CHAPTER 1

Gastrointestinal, Urology, Breast and Endocrine Surgery

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1.1 A 44-year-old woman has generalised abdominal pain and vomiting for 8 hours. She is unable to eat or drink without vomiting. The pain worsens on deep inspiration. She has known gallstones. She drinks no alcohol. On examination, her pulse rate is 98 bpm, BP 108/66 mmHg, respiratory rate 24 breaths per minute and temperature 38.2°C. She appears jaundiced and diaphoretic. There is guarding and rebound tenderness in the right upper quadrant.

Investigations:

White cell count	16.4×10^9/L
CRP	132 mg/L
ALT	156 U/L
Alkaline phosphatase	182 U/L
Bilirubin	72 µmol/L

Which is the most appropriate next step in management?

A. Transabdominal ultrasound
B. Thiamine with vitamins B and C (Pabrinex®)
C. Contrast-enhanced computed tomography
D. Endoscopic retrograde cholangiopancreatography
E. Cholecystectomy

1.2 A 31-year-old man has severe pain on defaecation for the last 2 months. The pain lasts for up to an hour after opening his bowels. He has noticed a small amount of blood on the toilet paper after wiping. He has been constipated for the past 2 weeks and has introduced more fibre and fluids into his diet. He has also tried laxatives, but there has been little benefit. On examination, there is a longitudinal tear in the anal canal, distal to the dentate line, with a skin tag in the midline posteriorly.

Which is the most appropriate next step in treatment?

A. Topical glyceryl trinitrate
B. Topical diltiazem
C. Topical cinchocaine with hydrocortisone (Proctosedyl®)
D. Anusol® HC suppository
E. Glycerol suppository

1.3 A 49-year-old woman has intermittent right lower quadrant pain, loss of appetite and weight loss for 2 months. She denies any fever. On examination, there is mild tenderness in the right lower quadrant but no guarding or rebound tenderness.

Investigations:

White cell count	13.6×10^9/L
CRP	32 mg/L
Contrast-enhanced CT scan of abdomen	1 cm mass at the tip of the appendix with peri-appendiceal fat stranding but no abscess formation or free fluid

Which is the most likely diagnosis?
A. Chronic appendicitis
B. Appendiceal lymphoma
C. Diverticulitis
D. Appendiceal phlegmon
E. Appendiceal neuroendocrine neoplasm

1.4 A 32-year-old man has felt a lump in his testis when checking himself in the shower. On examination, there is a 1 cm smooth, painless mass in the left testis, which does not transilluminate. There is no lymphadenopathy.

Investigations:

Serum β-hCG	725,640 IU/L	(normal: <5 IU/L)
Serum LDH	1425 U/L	(normal: <250 U/L)
Serum alpha-fetoprotein	1.45 ng/mL	(normal: <10 ng/mL)

Which is the most likely diagnosis?
A. Embryonal carcinoma
B. Teratoma
C. Choriocarcinoma
D. Yolk sac tumour
E. Sertoli cell tumour

1.5 A 43-year-old woman has a painless, hard, irregular, and immobile breast lump in the upper outer quadrant of her left breast. She has noticed that it has increased in size over the past 3 months. On examination, there is no nipple discharge, skin dimpling or axillary lymphadenopathy. She has no family history of breast cancer. A mammogram shows an ill-defined, microlobulated and spiculated mass.

Which is the most likely diagnosis?
A. Fat necrosis
B. Invasive ductal carcinoma
C. Fibroadenoma
D. Phyllodes tumour
E. Fibrocystic changes

1.6 A 41-year-old man undergoes a total thyroidectomy for a rapidly enlarging thyroid nodule. Postoperatively, he develops muscle cramps and carpopedal spasms. On examination, he has positive Chvostek and Trousseau signs.

Which is the most important immediate investigation?
A. Serum corrected calcium
B. Serum phosphate
C. Serum vitamin D

D. Serum creatine kinase
E. Plasma parathyroid hormone

1.7 A 29-year-old woman has a painless, well-circumscribed, mobile breast lump in the upper outer quadrant of her right breast. She noticed it 2 months ago. It has remained the same size. On examination, there is a 2 cm, smooth, mobile mass. There is no axillary lymphadenopathy.

Which clinical feature best differentiates fibroadenoma from breast carcinoma?
A. Nipple inversion
B. Progressive skin reddening
C. Puckering
D. Well-circumscribed, mobile mass
E. Painless lump

1.8 A 38-year-old man undergoes a total thyroidectomy due to compression of a multinodular goitre.

Which is the most likely complication following surgery?
A. Weakened neck flexion
B. Reduced elevation of the scapula
C. Xerostomia
D. Dyspnoea
E. Dysphonia

1.9 A 43-year-old woman has muscle weakness and has started to bruise easily. She has gained weight over the past 6 months. Her BMI is 39 kg/m^2 and her BP is 182/98 mmHg. On examination, she has central obesity, facial plethora and a dorsocervical fat pad.

Investigations:

Serum morning cortisol	695 nmol/L
Plasma adrenocorticotrophic hormone	5 ng/L
Low-dose dexamethasone suppression test	690 nmol/L
24-Hour urinary free cortisol	1640 nmol/24 hours (normal <120 nmol/24 hours)

Which is the most likely diagnosis?
A. Pheochromocytoma
B. Adrenocortical carcinoma
C. Conn's syndrome
D. Cushing's syndrome
E. Pituitary adenoma

1.10 A 34-year-old man has a painless lump in his neck for 2 months. On examination, there is a 2 cm firm, non-tender nodule in the right lobe of the thyroid gland. A fine needle aspiration biopsy confirms the diagnosis of papillary thyroid carcinoma.

Which is the most appropriate treatment?
A. Partial thyroidectomy
B. Total thyroidectomy
C. Chemotherapy
D. External beam radiation therapy
E. Radioactive iodine therapy

1.11 A 54-year-old postmenopausal woman has been commenced on adjuvant hormonal therapy for oestrogen receptor-positive breast cancer. She has hot flushes, joint pains, hair thinning and vaginal dryness. A bone density scan shows osteoporosis of the femoral head.

Which drug is most likely responsible for her symptoms?

A. Ribociclib
B. Goserelin
C. Fulvestrant
D. Tamoxifen
E. Letrozole

1.12 A 42-year-old man has unexplained weight loss and right lower quadrant abdominal pain for 2 months. He has no other symptoms. He is otherwise fit and well. He takes no regular medication. Digital rectal examination is normal.

Which is the most appropriate management?

A. Faecal immunochemical testing
B. Refer using a suspected cancer pathway referral for colorectal cancer
C. Reassurance and safety netting
D. Refer for colonoscopy
E. Arrange testing for coeliac serology

1.13 A 43-year-old woman has sudden onset epigastric pain radiating to her back. She also has nausea and vomiting. She has no past medical history. She drinks 24 units of alcohol per week. On examination, her pulse rate is 105 bpm and BP 114/72 mmHg. She has epigastric tenderness with guarding.

Investigations:

Serum amylase	425 U/L

Which is the most appropriate next step in management?

A. Immediate CT scan of abdomen
B. Intravenous antibiotics
C. Endoscopic retrograde cholangiopancreatography
D. Intravenous fluids and nil by mouth
E. Laparoscopic cholecystectomy

1.14 A 39-year-old man has severe anal pain that began suddenly 2 days ago. He describes the pain as constant and worse on sitting. The pain is now so severe that he cannot sit at work. He has no rectal bleeding. On examination, there are multiple purplish, tender, tense swellings at the anal verge, which appear 'like a bunch of grapes'.

Which is the most appropriate next step in management?

A. Sclerotherapy
B. Rubber band ligation
C. Urgent admission to the surgical assessment unit
D. Analgesia and high-fibre diet
E. Topical antibiotics

1.15 A 56-year-old woman is diagnosed with Barrett's oesophagus on endoscopy, which shows intestinal metaplasia without dysplasia. She is taking high-dose lansoprazole and has done for 10 years. Acid reflux symptoms return on cessation of lansoprazole. She does not wish to continue taking acid suppression therapy. She is also concerned about the risk of progression to oesophageal adenocarcinoma.

Which is the most appropriate management?

A. Oesophagectomy
B. Laparoscopic fundoplication
C. Endoscopic mucosal resection
D. Radiofrequency ablation
E. Photodynamic therapy

1.16 A 42-year-old man undergoes an elective splenectomy for hereditary spherocytosis. Three months after the procedure, he develops fever, rigors and dyspnoea. On examination, his pulse rate is 102 bpm, BP 104/68 mmHg, temperature 38.9°C and oxygen saturation 95% on room air. He has developed widespread petechiae. Blood tests show neutrophilia.

Which is the most likely complication causing these symptoms?

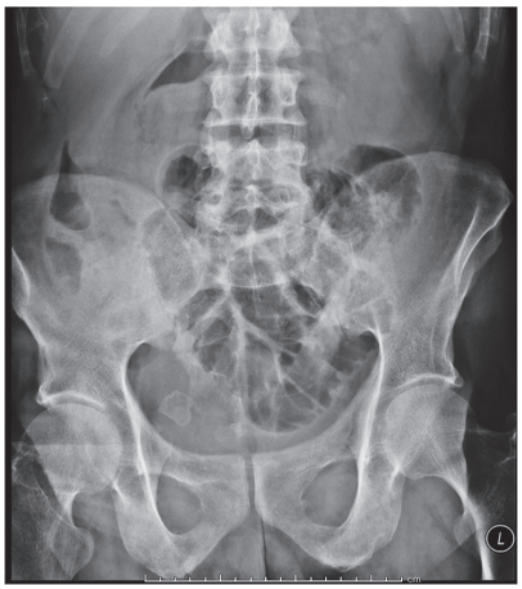
A. Subphrenic abscess
B. Venous thromboembolism
C. Post-splenectomy haemorrhage
D. Pancreatitis
E. Overwhelming post-splenectomy infection

1.17 A 31-year-old woman with a 10-year history of ulcerative colitis has worsening bloody diarrhoea, abdominal pain, and weight loss despite maximum medical therapy, including corticosteroids and biologics. Her most recent colonoscopy shows extensive colitis with areas of dysplasia. She is now considering surgical options.

