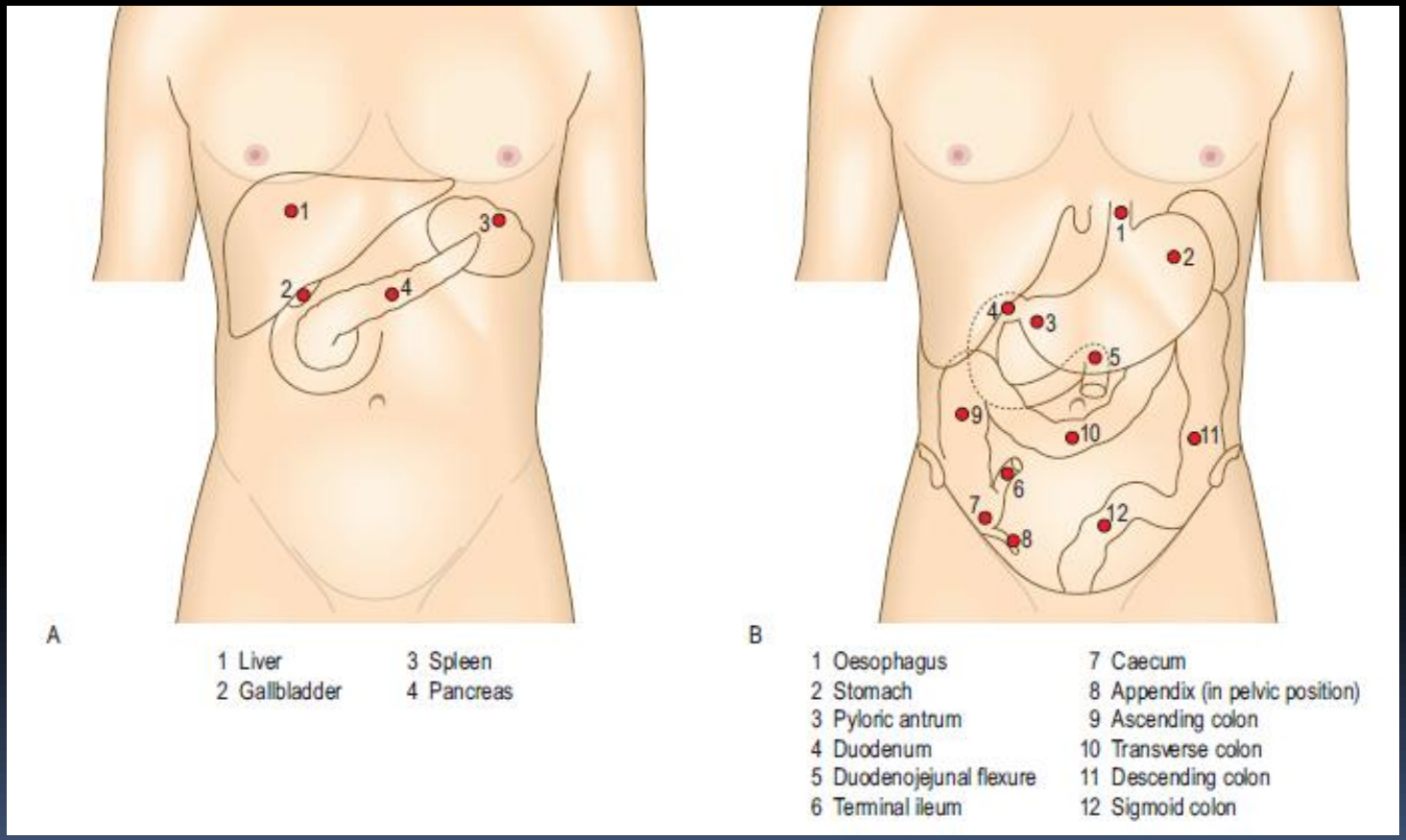
Gastrointestinal System

- Alimentary tract from the mouth to the anus
- liver and biliary system (including the gallbladder)
- Pancreas
- Spleen

