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A Scientific Erudition

Proposed Protocols for Management of Acute Abdomen in Adult at the University Teaching Hospital Lusaka, Zambia

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ABSTRACT

Background: Abdominal pain is a common complaint for patients seeking health care at emergency departments, estimated at 3.4 million per year in USA, where it is considered as a frequent and potentially high chief claim. The acute abdomen pain has no specificity with regard to its outcome. This is shown in the acute appendicitis, the commonest aetiology of acute abdomen pain. If treated correctly and on time, the outcome of acute appendicitis is usually good. Untreated on time, it may lead to perforation, generalized peritonitis and even to death. In our knowledge, there is no formal acute abdomen protocol or policy in the sub Saharan region at large and in Zambia and Lusaka in particular. Hence need of this pioneering work to be revised and adjusted with circumstances of time and area. **Objective:** The purpose of this study is an essay of establishing based on the University Teaching Hospital some guideline for the management of patients with acute abdomen pain in the setting and that might also assist physicians working under similar health facilities, at filter clinic, casualty and admitting rooms. **Methods:** It was a descriptive analytic study carried out in 2015 based on the two-year work of 5 general surgery units' data, at the Lusaka UTH. The population study included all admitted patients to these 5 units for clinical diagnosis of AA, directly from casualty of admitting rooms or indirectly from other UTH units or firms. The data collections was done by the team following the questionnaire and entered in Excel spread sheet before being analysed by SSP. Discussion of the results was done and proposed protocols were written and read by a team member during wide regional conference for more discussions and adjustments. **Results:** The proposed protocols are given in texts, tables and figures. The orientation of the patient with AA is important to not missing out the time of operation of a SAC and the way to score each of them is shown. It is needed to regularly review these protocols to adjust them and to appreciate the impact of new non invasive investigations. As emphasized by many authors, an important component of guidelines utilization is the date of their publication and their current applicability to patient care.

Keywords: Acute pain management, Abdomen, Spontaneous, Emergency, Resuscitation, Investigations, Patients' orientation

INTRODUCTION

Abdominal pain is a common complaint for patients seeking care at emergency departments, estimated at 3.4 million per year [1] in USA, roughly 7% of annual US emergency department visits. It is considered as a frequent and potentially high-risk chief complaint. It remains in USA [2] a common cause of malpractice claims against emergency physicians regarding management challenges, adverse consequences of radiographic imaging and intravenous contrast, so the American College of Emergency Physicians (ACEP) updates its clinical policies on a regular basis. The burden from acute abdomen infers from the fact that this condition has no specificity, neither in its aetiology nor its outcome. Thus, appendicitis, the most common aetiology of abdominal pain and the most common abdominal surgical emergency (with over 250,000 appendectomies performed annually in the U.S. constantly) raises concerns before any feature of acute abdomen. Untreated appendicitis can lead to perforation of the appendix, to intra-abdominal infection, sepsis, formation of intra peritoneal abscesses, able to lead to death [2-4].

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Acute abdomen protocols may target general management [1-7] or be specific addressing clinical assessment [8-13] radiology, laboratory assessment [14-16] or treatment [17-20]. Some protocols are made for special groups of population [21,22] or to associated factors to pain [23,24]. These protocols shall mainly be based on available means which, actually and in most important parts of settings, consist on clinical examination and routine laboratory and imaging facility despite the advantage the new noninvasive investigations of which indications must be specified. While protocols or guidelines are being used worldwide [15,16,25], in our knowledge, there is no formal acute abdomen protocol or policy in the sub Saharan region at large and in Zambia and Lusaka in particular. Hence need of this pioneering work to be revised and adjusted to the circumstances (settings and time).

The aim of the study was to find out from a two-year data of five units of general surgery at the University Teaching Hospital of Lusaka, some guidelines for the management of SAA that may lead to the establishment in the future of Lusaka score to predict each of them, contributing to strengthening all emergency physicians working under similar circumstances. More specifically, the study intended to

- determine the frequency of AA among the population admitted as emergency cases in general surgical units,
- describe the aetiology of admitted AA,
- establish the impact of clinical examination and routine laboratory and basic imaging on the accuracy of diagnosing SAA,
- to indicate the place of modern noninvasive modern investigations
- initiate scoring (Lusaka score) each of the main admitted SAA

METHODS

It was a descriptive analytic study carried out in 2015 based on the three-year work of 5-general surgery units' data, at the Lusaka UTH, from 01 January 2012 to 31 January 2013. The population study included all admitted patients to each of these 5 units on clinical diagnosis of AA, directly from casualty or admitting rooms or indirectly from other UTH unit or firm. We excluded from this study the cases of patients operated upon for acute abdomen pain outside the UTH and referred to this institution or to its Intensive care Unit for management of complicated outcomes. Our sampling method to reach the sample size was done by convenience (as the case without randomization) of all cases during the period and for cases with substantial data. The study used patients' files, operating theaters' and in-wards records.

A case of acute abdomen was defined as follows

1. Severe onset abdomen pain
2. Developed over a period of hours, at most one or two weeks
3. Accompanied by bowel flow disturbance
4. With or without abdomen tenderness or rigidity
5. Without history of trauma during the period
6. Suggesting need of urgent therapeutic decision
7.

An important review of the literature was done to help in stating the problem and establishing the questionnaire which was anonymous and kept with confidentiality by the team. There was no conflict of interest. The data collections was carried out the team following the questionnaire and entered in Excel spreadsheet for analysis before being analyzed by SSP. The characteristics of

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patients enrolled were done on texts, tables and figures. For categorical variables association was detected by the Chi square test while the t-test was used for continuous variables.

Discussion of the results was done and proposed protocols were written and read by a member of the team during wide regional conference for more discussion and adjustment of the protocols

RESULTS

Characteristics of enrolled patients and frequency of AA of admitted patients

During the period of the study, a total of 655 patients whose files satisfactory were admitted directly or indirectly in the five general surgery units. Out of these admissions, 486 were considered as emergency cases. 286 of the 486 emergency patients were post trauma victims. Cases of Acute abdomen were 124 among remaining spontaneous emergencies. Other admissions were elective cases. As shown in the Table 1, the majority of admitted patients in general surgery units represented 486 cases of emergency cases out of 655: 74. 20%. Among these emergency cases (486) acute abdomen with 124 cases occupied the second position 25.51% after the post trauma victims: 58.85 and before other spontaneous emergency: 15.64%.

Table 1: Admissions during the study period

Categories	N	%
Post trauma emergency	286	43.67
Acute abdomen	124	18. 93
Other spontaneous emergency	76	11.60
Elective admissions	169	25.80
Total	655	100.00

Among the 124 patients with acute abdomen, there were 76 females and 48 males with sex ratio of F/M: 1.5. The mean age was 40 years old for female (extremes at 18 and 62 years) and 57 years old for males (extremes at 25 and 75 years).

These date matched those of many sub-Saharan general surgery settings where emergency admissions are more frequent than the elective with the predominance of trauma victims. We could not find from literature date comparing characteristics of patients admitted with acute abdomen either in their frequency or in their distribution among emergency cases, age and sex ratio.

