1./5Editor Only Mss no and title	59279.
Author contact details Email: Contact number:	Josey Coaten – Josey-Marie.Coaten@hull.ac.uk
Honorarium	£120
Pages	6
Figures	9 – 3/4 figs for redrawing (see prod notes) (could maybe omit fig 1 if we adapt fig 2) figs 7, 8 & 9 could possibly be omitted if we don't have space.
Boxes	
Tables	3
Note for first/second editor	• Article needs cutting down to fit 6 pages. Pics have been reduced but may need reducing further. Those that are optional are marked. • One section has already been cut. Reduce the history section right down as taking a history is fully covered in a previous article including SOCRATES .
Peer reviewed	Yes
Notes for production	Redraw 1, 7 & 8 (For Fig 2 could amend pic already used in previous article). NB Fig 7 is optional. Fig 6 is a shutterstock pic and is optional
Notes for online	
Web navigation	Categories for analytics (main category in bold):

Main Zone:	
Other Zones:	
Innovation Hub:	

Strap

Practical Procedure

Substrap

Assessment skills

Standfirst [approx. 150 characters including spaces, for online only]

Learn how to conduct an advanced abdominal assessment to give a working diagnosis and guide clinical investigations and management. the highlighted has been removed from this article (investigations have been removed)

Keywords [5 maximum]

Abdominal assessment/Inspection/Palpation/Percussion/Auscultation

Meta description

Learn how to assess and examine a patient with abdominal symptoms to give a working diagnosis and guide clinical investigations and management. Investigations from this article have been removed.

Head [approx 70 characters including spaces]

How to assess and examine a patient with abdominal symptoms [head ok?] OK

Author/s [full name, job title, place of work]

Josey Marie Coaten is lecturer and interim programme director (advanced **clinical** practice), University of Hull **[please check byline] Correct**

Abstract [50-100 words. No citations or abbreviations]

This article presents a systematic approach to assessment and examination of a patient presenting with abdominal symptoms to give a working diagnosis and guide clinical investigations and management. This includes how to take a thorough history and examine the abdomen using the inspection, palpation, percussion and auscultation framework, with a focus on the non-deteriorating patient. It is the seventh in a series of articles on advanced assessment and interpretation skills [revised abstract. OK?] Yes

Citation

[Art desk: Box please insert standard box at top of article for this series]

Advanced practitioners

This series is aimed at nurses and midwives working at or towards advanced practice. Advanced practitioners are educated at masters level and are assessed as competent to make autonomous decisions in assessing, diagnosing and treating patients. Advanced assessment and interpretation is based on a medical model and the role of advanced practitioners is to integrate this into a holistic package of care.

[main article] **[I've provisionally suggested a new opening section leading into history taking to make it clear the article's about abdominal symptoms not just gastrointestinal and have indicated sources as possible refs. (Could also include Innes, 2023 - please indicate where). Please check and amend if necessary]**

Abdominal symptoms **[such as? Please examples of give common presentations eg pain, distension etc]** Pain, bloating, Nausea, Vomiting, diarrhea and distention are common presenting complaints, but can be hard to assess as so many conditions can present in this way. (Pulsenotes, 2022; Dunlap and Peterson, 2020). The job of the advanced clinical practitioner is to ensure a thorough history taking and examination to establish a working diagnosis and guide clinical investigations and

management. Key to this is physical examination of the abdomen, which as well as being used to assess abdominal symptoms is an essential part of all routine patient examinations.

This article advises nurses and other non-medics advancing in their practice how to assess a patient presenting with abdominal symptoms, with a particular focus on the non-deteriorating patient. Working with colleagues and asking for supervision when needed will enable safe practices and develop the nurse's knowledge, skills and competence further [this sentence moved up].

[cross head] Anatomy

It is helpful to visualise the anatomy when examining the patient. The abdomen is the area of the body between the thorax (chest) and pelvis. The abdominal cavity is separated from the thorax by the diaphragm and is enclosed by abdominal muscles at the front and sides and the vertebral column at the back (TeachMeAnatomy, nd https://teachmeanatomy.info/abdomen/). The abdomen houses a large part of the gastrointestinal/digestive tract, including the stomach, small intestine (duodenum, jejunum and ileum) and large intestine (colon, rectum and anus). [definitions of the large intestine vary but this seems the simplest and would go with the proposed figs]Ok Also in the abdomen is the genitourinary system, comprising renal and reproductive organs. Accessory organs of the abdomen include the liver, pancreas and gallbladder (all vital for digestion), spleen, adrenal glands and kidneys. See Fig 1 for the location of different organs while Fig 2 shows what is directly under the hand) [see suggestion for new fig 1].

[cross head] History taking [this section shortened to save words and avoid repetition with previous articles]

[sub head] Introduction

First introduce yourself, your role and anyone else in the room as this is key to building up a therapeutic relationship (Peart, 2022). Then begin with open questioning (for example, "How can I help today") to allow patients to 'offload' [is this a direct quote from the ref? No] their complaint and feel valued and listened to (Daly and Zarate-Lopez, 2021). Closed questions can then be used for clarification (for example, "Have you experienced any weight loss?").

At the end of history taking, summarise the information back to the patient to check you have understood and interpreted it correctly and not missed anything (Peart, 2022). [moved forward]. The components of history taking are summarised briefly below (Innes, 2023).Ok

[sub head] Presenting complaint

Explore each presenting symptom. Consider using a mnemonic like SOCRATES, adapted to the presenting complaint (Simon et al, 2014) (see article in this series on history taking). This gives structure and focus and reduces your chance of missing key information that could lead to misdiagnosis.Ok

[sub head] Past medical history

Establish the patient's past medical history to help identify disease risk or reoccurrence (for example, alcohol use disorder is a risk factor for acute pancreatitis) (Innes et al, 2023).

