

INTRODUCTION

Abdominal complaints are very common in emergency medicine. The specific cause of the abdominal pain can very rarely be determined in the pre-hospital environment, however performing a good patient assessment and gathering a good history can help point to the probable cause. When dealing with abdominal complaints, it is most important that the clinician be able to recognize if a patient is unstable and requires urgent transport to definitive care.

SAFETY

Vomiting is a common occurrence in patients with abdominal pain. The clinician should wear appropriate personal protective equipment to protect against splashing emesis.

ASSESSMENT

Most abdominal pain can be categorized into three types – tension, inflammatory, or ischemic.

Tension pain is caused by distension of a hollow organ such as in the case of a bowel obstruction, constipation, renal colic (in the ureter), or early appendicitis. Fluid accumulation from trauma or other causes can also cause this type of pain. These patients have a hard time finding a position of comfort or sitting still.

Inflammatory pain often feels deep and can be generalized if the visceral peritoneum is involved. As the parietal peritoneum becomes inflamed, the pain begins to localize. Patients with inflammatory pain often prefer to lie still and avoid movement. Pancreatitis, late appendicitis, and cholecystitis all cause inflammatory-type pain.

Ischemic pain is the least common type of pain, but is the most serious. If an organ loses blood flow due to an arterial occlusion, the area will become necrotic very quickly. The pain associated with ischemia is sudden in onset and very intense. Often, the level of pain reported is disproportionate to the assessment findings (e.g. patient will report 10/10 pain but will have a soft, non-tender, non-distended abdomen). Analgesics rarely help this type of pain. Mesenteric artery occlusion or strangulated bowel both cause ischemic-type pain. These patients will want to remain still, much like patients with inflammatory pain.

It is also important to note that abdominal pain can be referred from another area, such as epigastric pain

occurring during a myocardial infarction. The reverse of this is also true, where some abdominal pain can be referred to other areas of the body, such as shoulder pain from diaphragmatic irritation, or back pain with cholecystitis.

Determining the specific cause of abdominal pain is very difficult, if not impossible, in the pre-hospital setting. The most important diagnoses to consider first are those which are life-threatening.

Acute Life-Threatening Abdominal Emergencies

Aortic Aneurysm (ruptured or leaking)

In patients presenting with sudden onset of abdominal, flank or back pain, a leaking or ruptured aneurysm cannot be ruled out. Ask about a family or personal history of AAA. Other signs and symptoms can include hypotension, syncope, a pulsatile mass, and sudden onset of severe pain (may be stabbing, ripping, or tearing); often resembles renal colic

Ectopic Pregnancy

Ectopic pregnancy should be considered in any woman of childbearing age complaining of abdominal or pelvic pain or PV bleeding.

Myocardial Infarction

Women, older adults and patients with diabetes often present with symptoms other than 'chest pain', such as abdominal or back pain. A 12-lead ECG must be obtained.

Traumatic Rupture of Abdominal Organs (mainly liver or spleen)

This patient may have a history of blunt or penetrating trauma (even minor trauma) and may present with hypotension, tachycardia and/or syncope.

Uncontrolled GI Bleed

Caused by peptic ulcer disease, erosive gastritis/esophagitis, or esophageal/gastric varices. These patients may present with hematemesis, melena, hypotension, tachycardia, syncope and an altered level of consciousness.

In addition to asking OPQRST and SAMPLE questions, an appropriate history would also include questions regarding symptoms such as fever or chills, nausea, vomiting, and GI or PV bleeding. Changes in appetite, bowel movements, urination, or menses should also be explored. Clinicians should maintain a high index of suspicion when onset of pain is sudden. Abdominal emergencies with sudden pain are often more serious as this may signify the rupture of an organ or vascular structure.

A general physical exam should identify the location of the pain as well as guarding, bruising, rigidity, or the appearance of a pulsatile mass. Bruising around the navel or the flanks suggest severe bleeding within the abdominal cavity. When assessing the abdomen, look for scars which may suggest previous surgeries. Previous surgery is a risk factor for bowel obstruction.

Bowel obstruction must be considered in a patient who is vomiting with no associated diarrhea. It must also be considered in elderly patients with constipation-like symptoms.

