High Dose Cytarabine: AML, Adult Cancer Inpatient Order Set

Clinical Decision Support
Guides:
- Each order set should include access to the LYHE-008 ACUTE MYELOID LEUKEMIA Guidelines Resource Unit (GURU) Clinical Practice Guideline

References:
- Build required for Neurological Assessment for Cerebellar Dysfunction form; See internal Alberta Health Services webpage for assessment form

Alerts:
- If patient has an FMS-like tyrosine kinase 3 (Flt 3) positive mutation previously resulted in their chart, alert clinician, at time of ordering treatment protocol, to ensure midostaurin is added to treatment protocol

Order Set Keywords: HiDAC, HDAC, AML, Acute Myeloid Leukemia, consolidation, cytarabine, ARA-C, midostaurin, FMS-like tyrosine kinase 3 (Flt 3) positive mutation

Order Set Requirements:
Most Recent:
- Height ______ cm
- Weight
  - actual ______ kg
- BSA ______ m²
- Estimated Creatinine Clearance (CrCl) ______
- Bilirubin and creatinine lab results
- Link patient age with recommended dose of chemotherapy:
  - For adults age less than or equal to 60 years: cytarabine (3000 mg/m²/dose)
  - For adults age greater than 60 years: cytarabine (1000 mg/m²/dose)
- FMS-like tyrosine kinase 3 (Flt 3) status

Indication
Consolidation therapy for Acute Myeloid Leukemia (AML)

Treatment Phase:
Consolidation

Treatment Goal:

Treatment Cycle and Dates
Cycle ______ (current cycle number) of ______ (total number of cycles to be administered)
Cycle length ______ (days/weeks)
Protocol Description:
Cycle length: 35 days (dependent on count recovery)
Number of Cycles: 4 (or less)
Protocol Day 1 to 6
cytarabine 3000 mg/m²/DOSE (for 60 years old or less), OR
cytarabine 1000 mg/m²/DOSE (for more than 60 years old)
   Morning Start: DAY 1, 3 & 5: 0730 hours & 1930 hours
   Afternoon Start: Day 1 to 6: 1630 hours & 0830 hours
   Evening Start: DAY 1 to 6: 2000 hours & 0800 hours
Protocol Day 8 to 21
midostaurin 50 mg BID (for FMS-like tyrosine kinase 3 (Flt 3) positive status only)

Laboratory Investigations
~Start of Order Panel~  Hematology Laboratory Investigations – ONCE – Inpatient

Hematology Laboratory Investigations – ONCE – Inpatient
Keywords: Admission, labs, one time

ONCE - Day of admission or start of therapy
☐ Unit to Collect    ☐ Lab to Collect
Hematology
☑ Complete Blood Count (CBC) with Differential  ☐ Fibrinogen
☑ PT (INR)         ☐ Retic Count
☑ PTT
Transfusion Medicine
☑ Type and Screen
Chemistry
☑ Electrolytes (Na, K, Cl, CO2)  ☑ Albumin  ☐ Bilirubin Direct
☑ Creatinine        ☐ AST          ☑ LD
☑ Glucose (Random)  ☑ ALT          ☑ Lipase
☑ Calcium (Ca)      ☑ ALP          ☑ Protein Total
☑ Magnesium (Mg)    ☑ GGT          ☑ Urea
☑ Phosphate         ☑ Bilirubin Total  ☑ Urate (Uric Acid)

Other Labs
Order for ALL women of childbearing age
☐ HCG Beta - serum

~End~
**Hematology Laboratory Investigations – REPEATING: DAILY/TWICE WEEKLY – Inpatient**

**Keywords:** labs, repeat, Day 2

**REPEATING - Starting on Day 2**

- [ ] Unit to Collect
- [ ] Lab to Collect

**Draw the following labs daily for 5 weeks**

- [x] Complete Blood Count (CBC) with Differential
- [x] Electrolytes (Na, K, Cl, CO$_2$)
- [x] Creatinine

