

Index

- abdomen
 - pain, 470–471
 - step-laddering appearance, 56
- abdominal aorta, 484
 - anatomy, 276
 - angiogram, 488, 489, 490
 - evaluation, 374
 - ultrasonography
 - clinical images, 277–283
 - diagnostic capabilities, 276
 - imaging pitfalls, 277
 - indications, 276
 - technique, 276–277
- abdominal aortic aneurysm, 247, 572
 - CT angiography of abdominal vasculature and, 485
- abdominal CT
 - diagnostic capabilities, 469–471
 - indications, 469
 - limitations and pitfalls, 471
- abdominal MRI
 - clinical images, 571–581
 - clinical indications, 568
 - diagnostic capabilities, 568–570
 - imaging pitfalls, 570
 - in pediatric patients, 568
- abdominal plain radiography, 58
 - bladder stone, 73
 - cecal volvulus, 63
 - Chilaiditi finding, 68–69
 - diagnostic capabilities, 55–56
 - in elderly, 179
 - examining, 55
 - feeding tube replacement, 78
 - fluid collection, 58
 - free air, 59–60
 - GI tract pathology, 57
 - ileus, 56–57, 59–60
 - imaging pitfalls, 58–78
 - indications, 55
 - large bowel obstruction, 65–66
 - normal upright, 58
 - obstruction, 56–57
 - pancreatic calcifications, 75
 - pediatric
 - abdominal contents, 144
 - appendicitis, 155–157
 - bony abnormalities, 172–173
 - bowel obstruction, 144–147
 - diagnostic capabilities, 144
 - foreign bodies, 166–169
 - ileus, 144–147
 - imaging pitfalls, 144
 - indications, 144
 - intussusception, 157–166
 - lungs, 173
 - malrotation, 147–155
 - midgut volvulus, 147–155
 - pneumatosis intestinalis, 165–166
 - urolithiasis, 169–171
 - perforated viscus, 56
 - pneumatosis intestinalis, 71
 - pneumobilia, 69–70
 - porcelain gallbladder, 75
 - portal venous gas, 70–71
 - pseudoobstruction, 67–68
 - renal stone, 72
 - retroperitoneal air, 71–72
 - retroperitoneal processes, 58
 - sentinel loop with appendicitis, 60–63
 - sigmoid volvulus, 63–65
 - small bowel obstruction in, 60
 - soft tissue masses, 58
 - solid organ conditions, 57
 - staghorn calculus, 72
 - toxic megacolon, 66–67
 - ureteral stone, 72–73
 - uterine fibroid calcifications, 72
 - vascular calcifications, 75–76
- abdominal ultrasound
 - abdominal wall hernias, 339
 - appendicitis on, 338, 340, 342
 - clinical images, 340
 - diagnostic capabilities, 338–339
 - GI tract and, 338–339
 - for IHPS, 338–339, 341
 - indications for, 338
 - for intussusception, 339
 - of pancreas, 339
 - of spleen, 339
 - of umbilical hernia, 342
- abdominal vasculature CT angiography, 484
 - abdominal aortic aneurysm and, 485
 - aortic dissection, 485
 - aortitis, 486
 - arterio-venous fistula, 486
 - arterio-venous malformation, 486
 - artifacts in, 487
 - atherosclerosis, 486
 - breastfeeding and, 487
 - clinical images, 487–493
 - contra-indications, 486
 - contrast allergy and, 486
 - fibromuscular dysplasia, 486
 - gastrointestinal bleeding, 485
 - indications, 485–486
 - limitations and risks, 487
 - MALS, 486
 - mesenteric ischemia, 485
 - normal anatomy, 484
 - patient preparation, 484–485
 - pregnancy and, 487
 - radiation in, 487
 - renal dysfunction and, 486–487
 - renal vascular hypertension, 486
 - technique, 485
 - trauma and, 485
- abdominal wall hernia, 471
 - ultrasound, 339
- abdominal-pelvic ultrasound
 - clinical images, 313–323
 - diagnostic capabilities, 313
 - imaging pitfalls, 313
 - indications, 313
- abscess, 246
 - brain, 532–533
 - complex cutaneous, 363
 - epidural, 549
 - neck, 414
 - peritonsillar, 366
 - diagnostic capabilities, 362
 - imaging, 362
 - indications, 362
 - ultrasound of, 362
 - subcutaneous, 363
- accessory spleen, 344
- ACEPs. *See* American College of Emergency Physicians
- acetabular fracture, 13, 103
- Achilles tendon, 354–355, 625
- acoustics
 - enhancement, 206–207
 - impedance, 201
 - power, 203
 - shadowing, 206
- ACR. *See* American College of Radiology
- acromioclavicular separation, 1, 2
- acute appendicitis ultrasound, 338
- acute cholecystitis, 217, 226
- acute cranial trauma, 227
- acute osteomyelitis, 25
- acute pancreatitis, 475
- acute valvular emergencies, 247
- adenomyomatosis, 221
- adrenal adenoma, 575
- air bronchograms, 44
- AIUM. *See* American Institute of Ultrasound in Medicine
- ALARA. *See* as low as reasonably achievable
- allergic-type reactions
 - to IV contrast, 403–404
 - to shellfish, 403
- altered mental status, 422–423
- American Board of Emergency Medicine, 195
- American College of Emergency Physicians (ACEPs), 195, 197, 338

Index

- American College of Radiology (ACR), 80, 338, 402, 404, 559, 568
 pre-treatment protocols, 403
