

Clinical Pharmacy

Lec. 2

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Gastrointestinal Conditions: Diarrhea, Heart burn and indigestion, and IBS

Diarrhea

1-Diarrhea is an increased frequency of bowel evacuation with the passage of abnormally soft or watery stools ⁽¹⁾. Although the normal frequency of bowel movements varies with each individual, more than three bowel movements per day are considered abnormal ⁽²⁾.

2-Diarrhea may be **acute** (less than 14 days duration), **persistent** (14 days to 4 weeks duration), or **chronic** in nature (more than 4 weeks). Chronic and persistent diarrheal illnesses are often secondary to other chronic medical conditions (or treatments) and need medical care ⁽²⁾.

Causes

1-Acute diarrhea (infective diarrhea, gastroenteritis):

The most common causes of acute diarrhea are bacterial and viral infection and food toxins ⁽³⁾.

Viral: Rotavirus responsible for causing severe diarrhea in infants and children and **the most common cause of gastroenteritis among children worldwide** ⁽³⁾.

Rotavirus tends to be a seasonal infection, with peaks of gastroenteritis occurring between November and February. It is spread by the fecal-oral route ⁽²⁾. Associated symptoms are those of a cold and perhaps a cough. The infection starts abruptly and vomiting often precedes diarrhea. ⁽¹⁾. Whilst in the majority the infection is usually not too severe and is self-limiting, it should be remembered that rotavirus infection can cause death. This is most likely in those infants already malnourished and living in poor social circumstances who have not been breastfed ⁽¹⁾.

Note: vaccine is available to protect against rotavirus ⁽³⁾.

Bacterial: These are *the food-borne infections* (previously known as food poisoning). There are several different types of bacteria that can cause such infections: *Salmonella*, *Shigella*, pathogenic *Escherichia coli*,..... . The typical symptoms include severe diarrhea and/or vomiting, with or without abdominal pain ⁽¹⁾.

Antibiotics are generally unnecessary as most food-borne infections resolve spontaneously. The most important treatment is adequate fluid replacement. Antibiotics are used (by prescription only) for *Shigella* infections and the more severe *Salmonella*. *Ciprofloxacin* (by prescription) may be used in such circumstances ⁽¹⁾.

Protozoan: Examples include *Entamoeba histolytica* (amoebic dysentery) and *Giardia lamblia* (giardiasis). Diagnosis is made by sending stool samples to the laboratory ⁽¹⁾.

2-Chronic diarrhea:

There are several causes and chronic diarrhea requires medical investigation. Causes include: **Irritable-bowel syndrome (IBS)**, inflammatory bowel disease (**Crohn's disease, ulcerative colitis**), malabsorption syndromes (such as **celiac disease**).....⁽⁴⁾.

Patient assessment with diarrhea

A-Age

Infants (<1 years) and elderly patients are especially at risk of becoming **dehydrated** ⁽¹⁾. In newborn, water comprise up to 75% of total body weight. After 8-10 bowel movements within 24 hours period, a 2-month-old infant could lose enough fluid to cause circulatory collapse *and renal failure* ⁽²⁾.

B-Duration

Diarrhea of >1 day duration in children <1 year required referral ⁽⁴⁾.
(but in babies under 3 months: refer immediately)⁽⁴⁾.

Diarrhea of >2 days duration in children <3 years and elderly patients required referral ⁽⁴⁾.

Diarrhea of >3 days duration in older children and adults required referral ⁽⁴⁾.

Diarrhea of more than 24 hours in people with **diabetes** required referral ⁽⁴⁾.

C-Severity

Severe diarrhea (passing 6 or more unformed stool in 24 hours) **required referral** ⁽²⁾.

D-Periodicity

A history of recurrent diarrhea of no known cause -----should be referred for further investigations ⁽⁵⁾.

E-Associated symptoms

The presence of **blood** or **mucus** in the stools is an indication for referral for further investigations ⁽¹⁾.

Diarrhea with severe **vomiting** or with **high fever** required referral for further investigations ⁽¹⁾.

Diarrhea with **severe abdominal pain** required referral for further investigations ⁽⁵⁾.

F-Recent travel abroad

Diarrhea in patient who has **recently travelled** abroad requires referral since it may be infective in origin (**Traveler's diarrhea**) ⁽¹⁾.

G-Signs of dehydration ⁽³⁾

Patient with signs or symptoms of debilitating dehydration required referral (table1-5).

children	adults
Dry mouth, tongue and skin Fewer or no tears when crying Decreased urination (less than 4 wet diapers in 24 hours) Sunken eye, cheeks or abdomen sunken fontanel decreased skin turgor irritability or listlessness	Increased thirst Decreased urination Feeling weak or lightheaded Dry mouth/ tongue

H-Medication ⁽¹⁾

Medicines already tried: The pharmacist should establish the identity of any medication that has already been taken to treat the symptoms in order to assess its appropriateness.

Other medicines being taken:

Details of any other medication being taken (both OTC and prescribed) are also needed, as the diarrhea may be **drug induced** (Table 1-6).

Table1-6: Some drugs that may cause diarrhea ⁽¹⁾.

Antacids: <i>Magnesium salts</i>
Antibiotics
Antihypertensives: <i>methyldopa</i> ; beta-blockers (rare)
Digoxin (toxic levels)
Diuretics (<i>furosemide</i>)
Iron preparations
Laxatives
Misoprostol
Non-steroidal anti-inflammatory drugs
Selective serotonin reuptake inhibitors

Treatment timescale

One day in children, otherwise 2 days ⁽¹⁾.