[sub head] Drug history

Explore the patient's drug history, prescribed and over the counter including herbal, as many medications can cause gastrointestinal symptoms (Kumar and Clark, 2020). For example, Metformin for diabetes has common side effects of nausea, abdominal pain and diarrhoea (National Institute for Health and Care Excellence (NICE), no date). **[date changed from 2018 as no date on this document] OK**

[sub head] Family history

Ask about the patient's family history (if known) to help identify specific risk factors. For example, many gastrointestinal diseases can be genetic, with patients more at risk of conditions such as inflammatory bowel Disease (Crohns or Ulcerative colitis), bowel cancers and stomach ulcers if they have a family history (Innes et al, 2023). [check edits]OK

[sub head] Social history

Take a social history, which includes lifestyle factors such as diet, food intolerances, alcohol use, smoking, stress and travel, which can increase the risk of certain conditions (Table 1). OK

[sub head] Systems review

A systems review is used to identify any potentially related symptoms the patient has not mentioned or thought relevant. It can also help in identifying any red flags/urgent symptoms that may need rapid treatment. In relation to gastrointestinal symptoms, it is helpful to ask about weight loss, changes in bowel habit or blood in the stools as these can be a red flag for a potential cancer **(Kumar and Clark, 2020).**

[cross head] Examination

An initial assessment, based on observation of the patient and how they first present [OK? Yes], is vital to identify the deteriorating/acutely unwell patient. The national early warning score (NEWS 2)

can give a more accurate assessment of acute deterioration (Royal College of Physicians, 2017). If a patient is identified as deteriorating, use the ABCDE (Airway, breathing, Circulation, Disability, Exposure) assessment approach (Resuscitation Council UK, 2021).

For patients who are stable and presenting with a potential abdominal complaint, a systematic physical examination is needed. This can be achieved using the inspection, palpation, percussion and auscultation framework (IPPA) (Innes et al, 2023). Some sources suggest palpation prior to auscultation can alter bowel sounds, therefore auscultation should be performed first (Ferguson, 1990). [seminal ref] However, there is no conclusive evidence that one approach is better than the other. Therefore, this article adheres to the standard IPPA approach outlined in recent literature (Innes et al, 2023; Kumar and Clark, 2020).

Before physically examining the patient, gain the patient's consent, secure a private location and offer the patient a chaperone if needed. Prepare the room, wash your hands and done appropriate personal protective equipment. For the patient's comfort **[OK? yes]** ensure your hands are warm and maintain the patient's dignity by only exposing the section of the body needed, following professional standards (Nursing and Midwifery Council, 2018).

[sub head] Inspection

Observational assessment of the patient and their environment will give clues to the patient's current medical status, past medical history and medications. For example, this could include end-of-the bed observations, checking the patient's medical charts/medical records, observing the patient's home environment and visual assessment of the patient (Table 2). Observations and the order they are undertaken will depend on the specific case/environment and the nurses' professional judgement. **[OK? Yes]**

Once you've made your initial assessment, the next stage is to physically examine the patient. Before you begin ensure the patient is laid in a supine position (horizontally face up) [OK? Yes] as this allows the abdominal muscles to relax and ensures an easier examination (Innes et al, 2023).

[sub head] Palpation

This consists of applying light then firm pressure with the hand on the abdomen to [**added OK? edited}** identify potential abnormality (for example abdominal tenderness, enlarged organs **[added OK?Yes]** or masses).

The abdomen can be split into four quandrants (right upper, right lower, left upper, left lower) **[OK? Ok but note to palpate the 9 regions not 4 quadrants edit below]** or nine regions as shown in Fig 2.

Picturing what is under the hand when palpating will help identify a potential cause. Before palpating ask the patient about the location of any pain and start by palpating away from that area as this helps gain the patient's trust, ensure to palpate the nine regions (Ford, 2019). The procedure is as follows:

- Stand or kneel at the side of the patient and start with a light palpation of each of the regions. Hold your hand flat and ensure full contact with the patient's abdomen, while applying a light downward pressure;
- Observe the patient for any expression of pain and feel for masses and enlarged organs;
- Repeat with a deeper palpation. If pain is felt in a particular region assess its severity and the presence of voluntary guarding (tightening of the abdominal muscles) when palpating. Involuntary guarding (typically indicated by a board-like or rigid abdomen) may also occur and can indicate pathology such as peritonitis (inflammation of the abdomen lining caused by infection or organ rupture [OK?Yes]) (Innes et al, 2023).
- Note the site of any pain as this may help identify what organ it could be associated with. For example, pain in the epigastric region could indicate a peptic ulcer or pancreatitis (inflamed pancreas);

For an overview of potential causes of pain in each region see Table 3.

If a mass is palpated, note the size, location, shape and consistency and whether it is fixed or mobile (Simon et al, 2014). The location and character of the mass, together with any key indicators from the clinical history and presenting symptoms, may help with a potential diagnosis. However, a mass can indicate anything from faeces to a hernia (usually more prominent when coughing and fully reducible) and a lipoma (slow growing fatty lump) to a tumor (Innes et al, 2023). Therefore, if a mass is found **[OK? Yes],** it is vital to request a scan (ultra sound or computerised tomography (CT)) or a referral (urgent if history indicates) to confirm a diagnosis.

A pulsatile mass in the upper abdominal regions could indicate an abdominal aortic aneurysm which requires emergency escalation (Kumar and Clarke, 2020). However, for a patient who is thin or frail, this can indicate a normal aortic pulse.