Gastrointestinal System



Gastrointestinal System

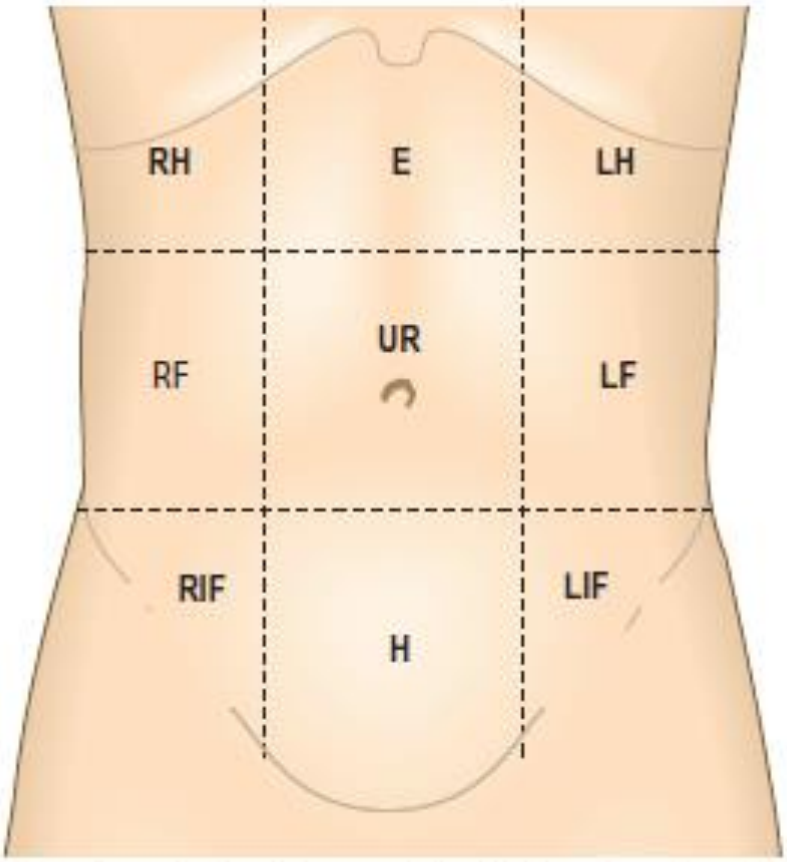


Fig. 8.3 Regions of the abdomen. RH, right hypochondrium; RF, right flank or lumbar region; RIF, right iliac fossa; E, epigastrium; UR, umbilical region; H, hypogastrium or suprapubic region; LH, left hypochondrium; LF, left flank or lumbar region; LIF, left iliac fossa.

Anorexia and weight loss

- Anorexia is loss of appetite and/or a lack of interest in food.
- Weight loss : Unintentional weight loss

clinically important weight loss is often defined as loss of more than 5 percent of usual body weight over 6 to 12 months.

  - Increased energy expenditure as in hyperthyroidism, fever or the adoption of a more energetic lifestyle.
  - Reduced energy intake due to dieting, loss of appetite or malabsorption and malnutrition.

Heartburn and Reflux

- Heartburn is a hot, burning retrosternal discomfort which radiates upwards
  - DDx of cardiac pain
- Reflux a sour taste in the mouth from regurgitating gastric acid .
- Waterbrash is the sudden appearance of fluid in the mouth due to reflex salivation as a result of GERD or, rarely, peptic ulcer disease.

Dyspepsia

- pain or discomfort centered in the upper abdomen
- Clusters of symptoms are used to classify dyspepsia:
  - reflux-like dyspepsia (heartburn-predominant dyspepsia)
  - ulcer-like dyspepsia (epigastric pain relieved by food or antacids)
  - dysmotility-like dyspepsia (nausea, belching, bloating and premature satiety)

Odynophagia

- Pain on swallowing , it can be present with or without dysphagia
- Indicate active esophageal ulceration from peptic esophagitis or esophageal candidiasis.

Dysphagia

- Difficult swallowing, record the site at which the patient feels the food sticking.
  - Neurological dysphagia is worse for liquids than for solids, and may be accompanied by choking.
  - Neuromuscular dysphagia, or esophageal dysmotility, presents in middle age, is worse for solids and may be helped by liquids and sitting upright.

Dysphagia

- Mechanical dysphagia is often due to esophageal stricture.
  - With weight loss, a short history and no reflux symptoms, suspect esophageal cancer.
  - Longstanding dysphagia without weight loss but accompanied by heartburn is more likely to be due to benign peptic stricture.
- Dysphagia for liquids due to neuromuscular disorder or for solids due to esophageal obstruction (cancer, peptic stricture, achalasia).

8.7 Causes of dysphagia

Oral	
• Tonsillitis, glandular fever, pharyngitis, peritonsillar abscess	• Painful mouth ulcers
Neurological	
• Bulbar or pseudobulbar palsy	• Cerebrovascular accident
Neuromuscular	
• Achalasia • Pharyngeal pouch	• Myasthenia gravis • Oesophageal dysmotility
Mechanical	
• Oesophageal cancer • Peptic oesophagitis • Other benign strictures, e.g. after prolonged nasogastric intubation	• Extrinsic compression, e.g. lung cancer • Systemic sclerosis

8.8 Symptom checklist in dysphagia

- Is dysphagia painful or painless?
- Is dysphagia intermittent or progressive?
- How long is the history of dysphagia?
- Is there a previous history of dysphagia or heartburn?
- Is the dysphagia for solids or liquids or both?
- At what level does food stick?
- Is there complete obstruction with regurgitation?

Abdominal Pain

- ***Site***
  - Visceral abdominal pain
    - deep and poorly localized in the midline
  - Somatic pain from the parietal peritoneum and abdominal wall
    - localized to the area of inflammation
- ***Onset***
  - Sudden onset of severe abdominal pain, rapidly progressing to become generalized and constant, suggests a hollow viscus perforation