 American Institute of Ultrasound in Medicine (AIUM), 209–210
 A-mode ultrasound, 201
 anaphylactoid reactions, 403–404
 anesthesia, 291
 aneurysm
 abdominal aortic, 247, 572
 CT angiography of abdominal vasculature and, 485
 celiac artery, 283
 saccular, 374
 thoracic aorta, 189
 aneurysms, 58
 anisotropy, 347
 ankle
 anatomy, 621
 dislocation, 31
 effusion, 26
 fracture-dislocation, 31
 annular calcification, 185
 anterior hip fracture, 12
 anterior humeral line, 112
 anterolisthesis, 99, 542
 aorta
 assessment, 374
 in pediatric chest plain radiography, 121
 tearing, 462
 aortic arch, 136
 aortic calcification, 183
 aortic dissection, 282, 374, 477, 479, 564, 573
 CT angiography of abdominal vasculature, 485
 in CXR, 50
 aortitis, 486
 aortogram, 134
 apical pneumothorax, 129
 appendicitis, 57, 474, 570
 abdominal ultrasound for, 338, 340, 342
 acute, ultrasound, 338
 pediatric abdominal plain radiography, 155–157
 in pregnancy, 581
 sentinel loop with, 60–63
 appendicolith, 155
 array transducers, 204–205
 arterio-venous fistula, 492–493
 CT angiography of abdominal vasculature, 486
 arterio-venous malformation, 486
 arthrocentesis
 elbow, 354–355
 ultrasound
 anatomic considerations, 307–308
 clinical images, 308
 indications, 307
 pitfalls, 308
 procedure, 308
 artifacts
 beam hardening, 426
 in CT angiography of abdominal vasculature, 487
 in head CT, 423–424
 mirror image, 209
 ring-down, 287
 twinkle, 262
 ultrasound, 205–206
 volume averaging, 426
 as low as reasonably achievable (ALARA), 203, 209–210, 404–405
 asbestosis, 189
 ascites, 298
 atelectasis, 44, 122
 upper lobe, 190
 atherosclerosis, 496
 CT angiography of abdominal vasculature, 486
 avascular necrosis (AVN), 14
 avulsion fracture, 33
 Bastrup disease, 420
 back pain, 408, 420
 medical history in, 538
 Baker's cyst, 241, 245
 Bankart fracture, 4
 barium enema, 57
 barium esophagram, 140
 barium study, 141
 BCVI. *See* blunt cerebrovascular injury
 beam hardening artifact, 426
 beam width, 202–203
 bear's paw, 262
 bedside ultrasound, 195, 228
 benign testicular masses, 335
 Betadine, 403
 bilateral central pulmonary infiltrates, 121
 bilateral decubitus view, 128
 bilateral dislocation, 414
 bilateral ligamentum flavum hypertrophy, 418
 bilateral pubic bone fractures, 103
 biliary obstruction, 226
 biliary tract, 212–226
 biliary ultrasound
 clinical images, 211–221
 diagnostic capabilities, 211
 imaging pitfalls, 211
 indications, 211
 bipartite patella, 12, 17
 bladder
 contents, 144
 evaluation, 263
 perforation, 299
 tumor, 273
 ultrasonography, 263
 ultrasound, 285–286
 bladder stone, 73
 blind subxiphoid technique, 302
 Bloch, Felix, 516, 519
 blood window, 425
 blooming, 505–506
 blunt cerebrovascular injury (BCVI), 498
 B-mode ultrasound, 201
 bones
 in chest CT, 463–466
 contents, 144
 in CXR, 42
 marrow, 539
 edema, 583
 musculoskeletal ultrasound, 347
 in pediatric chest plain radiography, 121
 window, 425
 bony abnormalities, 172–173
 bony metastases, 187
 bowel
 contents, 144
 distension, 146
 bowel obstruction, 161
 air-fluid levels in, 146–147
 gas distribution in, 144
 ileus compared to, 144–147
 large, 57
 abdominal radiography of, 65–66
 orderliness in, 147
 pediatric abdominal plain radiography, 144–147
 small, 57, 473
 abdominal radiography, 60
 brachiocephalic vein, 240
 brain abscess, 532–533
 brain mass, 422–423
 brain MRI, 519
 clinical images, 520
 diagnostic capabilities, 520
 imaging pitfalls, 520
 indications, 520
 infectious diseases, 532–533
 intracranial hemorrhage, 529–532
 ischemia, 528–529
 of neoplasms, 535–536
 non-infectious diseases, 534
 normal anatomy, 521–527
 principles of, 519–520
 brain neoplasms, 535–536
 brain window, 425
 breastfeeding
 CT angiography of abdominal vasculature and, 487
 IV contrast and, 401
 brevis tendon, 623
 Brewerton view, 6
 bronchogenic cyst, 141
 bronchopulmonary dysplasia, 131
 bucket handle fractures, 174–175
 C1-C2 subluxation, 543
 C3, axial view of, 410
 C3/4 disc protrusion, 414
 calcaneal fracture, 32
 calcifications
 annular, 185
 circular, 133
 pancreatic, 75
 testicular, 336
 uterine fibroid, 72
 vascular, 75–76
 calculi, 58
 Calipers, 196
 Canadian C-spine Rule (CCR), 80, 407
 rule, 80
 Canadian Head CT Investigators, 423
 carcinoma
 gallbladder, 221
 hepatocellular, 470, 579, 609
 renal, 272, 574
 urinary tract and kidney ultrasound, 263
 cardiac arrest, 373
 cardiac ultrasound
 clinical images, 249

Index

- cardiac ultrasound (cont.)
