Paediatric radiology

PAPER 3

1 A two year old presents with weight loss and fatigue. On examination he has a palpable abdominal mass and bluish nodules on the skin. He undergoes a CT of the abdomen. What are the most likely radiological findings?

- **a** Enlarged liver containing multiple low-attenuation lesions
- **b** Heterogeneous suprarenal mass containing calcification displacing the left kidney
- **c** Well-circumscribed heterogeneous mass arising from the left kidney with a beak of renal tissue extending partially around the mass
- **d** Well-circumscribed multi-septated cystic mass replacing the lower pole of the left kidney
- **e** Solitary heterogeneous lesion within the right lobe of the liver

2 The paediatric team sees a neonate with respiratory distress, bradycardia and poor swallowing. Following imaging investigation the child was found to have a small posterior fossa and dysgenesis of the hindbrain. The fourth ventricle and hindbrain are displaced caudally and the tonsils and vermis are herniating through the foramen magnum. What further CNS abnormalities may be present?

- **a** A funnel-shaped posterior fossa
- **b** Klippel-Feil deformity
- **c** Basilar impression
- **d** Herniation of the cerebellar tonsils
- **e** Lumbar myelomeningocele

3 A neonate born at term by emergency Caesarean section for foetal distress is admitted to the neonatal unit. She is below the 0.25th centile and has dysmorphic features and clenched fists with overlapping second and third fingers. Chest radiograph shows a hypoplastic sternum and thin ribs and clavicles. Which of the following is the most likely diagnosis?

a Trisomy 13
b Trisomy 21
c Trisomy 18
d Turner's syndrome
e Cleidocranial dysplasia

4 A full-term infant born by ventouse delivery required resuscitation immediately after birth following a difficult labour. He was admitted onto the neonatal unit for observation and examination the following day revealed a palpable mass in the left lumbar region. Further tests revealed an elevated serum creatinine and haematuria. Ultrasound showed an enlarged left kidney with loss of corticomedullary differentiation. What is the most likely diagnosis?

a Autosomal recessive polycystic kidney disease
b Renal vein thrombosis
c Wilms' tumour
d Glomerulonephritis
e Medullary sponge kidney

5 The CXR of a tachypnoeic term neonate delivered by Caesarean section shows linear densities radiating from the hila, thick fissures and small pleural effusions. What is the most likely diagnosis?

a Transient tachypnoea of the newborn
b Hyaline membrane disease
c Meconium aspiration
d Bronchopulmonary dysplasia
e Pulmonary haemorrhage

6 You are approached by a paediatric registrar who has an externally performed cranial ultrasound report. The ultrasound was performed in a district general hospital prior to the child being transferred to your hospital's neonatal intensive care unit. The report concludes the child has a Grade 3 haemorrhage. What does this mean?

a Intraventricular haemorrhage with ventricular dilatation, 20% mortality
b Intraventricular haemorrhage with ventricular dilatation, 50% mortality
c Intraventricular haemorrhage without ventricular dilatation, 20% mortality
d Intraparenchymal haemorrhage, 70% mortality
e Intraventricular haemorrhage without ventricular dilatation, 10% mortality

7 A seven-year-old girl is above the 99th centile for height with long limbs. She wears glasses to correct her myopia. She undergoes a plain radiograph of the thoracic and lumbar spine. Which of the following findings would suggest a diagnosis of Marfan's syndrome rather than homocystinuria?

- **a** Biconcave vertebrae
- **b** Scoliosis
- **c** Osteoporosis of vertebrae
- **d** Posterior scalloping of vertebral bodies
- **e** Segmentation abnormality

8 A premature infant was born at 32 weeks' gestation requiring intubation at birth and a nasogastric tube to be inserted. A CXR was performed to check the endotracheal tube position. On the CXR you see the nasogastric tube is doubled up within the neck and no air in the gut. What is the likely diagnosis?

