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 disc

f) Leg ultrasound only if leg symptoms

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 disc

f) Leg ultrasound only if leg symptoms

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

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 disc

f) Leg ultrasound only if leg symptoms

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 disc

f) Leg ultrasound only if leg symptoms

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 disc

f) Leg ultrasound only if leg symptoms

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/artatoban/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) Cardiolipin 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) Pancytopenia 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 malign
   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 malign
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