Which is the most appropriate surgical intervention?

A. Hemicolectomy
B. Subtotal colectomy with ileorectal anastomosis
C. Total colectomy with end ileostomy
D. Proctocolectomy with ileal pouch-anal anastomosis
E. Anterior resection

1.18 A 78-year-old man has abdominal pain, distension and vomiting for 2 days. He has not opened his bowels for 3 days. On examination, his abdomen is distended with high-pitched sounds. An abdominal X-ray was performed (see image).



Which is the most likely diagnosis?
A. Small bowel obstruction
B. Paralytic ileus
C. Volvulus
D. Umbilical hernia
E. Faecal loading

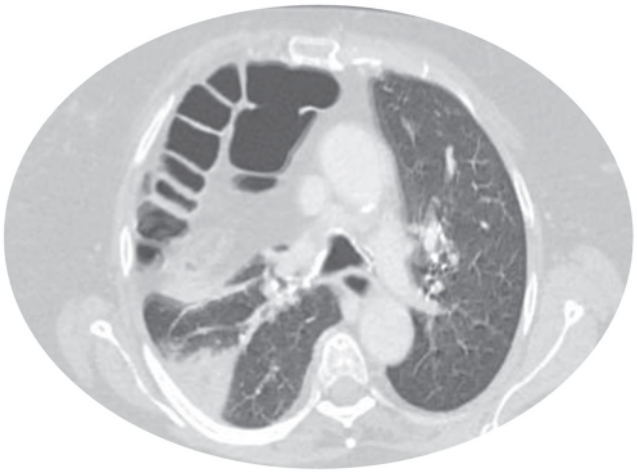
1.19 A 47-year-old woman is diagnosed with a 2.5 cm invasive ductal carcinoma in the upper outer quadrant of her left breast. There are no signs of metastases, but an axillary lymph node is palpable. She opts for breast-conserving surgery.

Which is the most appropriate next step in management?
A. Core biopsy of the axillary lymph node
B. Axillary lymph node dissection
C. Sentinel lymph node biopsy
D. Fine needle aspiration of the axillary lymph node
E. PET-CT scan

1.20 A 43-year-old man has fever, perineal pain and difficulty urinating for 2 days. He also has a dull ache to the lumbar spine, increased urinary frequency, urgency and dysuria. Digital rectal examination reveals a tender, enlarged prostate. Urinalysis shows pyuria.

Which is the most appropriate treatment?
A. Nitrofurantoin
B. Ofloxacin
C. Co-trimoxazole
D. Fosfomycin
E. Gentamicin

1.21 A 78-year-old woman has insidious right upper quadrant pain, right-sided chest pain and dyspnoea. The pain is intermittent, described as a pricking, with no radiation, and is worsened on lying flat. She denies altered bowel habits or vomiting. There has been no trauma. She has a history of recurrent pneumonia and poorly controlled angina. A CT scan of chest and abdomen was performed (see image).

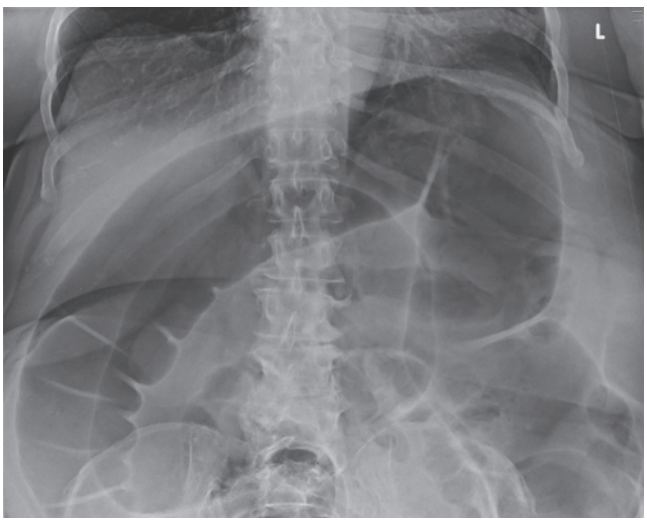


Which is the most likely diagnosis?
A. Sliding hiatus hernia
B. Para-oesophageal hernia
C. Bochdalek hernia
D. Morgagni hernia
E. Diaphragmatic eventration

1.22 A 68-year-old man has developed hot flushes during prostate cancer treatment with leuprorelin acetate.

Which is the most appropriate treatment?
A. Medroxyprogesterone acetate
B. Cyproterone acetate
C. Tamoxifen
D. Tadalafil
E. Alendronate

1.23 A 76-year-old woman has vomiting, constipation and generalised abdominal pain for 3 days. She has osteoarthritis of both hips and knees. She takes 60 mg codeine phosphate every 6 hours, and 25 mg amitriptyline at night. On examination, her abdomen is distended and tympanic, with absent bowel sounds. There are no signs of peritonism. Her pulse rate is 84 bpm, BP 145/94 mmHg and temperature 36.8°C. An abdominal X-ray was performed (see image).



Which is the most appropriate next step in management?
A. Emergency laparotomy
B. Neostigmine infusion
C. Colonic decompression
D. Nil by mouth and nasogastric aspiration
E. Surgical cecostomy

1.24 A 62-year-old man has urinary frequency, nocturia, hesitancy and a weak urinary stream for 6 months. He denies weight loss and haematuria. Digital rectal examination reveals an enlarged, smooth, non-tender prostate. His International Prostate Symptom Score (IPSS) is 10.

Investigations:

PSA	4.8 µg/L
Urinalysis	normal

Which is the most appropriate management?
A. Watchful waiting
B. Tamsulosin
C. Oxybutynin
D. Tolterodine
E. Dutasteride

1.25 A 30-year-old woman has a painful left breast for 3 days. She has no nipple discharge. She is currently breastfeeding her 6-week-old infant. On examination, there is a tender, erythematous, warm region to the inferior aspect of the left breast, with no palpable fluctuant swelling. Her pulse rate is 78 bpm, BP 118/78 mmHg and temperature 38.2°C.

Which is the most appropriate management?
A. Refer urgently to a general surgeon
B. Reassurance and watchful waiting
C. Stop breastfeeding and start antibiotics
D. Continue breastfeeding and start antibiotics
E. Apply a cold compress and start simple analgesia

1.26 A 27-year-old man has a painless swelling in his left scrotum that has gradually increased over the past year. On examination, enlarged, distended veins are palpable within the scrotum, the swelling does not transilluminate, and it reduces in size when lying supine. He reports no pain but has been trying unsuccessfully to conceive with his partner for over a year. He is a self-employed plumber.

Investigations:

Ultrasound shows dilated veins in the left pampiniform plexus measuring 4 mm with retrograde flow on Valsalva manoeuvre
Semen analysis shows oligospermia and reduced motility

Which is the most appropriate next step in management?
A. Reassure and advise scrotal support
B. Assisted reproduction techniques
C. Open surgical varicocelectomy
D. Embolisation
E. Needle aspiration

1.27 A new screening test for colorectal cancer is being evaluated in a population in the UK. The table below summarises the results compared to the gold standard.

Investigations:

	Colorectal cancer present	Colorectal cancer absent
Test positive	80	20
Test negative	20	180

What is the specificity of the new screening test?
A. 80%
B. 85%
C. 88%

D. 90%
E. 95%

1.28 A 58-year-old man has weight loss, abdominal pain and jaundice.

Investigations:

Bilirubin	145 µmol/L
Alkaline phosphatase	290 U/L
GGT	355 U/L
CT scan of abdomen shows a hypo-enhancing mass in the pancreatic head	

Which is the most appropriate next investigation?
A. AFP
B. CEA
C. CA19–9
D. PSA
E. β-hCG

1.29 A 64-year-old woman has a swelling in her right groin for 3 months. The swelling protrudes on coughing. It is not painful. She does not report nausea or vomiting. Her bowels are opening normally. She is normally fit and well. She takes no regular medication and she had an open appendicectomy as a teenager. On examination, there is a 2 × 2 cm swelling below the inguinal ligament and lateral to the pubic tubercle. Bowel sounds are normal.

Which is the most likely diagnosis?
A. Incisional hernia
B. Direct inguinal hernia
C. Indirect inguinal hernia
D. Femoral hernia
E. Richter hernia

1.30 A 42-year-old man has recurrent perianal pain. He reports ongoing purulent discharge from the anus. He finds it very painful to sit down during these episodes. On inspection, there is a small opening with visible drainage, with surrounding hypertrophied tissue.

Which is the most likely diagnosis?
A. Pilonidal sinus
B. Pilonidal abscess
C. Pilonidal cyst
D. Infected external haemorrhoid
E. Fistula in ano

1.31 A 27-year-old woman has worsening dysphagia for 3 months. She has lost a stone in weight. She has retrosternal chest pain, worse after eating, and a nocturnal cough. She has frequent chest infections which often require antibiotics. She is otherwise fit and well and takes no regular medication.

Which investigation is most likely to help confirm the diagnosis?
A. Upper gastrointestinal endoscopy
B. Oesophageal manometry
C. Oesophageal pH monitoring
D. Barium swallow
E. CT scan of chest and abdomen

1.32 A 51-year-old man has right upper quadrant pain, weight loss, and fatigue. He has chronic hepatitis B. Physical examination reveals ascites and hepatomegaly.