**Draw the following labs every Monday and Thursday for 5 weeks**

**Hematology**

- [x] PT (INR)
- [ ] PTT
- [x] Fibrinogen
- [ ] Retic Count

**Chemistry**

- [x] Calcium (Ca)
- [x] ALT
- [x] LD
- [ ] ALP
- [ ] Lipase
- [x] Glucose (Random)
- [x] GGT
- [x] Protein Total
- [ ] Magnesium (Mg)
- [ ] Bilirubin Total
- [ ] Urea
- [ ] Phosphate
- [x] Bilirubin Conjugated
- [x] Urate (Uric Acid)
- [ ] Albumin
- [ ] AST

**Diagnostic Investigations**

- [ ] Chest X-ray, 2 Projections (GR Chest, 2 Projections): Once prior to starting chemotherapy
- [ ] Electrocardiogram – 12 lead: Once prior to starting chemotherapy

*Order the following only if patient to receive midostaurin:*

- [ ] Electrocardiogram – 12 Lead: Monday, Wednesday, Friday starting Day 8 and continuing for duration of midostaurin

**Provider Communication**

- [ ] Provider Communication: If patient is positive for Flt 3 mutation, add midostaurin to treatment protocol
- [ ] Provider Communication: Review medications to ensure strong CYP34 inhibitors are not ordered as may be contraindicated with midostaurin
- [ ] Provider Communication: Refer to British Columbia Cancer Agency (BCCA) Cancer Drug Manual for cytarabine dose adjustment guidelines
- [ ] Provider Communication: Consider a dose reduction or holding of midostaurin if ECG results report a QTc greater than 480 or if the QTc increases more than 25% over prior ECG, even if QTc is within normal limits
Nurse Communication

- Nurse Communication: Ensure HLA typing has been drawn prior to initiating treatment.
- Nurse Communication: Ensure central venous access device (CVAD) is in situ and patent prior to initiating treatment protocol.
- Nurse Communication: Perform Neurological Assessment for Cerebellar Dysfunction prior to initiation of each cytarabine dose.
- Nurse Communication: Pre-Day 1 lab results: May be drawn within 5 days prior to Day 1 chemotherapy; Hold and notify provider prior to starting Day 1 chemotherapy if labs results within 5 days prior to Day 1 are:
  - absolute neutrophil count (ANC) less than 1.5 x 10^9/L, or
  - platelets less than 100 x 10^9/L, or
  - creatinine clearance 60 mL/min or lower.
- Nurse Communication: Day 1 to 6 lab results: Notify provider if creatinine clearance less than 60 mL/min once result is available; However, do not need to wait for lab results prior to starting chemotherapy.
- Nurse Communication: Ensure clinician has reviewed and approved ECG results prior to administering midostaurin.

Supportive Medications

- Only order for menstruating women
- norethindrone - ethinyl estradiol (Ortho 1/35) 1 tab PO daily starting Day 1

Prophylactic Medications

- fluCONazole 400 mg PO daily starting Day 1 and continuing for 35 days or reassess when absolute neutrophil count (ANC) greater or equal to 0.5 x 10^9/L

Conjunctivitis Prophylaxis

Choose ONE of the following:

Preferred Option:
- predniSOLone 1% eye drops 2 drops to each eye TID while awake starting on Day 1 and continuing until 48 hours after last dose of cytarabine for a total of 12 doses; First dose to be given pre cytarabine on Day 1

OR choose BOTH:
- dexamethasone 0.1% eye drops 2 drops to each eye every 4 hours while awake starting on Day 1 and continuing until 48 hours after last dose of cytarabine for a total of 24 doses; First dose to be given pre cytarabine on Day 1

AND
- dexamethasone 0.1% eye ointment 1.5 cm strip to each eye at bedtime starting on Day 1 and continuing until 48 hours after last dose of cytarabine for a total of 4 doses

Pre-Medication

- ondansetron 8 mg PO/IV BID on Days 1 to 6 for a total of 12 doses; To be given 30 to 60 minutes pre chemotherapy
- ondansetron 8 mg PO/IV BID PRN starting on Day 7 for nausea
□ metoclopramide 10 mg PO/IV every 6 hours PRN starting on Day 1 for nausea