[sub sub sub head] Aortic palpation

The aorta can be palpated separately. Locate the midline of the abdomen, just above the umbilical region, place **[the index finger of Yes ? - as shown in the Fig]** each hand either side of the aorta and perform deep palpation (Fig 3).

If this **[the aorta Yes?]** is easy to palpate, or if the hands move outward and not upward with the pulsation, this may indicate an aortic aneurysm which requires immediate escalation (Ford, 2019).

[sub sub sub head] Palpation of the liver

Enlarged organs may indicate a pathology. Palpate the organs separately, starting with the liver as follows:

- Locate the right iliac fossa (large depression on the internal surface of the ilium, which is part of the three fused bones making the hip bone) **[OK?Yes]** and place the hand flat on this part of the abdomen leading with the radial side (towards the thumb **[OK? Not sure toward the thumb makes sense? Alternative - outer aspect of the index finger??])** of the index finger;
- Ask the patient to breath in and out deeply and on each inspiration perform deep palpation;
- Move your hand upward in increments of 1-2 cm, continuing to palpate **[ok?Yes]** until you reach the right costal margin (right side of the lower ribs) or feel the liver edge as it moves downward during inspiration [moved up] (Fig 4);

If the liver is palpated, note the position and whether this indicates enlargement. An enlarged liver. is called hepatomegaly and can indicate multiple pathology, including liver disease, cancer, hepatitis, lymphoma and leukemia (Simon et al, 2014). If the edge can be palpated, note if it is sharp or nodular; a hard, rough and nodular liver could indicate liver cirrhosis (Innes et al, 2023).

[sub sub head] Palpation of the spleen

The technique is similar to that for the liver except movement is diagonal **[OK?Yes]:**

- Begin at the right iliac fossa, leading with the radial side of the index finger;
- Keep the hand positioned horizontally on the abdomen while asking the patient to breathe deeply in and out;
- On inspiration perform deep palpation, moving from the right iliac fossa diagonally toward the left coastal margin (left lower ribs), moving the hand in 1-2 cm increments (Fig 5).

The spleen should not be palpable as it is tucked under the left side of the ribs; if it is palpable this means it has at least tripled in size. When the spleen enlarges it stretches toward the umbilical region, which is the reason for palpating in a diagonal direction. Some causes of an enlarged spleen are: infection, such as glandular fever; injury; hepatic portal hypertension caused by liver cirrhosis; and hematological malignancy (Innes et al, 2023).

[sub sub head] Palpation of the kidneys

This is often called balloting the kidneys and is described below:

1. Place the left hand under the patient's flank, just below the ribs;
2. Position the right hand on the front of the abdomen, just below the costal margin (lower ribs) in the flank region;
3. Press upward with the left hand and downward with the right hand to palpate the kidneys on either side (Fig 6).

Usually the kidneys are not palpable, but in some people the lower (inferior) pole of the right kidney **[OK?Yes]** can be palpable. While this may be normal for some patients, in others the kidney being palpable on one side may indicate a tumor. If both kidneys are felt this could indicate polycystic kidney disease (Innes et al, 2023).

[sub sub head] Murphy's sign

If you suspect acute cholecystitis (inflammation of the gallbladder) use Murphy's sign to help with a differential diagnosis:

- Locate [OK?yes] the gallbladder by placing a hand below the right costal margin in the mid-clavicular line (imaginary vertical line through the mid-point of the clavicle or collarbone) **[OK?Yes];**
- Ask the patient to take a deep breath in while palpating the gallbladder.

If pain is present the patient will often halt their breath. This is a positive Murphy's sign which may indicate acute cholecystitis **[OK? Yes]** (Bickley et al, 2023). [**updated from 2020 to 2023 edition. OK? Yes]**

[sub sub head] Rovsing sign

If you suspect acute appendicitis (inflammation of the appendix), perform the Rovsing sign. Palpate in the left iliac fossa region. If the patient feels pain on the opposite side (right iliac fossa), this is a positive Rovsing sign and may indicate appendicitis, requiring a surgical referral (Baird, 2017).

[sub sub head] McBurney's sign

Where appendicitis or acute peritonitis is suspected, a useful test is McBurney's sign:

- Locate the McBurney's point (Fig 7), which is two thirds of the distance from the umbilicus to the right anterior superior iliac spine (bony section of the hip) **[OK? Yes]** (Innes, et al, 2023).

- Perform deep palpation of this point;
- Release the pressure rapidly (rebound).

If pain is felt on palpation this may help confirm a diagnosis of appendicitis (Baird, 2017). However, if pain is felt when you remove your hand rapidly, this is known as rebound tenderness, which may indicate peritoneal inflammation or peritonitis (Baird, 2017).

[Sub head] Percussion

Percussion is tapping of the body with the fingers to determine the size, consistency and borders of body organs by the sound this makes **[suggested explanation. OK?Yes].** Place the middle finger of the nondominant hand on the patient's abdomen and tap on the distal interphalangeal joint (the small joint closest to the nail on the finger) **[do you mean tapping directly onto the abdomen with that middle finger or tapping on the middle finger with one or two fingers of your other hand? Please clarify Tapping on the middle finger of the hand placed on the abdomen with one finger usually the index finger of the other hand**]. The main sounds relating to the abdomen include: tympany (hollow, resonating [OK?Yes] drum-like sound over air filled organs/regions) and dull (the normal sound heard over a solid organ) (Bickley et al, 2020).