Which is the most likely diagnosis?
A. Hepatocellular carcinoma
B. Cholangiocarcinoma
C. Hepatic abscess
D. Hepatic haemangioma
E. Ascending cholangitis

1.33 A 43-year-old woman has severe right-sided loin pain radiating to her groin. She states the pain is worse than giving birth. She is normally fit and well. Urinalysis shows a trace of blood but nil else. Abdominal X-ray shows a right ureteric calculus.

Which is the most likely composition of the calculus?
A. Uric acid
B. Calcium oxalate
C. Magnesium ammonium phosphate
D. Cystine
E. Xanthine

1.34 A 68-year-old man has a PSA test as part of a well-man check. He has no urinary symptoms and has a normal digital rectal examination. He is normally fit and well and is a keen cyclist. His PSA level is 6.8 μg/L. Urinalysis is negative for leucocytes, nitrites, blood and protein.

Which is the most appropriate next step in management?
A. Prostate biopsy
B. Multiparametric MRI of prostate
C. Repeat PSA in 6 weeks
D. Commence ciprofloxacin
E. Repeat digital rectal examination in 6 months

1.35 A 48-year-old woman has nipple discharge and occasional breast pain. On examination, the left nipple is retracted, and the discharge is greenish brown in colour. There is no palpable lump. Mammography is unremarkable.

Which is the most likely diagnosis?
A. Fibroadenoma
B. Intraductal papilloma
C. Paget disease
D. Galactorrhoea
E. Duct ectasia

1.36 A 26-year-old man has a 4-day history of left scrotal pain and swelling. He has dysuria and increased frequency. He reports no trauma. On examination, there is tenderness and swelling over the left epididymis, with a positive Prehn's sign. He is afebrile.

Which is the most appropriate treatment?
A. Trimethoprim
B. Ceftriaxone

C. Pivmecillinam
D. Ofloxacin
E. Co-amoxiclav

1.37 A 56-year-old postmenopausal woman is diagnosed with early-stage oestrogen receptor-positive (ER+) breast cancer. She is at high risk of disease recurrence.

Which is the most appropriate treatment?
A. Tamoxifen
B. Dexamethasone
C. Anastrozole
D. Radiotherapy
E. Paclitaxel

1.38 A 64-year-old man has urinary urgency, daytime urinary frequency, nocturia and often feels the need to urinate again just after passing urine. He does not report urinary incontinence. He has stopped drinking fluids after 6 pm. He is normally fit and well. He is a long-distance lorry driver. On examination, his abdomen is soft and non-tender. Digital rectal examination reveals an enlarged symmetrical prostate. Urine dipstick testing is normal.

Which is the most appropriate management plan?
A. Refer to the urology clinic
B. Refer to a continence physiotherapist
C. Offer supervised pelvic floor muscle training
D. Offer an alpha blocker
E. Offer an antimuscarinic

1.39 A 42-year-old woman has a 2 cm firm left breast lump. She is referred to the breast clinic. She is diagnosed with an invasive ductal carcinoma with no evidence of metastasis. There is no evidence of lymph node involvement on ultrasound. She wishes to preserve her breast, if possible.

Which is the most appropriate management?
A. Breast-conserving surgery with sentinel lymph node biopsy
B. Breast-conserving surgery with axillary lymph node clearance
C. Breast-conserving surgery without lymph node evaluation
D. Mastectomy
E. Mastectomy with immediate reconstruction

1.40 A 39-year-old woman has concerns about breast cancer due to her strong family history. She consults with her GP to discuss genetic risk factors, as her mother had breast, endometrial and thyroid cancer, and squamous cell carcinoma of the skin.

Which is the most likely genetic condition that her mother had?
A. Li–Fraumeni syndrome
B. Peutz-Jeghers syndrome
C. Fanconi anaemia
D. Cowden syndrome
E. Hereditary diffuse gastric cancer syndrome

1.41 A 61-year-old man is diagnosed with a 3 cm localised renal mass in the right kidney (T1aN0M0). Imaging confirms no evidence of lymph node involvement or distant metastases. He has no past medical history. He takes no regular medication. He works as a painter and decorator.

Which is the most appropriate management?

A. Radical nephrectomy
B. Partial nephrectomy
C. Radiofrequency ablation
D. Adjuvant therapy
E. Surveillance

1.42 A 79-year-old woman has urinary urgency, frequency, and nocturia for 6 months. She is awaiting assessment in the memory and falls clinics. Other than chronic constipation, she is otherwise well. Urinalysis is normal. Urodynamic studies show involuntary contraction of the bladder during filling. She has tried bladder training for 6 weeks to no avail.

Which is the most appropriate next step in management?

A. Anticholinergic medication
B. Pelvic floor muscle training
C. Botulinum toxin A injections
D. Sacral nerve stimulation
E. Augmentation cystoplasty

1.43 A 66-year-old man is diagnosed with prostate cancer. He has a Gleason score of 8 and a PSA of 32 µg/L. He is otherwise healthy and prefers an active treatment approach.

Which is the most appropriate management?

A. Active surveillance
B. Brachytherapy
C. Transurethral resection of the prostate
D. Radical radiotherapy without androgen deprivation therapy
E. Radical prostatectomy

1.44 A 46-year-old woman is seen by the GP for a 3-month review. Her serum calcium has been persistently raised, and her PTH levels are above the normal range. She has no symptoms. Her recent T-score on dual-energy X-ray absorptiometry (DEXA) scanning is −2.7.

Which is the most appropriate next step in management?

A. Monitor serum calcium and PTH levels annually and reassess DEXA scan in 3 years
B. Refer for parathyroidectomy
C. Commence alendronate
D. Commence cinacalcet
E. Arrange a sestamibi scan

1.45 A 63-year-old man has severe epigastric pain radiating to the shoulders, which started suddenly 4 hours ago. He uses omeprazole when required for gastro-oesophageal reflux disease. He drinks 30 units of alcohol per week. He smokes 15 cigarettes daily. His pulse rate is 123 bpm, BP 90/60 mmHg, respiratory rate 25 breaths per minute and temperature of 38.4°C. A chest X-ray shows free air under the diaphragm.

Which is the most appropriate next step in management?

A. Administer high-dose proton pump inhibitor therapy and admit for observation
B. Start nasogastric decompression and refer for non-urgent endoscopy
C. Perform a CT scan of abdomen
D. Administer intravenous fluids, antibiotics and refer for urgent endoscopy
E. Administer intravenous fluids and antibiotics, and refer urgently to the surgical team

1.46 A 71-year-old woman has severe, diffuse abdominal pain of 3 hours duration. She describes the pain as out of proportion to the abdominal tenderness on examination, where her abdomen is soft with minimal peritonism. She denies vomiting and she last opened her bowels 6 hours earlier. She has hypertension and atrial fibrillation. She is an ex-smoker and drinks alcohol occasionally. Her pulse rate is 106 bpm, BP 104/72 mmHg, respiratory rate 18 breaths per minute and oxygen saturation 97% on room air.

Investigations:

Amylase	98 U/L
Lactate	5.2 mmol/L
pH	7.28
HCO_3^-	16 mmol/L
pCO_2	3.5 kPa

Which is the most likely diagnosis?

A. Acute pancreatitis
B. Perforated peptic ulcer
C. Acute mesenteric ischaemia
D. Diverticulitis
E. Small bowel obstruction

1.47 A 27-year-old man has increasing pain and swelling in the sacrococcygeal region for 2 days. He has difficulty sitting and describes a foul-smelling discharge from the area. On examination, there is erythema, tenderness, and a fluctuant swelling in the intergluteal cleft.

Which is the most appropriate next step in management?

A. Incision and drainage
B. Oral antibiotics
C. Sitz baths and hygiene advice
D. Wide excision and wound packing
E. Excision and primary closure

1.48 A randomised controlled trial investigates the efficacy of a new chemotherapy drug for pancreatic cancer. The trial includes 200 patients, with 100 patients in the treatment group and 100 in the control group. After 1 year, 40 patients in the treatment group survived compared to 20 patients in the control group.

Which is the number needed to treat (NNT) to achieve one additional survivor at 1 year?

A. 2
B. 5
C. 10
D. 20
E. 50

1.49 A 34-year-old woman has breast pain and multiple lumps in both breasts that vary in size and tenderness during her menstrual cycle. On examination, the breasts are nodular, and the lumps are mobile and non-tender. There is no overlying skin change or nipple discharge.

Which is the most likely diagnosis?

A. Ductal ectasia
B. Fat necrosis
C. Lipomatous tumours
D. Fibroadenoma
E. Fibroadenosis

1.50 A 46-year-old man has severe epigastric pain radiating to his back, fever and vomiting. He has a history of recurrent episodes of right upper quadrant pain, nausea and vomiting. His pulse rate is 110 bpm, BP 108/72 mmHg and temperature 38.5°C.

Investigations:

White cell count	17.4×10^9/L
ALT	326 U/L
Alkaline phosphatase	441 U/L
Amylase	1102 U/L
Bilirubin	60 µmol/L

Ultrasound abdomen performed 6 months earlier revealed multiple gallstones in the gallbladder with no biliary dilatation

Which is the most appropriate next step in management?

A. Urgent laparoscopic cholecystectomy
B. Percutaneous cholecystostomy
C. Endoscopic retrograde cholangiopancreatography
D. Supportive management with IV fluids and antibiotics
E. Magnetic resonance cholangiopancreatography

ANSWERS

1.1 *A – Transabdominal ultrasound*

This 44-year-old woman presents with fever, jaundice, abdominal pain, and peritonism in the right upper quadrant. Her blood results show leucocytosis, raised CRP, and cholestatic liver function test derangement, raising strong suspicion for acute ascending cholangitis secondary to gallstones. However, while highly suggestive, this is not diagnostic without imaging evidence of biliary obstruction.