Aetiololgy of admitted acute abdomen

As it is going to be shown in the section on impact of examination to the diagnosis of SAA, the majority of them were identified mainly by an orderly clinical examination with sometimes the additional basic imaging and laboratory. This examination was repeated for doubtful cases to avoid unnecessary laparotomy. It was also useful to recognize cases needing prior resuscitation. Finally, it must be emphasized the need of thinking about extra-abdominally causes of authentic clinical picture of AA and consultation to specialized physicians for possible appropriate investigations.
So all the admitted patients to surgical units are not operated upon arrival but submitted to meticulous clinical examination.

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The Table 2 shows overall aetiology of admitted AA. Almost 30% were acute appendicitis, followed by all perforated peritonitis (18.55), mechanical intestinal obstruction (15.32), primary peritonitis mainly gynecologic disease (4.84), acute pancreatitis (4.03) and spontaneous intra-peritoneal bleeding or hemoperitoneum (3.23). If it is added in these count rare cases of intestinal infarction and of Merkel diverticulitis, the impact of SAA on this series represented 86%. This justifies the fact that doubtful cases of AA should be observed in surgical settings.

Table 2: Aetiology of acute abdomen admitted in UTH surgical units

Aetiology	N	%	
Acute appendicitis	36	29.03	
Perforated peritonitis	23	18.55	
Mechanical intestinal obstruction	19	15.32	
Primary peritonitis (gynaecologic disease PID, pelvic peritonitis)	6	4.84	
Acute pancreatitis	5	4.03	
Spontaneous hemoperitoneum	4	3.23	
Acute cholecystitis	3	2.42	
PUD crisis	3	2.42	
Merckel's diverticulitis	1	0.81	
Miscellaneous identified intra-abdominal causes: Acute intestinal ischaemia (infarction), Sickle cell crisis, TB abdomen, Inflammatory bowel disease, HIV-associated lymphadenopathy	5	4.03	
Miscellaneous extra abdominal identified causes: Testicular torsion, urinary retention, myocardial infarction, Pericarditis, Pneumonia	5	4.03	
Unknown (resolving pain)	14	11. 29	
Total	124	100.00	

The representation in Figure 1 gives orientation and reinforces the need of knowledge of main groups of aetiology by each emergency physician

- Surely Surgical Sursur: (77%): Acute appendicitis; Perforated peritonitis; Mechanical intestinal obstruction; Intra-peritoneal bleeding (Hemoperitoneum); Pancreatitis; Bowel infarction; Merkel diverticulitis
- Doubtful Surgical: Dousur (3%): Acute cholecystitis; PUD (Peptic Ulcer Disease) crisis; Sickle cell crisis; Renal colic; Urinary retention; Testicular Torsion
- Surely Medical: Surmed (10%): Gastritis; Bowell inflammation; Pericarditis; Myocardial infarction; Pneumonia; Otitis; Porphyria
- Unknown (10%)

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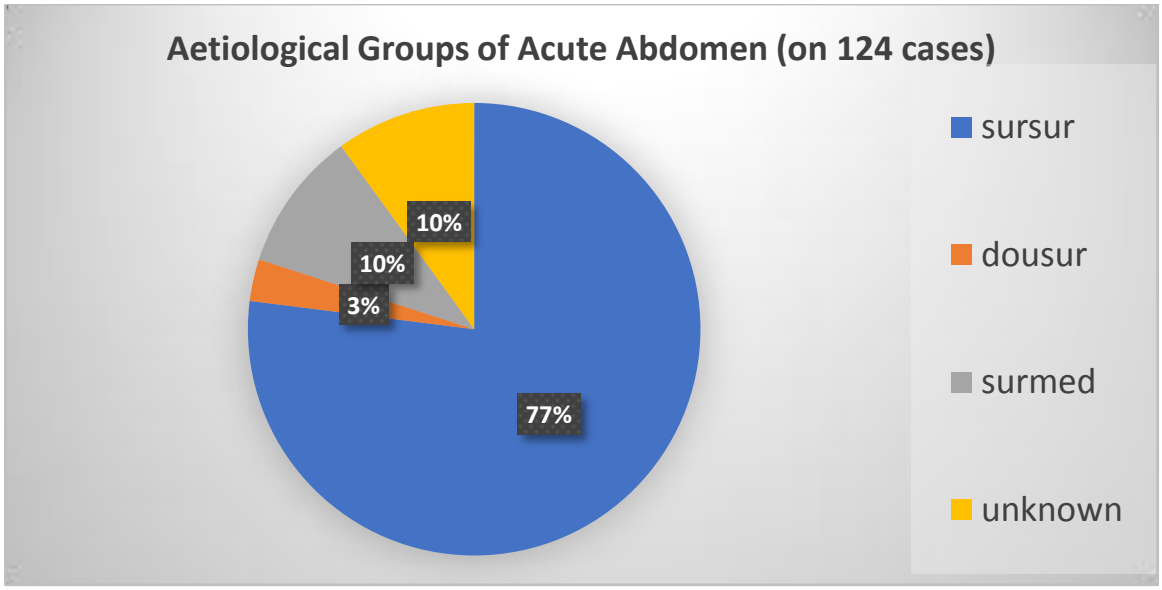

sursur: surely surgical; **dousur:** doubtful surgical**; surmed:** surely medical; unknown

Figure 1: Aetiological groups of admitted AA

When compared to literature data our results are almost similar but our group of unknown is less important: 10% in our cases in comparison of 20% as shown in the Table 3 from Taourel P [16] and Diercks DB [25]. It may depend on the number of cases and also on the fact of the settings of the study.

Table 3: Aetiological groups of acute abdomen from literature

28%	**Acute appendicitis**
15%	Peritonitis (stomach, duodenum, small and large bowel, appendix perforation)
12%	Bowel obstruction (strangulated hernia, sigmoid volvulus...)
4%	Gynaecologic disease (primary peritonitis, PID, pelvic-peritonitis)
4%	Acute cholecystitis
3%	Spontaneous hemoperitoneum (splenomegaly, ectopic pregnancy, aortic aneurysm)
3 %	Acute pancreatitis
3 %	Renal colic
2 %	PUD crisis
1 %	Acute diverticulitis, Acute intestinal ischaemia (infarction) or vasculitis, Gastrointestinal (GI) haemorrhage. Acute urinary retention, Testicular torsion, Myocardial infarction, Pericarditis, Pneumonia, Sickle cell crisis, Hepatitis, Inflammatory bowel disease, Opiate withdrawal, Typhoid, Acute intermittent porphyria, HIV-associated lymphadenopathy or enteritis., Placenta, Thromboembolism
1%	Merkel's diverticulitis,
25%	Unknown cause