 diagnostic capabilities, 247–248
 imaging considerations, 248–249
 imaging pitfalls, 249
 indications, 247
- cardiogenic shock, 371
- cardiomediastinum, 42, 50
- cardiomegaly, 47, 132, 133
- cauda equina syndrome, 407
- cavernous hemangioma, 554
- CBD. *See* common bile duct
- CCR. *See* Canadian C-spine Rule
- CDI. *See* color Doppler imaging
- cecal volvulus, 63
- cecum, 55
- celiac artery, 484
 aneurysm, 283
- cellulitis, 241, 245, 359
- central testicular blood flow, 332
- central venous catheter (CVC)
 tip placement
 femoral approach, 375
 in resuscitation ultrasound, 375
 subclavian approach, 375
 ultrasound placement of, 287
 anatomical placement, 287
 clinical images, 288
 pitfalls, 287–288
 procedure, 287–288
- cerebral contusion, 430
- cervical burst fracture, 545
- cervical compression fracture, 180
- cervical disc extrusion, 546
- cervical fracture, 543
- cervical hyperostosis, 181
- cervical spine, 541
- CFA. *See* common femoral artery
- CFV. *See* common femoral vein
- CHD. *See* common hepatic duct
- chest CT
 angiography
 diagnostic capabilities, 479
 imaging pitfalls, 479–483
 indications, 479
 aortic tear, 462
 bones in, 463–466
 clavicle fractures, 463–466
 clinical images, 457
 diagnostic capabilities, 456
 diaphragmatic rupture, 463
 of empyemas, 459–461
 esophagus, 462–463
 of exudates, 459–461
 in hemothorax, 459
 hydropneumothorax, 459
 indications, 456
 lung lacerations, 457–458
 lung parenchyma, 457–458
 malpositioned chest tubes, 466
 of mediastinum, 461–463
 of pericardial effusion, 462
 pitfalls, 456
 of pleural space, 459
 of pneumomediastinum, 461
 of pneumonia, 458–459
 pulmonary contusion, 457–458
 radiation doses in, 456
 rib fracture, 463–466
 scapular fracture, 466
 of sternal fractures, 466
 sternoclavicular dislocations, 463–466
 of tension pneumothorax, 459
 of tracheobronchial injuries, 462
 of transudates, 459–461
 in traumatic effusions, 459
 vertebral fractures, 466
 wound tracks, 466
- chest MRI
 clinical images, 563
 clinical indications, 559–560
 diagnostic capabilities, 560–562
 imaging pitfalls, 562
 in pregnancy, 559
- chest plain radiography, pediatric
 aorta in, 121
 bones in, 121
 clinical images, 121
 diagnostic capabilities, 120
 heart in, 121
 imaging pitfalls, 120
 indications, 120
 lungs in, 120–121
 mediastinum in, 121
- chest radiograph (CXR)
 aortic dissection in, 50
 bones in, 42
 cardiomediastinum in, 42, 50
 diagnostic capabilities, 41
 diaphragms in, 42
 in elderly, 179
 free air, 51
 imaging pitfalls, 41
 indications, 41
 intubation, 50
 lung fields in, 42
 mass and nodule in, 51
 normal apical, 43
 normal infant, 43
 normal lateral, 42
 normal PA and lateral, 42
 normal pneumonia, 44
 normal supine, 43
 PCP, 52
 pediatric, 120
 pediatric infiltrate, 45
 pleural effusion, 49
 supine, 456
 systematic approach to reading, 41
 tuberculosis, 48
- chest tube, 50
- Chilaiditi finding, 68–69
- child abuse, plain radiography in
 clinical images, 174
 diagnostic capabilities, 174
 imaging pitfalls, 174
 indications, 174
- childhood cancer, 404
- choking, 127
- cholangiocarcinoma, 225
- cholangitis, 568–570
- cholecystitis, 207, 211, 470, 474
 acute, 217
- choledocholithiasis, 225, 577
- cholelithiasis, 211, 576
- cholescintigraphy, 211
- chondrocalcinosis, 193
- chronic femoral DVT, 245
- chronic obstructive pulmonary disease (COPD), 41, 46
- chronic pancreatitis, 475
- circular calcification, 133
- cirrhosis, 225
- clavicle fractures, 2
 chest CT, 463–466
 musculoskeletal ultrasound of, 351
- clay shoveler's fracture, 411
- Cline Loop, 196
- CME. *See* continuing medical education
- coarctation, 565
- cobblestoning, 360
- coccygeal dislocation, 106
- Colles' fracture, 7
- color Doppler, 204, 240, 258
- color Doppler imaging (CDI), 331
- color flow Doppler, 197
- common bile duct (CBD), 212
 measurement, 223
- common extensor tendon, 590
- common femoral artery (CFA), 240
- common femoral vein (CFV), 240
- common flexor tendon, 590
- common hepatic duct (CHD), 212
- complex cutaneous abscess, 363
- complex skull fracture, 176
- complex spine fractures, 539
- comprehensive echocardiography, 376
- computed tomography. *See* CT
- continuing medical education (CME), 199
- contractility, LV, 369
- COPD. *See* chronic obstructive pulmonary disease
- costophrenic angle, 232
- costovertebral angle (CVA), 169
- creatinine, 401
- crescant sign, 160, 161
- CRITOE, 111–112
- C-spine
 plain radiography of
 capabilities, 79–80
 clinical images, 96
 diagnostic capabilities, 96
 imaging pitfalls, 96
 sagittal view, 409
- C-spine injury
 causes, 79
 plain radiography of
 AP view, 79
 capabilities, 79–80
 CT compared with, 81–82
 diagnostic pitfalls, 81
 F/E view, 79
 inadequate imaging, 81
 indications, 80–81
 lateral view, 79
 open-mouth odontoid view, 79
 pediatrics, 81
 relative stability of, 79
- CT
 abdominal
 diagnostic capabilities, 469–471
 indications, 469

- limitations and pitfalls, 471
- chest
 - aortic tear, 462
 - bones in, 463–466
 - clavicle fractures, 463–466
 - clinical images, 457
 - diagnostic capabilities, 456