[sub sub head] Percussion of the liver

This is used to assess whether the size of the liver is within normal parameters. The size of a normal healthy liver depends on factors such as the person's height and weight but averages 6-12 cm in adults (Bilal et al, 2017). Percussion is performed as follows:

- Start at the right iliac fossa and percuss upward in 1-2 cm increments towards the costal margin;
- When the note changes from resonant to dull this is probably the lower liver border so note down this location;
- Now percuss from above, starting at the mid-clavicular line at the fifth intercostal space and moving downward until you detect a dull note. This is likely the upper border of the liver, allowing you to determine the approximate size of the liver (Innes et al, 2023).

[sub sub head] Percussion of the spleen

As with the liver, percussion of the spleen is to assess the approximate size:

- Start in the right iliac fossa;
- Percuss upwardly and diagonally towards the left costal margin in 1-2 cm increments (Innes et al, 2023).

The spleen will only be detected on percussion if it is enlarged. In a healthy person the percussion note will remain tympanic; however, any dullness may indicate splenomegaly (enlargement of the spleen). [check edited sentence] Yes ok

[sub sub head] Shifting dullness

Percussion can also be used to determine if there is fluid in the abdominal cavity (known as ascites):

- Start at the umbilical region moving outward toward one flank;
- A change in note from tympanic to dull could indicate fluid is present;
- Ask the patient to roll onto their opposite side to where your hand is keeping your finger in place;
- Wait 10 seconds to allow the fluid to drain away to the opposite side and percuss again. If there is now a resonant note where there was previously dullness, this could indicate shifting fluid or shifting dullness (Bilal et al, 2017).

Shifting dullness could indicate ascites or (fluid collecting in the abdomen) **[OK? Maybe in brackets as ascites is fluid collecting in the abdomen]** (Fig 8). This can be due to liver disease, an abdominal cancer (bowel, ovarian, pancreatic, uterine, stomach, lung, liver, breast), heart failure or pancreatitis.

[sub head] Auscultation

Auscultation is listening to sounds in the body with a stethoscope. High pitched sounds are traditionally detected using the larger side of the stethoscope (diaphragm) and low pitched sounds using the smaller side (bell). However, this depends on the stethoscope, so always check the manufacturer's instructions.

The diaphragm is usually [ok? Yes] used for the abdomen [please explain why as it enables recognition of higher pitched sounds]. Literature differs as to where to listen. Innes et al (2023) recommend listening only on the right side of the umbilicus, while Bickley et al (2020) recommend listening on the lower right of the abdomen. Usually one location is enough, but if you are unsure of the sounds, listen in more than one location.

Normal sounds are low pitched gurgling sounds occurring around every 5-10 seconds. Listen for abnormal [OK?Yes] sounds such as tinkling, which may indicate an intestinal obstruction, or absent sound, which could indicate an ileus (paralytic bowel) or peritonitis (Innes et al, 2023). For absent bowel sound listen for at least two minutes before escalating urgently (Bickley et al, 2020).

[sub sub head] Auscultation of the aorta and renal arteries

Finally, listen over the aorta and renal arteries for bruits (turbulent blood flow). A bruit could indicate an abnormality such as renal artery stenosis (narrowing of this artery) (Innes et al, 2023) and should always be escalated. [check edits OK] The highlighted could be deleted as I state this below?. Auscultation is as follows:

- For the aorta [OK?Yes], listen 2 cm above the umbilicus. A bruit heard here could indicate aortic aneurysm;
- For the renal arteries, listen 2-3 cm above and to one side of the umbilicus. [could a bruit here indication renal artery stenosis?Yes]

Fig 9 shows the auscultation points for the aorta and renal arteries. [does the fig show the auscultation points or the actual location of the aorta and renal arteries or both?] **Both**

[cross head] Working diagnosis and clinical management plan

There should be enough information from the history and clinical examination to inform a working diagnosis or impression, which can guide your investigations and clinical management plan. Being systematic and thorough will avoid missing vital information that could lead to incorrect diagnosis and management and risk unnecessary investigations, causing possible harm to the patient (Graber, 2022). Ensure you document all relevant aspects of the consultation and management plan to demonstrate your clinical reasoning and decision-making at the time of the consultation in line with the Nursing and Midwifery Council (2018) Code.

Conclusion

The abdominal assessment is an important component of a nurse's skill set. As abdominal problems can be difficult to diagnose, it is important that history taking and examination is detailed, logical and structured. Omitting any component risks missing vital information required to build the impression or working diagnosis. The implications of this could be incorrect diagnosis, management and treatment, with a risk to patient safety. As well as being competent in abdominal assessment and examination, nurses should be ready to escalate if there is any doubt.

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Bilal M et al (2017) The Clinical anatomy of the physical examination of the abdomen: a comprehensive review. *Clinical Anatomy.* 30: 3, 352-356. https://pubmed.ncbi.nlm.nih.gov/28165642/

Basten G (2019) *Blood Results in clinical practice: A practical guide to Interpreting blood test results*. M & K Update Limited. **[reference not cited in article, please add or remove reference]This section of the article has been removed? Remove reference if not used**

Cancer Research UK (2023) *Testing for blood in your poo using FIT test*. [Accessed 11 March 2024] https://www.cancerresearchuk.org/about-cancer/bowel-cancer/getting-diagnosed/tests/FIT. **[reference not cited in article, please add or remove reference]** as above this section has been removed, therefore remove reference if deleted

Dains JE et al (2020) *Advanced Health Assessment and Clinical Diagnosis in Primary Care.* Elsevier.

