UNIT NO. 6

A RISK MANAGEMENT APPROACH TO ABDOMINAL PAIN IN PRIMARY CARE

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ABSTRACT

Abdominal pain is a common presentation to the family physician clinic and emergency departments and although common, it is often a symptom of serious disease, with many diagnostic challenges that the physician has to overcome. The missed surgical abdomen often results in high morbidity and mortality to the patient, and high medico-legal risk to physicians. In certain patient groups, such as the elderly, the women of childbearing age and the immunocompromised, presentation of abdominal pain can be atypical, and hence additional caution and consideration should be taken. In order to mitigate risk in the challenging primary healthcare environment that the primary physician faces where investigative resources can be limited, a careful diagnostic approach with regards to history taking and physical examination is used, coupled with good documentation of findings and patient discussion.

Keywords:
Abdominal Pain, Acute Abdomen, Appendicitis, Peritonitis

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INTRODUCTION

The patient with abdominal pain presents with many risk-management issues for the family physician as well as emergency physician. The causes for abdominal pain are legion, where the spectrum of illnesses can range from the benign and self-limiting, to the catastrophic, with pathologies that can be both intra-abdominal and extra-abdominal.

The patient with abdominal pain is a particularly challenging case to manage in the primary care setting, as sometimes in order to mitigate risks to the patient and physician, the doctor has to exclude certain clinically important diagnoses, hence the need for laboratory tests and imaging studies. However in the primary care setting, where the average physician does not always have the benefits of on-site access to laboratory tests with quick turnover of results, or imaging studies (oftentimes requiring the patient to travel elsewhere to an imaging centre and return with the images), the primary physician will have to manage the patients based entirely on their clinical history and physical examination, combined with clinical gestalt. It is therefore important to develop an organised approach to patients presenting with abdominal pain.

It is recognised that the exact aetiology of the abdominal pain will not be determined in the initial visit in many cases. It is just as important to recognise the patients that require a referral to a surgeon and/or admission, as it is to determine an exact diagnosis.

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DIFFERENTIAL DIAGNOSIS AND CONSIDERATIONS

Causes of abdominal pain can be due to pathologies from various systems. Although the gastrointestinal (GI) and genitourinary (GU) systems are the leading causes of abdominal pain, it is important to remember extra-abdominal and systemic causes as well (see Table 1).

Of particular importance are 3 patient populations where the spectrum of pathologies can be significantly different from the majority of patients, which can result in misdiagnosis and poorer outcomes, and therefore extra attention and caution is warranted in the clinical evaluation of these patients: the women of childbearing age, the elderly, and the immunocompromised.

The Women of Childbearing Age

Women of childbearing age who present with abdominal pain pose a diagnostic challenge to the primary care physician, as one has to consider pregnancy-related disorders and other gynaecologic diagnoses. The most important first step is to diagnose pregnancy — as it is important to exclude the possibility of ectopic pregnancy in these patients. The common pitfall here when seeking to exclude pregnancy is to rely on the patients' menstrual history, or the patients' claim of contraceptive usage or personal claims that they do not think they are pregnant.

Once pregnancy is excluded, the other differential diagnoses such as urinary tract infections (upper and lower), GI conditions or pelvic (pelvic inflammatory disease, ovarian disorders) conditions have to be considered. It is not uncommon for women of childbearing age to have a misdiagnosis before being finally diagnosed with appendicitis[2] — up to one-third of women in this group with appendicitis are initially misdiagnosed with gastroenteritis or PID. The menstrual history and the presence (or absence) of GI symptoms also cannot reliably distinguish between appendicitis and pelvic disease. Blood tests will also not help clarify matters further as well. It is also worth remembering that in pregnancy, the baseline haematological parameters change as well, with an elevation of the total white cell counts, with neutrophil predominance. Also, with regards to advanced pregnancy, the presence of a large gravid uterus that displaces the abdominal contents upwards can result in atypical presentations with regards to location of pain — for example, due to displacement of the appendix out of the right lower quadrant, patients with acute appendicitis can present with right upper quadrant, flank or central abdominal pain.