Abdominal Pain

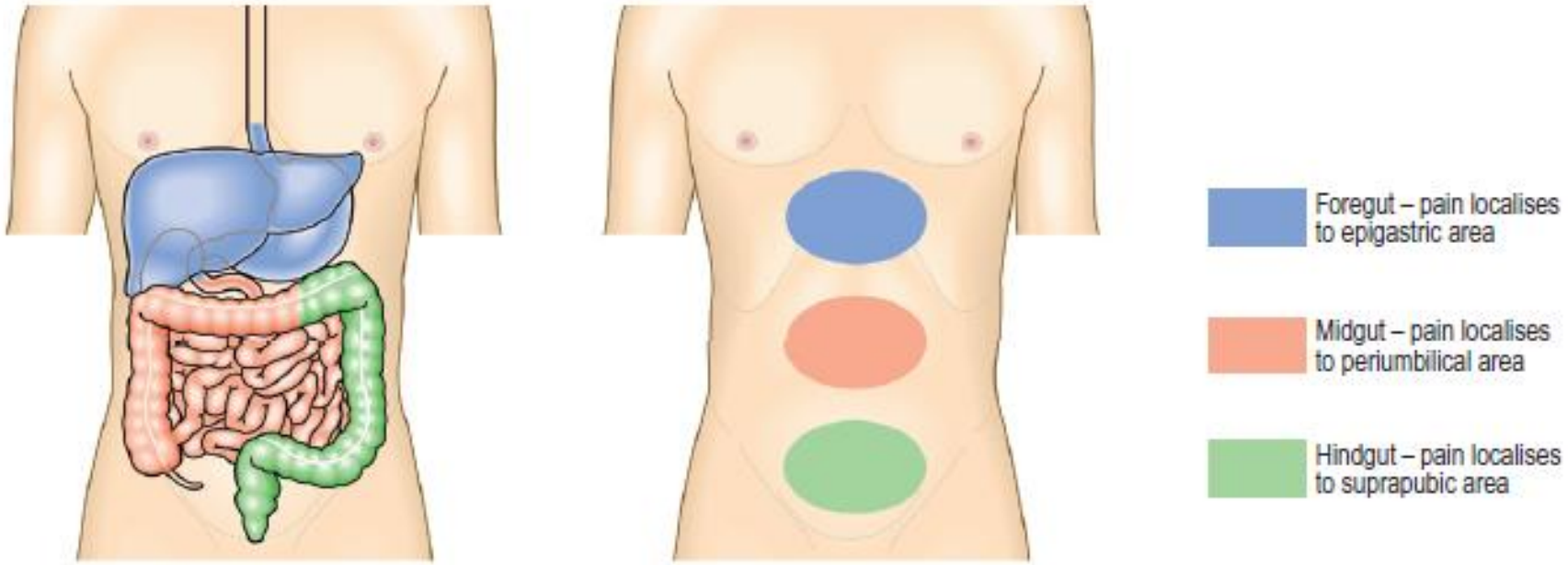


Fig. 8.5 Abdominal pain. Perception of visceral pain is localised to the epigastric, umbilical or suprapubic region, according to the embryological origin of the affected organ.

Abdominal Pain

- ***Character***
  - Inflammation usually produces constant pain exacerbated by movement or coughing
  - Colicky pain arises from hollow structures, e.g. small or large bowel obstruction, or the uterus during labour It lasts for a short period of time (seconds or minutes), eases off and then returns.
  - Dull, vague and poorly localised pain is more typical of an inflammatory process or low-grade infection, e.g. salpingitis, appendicitis or diverticulitis.
- ***Radiation***
- ***Referral***
- ***Shifting***

