CLINICAL PATHWAY:
Oncology Patient with Fever

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

If there is a clinical suspicion for Multi-System Inflammatory Syndrome in Children (MIS-C), please follow the MIS-C Clinical Pathway.

Clinical *suspicion* would include:
Fever ≥100.4 F for ≥24 hours AND any one of the following:
- GI: **abdominal pain, diarrhea, vomiting**
- CV: chest pain, arrhythmia, **signs of shock,** hypotension
- Mucocutaneous: **rash**, oral changes, conjunctivitis, extremity swelling/ peeling
- Resp: cough, shortness of breath, difficulty breathing
- Neuro: altered mental status, headache, irritability

(Bolded symptoms are most common presenting symptoms)

Inclusion Criteria:
(1) Oncology patients receiving chemotherapy/radiation **AND**
(2) Fever: temperature (obtained in any way) at home or in hospital ≥38 sustained over an hour, or ≥38.5 at any time **OR** the patient is ill-appearing (hypothermic/hypotensive/altered mental status)
Exclusion Criteria: (1) Patients who completely finished chemotherapy >1 mo ago AND no longer have a central venous line (CVL); (2) Bone marrow transplant

Initial Management:
ED Triage: Triage ESI Level 2

ED RN:
- Obtain vitals ASAP upon presentation
- Obtain vascular access and labs per Nursing Treatment Protocol
  - Access port/central line if present. Place PIV if unable to access or no CVL
  - Blood cultures from all lumens of CVL; peripheral blood cx only if PIV placed
  - CBC with auto diff
- If febrile and not already given in last 4 hours:
  - Give acetaminophen 15 mg/kg PO

Do NOT give any medications per rectum.
Do NOT give NSAIDs (contraindicated in oncology patients).

ED Provider:
- **STAT:** Order antibiotics[1] and labs (CBC w diff, blood cultures if not done by RN) – see dosing below[1]
- Obtain H&P
  - Type of cancer; stage of treatment; recent chemo (type, date); hx of prior infections; mucositis; CVL erythema/discharge/pain; prior complications; signs of neutropenic enterocolitis
- Consider further work up as indicated (CRP, chemistries, LFTs, UA/Ucx, CXR, type & screen)

Signs of sepsis: Notify attending/fellow immediately and proceed to Septic Shock Pathway.

[1]**GIVE ANTIBIOTICS within 1 hour of presentation!**
Do NOT wait until labs have returned! Review any labs completed in past 24 hours.

Standard Risk:
- ANC ≥≥500 (on CBC done in last 24 hr) AND well appearing; OR no CBC available:
  - **Ceftriaxone** IV 75 mg/kg (max 2 g) x1 dose
  - *If allergy*: **Levofloxacin** IV 6 mo-4 yr: 10 mg/kg, 5-9 yrs old: 7 mg/kg, 10 yrs old: 10 mg/kg (max 750 mg) x1 dose
- ANC <500 (on CBC done in last 24 hr):
  - **Piperacillin/Tazobactam** IV 100 mg/kg (max 4.5 g) x1 dose
  - *If allergy*: **Clindamycin** IV 10 mg/kg q6hr (max 600 g/dose) AND **Ciprofloxacin** IV 10 mg/kg q8hr (max 400 mg/dose)

High Risk?[2]
- **Ceftazidime** IV 50 mg/kg x1 dose AND
- **Vancomycin** IV x1 (<52 weeks PMA‡/about <3 mo old: 15 mg/kg x1; ≥52 weeks PMA‡/about 3 months old – 11 years old: 17.5 mg/kg x1; ≥12 yrs old: 20 mg/kg x1)

‡PMA (Post-Menstrual Age) = gestational age + postnatal age

[2]High Risk
- Ill-appearing
- Skin soft tissue infection
- Mucositis
- Concern for neutropenic enterocolitis
- Pneumonia
- Hx of strep viridans or known ESBL colonization
- If ANC < 500:
  - ALL, not in maintenance
  - AML
  - Relapsed ALL/ Lymphoma
  - Down syndrome

Current ANC <500 or Ill-appearing

Current ANC >500 and well-appearing

Discharge home if:
- Family able to return q24hr if still febrile
- Discussion with Heme/Onc attending re: disposition
- Follow-up with Heme/Onc

If Ceftriaxone allergy: give Rx for 24 hours of coverage of **levofloxacin** PO:
- 6 mo-5yr: 12 mg/kg q12hr
- 5-10 yr: 8 mg/kg q12hr
- >10 yr: 10 mg/kg q24hr
- max 750 mg/day for all ages

ED to call Heme/Onc to discuss admission and High Risk vs Standard Risk status[2]

Standard Risk

High Risk[2]

Antibiotics:
Start antibiotics ASAP (if not already given in the ED)
- **Piperacillin/Tazobactam** IV 100 mg/kg q6hr (max 4.5 g/dose)
  - *If allergy*: **Clindamycin** IV 10 mg/kg q6hr (max 600 g/ dose) AND **Ciprofloxacin** IV 10 mg/kg q8hr (max 400 mg/ dose)

Labs:
- CBC q24hr
- Blood culture q24hr from all CVL lumens if patient remains febrile

Febrile >72 hours? Yes

No

Antibiotics:
Start antibiotics ASAP if not given in the ED (if initially low risk, change antibiotics to below)
- **Vancomycin IV:** (<52 weeks PMA‡/about <3 mo old: 15 mg/kg q8hr or as determined by pharmacy based on estimated AUC; ≥52 weeks PMA‡/about ≥3 months old – 11 years old: 70 mg/kg/day div q6hr; ≥12 yrs old: 60 mg/ kg/day div q8hr)
- AND **Ceftazidime** IV 50 mg/kg q8hr (max 2 g/dose)
- *If allergy:* **Vancomycin** IV AND **Ciprofloxacin** IV 10 mg/kg q8hr (max 400 mg/dose)
- *Concern for neutropenic enterocolitis*: ADD **Metronidazole** IV 10 mg/kg q8hr (max 500 mg/dose)

Labs:
- CBC w diff q24hr; Blood culture q24hr from all CVL lumens if patient remains febrile

‡PMA (Post-Menstrual Age) = gestational age + postnatal age

If negative blood culture x48 hours (after starting vancomycin) and well appearing:
- Discontinue Vancomycin (even if still febrile)
- Change Ceftazidime to **Piperacillin/Tazobactam** IV

If positive blood culture or history of multi-drug resistant organisms:
- Consult Infectious Disease service

If febrile >96 hours OR new fever after afebrile x24 hr with persistent neutropenia:
- Consider starting anti-fungal therapy: **Micafungin** IV 3 mg/kg daily (max 150 mg/day)
  - *If concern for mucor or CNS/urine disease*: consider **Liposomal Amphotericin B** IV 3 mg/kg daily
- Prior to starting antifungals: Send fungal culture, aspergillus antigen (galactomannan)
- Consider Infectious Disease consult

Discharge Criteria:
(1) well appearing; (2) tolerating PO; (3) Afebrile x24 hours; (4) negative blood cultures; (5) APC >200 with rising ANC x2 days; (6) outpatient follow up in place

CONTACTS: NATALIE BEZLER, MD | ANDREA ORSEY, MD

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Connecticut Children's