The most appropriate next step is therefore transabdominal ultrasound, which is the first-line investigation to assess for gallstones and bile duct dilatation. If obstruction is demonstrated, the definitive treatment is ERCP for decompression.

Other options are less appropriate:

- **ERCP** is not performed without confirmation of obstruction, as it carries risks of bleeding, pancreatitis, and perforation.
- **Thiamine with vitamins B and C (Pabrinex®)** is given for Wernicke's prophylaxis in alcohol misuse, not relevant here.
- **Contrast-enhanced CT** may detect complications but is not first line in suspected biliary obstruction.
- **Cholecystectomy** is definitive treatment for gallstones but is not performed for acute cholangitis.

1.2 *A – Topical glyceryl trinitrate*

This 31-year-old man presents with severe post-defaecatory pain lasting up to an hour, rectal bleeding on wiping, and examination reveals a longitudinal tear in the anal canal distal to the dentate line with a posterior midline skin tag, consistent with a chronic anal fissure. Conservative measures with fibre, fluids, and laxatives have already been attempted with little benefit. The most appropriate next step is medical therapy to promote healing by reducing internal sphincter tone, with topical glyceryl trinitrate (GTN) ointment as first-line treatment. If there is inadequate adherence due to side effects such as intolerable headache, specialist advice should be sought on alternatives such as topical diltiazem 2% (unlicensed product).

Other options are less appropriate:

- **Topical cinchocaine with hydrocortisone (Proctosedyl®)** provides local anaesthetic and steroid but does not address the underlying sphincter hypertonia, so it is not definitive management.
- **Anusol® HC suppository** is mainly used for haemorrhoids, not fissures.
- **Glycerol suppository** helps constipation but does not treat the fissure itself.

1.3 *E – Appendiceal neuroendocrine neoplasm*

This 49-year-old woman presents with a 2-month history of intermittent right lower quadrant pain, anorexia, and weight loss, without fever. Examination shows only mild tenderness, and blood tests reveal a raised WCC and CRP. CT imaging demonstrates a 1 cm mass at the tip of the appendix with peri-appendiceal fat stranding, but no abscess or free fluid. This subacute presentation with constitutional symptoms and a discrete appendiceal lesion is most consistent with an appendiceal neuroendocrine neoplasm (carcinoid tumour), the most common primary tumour of the appendix, typically located at the tip and often <2 cm.

Other options are less likely:

- **Chronic appendicitis** is controversial, usually presents with recurrent episodes rather than a persistent mass, and is not associated with weight loss.
- **Appendiceal lymphoma** is rare, usually produces a bulky mass, and is less likely with this small, well-defined lesion.
- **Diverticulitis** usually affects the sigmoid colon, not the appendix, and presents more acutely with fever and left lower quadrant pain.
- **Appendiceal phlegmon** refers to an inflammatory mass due to acute appendicitis with localised perforation/abscess, which would present more acutely with systemic features.

1.4 *C – Choriocarcinoma*

This 32-year-old man presents with a painless, smooth intratesticular mass that does not transilluminate, consistent with a testicular tumour. His tumour markers show an extremely elevated β-hCG (>700,000 IU/L), markedly raised LDH, and a normal alpha-fetoprotein. This biochemical profile is characteristic of choriocarcinoma, a rare but highly aggressive non-seminomatous germ cell tumour, which classically produces very high β-hCG levels.

Other options are less likely:

- **Embryonal carcinoma** may elevate both AFP and β-hCG, but usually not to such extreme levels, and AFP is often raised, which is not the case here.
- **Teratoma** often produces normal tumour markers or mild LDH elevation but does not cause isolated massive β-hCG elevation.
- **Yolk sac tumour** typically produces elevated AFP, which is normal in this case.
- **Sertoli cell tumour** is a rare non-germ cell tumour that usually does not elevate AFP, β-hCG, or LDH.

1.5 *B – Invasive ductal carcinoma*

This 43-year-old woman presents with a painless, hard, irregular, and immobile breast lump in the upper outer quadrant of her left breast, which has increased in size over the past 3 months. Mammography shows an ill-defined, microlobulated, and spiculated mass. These clinical and radiological features are consistent with invasive ductal carcinoma, the most common type of breast cancer, which typically presents as a firm, irregular, immobile mass in middle-aged women and often appears spiculated on imaging.

Other options are less likely:

- **Fat necrosis** usually follows trauma or surgery and may mimic malignancy on imaging, but there is no history of trauma, and it rarely presents as a rapidly enlarging, hard, irregular mass.
- **Fibroadenoma** typically occurs in younger women, presents as a soft, mobile, well-circumscribed mass, and grows slowly.
- **Phyllodes tumour** can grow rapidly and be firm, but it is usually well-circumscribed and not spiculated on mammography.
- **Fibrocystic changes** are generally diffuse, bilateral and often tender, rather than a solitary, hard, spiculated mass.

1.6 *A – Serum corrected calcium*

This 41-year-old man develops muscle cramps and carpopedal spasms after a total thyroidectomy, with positive Chvostek and Trousseau signs, which are classic features of acute hypocalcaemia due to possible inadvertent removal or injury of the parathyroid glands during surgery. The most important immediate investigation is serum corrected calcium, which quantifies the degree of hypocalcaemia and guides urgent management with intravenous calcium if needed.

Other options are less immediately relevant:

- **Serum phosphate** may be altered in chronic hypoparathyroidism, but it is not critical for the immediate assessment of symptomatic hypocalcaemia.
- **Serum vitamin D** reflects long-term calcium metabolism and is not urgent in acute post-surgical hypocalcaemia.
- **Serum creatine kinase** may rise in severe tetany but does not guide acute management.
- **Plasma parathyroid hormone (PTH)** helps determine the underlying cause (hypoparathyroidism vs other), but results are not immediately required to treat life-threatening hypocalcaemia.

1.7 *D – Well-circumscribed, mobile mass*

This 29-year-old woman presents with a painless, well-circumscribed, mobile breast lump in the upper outer quadrant that has remained stable in size over 2 months. These features are characteristic of a fibroadenoma, a common benign breast tumour in young women. Among the listed options, the feature that best differentiates fibroadenoma from breast carcinoma is a well-circumscribed, mobile mass, as carcinomas are typically hard, irregular and fixed to surrounding tissues.

Other options are less discriminative:

- **Nipple inversion** can occur in malignancy but is not always present and can rarely be seen in benign conditions.
- **Progressive skin reddening** may indicate inflammatory breast cancer or infection, but it is not specific for differentiating fibroadenoma.
- **Puckering (skin dimpling)** is more characteristic of invasive carcinoma due to tethering of Cooper's ligaments.
- **Painless lump** is common to both fibroadenoma and breast carcinoma, so it does not reliably differentiate them.

1.8 *E – Dysphonia*

This 38-year-old man undergoes a total thyroidectomy for a multinodular goitre. The most common complication after thyroid surgery is injury to the recurrent laryngeal nerve, which innervates the intrinsic muscles of the larynx (except the cricothyroid). Damage can lead to dysphonia (hoarseness of voice), which may be transient or permanent depending on the extent of nerve injury.

Other options are less likely:

- **Weakened neck flexion** occurs with injury to the anterior neck muscles or cervical nerves, which are not typically affected in thyroidectomy.
- **Reduced elevation of the scapula** suggests injury to the spinal accessory nerve, usually during lymph node dissection in the posterior triangle of the neck, not routine thyroidectomy.

- **Xerostomia** (dry mouth) is associated with salivary gland disorders or parasympathetic nerve injury, not thyroid surgery.
- **Dyspnoea** may occur with bilateral recurrent laryngeal nerve injury or large haematoma causing airway compression, but it is less common than isolated dysphonia.

1.9 *D – Cushing's syndrome*

This 43-year-old woman presents with muscle weakness, easy bruising, weight gain, central obesity, facial plethora and a dorsocervical fat pad, along with hypertension. These features are classic signs of Cushing's syndrome. Her investigations show:

- Elevated serum morning cortisol (695 nmol/L)
- Suppressed plasma ACTH (5 ng/L)
- No suppression on low-dose dexamethasone (690 nmol/L)
- Markedly elevated 24-hour urinary free cortisol (1640 nmol/24 h)

The combination of high cortisol with low ACTH indicates ACTH-independent Cushing's syndrome, meaning the source of excess cortisol is adrenal in origin. Among adrenal causes, adrenal adenoma is the most common.

Other options are less likely:

- **Pheochromocytoma** causes catecholamine excess, leading to episodic hypertension, palpitations, and sweating, not cortisol excess.
- **Adrenocortical carcinoma** can produce cortisol, but it is rare and often presents with rapidly progressive symptoms and a large adrenal mass.
- **Conn's syndrome** (primary hyperaldosteronism) causes hypertension and hypokalaemia, not Cushingoid features.
- **Pituitary adenoma** causes ACTH-dependent Cushing's syndrome, with elevated ACTH, which is inconsistent with this patient's low ACTH.

1.10 *B – Total thyroidectomy*

This 34-year-old man presents with a painless thyroid nodule, and fine needle aspiration confirms papillary thyroid carcinoma (PTC). The standard initial treatment for PTC >1 cm, or for tumours in the thyroid lobe with potential multifocality, is total thyroidectomy, which allows complete removal of the tumour, facilitates postoperative monitoring with thyroglobulin, and permits adjuvant radioactive iodine therapy if needed.

Other options are less appropriate:

- **Partial thyroidectomy** (lobectomy) may be considered only for small (<1 cm), unifocal, low-risk tumours, which is not the case here given typical practice guidelines for a 2 cm tumour.
- **Chemotherapy** has no role in initial management of PTC.
- **External beam radiation therapy** is reserved for unresectable, locally advanced, or metastatic disease.
- **Radioactive iodine therapy** is an adjuvant treatment, not the primary surgical intervention.