 - diaphragmatic rupture, 463
 - of empyemas, 459–461
 - esophagus, 462–463
 - of exudates, 459–461
 - in hemothorax, 459
 - hydropneumothorax, 459
 - indications, 456
 - lung lacerations, 457–458
 - lung parenchyma, 457–458
 - malpositioned chest tubes, 466
 - of mediastinum, 461–463
 - of pericardial effusion, 462
 - pitfalls, 456
 - of pleural space, 459
 - of pneumomediastinum, 461
 - of pneumonia, 458–459
 - pulmonary contusion, 457–458
 - radiation doses in, 456
 - rib fracture, 463–466
 - scapular fracture, 466
 - of sternal fractures, 466
 - sternoclavicular dislocations, 463–466
 - of tension pneumothorax, 459
 - of tracheobronchial injuries, 462
 - of transudates, 459–461
 - in traumatic effusions, 459
 - vertebral fractures, 466
 - wound tracks, 466
- in C-spine injury, 81–82
- facial, 439
 - analysis, 440
 - head CT contrasted with, 439
 - mandible, 442–446
 - maxillary fractures, 441–442
 - method, 439
 - orbital blowout fractures, 440–441
 - zygoma, 441
- head, 422
 - altered mental status and, 422–423
 - artifacts in, 423–424
 - brain mass and, 422–423
 - clinical images, 427–431, 432–437
 - diagnostic capabilities, 422–423
 - facial CT contrasted with, 439
 - imaging pitfalls, 423–424
 - infection, 437
 - ischemic stroke and, 423
 - in pediatric population, 422
- pediatric patients, 404–405
- pelvic
 - diagnostic capabilities, 469–471
 - indications, 469
 - limitations and pitfalls, 471
- plain radiography compared with, 81–82
- of spine
 - clinical indications, 407
 - criteria, 408
 - diagnostic capabilities, 408
 - in pediatric population, 408–409
 - pitfalls, 408–409
- ultrasound compared with, 338
- CT angiography (CTA)
 - of abdominal vasculature, 484
 - abdominal aortic aneurysm and, 485
 - aortic dissection, 485
 - aortitis, 486
 - arterio-venous fistula, 486
 - arterio-venous malformation, 486
 - artifacts in, 487
 - atherosclerosis, 486
 - breastfeeding and, 487
 - clinical images, 487–493
 - contra-indications, 486
 - contrast allergy and, 486
 - fibromuscular dysplasia, 486
 - gastrointestinal bleeding, 485
 - indications, 485–486
 - limitations and risks, 487
 - MALS, 486
 - mesenteric ischemia, 485
 - normal anatomy, 484
 - patient preparation, 484–485
 - pregnancy and, 487
 - radiation in, 487
 - renal dysfunction and, 486–487
 - renal vascular hypertension, 486
 - technique, 485
 - trauma and, 485
- of chest
 - diagnostic capabilities, 479
 - imaging pitfalls, 479–483
 - indications, 479
- of extremities
 - diagnostic capabilities, 505
 - imaging pitfalls, 505–506
 - indications, 505
 - major arteries in, 506–508
- head and neck, 495
 - clinical images, 499–503
 - diagnostic capabilities, 497–498
 - in hemorrhagic stroke, 496–498, 499
 - imaging pitfalls, 498
 - indications, 495–496
 - in ischemic stroke, 496–498, 499
 - radiation dose in, 499
 - in trauma, 497, 498, 499
- CT perfusion (CTP), 495
- CTA. *See* CT angiography
- CTP. *See* CT perfusion
- curvilinear abdominal probe, 204–205
- CVA. *See* costovertebral angle
- CVC. *See* central venous catheter
- CXR. *See* chest radiograph
- cyanosis, 133
- dancer's fracture, 33
- D-dimer, 239
- de Quervain's tenosynovitis, 598
- decibel, 202
- decubitus film, 49
- deep venous thrombosis (DVT), 239
 - acute, 241
 - chronic, 241
 - chronic femoral, 245
 - longitudinal axis, 244
 - popliteal, 244
 - proximal, 244
- risk factors, 239
- ultrasound
 - clinical images, 241
 - diagnostic capabilities, 239
 - imaging pitfalls, 240–241
 - indications, 239
 - technique, 240
- degenerative joint disease (DJD), 178, 194
- dens fractures, 182, 411
- dens-C1 interface, 411
- depth, ultrasound, 203
- dexamethasone sodium sulfate, 403
- dextroscoliosis, 419
- diabetes mellitus, 628
 - IV contrast and, 402
 - RCIN and, 401
- diaphragm, 42
- diaphragmatic hernia, 130, 131
- diaphragmatic rupture, 463
- diffuse axonal injury, 431
- diffuse idiopathic skeletal hyperostosis (DISH), 179
- diffuse sclerotic changes, 100
- Diffusion Weighted Imaging (DWI), 519–520
- DiGeorge syndrome, 138
- diphenhydramine, 403
- discitis, 142
- DISH. *See* diffuse idiopathic skeletal hyperostosis
- dislocated total hip arthroplasty, 16
- distal biceps tendon, 592
- distal phalanx, 10
- distal radius fracture, 6
- distributive shock, 371
- diverticulitis, 473
- DJD. *See* degenerative joint disease
- donut sign, 342
- Doppler
 - color, 204, 240, 258
 - power, 197, 204
 - spectral, 204, 240, 243–244
 - ultrasound, 203–204
- dorsal displacement, 7
- duodenal obstruction, 472
- duodenal perforation, 472
- DVT. *See* deep venous thrombosis
- DWI. *See* Diffusion Weighted Imaging
- dye infiltration, 487
- Eastern Association for the Surgery of Trauma (EAST), 407
- ejection fraction (EF), 248
- elbow
 - arthrocentesis, 354–355
 - dislocation, 116
 - effusions, 354
 - musculoskeletal ultrasound of, 354
 - ossification, 111–112
 - plain radiography
 - clinical images, 4–5
 - imaging pitfalls, 4
 - indications for, 2–4
- elderly
 - plain radiography
 - abdominal imaging, 179
 - chest imaging, 179

Index

- elderly (cont.)
