

Chapter 6

Abdominal pain

Like thoracic pain, abdominal pain implicates a large number of organs and supporting structures that are capable of generating pain of different character. However in particular it is pain of colic nature that is the most common complaint due to the smooth muscle walls which are found throughout the GI tract

The viscera are only able to perceive limited types of sensations. The abdominal walls contain a large amount of stretch receptors; therefore any distension would generate pain. If the structure is significantly eroded to affect the adjacent connective tissues rather than just the parenchyma it will also generate pain. For instance, intra-hepatic lesions are insensitive to pain, but if a lesion has caused stretching of the fibrous capsule or affecting the biliary system then pain will result.

In order to formulate your differential diagnosis, when a patient presents with abdominal pain it is again essential to fully investigate all the circumstances which lead to the development of the patient's symptoms. Is the abdominal pain a cyclical event associated with eating and drinking habits, or completely independent? When abdominal pain ensues is it a prolonged event or short episodes? It is useful to identify these triggers or associated factors as it may provide you with valuable clues to the structures and mechanisms involved.

If the alimentary tract is implicated rather than accessory organs, then it is important to fully evaluate dietary and pharmacological/iatrogenic factors. For example, is it the types of food or drugs that may be acting as predisposing or maintaining factors to the patient's symptoms? Like thoracic pain, visceral pain will provide a diagnostic challenge especially to the inexperienced and non-specialist clinicians. Quite often in addition to physical examination a patient may need to undergo further diagnostic procedures to confirm or quantify the working diagnosis or in order to exclude a more serious pathology.

Unfortunately, many serious gastrointestinal pathologies remain asymptomatic until they are quite advanced; for example many types of malignancies will go on undetected until there is a significant influence on the structure and function of the affected region, or when adjacent areas have been invaded or infiltrated. Colorectal cancer may remain undetected until there is significant occlusion in the lumen of the large intestine, leading to changes in the patient's bowel habit. Similarly, stomach cancer may be picked up when a patient presents with hematological disturbances or in other instances the patient may complain of early satiety.

Another less sinister scenario is when a patient is not aware of the fact that he/she may have cholelithiasis until there is an obstruction to the common bile duct.

In many instances a patient will not present with 'a gastrointestinal condition', and it is your task to ascertain if their symptoms stem from this system or from organs or structures located in the same region. Abdominal pain may be associated with urinary or reproductive systems, or it may be as a result of a referral system.

Let us briefly review the nerve supply to this region to help us determine how pain may be generated and perceived. As with all viscera, this area is also supplied by the autonomic nervous system. In particular the pair of vagus nerves (CN X) which originate from the medulla oblongata and descend through the thorax to supply the gastrointestinal system until the middle of the transverse colon. This is a parasympathetic nerve with mostly efferent component, but also with a more recently appreciated afferent function as well. From the middle of the transverse colon until the rectum is supplied by the parasympathetics from the sacral nerve (S2-4). Sympathetic supply to the abdominal cavity in general originates from the mid to the lower thoracic regions forming extensive plexuses after synapsing in the coeliac, superior and inferior mesenteric ganglia. Although the visceral peritoneum is insensitive to pain, the parietal peritoneum is sensitive and pain is well localised. Somatic nerve supply to the parietal peritoneum and musculo-ligamentous structures of the abdominal wall are supplied from spinal segments T8-12.

Of particular importance to the referral of pain of abdominal structures is their position in relation to the peritoneum. Retroperitoneal structures will refer pain to the posterior abdominal wall (including the spine and muscles). The following tables detail the positions of the abdominal structures in relation to the peritoneum.

Intraperitoneal structures:

- Stomach
- First part of the duodenum
- Jejunum and ileum
- Colon and appendix
- Rectum (upper 1/3)
- The tail of the pancreas
- Liver
- Spleen
- Fallopian tubes
- Ovaries

Retroperitoneal structures:

- Kidneys and adrenal glands
- Ureters
- Urinary bladder
- Aorta and inferior vena cava
- The tail of the pancreas
- Oesophagus (part)
- Uterus
- Rectum (lower 1/3)

The nature of visceral pain

Smooth muscle is incapable of the rapid acute muscle spasms unlike that of striated muscle. Therefore any contraction of smooth muscle would be slow and progressive, as well as its relaxation phase, hence the characteristic description of colic pain.

Characteristics of Visceral Pain:

- Burning
- Deep
- Boring
- Aching
- Gnawing
- Vague
- Colic-like
- Gradual onset

Exercise:

List all the different structures which are capable of producing colic pain. Then describe the quality, intensity and distribution for each structure listed.

Abdominal pain differential diagnosis exercise 1
Attempt to identify the pathologies described for patients X & Y

Condition X

- Diarrhoea
- Constipation
- Fever
- Abdominal pain
- Rectal bleeding
- Night sweats
- Reduced appetite
- Skin lesions
- Uveitis
- Arthritis
- Migratory arthralgias

Answer: UC & Crohn's

Condition Y

- Painful abdominal cramps
- Constipation
- Diarrhoea
- Nausea
- Vomiting
- Anorexia
- Flatulence
- Foul breath
- Mucus in stools
- Bloating

Answer: IBS

Abdominal pain differential diagnosis exercise 2
Attempt to identify the pathologies described for patients X & Y

Condition X

- Epigastric pain
- 45-60 mins after meal
- Relieved by food, milk, antacids
- Radiating to the back
- Nausea
- Anorexia
- Weight loss
- Black tarry stools

Answer: Peptic ulcer

Condition Y

- Epigastric pain
- Radiating to the back
- Upper left lumbar region pain
- Constipation
- Flatulence
- Weight loss
- (Jaundice)
- (Nausea & vomiting)
- (Fever)

Answer: Pancreatitis (acute)

Symptom sorter for common abdominal conditions:

APPENDICITIS

Early symptoms:

- Periumbilical pain, colic in nature
- Low grade fever

Later symptoms:

- Pain in right iliac fossa
- Peritonitis and guarding
- Tachycardia
- Vomiting
- Frequency and dysuria
- Diarrhoea

CHOLECYSTITIS

- Tenderness and colic in the right hypochondrium
- Positive Murphy's sign
- Radiation of pain into right scapula region
- Intolerance to fatty foods
- Steatorrhoea
- Nausea and vomiting
- Jaundice and pruritis (if cholestasis)

DIVERTICULITIS

- Abdominal pain, usually colic in nature
- Pain in the left iliac fossa
- Mucus in stools
- Tender abdomen
- Nausea and vomiting
- Changes in bowel habit
- Fever (if inflamed)
- Occasional frank blood in stools

HEPATIC FAILURE

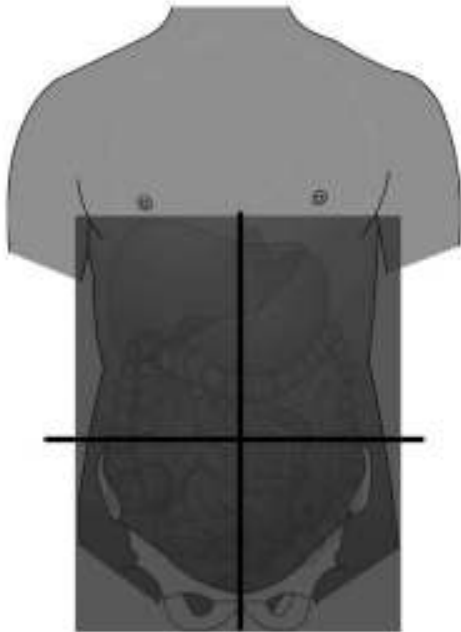
- Jaundice
- Oedema
- Haemorrhoids
- Hypoalbuminaemia
- Purpura and pruritis
- Epistaxis
- Melaena
- Spider naevi and caput medusae
- Palmar erythema
- Gynaecomastia and testicular atrophy
- Flapping tremor
- Confusion
- Coma

PAIN image

EXERCISE

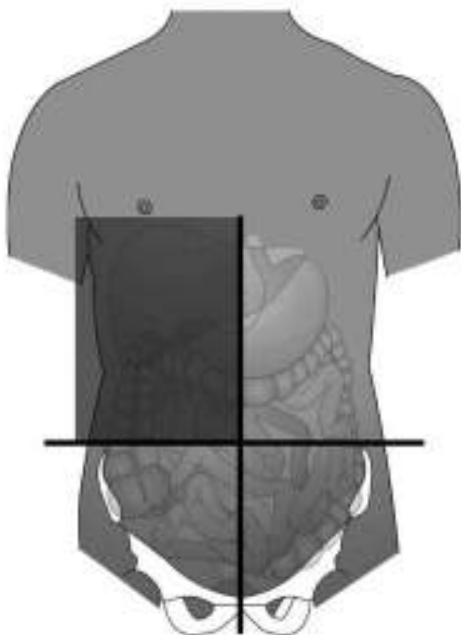
Identify some of the most likely causes of abdominal pain affecting the areas highlighted below.

Question sheet



Identify conditions that might produce diffuse/generalised abdominal pain.

- A
- B
- C
- D
- E
- F
- G
- H
- I
- J



Identify conditions that might produce abdominal pain in the right upper quadrant.

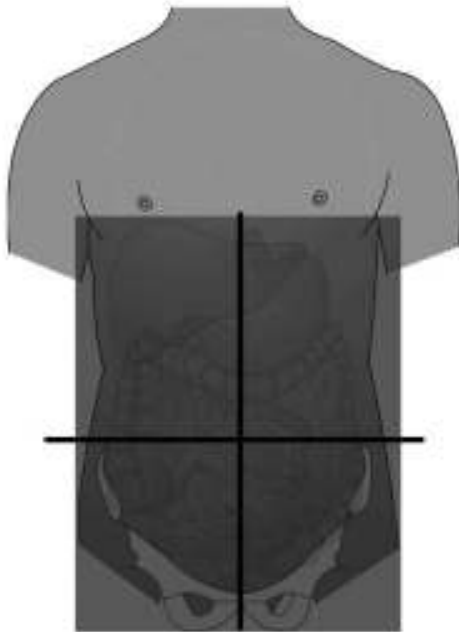
- A
- B
- C
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- I
- J

PAIN image

EXERCISE

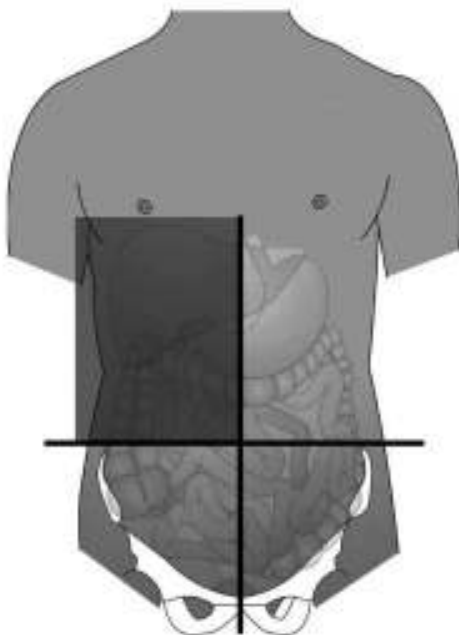
Identify some of the most likely causes of abdominal pain affecting the areas highlighted below.

Answer sheet



Identify conditions that might produce diffuse/generalised abdominal pain.

- A** Appendicitis & peritonitis
- B** Gastroenteritis
- C** Bowel obstruction
- D** Dysbiosis, metabolic, toxicity
- E** Mesenteric adenitis
- F** Constipation
- G** Pancreatitis
- H** Inflammatory bowel disease; Crohn's disease & ulcerative colitis
- I** Irritable bowel syndrome
- J** Abdominal aortic aneurism



Identify conditions that might produce abdominal pain in the right upper quadrant.