Daly M, Zarate-Lopez N (2021) Functional gastrointestinal disorders: history taking skills in practice. *Clinical Medicine;* 21: 5, e480-486. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8439526/

Dunlap JJ, Patterson S (2020) Assessing abdominal pain; Gastroenterology Nursing; 43:3, 267-270. **[new suggested ref]OK**

Ferguson C (1990) Clinical Methods: The history, physical and laboratory examinations. 3rd edition. Butterworth. https://www.ncbi.nlm.nih.gov/books/NBK201/ **[are you referencing a particular chapter by Ferguson as editors for this are Walker HK et al? If so please give chapter title for the Ferguson ref] Chapter 93 Inspection, Title: Auscultation, Palpation and Percussion of the Abdomen written by Ferguson C – Updated link to chapter https://www.ncbi.nlm.nih.gov/books/NBK420/#:~:text=Take%20the%20history%20and%20perform,sounds%20if%20performed%20before%20auscultation.**

Ford C (2019) Adult pain assessment and management. *British Journal of Nursing;* 28: 7, 421-423. https://www.magonlinelibrary.com/doi/abs/10.12968/bjon.2019.28.7.421?rfr_dat=cr_pub++0pubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org

Graber ML (2022) the Incidence of Diagnostic error in Medicine. *BMJ Quality and Safety*; 22 (suppl 2), ii21-27. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3786666/

Commented [A1]: Older reference included for one point regarding the auscultation/palpation debate

Hamilton, P (2023) *Blood Tests Made Easy.* Elsevier. **[not cited in text. Please insert in text or remove this section has been removed**

Innes JA et al (2023) *Macleod's Clinical Examination*. Elsevier.

Kaushal, R K (2018) Abdomen. In: Self Assessment and Review of Anatomy. Japee Digital. https://www.jaypeedigital.com/book/9789352700158/chapter/ch9 **[ref for proposed new Fig 1 to be added if we use]**

Kumar PJ and Clark M L (2020) *Kumar and Clark's Clinical Medicine*. Elsevier.

Martini FH et al (2018) *Fundamentals of Anatomy and Physiology*. Pearson Education Ltd. [reference not cited in article, please add or remove reference] Section removed remove reference

National Institute for Health and Care Excellence (2018) *Urinary Tract Infection (lower): Antimicrobial prescribing.* [Accessed 11 March 2024] https://www.nice.org.uk/guidance/ng109 **[not cited in text. Please insert in text or remove]** **Remove as above**

National Institute for Health and Care Excellence **(no date)** *Metformin hydrochloride* (accessed 20 June 2024) https://bnf.nice.org.uk/drugs/metformin-hydrochloride/#side-effects **[changed to no date as I can't see a date for this document]** **OK**

Nursing and Midwifery Council (2018*) The Code: Professional Standards of Practice and Behaviour for Nurses, Midwives and Nursing Associates.* NMC https://www.nmc.org.uk/globalassets/sitedocuments/nmc-publications/nmc-code.pdf

Nigam Y et al (2019) Gastrointestinal tract 4: anatomy and role of the jejunum and ileum. *Nursing Times;* 115: 9, 43-46. **[reference not cited in article, please add]** **Section potentially removed as this was the overview of the GI tract – remove ref**

Peart P (2022) Clinical history taking. *Clinics in Integrated Care;* 10, 100088. **[please provide a link for this]** **https://www.sciencedirect.com/science/article/pii/S2666869622000252**

Pulsenotes (2022) Abdominal pain, app.pulsenotes.com, July (accessed 12 June 2024). [new suggested ref]Ok https://app.pulsenotes.com/presentations/gastrointestinal/notes/abdominal-pain

Resuscitation Council UK (2021) *The ABCDE approach, resus.org* (accessed 20 June 2024) https://www.resus.org.uk/library/abcde-approach

Royal College of Physicians (2017) *National Early Warning Score (NEWS) 2, rcp.ac.uk, 22 Dec (*accessed 20 June 2024]https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2

Simon C et al (2014) *Oxford Handbook of General Practice*. Oxford University Press.

TeachMeAnatomy (no date) The abdomen, teachmeanatomy.info (accessed 13 June 2024**). [new suggest ref added. OK?]**OK

Fig 1. Anatomy of the gastrointestinal system [this shows the whole gastrointestinal system rather than depicting the abdomen. We could redraw and just include the abdomen, making it clear that this is just the digestive system but the downside is it doesn't show the position of other abdominal organs mentioned in the text and is perhaps too much of a focus on the digestive system] Suggested alternatives below