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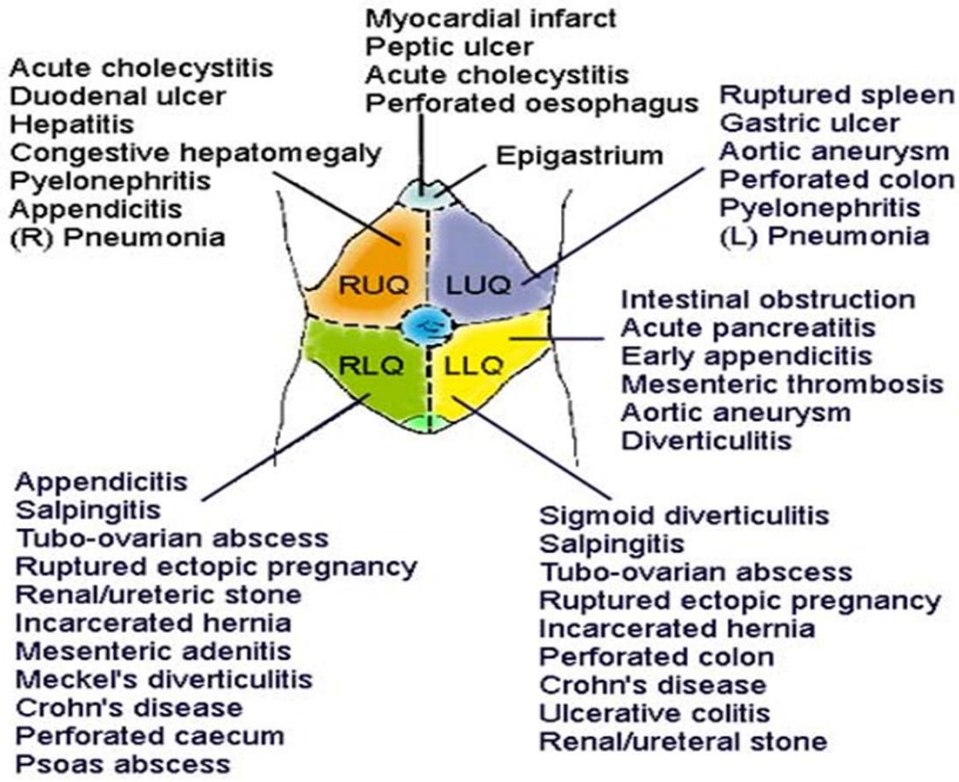

Figure 2: Causes of acute abdomen and the area of the abdomen most affected by pain

Establishment of the impact of clinical examination and routine laboratory, basic imaging on the accuracy of diagnosing SAA

Initial clinical, routine laboratory and imaging assessment protocol, for specific findings and orientation proposed at UTH emergency rooms. The objective is to seek for appropriate clinical criteria by direct and concise history and physical examination that added or not to routine laboratory and imaging are highly suggestive of surgical AA, for a timely referral to the appropriate surgeon or gynecologist for prompt intervention and pain alleviation [1]

Steps are as follows:

1. Initial impression
2. History
3. Examination
4. Basic laboratory
5. Basic imaging
6. Common surgical AA and basic specific findings

1. Initial impression/observation to perform a possible needed resuscitation

1.1 Is the patient in respiratory distress?

1.1.1 Then assess and treat Airway, Breathing and Circulation (ABC) as a priority: first survey, second survey (see critical care).

1.1.2 In this series 2 patients out of 124 needed air-way attention

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1.2 Does the patient look shocked? : Needs resuscitation with regard to the type of shock. Require specialist opinion. Arrange the next step on the type of shock: hypovolemic shock, hemorrhagic shock, septic shock, cardiogenic shock, traumatic shock, anaphylactic shock (See critical care)

1.2.1 In district hospital: consider transfer except if bleeding
1.2.2 In this series 6 patients out of 124 presented a status of shock at the time of admission

1.3 Otherwise look how the patient with abdomen pain is lying

1.3.1 Still?, Calm?, (think peritonitis) or
1.3.2 Rolling around? (think intestinal obstruction, biliary or renal colic):
1.3.3 Frankly restless, and asking for water or drink? (think hemoperitoneum) or
1.3.4 With chest and lower limbs flexed anteriorly on lateral decubitus (think pancreatitis)

1.4 In this series 8 patients out of 124 needed resuscitation before pursuing

2. HISTORY

Demographic, type of pain, associated symptoms or factors, past medical history (contribution of patients, relatives, accompanying persons)

2.1 Demographic details

2.1.1 Age, sex, address
2.1.2 Occupation
2.1.3 Recent travel
2.1.4 History of recent abdominal trauma. This allowed to consider neglected abdominal trauma

2.2 Type of pain

2.2.1 Onset (including whether new pain or previously experienced)
2.2.2 Sudden?, abrupt (think viscus perforation) or
2.2.3 Progressive (think intestinal or duct or vessel obstruction)

2.3 Site: (ask the patient to point out)

2.3.1 Localized (see cause of localized pain as appendicitis)or
2.3.2 Diffuse (like generalized peritonitis or distant obstruction)

2.4 Nature or mechanism of pain

2.4.1 Constant(think strangulation, ischemic), intermittent (think obstruction, spasmodic)
2.4.2 Colicky pain: distension, obstruction: alleviated by analgesic or antispasmodic
2.4.3 Ischaemic pain: strangulated bowel, mesenteric thrombosis: slightly alleviated even by narcotic, ischaemic bowel or viscus.
2.4.4 Extremely chard: nerve irritation: acute pancreatic pain
2.4.5 Nonspecific pain: mild or long standing condition: perforated ulcers, advanced disease.

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2.5 Radiation

- **2.5.1** Right shoulder: acute cholecystitis
- **2.5.2** Back : angiocholitis
- **2.5.3** Left upper limb: angina pectoris

2.6 Severity

- **2.6.1** Mild (appendicitis)
- **2.6.2** Moderate (cholecystitis)
- **2.6.3** Severe, abdominal drama (pancreatitis)

2.7 Relieving/aggravating factors

- **2.7.1** Worsened by movement/coughing, think active peritonitis;
- **2.7.2** Relieved by sitting forward: pancreatitis

2.8 Factors associated to pain

- **2.8.1** Vomiting and the nature of vomitus
  - **2.8.1.1** undigested food or bile think upper GI pathology or obstruction;
  - **2.8.1.2** Feculent vomiting thinks lower GI obstruction).
- **2.8.2** Fever/rigors in favour of sepsis, infection
- **2.8.3** Diarrhea: severity of the condition
- **2.8.4** Constipation with without ability to pass flatus: think intestinal obstruction
- **2.8.5** Haematemesis or melaena (GI Tumours, PUD)
- **2.8.6** Stool/Urine colour (surgical jaundice)
- **2.8.7** New lumps in the abdominal region/groins : hernia
- **2.8.8** Relation with meal
  - **2.8.8.1** Not at all
  - **2.8.8.2** Postprandial pain: gastritis, PUD, Pancreatitis, angina abdominis
  - **2.8.8.3** Last meal occurred when (for general anaesthesia)
- **2.8.9** Fainting, dizziness or palpitations
- **2.8.10** Rash or itching: obstructive jaundice
- **2.8.11** Urinary symptoms: renal colic
- **2.8.12** Recent weight loss: malignancy, systemic disease