Management**A-Advices for patients suffering from diarrhea** ⁽⁴⁾

1-Drink **plenty of clear fluids**, such as water.

2-**Avoid drinks high in sugar** as these can prolong diarrhea.

3-**Avoid milk** and milky drinks, as a temporary lactose intolerance occurs due to damage done by infecting organisms to the cells lining the intestine, making diarrhoea worse.

4-**Babies should continue to be fed as normal**, whether by breast or bottle.

B-Oral rehydration therapy

1-The risk of dehydration from diarrhea is greatest in babies, and **rehydration therapy** is considered to be the standard treatment for acute diarrhea in babies and young children ⁽¹⁾.

2-Oral rehydration sachets may be used **with antidiarrheals** in older children and adults ⁽¹⁾.

3-Rehydration may still be **initiated even if referral** to the doctor is advised ⁽¹⁾.

A premixed solutions ⁽²⁾ or Sachets of powder for reconstitution are available; these contain sodium as chloride and bicarbonate, glucose and potassium. The absorption of sodium is facilitated in the presence of glucose ⁽¹⁾.

4-Table1-7 provides the volumes required per watery stool ⁽¹⁾.

5-Reconstitution of ORS: Only water should be used to make the solution and that boiled and cooled water should be used for children < 1 year ⁽¹⁾.

6-Stability of ORS after reconstitution: To avoid risk of possible exposure to further infection, the solution should be discarded not later than 1hour after reconstitution, or it may be kept for up to 24 hours if stored in a refrigerator. ⁽⁹⁾.

7- If the child is **vomiting**, give 1 teaspoon of ORS every few minutes ⁽²⁾.

Table1-7:Amount of rehydration solution to be offered to patients. ⁽¹⁾.

Age	Quantity of solution (per watery stool)
Under 1 year)	50 mL (quarter of a glass)
1–5 years	100 mL (half a glass)
6–12 years	200 mL (one glass)
Adult	400 mL (two glasses)

C-Antimotility Drugs:

1-Loperamide, and Co-phenotrope (Diphenoxylate+Atropine) [Atropine is included at a subtherapeutic dose **to discourage abuse** (unpleasant antimuscarinic effects will be experienced if higher than recommended doses are taken)] ⁽⁴⁾.

2-Loperamide is considered an OTC drug only for patient of > 12 years old ⁽¹⁾.

Adult dose: Initially 2 tablets (4 mg) followed by 1 tablet (2 mg) after each loose stool (max. 8 tablets / day) ⁽⁶⁾.

3-Co-phenotrope is considered an OTC drug only for patient of > 16 years old ^(1,6).

B-Adult doses: 4 tablets initially followed by 2 tablets every 6 hours ⁽⁶⁾.

D-Adsorbents: Like Pectokaolin® (pectin +kaolin)

Adsorbents such as kaolin **are not recommended for acute diarrheas** ⁽⁶⁾.

Extra-Notes:

A-Probiotics (dietary supplement): Probiotics are dietary supplements containing bacteria (including several *Lactobacillus* species) that may promote health by enhancing the normal microflora of the GI tract while resisting colonization by potential pathogens ⁽⁷⁾. Probiotics have been shown to **decrease the duration of infectious and antibiotic-induced diarrhea** (AAD) in adults and children (however; the use of probiotics to treat and prevent AAD is **controversial** ⁽⁸⁾.

B-Use of zinc in children with diarrhea: Several large studies performed in **developing countries** have shown that daily zinc supplementation in young children with acute diarrhea reduces both the **duration** and **severity** of diarrhea ^(2, 3). The **WHO/UNICEF** recommends that children with acute diarrhea also receive zinc (10 mg

4th stage 1st semester
of elemental zinc/day for infants younger than 6 months; 20 mg of elemental zinc/day for older infants and children) for 10 to 14 days ^(2, 3).

References

- 1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 8th edition. 2018.
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Irritable Bowel Syndrome (IBS)

1-Irritable Bowel Syndrome is defined as: a functional bowel disorder in which **abdominal pain** is associated with **abdominal distention** and a **change in bowel habit** (diarrhea and constipation may occur; sometimes they alternate) ^(1, 2).

2-The two main classifications of IBS are IBS with constipation predominant (**IBS-C**) and IBS with diarrhea predominant (**IBS-D**). Some patients may also have IBS with alternating diarrhea and constipation (**IBS-A**) ⁽³⁾.

Adult prevalence rates in Western countries are reported to be between 10% and 20%, with approximately twice as many women than men affected ⁽²⁾.

3-The cause is unknown ⁽¹⁾. Some possible causes include genetic mutations, abnormal GI motility, enhanced gut pain sensation (visceral hypersensitivity), or psychological changes. Most likely a **combination of these factors leads to IBS** ⁽³⁾.