1.11 *E – Letrozole*

This 54-year-old postmenopausal woman with oestrogen receptor-positive breast cancer presents with hot flushes, joint pains, hair thinning, vaginal dryness, and osteoporosis, which are classic features of oestrogen deficiency. These are most commonly caused by aromatase inhibitors such as letrozole, which reduce circulating oestrogen

in postmenopausal women, leading to vasomotor symptoms, musculoskeletal pain, genitourinary atrophy, and bone loss.

Other options are less likely:

- **Ribociclib** is a CDK4/6 inhibitor; it causes neutropenia, fatigue, and nausea, but not oestrogen deficiency or osteoporosis.
- **Goserelin** is a GnRH agonist used to suppress ovarian function in premenopausal women; it is less relevant postmenopause.
- **Fulvestrant** is an oestrogen receptor degrader used in advanced disease; bone loss and menopausal symptoms are more characteristic of aromatase inhibitors.
- **Tamoxifen** is a selective oestrogen receptor modulator; in postmenopausal women, it is bone-protective, and vasomotor symptoms are usually milder.

1.12 *A – Faecal immunochemical testing*

This 42-year-old man presents with unexplained weight loss and right lower quadrant abdominal pain for 2 months. In patients aged ≥40 with unexplained weight loss or abdominal pain without rectal bleeding, or adults with iron-deficiency anaemia, a change in bowel habit or a palpable abdominal mass, the recommended first-line investigation is a faecal immunochemical test (FIT). A positive FIT then triggers an urgent referral for colonoscopy via the suspected cancer pathway.

Other options are less appropriate:

- **Referral for colonoscopy** is not the initial step because the patient does not have high-risk features (rectal bleeding, palpable mass, iron-deficiency anaemia, or persistent change in bowel habit). NICE recommends FIT first to triage risk and prioritise colonoscopy for those most likely to have malignancy.
- **Reassurance and safety-netting** alone are unsafe given the red-flag symptom of unexplained weight loss.
- **Suspected cancer pathway referral without FIT** is reserved for patients with high-risk features, such as a rectal mass, or unexplained appetite loss or weight loss.
- **Coeliac serology** is indicated for malabsorption or chronic diarrhoea, not isolated weight loss and localised abdominal pain.

1.13 *D – Intravenous fluids and nil by mouth*

This 43-year-old woman presents with sudden-onset epigastric pain radiating to the back, nausea and vomiting, along with tachycardia and hypotension. Her serum amylase is elevated (425 U/L), which is more than three times the upper limit of normal. These findings are classic for acute pancreatitis, likely alcohol-induced given her intake.

The cornerstone of initial management in acute pancreatitis is supportive care:

- Intravenous fluids to correct hypovolaemia
- Analgesia and monitoring for complications

Other options are less appropriate at this stage:

- **Immediate CT scan of the abdomen** is not routinely indicated on admission unless the diagnosis is uncertain or the patient is not improving after 48–72 hours.

- **Intravenous antibiotics** are not indicated in uncomplicated acute pancreatitis. They are reserved for confirmed infected pancreatic necrosis.
- **Endoscopic retrograde cholangiopancreatography (ERCP)** is only indicated in gallstone pancreatitis with cholangitis or ongoing obstruction, which this patient does not have.
- **Laparoscopic cholecystectomy** is not indicated in alcohol-induced pancreatitis; it is reserved for gallstone-related cases after recovery.

1.14 *C – Urgent admission to the surgical assessment unit*

This 39-year-old man presents with sudden-onset severe anal pain that is constant, worse on sitting, and has purplish tender swellings at the anal verge. These features are classic for an acute thrombosed external haemorrhoid. It is important to determine if the haemorrhoids are acutely strangulated internal haemorrhoids or acutely thrombosed external haemorrhoids. Therefore, the most appropriate management for a patient who presents with severe pain within 48–72 hours is to refer to the surgical team for further assessment. Reduction, incision and evacuation of haemorrhoidal haematoma or (rarely) excision may be needed, but often the mainstay is conservative treatment with ice packs, topical lidocaine gel and stool softeners.

Other options are less appropriate:

- **Sclerotherapy** is used for internal haemorrhoids, not external thrombosed haemorrhoids.
- **Rubber band ligation** is indicated for internal haemorrhoids; not acute external thromboses.
- **Analgesia and high-fibre diet** may relieve symptoms in chronic or mild haemorrhoids, but are insufficient initially for acutely thrombosed.
- **Topical antibiotics** are not indicated unless there is secondary infection, which is uncommon.

1.15 *B – Laparoscopic fundoplication*

This 56-year-old woman has Barrett's oesophagus with intestinal metaplasia but no dysplasia, and she is dependent on high-dose proton pump inhibitor (PPI) therapy for symptom control. She is concerned about progression to oesophageal adenocarcinoma but wishes to avoid long-term acid suppression.

The most appropriate management for non-dysplastic Barrett's oesophagus in a patient with symptomatic reflux intolerant of medical therapy is anti-reflux surgery, usually laparoscopic fundoplication, which reduces acid exposure, controls reflux, and may lower the risk of progression.

Other options are less appropriate:

- **Oesophagectomy** is reserved for high-grade dysplasia or invasive adenocarcinoma, not non-dysplastic Barrett's.
- **Endoscopic mucosal resection** is used for visible lesions or dysplasia, not routine intestinal metaplasia without dysplasia.
- **Radiofrequency ablation** is indicated for Barrett's with dysplasia, not non-dysplastic metaplasia.
- **Photodynamic therapy** is largely historical and is used for dysplastic Barrett's; it is not recommended for non-dysplastic cases.

1.16 *E – Overwhelming post-splenectomy infection*

This 42-year-old man underwent elective splenectomy for hereditary spherocytosis and presents 3 months postoperatively with fever, rigors, dyspnoea, tachycardia, hypotension, and widespread petechiae, along with neutrophilia. These features are classic for overwhelming post-splenectomy infection (OPSI), a potentially life-threatening complication caused by encapsulated bacteria (most commonly *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Neisseria meningitidis*). The presence of petechiae suggests sepsis with possible disseminated intravascular coagulation.

Other options are less likely:

- **Subphrenic abscess** usually presents later (1–3 weeks), with fever, abdominal pain, and localised tenderness, but petechiae and rapid systemic deterioration are not typical.
- **Venous thromboembolism** can cause dyspnoea and tachycardia, but fever, rigors, and petechiae are not characteristic.
- **Post-splenectomy haemorrhage** usually occurs within 24–48 hours and presents with hypotension and abdominal pain; fever is uncommon.
- **Pancreatitis** may occur post-splenectomy, albeit very rarely, but presents with epigastric pain radiating to the back, nausea/vomiting, and elevated amylase, not petechiae or rigors.

1.17 *D – Proctocolectomy with ileal pouch-anal anastomosis*

This 31-year-old woman has a 10-year history of ulcerative colitis with worsening bloody diarrhoea, abdominal pain, and weight loss despite maximum medical therapy, including corticosteroids and biologics. Her recent colonoscopy shows extensive colitis with areas of dysplasia, which carries a high risk of progression to colorectal cancer.

The most appropriate surgical intervention in ulcerative colitis with dysplasia is proctocolectomy with ileal pouch-anal anastomosis (IPAA). This procedure removes the entire colon and rectum, eliminating the risk of malignant transformation while preserving continence by creating a neorectum from the ileum.

Other options are less appropriate:

- **Hemicolectomy** only removes part of the colon, leaving the remaining diseased colon at risk of malignancy.
- **Subtotal colectomy with ileorectal anastomosis** leaves the rectum in place, which still carries a risk of cancer in dysplastic patients.
- **Total colectomy with end ileostomy** is curative but sacrifices anal continence; it may be considered if IPAA is not feasible.
- **Anterior resection** is a segmental rectal resection, which is insufficient in the context of extensive colitis and dysplasia.

1.18 *A – Small bowel obstruction*

This 78-year-old man presents with abdominal pain, distension, vomiting, and absolute constipation. On examination, his abdomen is distended with high-pitched bowel sounds, consistent with bowel obstruction. The abdominal X-ray shows dilated loops of small bowel with multiple central air-fluid levels and valvulae conniventes visible, which are highly characteristic of small bowel obstruction.

Other options are less likely:

- **Paralytic ileus** would show diffuse bowel dilatation without the typical central air-fluid levels and high-pitched bowel sounds; bowel sounds are usually absent or reduced.
- **Volvulus** (e.g. sigmoid or caecal) would show a markedly dilated loop with a 'coffee-bean' or kidney-shaped appearance, not seen here.
- **Umbilical hernia** could be a cause of obstruction but would be clinically evident as a palpable swelling rather than the primary radiological diagnosis.
- **Faecal loading** would show mottled, granular opacities in the colon, not dilated central small bowel loops with air-fluid levels.

1.19 *C – Sentinel lymph node biopsy*

This 47-year-old woman is diagnosed with a 2.5 cm invasive ductal carcinoma in the upper outer quadrant of her left breast. There are no signs of distant metastases, but an axillary lymph node is palpable. She opts for breast-conserving surgery. Accurate axillary staging is important to guide further treatment and prognosis.

The most appropriate next step in axillary management in a patient undergoing breast-conserving surgery with clinically palpable nodes is sentinel lymph node biopsy (SLNB). SLNB identifies the first draining lymph nodes from the tumour site, allowing staging with minimal morbidity compared with full axillary dissection.

Other options are less appropriate:

- **Core biopsy of the axillary lymph node** may confirm metastasis but is not routinely required before SLNB in clinically node-negative patients.
- **Axillary lymph node dissection** is associated with higher morbidity and is usually reserved for confirmed nodal metastases or positive SLNB.
- **Fine needle aspiration of the axillary lymph node** can detect metastasis but does not provide comprehensive staging for surgical planning.
- **PET-CT scan** is not indicated in early-stage breast cancer with no systemic symptoms or signs of metastasis.