 - clinical images, 179
 - diagnostic capabilities, 178
 - imaging pitfalls, 179
 - indications, 178
 - pelvic imaging, 179
 - rheumatologic conditions, 179
- spine plain film imaging in, 178–179
- electricity, 515
- electrons, 515
- emergency physicians, 195
- emphysematous cholecystitis, 220
- empyemas, 459–461
- endometrial line sign, 319
- endotracheal tube placement, 375
- endovaginal longitudinal view, 316, 322
- endovaginal probe, 196–197
- endovaginal sagittal view, 314–315, 317
- endovaginal ultrasound, 313
- end-stage renal disease (ESRD), 403
- enostosis, 420
- epicondylitis, 2
- epididymitis, 331, 334
- epidural abscess, 549
- epidural hematoma, 427
- esophageal coin, 135, 136
- esophagogastrroduodenoscopy, 59
- esophagus, 462–463
- ESRD. *See* end-stage renal disease
- ESUR. *See* European Society of Urogenital Radiology
- EUG. *See* extrauterine gestation
- European Society of Urogenital Radiology (ESUR), 403
- expiratory view, 128
- extratesticular fluid, 333
- extrauterine gestation (EUG), 315
- extremities
 - lower extremity injuries
 - diagnostic capabilities, 11
 - imaging pitfalls, 11–12
 - indications, 11
 - upper, 1
- extremity CT angiography
 - diagnostic capabilities, 505
 - imaging pitfalls, 505–506
 - indications, 505
 - major arteries in, 506–508
- extremity MRI
 - diagnostic capabilities, 584
 - figure legends, 585–628
 - imaging pitfalls, 584
 - indications, 583
 - pregnancy and, 583
- extremity plain radiography, pediatric
 - clinical images, 107–119
 - diagnostic capabilities, 107
 - imaging pitfalls, 107
 - indications, 107
- exudates, 459–461
- eye, foreign body retention, 328
- fabella, 24
- facial CT, 439
 - analysis, 440
 - head CT contrasted with, 439
- mandible
 - diagnostic capabilities, 442
 - incidence and characterization, 446
 - indications, 442
 - pitfalls, 442–446
- maxillary fractures, 441
 - diagnostic capabilities, 441–442
 - indications, 441–442
 - pitfalls, 441–442
- method, 439
- orbital blowout fractures
 - diagnostic capabilities, 440
 - indications, 440
 - pitfalls, 440–441
 - types of, 440
- zygoma
 - diagnostic capabilities, 441
 - indications, 441
 - pitfalls, 441
- facial fractures, 352
- falciform ligament sign, 56
- FAST exams, 199, 227–228, 229, 368
 - principles of, 374
- fecalith, 341
- feeding tube replacement, 188
 - abdominal radiography, 78
- female reproductive tract, 144
- femoral approach, 375
- femoral condyle fracture, 18
- femoral neck fracture, 15
- femoral vein, 240
- femoral vessel, 242
- femur, 349–350
- fetal radiation exposure, 404
- FF. *See* free fluid
- fibrinolytic medications, 422
- fibroids, 320
 - submucosal, 320
- fibromuscular dysplasia, 486
- fibular shaft fracture, 26
- FLAIR. *See* Fluid-Attenuated Inversion Recovery
- fluid collections, 58
- Fluid-Attenuated Inversion Recovery (FLAIR), 519
- focused cardiac ultrasound, 368–371
 - cardiac arrest, 373
 - IVC in, 370–371
 - left ventricle assessment, 369–370
 - pericardial effusion, 369
 - priorities of, 368
 - pulmonary embolism and, 371–373
 - RV in, 370–371
 - in shock states, 371
- focused lung ultrasound, 373–374
- FOOSH injury, 6
- forearm, plain radiography
 - clinical images, 4–5
 - diagnostic capabilities, 4
 - imaging pitfalls, 4
 - indications for, 2–4
- foreign bodies, 1
 - in eye, 328
 - glass, 365
 - pediatric abdominal plain radiography, 166–169
- radiolucent, 37
- radiopaque, 36
- soft tissue ultrasound
 - diagnostic capabilities, 360–361
 - imaging considerations, 361
 - imaging pitfalls, 361
 - indications, 360
- ultrasound detection
 - anatomical considerations, 291
 - clinical images, 292–293
 - indications, 290
 - pitfalls, 291
 - procedure, 291
- wooden, 365
- fractures
 - acetabular, 13, 103
 - ankle, 31
 - anterior hip, 12
 - avulsion, 33
 - Bankart, 4
 - bilateral pubic bone, 103
 - bucket handle, 174–175
 - calcaneal, 32
 - cervical, 543
 - cervical burst, 545
 - cervical compression, 180
 - clavicle, 2
 - chest CT, 463–466
 - musculoskeletal ultrasound of, 351
 - clay shoveler's, 411
 - Colles', 7
 - complex skull, 176
 - complex spine, 539
 - dancer's, 33
 - dens, 182, 411
 - distal radius, 6
 - facial, 352
 - femoral condyle, 18
 - femoral neck, 15
 - fibular shaft, 26
 - Galeazzi, 6, 114
 - greater trochanter, 15
 - Greenstick, 111
 - Hangman's, 411
 - head, 427
 - head CT, 427
 - hip avulsion, 119
 - Hoffa, 18
 - horizontal intertrochanteric, 15
 - humeral head, 4
 - iliac wing, 104
 - isolated arch, 441
 - Jefferson's, 412
 - Jones, 33
 - L1 compression, 97
 - L1 superior end plate, 98
 - lateral epicondyle, 115, 117
 - lateral malleolus, 27
 - Le Fort, 441