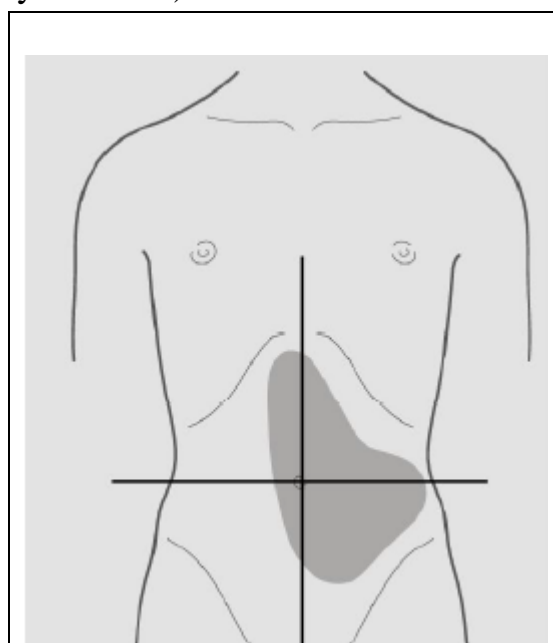


Figure1-9: The position of pain associated with irritable bowel syndrome ⁽²⁾.

Patient assessment with IBS

A-Age:

Because of the difficulties in the diagnosis of abdominal pain in children ⁽¹⁾, it is best to refer children *less than 16 years* ⁽²⁾.

IBS often develop in young adult life ⁽¹⁾. **If an older** (above 45⁽²⁾) **person presenting with for the first time with no previous history of bowel problems, referral should be made** ⁽¹⁾.

B-Symptoms:

IBS has three Key symptoms: **abdominal pain, abdominal distention/bloating and disturbance of bowel habit** ⁽¹⁾.

1-Abdominal pain: The pain can occur anywhere in the abdomen. It is often central or left sided and can be severe ⁽¹⁾ (pain normally located in the **left lower quadrant**) (figure1-9) ⁽²⁾.

The site of pain can vary from person to person and even for an individual ⁽¹⁾. Sometimes the pain comes on after eating and can be relieved by defecation ⁽¹⁾ or the passage of wind ⁽²⁾.

2-Bloating: A sensation of **bloating** is commonly reported. Sometimes it is so severe that clothes have to be loosened ⁽¹⁾.

3-Bowel habit: Diarrhea and constipation may occur; sometimes they alternate. A **morning rush** is common, where the patient feels an urgent desire to defecate several times after getting up in the morning and following breakfast, after which the bowel may settle. There, may be a feeling of incomplete emptying after a bowel movement. The motion is often described as loose and **semiformed** rather than watery. Sometimes it is like pellets or rabbit dropping, or pencil shaped. There may be a mucus but **never blood** ⁽¹⁾.

4-Other symptoms: Some patients may also complain of nausea, and other unrelated symptoms such as: backache, feeling tired, urinary urgency, and the need to pass urine during the night.

Patient with **unexplained weight loss**, or with **signs of bowel obstruction** (like vomiting) required referral for further investigation ⁽¹⁾.

C-Periodicity:

IBS tend to be episodic. The patient might have a history of being well for a number of weeks or months in between bouts of symptoms ⁽²⁾.

D-Previous history:

To know whether the patient has consulted the Dr. about the symptoms and if so, what they were told. Any history of **previous bowel surgery** would suggest a need for referral ⁽¹⁾.

When to refer ^(1, 2)

- Children
- Older person with no previous history of IBS
- Pregnant women
- Blood in stools
- Unexplained weight loss
- Caution in patients aged over 45 years with changed bowel habit
- Signs of bowel obstruction
- Unresponsive to appropriate treatment
- Fever .

E-Aggravating factors:

Stress appears to play an important role and can precipitate and exacerbate symptoms. Also some types of food may aggravate IBS ⁽¹⁾.

F-Pregnant women: required referral for further investigation ⁽¹⁾.

G-Medication ⁽¹⁾:

To know:

- 1-What had been tried to treat the condition and whether it produced an improvement. (Unresponsive to appropriate treatment required referral).
- 2-Other medicines (IBS is associated with depression and anxiety in many patients).

Treatment timescaleSymptoms should start to improve within a **week** ⁽¹⁾.**Management****A-Diet:**

Patient with IBS should follow the recommendation for a healthy diet (**low fat, low sugar, high fiber**). In addition patient should avoid any food **they know to exacerbate their symptoms** ⁽¹⁾. Various foods such as beans, and fatty meals, and gas-producing foods such as legumes, may aggravate symptoms in some patients. This has led many patients to exclude these suspected aggravating foods from their diet although the effectiveness of such practices remains controversial ⁽³⁾.

B-Antispasmodics:

Antispasmodics (table1-14) ⁽²⁾ **are the main stay of OTC treatment of IBS.** They work by a direct effect on the smooth muscle of the gut, causing relaxation and thus reducing abdominal pain. The patient should see an improvement within a few days of starting treatment ⁽¹⁾.

1-Mebeverine: It is given in a dose of 135 mg (1 tablet) three times a day, preferably **20 minutes before meals** ⁽¹⁾.

2-Alverine citrate: Alverine citrate is given in a dose of 60–120 mg (one or two capsules) up to three times a day ⁽¹⁾.

3-Pippermint oil capsules: Capsules containing 0.2 mL of the oil are taken in a dose of one or two capsules three times a day, 15–30 min before meals ⁽¹⁾.

4-Hyoscine butylbromide: The recommended dose for adult is one tablet(10 mg) three times a day , although this can be increased to two tablets four a day if necessary ⁽²⁾.

