

Contents

<i>Preface</i>	ix
<i>Acknowledgements</i>	xi
1 Understanding childhood	1
Physical growth	2
Psychological and cognitive development	4
Birth to 3 years	4
3 to 7 years	4
7 to 11 years	5
Adolescents	5
Role of family	6
Role of play	7
Summary	8
References	8
2 Consent, immobilisation and health care law	9
Children's rights	9
Health care law	10
Immobilisation versus restraint	11
Holding children still – a five-point model	12
Summary	18
References	19
3 Radiation protection	21
Ionising radiation regulations	21
Patient positioning	22
Field size and beam limitation	23
Protective shielding	23
Radiographic exposure parameters	25
Focal spot size	25
Tube filtration	26
Voltage	26
Anti-scatter grids	26
Screen film systems	26
Digital systems	27
Automatic exposure control	27
Automatic brightness control	27
Summary	27
References	28

4 The chest and upper respiratory tract	29
Structural and functional anatomy	29
The thorax, lungs and respiratory tract	29
The thymus	30
The heart	30
Pathology of the chest and upper respiratory tract	30
The upper/extra-thoracic airway	30
The lower/intra-thoracic airway	35
The chest wall and pleura	41
Radiographic technique for the chest and upper respiratory tract	50
Choice of projection	51
Antero-posterior (supine)	52
Antero-posterior (erect)	53
Postero-anterior (erect)	54
Radiographic assessment criteria for antero-posterior/ postero-anterior projections of the chest	54
Area of interest to be included on the radiograph	54
Rotation	55
Lordosis	55
Respiration	57
Exposure	57
Artefacts	57
Supplementary radiographic projections of the chest and upper respiratory tract	57
Lateral chest	57
Lateral decubitus (antero-posterior)	58
Lateral soft tissue neck	59
Post-nasal space	60
Exposure factors and radiation protection	61
Summary	61
References	62
5 The abdomen	63
<i>Anne-Marie Dixon</i>	
Structural and functional anatomy	63
Gastrointestinal system	63
Genitourinary system	64
Gastrointestinal pathology	64
Congenital pyloric stenosis	64
Intussusception	65
Appendicitis	67
Hernia	67
Gastroesophageal reflux	67
Meckel's diverticulum	67

Inflammatory bowel disease	67
Swallowed foreign body	69
Genitourinary system pathology	70
Urinary tract infection	70
Vesicoureteric reflux	72
Hydronephrosis	72
Posterior urethral valves	73
Haematuria	73
Renal agenesis	73
Chronic renal failure	74
Undescended testes (cryptorchidism)	74
Abdominal mass	75
Nephroblastoma (Wilms' tumour)	75
Signs and symptoms of abdominal pathology	75
Abdominal pain	75
Vomiting	76
Gastrointestinal bleeding	77
Constipation	77
Chronic diarrhoea	77
Gastric dilatation	77
Radiographic technique for the abdomen	78
Plain film abdominal radiography	78
Supine abdomen	79
Erect abdomen	81
Lateral decubitus	81
Lateral abdomen	82
Exposure factors and radiation protection	83
Radiographic assessment criteria	84
Fluoroscopic examinations	85
Gastrointestinal tract examinations	85
Barium swallow and meal	85
Barium follow-through	86
Small bowel enema	88
Barium enema	88
Renal tract examinations	89
Intravenous urography	89
Micturating cystourethrography	90
Summary	92
References	92
6 Neonates	94
Organisation of neonatal care	94
Care by the radiographer	95
Handling	95
Infection	95

Warmth	96
Noise	97
Respiratory and cardiovascular pathology	97
Transient tachypnoea	97
Hyaline membrane disease (idiopathic respiratory distress syndrome – IRDS)	99
Meconium aspiration	99
Pulmonary interstitial emphysema	99
Pneumothorax	99
Pneumomediastinum	101
Pneumopericardium	101
Pneumonia	105
Congenital malformations	105
Persistent pulmonary hypertension	106
Congenital heart disease	106
Pierre Robin syndrome	107
Abdominal pathology	107
Bowel atresia	108
Malrotation	111
Volvulus	111
Meconium ileus	112
Meconium plug	112
Congenital megacolon (Hirschprung’s disease)	113
Necrotising enterocolitis	113
Abdominal mass	115
Jaundice	115
Catheters, lines and tubes	115
Endotracheal tube	115
Umbilical arterial catheter	115
Umbilical venous catheter	116
Central venous catheter	116
Chest drain	117
Feeding tubes	118
Radiographic technique for the chest	118
Antero-posterior (supine)	118
Lateral chest	121
Antero-posterior in the lateral decubitus position	122
Radiographic technique for the abdomen and related anatomy	122
Antero-posterior (supine)	122
Lateral abdomen (supine)	123
Antero-posterior lateral decubitus abdomen	123
Inverted lateral rectum	125
Exposure factors	125
Summary	126
References	126

7 Skeletal trauma	128
<i>Jonathan McConnell</i>	
Children's fractures	128
The epiphyses	131
Upper limb injuries	132
The clavicle	132
The scapula	136
The glenohumeral joint	136
The proximal humerus	137
The elbow	137
Supracondylar fracture	139
Condyles	140
Epicondyles	143
Proximal radius	143
Proximal ulna	143
Elbow dislocations	143
The forearm	144
The wrist	146
The hand	147
Lower limb injuries	148
The hip	148
Femoral shaft injuries	150
Distal femoral injuries	151
The knee	151
The patella	152
The tibia and fibula	152
The toddler's fracture	154
Stress fracture	155
The ankle	155
The foot	158
The calcaneum	158
The talus	159
The metatarsals	159
The phalanges	159
The axial skeleton	159
The cervical spine	159
The thoracolumbar spine	162
The pelvis	163
Summary	165
References	165
8 Orthopaedics	167
The foot	168
Metatarsus adductus/varus	168
Talipes equinovarus (club foot)	169

Pes planus (flat foot)	170
Osteochondrosis and osteochondritis	170
The knee and lower leg	171
Osgood-Schlatter disease	171
Sinding-Larson-Johansson syndrome	172
Tibial bowing	172
The hip	174
Transient synovitis	174
Developmental dysplasia of the hip	174
Perthes' disease	175
Slipped capital femoral epiphysis	177
The upper limb	177
Sprengel's deformity	177
The radius and ulna	179
Polydactyly and syndactyly	179
The spine	180
Discitis	180
Kyphosis and lordosis	182
Scoliosis	182
Infection	183
Osteomyelitis	183
Septic arthritis	184
Bone tumours	184
Fibrous cortical defect and non-ossifying fibroma	185
Fibrous dysplasia	186
Osteochondroma	186
Enchondroma	187
Chondroblastoma	187
Osteoid osteoma	188
Solitary/unicameral bone cyst	188
Osteosarcoma	189
Ewing's sarcoma	189
Summary	190
References	190
9 Non-accidental injury	192
Physical abuse	192
Role of imaging	192
Injury patterns	195
Cutaneous injury	195
Skeletal injury	196
Summary	202
References	204
<i>Index</i>	205