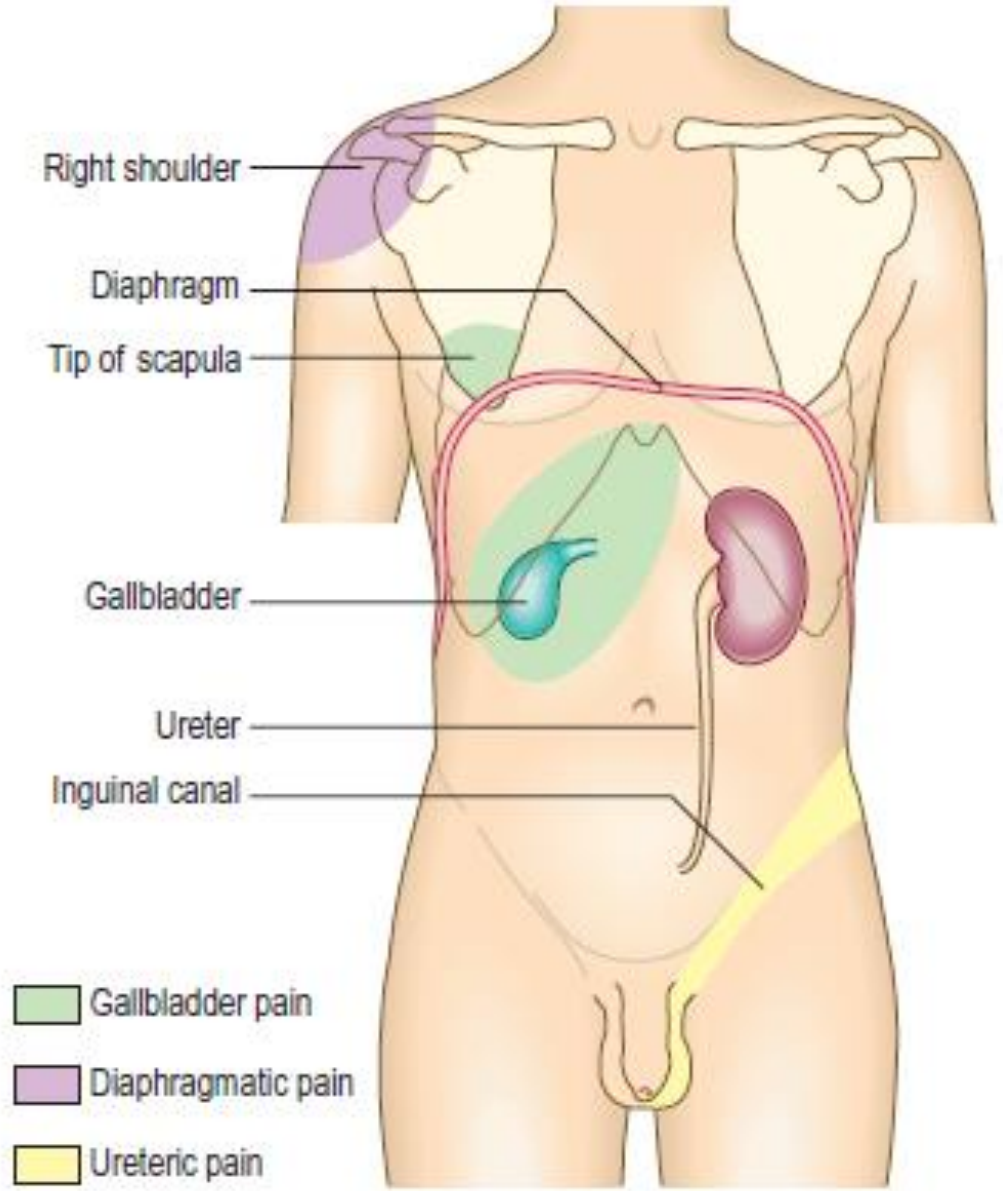


Fig. 8.6 Characteristic radiation of pain from the gallbladder, diaphragm and ureters.

Abdominal Pain

- ***Associated symptoms***
  - Anorexia, nausea and vomiting
  - Common but nonspecific
  - May be absent, even in advanced intraabdominal disease
- ***Timing***
  - Silent interval during the first hour or two after perforation.
- ***Exacerbating and relieving factors***
- ***Severity***

Abdominal Pain

2.10 Characteristics of pain (SOCRATES)

Site

- Somatic pain, often well localised, e.g. sprained ankle
- Visceral pain, more diffuse, e.g. angina pectoris

Onset

- Speed of onset and any associated circumstances

Character

- Described by adjectives, e.g. sharp/dull, burning/tingling, boring/stabbing, crushing/tugging, preferably using the patient's own description rather than offering suggestions

Radiation

- Through local extension
- Referred by a shared neuronal pathway to a distant unaffected site, e.g. diaphragmatic pain at the shoulder tip via the phrenic nerve (C_3, C_4)

Associated symptoms

- Visual aura accompanying migraine with aura
- Numbness in the leg with back pain suggesting nerve root irritation

Timing (duration, course, pattern)

- Since onset
- Episodic or continuous
  - If episodic, duration and frequency of attacks
  - If continuous, any changes in severity

Exacerbating and relieving factors

- Circumstances in which pain is provoked or exacerbated, e.g. food
- Specific activities or postures, and any avoidance measures that have been taken to prevent onset
- Effects of specific activities or postures, including effects of medication and alternative medical approaches

Severity

- Difficult to assess, as so subjective
- Sometimes helpful to compare with other common pains, e.g. toothache
- Variation by day or night, during the week or month, e.g. relating to the menstrual cycle

Nausea and vomiting

- Nausea is the sensation of feeling sick.
- Vomiting is the expulsion of gastric contents via the mouth.
- Vomiting is typically preceded by nausea, but in increased intracranial pressure may occur without warning.
- suggest upper gastrointestinal disorders
- Obstruction distal to the pylorus produces bile-stained vomit while gastric outlet obstruction causes projectile non bile stained vomit.
- Vomiting is common in gastroenteritis, cholecystitis, pancreatitis and hepatitis.
- Vomiting may be caused by severe pain as renal or biliary colic, myocardial infarction, as well as systemic disease, metabolic disorders and drug therapy.

8.9 Non-alimentary causes of vomiting

Neurological	
• Raised intracranial pressure, e.g. meningitis, brain tumour • Labyrinthitis and Ménière's disease	• Migraine • Vasovagal syncope, shock, fear and severe pain, e.g. renal colic, myocardial infarction
Drugs	
• Alcohol, opioids, theophyllines, digoxin, cytotoxic agents, antidepressants	• Consider any drug
Metabolic/endocrine	
• Pregnancy • Diabetic ketoacidosis • Renal failure	• Liver failure • Hypercalcaemia • Addison's disease
Psychological	
• Anorexia nervosa	• Bulimia

8.10 Symptom checklist in vomiting

- What medications has the patient been taking?
- Is vomiting:
  - heralded by nausea or occurring without warning?
  - associated with dyspepsia or abdominal pain?
  - relieving dyspepsia or abdominal pain?
  - related to mealtimes, early morning or late evening?
  - bile-stained, blood-stained or faeculent?

Wind and flatulence

- 200–2000 ml /day of flatus is passed normally.
- Excessive flatus occurs in lactase deficiency and intestinal malabsorption.
- No flatus is passed with intestinal obstruction.
- Belching is due to air swallowing and has no medical significance.
- Belching may indicate anxiety, or an attempt to relieve abdominal pain or discomfort, and accompanies GERD.