The abdomen is divided into 4 quadrants (and 9 regions). The location of the pain can help to determine the etiology (See Figure 1). Abdominal pathologies may present atypically, especially in the elderly, and pain can often present in overlapping regions.

Figure 1: Differential Diagnosis Based on Classic Region of Pain

<p><u>RUQ</u> Cholecystitis Hepatitis Bile duct pathology Biliary colic</p>	<p><u>Epigastric</u> Pancreatitis GERD MI Peptic ulcer</p>	<p><u>LUQ</u> Gastritis Splenic rupture Pancreatitis</p>
<p><u>Right Flank</u> Renal colic AAA Pyelonephritis</p>	<p><u>Umbilical</u> Pancreatitis Peptic ulcer Early appendicitis Umbilical hernia IBD</p>	<p><u>Left Flank</u> Renal colic AAA Pyelonephritis</p>
<p><u>RLQ</u> Appendicitis IBD Diverticulitis Ovarian torsion Endometriosis Ectopic pregnancy Inguinal hernia</p>	<p><u>Suprapubic</u> PID Endometriosis UTI IBD Diverticulitis Urinary retention</p>	<p><u>LLQ</u> Diverticulitis Ovarian torsion Endometriosis Ectopic pregnancy Inguinal hernia</p>

Some conditions may cause diffuse or poorly localized abdominal pain, such as peritonitis, ischemic bowel, IBD, gastroenteritis, bowel obstruction, early appendicitis, and pancreatitis.

Not all abdominal emergencies present with pain, such as with some GI bleeds. Upper GI bleeding can present with hematemesis (bright red or coffee-ground colour) and/or melena (black/tarry stool). Lower GI bleeding typically presents with hematochezia (maroon blood mixed in the stool), or bright-red blood per rectum.

All patients with abdominal pain should have a 12-lead ECG obtained and continuous cardiac monitoring.

MANAGEMENT

If the patient is suspected of having a life-threatening abdominal emergency, prepare for rapid transport.

An anti-emetic should be administered if the patient has nausea or vomiting (**PEP 1 supportive**).

Analgesia should be considered to reduce pain (**PEP 1 supportive**). Analgesia does not obscure subsequent assessment and diagnostic testing in the emergency department.

The patient should not be given anything by mouth, unless the cause is determined to be an MI and the administration of ASA and/or other anti-platelet is required. Dehydration and hypotension can be treated with IV fluids.

The majority of patients with acute abdominal pain or gastrointestinal bleeding require lab tests, imaging, and possibly surgery. Management in the pre-hospital setting is for the most part supportive, and the clinician should ensure a thorough history is obtained.

Pediatric Abdominal Emergencies

The signs and symptoms of abdominal emergencies in pediatric patients will differ depending on their age. In general, signs and symptoms of abdominal emergencies in pediatric patients include:

- Vomiting
- Pain
- Diarrhea
- Constipation
- Bleeding
- Jaundice

EHS has made every effort to ensure that the information, tables, drawings and diagrams contained in the Clinical Practice Guidelines issued Q4 DHW2022 is accurate at the time of publication. However, the EHS guidance is advisory and has been developed to assist healthcare professionals, together with patients, to make decisions about the management of the patient's health, including treatments. It is intended to support the decision making process and is not a substitute for sound clinical judgment. Guidelines cannot always contain all the information necessary for determining appropriate care and cannot address all individual situations; therefore individuals using these guidelines must ensure they have the appropriate knowledge and skills to enable appropriate interpretation.

- Abdominal masses

Abdominal emergencies may present as irritability, lethargy, or restlessness. It is important to note the patient's behaviour prior to and during assessment. In many cases, the abdominal pain may be from an extraabdominal origin such as pneumonia.

Ask the child or parents/guardians if there has been any vomiting or diarrhea and check for or ask about any discoloration or blood in either. A thorough history should also include asking about fever, bowel habits, weight changes and feeding habits. Allow the pediatric patient to remain in the parent/guardian's lap or arms during assessment in order to help establish rapport.

