

## Approach to Acute Abdomen in the Primary Health Care Setting

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### Abstract

Acute abdomen is a life-threatening condition with different etiologies, presenting signs and therapeutic approaches. We aim to provide a comprehensive review of the management of acute abdomen illness in a primary health care setting. A comprehensive literature search was done to include relevant articles. A detailed algorithm should be applied beginning with detailed history for detection of patient demographic characteristic, site of pain and associated symptoms to reach a provisional diagnosis. Subsequently, followed by physical and abdominal examinations which include inspection, palpation, percussion, and auscultation for detection of apparent or hidden signs of medical importance to reach a proper diagnosis. If previous procedures failed to detect the etiologic factor which induced acute abdomen pain. Referral to the specialized hospital should be obtained for providing investigations that constitute the key factor in confirmation or exclusion of several diagnoses developed by the primary health care provider.

**Keywords:** Acute Abdomen; Diagnosis; Examination; Management

### Introduction

Acute abdomen represents one of the dangerous emergency conditions that need special care from primary health care providers especially with the high associated mortality [1]. The proper management of this condition starts with an appropriate diagnosis. Patients with acute abdomen present to primary health care setting with different signs and symptoms including anoxia, flushing, nausea, vomiting, diarrhea, rectal bleeding, and altered mental state; the latter is associated with high mortality if not medically controlled [2]. Several intra-abdominal etiologies are responsible for the acute abdomen including appendicitis, diverticulitis, perforated peptic ulcer, cholecystitis and pancreatitis [2,3]. However, pain foci may originate from extra-abdominal causes that stimulate abdominal pain. In a preliminary report on children aged (1 month - 14 years), pneumonia, tonsillitis, otitis media, leukemia, and diabetes are the most

common pathologic diseases that induce abdominal pain in children [4]. Therefore, detailed history and proper examination are essential to finding the casual factor to start treatment before progression of infection, rupture of an intra-abdominal organ or cancer metastasis [5,6]. The role of primary health care in the acute abdominal case is to take a full history, provide clinical examination and introduction of life-supporting measures. If the diagnosis is not conclusive after the two procedures, referral for specialized emergency department and proper investigations should be obtained [7]. Herein, we aim to discuss the clinical approach used for acute abdomen management in primary health care settings which will provide a general look on history taking and full examination that can provide a substantial role in detecting the etiologic factors responsible for acute abdomen.

### Methods

We performed an extensive literature search of the Medline, Cochrane, and EMBASE databases on 1 June 2019 using the MeSH term 'acute abdomen' OR the keywords 'abdominal pain' OR acute abdomen. All papers discussing acute abdomen in the primary health care setting were screened for relevant information. There were no limits on date, language, age of participants or publication type.

### Approach to a patient with an acute abdomen

The key factors in the proper identification of the cause of the acute abdomen are accurate history taking and physical examination, following a planned systematic approach. Following laboratory investigations and imaging studies, if indicated, will help physicians to reach a proper diagnosis with maximum accuracy and proper subsequent risk stratification of the patients. Moreover, appropriate documentation of all information gathered is crucial to avoid any discrepancies or misinterpretation that may lead to missing or misdiagnosing high-risk conditions [8,9].

### History

History taking should start by eliciting pain characteristics including; detailed description, site, provoking and relieving factors, severity, radiation, duration, progression, and previous similar episodes. Afterwards, a detailed medical, social and surgical history is important to identify different precipitating factors. A sexual and gynecological history should be always obtained in women with pregnancy testing for those in the childbearing period [10].

Associated symptoms that may be present like anorexia, nausea, vomiting or bowel problems, should be inquired as well. Noteworthy, some points in history and identifying risk groups are considered of greater yield. Old patients are a risk, more vulnerable, group with associated poorer results in terms of mortality and morbidity, thus a prompt evaluation and subsequent emergency referral (if indicated) is highly needed. Additionally, old patients with a history of cardiovascular diseases should be evaluated for vascular causes of the acute abdomen such as dissections or aneurysms. In the same context, thromboembolic diseases or atrial fibrillation patients are at higher risk for mesenteric ischemia. Moreover, a previous history of abdominal surgeries is a risk factor for adhesions and subsequent obstruction [11]. The most predictive symptoms of appendicitis, as a frequent cause of acute abdomen, are right lower quadrant pain (RLQ) with radiation of pain from the periumbilical region. Other associated symptoms like anorexia and vomiting have been found to have little predictive value in the diagnosis of appendicitis [12].

### Physical examination

Physical examination with a full assessment of the patient's general condition, vital signs, facial expression, position, and the respiratory pattern is a cornerstone to reach a proper diagnosis. Noteworthy, well-appearing patient should not give the physician a false sense of safety since some serious diseases may not manifest obviously in some patients [13]. Administration of analgesia, as opioid, may be needed and showed to have no adverse outcomes nor masking effect in the diagnosis of acute abdomen [14].