Abdominal distension

8.11 Causes of abdominal distension

Factor	Consider
Fat	Obesity
Flatus	Pseudo-obstruction, obstruction
Faeces	Subacute obstruction, constipation
Fluid	Ascites, tumours (especially ovarian), distended bladder
Fetus	Check date of the last menstrual period
Functional	Bloating, often associated with irritable bowel syndrome

Abdominal distension

8.12 Causes of ascites

Diagnosis	Comment
Common	
Hepatic cirrhosis with portal hypertension	Transudate
Intra-abdominal malignancy with peritoneal spread	Exudate, cytology may be positive
Uncommon	
Hepatic vein occlusion (Budd–Chiari syndrome)	Transudate in acute phase
Constrictive pericarditis and other right heart failure	Check jugular venous pressure and listen for pericarditic rub
Hypoproteinaemia (nephrotic syndrome, protein-losing enteropathy)	Transudate
Tuberculosis peritonitis	Low glucose content
Pancreatitis	Very high amylase content

Diarrhoea

- Diarrhoea is the frequent passage of loose stools.
- Normal bowel movement frequency ranges from three times daily to once every 3 days.
- Bloody diarrhoea may be due to inflammatory bowel disease, colonic ischaemia or infective gastroenteritis.

Diarrhoea

8.14 Symptom checklist in patients with diarrhoeal disorders

- Is diarrhoea acute, chronic or intermittent?
- Is there tenesmus, urgency or incontinence?
- Is the stool:
  - watery, unformed or semisolid?
  - large-volume and not excessively frequent, suggesting small-bowel disease?
  - small-volume and excessively frequent, suggesting large-bowel disease?
  - associated with blood, mucus or pus?
- Is sleep disturbed by diarrhoea, suggesting organic disease?
- Is there a history of:
  - contact with diarrhoea or of travel abroad?
  - relevant sexual contact ('gay bowel syndrome', human immunodeficiency virus (HIV))?
  - alcohol abuse or relevant drug therapy?
  - gastrointestinal surgery, gastrointestinal disease or inflammatory bowel disease?
  - family history of gastrointestinal disorder, e.g. gluten enteropathy, Crohn's?
  - any other gastrointestinal symptom, e.g. abdominal pain and vomiting?
  - systemic disease suggested by other symptoms, e.g. rigors or arthralgia?

Diarrhoea

8.13 Causes of diarrhoea

Acute

- Infective gastroenteritis, e.g. *Clostridium difficile*
- Drugs (especially antibiotics)

Chronic (>4 weeks)

- Irritable bowel syndrome
- Inflammatory bowel disease
- Parasitic infestations, e.g. *Giardia lamblia*, amoebiasis, *Cryptosporidium* spp.
- Colorectal cancer
- Autonomic neuropathy (especially diabetic)
- Laxative abuse and other drug therapies
- Hyperthyroidism
- Constipation and faecal impaction (overflow)
- Small-bowel or right colonic resection
- Malabsorption, e.g. lactose deficiency, coeliac disease

Constipation

- Infrequent passage of hard stools and may be due to impaired colonic motility, physical obstruction, impaired rectal sensation or anorectal dysfunction causing anismus (impaired process of evacuation)
- Absolute constipation (no gas or bowel movements) suggests intestinal obstruction and is likely to be associated with pain, vomiting and distension.
- Tenesmus the sensation of needing to defecate although the rectum is empty, suggests rectal inflammation or tumour.

Constipation

8.16 Symptom checklist in patients with constipation

- Has constipation been lifelong or is it of recent onset?
- How often do the bowels empty each week?
- How much time is spent straining at stool?
- Is there associated abdominal pain, anal pain on defecation or rectal bleeding?
- Has the shape of the stool changed, e.g. become pellet-like?
- Has there been any change in drug therapy?

8.17 Causes of constipation

- Lack of fibre in diet
- Irritable bowel syndrome
- Intestinal obstruction (cancer)
- Drugs (opioids, iron)
- Metabolic/endocrine (hypothyroidism, hypercalcaemia)
- Immobility (stroke, Parkinson's disease)

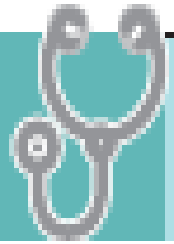
The Bristol Stool Form Scale

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces ENTIRELY LIQUID

Haematemesis & Melaena

- Haematemesis is vomiting blood
  - Fresh and red
  - Coffee grounds dark brown
- Melaena is the passage of tarry, shiny black stools with a characteristic odour.

Haematemesis & Melaena



8.18 Symptom checklist in haematemesis and melaena

- Is there a previous history of dyspepsia, peptic ulceration, gastrointestinal bleeding or liver disease?
- Is there a history of alcohol, NSAIDs or corticosteroid ingestion?
- Did the vomitus comprise fresh blood or coffee ground-stained fluid?
- Was the haematemesis preceded by intense retching?
- Was blood staining of the vomitus apparent in the first vomit?