Name of medicine	Likely side effects	Drug interactions of note	Patients in which care is exercised
Hyoscine	Constipation and dry mouth	Tricyclic antidepressants, neuroleptics, antihistamines and	Glaucoma, myasthenia gravis and prostate enlargement

		disopyramide	
Mebeverine	None	None	None
Peppermint oil	Heartburn	None	None
Alverine	Rash	None	None

C-Laxatives and antidiarrheals:

1-In addition, Bulk-forming and stimulant laxatives can be used to treat constipation predominant (IBS-C) ⁽²⁾. Insoluble fiber (e.g. bran) may exacerbate symptoms and its use should be discouraged ⁽⁴⁾.

2-Use of OTC antidiarrheals such as **loperamide** is appropriate only on an occasional, short-term basis ⁽¹⁾.

D-Compound preparations:

Bulking agents are also available in combination with antispasmodics ⁽¹⁾.

e.g. **Fybogel® Mebeverine**: effervescent Granules (in sachets), contain ispaghula husk (Bulk-forming laxatives) and mebeverine hydrochloride ⁽⁴⁾.

Dose: 1 sachet in water, morning and evening 30 minutes before food; an additional sachet may also be taken before the midday meal if necessary ⁽⁴⁾.

E-Probiotics:

Probiotics such as *lactobacillus* and *Bifidobacterium* have also been promoted for IBS. The studies showed that probiotics appear to be effective however the size of the effect need to be established ⁽²⁾.

References:

1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 8th edition. 2018.

2-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 5th edition. 2021.

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Heartburn

Background

1-Gastro-esophageal reflux disease (GERD), also known as reflux esophagitis, and commonly called heartburn ⁽¹⁾. Symptoms of heartburn are caused when there **is reflux of gastric contents**, particularly acid, into the esophagus, which irritate the mucosal surface ⁽²⁾.

2-Unlike the stomach lining, the esophageal mucosa has no protection against gastric acid and readily irritated by acid) ^(1, 2).

Patient assessment with GERD

A-Signs and symptoms

Heartburn is a common symptom of GERD ⁽³⁾ which is described as:

A burning sensation or pain experienced in the upper part of the stomach ⁽²⁾ (i.e. the lower chest ⁽³⁾) in the Medline (epigastrium) ⁽²⁾.

The burning feeling tends to move upwards behind the breastbone . The pain may be felt only in the lower area or may be felt right up to the throat causing an acid taste in the mouth ⁽²⁾. (Figure1-3)⁽⁴⁾.

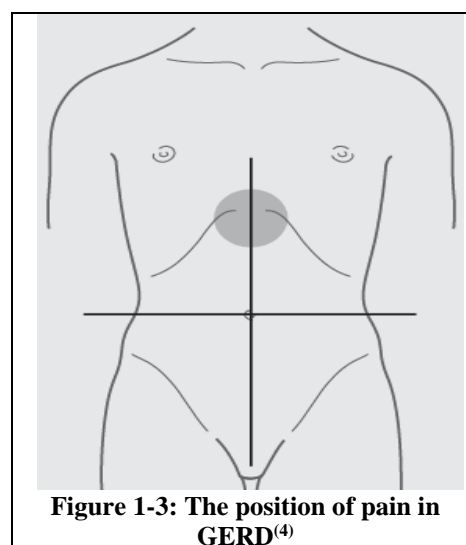


Figure 1-3: The position of pain in GERD⁽⁴⁾

B-Precipitating or aggravating factors.

Diagnosis of GERD can be helped greatly by asking about the Precipitating factors. These are ⁽²⁾:

- A-Bending **or lying down**.
- B-**Overweight**.
- C-After **large meal**.
- D-**Pregnancy**(mechanical and hormonal influence).
- E-It can be aggravated or even caused by **belching**.

C-Severity and location of pain:

Patient who have **severe pain** should be referred ⁽³⁾ as well as pain that radiate to the back and arm (possible heart attack) ⁽²⁾.

D-Difficulty in swallowing and regurgitation:

The sensation that food sticks as it is swallowed or it does not seem to pass directly into the stomach (**dysphagia**) is an indication for immediate referral.(It may be due to obstruction of the esophagus for e.g. by tumor). **Regurgitation** can be associated with difficulty in swallowing. It occurs when recently eaten food sticks in the esophagus and is regurgitated without passing into the stomach. This is due to a mechanical blockage in the esophagus and required referral ⁽²⁾.

E-Age:

Heartburn is not normally experienced in childhood; therefore, **children** with symptoms of heartburn should be referred for further investigations ⁽²⁾.

F-Medication: To know:

1-What had been tried to treat the condition (**failed medication** required referral) ⁽²⁾.

2-The use of **some drugs may cause GERD** and may also lead to an increase in existing GERD symptoms and signs. The mechanisms by which drugs cause reflux include a reduction in lower esophageal sphincter pressure (LESP) and delayed gastric emptying; drugs may also directly cause GERD by causing damage or inflammation in the esophageal mucosa (**Figure1-4**) ⁽⁵⁾.