- **a** Oesophageal atresia with distal tracheo-oesophageal fistula
- **b** Pyloric stenosis
- **c** Oesophageal atresia without tracheo-oesophageal fistula
- **d** Laryngeal web
- **e** Duodenal atresia

9 A previously well 15-year-old girl presents with a three-hour history of abdominal pain. On examination she has low-grade pyrexia and is diffusely tender over the right lower quadrant. An abdominal ultrasound shows an unremarkable upper abdomen. Within the right lower quadrant there are enlarged mesenteric lymph nodes, prominent pericaecal fat and a focal collection of fluid. What is the most likely diagnosis?

- **a** Meckel's diverticulitis
- **b** Crohn's disease
- **c** Pelvic inflammatory disease
- **d** Appendicitis
- **e** Infectious enteritis

10 A hip ultrasound is performed on a three-month-old infant with suspected developmental dysplasia of the hips. The alpha angle is measured. Which of the following would be the expected alpha angle if the hip were dislocated?

- **a** 77 degrees
- **b** 60 degrees
- **c** 55 degrees
- **d** 45 degrees
- **e** 41 degrees

11 A seven-year-old boy with developmental delay is being investigated for myoclonic seizures, which appear to be reducing in frequency. On examination

he has a facial angiofibroma. A CT brain is performed, which shows multiple areas of cortical abnormality with a hypodense centre, broadened gyri and curved linear calcifications. Which other intracranial abnormality may be seen?

a Giant cell astrocytoma
b Hydrocephalus
c Arteriovenous malformations
d Neuroblastoma
e Venous angiomas

12 A four-year-old girl is referred by her GP with a six-month history of persistent cough and wheeze despite being treated for several chest infections. She has a CXR, which reveals a cystic mediastinal mass, with widening of the carina and mild narrowing of the proximal aspect of both left and right main bronchi. The lung volumes are normal. What is the most likely diagnosis?

a Lymphoma
b Hiatus hernia
c Tracheo-oesophageal fistula
d Pericardiac tumour
e Bronchogenic cyst

13 A nine-year-old boy presents with colicky right upper quadrant pain and weight loss. He has a long history of intermittent obstructive jaundice and an intermittent palpable mass in the right upper quadrant. He undergoes an abdominal ultrasound. Which of the following are the most likely radiological findings?

a Thickened gallbladder wall with intramural gas and no evidence of gallstones
b Thickened and striated gallbladder wall containing multiple calculi
c Dilated common bile duct and brightly echogenic portal triads
d Complex collection surrounding the gallbladder
e Fusiform cyst beneath the porta hepatis, separate from the gallbladder

14 A 12-year-old obese boy presents with hip pain. It is thought that his capital epiphysis has slipped in relation to the femoral neck. A frontal radiograph is taken and a line is drawn along the superior edge of the femoral neck. In relation to the capital epiphysis the line is most likely to be:

a Superior and lateral
b Superior and medial
c Inferior and lateral
d Inferior and medial
e Crossing it

15 A neonate presents with feeding difficulties. On examination he is moderately cyanosed, becoming more so when crying, with evidence of congestive heart failure and a systolic murmur. The CXR shows an enlarged heart with a widened mediastinum and pulmonary plethora. Which of the following is the most likely diagnosis?

a Tetralogy of Fallot
b Tricuspid atresia
c Truncus arteriosus
d Patent ductus arteriosus
e Hypoplastic left heart

16 A six-year-old girl is investigated for having pubic and axillary hair. She undergoes an abdominal ultrasound as part of her work-up. This shows a 2-cm well-circumscribed mass arising from the left adrenal gland. It is hypoechoic to the kidney and does not contain any calcification. Which of the following is the most likely diagnosis?

a Phaeochromocytoma
b Neuroblastoma
c Adrenal haemorrhage
d Adrenocortical carcinoma
e Adrenal metastasis

17 A six-year-old girl falls and suffers a hyperextension injury of the elbow. A plain radiograph of the elbow shows elevation of the anterior and posterior fat pads. What is the most likely underlying injury?

a Avulsion of the medial epicondyle
b Fracture between the lateral condyle and trochlea
c Fracture through the capitellum
d Supracondylar fracture
e Transverse radial neck fracture