**Oral Chemotherapy**  
*Only for Flt 3 positive patients*

□ midostaurin 50 mg PO BID on Days 8 to 21 for a total of 14 days; Administer with food; On days when ECG is ordered, do not administer until ECG has been read and assessed by physician for QTc prolongation
  - *Dosing adjustments: Dosage reduction may be required for renal impairment*
  - *Dosing adjustments: Dose may need to be held for QTc prolongation*

**Systemic Therapy**  
*Choose ONE of the following three treatment schedules:*

1. **Morning Start Schedule (0730h)**
   
   **Chemotherapy**
   *Choose ONE of the following doses:*
   
   **For adults age 60 or under**
   □ cytarabine (3000 mg/m²) ______ mg IV in 500 mL every 12 hours at 0730h and 1930h on Days 1, 3, and 5 for a total of 6 doses; Infuse each dose over 2 to 3 hours
   - *Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment*
   
   OR
   
   **For adults greater than 60 years of age**
   □ cytarabine (1000 mg/m²) ______ mg IV in 500 mL every 12 hours at 0730h and 1930h on Days 1, 3, and 5 for a total of 6 doses; Infuse each dose over 2 to 3 hours
   - *Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment*

   **Intravenous Fluid**
   □ 0.9% NaCl 500 mL IV every 12 hours on Days 1, 3 and 5 for a total of 6 boluses; Infuse concurrently with cytarabine over 2 to 3 hours

   Optional:
   □ 0.9% NaCl 1000 mL IV on Days 2, 4 and 6 for a total of 3 boluses; Infuse each bolus over 2 to 3 hours

2. **Afternoon Start Schedule (1630h)**
   
   **Chemotherapy**
   *Choose ONE of the following doses:*
   
   **For adults age 60 or under**
   □ cytarabine (3000 mg/m²) ______ mg IV in 500 mL every 48 hours at 1630h on Days 1, 3, and 5 for a total of 3 doses; Infuse each dose over 2 to 3 hours
   - *Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment*
   AND
   
   □ cytarabine (3000 mg/m²) ______ mg IV in 500 mL every 48 hours at 0830h on Days 2, 4, and 6 for a total of 3 doses; Infuse each dose over 2 to 3 hours
   - *Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment*
   
   OR
For adults greater than 60 years of age
- cytarabine (1000 mg/m²) ______ mg IV in 500 mL every 48 hours at 1630h on Days 1, 3, and 5 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment
AND
- cytarabine (1000 mg/m²) ______ mg IV in 500 mL every 48 hours at 0830h on Days 2, 4, and 6 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment

Intravenous Fluid
- 0.9% NaCl 500 mL IV daily on Days 1 to 6 for a total of 6 boluses; Infuse concurrently with cytarabine over 2 to 3 hours

3. Evening Start Schedule (2000h)
Chemotherapy
Choose ONE of the following doses:
For adults age 60 or under
- cytarabine (3000 mg/m²) ______ mg IV in 500 mL every 48 hours at 2000h on Days 1, 3, and 5 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment
AND
- cytarabine (3000 mg/m²) ______ mg IV in 500 mL every 48 hours at 0800h on Days 2, 4, and 6 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment
OR
For adults greater than 60 years of age
- cytarabine (1000 mg/m²) ______ mg IV in 500 mL every 48 hours at 2000h on Days 1, 3, and 5 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment
AND
- cytarabine (1000 mg/m²) ______ mg IV in 500 mL every 48 hours at 0800h on Days 2, 4, and 6 for a total of 3 doses; Infuse each dose over 2 to 3 hours
  ✗ Dosing adjustments: Dosage reduction may be required for renal or hepatic impairment

Intravenous Fluid
- 0.9% NaCl 500 mL IV daily on Days 1 to 6 for a total of 6 boluses; Infuse concurrently with cytarabine over 2 to 3 hours