 - diagnostic capabilities, 441–442
 - imaging pitfalls, 441–442
 - linear skull, 176
 - Lisfranc's, 11
 - chronic, 35
 - subluxation, 34–35
 - long bone, 227, 349

- musculoskeletal ultrasound for, 349
 - lumbar, 544
 - Maisonneuve, 27
 - maxillary, 441
 - diagnostic capabilities, 441–442
 - indications, 441–442
 - pitfalls, 441–442
 - medial, 28
 - metacarpal neck, 10
 - metaphyseal corner, 174–175
 - metatarsal stress, 34
 - Monteggia, 5, 114
 - musculoskeletal ultrasound for, 348–349
 - occult, 352
 - odontoid, 542
 - orbital blowout, 440, 443, 444
 - diagnostic capabilities, 440
 - indications, 440
 - pitfalls, 440–441
 - types of, 440
 - osteoporotic lumbar compression, 180
 - physeal, 107
 - posterior malleolar, 28
 - posterior rib, 176
 - pubic rami, 103, 104, 106
 - reduction of, 352–353
 - rib, 351
 - chest CT, 463–466
 - musculoskeletal ultrasound, 351
 - posterior, 176
 - S5 transverse, 105
 - scaphoid, 6, 8
 - scapular, 53
 - chest CT, 466
 - shoulder, 192
 - small bone, 351–352
 - smash, 441, 452, 453
 - Smith's, 8
 - sternal, 466
 - supracondylar, 112, 113
 - T8 compression/wedge, 97
 - T12 compression/wedge, 98
 - T12 superior end plate, 98
 - tibial, 26
 - tibial plafond, 30
 - tibial plateau, 20
 - toddler, 26, 118, 177
 - torus, 111
 - traumatic compression, 546
 - vertebral, 466
 - wedge-type, 419
 - ZMC, 441, 447
- free air
- abdominal radiography, 59–60
 - CXR of, 51
- free fluid (FF), 340
- Freeze, 196
- frequency
- Doppler, 202
 - shift, 203–204
 - in ultrasound, 202
- gadolinium, 562
- pregnancy and, 540
- gain, 202
- Galeazzi fractures, 6, 114
- gallbladder
- anatomy, 212
 - carcinoma, 221
 - clinical images, 211–221
 - distension, 220
 - porcelain, 57, 75, 221
 - SIN sign, 217
 - sludge, 216
 - variations, 213
 - wall, 213
 - wall thickening, 219, 226
- gallstones, 214
- WES sign, 215
- garden spade deformity, 8
- gastric cancer, 552
- gastric outlet obstruction, 472
- gastrointestinal bleeding, 485
- ghost sign, 628
- GI tract pathology
- abdominal radiography, 57
 - abdominal ultrasound and, 338–339
- giant cell tumor of bone, 17
- glass foreign body, 365
- globe rupture, 329
- glomerular filtration rates, 401, 583
- gout, 39
- gray scale ultrasound, 331
- greater saphenous vein (GSV), 240
- greater trochanter fracture, 15
- Greenfield filter, 67–68
- Greenstick fracture, 111
- GSV. *See* greater saphenous vein
- Guillain–Barré, 408
- gunshot wound, 431
- hand, plain radiography
- clinical images, 7
 - diagnostic capabilities, 6
 - imaging pitfalls, 6–7
 - indications, 5–6
- Hangman's fracture, 411
- Harborview Criteria, 82
- HD. *See* hemodialysis
- head, gunshot wound, 431
- head and neck CT angiography, 495
- clinical images, 499–503
 - diagnostic capabilities, 497–498
 - in hemorrhagic stroke, 496–498, 499
 - imaging pitfalls, 498
 - indications, 495–496
 - in ischemic stroke, 496–498, 499
 - radiation dose in, 499
 - in trauma, 497, 498, 499
- head CT, 422
- altered mental status and, 422–423
 - artifacts in, 423–424
 - brain mass and, 422–423
 - clinical images
 - fractures, 427
 - non-trauma, 432–437
 - diagnostic capabilities, 422–423
 - facial CT contrasted with, 439
 - imaging pitfalls, 423–424
 - infection, 437
 - ischemic stroke and, 423
 - in pediatric population, 422
- headache, 424
- heart
- MRI
 - clinical images, 563
 - clinical indications, 559–560
 - diagnostic capabilities, 560–562
 - imaging pitfalls, 562
 - in pregnancy, 559
 - in pediatric chest plain radiography, 121
 - transplant, 565
- hemangioma, 470
- cavernous, 554
 - spleen, 344
- hematoma
- epidural, 427
 - subdural, 177, 428, 549
 - isodense, 429
- hematuria, 285
- hemidiaphragm, 126
- hemithorax, 49
- hemodialysis (HD), 403
- hemopericardium, 234
- hemoperitoneum, 227, 232–233
- hemorrhagic renal cysts, 573
- hemorrhagic stroke
- head and neck CT angiography in, 496–498, 499
 - presentation, 496
 - risk factors, 496
- hemothorax, 459
- hepatic cysts, 579
- hepatocellular carcinoma, 470, 579, 609
- hernia
- abdominal wall, 471
 - ultrasound, 339
 - diaphragmatic, 130, 131
 - hiatal, 188
 - inguinal, 339
 - lumbar disc, 547
 - occult, 339
 - umbilical, 342
 - ventral wall, 342, 477
- hiatal hernia, 188
- high-frequency linear array, 196–197
- Hill–Sachs deformity, 4
- hip
- anatomy, 602
 - avulsion fracture, 119
 - displacement, 105
 - effusions, 353–354
 - joint, 353
 - pain, 608
 - bilateral, 608
 - pregnancy and, 609
 - prosthesis, 105
 - displacement, 105
- HIV, 424
- Hoffa fractures, 18
- hold compressions, 373
- horizontal intertrochanteric fracture, 15
- horseshoe kidney, 275
- hourglass sign, 111–112
