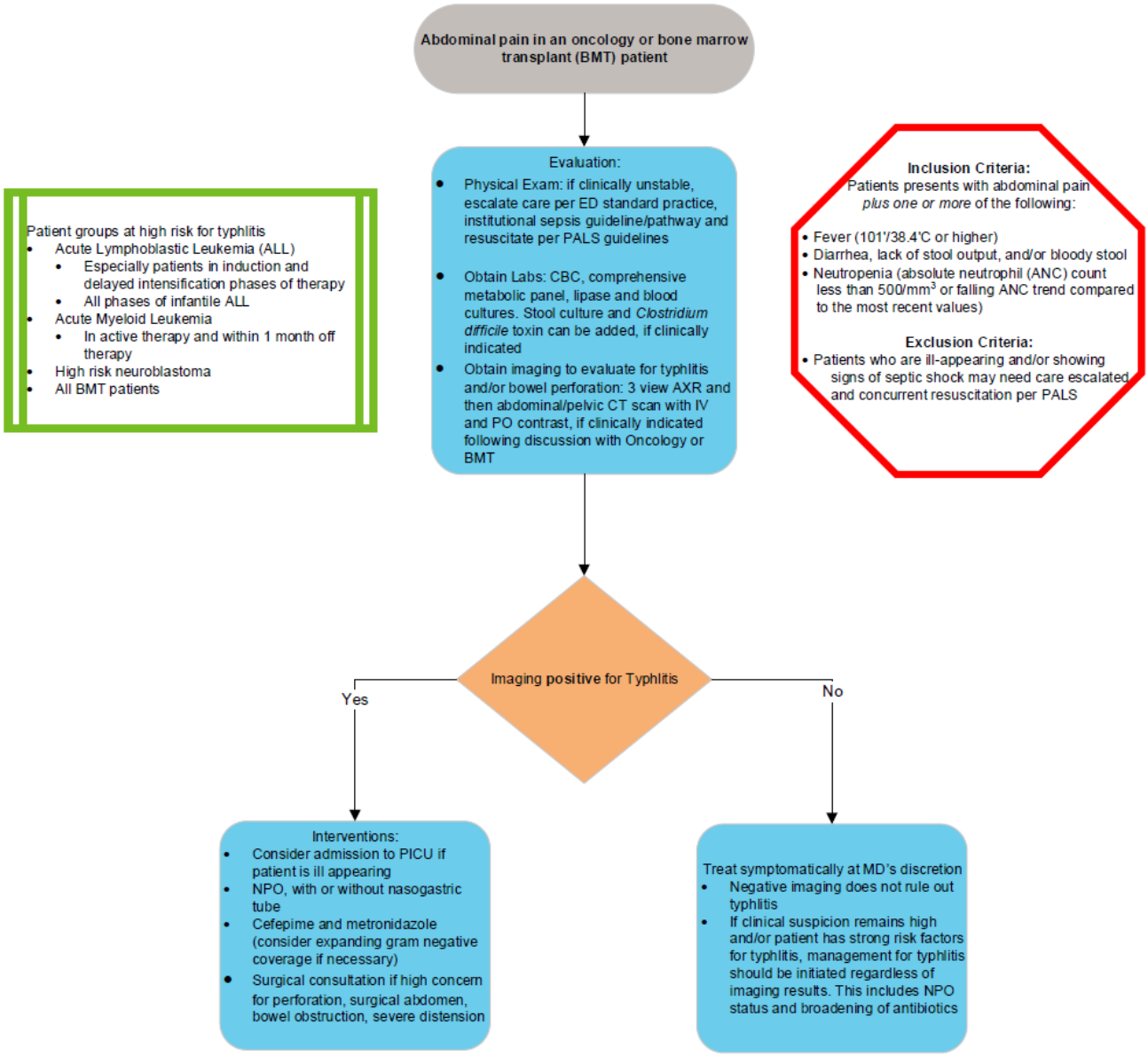
ABDOMINAL PAIN IN AN ONCOLOGY OR BONE MARROW TRANSPLANT (BMT) PATIENT (AKA TYPHLITIS)

ALGORITHM. Abdominal Pain in an Oncology or BMT Patient



Quick Links: Sepsis Pathway

TABLE OF CONTENTS

TARGET POPULATION

Inclusion Criteria

- All oncology and bone marrow transplant (BMT) patients with abdominal pain

Exclusion Criteria

- General medicine patients
- Hematology patients who are not immunocompromised

CLINICAL MANAGEMENT

Overview

Typhlitis, also referred to as neutropenic enterocolitis[1], is an acute life-threatening condition, seen most commonly in children with myelosuppression. Mortality and morbidity rates associated with typhlitis are very high and early diagnosis and treatment is imperative as the clinical course progresses very quickly[1].

Clinical Presentation

A high index of suspicion for typhlitis should be given to oncology or BMT patients presenting with abdominal pain[2] plus one or more of the following:

- Fever[1-3] (101°F/38.4°C or higher)
- Diarrhea[2,3], lack of stool output, and/or bloody stool
- Neutropenia[1-3] (absolute neutrophil count (ANC) less than 500/mm^3 or falling ANC trend compared to most recent values)
- Diagnoses, including but not limited to:
  - Acute lymphoblastic leukemia (ALL), especially patients in Induction therapy or delayed intensification phases of therapy,[1] and infant ALL
  - Acute myeloblastic leukemia (AML), in active therapy or within 1 month off therapy
  - High-risk neuroblastoma[1]
  - Bone marrow transplant patients (BMT)

Differential Diagnoses

Signs and symptoms of typhlitis often mimic other common gastrointestinal disorders including appendicitis, colonic pseudo-obstruction, diverticulitis, inflammatory bowel disease, infectious colitis, pancreatitis, and pseudomembranous colitis[3].

