High Risk Abdomen

Emergency Department

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Center for Clinical Excellence

Inclusion Criteria:

- Patient with complex medical history and barrier to reliable communication ***or*** exam, due to nonverbal status, neurologic or neurodevelopmental disorder and/ or any other condition(s)

AND

- Concern for peritonitis or **acute** surgical abdomen, including:
  - Feeding intolerance or anorexia
  - Bilious or persistent emesis
  - Hematochezia, melena
  - Focal or diffuse abdominal tenderness/rigidity
  - Abdominal distention
  - Change in baseline behavior/ mentation
  - Parent/caregiver believes patient shows signs of abdominal pain
  - Previous abdominal surgery

Exclusion Criteria:

- Known and clear diagnosis that explains symptoms and provider is confident there is not a concurrent intra-abdominal process

Differential Diagnoses

***Admission criteria:**

- Unable to tolerate enteral nutrition or maintain hydration
- Requires additional workup
- Need for observation or inpatient procedure
- Family discomfort with discharge

Hemodynamic instability or signs of peritonitis?

Yes → Fluid resuscitation STAT Surgery Consult Consider need for antibiotics

No

If concerned for acute surgical abdomen, immediately consult Surgery and consider other appropriate pathways.

Testing

- Blood glucose, CBC w/ diff, CMP, lipase, lactate
- UA
- HCG for females ≥ 10 yo
- Type & Screen
- Acute Abdominal Series
- Any G- or J-tube to straight drainage or NG as indicated

For patients with history of spinal cord injury, consult Physical Medicine to assess risk for autonomic dysreflexia and associated complications.

X-rays with any of the following?

- Free air
- Bowel obstruction
- Pneumatosis
- Portal venous gas

Yes → Surgery consult +/- further imaging as deemed appropriate after discussion with Surgery

No

Abnormal labs?

Yes → Emergent/ urgent surgery planned?

No

Meets admission criteria*?

Yes → Medical management as appropriate

No → Discharge

Yes

Toxic, in distress, or unstable?

No → Admit to Floor: Hospital Pediatrics or appropriate subspecialty if established patient and accepted by service

Yes → Admit to PICU

Yes → Admit to Pediatric Surgery

High Risk Abdomen

Inpatient

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Patient meeting pathway inclusion criteria

Definition and Diagnosis

Differential Diagnoses

Signs of bacterial peritonitis +/- sepsis?

Yes

- Consider ACT
- Consider Watcher status
- Consider IV Fluid resuscitation
- Consider Sepsis evaluation and antibiotics for High Risk Patient with concern for intra-abdominal infection
- **STAT Surgery Consult**
- Neurosurgery Consult if patient has VP/LP shunt

No

- Labs and Imaging, unless already obtained
- Any G- or J-tube to dependent drainage or NG as indicated
- Consider PM&R consult if spinal cord injury and suspicion for autonomic dysreflexia

Emergent/urgent surgery planned?

No

Yes

X-rays with any of the following?

- Free air
- Bowel obstruction
- Pneumatosis
- Portal venous gas

No

Yes

Transfer to **Pediatric Surgery** post-op

- **Surgery consult**
- Consider Neurosurgery consult if VP/LP shunt
- Team Assessment & Monitoring

Emergent/urgent surgery planned?

Yes

No

Medical management as clinically indicated

Inclusion & Exclusion Criteria

- **Inclusion criteria:**
  - Patient with complex medical history and barrier to reliable communication ***or*** exam, due to nonverbal status, neurologic or neurodevelopmental disorder and/or any other condition(s)

    AND
  - Concern for peritonitis or **acute** surgical abdomen, including:
    - Feeding intolerance or anorexia
    - Bilious emesis or persistent emesis
    - Hematochezia, melena
    - Focal or diffuse abdominal tenderness/rigidity
    - Abdominal distention
    - Change in baseline behavior/mentation
    - Parent/caregiver believes patient is showing signs of abdominal pain
    - Previous abdominal surgery, including presence of tubes like a VP shunt or feeding tubes and insertion of hardware such as a baclofen pump

- **Exclusion criteria:**
  - Known and clear diagnosis that explains symptoms and provider is confident there is not a concurrent intra-abdominal process

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Diagnosis & Definition

The **High Risk Abdomen Algorithm** describes management of a Complex Abdomen in patients with neurologic or neurodevelopmental condition that are nonverbal or have difficulty communicating or have a condition prohibiting a reliable abdominal exam such as spinal cord injury. These patients can present with vague symptoms that may or may not indicate an underlying surgical abdomen as the primary cause for these symptoms.

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Differential Diagnoses

- Potential surgical pathologies:
  - Appendicitis, malrotation, volvulus, small or large bowel obstruction, intussusception, intestinal ischemia, perforated viscous, incarcerated or strangulated hernia (ventral, inguinal, internal, other), ovarian or testicular torsion, VP shunt pseudocyst, cholelithiasis, choledocholithiasis, gallstone pancreatitis, intraabdominal infection
- Findings suggestive of another diagnosis include:
  - Infiltrate on chest x-ray
    - Pneumonia
  - Positive urinalysis with leukocyte esterase, nitrites, or bacteria, with or without flank pain
    - Pyelonephritis
    - UTI
  - History of sexual activity or abuse, vaginal discharge
    - STD, PID
  - Triad of diarrhea, vomiting, and fever
    - Gastroenteritis
  - Hard feces in rectal vault on DRE
    - Fecal impaction or constipation
  - Elevated lipase, amylase
    - Pancreatitis

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Testing

Laboratory

- Blood glucose, urinalysis, CBC w/ diff., CMP, lipase, lactate, HCG for females ≥ 10 yo
- Type and screen
- CRP, ESR, procalcitonin, coagulation panel, blood cultures and urine culture as indicated for suspected infection
- Consider stool studies
- STI testing as appropriate