Haematemesis & Melaena

8.19 Causes of upper gastrointestinal bleeding

- Gastric or duodenal ulcer
- Mallory–Weiss oesophageal tear
- Oesophagitis, gastritis, duodenitis
- Oesophagogastric varices
- Oesophageal or gastric cancer
- Vascular malformation

Rectal Bleeding

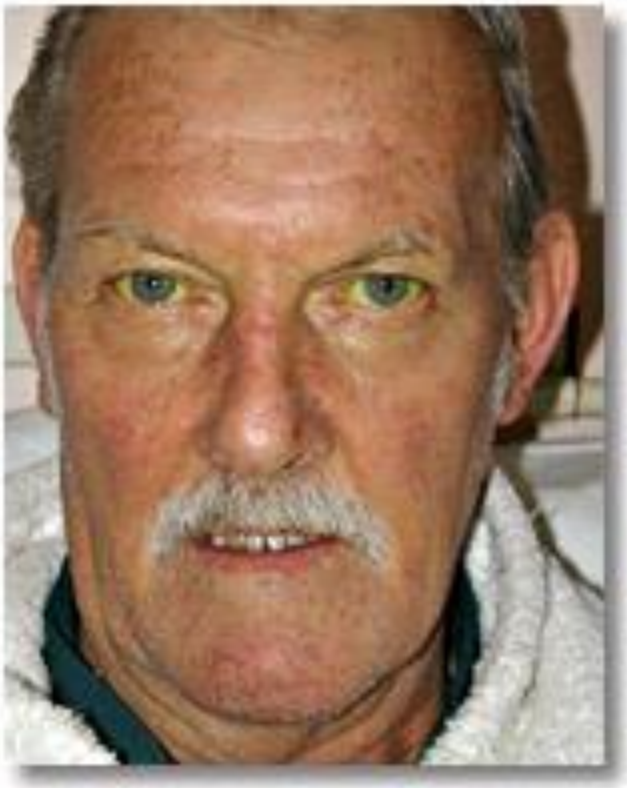
- Fresh rectal bleeding indicates a disorder in the anal canal, rectum or colon
  - Haemorrhoids
  - Anal fissure
  - Colorectal polyps
  - Colorectal cancer
  - Inflammatory bowel disease
  - Ischaemic colitis
  - Diverticular disease
  - Vascular malformation
- Blood may be mixed with stool, coat the surface of otherwise normal stool, or be seen on the toilet paper.
- Severe upper GI can cause fresh rectal bleeding.

Jaundice

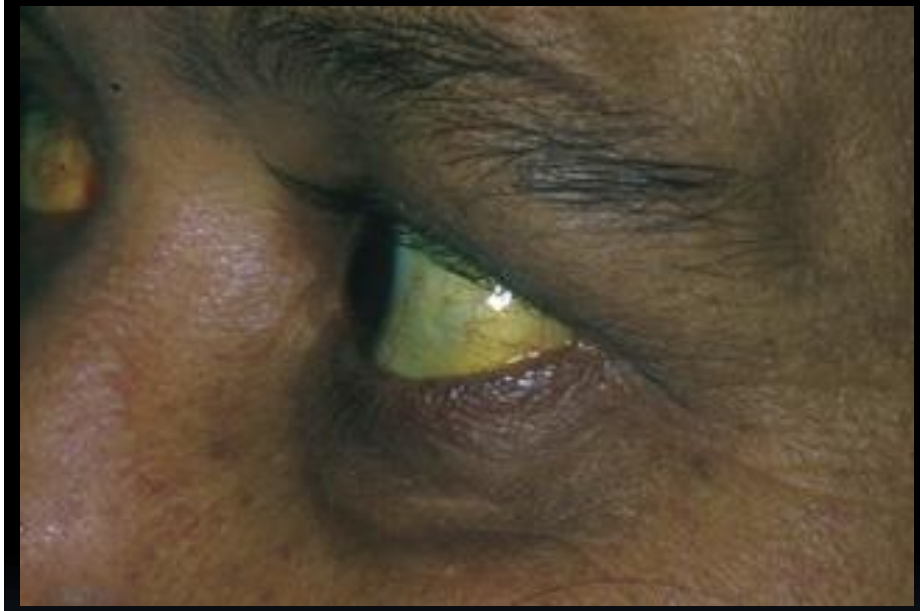
- **Yellow discoloration of the sclera, mucus membranes & skin from increased serum bilirubin concentration in the body fluids**