18 A mother brings her two-week-old baby to the GP surgery complaining that she is looking blue. The GP immediately refers the mother and baby to the paediatrician who examines the child and requests a CXR, which reveals right heart enlargement, an absent pulmonary trunk, and an ascending aorta with convexity to the right. What is the most likely diagnosis?

a Tetralogy of Fallot
b Pulmonary ductus arteriosus
c VSD
d Coarctation of aorta
e Transposition of great arteries

19 A patient with known Dandy-Walker malformation presents with seizures and is investigated with a CT scan of the brain. This demonstrates the large posterior fossa cyst expected in Dandy-Walker malformation, but also a high and enlarged third ventricle with parallel lateral ventricles. The anterior horns of the ventricles are small in comparison to the posterior horns. What other abnormality is represented on this scan?

- **a** Prominent cavum vergae
- **b** Hydrocephalus
- **c** Holoprosencephaly
- **d** Arachnoid cyst in the midline
- **e** Agenesis of the corpus callosum

20 A five-month-old boy is treated for a proven urinary tract infection. He does not respond well to suitable antibiotics within 48 hours and becomes septic. Which of the following would be appropriate imaging follow-up?

- **a** Ultrasound during the acute infection, DMSA four to six months after the acute infection and MCUG
- **b** Ultrasound during the acute infection, DMSA four to six months after the acute infection, no MCUG
- **c** Ultrasound within six weeks of the acute infection, DMSA four to six months after the acute infection, no MCUG
- **d** Ultrasound within six weeks of the acute infection, no DMSA or MCUG
- **e** Ultrasound and DMSA within six weeks of the acute infection

21 A 12-year-old boy presents with a three-month history of a painful knee, which clicks and locks. A PA radiograph of the knee shows a linear lucency separating a fragment of bone from the lateral aspect of the medial femoral condyle. MR shows the fragment to be of intermediate signal on all sequences. On T2-weighted imaging a rim of high signal separates this from the condyle. Which of the following is the most likely diagnosis?

- **a** Spontaneous osteonecrosis
- **b** Osteochondritis dissecans
- **c** Blount disease
- **d** Acute osteochondral fracture
- **e** Osteogenesis imperfecta

22 A five-year-old girl complains of shortness of breath and on CXR is found to have an enlarged cardiac silhouette with discrete calcific densities. Ultrasound reveals a pericardial complex cystic mass containing calcific foci and a pericardial effusion. What are the calcific foci most likely to be?

a Bone
b Teeth
c Stones
d Foreign bodies
e Calcified pericardial cyst

23 A 10-year-old boy presents with a history of severe left-sided testicular pain lasting for 48 hours. On examination the left testis is swollen and exquisitely tender. The urinalysis is negative. He undergoes a scrotal ultrasound. Which of the following are the most likely radiological findings?

a Enlarged hyperechoic left testis with increased peritesticular flow and absent parenchymal flow
b Small atrophied left testis with absent peritesticular and parenchymal flow
c Normal-sized hypoechoic left testis with absent peritesticular and parenchymal flow
d Enlarged hypoechoic left testis with normal parenchymal flow
e Normal-sized hyperechoic left testis with increased peritesticular and parenchymal flow

24 A five-year-old girl is systemically unwell with left leg pain and a limp. On examination she is exquisitely tender over the left femur. *Staphylococcus aureus* is grown from her blood cultures. A plain radiograph of the left leg confirms the diagnosis of osteomyelitis. Where is the abnormality likely to be?

a Femoral metaphysis
b Femoral epiphysis
c Femoral diaphysis
d Distal femoral physis
e Multicentric involvement

25 A two-year-old boy presents with a one-week history of fever, vomiting and conjunctivitis. On examination he is found to have a red tongue, a rash on both elbows and bilateral non-purulent conjunctivitis. Which of the following is the most likely diagnosis?

