consider steroid pulse for symptoms
- 60) Alpha thalassemia
 - a) Determine chronicity of low MCV
 - b) If chronic low MCV and iron sat nl then assume alpha thal
 - c) Alpha thal has no inpatient testing
 - d) No intervention required for alpha thal, so no testing required
 - e) It is possible to have both alpha thal and iron deficiency
- 61) Beta thalassemia
 - a) Determine chronicity of anemia
 - b) If anemia not iron defic nonmalig then consider Hgb electrophoresis to r/o beta thalassemia (high Hgb A2)
 - c) Consider transfusion parameters
 - d) Consider inpatient ferritin to decide whether iron chelator worth considering
- 62) Sicklers

- a) Confirm diagnosis by reviewing LDH, retic, Hgb electrophoresis
 - b) Determine whether hospital admission is for pain, anemia, infxn, or clotting
 - c) For pain, prescribe PCA opiate med if possible, lower IVF, determine ACS
 - d) For anemia, determine whether RBC transfusion or justified for refractory pain, HCT<15, known transfusion dependence for comfort
 - e) For infection, assume pneumonia and high risk for infection, consider IV abx
 - f) For clotting, use routine DVT PE prevention and consider eval for DVT PE
 - g) Consider inpatient ferritin to decide whether iron chelator worth considering
 - h) Consider exchange transfusion for ischemic events, stroke, ACS, refractory pain
 - i) Incentive spirometer for all SCD patients
 - j) Continue hydrea or consider starting hydrea if >2 hospitalizations/yr for pain
- 63) Pregnant, known sickle cell disease
- a) More liberal transfusions for goal HCT 25-30
 - b) More liberal anticoag with lovenox 40mg subq daily
 - c) Same opiate medications for pain
- 64) Abnormal kappa/lambda test in a non-myeloma patient
- a) Determine reason K/L testing was requested
 - b) If nephrology considering MGRS then review data and consider BMBx
 - c) If neurology considering neuropathy causes then review data
 - d) If both kappa and lambda are elevated then probably still not myelom