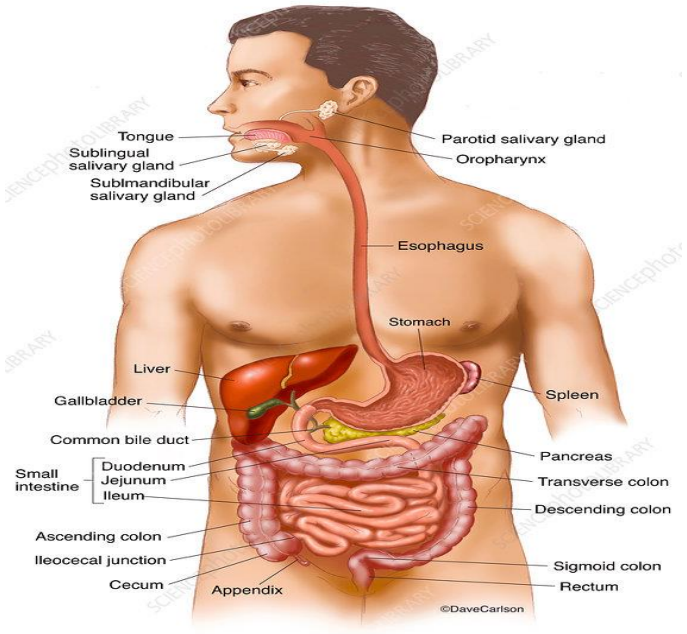
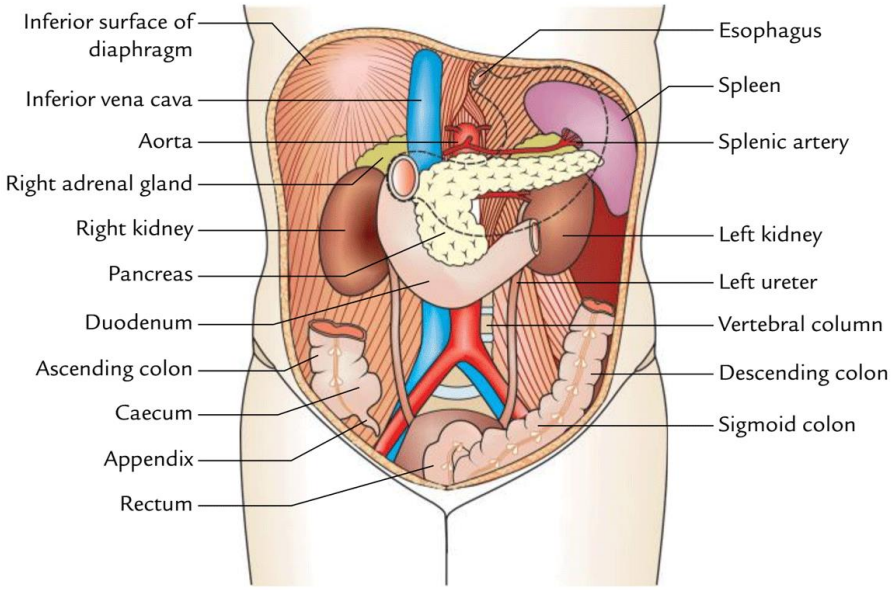
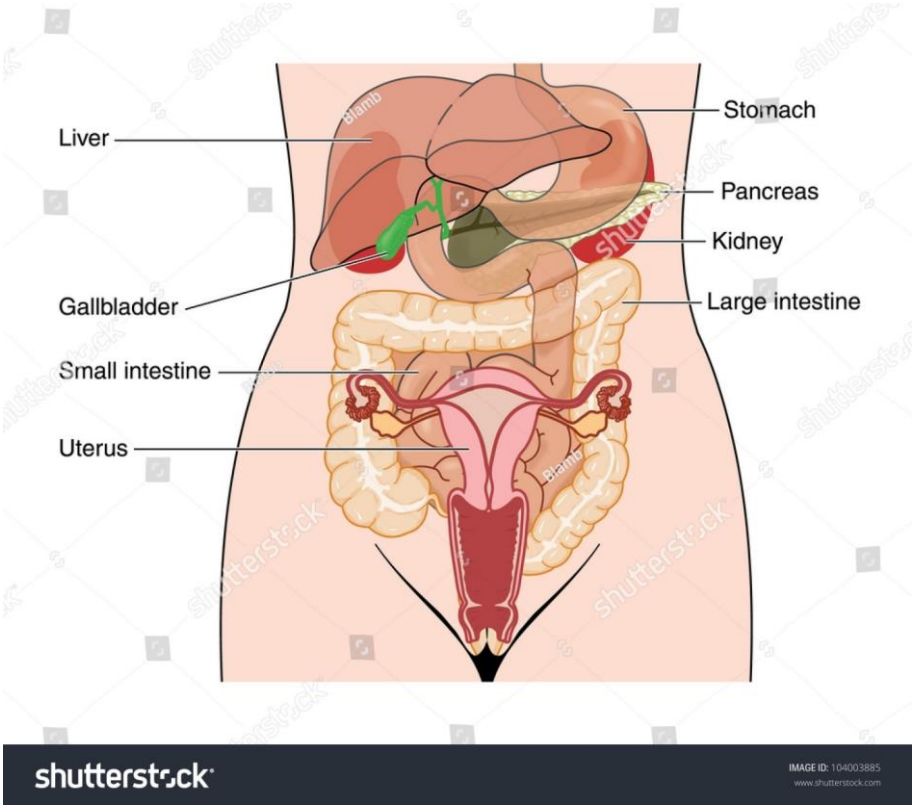


Fig 1. [other possibles for Fig 1 included below. The first could be used with annotations slightly amended to reflect the text, eg changing 'duodenum' to 'duodenum (first part of small intestine)'. It can be used in conjunction with Fig 2 where Fig 1 shows position of key organs and Fig 2 shows what's under the hand].

Another alternative is the fig of the female abdomen below this one. This is simpler but shows fewer organs and the reproductive system featured prominently barely features in the article.

Fig 1. Abdomen indicating the position of key organs (adapted from Kaushal, 2018) I don't like this fig as it is confusing with the large and small bowel missing





Suggested new Fig 1. Female abdominal organs including the gastrointestinal tract and some of the urinogenital organs Shutterstock 104003885 **This is better preferred option for me**

[Replacement labels for Fig 1]