Table 1. Extra-abdominal causes of abdominal pain [1]

Cardiac	Acute coronary syndrome Myocarditis Congestive cardiac failure
Respiratory	Pneumonia Pneumonitis Pulmonary embolism Pneumothorax
Metabolic / Systemic	Ketoacidosis (diabetic and alcoholic) Uraemia Thyrotoxicosis Hypercalcemia Acute adrenal insufficiency Acute porphyria Sickle cell anaemia Acute leukaemia Vasculitis Henoch-Schönlein purpura
Infectious	Herpes Zoster Streptococcal pharyngitis (children) Rocky Mountain Spotted Fever Infectious mononucleosis
Genitourinary	Testicular Torsion Renal colic
Toxins	Heavy metal poisoning Methanol poisoning Black widow spider bite Scorpion sting Acute drug withdrawal states
Miscellaneous	Abdominal wall haematoma Abdominal muscle spasm Somatisation states Neuralgia Hypersensitivity reactions

If a patient is diagnosed with pregnancy and presents with abdominal pain, it is important for the patient to be referred for a pelvic/trans-vaginal ultrasound in order to confirm the presence of an intrauterine pregnancy, and exclude an ectopic pregnancy, before proceeding with the general work-up for abdominal pain.

The Elderly

Abdominal pain in the elderly is associated with significant morbidity and mortality. The reason for this is because the diagnosis of a surgical abdomen is frequently complicated by the lack of the classic historical and physical findings we are taught to look for, such as fever, guarding, rigidity and pain severity.

Other factors have to be considered as well in this vulnerable patient group. Poorer patient recall can complicate history taking, or under-reporting of symptoms due to impaired cognition. Poorer nociception and reduced abdominal wall musculature might result in falsely reassuring abdominal examinations, and reduced humoral immunity is believed to render this population of patients more vulnerable to cancers, autoimmune disease and infectious diseases. Certainly, the disease spectrum in abdominal pain in patients above 50 years old differs significantly from the younger age group (see Table 2), with a larger proportion of disease attributed to infectious causes of biliary origin, malignancies, as well as vascular causes.

Also, due to their age and reduced physiological reserves, surgical problems in the elderly are more rapidly life-threatening than in younger patients.[4] Older patients are also at risk of vascular catastrophes (such as aortic dissection, mesenteric ischaemic, aortic aneurysm rupture, acute myocardial infarctions), compared to younger patients, where such conditions are much rarer.

As the elderly get older, the diagnostic accuracy of the physician in their evaluation drops, while mortality from abdominal emergencies rises (due to the changes in the type of pathologies these patients are faced with). Mortality in this high-risk group of patients that present with acute abdominal pain can be as high as 10 percent.

Table 2. Disease spectrum of abdominal pain by age [1, 3]

Cause	Patient age < 50 (N=6,317)	Patient age >50 (N=2,406)
Cholecystitis	6%	21%
Non-specific abdominal pain	40%	16%
Acute appendicitis	32%	15%
Bowel obstruction	2%	12%
Pancreatitis	2%	7%
Diverticular disease	<0.1%	6%
Cancers	<0.1%	4%
Hernia	<0.1%	3%
Vascular	<0.1%	2%

Due to age-related immunological changes (or immunosenescence), common physiological responses and laboratory findings in sepsis — such as hyperthermia, elevated total white cell counts and elevation of inflammatory markers — might be blunted. Consumption of certain medications that can alter the heart rate due to common comorbidities encountered in the elderly patient — such as beta-blockers, digoxin, calcium channel blockers, etc., can blunt the tachycardic response in hypovolaemic or distributive shock states.

The Immunocompromised

Patients with immunocompromised states, such as patients with HIV, or patients on chemotherapy or organ transplant patients on long-term immunosuppression, are to be approached with some additional considerations as well in the evaluation of abdominal pain.

They might have unusual infectious causes such as bacterial enterocolitis, tuberculosis of the GI tract, cytomegalovirus colitis/gastritis/oesophagitis, cholangitis, or typhilitis. They are also at increased risk of common conditions such as appendicitis and cholecystitis. Other conditions such as drug-induced pancreatitis need to be considered as well, due to its high mortality.