1.20 *B – Ofloxacin*

This 43-year-old man presents with fever, perineal pain, dysuria, urinary frequency, urgency, and a dull lumbar spine ache. On digital rectal examination, his prostate is tender and enlarged, and urinalysis shows pyuria. These findings are classic for acute bacterial prostatitis, most commonly caused by Gram-negative bacteria such as E. coli.

The most appropriate treatment is an oral fluoroquinolone such as ofloxacin, which achieves good prostatic tissue penetration and covers typical urinary pathogens. Treatment is usually for 2–6 weeks to ensure eradication of infection and prevent chronic prostatitis.

Other options are less appropriate:

- **Nitrofurantoin** does not achieve therapeutic concentrations in prostatic tissue and is ineffective for prostatitis.
- **Co-trimoxazole** can be used in some cases but has less reliable tissue penetration compared with fluoroquinolones.
- **Fosfomycin** is not recommended for acute bacterial prostatitis due to limited evidence of efficacy.
- **Gentamicin** is an intravenous aminoglycoside and is generally reserved for severe or hospitalised cases, not uncomplicated outpatient management.

1.21 *D – Morgagni hernia*

This 78-year-old woman presents with insidious right upper quadrant pain, right-sided chest pain, and dyspnoea, alongside a history of recurrent pneumonia. The CT scan demonstrates bowel loops herniating into the right hemithorax, with displacement of lung tissue. This is most consistent with a Morgagni hernia – a congenital diaphragmatic hernia occurring through the foramen of Morgagni, typically right-sided and anterior, often presenting in older adults with respiratory or gastrointestinal symptoms.

Other options are less likely:

- **Sliding hiatus hernia** involves herniation of the gastro-oesophageal junction and proximal stomach through the oesophageal hiatus, seen posteriorly, not right anterior.
- **Para-oesophageal hernia** also occurs through the oesophageal hiatus, but the gastro-oesophageal junction remains in place; herniated stomach lies adjacent to oesophagus, not into right chest as bowel loops.
- **Bochdalek hernia** occurs posterolaterally (usually left side) and is typically detected in neonates/infants, not in an elderly woman.
- **Diaphragmatic eventration** is due to abnormal elevation of an intact hemidiaphragm, not true herniation of abdominal contents.

1.22 *A – Medroxyprogesterone acetate*

This 68-year-old man has developed hot flushes during treatment for prostate cancer with leuprorelin acetate, a GnRH agonist that induces medical castration by suppressing testosterone. Hot flushes are a common side effect of androgen deprivation therapy.

The most appropriate treatment for androgen deprivation-induced hot flushes is medroxyprogesterone acetate, which reduces vasomotor symptoms by modulating hypothalamic temperature regulation.

Other options are less appropriate:

- **Cyproterone acetate** is an anti-androgen; while it lowers testosterone, it is not first line for symptomatic relief of hot flushes.
- **Tamoxifen** is a selective oestrogen receptor modulator used for breast cancer, not for androgen deprivation-induced hot flushes.
- **Tadalafil** is a phosphodiesterase-5 inhibitor used for erectile dysfunction; it does not treat hot flushes.
- **Alendronate** is a bisphosphonate used to prevent osteoporosis, which may occur with androgen deprivation, but it does not relieve hot flushes.

1.23 *D – Nil by mouth and nasogastric aspiration*

This 76-year-old woman presents with constipation, abdominal distension, vomiting and abdominal pain. On examination, her abdomen is distended, tympanic and bowel sounds are absent, but there are no signs of peritonism. Her vital signs are stable. The abdominal X-ray shows a grossly dilated large bowel without mechanical obstruction, consistent with acute colonic pseudo-obstruction (Ogilvie's syndrome), likely precipitated by her codeine and amitriptyline use, both of which reduce gut motility. The most appropriate initial management is conservative, involving bowel rest, nasogastric aspiration, intravenous fluids, correction of electrolytes, and discontinuation of constipating medications.

Other options are less appropriate:

- **Emergency laparotomy** is not indicated as there is no evidence of perforation or peritonitis.
- **Neostigmine infusion** is used if conservative treatment fails or if the caecum becomes dangerously distended (>10–12 cm).
- **Colonic decompression** is reserved for refractory cases where neostigmine is contraindicated or unsuccessful.
- **Surgical caecostomy** is a last resort for severe, complicated, or perforated cases.

1.24 *B – Tamsulosin*

This 62-year-old man presents with lower urinary tract symptoms (LUTS) including frequency, nocturia, hesitancy, and a weak urinary stream for 6 months. Digital rectal examination reveals an enlarged, smooth, non-tender prostate; PSA is mildly elevated at 4.8 µg/L; and urinalysis is normal. His IPSS score of 10 indicates moderate symptoms. These features are consistent with benign prostatic hyperplasia (BPH).

The most appropriate initial management for moderate BPH symptoms impacting quality of life is an α-1 blocker such as tamsulosin, which relaxes prostatic smooth muscle and improves urinary flow.

Other options are less appropriate:

- **Watchful waiting** is suitable for mild symptoms (IPSS ≤7) or minimal bother, not for moderate symptoms affecting quality of life.
- **Oxybutynin** and **tolterodine** are antimuscarinics used for overactive bladder; they are not first line for obstructive BPH symptoms and may worsen urinary retention.
- **Dutasteride** is a 5-α-reductase inhibitor, used for prostate volume reduction, but its effect is gradual and not first line for moderate symptoms needing rapid relief.

1.25 *D – Continue breastfeeding and start antibiotics*

This 30-year-old woman presents with a painful, erythematous, warm area in the left breast while breastfeeding her 6-week-old infant. She has fever (38.2 °C) and tenderness, but no palpable fluctuant mass, which is consistent with acute mastitis, most commonly caused by *Staphylococcus aureus* in lactating women.

The most appropriate management is to continue breastfeeding and start antibiotics, as ongoing milk drainage prevents milk stasis and promotes resolution. Oral flucloxacillin is first-line therapy. Supportive measures such as analgesia and local warmth may also help.

Other options are less appropriate:

- **Referral urgently to a general surgeon** is unnecessary unless there is a palpable abscess or systemic sepsis.
- **Reassurance and watchful waiting** is inappropriate because she has fever and infection signs requiring antibiotics.
- **Stopping breastfeeding and starting antibiotics** is not recommended; continued breastfeeding or expressing milk is essential.
- **Applying a cold compress and starting simple analgesia** alone is insufficient in the presence of systemic symptoms.

1.26 *D – Embolisation*

This 27-year-old man has a painless left-sided varicocele with infertility, confirmed by ultrasound showing dilated pampiniform plexus with retrograde flow and abnormal semen parameters. He is self-employed as a plumber, so minimising recovery time is relevant.

Both open surgical varicocelectomy and percutaneous embolisation are effective in correcting varicoceles and improving semen quality. Varicocelectomy involves ligation of the dilated pampiniform plexus veins rather than excision of tissue (which ...ectomy often infers). Embolisation offers a shorter recovery period, avoids an inguinal incision, and allows him to return to work sooner, which may be more suitable given his occupational demands.

Other options are less appropriate:

- **Reassurance and advising scrotal support** is only appropriate for asymptomatic varicoceles without infertility.
- **Assisted reproduction techniques** may be used if varicocele correction fails but are not first line when the underlying cause is correctable.
- **Needle aspiration** is not indicated, as there is no fluid collection or hydrocele.

1.27 *D – 90%*

$$\text{Specificity} = \frac{\text{True Negatives}}{\text{True Negatives} + \text{False Positives}} \times 100$$

From the 2×2 table:

	Cancer present	Cancer absent
Test positive	80	20
Test negative	20	180

$$\text{Specificity} = \frac{180}{180 + 20} \times 100 = 90\%$$

1.28 *C – CA19–9*

This 58-year-old man presents with weight loss, abdominal pain, and jaundice. Investigations show cholestatic liver enzyme pattern (elevated bilirubin, alkaline phosphatase, GGT) and a hypo-enhancing mass in the pancreatic head on CT, which is highly suggestive of pancreatic adenocarcinoma.

The most appropriate next investigation is CA19–9, a tumour marker commonly elevated in pancreatic adenocarcinoma. While it cannot confirm the diagnosis alone, it is useful for supporting the diagnosis, assessing prognosis, and monitoring response to treatment.

Other options are less appropriate:

- **AFP** is mainly used in hepatocellular carcinoma and germ cell tumours of the liver.
- **CEA** is raised in some gastrointestinal malignancies, particularly colorectal cancer, but is less specific for pancreatic cancer.
- **PSA** is a marker for prostate cancer, irrelevant in this context.
- **β-hCG** is a marker for certain germ cell tumours, not pancreatic cancer.

1.29 *D – Femoral hernia*

This 64-year-old woman presents with a 3-month history of a right groin swelling that protrudes on coughing and is not painful. The most likely diagnosis is a femoral hernia, which typically occurs below the inguinal ligament, just lateral to the pubic tubercle, and is more common in older women. Femoral hernias have a higher risk of incarceration.

Other options are less likely:

- **Incisional hernia** occurs at the site of a previous surgical incision; her appendicectomy scar is remote and in the right lower quadrant, not at the groin.
- **Direct inguinal hernia** protrudes medial to the pubic tubercle through Hesselbach's triangle.
- **Indirect inguinal hernia** protrudes lateral to the pubic tubercle, but above the inguinal ligament; it is more common in younger men.
- **Richter hernia** involves only part of the bowel wall; it usually presents with pain, obstruction, or strangulation, which is not the case here.

1.30 *E – Fistula in ano*

This 42-year-old man presents with recurrent perianal pain, purulent discharge, and pain on sitting. The history of chronic, recurrent infection with a persistent external opening is typical of a fistula in ano.