a Takayasu's arteritis
b Polyarteritis nodosa
c Kawasaki syndrome
d Stevens-Johnson syndrome
e Henoch-Schönlein purpura

26 A two-year-old child is under investigation for delayed walking and wide-based gait. Their speech is difficult to understand. There is a history of recurrent chest infections. A CT brain is performed, which demonstrates cerebellar cortical atrophy and dilatation of the fourth ventricle. There is also a cerebral infarct. What is the most likely diagnosis?

a Friedreich's ataxia
b Ataxia telangiectasia
c Multiple sclerosis
d Wolman disease
e Niemann-Pick disease

27 An abdominal radiograph on a two-year-old child shows a paucity of bowel gas. An abdominal ultrasound is then performed which shows a 5 cm × 2 cm mass in the right upper quadrant. In the longitudinal plane, this has a 'pseudokidney' appearance with a central echogenic focus and in the transverse plane it has the appearance of a 'bull's-eye'. What is the most likely diagnosis?

a Ischaemic colitis
b Intussusception
c Volvulus
d Necrotising enterocolitis
e Appendicitis

28 A skull radiograph of a one-year-old infant demonstrates a diastatic fracture. The paediatricians suspect non-accidental injury. There are no neurological signs on examination. What should the next investigation be?

a CT head with intravenous contrast
b CT head without intravenous contrast
c MRI brain
d Radioisotope scintigraphy
e Transfontanellar cranial ultrasound

29 A two-year-old with previous urinary tract infections is investigated by ultrasound and DMSA. The ultrasound shows possible duplex systems but normal-sized kidneys and no obvious scarring. How will the DMSA study aid the investigation?

a Differential function can be measured
b Obstruction can be demonstrated on dynamic images
c Reflux can be assessed without the need for invasive tests
d GFR can be performed based on the post DMSA blood results
e Horseshoe kidney can be excluded

30 A five-year-old girl presents with colicky abdominal pain and a purpuric rash on her legs and the extensor surface of her arms. Urinalysis reveals haematuria and proteinuria. An abdominal ultrasound shows enlarged slightly hyperechoic kidneys and areas of bowel wall thickening in the terminal ileum. What is the most likely diagnosis?

a Haemolytic uraemia syndrome
b Henoch-Schönlein purpura
c Crohn's disease
d Eosinophilic gastroenteritis
e Coeliac disease

31 A six-year-old child presents with a two-month history of anterior thigh pain and a limp. Radiographs of the hips demonstrate femoral head fragmentation, subchondral fracture and femoral neck cysts. Radionucleotide bone scan demonstrates increased tracer uptake in the femoral head. What is the most likely cause?

a Developmental dysplasia of the hip
b Late-phase Perthes disease
c Early-phase Perthes disease
d Moderate slipped capital femoral epiphysis
e Severe slipped capital femoral epiphysis

32 A 16-month-old girl presented with an enlarging head circumference and bulging occiput. She was noted to have poor fine motor control. An MRI of the head was performed, which showed a large uniformly low signal cystic area in the posterior fossa on T1-weighted images and an elevated tentorium cerebelli. On axial images the cerebellar hemispheres appeared widely spaced. What is the most likely diagnosis?

a Dandy-Walker malformation
b Large arachnoid cyst
c Cystic cerebellar astrocytoma
d Epidermoid cyst
e Haemangioblastoma

33 A two-year-old boy is brought in with a sudden onset of cough. On CXR there is a radio-opaque midline opacity and atelectasis. Which of the following additional features are you most likely to see?

a Consolidation
b Cardiomegaly
c Pneumothorax
d Pulmonary infiltrates
e Air trapping and hyperinflation

34 A nine-year-old undergoes a Tc-99m pertechnetate scan for possible Meckel's diverticulum. Which of the following would give a false negative result?

a Urinary obstruction
b Inflammatory bowel disease
c Malrotation of the ileum
d Haemangioma
e Intussusception

35 A 12-year-old boy presents with long-standing left knee pain with no history of trauma. A plain radiograph shows a lucent lesion within the metaphysis of the proximal tibia. This has a well-defined sclerotic margin and contains trabeculations. There is no associated periosteal reaction. Which of the following is the most likely diagnosis?