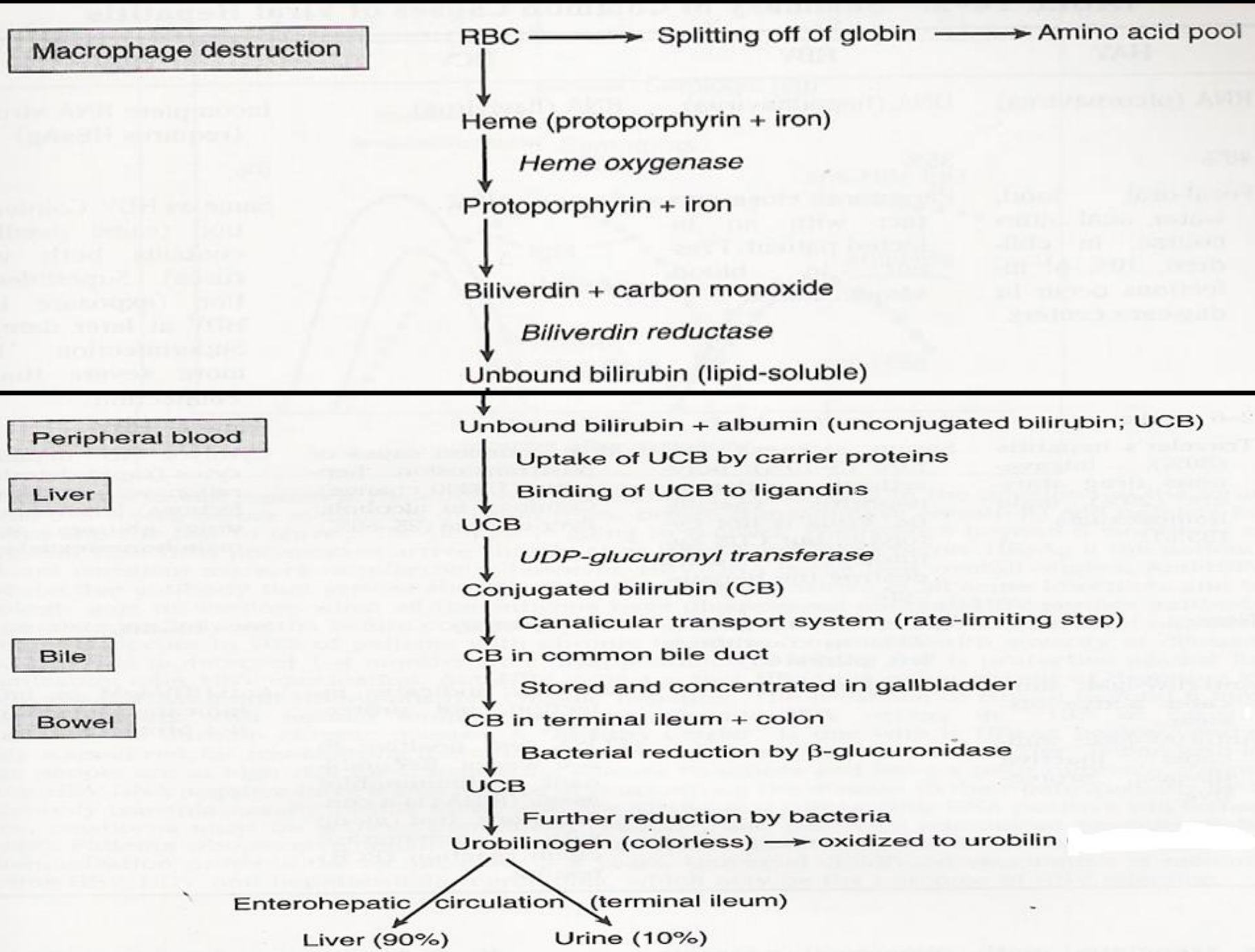
- **NORMAL RANGE 5-17 micromol/L**
  (0.3 – 1.0mg/dl)
- **LEVEL ABOUT 50 micromol/L (3mg/dl)**
  →CLINICAL JAUNDICE
- **Total bile flow-600ml/day(500-1000ml/day)**

Jaundice



Jaundice is most easily seen in the sclera




Macrophage destruction
RBC
Splitting off of globin
Amino acid pool
Heme (protoporphyrin + iron)
Heme oxygenase
Protoporphyrin + iron
Biliverdin + carbon monoxide
Biliverdin reductase
Unbound bilirubin (lipid-soluble)
Peripheral blood
Unbound bilirubin + albumin (unconjugated bilirubin; UCB)
Uptake of UCB by carrier proteins
Liver
Binding of UCB to ligandins
UCB
UDP-glucuronyl transferase
Conjugated bilirubin (CB)
Canalicular transport system (rate-limiting step)
Bile
CB in common bile duct
Stored and concentrated in gallbladder
Bowel
CB in terminal ileum + colon
Bacterial reduction by β-glucuronidase
UCB
Further reduction by bacteria
Urobilinogen (colorless)
oxidized to urobilin
Enterohepatic circulation
(terminal ileum)
Liver (90%)
Urine (10%)