2.9 Past medical history/medication

- **2.9.1** Previous abdominal surgery: think adhesions, bands
- **2.9.2** Alcohol abuse, PUD, Amoebic disease, depressed immunity
- **2.9.3** Gynaecological and obstetric history: Contraception (including intrauterine contraceptive device (IUCD) use). Last menstrual period. History of sexually transmitted infections/pelvic inflammatory disease. Previous gynaecological or tubal surgery. Previous ectopic pregnancy. Vaginal bleeding.
- **2.9.4** Drug history and allergies - including any complementary medication

3. Physical Examination: Orderly physical examination including inspection, auscultation, percussion, palpation and perineal digital examination focus mainly on

3.1 Pulse, temperature and blood pressure

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3.2 Respiratory rate and pattern: high: peritonitis (shallow, rapid breaths to reduce pain.), hemoperitoneum

3.3 If there is altered consciousness, check Glasgow Coma Scale (GCS) or AVPU (Alert, Voice response, Pain response, Unconscious)

3.4 Inspection: look for

3.4.1 Evident anaemia/jaundice,
3.4.2 Distended abdomen: Intestinal obstruction, Paralytic ileus
3.4.3 Visible peristalsis: intestinal obstruction)
3.4.4 Bruising around the umbilicus (Cullen's sign e.g. In haemorrhagic pancreatitis and ectopic pregnancy) or
3.4.5 The flanks (Grey Turner's sign e.g. In retroperitoneal haematoma)
3.4.6 Dehydrated (skin turgor/dry mucous membranes).

3.5 Auscultation of the abdomen of four quadrants

3.5.1 Absent bowel sounds: paralytic ileus, generalized peritonitis or
3.5.2 Intestinal obstruction. High-pitched and tinkling bowel sounds: sub-acute intestinal obstruction
3.5.3 Normal bowel sounds possible in Intestinal obstruction.
3.5.4 Abdominal bruits or murmurs: abdominis angina, aneurism.

3.6 Percussion

3. 6.1 Tympanum or hyper resonance (gas): intestinal obstruction or
3.6.2 Dullness with or without shifting dullness (ascitis, fluid)
3.6.3 Tenderness (like in generalized peritonitis)
3**.6.4** Fluid thrill
3.6.5 Size of an abdominal mass/extent of organomegaly

3.7 Palpation

3.7.1 Gently and superficially, away from the pain and then coming to it (to illicit tenderness)
3.7.2 Tenderness and test for rebounded tenderness
3.7.3 Involuntary guarding: think peritonitis
3.7.4 Masses, organomegaly: surface, consistency, shape: liver, spleen, gall bladder, urinary bladder or other
3.7.5 Palpate groins seek and study herniae
3.7.6 Palpate scrotum in men (referred from unrecognized testicular pathology)
3.7.7 Supra clavicular and groin lymph nodes

3.8 Further examinations

3.8.1 Digital rectal and vaginal examination (with an appropriate chaperone in attendance) suggestive of peritonitis and hemoperitoneum
3.8.2 Check lower limb pulses: abdominal aortic aneurysm complications
3.8.3 Examine urine and send a sample for culture if appropriate.
3.8.4 In a woman of childbearing age, assume pregnancy and perform a pregnancy test.

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3.8.5 Complete the examination according to the situation

3.9 Severity findings

3.9.1 Signs of shock: hypovolaemic shock, septic shock, cardiogenic shock
3.9.2 Confusion/impaired consciousness
3.9.3 Signs of dehydration. Rigid abdomen
3.9.4 Patient lying very still. Absent or altered bowel sounds
3.9.5 Marked involuntary guarding/rebound tenderness
3.9.6 Tenderness to percussion
3.9.7 History of haematemesis/melaena or evidence of latter on examination per rectum (PR)
3.9.8 Suspicion of a medical cause for abdominal pain

3.10 Special situations

3.10.1 Children see appropriate protocols**:** Pain aetiology varies with age; history and examination can be difficult.
3.10.2 Pregnancy: Always consider ectopic pregnancy in women of childbearing age. Causes of acute abdomen in late pregnancy are different and require expert combined obstetric, gynaecological and surgical evaluation. Please see appropriate protocols
3.10.3 Older patients:
3.10.3.1 Tend to show less specific symptoms and signs
3.10.3.2 T end to present later in the course of their illness
3.10.3.3 Morbidity and mortality in older patients presenting with acute abdominal pain are high. Aortic aneurysm and bowel ischaemia are more prevalent in the elderly. Angiodysplasia of the colon is more common and can cause GI haemorrhage
3.10.3.4 Medical causes of abdominal pain are encountered more frequently: 'Top 5 medical causes of an acute abdomen to consider in older patients are: myocardial infarction, lower-lobe pneumonia/ pulmonary embolism causing pleurisy, diabetic ketoacidosis or hyperosmolar non ketotic coma, pyelonephritis, inflammatory bowel disease.
3.10.3.5 Biliary tract disease, including cholecystitis, is the most common indication for surgery in older patients with abdominal pain.

4. Locally available and affordable emergency diagnostic laboratory assessment protocols at the UTH

4.1 Few useful in the community assessment of the patient with acute abdominal pain
4.2 Concerned patient should be referred to secondary care from the community after routine measures for ABCD in general
4.3 Tests commonly used but can be nonspecific and must be interpreted in the clinical context and with appropriate medical/surgical expertise
4.4 Must be complementary to clinical findings and suggested by these letters

4.4.1 Blood tests: FBC++, Hb, arterial blood gas clothing profile
4.4.2 U&Es, LFTs,
4.4.3 Amylase, lipase+++ (pancreatitis)
4.4.4 Cardiac enzymes +++ (to rule out myocardial infarction)
4.4.5 RBS, clotting, and occasionally calcium; arterial blood gas (pancreatitis).
4.4.6 Group and save' or cross match

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4.4.7 Blood cultures
4.4.8 Pregnancy test in women of childbearing age
4.4.9 Urinalysis. urine dipstick
4.4.10 To require laboratory standards for specimens and for results analysis)

5. Locally available and affordable amergency diagnostic imaging assessment protocols and significance

5.1 Not mandatory if diagnosis evident otherwise

5.2 Tests commonly used but can be nonspecific and must be interpreted in the clinical context and with appropriate medical/surgical expertise

5.3 Must be complementary to clinical findings and suggested by these letters

5.3.1 Chest X-rays: Anterior posterior views (for readiness to operating theatre in elderly patient)
5.3.2 Plain abdominal X-rays including the diaphragm: Erect or seated anterior posterior views (lateral decubitus if patient cannot stand or seat); supine anterior-posterior view
5.3.3 Consider ECG if cardiac condition suggested (and cardiac enzymes)
5.3.4 Peritoneal lavage if there is a history of abdominal trauma
5.3.5 Laparoscopy has become a routine procedure in the management of acute abdominal disease and can be a useful therapeutic and additional diagnostic tool in selected cases

6. Common surgical acute abdomen and basic specific findings from initial clinical, basic lab and imaging assessment protocols at the UTH

From the performed clinical examination, the basic laboratory and imaging performed, the main aetiological groups of Surgical abdominal were characterized by the following algorithms as well as their differential diagnosis going progressively from initial clinical impression to available routine available and affordable imaging procedure. Please read legends verify the various algorithms given at the step of the examination by the texts and tables and in summarizing table by aetiology before evaluating the impact of the powerful non-invasive but locally expensive and time consuming in 10% of cases.