a Enchondroma
b Chondromyxoid fibroma
c Simple bone cyst
d Non-ossifying fibroma
e Fibrous dysplasia

36 An 11-year-old boy presents with abdominal pain, nausea and vomiting and has an inhaler for a chronic cough. His CXR reveals gas-filled loops of bowel in the centre of his chest. What is the likely diagnosis?

a Bochdalek hernia
b Morgagni hernia
c Septum transversum defect
d Hiatal hernia
e Eventration

37 A 10-year-old boy presents with a mass in the posterior triangle of the neck, night sweats and significant weight loss. The mass is biopsied under ultrasound guidance and found to be Hodgkin's lymphoma. A staging CT shows abnormal lymph nodes within the right axilla and left cervical chain. Which of the following would be the appropriate staging?

a Stage 1A
b Stage 2A
c Stage 2B
d Stage 3A
e Stage 3B

38 A 15-year-old girl complaining of long-standing right-sided chest pain has a CXR. This shows a right-sided pleural effusion and an abnormality of the sixth right anterior rib. There is a 4-cm ill-defined lytic lesion within the rib associated with a very large inhomogeneous soft-tissue mass. Which of the following is the most likely diagnosis?

- **a** Fibrous dysplasia
- **b** Enchondroma
- **c** Ewing's sarcoma
- **d** Haematopoiesis
- **e** Aneurysmal bone cyst

39 A six-year-old child presented with loss of vision, nausea and vomiting. On examination there was papilloedema and an ataxic gait. A brain MRI was performed, which did not show any abnormality on T1-weighted images, but revealed a well-circumscribed hyperintense lesion with a rim of low signal, containing multiple cysts on T2-weighted images. Which of the following is the most likely diagnosis?

- **a** Schwannoma
- **b** Pilocytic astrocytoma
- **c** Primitive neuroectodermal tumour (PNET)
- **d** Medulloblastoma
- **e** Ependymoma

40 The newborn daughter of a diabetic mother is noted to have nasal flaring and expiratory grunting. The CXR shows complete lung white out. What is the likely diagnosis?

- **a** Respiratory distress syndrome
- **b** Neonatal pneumonia
- **c** Unilateral pulmonary agenesis
- **d** Cystic fibrosis
- **e** Persistent foetal circulation syndrome

41 A three-month-old girl undergoes a renal ultrasound for a urinary tract infection. This demonstrates a horseshoe kidney. Her parents mention that she was born with very puffy hands and feet, which has now resolved. Which of the following is the most likely underlying diagnosis?

- **a** VACTERL (syndrome of vertebral, anal, cardiac, tracheo-oesophageal fistula/oesophageal atresia, renal and limb abnormalities)
- **b** Turner's syndrome
- **c** Prader-Willi syndrome
- **d** Noonan's syndrome
- **e** Edward's syndrome

42 A 15-year-old boy presents with a two-month history of dull thoracic back pain that is worse at night. On examination there is a scoliosis concave to the right. A radiograph of the thoraco-lumbar spine confirms the scoliosis and shows a lucent lesion originating in the spinous process of T8 extending into the T8 vertebral body. Which of the following is the most likely diagnosis?

a Osteoblastoma
b Osteochondroma
c Osteoid osteoma
d Haemangioma
e Fibrous dysplasia

43 A four-year-old girl presents with a fractured radius. The history given is inconsistent with the injury and non-accidental injury is suspected. A skeletal survey is carried out. No further fractures are demonstrated. Which would be the next most appropriate investigation?

a MRI brain
b Scintigraphy
c None
d Ultrasound abdomen
e Repeat skeletal survey in one to two months

44 A four-month-old boy presents with cough and difficulty feeding. On examination he is in respiratory distress with nasal flaring and subchondral recession and there is widespread wheeze. A CXR shows hyperexpansion and prominent hila with no focal parenchymal abnormality. Which of the following is the most likely diagnosis?