Other options are less likely:

- **Pilonidal sinus** occurs in the sacrococcygeal region, not directly at the anus, and is associated with hair-containing tracts in the natal cleft.
- **Pilonidal abscess** presents acutely with pain and swelling in the natal cleft; it is usually a one-off episode unless recurrent.
- **Pilonidal cyst** is a congenital or acquired cyst in the sacrococcygeal area and usually does not drain constantly.
- **Infected external haemorrhoid** presents with acute pain and perianal swelling, often bluish, but does not cause chronic purulent discharge.

1.31 *B – Oesophageal manometry*

This 27-year-old woman presents with progressive dysphagia over 3 months, weight loss, retrosternal chest pain, nocturnal cough, and recurrent chest infections. The combination of dysphagia for solids and liquids, regurgitation, and recurrent respiratory symptoms is highly suggestive of achalasia, a motility disorder of the oesophagus.

The investigation most likely to help confirm the diagnosis is oesophageal manometry, which measures the motility and lower oesophageal sphincter function, and is the gold standard for diagnosing achalasia.

Other options are less likely:

- **Upper gastrointestinal endoscopy** is useful to exclude malignancy or structural lesions, but it cannot reliably diagnose motility disorders.
- **Oesophageal pH monitoring** assesses acid reflux and is used for gastro-oesophageal reflux disease (GORD), not achalasia.
- **Barium swallow** can show the classic "bird-beak" appearance, but it is supportive rather than definitive.
- **CT scan of chest and abdomen** may identify extrinsic compression or malignancy but is not diagnostic for achalasia.

1.32 *A – Hepatocellular carcinoma*

This 51-year-old man presents with right upper quadrant pain, weight loss, and fatigue, and has a background of chronic hepatitis B. On examination, he has hepatomegaly and ascites, suggesting chronic liver disease with a space-occupying lesion. Chronic hepatitis B is a major risk factor for hepatocellular carcinoma (HCC).

Other options are less likely:

- **Cholangiocarcinoma** usually presents with painless jaundice, weight loss, and pruritus; ascites is uncommon in early disease.
- **Hepatic abscess** typically presents with fever, rigors, and right upper quadrant tenderness, often acutely, which is not described here.
- **Hepatic haemangioma** is usually asymptomatic and found incidentally; it does not cause weight loss or ascites.
- **Ascending cholangitis** presents acutely with Charcot's triad (fever, jaundice, right upper quadrant pain) and often sepsis; chronic liver disease with weight loss is not typical.

1.33 *B – Calcium oxalate*

This 43-year-old woman presents with sudden, severe right-sided loin-to-groin pain, described as worse than childbirth, and microscopic haematuria. Abdominal X-ray shows a right ureteric calculus, consistent with a typical renal/ureteric stone.

The most likely composition of the calculus is calcium oxalate, which is the most common type of urinary calculus in adults. Calcium oxalate stones are radiopaque on X-ray, frequently cause severe renal colic, and are seen in otherwise healthy individuals.

Other options are less likely:

- **Uric acid** stones are usually radiolucent on plain X-ray and often form in acidic urine.
- **Magnesium ammonium phosphate** stones are associated with chronic urinary tract infections and are typically staghorn calculi.
- **Cystine** stones are rare, usually bilateral, and occur in patients with cystinuria.
- **Xanthine** stones are extremely rare and usually occur in patients with xanthinuria or on certain metabolic medications.

1.34 *C – Repeat PSA in 6 weeks*

This 68-year-old man has an asymptomatic PSA of 6.8 µg/L, with a normal digital rectal examination and negative urinalysis. He is otherwise healthy and a keen cyclist. Vigorous cycling can cause transient elevations in PSA due to perineal microtrauma. In asymptomatic men with normal examination, it is important to exclude reversible causes of PSA elevation before proceeding to imaging or invasive procedures.

The most appropriate next step is to repeat the PSA in 6 weeks after avoiding cycling and other activities that may affect the result. If the repeat PSA remains elevated, further evaluation with multiparametric MRI and targeted biopsy may be indicated.

Other options are less appropriate:

- **Prostate biopsy** is premature without confirming persistent PSA elevation.
- **Multiparametric MRI of prostate** may be appropriate if PSA remains elevated, but repeating PSA first avoids unnecessary investigation.

- **Commencing ciprofloxacin** is not indicated, as there is no evidence of infection.
- **Repeating digital rectal examination in 6 months** alone does not adequately address an elevated PSA.

1.35 *E – Duct ectasia*

This 48-year-old woman presents with nipple discharge and occasional breast pain. Examination shows a retracted left nipple and greenish-brown discharge, with no palpable lump. Mammography is unremarkable. The combination of nipple retraction, periductal inflammation, and coloured discharge is most consistent with duct ectasia, a benign condition of the large subareolar ducts.

Other options are less likely:

- **Fibroadenoma** usually presents as a painless, mobile breast lump, not nipple discharge or retraction.
- **Intraductal papilloma** often causes unilateral serous or bloody nipple discharge, typically without nipple retraction.
- **Paget disease** presents with eczema-like changes, crusting, or ulceration of the nipple, sometimes with underlying carcinoma.
- **Galactorrhoea** is milky discharge often bilateral, associated with hyperprolactinaemia, and not typically accompanied by nipple retraction.

1.36 *D – Ofloxacin*

This 26-year-old man presents with acute onset left scrotal pain and swelling for 4 days, with a positive Prehn's sign, suggesting epididymo-orchitis rather than testicular torsion. He is afebrile. In men under 35, epididymitis is most commonly caused by sexually transmitted infections, particularly Chlamydia trachomatis and Neisseria gonorrhoeae.

The most appropriate treatment is ofloxacin, a fluoroquinolone with good epididymal penetration, covering both sexually transmitted and urinary pathogens. If an STI is suspected, patients should also be referred to a sexual health clinic for STI testing, partner notification, and counselling. Fluoroquinolones are appropriate antibiotics to prescribe in primary care, but it is important to advise patients on the very rare, but potentially irreversible adverse effect of tendon rupture.

Other options are less appropriate:

- **Trimethoprim** covers typical urinary pathogens but is less effective for epididymo-orchitis.
- **Ceftriaxone** is used as single-dose therapy for gonorrhoea and is usually combined with doxycycline or a fluoroquinolone for epididymo-orchitis.
- **Pivmecillinam** is used for uncomplicated urinary tract infections, not epididymo-orchitis.
- **Co-amoxiclav** is not first line for epididymo-orchitis and may be unnecessarily broad.

1.37 *D – Anastrozole*

This 56-year-old postmenopausal woman has early-stage, oestrogen receptor-positive (ER+) breast cancer and is considered high risk for recurrence. In postmenopausal women, aromatase inhibitors are more effective than tamoxifen for reducing the risk of recurrence in ER+ disease.

The most appropriate treatment is anastrozole, an aromatase inhibitor that suppresses peripheral oestrogen synthesis, thereby reducing stimulation of ER+ breast cancer cells.

Other options are less appropriate:

- **Tamoxifen** is a selective oestrogen receptor modulator; it can be used in postmenopausal women, but aromatase inhibitors are preferred for high-risk patients.
- **Dexamethasone** is a corticosteroid, not used for primary breast cancer treatment.
- **Radiotherapy** may be indicated after breast-conserving surgery but is adjuvant local therapy, not systemic treatment for ER+ high-risk disease.
- **Paclitaxel** is a chemotherapy agent; it may be used in certain cases, but endocrine therapy is the mainstay for ER+ disease in postmenopausal women.

1.38 *D – Offer an alpha-blocker*

This 64-year-old man presents with LUTS. The most appropriate management is to offer an alpha-blocker, which relaxes smooth muscle in the prostate and bladder neck, improving urinary flow and reducing voiding symptoms. This is first-line pharmacological therapy for men with moderate-to-severe LUTS secondary to benign prostatic hyperplasia.

Other options are less appropriate:

- **Referral to the urology clinic** is not needed initially unless there are red flags (haematuria, recurrent infections, abnormal prostate, renal impairment).
- **Referral to a continence physiotherapist** is appropriate for stress incontinence, not voiding symptoms due to prostate enlargement.
- **Offering supervised pelvic floor muscle training** is used for incontinence, particularly post-prostatectomy, not obstructive LUTS.
- **Offering an antimuscarinic** is more appropriate for storage symptoms due to overactive bladder, but in this case, symptoms point to prostatic obstruction.

1.39 *A – Breast-conserving surgery with sentinel lymph node biopsy*

This 42-year-old woman has a 2 cm invasive ductal carcinoma, with no evidence of metastasis and no lymph node involvement on ultrasound. She wishes to preserve her breast. For early-stage breast cancer in women who want breast conservation, the standard of care is breast-conserving surgery (wide local excision or lumpectomy) combined with sentinel lymph node biopsy. Sentinel lymph node biopsy is performed to evaluate for microscopic nodal disease while minimising morbidity compared to axillary clearance.

Other options are less appropriate:

- **Breast-conserving surgery with axillary lymph node clearance** is unnecessary unless there is proven nodal involvement.
- **Breast-conserving surgery without lymph node evaluation** would miss occult nodal disease, important for staging and prognosis.
- **Mastectomy** may be indicated for large tumours, multifocal disease, or patient preference, but not required here.
- **Mastectomy with immediate reconstruction** is not indicated as breast-conserving surgery is feasible.

1.40 *D – Cowden syndrome*

This 39-year-old woman is concerned about her family history of cancer. Her mother has had breast, endometrial, and thyroid cancer, along with squamous cell carcinoma of the skin. The combination of breast, thyroid, and endometrial cancers is characteristic of Cowden syndrome, a rare autosomal dominant condition caused by mutations in the PTEN tumour-suppressor gene. Patients are at increased risk of multiple benign hamartomas and various malignancies.