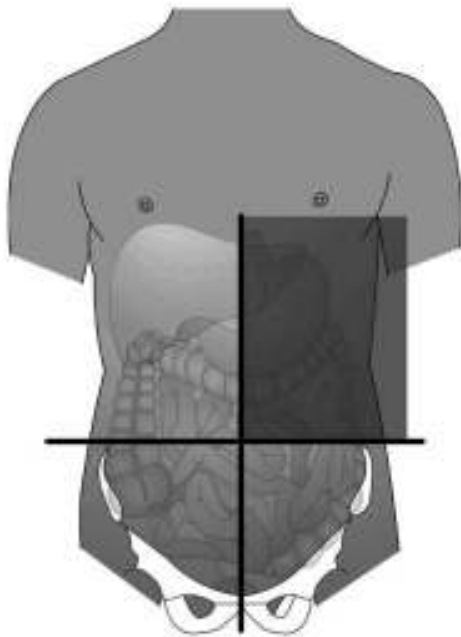
- A** Peptic ulcer
- B** Pneumonia
- C** Subphrenic/subhepatic abscesses
- D** Gall bladder and biliary tract
- E** Renal pain
- F** Hepatitis and hepatic abscess
- G** Referral from spine
- H** Pancreatitis
- I** Myocardial ischemia
- J** Herpes zoster

PAIN image

EXERCISE

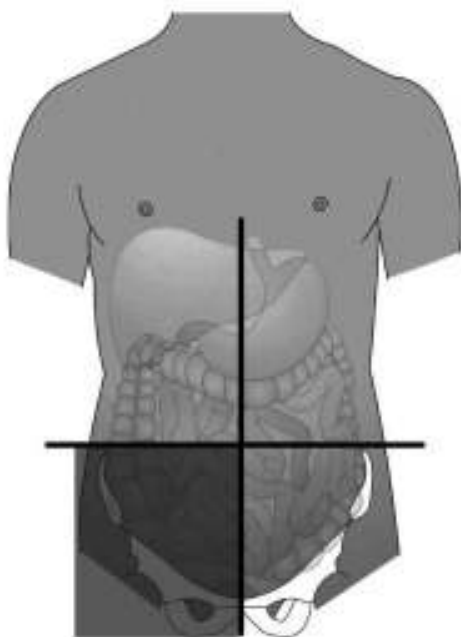
Identify some of the most likely causes of abdominal pain affecting the areas highlighted below.

Question sheet



Identify conditions that might produce abdominal pain in the left upper quadrant.

- A
- B
- C
- D
- E
- F
- G
- H
- I
- J



Identify conditions that might produce abdominal pain in the right lower quadrant.

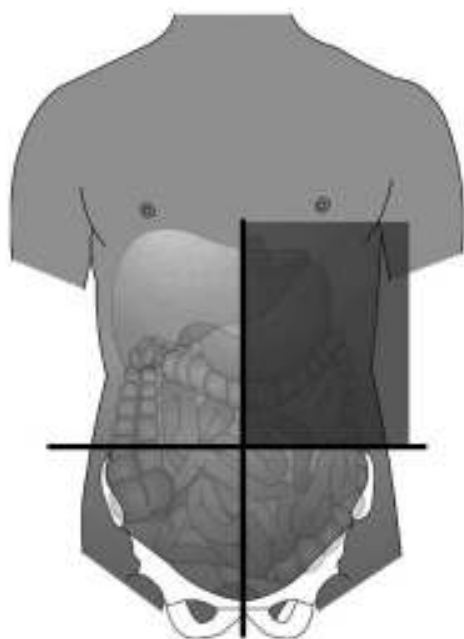
- A
- B
- C
- D
- E
- F
- G
- H
- I
- J

PAIN image

EXERCISE

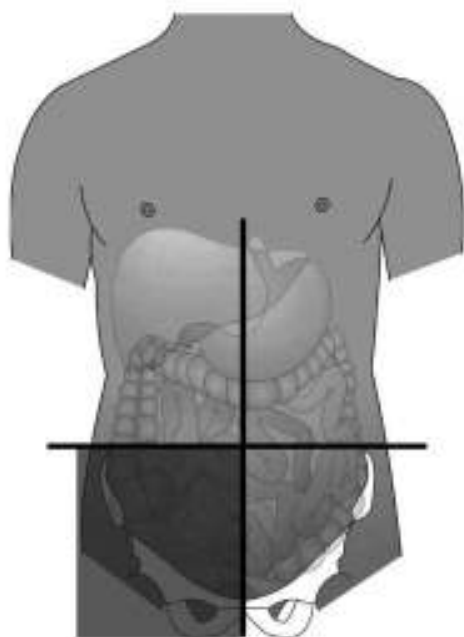
Identify some of the most likely causes of abdominal pain affecting the areas highlighted below.

Answer sheet



Identify conditions that might produce abdominal pain in the left upper quadrant.

- A** Peptic ulcer
- B** Gastritis
- C** Splenic diseases
- D** Pancreatitis
- E** Hiatus hernia
- F** Renal pain
- G** Pneumonia
- H** Spine and thorax lesions
- I** Myocardial ischemia
- J** Herpes zoster



Identify conditions that might produce abdominal pain in the right lower quadrant.