a Respiratory syncytial virus bronchiolitis
b Streptococcal pneumonia
c Varicella pneumonitis
d *Haemophilus* pneumonia
e Croup

45 An otherwise well three-year-old child of Caribbean origin has lower limb bowing bilaterally. Radiographs demonstrate tibia vara. There is beaking and irregularity of the tibial proximal medial metaphysis. What is the most likely diagnosis?

a Rickets
b Osteogenisis imperfecta
c Osgood-Schlatter disease
d Physiological bowing
e Blount disease

46 A six-year-old girl presented with jaundice and malaise. Examination showed evidence of portal hypertension and a dark ring around the iris of both eyes. An ultrasound demonstrated a small nodular liver with an irregular capsule but no focal lesions. Further imaging in the form of a CT abdomen was performed and the liver was found to be of normal attenuation. Which of the following is the most likely diagnosis?

- **a** Cystic fibrosis
- **b** Galactosaemia
- **c** Wilson's disease
- **d** Haemochromatosis
- **e** Alpha-1 antitrypsin deficiency

47 A CXR of a newborn is shown to have an indistinct right heart border with opacification in this area. A few days later the CXR shows a well-defined lucency in the right hemithorax with displacement of the mediastinum to the left, widened rib interspaces, and an intact right hemidiaphragm. What is the most likely diagnosis?

- **a** Venolobar syndrome
- **b** Sequestration
- **c** Congenital lobar emphysema
- **d** Cystic adenomatoid malformation
- **e** Lymphangiectasia

48 A 14-year-old girl is referred to the orthopaedic clinic with scoliosis. AP radiographs of the spine are taken. Two lines are drawn and the Cobb angle is measured between them to confirm the diagnosis. Where should the lines be drawn to correctly measure the Cobb angle?

- **a** From the centre of the apical vertebra to the centre of the superior end vertebra and from the centre of the apical vertebra to the centre of the inferior end vertebra
- **b** Tangential to the superior end plate of the apical vertebra and tangential to the inferior endplate of the apical vertebra
- **c** Tangential to the inferior end plate of the superior end vertebra and tangential to the superior end plate of the inferior end vertebra
- **d** Tangential to the superior end plate of the superior end vertebra and tangential to the inferior end plate of the inferior end vertebra
- **e** From the centre of the apical vertebra to the superior end plate of the superior end vertebra and from the centre of the apical vertebra to the inferior end plate of inferior end vertebra

49 A five-year-old girl presented with acute severe left upper quadrant pain. On examination she was found to have a massively enlarged spleen. Blood tests revealed low haemoglobin, low platelets and high reticulocytes. An ultrasound of the abdomen was performed that confirmed an enlarged spleen and

showed multiple hypoechoic lesions at the periphery of the spleen. Which of the following is the most likely diagnosis?

a Acute splenic sequestration crisis
b Autosplenectomy
c Idiopathic thrombocytopaenic purpura
d Thalassaemia
e Acute lymphoid leukaemia

50 A nine-year-old girl presents with a two-month history of right knee swelling and morning stiffness with no definite history of trauma. On examination she is afebrile and the knee is swollen and tender with a reduced range of movement. She is thought to have juvenile rheumatoid arthritis. A knee radiograph is performed. Which of the following are the likely findings?

a Soft-tissue swelling and transverse metaphyseal bands
b Osteosclerosis and small epiphyses
c Soft tissue swelling, juxta-articular osteopenia and periosteal reaction
d Retarded bone growth and transverse metaphyseal bands
e Soft-tissue swelling and osteosclerosis

51 An MRI brain was performed on a toddler who had failed to attain gross motor skills after initially achieving them on time. It was also noted that the child's head circumference was increasing faster than expected. The child's medical history and birth record were unremarkable. The MRI showed communicating hydrocephalus. What is the most likely underlying cause?

a Medulloblastoma
b Subdural haematoma
c Meningitis
d Venous obstruction
e Repetitive subarachnoid microhaemorrhage