The likely etiology of abdominal complaints differs with age. Some of the more serious causes of abdominal emergencies in children include:

Infants/neonates

- Necrotizing enterocolitis (premature neonate)
- Intussusception
- Incarcerated hernia
- Volvulus
- Pyloric stenosis
- Malrotation of the intestine
- GERD

2-5 years old

- Appendicitis
- Intussusception
- Volvulus
- Diabetic ketoacidosis
- Incarcerated hernia
- Metabolic acidosis
- Pneumonia

6 years and older

- Appendicitis
- Bowel obstruction
- Incarcerated hernia
- Peptic ulcer disease

- Pyelonephritis
- Ovarian/testicular torsion

Nausea/vomiting/diarrhea and/or abdominal pain in the pediatric population may represent an acute surgical emergency. All pediatric patients with signs or symptoms of abdominal emergencies should be transported to the hospital for further assessment and tests.

Key Points - Abdominal Emergencies

Be careful not to prematurely rule-out life-threatening causes

Adequately manage pain

Consider ACS differential

Acquire 12 Lead ECG

Abdominal pain in the geriatric population is a high risk presentation

TRANSFER OF CARE

Provide all relevant details to the receiving facility: history of present illness, pertinent history, vital signs, treatment rendered and the patient's response to treatment.

CHARTING

In addition to the mandatory fields it is important to document the following in the ePCR text fields:

- ✓ Location and description of pain
- ✓ Any treatment given and response to treatment

All 12-leads ECGs should be attached to the PCR.

KNOWLEDGE GAPS

There is research still to be done to determine the most effective anti-nausea/anti-emetic drug to use in the pre-hospital setting. Any interest in research regarding respiratory distress can be directed to EHS via the following link:

<http://www.gov.ns.ca/health/ehs/>

EDUCATION

Clinicians should maintain knowledge of the various potentially life-threatening causes of abdominal emergencies.

The optimal management of these emergencies is under continual review for ongoing continual medical education. Any recommendations for content delivery can be directed to the EHS Quality and Learning Department.

QUALITY IMPROVEMENT

Recent evidence shows that abdominal pain is undertreated; providing analgesia is appropriate.

It is important for the paramedic to record the overall management in the ePCR. This will require completion of the various fields in the ePCR, including an appropriate text description in the comment section. Only by appropriate, accurate and complete charting can we build the case for new techniques and strategies.

REFERENCES

<http://www.gov.ns.ca/health/ehs/>

<http://emergency.medicine.dal.ca/ehsprotocols/protocols/toc.cfm>

Ma, O.J., Cline, D.M., Tintinalli, J.E., Kelen, G.D., & Stapczynski, J.S. (Eds.). (2004). *Emergency Medicine Manual* (6th ed.). New York, NY: McGraw-Hill.

PEP 3x3 TABLES for ABDOMINAL EMERGENCIES

Throughout the EHS Guidelines, you will see notations after clinical interventions (e.g.: **PEP 2 neutral**). PEP stands for: the Canadian **P**rehospital **E**vidence-based **P**rotocols Project.

The number indicates the Strength of cumulative evidence for the intervention:

1 = strong evidence exists, usually from randomized controlled trials;

2 = fair evidence exists, usually from non-randomized studies with a comparison group; and

3 = weak evidence exists, usually from studies without a comparison group, or from simulation or animal studies.

The coloured word indicates the direction of the evidence for the intervention:

Green = the evidence is supportive for the use of the intervention;

Yellow = the evidence is neutral;

Red = the evidence opposes use of the intervention;

White = there is no evidence available for the intervention, or located evidence is currently under review.

PEP Recommendations for Abdominal Emergencies Interventions, as of 2022/10/24. PEP is continuously updated. See:

<https://emspep.cdha.nshealth.ca/> for latest recommendations, and for individual appraised articles.

Abdominal Pain

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)	<ul style="list-style-type: none"> Analgisia (narcotic) Fentanyl Ketamine 			
	2 (fair evidence exists)				
	3 (weak evidence exists)	<ul style="list-style-type: none"> Analgisia (NSAIDs) Nitrous Oxide 			


Flank Pain


Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)	<ul style="list-style-type: none"> Acetaminophen IV Analgesia (narcotic) Analgesia (NSAIDs) Ketamine Morphine 			
	2 (fair evidence exists)				
	3 (weak evidence exists)				

Nausea and Vomiting

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)	<ul style="list-style-type: none"> Antiemetic (Central) Antiemetic (GI Action) Isopropyl alcohol 			
	2 (fair evidence exists)				
	3 (weak evidence exists)				

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