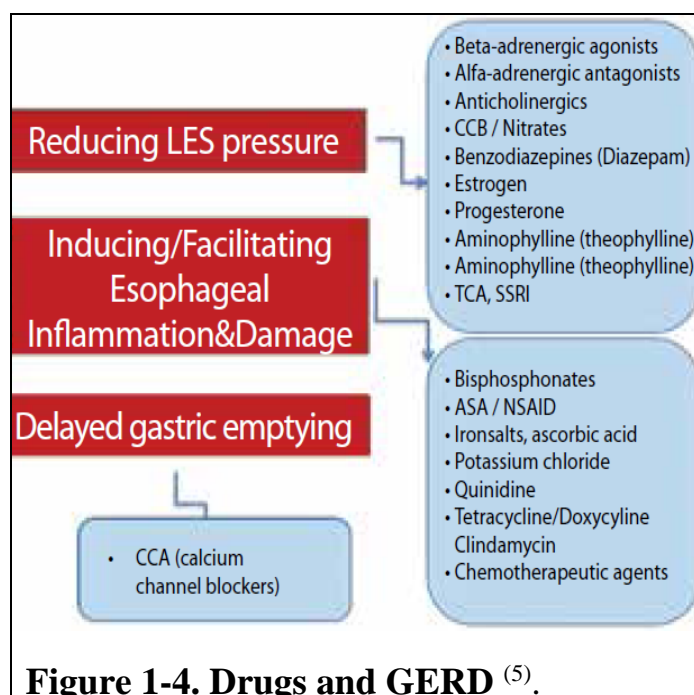


Figure 1-4. Drugs and GERD ⁽⁵⁾.

Treatment timescale

If symptoms have not responded to treatment **after 1 week** the patient should see a doctor ⁽²⁾.

Management:**Non-pharmacological advices:**

1-Eat **small and frequent meals** (to avoid distending the stomach) ⁽²⁾.

2-The **evening meal is best taken several hours before going to bed** ⁽²⁾ (Avoid lying down within 3 hours of a meal ⁽³⁾).

3-Use **extra pillow** to elevate the head of the bed ⁽²⁾. [using **GERD pillow** since the use of traditional pillows may worsen symptoms because they cause the individual to bend at the waist, which contributes to an increase in intragastric pressure] ⁽³⁾. (Using extra pillows is not as effective as raising the head of the bed. The reason for this is that using extra pillows raises only the upper part of the body, with bending at the waist, which can **result in increased pressure on the stomach contents**) ⁽²⁾.

4- **Wear loose fitting clothing** ⁽³⁾. (Tight, constricting clothing, especially waistbands and belts, can be an aggravating factor and should be avoided) ⁽²⁾.

5-**Avoid smoking** and foods that exacerbate symptoms of GERD. If alcohol or caffeine consumption is a contributing factor individuals should be advised to limit or discontinue use ⁽³⁾. (Smoking, alcohol, caffeine and chocolate have a direct effect by making the esophageal sphincter less competent by reducing its pressure and therefore contribute to symptoms) ⁽²⁾.

When to refer ⁽²⁾

- Failure to respond to antacids
- Pain radiating to arms
- Difficulty in swallowing
- Regurgitation
- Long duration
- Increasing severity
- Children

6-**Weight reduction** should be advised ⁽²⁾.

Pharmacological Therapy:

A-Antacids (AL salts, Mg salts, Ca-carbonate, Na-bicarbonate, ...):

Practical points:

1-Best time for taking Antacids :

Antacids are best taken about 1 h after a meal because the rate of gastric emptying has then slowed and the antacid will therefore **remain in the stomach for longer**. Taken at this time antacids may act for up to 3 h compared with only 30 min–1 h if taken before meals. ⁽²⁾. **Although antacids may be taken on when-needed basis** ⁽³⁾.

2-Dosage form ⁽⁴⁾:

Liquids and powders generally provide faster relief and have greater neutralizing capacity than tablets, as they are mixed very quickly with the stomach contents and their small particle size provides a large contact surface area for neutralizing activity ⁽⁶⁾.

Advantages of tablets over liquids include ease of portability and administration ⁽⁶⁾. It might be appropriate for the patient to have both; the liquid could be taken before and after working hours, while the tablets could be taken during the day for convenience ⁽²⁾.

Tablets should not be swallowed whole; **they should be chewed to initiate disintegration** or sucked to provide a relatively slow but sustained delivery of antacid to the stomach ⁽⁶⁾.

3-Interactions:

A-Antacids can affect the absorption of a number of drugs (via chelation and adsorption) ⁽⁴⁾. This interactions can usually be avoided when potentially interacting drugs are **separated by at least 2 hours** ⁽³⁾.

B- Antacids also interact with enteric-coated tablets, capsules and granules. These products are formulated to resist gastric acid and dissolve in the more alkaline medium of the duodenum, releasing the drug there. **Enteric coatings may be disrupted prematurely in the presence of antacids**, causing unwanted release of the drug in the stomach ⁽⁶⁾.

4-Side effects of antacids

A- AL-containing antacids tend to be constipating.

Mg-containing antacids tend to cause osmotic **diarrhea** and are useful in patients who are slightly constipated. Thus **combination** products of AL and Mg salts cause minimum bowel disturbances ⁽²⁾.

B- Antacids containing sod. Bicarbonate should be avoided in patients if sodium intake should be restricted (e.g. in patient with CHF, hypertension,.....) ⁽²⁾ and during pregnancy ⁽⁷⁾.

C-Calcium carbonate: It acts quickly, has a prolonged action and is a potent neutralizer of acid. It can cause **acid rebound** and, if taken over long periods at high doses, can cause **hypercalcaemia** and so should **not be recommended for long-term use** ⁽²⁾.