52 A young boy with tracheal stenosis undergoes a CT of his chest. He is found to have a tracheal bronchus. What findings would you expect to see?

a Right upper lobe apical segmental bronchus originates from the trachea rather than the right upper lobe bronchus
b Left upper lobe apical segment originates from the trachea rather than the left upper lobe bronchus
c Right lower lobe apical segment bronchus originates from the trachea rather than the right lower lobe bronchus
d Left lower lobe apical segment bronchus originates from the trachea rather than the left lower lobe bronchus
e Right upper lobe anterior segmental bronchus originates from the trachea rather than the right upper lobe bronchus

53 A 10 month old with known neurofibromatosis type I has a plain radiograph of the tibia and fibula. Which of the following is the most likely finding?
- **a** Anterolateral bowing of the tibia
- **b** Elongated tibia in relation to the fibula
- **c** Multiple lytic lesions within the medulla of the tibia
- **d** Expanded medullary cavity of the tibia
- **e** Posterior bowing of the fibula

54 Radiographs of both legs are performed on a neonate. They demonstrate diffuse demineralisation, multiple fractures with pseudoarthrosis and bowing deformity. There is exuberant callus formation. The baby is noted to have blue sclerae. What is the likely diagnosis?
- **a** Non-accidental injury
- **b** Osteogenesis imperfecta
- **c** Osteomalacia
- **d** Pyknodystosis
- **e** Rickets

55 A three-year-old girl is brought into hospital with vomiting, having swallowed household cleaning fluid. Her CXR at 10 hours is normal. How should this be interpreted?
- **a** She is likely to have aspirated but the findings have not yet appeared on CXR
- **b** She is likely to have aspirated but the findings have resolved
- **c** She is unlikely to have aspirated
- **d** The CXR is most likely to be inadequate
- **e** She can be discharged home

56 A three-year-old boy presents with an acute onset of generalised abdominal pain. On examination he is jaundiced with tender hepatomegaly and ascites and is diagnosed as being in acute hepatic failure. A contrast-enhanced CT scan reveals an enlarged liver with increased enhancement of the caudate lobe and patchy enhancement of the other hepatic segments. Non-enhancing thrombus is seen within the hepatic veins. Ascites and gallbladder wall oedema are present. Which of the following is the most likely diagnosis?
- **a** Hepatocellular carcinoma
- **b** Hepatoblastoma
- **c** Budd-Chiari syndrome
- **d** Hepatic veno-occlusive disease
- **e** Wilson's disease

57 A 14-year-old boy presented with history of aching leg pain for a few months that was more severe at night and relieved by non-steroidal anti-inflammatory drugs. A lateral radiograph of his leg showed a <1 cm lucent nidus surrounded

by dense sclerosis within the diaphysis of the tibia and an osteoid osteoma is suspected. A CT is planned for further evaluation. What are the expected findings on the CT scan?

a A well-demarcated low-attenuation lesion a few millimetres in size, surrounded by an area of high attenuation
b A localised low-attenuation lesion, which does not enhance with contrast with surrounding high attenuation and a small channel to the surrounding soft tissues
c Well-demarcated low-attenuation area of 2.5 cm in size, surrounded by an area of high attenuation
d A high-attenuation lesion with no area of low attenuation
e A linear high-attenuation lesion

58 A CT chest is performed on a six year old. An incidental soft-tissue mass is seen in the middle mediastinum. Which of the following is it most likely to represent?

a Neurogenic tumour
b Great vessel aneurysm
c Thymoma
d Lateral meningocele
e Teratoma

59 A six-year-old boy attends for a scrotal ultrasound following the discovery of a seemingly painless lump in his left testis. As he is undressed for the ultrasound he is noted to have bilateral gynaecomastia. The ultrasound reveals a normal-looking right testis and a well-defined hypoechoic mass within the left testis. Which of the following is the most likely diagnosis?