- humeral head fracture, 4
- humerus
- musculoskeletal ultrasound, 349
 - proximal, 349
- hydration therapy, 402
- hydrocele, 333
- hydrocephalus, 435

Index

- hydrogen atoms, 515
 hydronephrosis, 261, 263, 267, 575
 kidney and urinary tract ultrasonography, 262–263
 hypertension, 570
 hypertensive hemorrhage, 433
 hypoechoic halo, 361
 hypovolemia, 373
 hypovolemic shock, 371
- IgE, 403
 IHPS. *See* infantile hypertrophic pyloric stenosis
 ileus
 abdominal radiography of, 59–60
 air-fluid levels in, 146–147
 bowel obstruction compared to, 144–147
 gas distribution in, 144
 localized, 56
 orderliness in, 147
 pediatric abdominal plain radiography, 144–147
 radiography, 56–57
 iliac wing fracture, 104
 iliopsoas bursa, 608
 incarcerated uterus, 323
 infantile hypertrophic pyloric stenosis (IHPS), 338–339, 341
 inferior mesenteric artery, 484
 inferior vena cava (IVC), 247, 369
 in focused cardiac ultrasound, 370–371
 inguinal hernia, 339
 inguinal probe placement, 241–242
 intercondylar notch, 610
 intercostal vessels, 303
 intracavitary probe, 204–205
 intracranial hemorrhage, 529–532
 intrahepatic ducts, 212, 224
 intraperitoneal hemorrhage, 247
 intravenous pyelogram (IVP), 169
 intubation, CXR, 50
 intussusception, 172–173
 abdominal ultrasound for, 339
 pediatric abdominal plain radiography, 157–166
 inverted V sign, 56
 iodine, 404
 ischemic stroke, 434
 causes, 496
 head and neck CT angiography in, 496–498, 499
 head CT and, 423
 presentation, 496
 risk factors, 496
 isodense subdural hematoma, 429
 isolated arch fracture, 441
 IV contrast, 469, 540
 allergic-type reactions to, 403–404
 CT angiography of abdominal vasculature and, 486
 anaphylactoid reactions, 403–404
 breastfeeding and, 401
 diabetes mellitus and, 402
 dye infiltration, 487
 metformin and, 402
 multiple myeloma and, 402
 pregnancy and, 401
- IVC. *See* inferior vena cava
 IVP. *See* intravenous pyelogram
- Jefferson's fracture, 412
 jejunal perforation, 473
 joint effusions
 appearance of, 353
 elbow, 354
 knee, 353
 musculoskeletal ultrasound of, 354
 musculoskeletal ultrasound, 353
 joints
 hip, 353
 midcarpal, 597
 musculoskeletal ultrasound, 348
 radiocarpal, 597
 radioulnar, 597
 septic, 192
 Jones fracture, 33
- Kanavel's signs, 356
 kidneys
 anatomy, 264
 contents, 144
 function assessment, 484, 583
 horseshoe, 275
 ultrasonography
 carcinoma, 263
 clinical images, 264–275
 diagnostic capabilities, 261–262
 hydronephrosis, 262–263
 indications, 261
 pitfalls, 263
 prostatic hypertrophy, 263
 renal cysts and masses, 263
 ureteral stones, 262–263
 kissing contusions, 614, 616
 knee
 dislocation, 19
 joint effusions, 353
 musculoskeletal ultrasound of, 354
 lipohemarthrosis, 21
 locked, 613
 normal anatomy, 612
 OA of, 23
 pain, 617
 KUB, 144
 kyphosis, 418
- L1 compression fracture, 97
 L1 superior end plate fracture, 98
 L5 spondylolysis, 99
 lactic acidosis, 402
 LAD artery. *See* left anterior descending artery
 Ladd's bands, 148
 large bowel obstruction, 57
 abdominal radiography of, 65–66
 large knee joint effusion, 22
 lateral epicondyle fracture, 115, 117
 lateral malleolus fracture, 27
 lateral ulnar collateral ligament (LUCL), 590
 Le Fort fracture, 441
 diagnostic capabilities, 441–442
 imaging pitfalls, 441–442
 left anterior descending (LAD) artery, 480
 left lower quadrant, 470
- left upper quadrant, 470
 left ventricle (LV)
 contractility, 369
 focused cardiac ultrasound, 369–370
 function, 247
 systolic function, 369
 leiomyosarcoma, 417
 lens dislocation, 325
 leukemia, 554
 ligament, 348
 limbus vertebra, 186
 linear skull fracture, 176
 Lisfranc's fractures, 11
 chronic, 35
 subluxation, 34–35
 liver, 302
 blood supply, 470
 contents, 144
 enlargement, 57
 laceration, 474
 metastatic disease, 580
 localized ileus, 56
 long bone fractures, 227
 musculoskeletal ultrasound for, 349
 longitudinal axis DVT, 244
 lower extremity injuries
 diagnostic capabilities, 11
 imaging pitfalls, 11–12
 indications, 11
- LUCL. *See* lateral ulnar collateral ligament
 lumbar disc herniation, 547
 lumbar fracture, 544
 lumbar puncture ultrasound
 anatomical considerations, 295–296
 clinical images, 297
 indications, 295
 pitfalls, 297
 procedure, 296–297
 lumbar scoliosis, 184
 lumbar spine, 96, 408, 415, 416
 imaging, 408
 normal, 541
 lumbar spondylolisthesis, 184
 lumbar vertebra, 298, 471–472
 lumbosacral spine, 297
 lunate dislocations, 9
 lungs
 circular density in, 124
 contents, 144
 in CXR, 42
 fields, 42
 focused ultrasound, 373–374
 parenchyma, 457–458
 pediatric abdomen plain radiography, 173
 in pediatric chest plain radiography, 120–121
 luxatio erecta, 3