LEGENDS

MIO: Mechanical Intestinal Obstruction; SPE: Secondary Peritonitis; HEM: Hemoperitoneum
APP: Acute Appendicitis, PAN: Acute pancreatitis; ABD: Abdomen; PUD: Peptic Ulcer Disease; T°: Temperature; BP: Blood pressure; RR: Respiration rate; H: high or increased; N: normal; VA: Variable; DRE: Digital rectal examination; DVE: Digital vaginal Examination. H: High; S: Suggestive; OTP: Operating theatre purposes; VA: Variable; RIF: Right iliac fossa; Lt: Left. P: Positive; A: Absent;

6.1 From first impression and history

6.1.1 Summary: The Table 4 guides the first steps in accordance with the first impression on the need of resuscitation in cases of respiratory distress and in shocked patients.

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Table 4: Summary first impression

Think	If patient with or patient is
Need of air way and breathing attention	Evidence of air way obstruction and threatening chest breathing (see below)
Need of resuscitation	Evidence of shocked patient (see below)
MIO	Severe pain, progressive pain, lying rolled round, mildly agitated
SPE	Moderate pain , of abrupt onset, lying laterally and curved, ill looking but calm adynamic
HEM	Severe pain, progressive pain, respiratory distress, lying spine but restless
APP	Moderate pain, progressive, supine position, calm
PANC	Severe pain, rolling around, respiratory distress, restless
ISCHAEMIA	Constant pain

6.1.2 In details

The Table 5 (see last pages) shows what to think about the major types of acute abdomen from findings of the first impression: history, type of pain, symptoms associated to pain and the position of the patient in the bed.

6.2 From Physical Examination

6.2.1 Summary

As shown in the Table 6 (see last pages) the signs from the physical examination are very helpful to recognise main surgical acute abdomen pain with regard to inspection and palpation

6.2.2. Clinical examination in details

On the Table 7 (see last pages) the impact of each component of clinical examination appears helpful to diagnosis of major types of surgical acute abdomen: vital signs, inspection, palpation, percussion, auscultation

6.3 From initial basic laboratory and imaging assessment

However, frequently there is need of some initial basic laboratory and imaging assessment to confirm the diagnosis and to prepare and plan the treatment.

These items are summarised in the Table 8 showing the impact of the full blood count, the pregnant test and the plain abdomen X-rays that are available, almost elsewhere.

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Table 8: Summary basic laboratory and imaging assessment

Think of	IF patient is or with
MIO	Fluid level, distended bowel
SPE	Leukocytosis, air under diaphragm, distended bowel, diffuse opacity
HEM	Low Hb or anaemia, diffuse opacity, distended bowel
APP	Leucosis, RIF air retention
PAN	High blood lipase, Lt hypochondrium air retention
PREGNANCY	Pregnancy test

6.3.1 In details

More developed basic laboratory and imaging in surgical acute abdomen are found on Table 9 (see last pages).

7. Lusaka UTH surgical acute abdomen scoring assays from initial clinical, routine laboratory and basic imaging assessment

- Works or research proposals to be carried out aiming to determine UTH scores for acute abdomen diagnosis by using initial clinical, routine laboratory and basic imaging assessments
- Each case of SAA is tested
    - Mechanical intestinal obstruction (MIO)
    - Secondary peritonitis to perforation of any hollow viscus (SP)
    - Spontaneous hemoperitoneum (HEM0)
    - Pancreatitis (PAN)
    - Appendicitis (APP)
- Marks above 15/20 are predictable of SAA
- Doubtful cases lead to repeated examination or supplementary or more powerful investigations

These scores which are subjects or topics for dissertation proposal are developed on Tables 10, 11, 12, 13 and 14.

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The Table 10 is dedicated to the mechanical intestinal obstruction

Table 10: Assay on Lusaka scoring for acute abdomen secondary to mechanical obstruction

I) UTH some acute mechanical intestinal obstruction score		
History Symptoms	SYMPTOMS 1. Previous abdominal surgery 2. Vomiting 3. Progressive pain 4. Colicky 5. Constipation	MARK 1 2 2 1 2
Clinical signs	SIGNS 1. Rolls out the bed 2. Distended abd 3. Visible peristaltism 4. High bowel sound 5. Tympanism 6. Diffuse tenderness 7. Softness 8. Normal DRE/DVE	MARK 1 1 1 1 2 1 2 1
Routine Labo	JUST FOR OTP	
Basic Imaging	SIGNS 1. Fluid level 2. Distended bowel	MARK 2 1
Total		20
Predictability		**15-20**
Specificity ?		?
Sensitivity ?		?

Legends: DRE: Digital rectum examination; DVE: Digital vaginal examination; OTP: Operating theatre programme

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The second score to find is described on Table 11 and is to deal with the scoring for the generalised Peritonitis secondary to perforation

Table 11: Assay on Lusaka scoring for acute perforated peritonitis

II) UTH some secondary acute peritonitis score		
History Symptoms	Symptoms 1. PUD 2. Fever 3. Brutal onset pain 4. Constant	Mark 1 2 2 1
Clinical signs	1. Calm, quiet 2. Diffuse tenderness 3. Dullness 4. Gardening of the abdomen 5. Tender DRE/DVE	2 1 2 2 2
Routine Labo	1. Leucocytosis	2
Basic Imaging	1. Air under diaphragm 2. Distended bowel	2 1
Total		20
Predictability		15-20
Specificity ?		?
Sensitivity ?		?

Legends: PUD: Peptic ulcer disease; DRE: Digital rectum examination; DVE: Digital vaginal examination

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The third score is for the prediction of hemoperitoneum and is planned on the Table 12

Table 12: Assay on Lusaka scoring for acute spontaneous hemoperitoneum

III) LUSAKA UTH some acute surgical abdomen score for hemoperitoneum		
History Symptoms	SIGNS 1. Vasc. Diseases 2. Irregular menstres 3. Progressive 4. Increasing pain 5. Thirst	MARK 1 1 1 1 2
Clinical signs	1. Restless 2. Asking for drink 3. Pallor 4. Tachycardic 5. Increasing breath rate 6. Decreasing BP 7. Diffuse tenderness 8. Cold extremities 9. Special skin sign if ectopic pregnancy (Cullen's sign) or retroperitoneal haematoma (Grey Turner sign: flank)	1 1 1 1 1 1 1 1 1
Routine Labo	1. Hb decreasing 2. Decreasing RC (anaemia)	1 1
Basic Imaging	1. Diffuse opacity 2. Distended bowel 3. Peritoneal lavage	1 1 1
Total		20
Predictability		15-20
Specificity ?		?
Sensitivity ?		?