In immunocompromised patients or elderly patients where atypical presentation of pain or the masking of infective signs and symptoms results in delay of the diagnosis in appendicitis, perforation rates are increased.

Once again, it is important to remember that the typical immune responses we expect in normal patients are suppressed in this patient group, which can confound the history and physical findings in these patients as well. A low threshold for referral to the hospital and subsequent admission for evaluation should be adopted.

EVALUATION

A systematic approach towards the taking of the patient's history and physical examination is crucial in determining the aetiology of the abdominal pain. Also as important is the documentation of the information gathered, as litigation arising from physicians missing or misdiagnosing high-risk diagnoses such as appendicitis and ectopic pregnancy is often due to deficiencies in the history taking and data gathering, as opposed to misinterpretation of data.[5]

It is the combination of all the data — history, physical examination, laboratory investigations and imaging studies (if indicated) — that allows the physician to arrive at a diagnosis with maximal accuracy or, in cases where the diagnosis is not as clearly defined, allows the physician to arrive at a pre-test probability for an acute abdomen, thus allowing him/her to risk stratifying these patients and subsequently determining which patients will benefit from further referrals to hospitals and surgeons for evaluation.

History

Elicit a detailed description of the pain — its location, relieving and provoking factors, quality, radiation, severity, and any temporal factors (progression, duration, previous episodes etc.). Besides pain, the history should also include the patient's medical, surgical and social history, which may provide important additional information. The physician should also inquire about associated symptoms of nausea, vomiting, bowel symptoms or anorexia.

Some points in the clinical history can be considered to be of greater yield. Older patients are a vulnerable patient group to more significant disease with poorer outcomes in terms of morbidity and mortality, and should prompt a thorough evaluation, and if required, close observation and emergency department referral. Patients with a previous history of abdominal surgery can present with obstructive symptoms secondary to adhesions. Constant unremitting pain will be more concerning than intermittent pain. Vascular causes of abdominal pain — such as leaking abdominal aneurysms, or dissections, should be considered as a differential in older patients with a history of vascular or cardiac disease. Patients with a history of thromboembolic disease or atrial fibrillation are at risk of mesenteric ischaemia. A background history of cancer, diverticular disease, gallstone disease or chronic alcohol consumption or inflammatory bowel disease should also prompt a thorough evaluation where a greater index of suspicion for more serious abdominal conditions is adopted.

Symptoms most predictive of appendicitis are right lower quadrant pain (RLQ), and migration of pain from the periumbilical region to RLQ. Anorexia, which has been classically taught to be useful in diagnosing appendicitis has been found to have little predictive value.[6, 7] A gynaecological and sexual history should be obtained when evaluating women, with point-of-care pregnancy testing for those of childbearing age.

Other features in the history that should heighten the clinical suspicion for a more ominous pathology will be any evidence of gastrointestinal bleeding (coffee ground vomitus, melena), hypovolaemia (postural symptoms, syncope, giddiness), fever, a worsening progression of pain, and pain out of proportion to the abdominal examination findings.

Physical Examination

The physical examination first begins with an assessment of the patient's general appearance and vital signs. The physician should take note of the patient's position and movements, facial expressions and respiratory patterns. On the other hand, the physician should also avoid being lulled into a sense of safety with the well-appearing elderly patient because, sometimes, serious disease might not manifest as obviously in this patient group.

Abnormal vital signs also provide the first clues to suggest serious illness, however, normal vital signs do not exclude a serious diagnosis. In patients with sepsis or blood/fluid losses, a postural drop in blood pressure might be an early finding. Elderly patients on beta-blockers might not exhibit a significant tachycardia. Hyperthermia can be absent in more than 30 percent of patients with appendicitis as well as gallbladder infections. Also, bear in mind that in the elderly the febrile response can be blunted, and studies have suggested that the definition of fever in the elderly is a body temperature of ≥ 37.5°C. In patients with extra-abdominal causes of abdominal pain, such as chest infections or diabetic ketoacidosis, it is the respiratory rate and patterns of breathing that will provide the first clue.