B-Alginates (Gaviscon ®):

Alginate-containing antacids form a **sponge –like matrix** that float on the top of the stomach contents ⁽⁴⁾. Alginate-containing antacids can form a ‘raft’ that floats on the surface of the stomach **contents to reduce reflux and protect the oesophageal mucosa** ⁽⁸⁾. Some alginate-based products contain sodium bicarbonate. If a preparation low in sodium is required, the pharmacist can recommend one containing potassium bicarbonate instead. Alginate products with low sodium content are useful for the treatment of heartburn in patients on a restricted sodium diet ⁽²⁾.

Practical points:

1-They are best given **after each main meal and before bedtime**. Although it may be taken on when-needed basis ⁽⁴⁾.

2-They can be given in pregnancy and breastfeeding ⁽⁴⁾.

C-Histamine 2 receptor antagonists (H2RA):

1-They can be used for the short-term treatment of dyspepsia, hyperacidity and heartburn in **adults and children over 16 years** ⁽²⁾.

2-Duration for OTC H2RA: Treatment with **OTC H2RA** is limited to a maximum of 2 weeks ⁽⁶⁾. The treatment limit is intended to ensure that patients do not continuously self-medicate for long periods ⁽²⁾.

3-When to take H2RA (regarding OTC use for GERD only):

Patient can take 1 tablet when symptoms occur and if the symptoms persists, another tablet may be repeated after more than 1hour ⁽⁴⁾, but when food is known to precipitate symptoms, H2RA should be taken an hour before food⁽²⁾. (Table1-9) ⁽⁸⁾.

Note: Tolerance to the gastric antisecretory effect may develop when H2RAs are **taken daily** (versus as needed) and may be responsible for diminished efficacy.

Therefore, it is **preferable to take an H2RA on an as needed basis** rather than regularly every day ⁽³⁾.

4-Side effects of H2RA: Headache, dizziness, diarrhea and skin rashes have been reported as adverse effects but they are not common ⁽²⁾.

5-The OTC H2 antagonists are not licensed for sale to pregnant or breastfeeding women ⁽⁶⁾.

Table1-9: OTC H2RAs ⁽⁸⁾				
	H2RA	OTC dosage form	Max. single dose	Max. daily dose
1	Cimetidine	200 mg tablet	200 mg	800 mg
2	Famotidine	10 mg tablet	10 mg	20 mg
3	Nizatidine	75 mg tablet	75 mg	150 mg

4	Ranitidine	75mg tablet	75 mg	300 mg
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D-Proton pump inhibitors (PPIs):

1-PPIs are amongst the most effective medicines for the relief of heartburn ⁽²⁾. PPIs available OTC are:

United kingdom	Omeprazole (10 mg tablet), and Pantoprazole (20 mg tablet) ⁽⁸⁾ .
USA	Omeprazole (20 mg capsule), Lansoprazole (15 mg capsule) and esomeprazole (20 mg capsule) ⁽³⁾ .

2- OTC PPIs can be used for the relief of **heartburn symptoms associated with reflux in adults** ⁽²⁾ **over 18 years** ⁽⁸⁾. PPIs should not be taken (**as an OTC**) during **pregnancy** or whilst **breastfeeding** ⁽²⁾.

3-Onset of symptomatic relief following an oral dose may occur in 2-3 hours, but complete relief may take 1-4 days ⁽³⁾. During this period a patient with ongoing symptoms may need to take a concomitant **antacid** ⁽²⁾.

4-Treatment with OTC PPIs is limited to a maximum of **4 weeks** ⁽⁸⁾ (2 weeks in USA). This course of therapy must not be repeated more often than every 4 months ⁽³⁾.

5-OTC Doses of PPIs (table1-10):

Table1-10: OTC Doses of PPIs			
USA	1	Esomeprazole (20 mg capsule)	Single dose each day before breakfast for 14 days ⁽³⁾ .
	2	Lansoprazole (15 mg capsule)	Single dose each day before breakfast for 14 days ⁽³⁾ .
	3	Omeprazole (20 mg capsule)	Single dose each day before breakfast for 14 days ⁽³⁾ .
UK	1	Omeprazole (10 mg tablet)	The initial dose is two 10 mg tablets (i.e. 20 mg) once daily, swallowed whole before a meal, with plenty of liquid, until symptoms subside. Thereafter, a dose of 10 mg once daily can be taken, increasing to 20 mg if symptoms return. If no relief is obtained within 2 weeks, or if continuous treatment for more than 4 weeks is required to relieve symptoms, the patient should be referred to their doctor ⁽⁶⁾ .
	2	Pantoprazole (20 mg tablet)	Single dose each day before breakfast ⁽⁸⁾ .

Note: Immediate release omeprazole (Zegerid®) is formulated with [omeprazole 20 mg and sodium bicarbonate 1100 mg]. The sodium bicarbonate in Zegerid® raises intragastric pH, permitting **rapid absorption of omeprazole from the duodenum** ⁽³⁾.

6-Drug-interaction of PPIs:

PPIs-Clopidogrel drug interaction: the proton pump inhibitors esomeprazole, and omeprazole are predicted to decrease the efficacy of clopidogrel. Avoid ⁽⁸⁾.

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Indigestion

Indigestion (dyspepsia) is commonly presented in community pharmacies and is often self-diagnosed by patients, who use the term to include anything from pain in the chest and upper abdomen to lower abdominal symptoms. Many patients use the terms indigestion and heartburn interchangeably ⁽¹⁾.