Other options are less likely:

- **Li-Fraumeni syndrome** (TP53 mutation) predisposes to breast cancer, sarcomas, leukaemia, brain tumours, and adrenocortical carcinoma, but not thyroid or endometrial cancer.
- **Peutz-Jeghers syndrome** (STK11 mutation) is associated with gastrointestinal polyps and increased risk of pancreatic, breast, ovarian, and gastrointestinal cancers, but not thyroid cancer.
- **Fanconi anaemia** is associated with bone marrow failure, acute myeloid leukaemia, and some solid tumours, but not this pattern of malignancies.
- **Hereditary diffuse gastric cancer syndrome** (CDH1 mutation) is primarily associated with diffuse gastric carcinoma and lobular breast cancer, but not thyroid or endometrial cancers.

1.41 *B – Partial nephrectomy*

This 61-year-old man has a 3 cm localised renal mass (T1aN0M0), with no nodal or metastatic disease. For small, localised renal tumours (<4 cm, T1a), the preferred treatment is nephron-sparing surgery, provided it is technically feasible. Therefore, the most appropriate management is partial nephrectomy, which achieves oncological control while preserving renal function.

Other options are less appropriate:

- **Radical nephrectomy** may be considered for larger or centrally located tumours where partial nephrectomy is not possible, but it is overtreatment in this case.
- **Radiofrequency ablation** can be considered for patients unfit for surgery, but this man is otherwise healthy.
- **Adjuvant therapy** has no role in the management of localised T1a renal cell carcinoma after resection.
- **Surveillance** may be an option in elderly or frail patients with small masses, but not in a fit 61-year-old man.

1.42 *C – Botulinum toxin A injections*

This 79-year-old woman has overactive bladder symptoms with confirmed detrusor overactivity. She has failed conservative bladder training. While anticholinergic medication is the usual next step, in this patient with chronic constipation, cognitive concerns, and falls risk, anticholinergics would likely worsen her comorbidities and are therefore unsuitable.

The most appropriate next step is botulinum toxin A injections into the bladder wall, which reduce detrusor overactivity and improve urgency and frequency without systemic side effects.

Other options are less appropriate:

- **Anticholinergic medication** is first line pharmacologically but likely unsuitable here due to frailty, constipation, and cognitive/falls risk.
- **Pelvic floor muscle training** is effective for stress incontinence, not detrusor overactivity.
- **Sacral nerve stimulation** is reserved for refractory cases after failure of less invasive measures.
- **Augmentation cystoplasty** is a last-resort surgical procedure for intractable, severe cases.

1.43 *E – Radical prostatectomy*

This 66-year-old man has prostate cancer with a Gleason score of 8 and PSA of 32 µg/L, which classifies his disease as high-risk localised prostate cancer. He is otherwise healthy and prefers an active treatment approach. In fit men with high-risk localised disease, the standard curative option is radical prostatectomy with pelvic lymph node dissection, provided there is no evidence of metastasis.

Other options are less appropriate:

- **Active surveillance** is suitable for low-risk prostate cancer but inappropriate for high-risk disease.
- **Brachytherapy** is generally used for low- to intermediate-risk disease, often combined with external beam radiotherapy, but not usually alone in high-risk disease.
- **Transurethral resection of the prostate (TURP)** relieves obstruction but is palliative, not curative for prostate cancer.
- **Radical radiotherapy without androgen deprivation therapy** is suboptimal in high-risk disease, as radiotherapy in this context should be combined with androgen deprivation therapy.

1.44 *B – Refer for parathyroidectomy*

This 46-year-old woman has persistent hypercalcaemia with raised PTH, consistent with primary hyperparathyroidism. She is currently asymptomatic, but the key finding is a DEXA T-score of −2.7, which indicates osteoporosis.

According to international guidelines (e.g. NICE and American Association of Endocrine Surgeons), parathyroidectomy is indicated in asymptomatic primary hyperparathyroidism if any of the following are present:

- Age less than 50 years
- T-score of −2.5 or below (osteoporosis)
- Serum calcium more than 0.25 mmol/L above upper limit of normal
- Creatinine clearance less than 60 mL/min or nephrolithiasis

This patient meets criteria (T-score − 2.7), so she should be referred for surgical management.

Other options are less appropriate:

- **Monitor** is only appropriate if none of the surgical criteria are met.
- **Alendronate** can improve bone density but does not treat the underlying cause.
- **Cinacalcet** is used for patients with hypercalcaemia due to primary hyperparathyroidism who are not surgical candidates.

- **Sestamibi scan** is used for localisation after decision for surgery, not as the next step here.

1.45 *E – Administer intravenous fluids and antibiotics, and refer urgently to the surgical team*

This 63-year-old man has sudden severe epigastric pain, shock, and free air under the diaphragm on chest X-ray. This is diagnostic of a perforated viscus, most likely a perforated peptic ulcer in this context.

The key management priority is urgent resuscitation with IV fluids, IV antibiotics, and immediate surgical referral. Endoscopy is contraindicated because of the risk of further leakage of gastrointestinal contents into the peritoneal cavity. CT is not required when the diagnosis is already confirmed radiologically, but in practice, is likely to be performed to determine surgical strategy and to identify the site of perforation.

Other options are less appropriate:

- **High-dose PPI and observation** is for bleeding peptic ulcer, not perforation.
- **Nasogastric decompression and non-urgent endoscopy** are unsafe and inappropriate here.
- **CT scan of abdomen** is not necessary when free air under the diaphragm has been demonstrated, likely required after stabilisation.
- **Urgent endoscopy** is contraindicated in perforation.

1.46 *C – Acute mesenteric ischaemia*

This 71-year-old woman with atrial fibrillation, severe abdominal pain, a soft abdomen, and metabolic acidosis with raised lactate has acute mesenteric ischaemia. The classic feature is 'pain out of proportion to the abdominal findings', especially in the early phase before peritonitis develops. The presence of atrial fibrillation strongly suggests an embolic occlusion of the mesenteric vessels as the cause.

Other options are less likely:

- **Acute pancreatitis** causes epigastric pain radiating to the back, typically associated with nausea, vomiting, and a raised serum amylase or lipase. The disproportionate pain with minimal tenderness and the raised lactate make this unlikely.
- **Perforated peptic ulcer** usually presents with sudden, severe pain and rapidly developing peritonitis. A rigid, tender abdomen would be expected, not a soft abdomen.
- **Diverticulitis** produces left iliac fossa pain, fever, and localised tenderness. It develops more gradually, not as abrupt severe pain.
- **Small bowel obstruction** typically causes colicky pain with distension, vomiting, and constipation, none of which are described here.

1.47 *A – Incision and drainage*

This 27-year-old man has a tender, erythematous, fluctuant swelling in the sacrococcygeal region with foul-smelling discharge, consistent with an acutely infected pilonidal abscess. The most appropriate immediate management is incision and drainage, which provides rapid relief of pain and infection control.

Other options are less appropriate:

- **Oral antibiotics** are not sufficient for a fluctuant abscess.
- **Sitz baths and hygiene advice** are useful for chronic pilonidal sinus, not for an acute abscess.
- **Wide excision and wound packing** is a definitive procedure but not indicated in the acute setting due to infection and inflammation.
- **Excision and primary closure** is also a definitive option but only considered electively once acute infection has resolved.

1.48 *B – 5*

This randomised trial shows 1-year survival of 40% in the treatment group and 20% in the control group.

The absolute risk reduction (ARR) is:

$$\text{ARR} = \text{Event rate in treatment group} - \text{Event rate in control group}$$

$$\text{ARR} = 0.40 - 0.20 = 0.20$$

The number needed to treat (NNT) is:

$$\text{NNT} = \frac{1}{\text{ARR}} = \frac{1}{20} = 5$$

1.49 *E – Fibroadenosis*

This 34-year-old woman has bilateral, multiple breast lumps and cyclical mastalgia with changes in lump size and tenderness related to her menstrual cycle. The nodularity and absence of skin change or nipple discharge are typical of fibroadenosis (also called fibrocystic change), a benign, hormonally driven condition.

Other options are less likely:

- **Ductal ectasia** usually causes periductal inflammation with sticky or coloured nipple discharge and possible nipple retraction, not cyclical multiple lumps.
- **Fat necrosis** typically follows trauma or surgery and can produce a firm irregular mass that may mimic cancer, rather than cyclical tender lumps.
- **Lipomatous tumours** are usually solitary, soft, and well-circumscribed, not multiple cyclical nodules.
- **Fibroadenoma** usually presents as a single, well-defined, mobile lump in younger women and does not fluctuate with the menstrual cycle.

1.50 *E – Magnetic resonance cholangiopancreatography*

This 46-year-old man presents with severe epigastric pain radiating to the back, fever, vomiting, and raised amylase, consistent with acute gallstone pancreatitis. His history of recurrent right upper quadrant pain and known gallstones supports biliary aetiology.

His history of gallstones and abnormal liver function tests (elevated ALT, ALP, and bilirubin) suggest a biliary aetiology with possible common bile duct obstruction.

The most appropriate next step is MRCP (urgently), a non-invasive imaging modality that can confirm or exclude choledocholithiasis. If obstruction is demonstrated, therapeutic ERCP is then indicated.

Other options are less appropriate:

- **Urgent laparoscopic cholecystectomy** is recommended after recovery from pancreatitis (ideally same admission or within 2–3 weeks), not during the acute phase.
- **Percutaneous cholecystostomy** is reserved for patients with acute cholecystitis who are unfit for surgery.
- **ERCP** is not performed without evidence of obstruction/cholangitis, as it is invasive and carries risks.
- **Supportive management with IV fluids and antibiotics** is necessary but does not address the potential obstruction.