Analgesia can be administered to the patient prior to performing the abdominal examination. It has been demonstrated in studies that the administration of opioid analgesics does not obscure the diagnosis or interfere with the treatment and assessment of the patient, and a few randomised controlled studies have demonstrated that the use of analgesics in the acute abdomen does not result in adverse outcomes.[8]

Abdominal Examination

Inspect for surgical scars, rashes, and for abdominal manifestations for haemorrhage (Cullen's sign, Grey Turner sign). Look for distension, and abnormal abdominal wall movements such as visible peristalsis or pulsations. It is important to inspect and examine the hernia orifices as well as the genitalia, so as not to miss incarcerated herniae or genitourinary causes of abdominal pain, such as testicular torsion.

Palpation should begin with light palpation to localise the region of tenderness and to elicit guarding. Deep palpation follows for the detection of organomegaly and masses. However, this can be deeply distressing to the patient with severe peritonism, with limited diagnostic value. Adequate analgesia should be given prior to examination, and palpation should progress from the non-tender region to the region of concern. Well-localised tenderness can generally guide the formulation of a diagnosis, but generalised tenderness can prove to be a diagnostic challenge. Peritoneal irritation is elicited by looking for rebound tenderness, by performing gentle depression over the area of concern and suddenly releasing the hand after 15-30 seconds. The pain of rebound tenderness is worse on release. As this can be quite a painful test to elicit, some advocate gentle percussion over the area of concern instead. Carnett's sign is increased tenderness to palpation when the abdominal wall muscles are contracted as the patient lifts his/her legs off the bed as you palpate the abdomen – it is indicative of abdominal wall tenderness, as opposed to abdominal tenderness secondary to peritoneal irritation. It is not routinely done, but can be supportive of a diagnosis of abdominal wall pathology if the history is suggestive and examination and investigations have excluded significant intra-abdominal pathology.

Guarding and rigidity is an increase in the abdominal wall muscular tone, which can be seen in regions of the abdomen where there is underlying peritoneal irritation. However, this can be confounded by voluntary guarding, which is induced by the patient as he or she tenses up in apprehension, fearing a painful examination, or by anxiety or even the physician's cold hands in an air-conditioned environment. Reassurance and gentle palpation can overcome this. Also, in the elderly age group, guarding will not be as pronounced, or is even absent in those with reduced abdominal wall musculature.

Murphy's sign is positive when the examining physician elicits inspiratory arrest while deeply palpating the right upper quadrant. It is present in about 65 percent of adults with acute cholecystitis, and is less reliable in older patients. The psoas sign for acute appendicitis was shown to be specific (95%) but not sensitive (16%),[6] and the other eponymous signs of acute appendicitis such as the Rovsing sign (pain in the RLQ elicited by deep palpation of the LLQ) and the obturator sign (pain with internal rotation of the flexed right hip) have not been rigorously studied.

The rectal examination, while recommended in the evaluation of abdominal pain, has not been shown in the medical literature to contribute significantly towards establishing a diagnosis in the evaluation of a patient with an acute abdomen. However, it is still required in order to diagnose conditions such as rectal masses, foreign bodies in the rectum, prostatitis, impacted stools, and gastrointestinal bleeding.

The pelvic examination is also important in the assessment of abdominal pain in women of childbearing age. Pelvic

inflammatory disease (PID) and appendicitis can be virtually indistinguishable via the anterior abdominal examination, and it will be the pelvic examination that can reveal the true aetiology. While both conditions can result in painful cervical motion and adnexal tenderness, it is the presence of mucopurulent discharge from the cervix that will allow the physician to diagnose PID.