Legends: Vasc: Vascular; Hb: Hemoglobin

The fourth score pertains to the acute appendicitis and is described on Table 13

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Table 13: Assay on Lusaka scoring for acute appendicitis

IV)LUSAKA UTH some acute surgical abdomen score for acute appendicitis		
History Symptoms	SIGNS 1. Worm 2. Migrating pain 3. Progressive 4. Vomiting 5. Moderate fever	MARK 2 2 1 2 2
Clinical signs	1. Calm 2. RIF localised pain tenderness 3. Rebound tenderness 4. Test	1 2 2 2
Routine Labo	1. Leucocytosis	2
Basic Imaging	1. RIF AIR Retention	2
Total		20
Predictability		15-20
Specificity ?		?
Sensitivity ?		?

Legends: RIL: Right iliac fossa

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The fifth score is aiming to diagnose accurately the acute pancreatitis and is prepared on Table 14.

Table 14: Assay on Lusaka scoring for acute pancreatitis

V)LUSAKA UTH some acute surgical abdomen score for acute pancreatitis		
History Symptoms	SYMPTOMS 1. Alcohol abuse 2. Gall stones 3. Heavy meal 4. Chronic abdominal pain 5. Abdomen drama	MARK 2 1 1 1 1
Clinical signs	1. Rolls round 2. Chest on anteflexion 3. Regional tendernes 4. Regional distention 5. Some skin signs: haemorrhagic pancreatitis (Cullen's sign: umbilicus)	2 2 1 1
Routine Labo	1. Leucocytosis 2. High blood lipase rate	2 4
Basic Imaging	1. Regional air Retention	1
Total		20
Predictability		15-20
Specificity ?		?
Sensitivity ?		?

8. More powerful tools for acute surgical abdomen

If the predictive score value is low or weak, according to the degree of emergency, the stability of the general status, the availability, the affordability of the
Investigations, one may choose among the following:

1. Perform a therapeutic test
2. Perform an exploratory laparotomy or laparoscopy
3. Prescribe of the following U/S, TDM, MRI, ANGIOGRAM

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9. Analysis of medical imaging in acute abdomen (from literature)

Imaging methods being used worldwide

a. Computed tomography (CT) abdomen and pelvis +++
    a. Techniques: With contrast, without contrast, without and with contrast
b. Ultrasound (US) abdomen +
c. Magnetic resonance imaging (MRI) abdomen and pelvis
    a. Techniques: Without and with contrast, without contrast
d. X-ray ++++ (with or without contrast)
    a. Techniques: Plain Abdomen +++; Upper gastrointestinal (GI) series with small bowel follow-through; Contrast enema
e. Nuclear medicine ++ (Isotope scan)
    a. Techniques: Gallium (Ga)-67 scan abdomen; Technetium (Tc)-99m white blood cell (WBC) scan abdomen and pelvis; Indium (In)-111 WBC scan abdomen and pelvis

Some applications of Abdominal CT SCAN (literature information)

1. Said to be excellent inter observer agreement for specific urgent diagnoses such as diverticulitis (kappa value of 0.90), appendicitis (kappa value of 0.84), and bowel obstruction (kappa value of 0.81).
2. Elevated (WBC) >11.5 correlated with a positive abdominal CT
3. Combination of WBC >11.5, male sex, and age <25 years correlated with a diagnosis of appendicitis.
4. The radiation stays the main disadvantage and the duration of acquiring it (patient must be stable of stabilized).
5. The cost effective aspect must also be taken in account in our setting.
6. The availability and affordability of the investigation, the location as well as the patient's condition (stable and unstable) as, so despite their rating of sensitivity, certain imaging methods are not used in acute abdomen.
7. As protocols should include all proprieties to be appropriate: core of every procedure, all aspects of the examinations such: positioning, nursing instructions, parameters(including radiation dose), acquisition time; kVp: Between 80-140, Higher kVp: in routine CT abdomen, premedication Allergy patients: Oral: 50 mg of prednisone 13 h., 7 h. and 1 h. prior to procedure and IV: 200mg hydrocortisone 6h and 2h prior to procedure and 50 mg p o of Benadryl 1h prior to procedure.

Some applications

1. Appendicitis

    1. Most common causes of acute abdominal pain.
    2. Most: 1000 cc oral contrast before about 1 hour before. Others give oral & rectal.
    3. Scanning after 70 second from IV injection, might need delayed scan.

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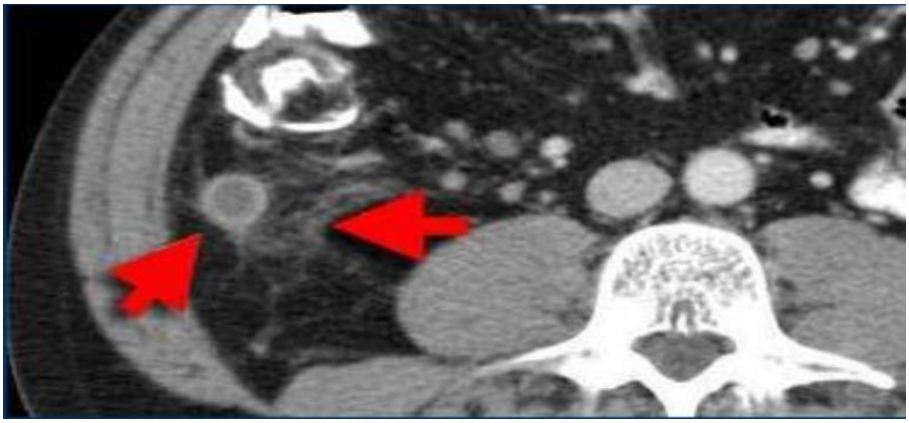

Figure 3: ABDOMEN CT SCANS: AC UTE appendicitis (literature)

Acute Pyelonephritis

1. Fever, chills, and flank tenderness. Referred for CT when symptoms are poorly localized or suspected complications.
2. Nephrographic phase (70–90 seconds after injection) or excretory phase (5 minutes after injection).

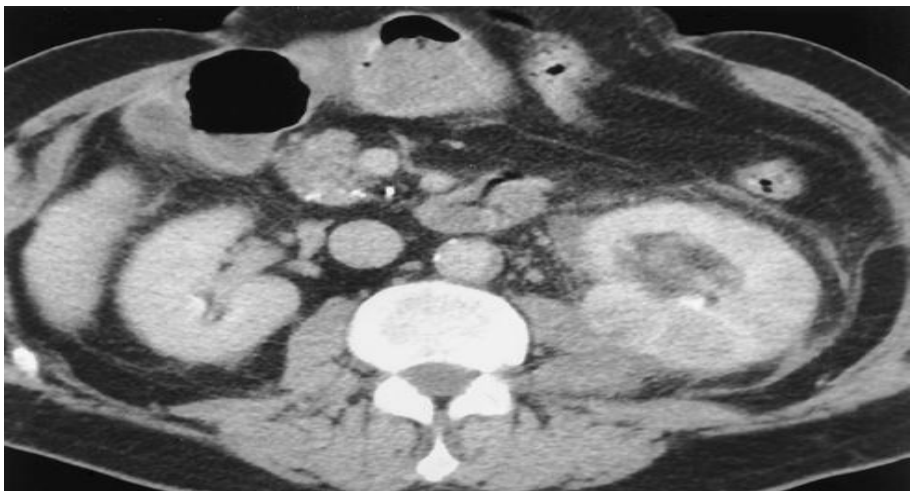

Figure 4: CT scan acute pyonephritis (literature)

Ureteral Stones

- Continuous breath-hold acquisition from kidneys to bladder base.
- Narrow (3-mm) collimation and small reconstruction intervals (also 3 mm) are essential for optimal detection of small calculi.
- Prone scans may be needed to differentiate ureterovesical junction stone from a recently passed stone.