### Abdominal examination

The first step of examination is the inspection for previous surgical scars, abnormal rashes, signs for hemorrhage (Grey Turner sign, Cullen's sign), distension and abnormal abdominal wall movements (pulsation or visible peristalsis). Moreover, an inspection of hernia orifices and genitalia is very important not to miss incarcerated hernias or abdominal pain of genitourinary origin (e.g. testicular torsion). Following the inspection, palpation should be done, beginning with the light palpation to locate tender points then deep palpation to detect organomegaly or any present masses. Moreover, rebound tenderness should be checked as well to detect any peritoneal irritation [10,15].

In the same context, Carnett's sign (increased tenderness with contracted abdominal wall muscles) is an indication of tender abdominal wall, as opposed to peritoneal irritation with subsequent abdominal tenderness associated with guarding and rigidity (an increase in the abdominal wall muscular tone). To avoid the confounding effect of voluntary guarding, reassurance of the patient along with gentle palpation with warm hands are recommended. Absence of guarding, due to weak abdominal wall muscles, in old patients should be noted as well. Moreover, proper deep palpation may be necessary to elicit some important diagnostic signs. Murphy's sign (inspiratory arrest elicited with deep palpation of the right upper quadrant [RUQ]), is present in 65% of acute cholecystitis patients in adults. Moreover, Rovsing (pain elicited in RLQ by deep palpation of LLQ) is a helping sign in the diagnosis of acute appendicitis [10,15].

### Digital rectal examination (DRE)

DRE is recommended in the evaluation of abdominal pain; however, it has not shown any significant contribution to the diagnosis of patients with the acute abdomen [16,17]. Nevertheless, it may be required in the diagnosis of some conditions like rectal masses, prostatitis, impacted stool, foreign bodies in the rectum and gastrointestinal bleeding [18].

### Pelvic examination

Pelvic examination is essential in women presenting with acute abdomen during their childbearing period. Some conditions, like pelvic inflammatory disease (PID), can be almost indistinguishable from appendicitis through anterior abdominal examination only. The pelvic examination, in the aforementioned condition, will detect abnormal mucopurulent discharge which is one of PID characteristics [9,19].

### Diagnostic tests

Most of primary health care centers would not have a readily available laboratory investigation with prompt results. Also, on-site radiological investigations would not be available in most cases and the patient will have to be referred to a nearby radiological unit and returned to the family physician with the results. Moreover, different diagnostic tests for acute abdomen, especially laboratory test, have shown not to be fully accurate with a false negative rate. Accordingly, a proper history taking and physical examination will remain the key factor for diagnosis in a primary health care setting. If the family physician came to a pre-test diagnosis of the condition, it would be highly recommended to refer the patient to the nearest Emergency Department for further evaluation and avoiding any unnecessary delay [20,21].

### Laboratory testing

Routine complete blood picture (CBC) examination is essential for appendicitis diagnosis which is associated with an increase in white blood cells (WBC) count with increased pro-inflammatory cytokines [22]. Furthermore, WBC count can be beneficial in the diagnosis of appendicitis stage where the ruptured appendix is associated with a marked increase in WBC count compared to other forms of appendicitis severity [22,23]. Pancreatic enzymes are essential for pancreatitis diagnosis, in which elevation of serum amylase and/or lipase occurs; however, lipase enzyme only is sufficient to for pancreatitis diagnosis while the elevation of serum amylase is not conclusive [24,25]. Moreover, liver enzymes and liver function tests are considered a cornerstone for measuring liver pathologies if it is the original

source of an acute abdomen [26,27]. Intra-abdominal infection diagnosis should be obtained once signs of toxicity are apparent for the physician and detailed laboratory investigations are requested in parallel with the associated signs and symptoms and the history obtained from the patient [28,29].

### Imaging testing

Site of abdominal pain determines the type of imaging procedure needed for adequate diagnosis. Ultrasonography is preferred when the pain originates from right upper quadrant for diagnosis of acute cholecystitis and suprapubic area for prostate cancer diagnosis [30,31]. Moreover, computed tomography (CT) is preferred when pain radiates from left upper quadrant for patients presented with pancreatitis; however diagnosis of appendicitis located in the right lower quadrant pain occurs through combination of CT with intravenous contrast media, while that of left lower quadrant needs combination of CT with oral and intravenous contrast media for renal or large intestine diseases [32-35]. Despite being an invasive technique, laparoscopy is indicated when the previous measures fail to establish a certain diagnosis. Laparoscopy yielded an efficacy estimated around 70% for the diagnosis of cases presented with acute abdomen; however, approximately 60% of patients are successfully treated with laparoscopy [3,36].

### Conclusion

Acute abdomen is a dangerous emergency illness with varied etiologies. Detailed history taking and proper examination constitute the cornerstone for acute abdomen management in a primary health care setting. Referral to the emergency department is mandated for further investigations and treatment.

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### Conflict of Interest

None.

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