However, Heartburn should not be confused with dyspepsia. The discomfort of dyspepsia is variably described as a **pain, distension**, or feeling of **fullness**, but is **generally not burning in nature** ⁽²⁾. (figure 1-5)

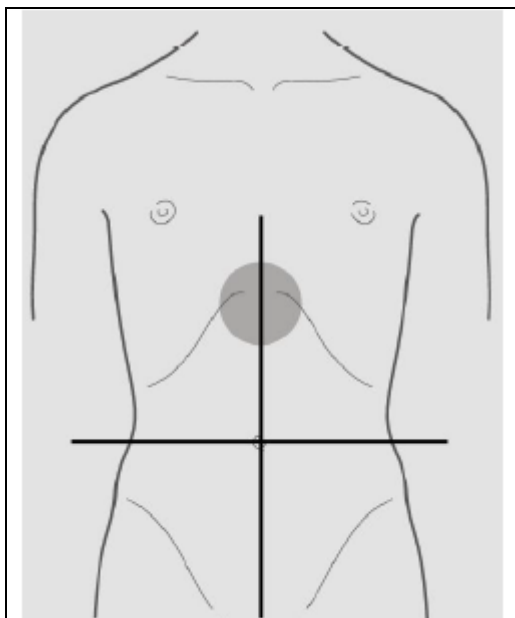


Figure1-5: The position of pain in dyspepsia ⁽⁴⁾.

Patient assessment with indigestion

A-Age

Indigestion is **rare in children**, who should be **referred** to the doctor. Be cautious when dealing with **first-time indigestion** in patients **aged 45 years or over** and **refer** for a diagnosis ⁽¹⁾.

B-Symptoms

The symptoms of typical indigestion include poorly localized **upper abdominal discomfort**, which may be brought on by particular foods, excess food, or medication (e.g. aspirin) ⁽¹⁾.

C-Duration/previous history

Indigestion that is **persistent** or **recurrent** should be **referred** to the doctor. Any patient with a previous history of the symptom which has **not**

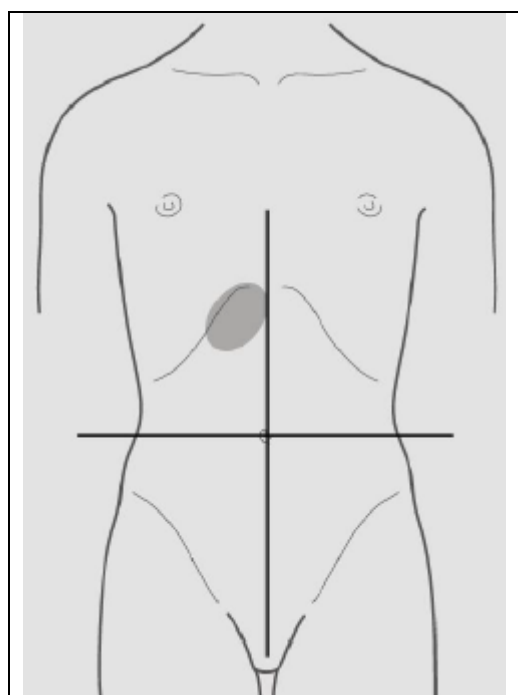


Figure1-6: The position of pain in ulcers ⁽⁴⁾.

responded to treatment, or which has **worsened**, should be **referred** ⁽¹⁾.

D-Diet and Smoking habit

Fatty foods and alcohol can cause indigestion, aggravate ulcers and precipitate biliary colic. **Smoking** predisposes to, and may cause, indigestion and ulcers. The pharmacist is in a good position to offer advice on smoking cessation, perhaps with a recommendation to use nicotine replacement therapy ⁽¹⁾.

E-Details of pain/associated symptoms

A few medical conditions that may present as indigestion described below:

1-Ulcer

Ulcers may occur in the stomach (gastric ulcer) or in the first part of the small intestine (duodenal ulcer).

Typically the pain of a **duodenal ulcer** is localized to the upper abdomen, slightly to the right of the midline. It is often possible **to point to the site of pain with a single finger** ⁽¹⁾. (figure 1-6). The pain is most likely to occur when the **stomach is empty, especially at night. It is relieved by food** and antacids.

The pain of a **gastric ulcer** is in the same area but **less well localized**. It is often **aggravated by food and may be associated with nausea and vomiting**. Appetite is usually reduced and the symptoms **are persistent and severe** ⁽¹⁾.

2-Gallstones

Single or multiple stones can become temporarily stuck in the opening to the bile duct as the gall bladder contracts. This causes **severe pain (biliary colic)** in the upper abdomen below **the right rib margin**. Sometimes this pain can be confused with that of a duodenal ulcer. Biliary colic may be precipitated by a **fatty meal** ⁽¹⁾. (figure 1-7)

3-Gastro-Esophageal reflux

The symptoms are typically described as **heartburn** arising in the upper abdomen passing upwards behind the breastbone. It is often precipitated by a large meal or by bending and lying down ⁽¹⁾.

4-Irritable bowel syndrome

Irritable bowel syndrome (IBS) is a common condition in which symptoms are caused by colon spasm. There is usually an alteration in bowel habit, often with alternating constipation and diarrhea. The diarrhea is typically worse first thing in the morning ⁽¹⁾.