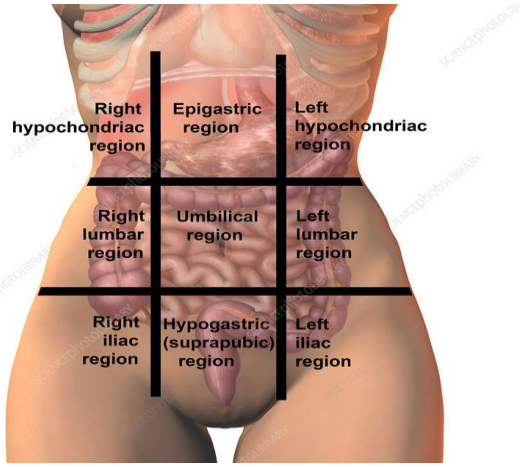


Fig 2. Abdominal regions and what is under the hand [if we redrew or adapted shutterstock image we could include a key and label some of the organs. Would also save space as we could perhaps omit fig 1. Another alternative is to adapt a fig we have already used – fig 2 on this article https://www.nursingtimes.net/clinical-archive/gastroenterology/gastrointestinal-tract-6-the-effects-of-gut-microbiota-on-human-health-21-10-2019/] Cant access this Fig here *https://sciencephotogallery.com/featured/regions-of-the-abdomen-carol--mike-wernerscience-photo-library.html*

[Annotations]

Right hypochondriac region

Right lumbar region

Right iliac region

Epigastric region

Umbilical region

Hypogastric (suprapubic) region

Left hypochondriac region

Left lumbar region

Left iliac region

Fig 3. Aortic palpation *Author's own]*

Fig 4. Palpation of the liver *Authors own]*

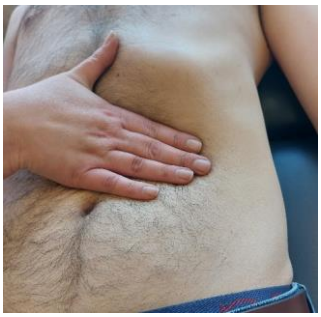


Fig 5. Palpation of the spleen [Authors own]

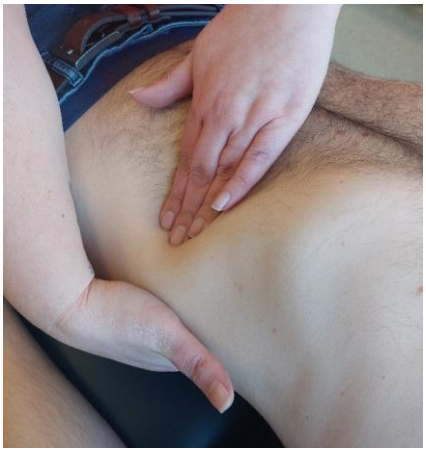


Fig 6. Balloting the kidneys *[author's own]*

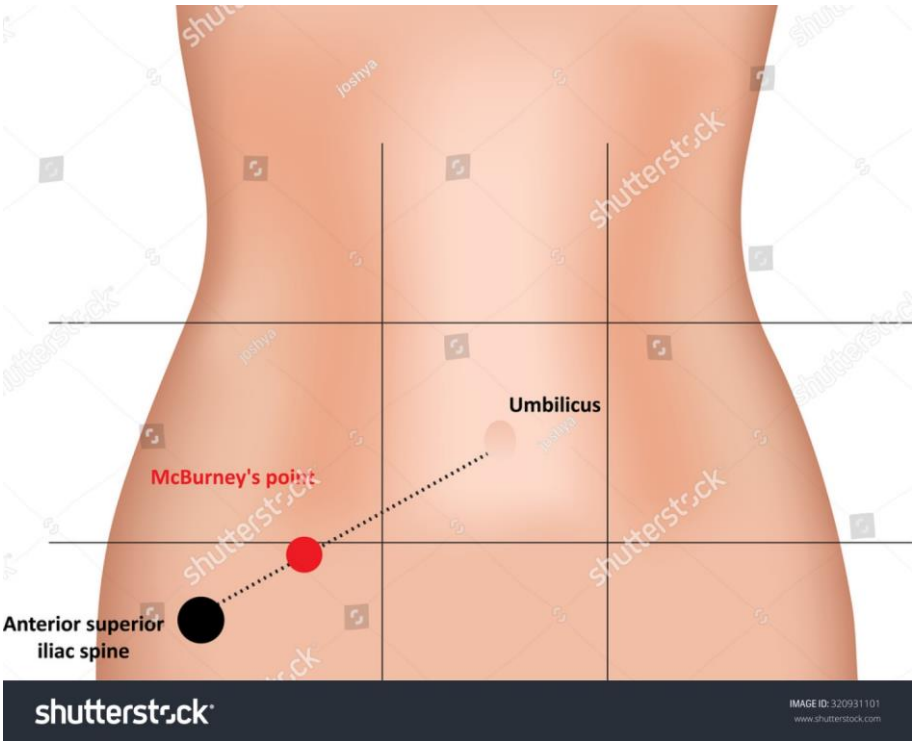


Fig 7. McBurney's Point *[use: https://www.shutterstock.com/image-vector/mcburneys-point-illustration-320931101* ***[suggest we remove this Figure if there's not enough room]***

Ok can remove

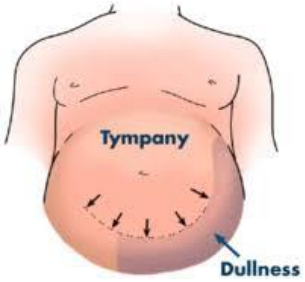


Fig 8. Location of ascites when patient is supine ***[optional. Suggest we omit if there's not enough space]*** *Can remove if needed*

Tympany

Dullness

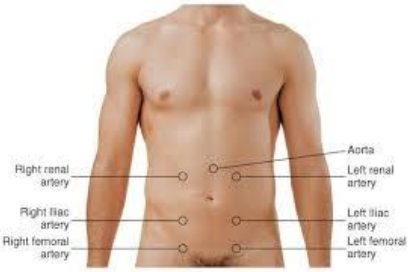


Fig 9. Auscultation [points?] of the aorta and renal arteries *[redraw only displaying renal and aortic artery location and removing iliac and femoral labels]* ***[could this fig also be optional depending on space?]*** ***Yes***

[revised annotations]

Right renal artery

Aorta

Left renal artery

[tables]

Table 1. Elements of social history (adapted from Innes et al, 2023)

Elements of social history	**Risk factors**
Diet	Poor diet can increase the risk of irritable bowel syndrome, nonalcoholic fatty liver disease, constipation, diarrhoea
Food intolerances	Certain foods can trigger gastrointestinal symptoms (for example, wheat, dairy.