Diagnostic Tests

In the primary healthcare setting, not every family physician will have readily available on-site access to a laboratory where the results can be processed and returned to the clinic within the hour. Similarly, not all primary health centres will have on-site radiology facilities, and in order for diagnostic imaging to be done, the patient has to be referred to a radiology unit elsewhere, and return to his or her physician with the images and radiology report in hand. This results in a significant delay to the time it takes for the physician to process the data needed for him or her to come to a working diagnosis and management decision for the patient. However, it must be emphasised that there are significant limitations to blood tests and imaging studies in the evaluation of acute abdominal pain, and that all diagnostic tests, especially laboratory tests, have a false negative rate. Therefore, if the family physician, after taking a history and performing a physical examination, has arrived at a high pre-test probability of a significant pathology, it would be more prudent to refer the patient to an Accident and Emergency Department or a centre where they can be admitted and further evaluated by the relevant concerning specialty.

However, if the pain is assessed to be that of low-risk, symptomatic treatment, close outpatient follow-up and investigations might help the managing physician risk-stratify the patient, as well as ensure that there is symptom resolution.

The urine pregnancy test should always be done in the evaluation of women of childbearing age. A urinalysis or dip-stick examination should be performed in patients with haematuria, lower urinary tract symptoms, flank pain or suprapubic pain. The 12-lead electrocardiogram should be performed in patients with cardiovascular risk factors presenting with epigastric pain or if there is any suspicion of an atypical presentation of acute coronary syndrome. In clinics and centres where there is availability of a bedside ultrasound machine and expertise in its use, one can consider the use of bedside ultrasonography to answer certain focused questions: "Is there an abdominal aortic aneurysm?"; "Are there gallstones or gallbladder wall thickening?"; "Is there free fluid in the abdomen?"; "Is there hydronephrosis?"

Plain abdominal radiographs are of limited utility in the evaluation of acute abdominal pain.[9] However, they are more readily obtainable, and less expensive than an ultrasound study or a computed tomography study, and in certain circumstances can prove useful still.[10] An erect chest radiograph to look for free air under the diaphragm is important, although a study suggests that in up to 40 percent of patients with a perforated viscus, this test can be negative.[11] Routinely performing an abdominal film for a patient with abdominal pain yields little information, unless one is specifically looking for air-fluid levels indicative of intestinal obstruction in a patient exhibiting obstructive symptoms. Abnormal calcifications associated with gallstone disease, kidney stones, appendicoliths, as well as aortic calcifications can sometimes be seen on the plain film as well. Often, the other investigations indicated in the evaluation of patients with acute abdominal pain such as ultrasonography or computed tomography will yield more information.[12] If the plain radiograph is to be used routinely, one has to appreciate the limitations.

HIGH-RISK CONDITIONS

Acute appendicitis

Acute appendicitis is the most common cause of the "surgical abdomen". However, it is commonly initially misdiagnosed in up to one-third of cases, with the commonest diagnosis attributed to gastroenteritis. It is important to remember that the diagnosis of gastroenteritis requires the presence of nausea, vomiting and diarrhoea. Patients who are commonly misdiagnosed at initial presentation are those at the extremes of age and females. Children often have difficulty localising the pain, while in the elderly, the pain can be vague, mild or diffuse. Females are often diagnosed with a pelvic pathology or urinary tract infection. In pregnancy, the presence of the gravid uterus can displace the appendix, thus resulting in an atypical location and presentation of appendicitis. Appendicitis in pregnancy presents as both a significant diagnostic and management challenge.

Classically, the pain of appendicitis is described as a vague, central abdominal pain that migrates to the RLQ. While the history of migratory, RLQ pain has a high predictive value for appendicitis, this only occurs in about 50% of cases. Other features in the history that is thought to be associated with appendicitis such as nausea and anorexia have poor sensitivity and specificity, and thus have poor diagnostic value.[13]

Performing a timely diagnostic imaging study in the outpatient setting of family medicine can be challenging, hence the physician will need to decide whether the patient is at high risk of acute appendicitis or not. The Alvarado score is a commonly used scoring system to aid in the diagnosis of acute appendicitis. It is obtained by adding the sum total of points assigned to 8 criteria, which comprise 6 clinical criteria and 2 laboratory criteria: migratory abdominal pain, anorexia, nausea or vomiting, RLQ tenderness, fever, rebound tenderness, and leucocytosis (see Table 3).