a Gonadoblastoma
b Seminoma
c Yolk sac carcinoma
d Orchitis
e Leydig cell tumour

60 A 16-year-old girl is having a third CT scan of her chest, which reveals dilated and beaded bronchi, bronchial wall thickening, and peripheral bronchial mucous plugging. There is also hyperinflation and hilar enlargement, which has progressed since the previous scan. What is the most likely diagnosis?

a Bronchiectasis
b Cystic fibrosis
c Swyer-James syndrome
d Juvenile rheumatoid arthritis
e Systemic lupus erythematosus

61 A three-week-old boy has an abdominal ultrasound, which shows a hyperperistaltic stomach with a thickened and elongated pylorus measuring 5 mm in thickness and 25 mm in length. Which of the following is the most likely diagnosis?

a Pylorospasm
b Pyloric stenosis
c Gastric volvulus
d Gastro-oesophageal reflux
e Microgastria

62 A two year old with pneumonia is not improving with antibiotics. CXR shows hyperinflation and patchy infiltrates. What is the likely diagnosis?

a *Chlamydia*
b *Streptococcus pneumoniae*
c *Pneumocystis carini*i
d RSV
e Adenovirus

63 A one month old with bilious vomiting has an abdominal radiograph that shows a dilated stomach and duodenum with only a trace of gas distally. Which of the following is the most likely diagnosis?

a Duodenal duplication cyst
b Intussusception
c Midgut malrotation
d Gastric volvulus
e Duodenal atresia

64 A seven-year-old boy presents with visual field defects. He is felt to be small for his age, taking into account the heights of his parents. A plain skull radiograph is performed, which shows marked destruction of the sella containing curvilinear calcifications. What is the most likely diagnosis?

a Epidermoid
b Rathke's cleft cyst
c Pituitary adenoma
d Teratoma
e Craniopharyngioma

65 A CXR is taken of a child two days after surfactant replacement therapy for hyaline membrane disease. The findings include left-sided cardiac enlargement, an enlarged aorta, and pulmonary oedema. How can these findings be explained?

a ASD
b VSD

c PDA
d Pulmonary artery stenosis
e Aortic coarctation

66 A three-day-old neonate born at 34 weeks' gestation shows signs of septic shock with abdominal distension and bilious nasogastric aspirates. Plain abdominal radiograph shows dilated loops of bowel and intramural gas. Which of the following is the most likely diagnosis?
a Hirschsprung disease
b Midgut volvulus
c Necrotising enterocolitis
d Intussusception
e Duplication cyst

67 A 15-year-old boy has a small, deformed right chest wall. The CXR demonstrates that the soft tissues over the right hemithorax are thinned. On CT there is an absence of the right-sided pectoral muscles. What is the most likely diagnosis?
a Askin tumour
b Poland syndrome
c Pectus excavatum
d Pectus carinatum
e Muscular dystrophy

68 A 14-day-old boy is admitted with prolonged jaundice and poor feeding. On examination he is hypotonic with cool, mottled skin, abdominal distension and an umbilical hernia. Serum biochemistry reveals a low T4 and an elevated TSH. Which of the following is the most likely ultrasound appearance?
a No thyroid tissue seen
b Ectopic thyroid tissue seen in the suprahyoid position
c Enlarged echogenic thyroid
d Solitary low reflectivity nodule within the thyroid
e Multiple low reflectivity nodules within an enlarged thyroid

69 A baby has a chest radiograph that shows 11 pairs of ribs and a hypersegmented manubrium. Which of the following is the most likely diagnosis?
a Cleidocranial dysplasia
b Campomelic dysplasia
c No further underlying abnormality
d Down's syndrome
e VACTERL syndrome

70 A six-year-old girl presents with a history of weight loss, malaise and intermittent jaundice. An abdominal ultrasound reveals a heterogeneous, low reflectivity soft-tissue mass with high Doppler flow in the porta hepatis and both intra-hepatic and extra-hepatic duct dilatation. Which of the following is the most likely diagnosis?

a Gallbladder carcinoma
b Cholangiocarcinoma
c Caroli's disease
d Rhabdomyosarcoma of the biliary tract
e Choledochal cyst