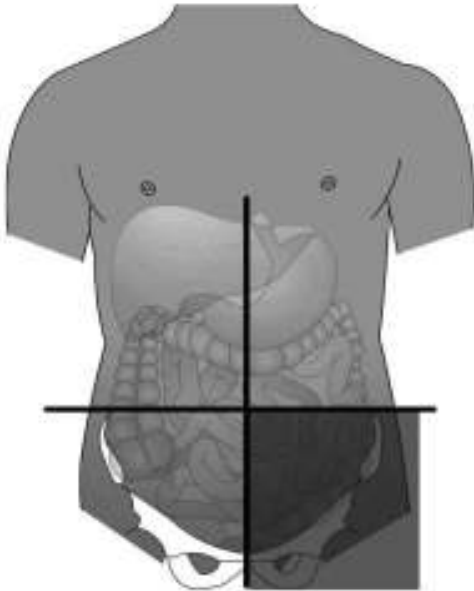
- A** Intestinal obstruction
- B** Renal pain
- C** Salpingitis
- D** Appendicitis
- E** Ectopic pregnancy
- F** Psoas abscess
- G** Diverticulitis
- H** Ovarian cyst or torsion
- I** Ureteral calculi
- J** Endometriosis

PAIN image

EXERCISE

Identify some of the most likely causes of abdominal pain affecting the areas highlighted below.

Question sheet



Identify conditions that might produce abdominal pain in the left lower quadrant.

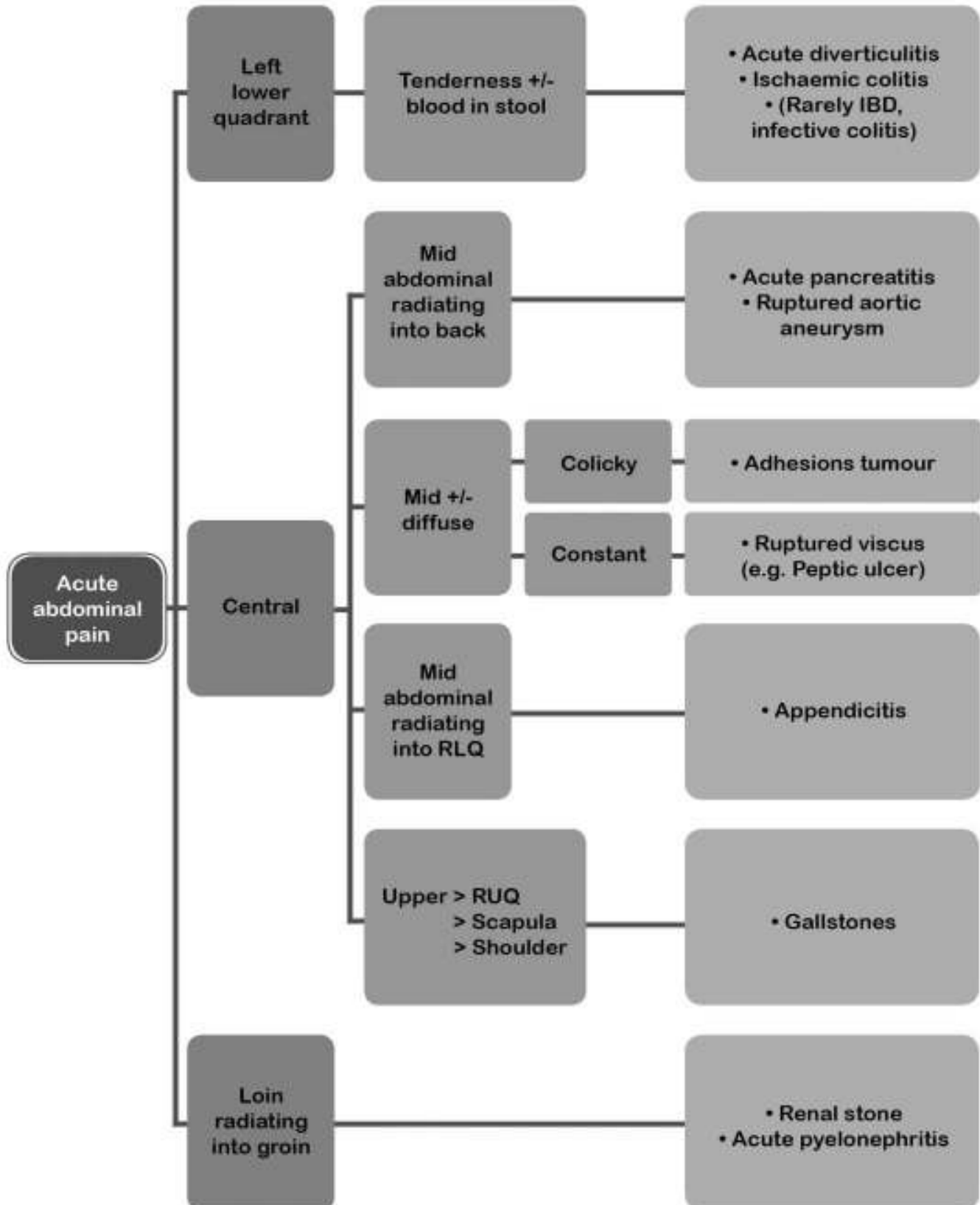
- A
- B
- C
- D
- E
- F
- G
- H
- I
- J

FLOW chart

EXERCISE

Fill the empty flow chart boxes.