The Alvarado score has been extensively studied and it has been shown in several studies that a low Alvarado score does not reliably exclude appendicitis, and hence should not be used to determine which patient can be discharged safely from the clinic or the emergency department for that matter.[15, 16] If a patient is discharged from the clinic, and deemed low risk for appendicitis, it will be prudent to discharge with the appropriate discharge advice, and to closely follow up to ensure resolution of

Table 3. The Alvarado Score[14]

ALVARADO SCORE	
Migratory pain	1
Anorexia	1
Nausea or vomiting	1
Tenderness in RLQ	2
Rebound positive	1
Elevated temperature	1
Leukocytosis	2
Shift to the left (white cell count)	1
Total	**10**
Score 0 - 4: Unlikely appendicitis Score 5 – 6: Equivocal Score 7 – 8: Probable appendicitis Score 9 – 10: Highly likely appendicitis	

symptoms. At the emergency department level, the use of the Alvarado score can provide a guide towards the subsequent investigations and disposition of the patient, where low-risk patients can be observed in extended observation units for serial abdominal examinations, and patients who are indeterminate in risk undergo further diagnostic imaging studies. The Alvarado score also has poor utility in paediatric patients, due to the propensity for atypical presentations.

The family physician has to assess each individual with consideration given to the patient characteristics that can affect diagnostic accuracy, as well as the available resources at the clinic or medical centre. If there is any concern for acute appendicitis, an early referral to the emergency department or surgeon would be the ideal disposition.

Abdominal Aortic Aneurysm

Abdominal aortic aneurysms (AAA) are defined as focal dilatations of at least 50 percent compared to normal, or any dilation of more than 3 cm. It has in incidence of about 5 percent in those above the age of 60 years. Detection of AAA is difficult, and can be missed if the diagnosis is not considered early. The condition is 5 times more likely to occur in men than women, and risk factors associated with AAA are advanced age, smoking, cardiovascular disease, peripheral vascular disease, hypertension, family history as well as a background of connective tissue disease. The classic presentation of a leaking AAA, where patients present with abdominal pain or back pain, hypotension and a pulsatile mass is not a common presentation pattern. The majority of patients with a leaking AAA will have microscopic haematuria, and this combined with flank pain or back pain can commonly lead the physician to diagnose renal colic, the most common misdiagnosis of AAA. Abdominal pain or back pain with syncope, or postural hypotension should always prompt the physician to suspect AAA.

The physical examination will demonstrate a pulsatile mass, but the patient's habitus can affect the accuracy of this finding. Plain films will only show a calcified aorta 60 percent of the time, and even so will be unable to tell the physician if this is a leaking AAA or not.

The preferred method of screening for an AAA is the bedside ultrasound. However, the bedside ultrasound machine is not widely available to all family clinics or medical centres. If it is available, it is a quick and easily performed test at the bedside. As always, the utility of ultrasonography to aid diagnosis is affected by the ability of the user, as well as the patient's body habitus. Bowel gas can also affect image quality. If there is any concern for an AAA, an urgent referral to the emergency department is appropriate for further evaluation and CT imaging of the patient.

Ectopic pregnancy

The diagnosis of ectopic pregnancy should be considered in every female patient who presents with abdominal pain. A urine pregnancy test should always be obtained in these patients and, if positive, a referral to the emergency department or gynaecologist for a trans-vaginal ultrasound should be made. In a normal pregnancy, the intrauterine gestational sac should be visualised.

Risk factors for ectopic pregnancies are history of previous ectopic pregnancies, history of PID, history of assisted reproductive techniques, usage of intrauterine contraceptive devices, and smoking.

COMMON PITFALLS

Beware the elderly patient with "constipation" or "renal colic" or "gastroenteritis"

As mentioned earlier in the article, the elderly patient presents with unique challenges and pitfalls in their evaluation and diagnosis. Multiple co-morbidities, higher rates of impaired cognition, polypharmacy, atypical presentation of symptoms and less reliable physical examination findings account for this.