LABORATORY | RADIOLOGIC STUDIES

Currently there is no gold standard for diagnosing typhlitis

Laboratory studies should include:

- Complete blood cell count (CBC)[4]
- Comprehensive metabolic panel[4]
- Serum lipase
- Blood cultures[4]
- Stool cultures and *Clostridium difficile* toxin[5] should be considered if clinically indicated

Imaging:

- Controversy exists regarding the ideal modality for diagnostic imaging in patients with potential typhlitis. Abdominal x-rays with consideration of clinical signs are usually the first step of investigation and are usually sensitive enough for the diagnosis of typhlitis. CT abdomen/pelvis with IV and PO contrast is the next step imaging modality if questions and uncertainty remain amongst ED, PICU and Oncology/BMT teams.
- Radiographic findings suggestive of typhlitis include:
  - "Thumb-printing"
  - Fluid-filled mass like density in the right lower quadrant of the abdomen
  - Pneumatosis
  - Distention of adjacent bowel loops
- CT scans can also be used for diagnosis in cases where other pathology is a concern. Abdominal x-ray is often sufficient for the diagnosis of typhlitis.

TREATMENT | THERAPEUTICS

Treatment must be individualized to each patient[4].

Conservative treatment consists of:

- Bowel rest[3] with or without nasogastric suction
  - Parenteral nutrition may be considered
- Hemodynamic support
  - Intravenous fluids, and/or blood products as needed
- Antimicrobial Coverage[3]
  - Cefepime: 50 mg/kg/dose intravenously every 8 hrs. Maximum: 6 grams/day plus metroNIDAZOLE: 7.5 mg/kg/dose intravenously every 6 hrs or 10 mg/kg/dose intravenously every 8 hrs. Recommended maximum: 2 grams/day
  - Consider additional Gram-negative coverage in patients who are clinically unstable, when resistant infection is suspected[5,7]
    - The agent to select for double coverage is controversial, as aminoglycosides are of variable benefit and increased nephrotoxicity, and fluoroquinolones increase risk of *C. difficile* disease[6,8]

    - Discontinue double Gram-negative coverage in patients who are clinically responding after 48 to 72 hours, if there is no specific microbiologic clinical indication to continue[6]
    - Consider adding Enterococcal coverage per patient risk factors and clinical severity, per National Fever and Neutropenia guidelines[6]
  - Consider expanding/adding anti-fungal coverage per patient risk factors and clinical severity, per National Fever and Neutropenia guidelines[6]
  - For patients with cephalosporin allergy, choices include meropenem 20 mg/kg/dose intravenously every 8 hrs (single agent) Maximum: 3 grams/day, or ciprofloxacin 10 mg/kg/dose intravenously every 12 hours (Recommended maximum: 800 mg/day) + metroNIDAZOLE 10 mg/kg/dose orally or intravenously every 8 hrs (Recommended maximum:500mg q8h)
    - If meropenem used, there is no clear benefit to double gram-negative coverage, though exceptions can be made for patients already on meropenem (for example for BMT prophylaxis) [8]
    - Double anaerobic coverage should be avoided, as it is unnecessary and may increase risk of *C. difficile infection*. Agents with significant anaerobic coverage used in this population include meropenem, piperacillin/tazobactam, metronidazole, and clindamycin (note: clindamycin is less effective against B. fragilis) [9]
  - Duration of antimicrobials is dependent on clinical improvement of typhlitis symptoms and/or resolving neutropenia, whichever comes later
- Pain management pharmacotherapy
    - Note that NSAIDs may be contraindicated in setting of typhlitis due to impact on GI endothelium
    - Opiates should be used judiciously due to possible worsening of ileus
- Do *NOT* administer anticholinergics or antidiarrheals, as they may aggravate the condition or complicate the clinical presentation.
- Consider surgical consultation
- Immediate surgical intervention may be indicated for patients with free intra-abdominal perforation, clinical deterioration during conservative medical treatment, unrelenting intra-abdominal sepsis or abscess formation, or continued hemorrhage[10]. A multidisciplinary discussion should be made between surgical, PICU, ED and oncology/BMT teams if a surgical intervention is indicated.

Risk of Recurrence

Patients with a history of typhlitis are at risk for developing it again during subsequent treatment. Chemotherapy is often always withheld until the patient has recovered and has sufficiently healed clinically. A discussion should take place between the oncology/BMT teams and the PICU or ED teams.

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APPROVED BY

Clinical Pathways and Measures Review Committee – March 28, 2022

Pharmacy & Therapeutics Committee – February 3, 2022

MANUAL/DEPARTMENT	Clinical Pathways/Quality
ORIGINATION DATE	March 1, 2011
LAST DATE OF REVIEW OR REVISION	March 28, 2022
COLORADO SPRINGS REVIEW BY	 Michael DiStefano, MD Chief Medical Officer, Colorado Springs
APPROVED BY	 Lalit Bajaj, MD, MPH Chief Quality Outcomes Officer

REVIEW | REVISION SCHEDULE

Scheduled for full review on March 28, 2026

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