Radiology

- Obtain **XR Acute Abdominal Series** (supine abdomen, upright or left decubitus abdomen, upright or supine chest) for initial evaluation
  - **Findings on x-rays warranting a surgery consult:**
    - Free air
    - Bowel obstruction
    - Pneumatosis
    - Portal venous gas

- Additional imaging (CT, ultrasound, contrast studies) to be obtained as indicated:
  - **CT of the abdomen and pelvis with IV contrast only (no PO contrast)** can be obtained at any point throughout the algorithm according to provider clinical judgement.
    - Surgery resident to discuss timing and location of CT scan with surgical attending.
    - If a CT scan with IV contrast is needed, the scan should be done in the ED
    - If a CT with IV and enteral contrast or gastrografin study is indicated, admit to the appropriate service after discussion with Pediatric Surgery.
    - If a provider is unsure if a CT scan will be beneficial, then a discussion with the surgery team can help move along the decision.
    - Please obtain CT scans judiciously to minimize radiation risk given high radiation burden in these chronic and complex patients.

  - For concerns of Adhesive Small Bowel Obstruction, consider a **Gastrografin study**. Refer to the **Adhesive Small Bowel Obstruction Pathway**.

  - For patient with ventriculoperitoneal (VP) or lumboperitoneal (LP) shunt, consider shunt x-ray (XR VP shunt, XR VJ shunt, XR LP shunt) and neuroimaging if concerned for shunt malfunction. Consider abdominal US if concern for pseudocyst or abscess.

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Severity Assessment

- Evidence of shock or sepsis should prompt a critical care assessment.
- **If the provider is concerned about an acute surgical abdomen at any point throughout the algorithm, a surgery consult should be called and the pathway can be bypassed.**

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Admission Criteria

- Inability to tolerate enteral nutrition or maintain hydration
- Unclear diagnosis requiring additional workup
- Need for admission or observation as deemed appropriate by any involved service
- Need for inpatient procedure (bowel washout, IR, etc.)
- Family uncomfortable going home

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Team Assessment & Monitoring

- Airway, Breathing, Circulation
- Cardiac monitor
- IV access
- RN to keep all stool, emesis, feeding tube, and drain specimens to be visualized by ED and surgery physicians or inpatient resident and surgery consult

- Physician assessment on presentation and as indicated
- RN assessment q1h
- RN to notify physician team of any changes or caregiver concerns
- Pain assessment
- Determine code status
- Direct communication between physician members of each team involved
- If a surgical consult is called, the patient will be seen within 30 minutes by a member of the surgery team. If the ED or IP attending feels like the consult is more emergent, they should reach out directly to the surgery attending on call.
- See **Testing** for team discussion and decision making about CT scan or other imaging

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Recommended Treatments

- Resuscitation as indicated
- NPO
- Maintenance intravenous fluids as indicated
- PRN pain medication
- G- or J-tube to straight drainage
- Nasogastric tube as indicated
- Antibiotics as indicated

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Testing/Treatments Not Recommended

- Do not give enteral diet until evaluation has been completed. NPO is preferred.
- Auscultation alone is not reliable in predicting normal vs abnormal bowel sounds or pathology.

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Deterioration & Escalation of Care

- Identification of Deterioration
  - Patient should be placed on cardiac monitor and RN will be performing q1h assessments.
  - If there is potential to deteriorate or there is continued deterioration, the patient should be admitted to a ward with a higher level of care, as indicated (example, ICU).
- Escalation of Care Protocol:
  - **If there is concern for a surgical abdomen, then surgery should be consulted at that time, regardless of the pathway.**
  - If the patient becomes toxic, unstable, or distressed, then ICU admission should be considered.

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Discharge Planning

- Follow-up: Patient is to follow-up with primary care provider upon discharge from Emergency Department.
- After an inpatient admission, patients will be given follow-up as deemed appropriate by the inpatient services involved.

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References

1. Tsao KJ, Anderson KT. Evaluation of abdominal pain in children. BMJ Best Practice US. Published 2020. https://bestpractice.bmj.com/topics/enus/787. Accessed October 1, 2020.
2. Preddy J, Boyd N, Darvill J, et al. Infants and children: acute management of abdominal pain. Published January 2005. https://www1.health.nsw.gov.au/pds/Active%20PDSDocuments/PD2013_053.pdf. Accessed October 1, 2020.

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Quality Measures

Pathway Goal:
To improve diagnostic accuracy and timeliness of effective care in patients with complex medical conditions and barriers to communication and/or a reliable physical exam

Quality Measures

Outcome Metrics

- Rate of admission
- Rate of ED/IP to OR

Process Metrics

- ED order panel usage
- IP order set usage

Balancing Metrics

- Readmission after ED/IP discharge within 7 days

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Potential Areas for Research

- Risk factors and signs/symptoms of all patients who were taken to the operating room and had a confirmed diagnosis of a surgical abdomen
- Risk factors and signs/symptoms of patients with neurologic or developmental delay who were taken to the operating room and had a confirmed diagnosis of a surgical abdomen
- Outcomes on application of clinical pathway in this population

*Multiple RCTs and a systematic review and meta-analysis have illustrated that administering analgesia prior to surgical consultation does not decrease diagnostic accuracy in children.[1-4]

** There is conflicting evidence as to the effectiveness and usefulness of auscultation bowel sounds to detect intraabdominal pathology. Several prospective and retrospective studies show low accuracy and inter-observer agreement, while others show a higher PPV of bowel sounds combined with a history and physical.[5-9]

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Team & Process

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Advisory Committee Date: *December, 2020*

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

For more information about our pathways and program please contact:
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