Constipation, for example, is a common problem in the elderly, and is easily treated in the outpatient setting. However, patients presenting with constipation may also have bowel ischaemia, obstruction, volvulus or intra-abdominal infections with ileus. It is important to provide the patients with the appropriate discharge advice. "Constipation colic" not relieved by passing of stools should prompt a referral to the emergency department. Renal colic is also a dangerous diagnosis to make in the elderly. Always consider the diagnosis of a leaking abdominal aortic

aneurysm or a dissection in elderly patients presenting with flank pain. Up to one-third of patients with abdominal aortic aneurysms may have haematuria, which can further confound the physician. Detection of vascular emergencies can be difficult if the diagnosis is not entertained from the outset.

It is absolutely reasonable to have a low threshold to refer the elderly patient with abdominal pain to the Emergency Department for evaluation. Low-risk abdominal pain or undifferentiated abdominal pain can be managed with admission, or with serial examinations and observation in the ED setting, which can allow for mitigation of risk to the patient.

Always do the urine pregnancy test in women of childbearing age
Avoid omitting pregnancy testing based on patients' reports of sexual abstinence, contraceptive use or last menstrual periods, as missing a ruptured ectopic pregnancy is catastrophic. If the tests are negative, consider a referral to the appropriate centre for a pelvic ultrasound to exclude other gynaecological disorders. In patients where they have already been diagnosed with pregnancy, remember that the detection of an intrauterine gestational sac is not enough to exclude an ectopic pregnancy, especially if there is a history of assisted reproductive techniques, or history of intrauterine contraceptive device usage or previous history of PID, as heterotopic pregnancies can rarely occur.

Do not be too reassured with the normal full blood count
Do not rule out the diagnosis of appendicitis based on a normal full blood count, especially if the patient is still symptomatic with supporting features. Twenty percent of patients with acute appendicitis have a normal white cell count. Acute mesenteric ischaemia in the elderly can present with normal laboratory results. Elderly patients with cardiovascular risk factors or thromboembolic risk factors are at particular risk of mesenteric ischaemia.

A positive urinalysis does not always mean a urinary cause of abdominal pain
Do not be overly reliant on a positive urine dip-stick test to establish a diagnosis if the suspicion of other causes of abdominal pain other than urinary tract infections exists. The urinalysis can be positive for haematuria in patients with abdominal aortic aneurysms and trauma. The test can be positive for leukocytes in patients with appendicitis and pelvic inflammatory disease as well.

Remember to provide discharge instructions
The aetiology of abdominal pain is not always going to be conclusively determined by the end of the outpatient consultation. Good instructions to the patient and family should be thorough and clear, and easily remembered. If the pain was of low risk and the patient is discharged home, and if the aetiology is uncertain, a short-term follow up should be provided to the patient, either back at the clinic or with the appropriate specialty. Patients should always to be instructed to return for persistent or worsening symptoms for re-evaluation, or to present to the Emergency Department.

SUMMARY

The assessment of abdominal pain in the primary healthcare setting will require the family physician to employ the traditional clinical methods of careful history taking and physical examination. The investigative resources available to the physician can be sometimes limited, and the return of results can take time. The family physician will therefore have to determine the need of these outpatient tests based on his or her assessment of the overall clinical picture, and weigh the risks and benefits of performing these tests at the clinic versus referring the patient to the emergency department for further evaluation. Special attention needs to be given to patient groups where there is altered physiology, or impaired perception or verbalisation of pain.

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LEARNING POINTS

- **All elderly patients with abdominal pain should be approached with greater care and clinical suspicion for severe disease.**
- **Assume every woman of childbearing age is pregnant, and do not forget the pregnancy test.**
- **Remember to evaluate for extra-abdominal causes of pain, e.g., chest infections, acute coronary syndromes, testicular torsion, etc.**
- **Avoid relying on laboratory tests to diagnose appendicitis.**
- **Analgesia is always appropriate and will not hinder your abdominal examination.**
- **Always address abnormal vital signs.**
- **Abdominal pain is a high-risk presentation — avoid poor documentation.**
- **Provide good discharge advice — and document it.**