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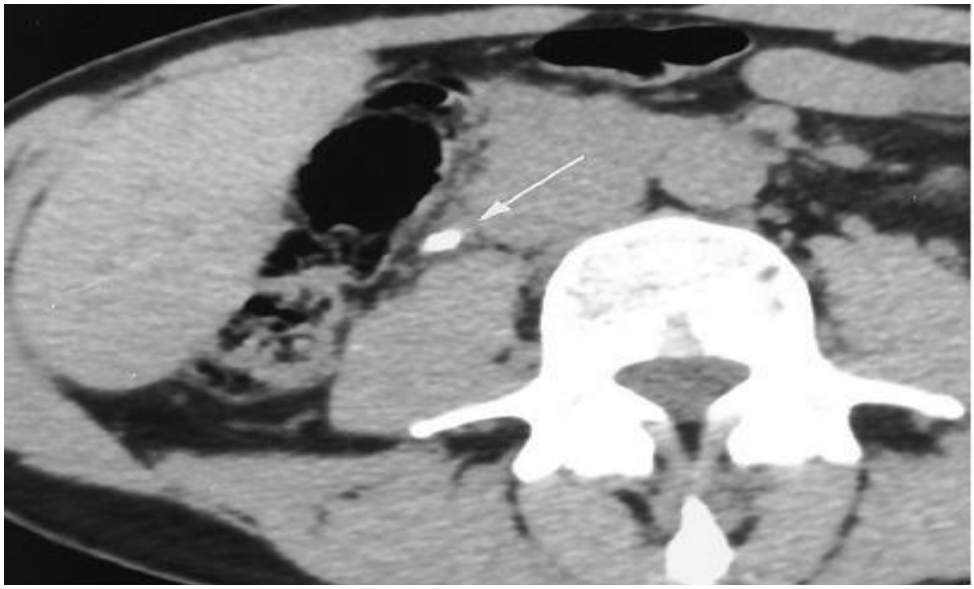

Figure 5: CT SCAN: Ureterovesical stone (Literature)

Acute Pancreatitis

1. Contrast: Patient should drink water as the oral contrast, opacification and distention of duodenum is very helpful.
2. IV contrast at 4-5mL/sec for 120 mL narrow collimation , thin reconstructions, apply radiation protection facilities in the machine.
3. Scan entire pancreas in single breath hold for all phases.
4. Non contrast – Liver dome to iliac crests.
5. Arterial phase – Initiate scan at 25 sec. Use "SMART PREP" Aorta (150HU) to monitor those with poor cardiac output. Top to bottom of liver. Ideally obtain excellent pancreatic parenchymal arterial opacification with minimal contrast in portal vein
6. Portal venous phase – 80 sec delay.
7. Scan the entire abdomen in this acquisition (top of the liver to sp).
8. Delayed 3 minute scan through liver and kidneys.
9. Coronal and sagittal reformat of portal venous phase

Some applications of Magnetic Resonance Imaging (literature information)

MRI offers imaging without ionizing radiation. Provide rapid diagnosis of acute bowel pathology, gynecological emergencies: ovarian hemorrhage, ectopic pregnancy, tumor rupture, torsion, hemorrhage, infarction, and PID.

Some applications of Nuclear Medicine (literature information)

It allows the evaluation of acute non localized abdominal pain using Technetium-99m–labeled Hexamethylpropyleneamine Oxime (Tc-99m HMPAO) white-cell-labeled scanning has a high sensitivity for IBD (91%-98%): role in diagnosing appendicitis in older patients.

It is said that it does not do as well as CT in depicting the complications of abscess and fistula but may be interesting in some circumstances: patient with fever, with diffuse or localized abdominal

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pain, or with a history of a condition that may predispose to abdominal abscesses, such as recent surgery and pancreatitis

Imaging studies that have been used to detect abdominal abscesses include

1. Radiographs (supine and upright, and occasionally decubitus, views)
2. Nuclear medicine studies such as gallium-, indium-, or technetium-tagged leukocyte or fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET) studies
3. US
4. CT of the abdomen is considered to be the first and best test for diagnosing intra-abdominal abscess in patients who have recently had abdominal surgery, and in patients with localizing signs for abscess
5. More recently MRI was cited but, to the guideline panel's knowledge, there is little current information on radiography's role in detecting abdominal abscesses.
6. Intravenous pyelogram (IVP)

CONCLUSION

These proposed protocols which should serve as guidelines to assist each physician at similar emergency rooms or casualty. They shall be adjusted with the time and the venue as the conditions of staff and equipment get improving. In these emergency settings, emergency physicians ought, as underlined by many authors the minimum of the following permanents concerns and medico-legal aspects.

The following should be the permanent concerns at the emergency department care of suspected acute surgical abdomen. We shall try to get them before the emergency

1. The patient suspect of surgical abdomen shall be kept nil orally (nil by mouth), to alleviate pain by distension and avoid aspiration.
2. A source of O2 should be available in case of Respiratory distress may occur.
3. Generally three tubes or drains must be nearby:
    - IVL set to procure bloodsample for ABO group and other blood investigations and to give fluids for resuscitation are these patients are potentially hypovolaemic.
    - Nasogastric (NG) tube to fight against severe vomiting and against aspiration.
    - Urinary catheter to be inserted with asepsis for monitoring the urine output that witnesses kidneys' work and strength to undergo surgical operation.
4. The use of analgesia remain controversial, but to be if severe pain, choosing what does note hide symptoms and operating time.
5. The use of "Antiemetic" also should be avoided as purely symptomatic treatment in a community setting.
6. Antibiotics shall be used in acute surgical abdomen patients as they are potentially septic. IV cephalosporin plus metronidazole are commonly used.
7. The provision of basic laboratory and routine imaging assessment must be real for these patients.
8. Same provision of urgent surgical/gynecological review or procedures must be appropriate.

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9. Each emergency physician shall know the main common cause of the acute surgical abdomen of the settings.
10. He or she shall have for each condition spread knowledge on aetiology, mechanism (pathogenesis), pathology (macro and microscopy), consequences (pathophysiology), clinical presentations, and means for diagnosis, treatment and prognosis.