Answer sheet

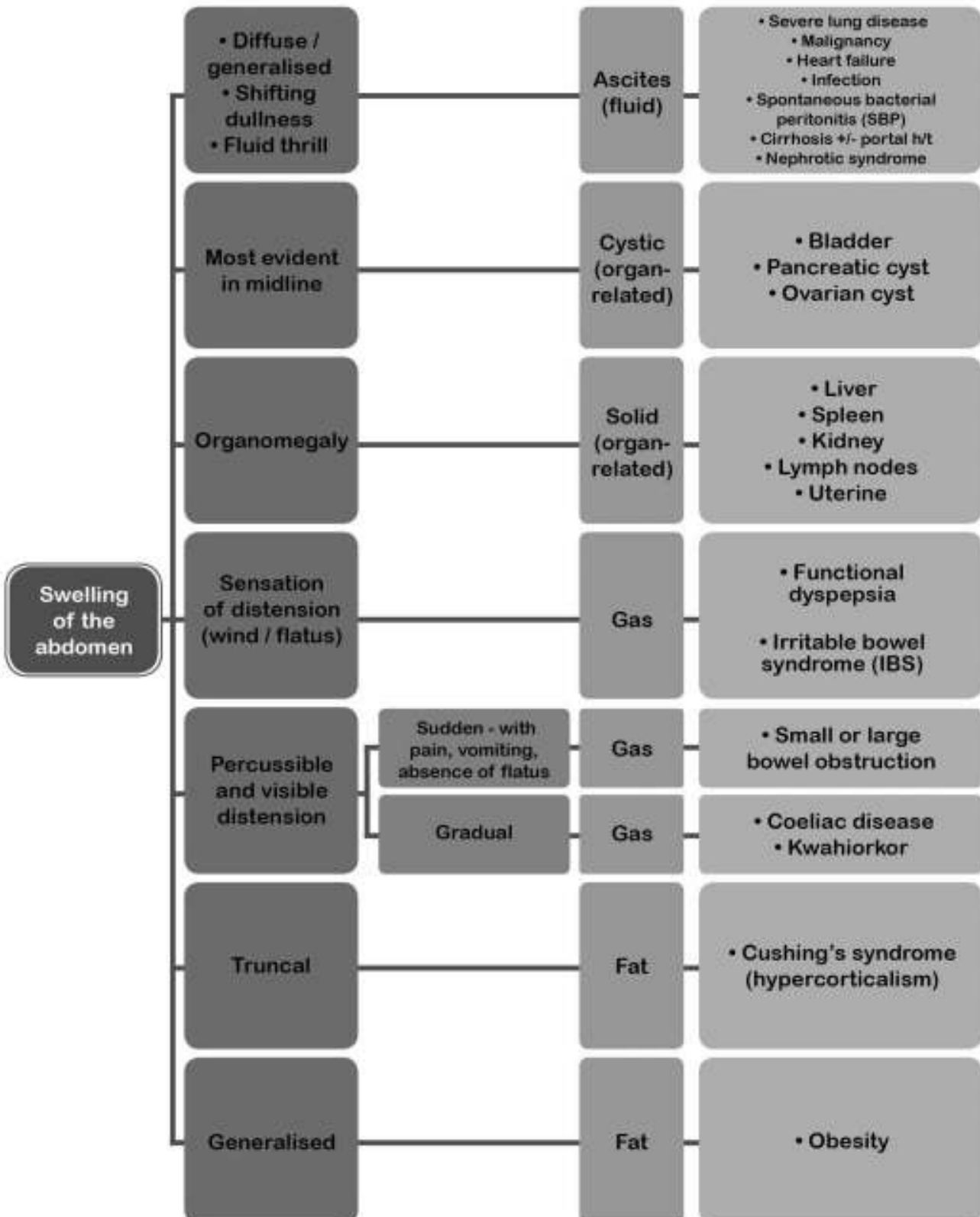


FLOW chart

EXERCISE

Fill the empty flow chart boxes.

Answer sheet

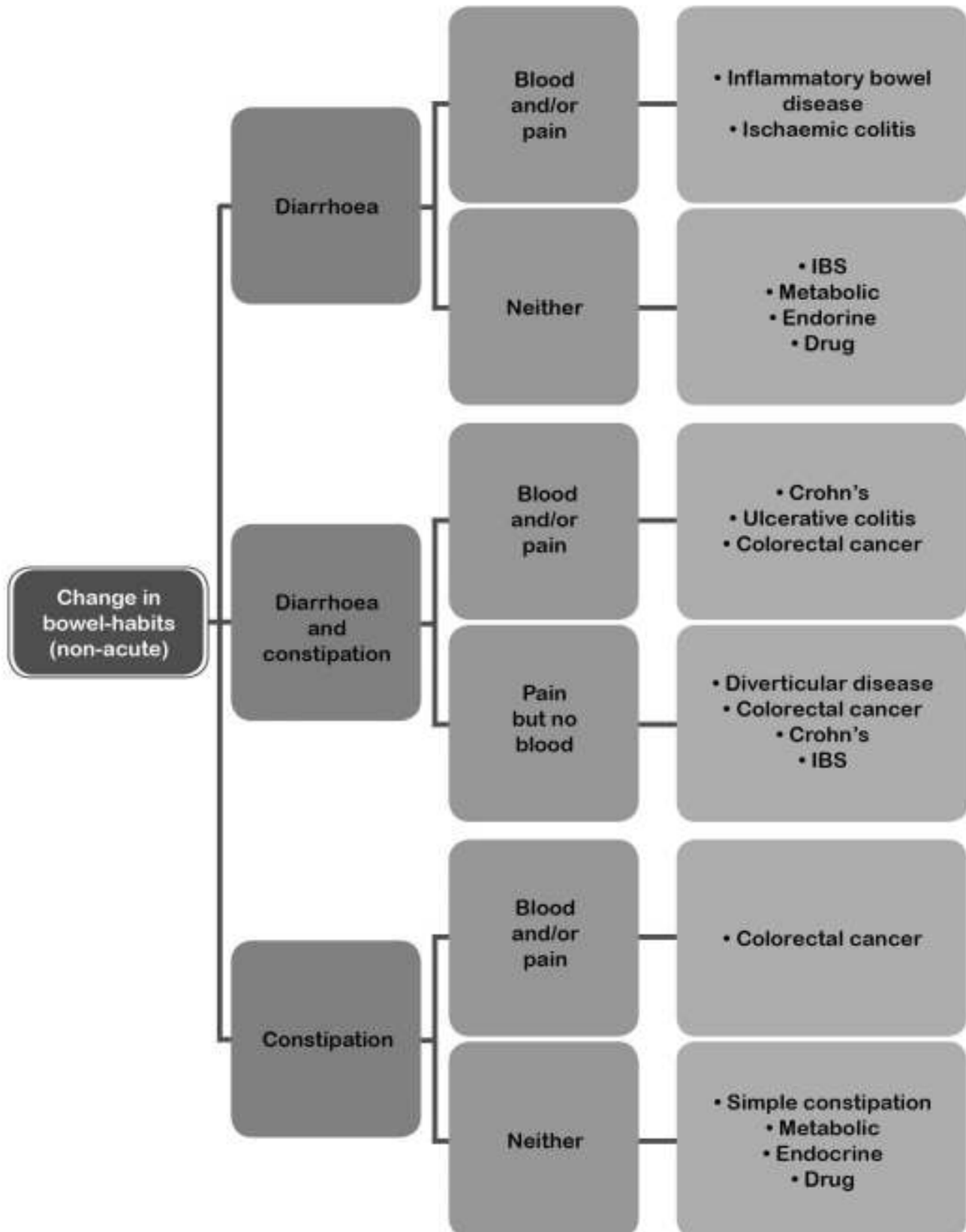


FLOW chart

EXERCISE

Fill the empty flow chart boxes.