Alcohol	Can increase the risk of liver disease and diarrhoea
Smoking	Can increase the risk of bowel cancer, oesophageal cancer, stomach ulcers
Stress	Increase in stress can trigger irritable bowel syndrome, dyspepsia/heartburn
Foreign travel	Diarrhoea is common after travel and in some countries hepatitis may be a risk.

Table 2. Inspection (adapted from Kumar and Clark, *2020*) *[extra column added]*

Inspection	Observations	Purpose/possible indications [OK?]
End-of-the-bed and patient environment	• Medications/drug charts	• Medication history
	• Fluid, observation and bowel charts	• Current medical status
	• Mobility aids	• Establish whether the patient needs a walking aid and whether this relates to abdominal symptoms or is normal for the patient
	• Feeding tubes, intravenous lines, fluids, cannulas	• [please fill in this column for feeding tubes etc]Establish if the patient is requiring another route for nutrition
	• Catheter	• Could the patient have catheter issues or a urine infection?
	• Patient's age	• Age-associated risk factors, such as a higher cancer risk for older patients?
	• Skin colour changes	• Yellow could indicate jaundice (liver disease, obstructive picture), pallor could indicate anaemia (bleeding, cancer)
	• Pain	

	• Confusion • Abdominal distension • Cachexia (weakness or wasting of the body) • Hernia	• Check for any non-verbal expressions of pain? Is patient clutching a region of their abdomen? • Many possible causes (eg infection, dementia), but can be associated with end-stage liver disease • Many possible causes (see abdominal observations below) **[OK?Yes]** but can indicate ascites (fluid collection in the abdomen), which is associated with liver disease or potential cancers • Malignancy, poor nutritional intake or malabsorption • Occurs when internal organs push through muscle or tissue most commonly in the abdomen
Hands	• Spoon shaped nails (koilonychia) • Clubbing (bulb like characteristics on finger ends) • Red palms (palmar erythema)	• Iron-deficiency anaemia • Possible indicator for many diseases, including chronic diseases such as inflammatory bowel disease, liver disease and more • May indicate liver disease but can be normal in pregnancy

Arms	• Flapping tremor (asterixis) • Bruising • Excoriation marks	• Liver disease (hepatic encephalopathy) • Coagulation problem which can be [OK?Yes] caused by liver disease • Widespread itching (pruritus), which can be an indicator of cholestasis (slowing or stalling of bile flow)
Eyes	• Conjunctival pallor • Jaundice/yellowing of the whites of the eyes	• Anaemia • Liver disease, billary obstructive disease (gallstones) or the hereditary disease Gilbert syndrome (involving excess bilirubin in the blood)
Mouth	• Angular stomatitis (dry cracked corners of the mouth) • Glossitis (inflammation of the tongue) • Oral ulcers • Dry mouth	• Malnutrition • Malabsorption of [OK?Yes] B12 or iron deficiency anaemia • Crohn's disease • Hydration or a side effect of medications (such as antidepressants), cancer treatments (such as radiation), alcohol or illicit drug use

Commented [A2]: Removed needle track marks, agree maybe contentious therefore removed

Chest	• Gynaecomastia (enlarged breast tissue in males) • Chest hair loss in males • Spider naevi (clusters of red blood vessels visible under the skin)	• Liver disease • Liver disease • Liver disease if there are more than five
Abdomen	• Scars • Distension • Engorged veins around the umbilicus (caput medusae) • Cullen's sign (bruising around the umbilicus) • Grey-Turners sign (bruising around the flanks)	• Does this indicate previous surgery? • For possible causes use the six Fs (fat, flatus, faeces, foetus, fulminant mass, fluid) • Hepatic portal hypertension. • Internal haemorrhage • Internal haemorrhage

*Note this list is not exhaustive and there may be other potential causes [add?]yes

Table 3. Location of abdominal pain and possible causes (Adapted from Dains et al, 2020)

Abdominal region	Potential causes of pain in this area
Right hypochondriac region	Duodenal ulcer, gallstones, cholecystitis, billary colic, hepatitis, liver abscess, lung causes

Epigastric region	Pancreatitis, peptic ulcer, heartburn, abdominal aortic aneurysm, aortic dissection
Left hypochondriac region	Peptic ulcer, ruptured spleen, splenic abscess, acute castritis
Left lumbar region	Kidney stones, diverticular disease, constipation, inflammatory bowel disease, pyelonephritis
Left iliac region	Diverticular disease, ovarian cyst, inflammatory bowel disease (ulcerative colitis), ectopic pregnancy
Suprapubic region	Urinary infection, urinary retention, testicular torsion, pelvic inflammatory disease
Right Iliac quadrant [change to region to make it consistent?]Yes	Appendicitis, inflammatory bowel disease (Crohn's), ovarian cyst, ectopic pregnancy
Right lumbar region	Kidney stones, pyelonephritis
Umbilical region	Early appendicitis, aortic dissection, abdominal aortic aneurysm, gastroenteritis.

*Note this list is not exhaustive and there may be other potential causes