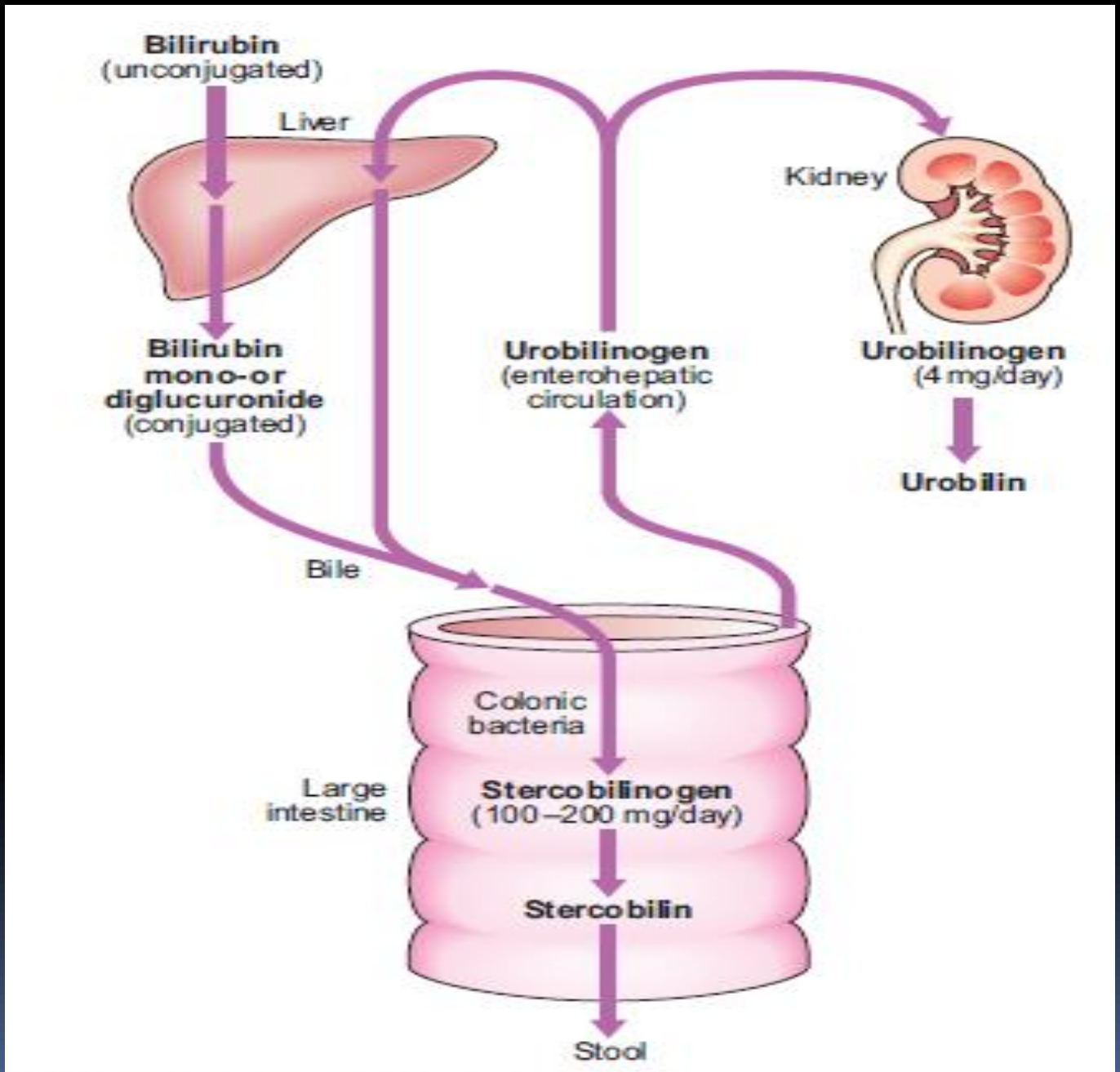


Fig. 8.9 Pathway of bilirubin excretion.

Jaundice

- Prehepatic / Hemolytic jaundice
- Hepatic jaundice
- Posthepatic / Obstructive/ Surgical jaundice

Jaundice

PRE HEPATIC	HEPATIC	POST HEPATIC
Excessive amount of bilirubin is presented to the liver due to excessive hemolysis	Impaired cellular uptake, defective conjugation or abnormal secretion of bilirubin by the liver cell	Impaired excretion due to mechanical obstruction to bile flow
Elevated unconjugated bilirubin in serum	Both conjugated and unconjugated bilirubin may be elevated in serum	Elevated conjugated bilirubin in serum

Jaundice

8.22 Common causes of jaundice

Increased bilirubin production

- Haemolysis (unconjugated hyperbilirubinaemia)

Impaired bilirubin excretion

- Congenital
  - Gilbert's syndrome (unconjugated)
- Hepatocellular
  - Viral hepatitis
  - Cirrhosis
  - Drugs
  - Autoimmune hepatitis
- Intrahepatic cholestasis
  - Drugs
  - Primary biliary cirrhosis
- Extrahepatic cholestasis
  - Gallstones
  - Cancer: pancreas, cholangiocarcinoma

Jaundice

8.24 Checklist for the history of jaundice

- Appetite and weight change
- Abdominal pain, altered bowel habit
- Gastrointestinal bleeding
- Pruritus, dark urine, rigors
- Drug and alcohol history
- Past medical history (pancreatitis, biliary surgery)
- Previous jaundice or hepatitis
- Blood transfusions (hepatitis B or C)
- Family history, e.g. congenital spherocytosis, haemochromatosis
- Sexual and contact history (hepatitis B or C)
- Travel history and immunisations (hepatitis A)
- Skin tattooing (hepatitis B or C)

Jaundice

8.23 Urine and stool analysis in jaundice

	Urine			Stools
	Colour	Bilirubin	Urobilinogen	Colour
Unconjugated	Normal	–	++++	Normal
Hepatocellular	Dark	++	++	Normal
Obstructive	Dark	++++	–	Pale

Alarm features

- Persistent vomiting
- Dysphagia
- Fever
- Weight loss
- GI bleeding
- Anaemia
- Painless, watery, high-volume diarrhoea
- Nocturnal symptoms disturbing sleep

Past History

- History of a similar problem may suggest the diagnosis.
- Previous abdominal surgery and radiological and other investigations.

Drug History

8.25 Examples of drug-induced gastrointestinal conditions

Symptom	Drug
Weight gain	Oral corticosteroids
Dyspepsia and gastrointestinal bleeding	Aspirin NSAIDs
Nausea	Many drugs, including selective serotonin reuptake inhibitor antidepressants
Diarrhoea (pseudomembranous colitis)	Antibiotics Proton pump inhibitors
Constipation	Opioids
Jaundice: hepatitis	Paracetamol (overdose) Pyrazinamide Rifampicin Isoniazid
Jaundice: cholestatic	Flucloxacillin Chlorpromazine Co-amoxiclav
Liver fibrosis	Methotrexate

- Family History
- Social history

Thank you