Answer sheet



BOX chart

EXERCISE

Attempt to fill in the missing information using the guidelines provided in the completed box(es).

Question sheet

	CLINICAL FEATURES	EXAM FINDINGS	DIAGNOSIS
NAUSEA & VOMITING			• Pharmacological (drugs)
			• Otitis media / otitis interna / labyrinthitis
			• Pancreatitis
			• Cerebellar disease
			• Increased intracranial pressure
			• Food intolerances
			• Pyloric obstruction
			• Alcoholic intoxication

BOX chart

EXERCISE

Attempt to fill in the missing information using the guidelines provided in the completed box(es).

Question sheet

	CLINICAL FEATURES	EXAM FINDINGS	DIAGNOSIS
NAUSEA & VOMITING			<ul style="list-style-type: none"> • Morning sickness
			<ul style="list-style-type: none"> • Uraemia
			<ul style="list-style-type: none"> • Gastroenteritis & gastritis
			<ul style="list-style-type: none"> • Psycho-emotional
			<ul style="list-style-type: none"> • Oesophageal obstruction
			<ul style="list-style-type: none"> • Diabetic gastroparesis • Viral and bacterial infection
			<ul style="list-style-type: none"> • Metabolic causes
			<ul style="list-style-type: none"> • Others

PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Question sheet

STOMACH ULCER

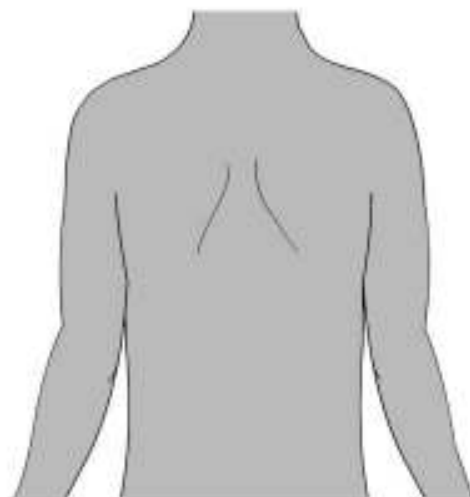
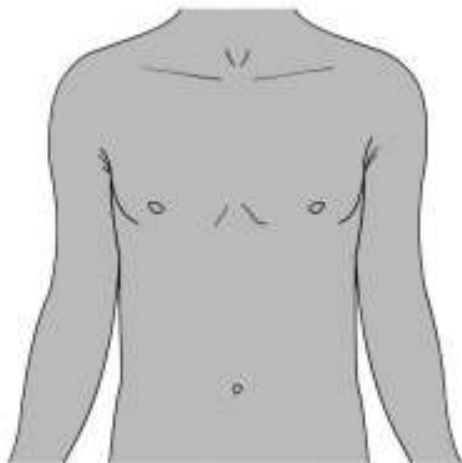
CHARACTERISTICS OF PAIN:

- | | |
|----------------|----------------|
| A | E |
| | |
| B | F |
| | |
| C | G |
| | |
| D | |
| | |

REFERRAL PATTERN:

- | |
|----------------|
| A |
| B |

DRAW ON THE REFERRAL PATTERN:



PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Answer sheet

STOMACH ULCER

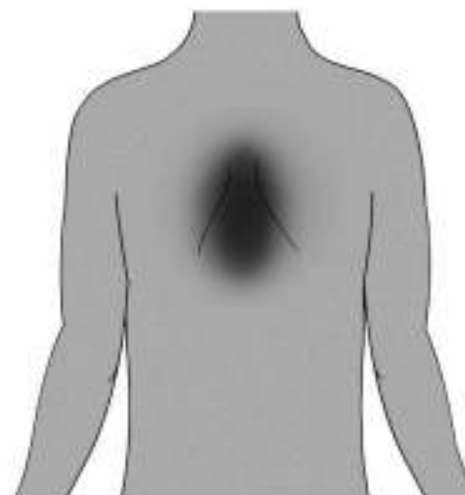
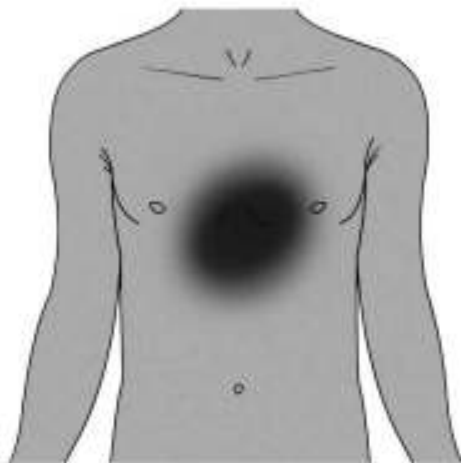
CHARACTERISTICS OF PAIN:

- | | |
|-------------------------------------------------------------|----------------------------------------------------|
| A Epigastric pain | E Relieved by vomiting and antacids |
| | |
| B Gnawing, aching and piercing | F Acidbrash, waterbrash and heartburn |
| | |
| C Can radiate to the back | G Cyclical pattern |
| | |
| D Triggered within less than an hour of eating | |
| | |

REFERRAL PATTERN:

- A** The epigastric region
- B** Mid thoracic spinal area and right shoulder

DRAW ON THE REFERRAL PATTERN:



PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Question sheet

PANCREATIC PAIN

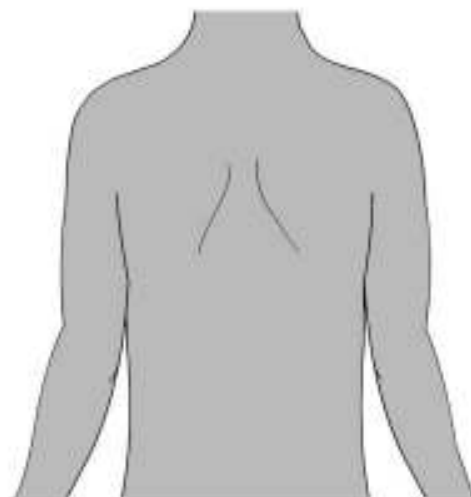
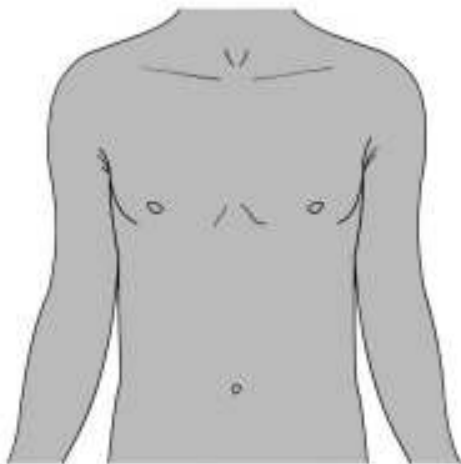
CHARACTERISTICS OF PAIN:

- A
-
- B
-
- C
-
- D
-

REFERRAL PATTERN:

- A
- B
- C

DRAW ON THE REFERRAL PATTERN:



PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Answer sheet

PANCREATIC PAIN

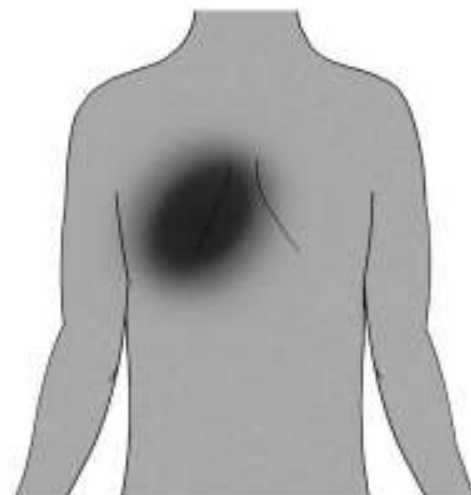
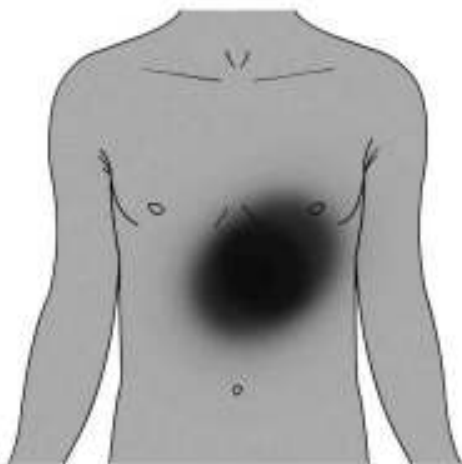
CHARACTERISTICS OF PAIN:

- A Epigastric pain
-
- B Gnawing or burning
-
- C Malabsorption and steatorrhoea
-
- D Nausea
-

REFERRAL PATTERN:

- A Epigastric
- B Mid thoracic spine
- C Left shoulder

DRAW ON THE REFERRAL PATTERN:



PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Question sheet

LIVER AND GALLBLADDER PAIN

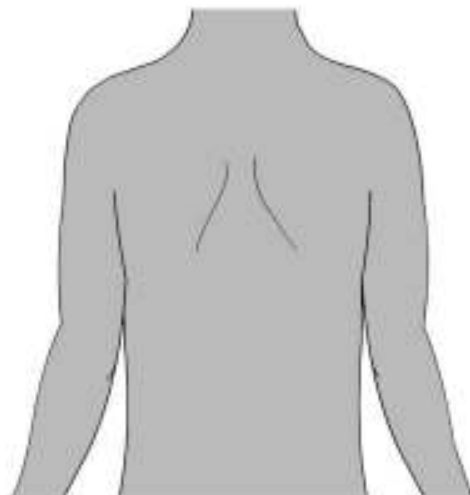
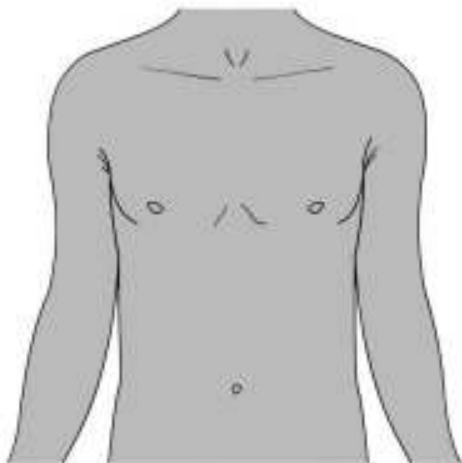
CHARACTERISTICS OF PAIN:

- A**
- B**
- C**
- D**
- E**

REFERRAL PATTERN:

- A**
- B**
- C**

DRAW ON THE REFERRAL PATTERN:



PAIN patterns

EXERCISE

Describe the nature of pain and general clinical features associated with the follow conditions.

Identify the distribution of pain and referral pattern produced.