The Medico-legal aspects and tips on acute abdomen examination are universal and mandatory to save the patient as well as the health personnel career

1. Careful documentation of the clinical situation and decision-making process is essential.
2. Appreciate the severity of illness through by assessing vital signs/taking heed of general condition.
3. Take note of history from carriers/parents in a patient who now seems relatively well, particularly in children.
4. Failure to examine adequately or to document findings.
5. Examine for an enlarged bladder, for hernia or to check the scrotum.
6. Carry out rectal or vaginal examination when it is indicated.
7. Explain the reason for an intimate examination, leading to an accusation of impropriety.
8. Avoid treating children as little adults and not considering paediatric-specific diagnoses.
9. Make concrete follow-up arrangements or advising a patient of when they should seek further assessment, when managing patients in the community.
10. Delayed transfer of acutely unwell patients to hospital. Use the appropriate phone line service where necessary.
11. Steroids or other forms of immune-compromise may mask symptoms and signs.
12. When pain outstrips signs, consider gut infarction or abdominal aortic aneurysm.
13. Don't rely on a normal test result to discount pathology if the clinical condition suggests otherwise.
14. Do not miss out pregnancy and conduct a pregnancy test.
15. Be ready to reassess the initial diagnosis, or a colleague's diagnosis, where the clinical situation has changed.
16. When operating theatre done, a good count of items to be performed before abdomen closure.

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Table 5: Details first impression

Think of if	MIC	SPE	HEM	APP	PAN	ISCHAEMIA
HISTORY OF PAIN	Previous ABD surgery PUD vomiting	Amoebic disease PUD Fever	Splenic disease Aortic Aneurysm irregular menstruation	Parasitosis fever vomiting	Alcohol abuse Gall Stones PUD	Atherosclerosis Angina abdominis
TYPE OF PAIN	Progressive; Diffuse All nature or mechanisms: constant or intermittent Colicky pain or ischemic	Abrupt, sudden diffuse, constant worsening with movement	Progressive diffuse increasing with time	Progressive migrating localised moderate	Sudden localised severe, abdomen drama extremely restless in the bed	Progressive diffuse constant
ASSOCIATATED TO PAIN	Vomiting Constipation	fever, rigors ileus	Thirst, increased breath rate	Moderate fever	Alleviated by chest anterior flexion General manifestations or seating with anteriorly flexion of the chest	Paralytic ileus General manifestations
(APART FROM STATUS OF SHOCK OR RESPIRATORY DISTRESS) THE PATIENT	Not calm on the bed Rolls around the bed most the time	Patient adynamic Calm seeking help	Patient restless seeking for drink	Calm	Extremely restless in the bed or seating with anteriorly flexion of the chest	Not calm on the bed Rolls around the bed most the time

Table 6: Summary physical examination (inspection /palpation of abdomen)

Think of if	If patient with or patient is
MIO	Distended abdomen, increasing bowel sounds, diffuse abdomen tenderness, Radial pulse>100
SPE	Distended abdomen, dullness, Garding ABD, Tender diffuse ABD, tender DRE and DVE, Fever
HEM	Distended ABD, dullness ABD, diffuse tender ABD, tender DRE and DVE
APP	Dullness ABD, Localized tender ABD, Radial pulse>100, Fever
PANC	Distended ABD, dullness ABD
ISCHAEMIA	Constant Pain, Paralytic Ileus

Legends
ABD: Abdomen; APP: Acute appendicitis; HEM: Hemoperitoneum; SPE: Secondary peritonitis; PAN: Acute pancreatitis; DRE: Digital rectum examination; DVE: Digital vagina examination

Table 7: Details physical examination (vital signs+ physical examination)

Think of If	**MIO**	**SPE**	**HEM**	**APP**	**PAN**	**ISCHAEMIC**
1. **T°** 2. **Pulse,** 3. **BP** 4. **RR**	N VA VA VA	H H VA H	N H N/L H	H H N N	VA VA V H	VA H VA H
INSPECTION for 1. Pallor 2. Jaundice 3. Skin, mucous dehydration 4. Distended ABD 5. Visible peristalsis 6. Bruising on the skin	A A VA P P A	VA A VA VA A A	P A VA P A P if ectopic pregnancy (Cullen's sign) or retroperitoneal hematoma (Grey Turner sign: flank)	VA A A A A A	VA VA VA P VA P if haemorrhagic pancreatitis (Cullen's sign: umbilicus)	A A VA P A A
AUSCULTATION Bowel sound	H or N or L	A	N or L	N	N or H	A

Vascular sounds	A	A	Abnormal or murmur	A	A	P OR A
PERCUSSION						
Tympanum	P	VA	VA	VA	VA	P
Dullness with or without	VA	VA	P	A	VA	VA
shifting	P	P	P	P	P	P
Tenderness	VA	VA	VA	A	VA	VA
Fluid thrill	VA	VA	VA	A	VA	VA
Size of abd mass						
PALPATION						
1. Superficial	Diffuse tenderness/ softness	Diffuse tenderness Local gardening	Tenderness	Local tenderness	Local tenderness	VA
2. Deep	VA	VA	VA	Rebound tenderness	VA	VA
3. Masses	VA		VA	VA	VA	VA
4. Rectal	N	VA Tender	Tender	N	VA	N N
5. Vaginal	N	Tender	Tender	N	VA	
OTHER						
1 Pregnancy test	VA	VA	P if ectopic pregnancy	VA	VA	VA

Legends: A: absent; APP: Acute appendicitis; HEM: Hemoperitoneum; MIO: Mechanical intestinal obstruction; N: Normal; PAN: Pancreatiti; P: positive; VA: Variable

Table 9: Details in basic laboratory and imaging assessment

Think of if	MIO	SPE	HEM	APP	PAN	ISCHAEMIA
LABORATORY						
1. WBC	VA	HS	N	HS	H	H
2. HB/Ht	VA	VA	LS	VA	VA	VA
3. LFTS	N	N	N	N	VA	VA
4. CPK	N	N	N	N	N	H OR VA
5. LIPASE	N	N	N	N	HS	N
6. RBS	VA	VA	N	N	VA	VA
7. BLOOD CLOTHING	VA	VA	VA	VA	VA	VA
8. PREGNANCT TEST	VA	VA	PS	VA	VA	VA
9. BLOOD CULT	N	PS	N	VA	VA	VA
10. GROUP AND SAVE	OTP	OTP	OTP	OTP	OTP	OTP
11. CROSSMATCH	OTP	OTP	OTP	OTP	OTP	OTP

BASIC IMAGING						
1. FLUID LEVEL	PS	A	A	A	A	A/P
2. AIR UNDER DIAPH	A	PS	A	A	A	A
3. AIR RETENTION	P	P	VA	P	PS	P
4. DISTENDED BOWEL	P	P	VA	VA	VA	P
5. DIFFUSE OPACITY	A	P	PS	A	VA	P

Legends: A: absent; APP: Acute appendicitis; HEM: Hemoperitoneum; MIO: Mechanical intestinal obstruction; N: Normal; PAN: Pancreatitis; P: positive; VA: Variable; OTP: operating theatre purpose; PS: positive significantly; HS: High significantly