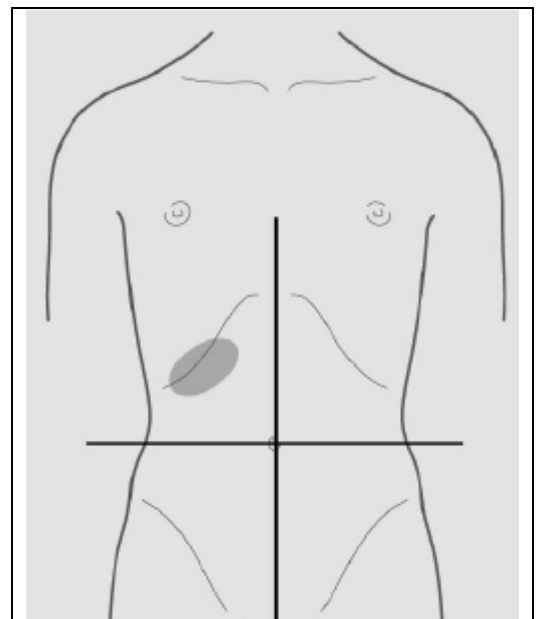


Figure 1-7 The position of pain in gallstone ⁽⁴⁾.

5-Myocardial ischemia

The pain is likely to be **precipitated by exercise** or exertion ⁽¹⁾ and it **radiates** to jaw, neck, shoulder, arm ⁽³⁾. Not all cases of angina have classical presentation. Patients can complain of dyspepsia-like symptoms and feel generally unwell (*Atypical angina*). These symptoms might be brought on by a heavy meal. In such cases antacids will fail to relieve symptoms and referral is needed ⁽⁴⁾.

6-Appendicitis

Starts **centrally** and radiates to **right iliac fossa** after some time ⁽³⁾ (figure 1-8).

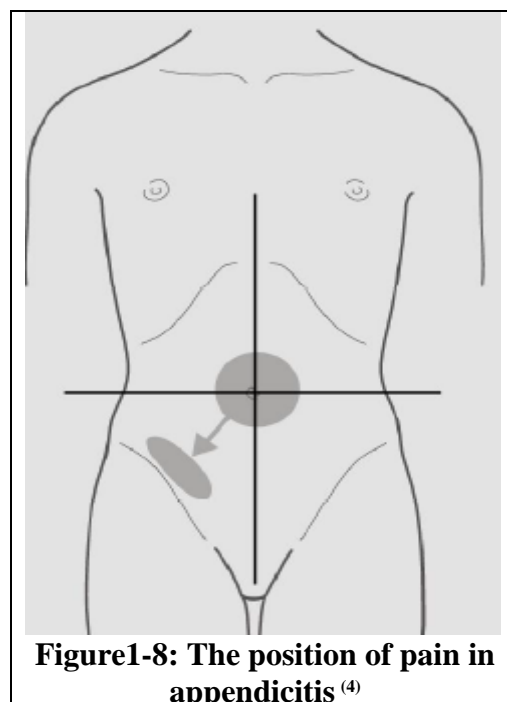


Figure1-8: The position of pain in appendicitis ⁽⁴⁾

7-More serious disorders

Persisting upper abdominal pain, especially when associated with **anorexia** and unexplained **weight loss**, may herald an underlying **cancer** of the stomach or pancreas. Ulcers sometimes start bleeding, which may present with blood in the vomit (**haematemesis**) or in the stool (**melaena**). In the latter the stool becomes tarry and black. **Urgent referral** is necessary. ⁽¹⁾

F-Medication

A-Medicines already tried: Anyone who has tried one or more appropriate treatments without improvement or whose initial improvement in symptoms is not maintained should see the Doctor ⁽¹⁾.

B-Other medicines being taken: Gastrointestinal (GI) side-effects can be caused by many drugs. NSAIDs have been implicated in the causation of ulcers and bleeding ulcers. Sometimes these drugs cause indigestion. **Elderly** patients are particularly prone to such problems and pharmacists should bear this in mind. **Severe or prolonged indigestion in any patient taking an NSAID is an indication for referral** ⁽¹⁾.

Summary of Symptoms and circumstances for referral ^(1, 3):

- 1-Age over 45 years if symptoms **develop for first time**.
- 2-Symptoms are persistent or recurrent.
- 3-Pain is severe. 4-Blood in vomit or stool. 5-Pain worsens on effort.
- 6-Persistent vomiting. 7-Treatment has failed. 8-Adverse drug reaction is suspected.
- 9-Associated weight loss. 10-Children.
- 11- Indigestion between meals or at night.
- 12-Pain radiating from central or epigastric areas.

Treatment timescale

If symptoms have not improved **within 5 days**, the patient should see the doctor ⁽¹⁾.

Management

Smoking, alcohol and fatty meals can all aggravate symptoms, so the pharmacist can advise appropriately ⁽¹⁾.

A-Antacids: as in GERD

B-Famotidine and ranitidine: as in GERD.

C-Dimeticone (dimethicone): Dimeticone is sometimes added to antacid formulations for its defoaming properties. Theoretically, it reduces surface tension and allows easier **elimination of gas** from the gut by passing flatus or belching. **Evidence of benefit is uncertain** ⁽¹⁾.

D-Domperidone

Domperidone 10 mg previously was used as an OTC for the treatment of **postprandial stomach symptoms** of excessive fullness, nausea, epigastric bloating and belching, occasionally accompanied by epigastric discomfort and heartburn. It increases the rate of gastric emptying, and also increases the strength of contraction of the esophageal sphincter ⁽¹⁾. Unfortunately in 2014 domperidone was reclassified back to prescription-only status over fears over its potential cardiac side effects ⁽⁴⁾.

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