Answer sheet

LIVER AND GALLBLADDER PAIN

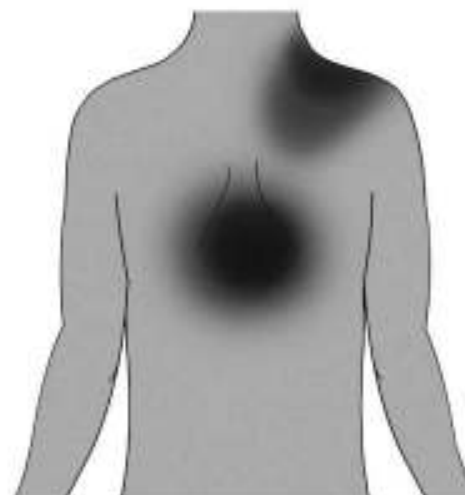
CHARACTERISTICS OF PAIN:

- A** Ache under right hypochondrium **E** Possibly steatorrhoea
-
- B** Tenderness on palpation of Murphy's point
-
- C** Low grade fever
-
- D** Possibly nausea and vomiting
-

REFERRAL PATTERN:

- A** Right shoulders
- B** Right scapula
- C** Upper thoracic spine

DRAW ON THE REFERRAL PATTERN:



Case history: Abdominal pain

A 64-year-old married social worker went to his doctor complaining of “tummy pain, indigestion and loss of appetite”. On questioning he said that the feeling of “indigestion or tummy pain” has been going on for several years but lately has become more persistent. Even small meals made him feel bloated and uncomfortable. He said that he found some relief by drinking milk, yogurts and sucking antacid tablets. His weight has decreased from 85 KG to 63 KG over the last year. When asked about his bowel habits he said that he fluctuated from constipation to diarrhoea. He also noted that his stools were quite dark and often offensively smelly. He said that his energy level is a bit down but he attributed this to his stressful job.

Previous medical history showed that he suffers from aches and pains in his joints, especially his knees and shoulders. He has been taking over-the-counter tablets to obtain relief from these symptoms. However, he discovered that lately his stomach couldn't tolerate them any more. He has been a smoker since 17 years of age and currently smokes about 15 cigarettes per day. He also drinks about 2-5 units of alcohol per day, usually whisky. His diet consists of white toast and jam in the morning with tea. Lunchtime usually is a sandwich and dinner varies but mostly jacket potatoes, pasta, cold meats, and a takeaway once a week usually a pizza, Chinese or Indian meal. He said that in the last year his stomach did not tolerate green vegetables or rich oily foods.

On examination the patient appeared unwell and pale. His blood pressure was 135/85, pulse rate 85 and regular. He appeared to have a tremor in his hands. His conjunctivae were a little pale.

QUESTIONS:

Q1. Discuss the differential diagnosis and provide reasons for the following symptoms:

- a) His abdominal symptoms.
- b) The alternating bowel habit.
- c) The dark stools.

Q2. What is/are the most probable diagnosis/ses and why?

Q3. What further tests and investigations could you perform or refer the patient to undergo?

Q4. What medication do you think he has been taking to help his aches and pains and what is the relevance of this in view of his condition?

Q5. Pain from internal organs can radiate to specific regions. For the following organs state the most likely area where pain would radiate.

- 1) Heart.
- 2) Gallbladder.
- 3) Stomach.

References, Bibliography and Recommended reading

Jamison J R (2007), Differential Diagnosis for primary Practice, 2nd edn., Churchill Livingstone. (ISBN-13: 978-0443102875)

Goodman C G, Snyder T K (2007), Differential Diagnosis for Physical Therapists: Screening for Referral, 4th edn, Saunders. (ISBN: 978-0721606194)

Seller R H, Differential Diagnosis of Common Complaints, Saunders, 3rd edn, 1996 ISBN: 978-1416029069

Beck R, et al (2003), Tutorials in Differential Diagnosis, 4th edn., Churchill Livingstone. ISBN: 978-04430615-7-8

DVD-VIDEO recordings

Syrimis A (2007), Clinical Examinations DVDs, Bloomsbury Educational Ltd,

ISBNs:

- Respiratory system examination: 978-0-9551291-0-0
- General system examination: 978-0-9551291-1-7
- Cardiovascular system examination: 978-0-9551291-2-4
- Abdominal system examination: 978-0-9551291-3-1
- Peripheral nervous system examination: 978-0-9551291-4-8
- Cranial nerves examination: 978-0-9551291-5-5
- Musculoskeletal examination: 978-0-9551291-6-2
- Case History Taking: 978-0-9551291-7-9
- Clinical Examinations: Complete DVD series: 978-0-9551291-9-3

<http://www.clinicalexams.co.uk/student-resources-section.htm>

(For additional lecture notes, Q&As and images, Username & Password provided in class)

Boon N A, Colledge N R, Walker, B & Hunter J A A (2006), Davidson's Principles and Practice of Medicine, 20th Edition, Churchill Livingstone ISBN: 978-0-4430703-5-8

Bickley, L. S.; Szilagyi, P. G.; 2003; ***Bates' Guide to Physical Examination and History Taking***; (8th Ed); Lippincott; New York.

Epstein, O.; et al.; 1997; *Clinical Examination*; (2nd Ed.); Mosby; London. (similar to Bates but presents the information in a different but equally good way. Some very good photographs and is user friendly).

Marsh J; 1999 *History and Examination*; Mosby London. (a great 'crash course' book with sample questions. Very user friendly. I recommend it).

Forbes, C. D.; Jackson, W. F.; 1998; *Color Atlas and Test of Clinical Medicine*; (2nd Ed.); Mosby; London. Excellent reference book for photographs of various pathologies.

Haslett, C.; et al.; 1999; *Davidson's Principles and Practice of Medicine*; (18th Ed.); Churchill Livingstone; Edinburgh. (Use to put your clinical findings into context of general medicine).

Bradley J, Rubenstein D, Wayne D, The Clinical Manual, Blackwell Scientific publications. ISBN 0-632-03312-6. This is another very good pocket size book but you may have to order it. I find this book very useful because it also had a summary of the main pathologies and their signs and symptoms.