

Hyperleukocytosis/Leukapheresis in Patients with Leukemia

Associated Order Sets: HO IP Leukemia/Lymphoma (Suspected); Tumor Lysis Pathway



Children's Mercy
KANSAS CITY

Evidence Based Practice

Symptoms of Leukostasis

Affected System	Signs & Symptoms
Central Nervous System	- Headache, dizziness, vision disturbance - Tinnitus - Ataxia - Confusion, somnolence/coma - Papilledema, retinal hemorrhage, retinal vein distension - Cranial nerve palsies
Cardiovascular	- Tachycardia/bradycardia & hypotension - Peripheral vascular occlusion - Pulmonary hypertension - Myocardial infarction, arrhythmias
Respiratory	- Tachypnea, dyspnea at rest - Hypoxia/hypoxemia - Respiratory failure - Pulmonary leukostasis syndrome: - Bilateral infiltrates, tachypnea, hypoxia
Renal/ Metabolic	- Oliguria, anuria, acute kidney injury - Tumor lysis syndrome (link to pathway)
Other	- Priapism - Disseminated intravascular coagulation

High Risk for Development of Symptoms of Leukostasis

- Leukemia NOS with WBC $\geq 200K/\mu L$
- Pts with presumed acute myelogenous leukemia (AML)

- Start definitive chemotherapy regimen determined by Hem/Onc
- Consider leukapheresis, particularly if WBC $\geq 400K/\mu L$

Pt presents with hyperleukocytosis (WBC $\geq 100K/\mu L$)

- Evaluate pt's degree of tumor lysis and coagulopathy
- Order Labs - refer to Hem/Onc Leukemia/Lymphoma (Suspected) power plan
 - Review peripheral smear
 - Obtain peripheral flow testing
- Start prompt supportive care

Inclusion criteria:

- Newly diagnosed or relapsed acute leukemia **AND**
- WBC $\geq 100K/\mu L$

Exclusion criteria:

- Known diagnosis or high suspicion of acute promyelocytic leukemia (APML) or myelogenous leukemia (CML) in chronic phase

Initial Labs:

- CBC with differential
- Peripheral smear
- BMP, phosphorus level, LFTs
- Serum uric acid, LDH
- PT/INR, aPTT, Fibrinogen, T&S

Supportive care:

- Refer to [Tumor Lysis Syndrome pathway](#) and power plans for fluid and additional lab orders

Does pt have symptoms of leukostasis **OR** is pt at high risk for developing symptoms?

No

Continue surveillance for leukostasis symptoms, supportive care, and diagnostic work-up to start definitive chemotherapy (as directed by Hem/Onc)

Yes

Transfer to PICU

What is the phenotype?

Lymphoid/Unknown

Myeloid

- Start definitive chemotherapy regimen determined by Hem/Onc
- Consider leukapheresis (excluding APML or CML), particularly if WBC $\geq 200K/\mu L$ and/or monocytic

Is leukapheresis indicated?

No

Continue supportive care

Yes

- Contact Apheresis doctor ASAP and place consult for Apheresis
- Plan for **Hyperleukocytosis Huddle**:
 - PICU will initiate the Hyperleukocytosis Huddle and notify participants via pager of huddle time
 - Participants: PICU, Hem/Onc and Apheresis (In person preferred, if not possible, then by phone or Teams)
 - Discuss likely phenotype to inform apheresis treatment needs/implications
 - Discuss venous access options and timing of procedure(s)
 - At CM, refer to "Apheresis Operations and Ordering Standards" for venous access decision-making
- Venous access is obtained and verified

Leukapheresis Initiated

Set-up for leukapheresis by the Apheresis RN may take 1-2 hours from time of their arrival



QR code for mobile view

Abbreviations:

NOS = No other symptoms
T&S = type and screen

Contact: EvidenceBasedPractice@cmh.edu

[Link to synopsis and references](#)

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