 LV. *See* left ventricle
 lymph node, 245
 lymphadenopathy, 241
 lymphoma, 339
- mac-off retinal detachment, 327
 mac-on retinal detachment, 327
 magnetic resonance
 cholangiopancreatography (MRCP), 568–570

- magnetic resonance imaging. *See* MRI
 magnetism, 515
 magnification, 203
 Maisonneuve fracture, 27
 malignant hypertension, 570
 malignant testicular masses, 336
 malpositioned chest tubes, 466
 malrotation, 147–155
 MALS. *See* median arcuate ligament syndrome
 mandible, facial CT
 diagnostic capabilities, 442
 incidence and characterization, 446
 indications, 442
 pitfalls, 442–446
 maxillary fractures, facial CT, 441
 diagnostic capabilities, 441–442
 indications, 441–442
 pitfalls, 441–442
 McConnell's sign, 371–373
 MDCT. *See* multidetector CT
 mechanical index (MI), 203
 mechanical transducers, 204
 mechanism of injury (MOI), 538
 Meckel's diverticulum, 339
 medial malleolar fracture, 28
 median arcuate ligament syndrome (MALS), 491–492
 CT angiography of abdominal vasculature, 486
 mediastinum
 chest CT of, 461–463
 in pediatric chest plain radiography, 121
 testis, 331
 mesenteric injury, 473
 mesenteric ischemia, 485
 metacarpal neck fracture, 10
 metal synovitis, 24
 metaphyseal corner fractures, 174–175
 metastasis, 407
 metastatic colon cancer, 187
 metastatic lesions, 100, 101
 metastatic liver disease, 580
 metatarsal apophyseal growth plate, 38
 metatarsal stress fracture, 34
 metformin
 IV contrast and, 402
 lactic acidosis and, 402
 methylene blue, 308
 methylprednisolone sodium succinate, 403
 MI. *See* mechanical index
 midcarpal joint, 597
 midgut volvulus, 147–155
 miliary tuberculosis, 125
 mirror image artifact, 209
 Mitchell, A. M., 401
 M-mode, ultrasound, 204–205
 MOI. *See* mechanism of injury
 molar pregnancy, 323
 momentum, 515
 Monteggia fractures, 5, 114
 MRCP. *See* magnetic resonance cholangiopancreatography
 MRI, 1
 abdominal
 clinical images, 571–581
 clinical indications, 568
 diagnostic capabilities, 568–570
 imaging pitfalls, 570
 in pediatric patients, 568
 brain, 519
 clinical images, 520
 diagnostic capabilities, 520
 imaging pitfalls, 520
 indications, 520
 infectious diseases, 532–533
 intracranial hemorrhage, 529–532
 ischemia, 528–529
 of neoplasms, 535–536
 non-infectious diseases, 534
 normal anatomy, 521–527
 principles of, 519–520
 of extremities
 diagnostic capabilities, 584
 figure legends, 585–628
 imaging pitfalls, 584
 indications, 583
 pregnancy and, 583
 formation of, 516
 of heart and chest, 559–560
 clinical images, 563
 clinical indications, 559–560
 diagnostic capabilities, 560–562
 imaging pitfalls, 562
 pregnancy, 559
 image characteristics, 516–518
 physical principles, 515–516
 pregnancy and, 404
 safety considerations, 518
 spine
 clinical images, 541
 clinical indications, 538–539
 contraindications, 540
 diagnostic capabilities, 539–540
 imaging pitfalls, 540
 pregnancy and, 540
 MS. *See* multiple sclerosis
 multidetector CT (MDCT), 456
 multiple ependymomas, 554
 multiple myeloma, 191, 553
 IV contrast and, 402
 multiple sclerosis (MS), 540
 muscles
 contents, 144
 in ultrasound, 347
 musculoskeletal ultrasound
 arthrocentesis, 353
 bones, 347
 of clavicle fractures, 351
 of elbow effusions, 354
 facial fractures, 352
 femur, 349–350
 for fractures, 348–349
 hip effusions, 353–354
 humerus, 349
 indications, 348–356
 joint effusions, 353
 joints, 348
 of knee effusions, 354
 ligament, 348
 limitations, 357
 for long bone fractures, 349
 muscle, 347
 nerves, 348
 occult fractures, 352
 rib fractures, 351
 small bone fractures, 351–352
 sonographic anatomy, 346–347
 technical considerations, 346
 of tendon injury, 354–355
 tendons, 347
 tenosynovitis, 356
Mycoplasma pneumoniae, 458–459
 myocardial stunning, 373
 nabothian cysts, 319
 N-acetylcysteine (NAC), 403
 National Emergency X-Radiography Utilization Study, 407
 National X-ray Utilization Investigators, 423
 NDP. *See* no definitive pregnancy
 near-drowning victim, 124
 NEC. *See* necrotizing enterocolitis
 neck abscess, 414
 neck pain, 415
 necrotizing enterocolitis (NEC), 165–166
 necrotizing fasciitis, 359
 necrotizing pancreatitis, 475
 neodymium magnets, 167–168
 nerves, 348
 neurocysticercosis, 533
 neurosarcoidosis, 534
 New Orleans Group, 423
 NEXUS criteria, 409
 NEXUS Low-risk Criteria (NLC), 80, 81
 NMR. *See* nuclear magnetic resonance
 no definitive pregnancy (NDP), 315–323
 normal abdominal aorta, 277–278
 normal anatomy, 426
 nuclear magnetic resonance (NMR), 519
 OA. *See* osteoarthritis
 obstruction. *See also* bowel obstruction
 abdominal, 56–57
 biliary, 226
 gastric outlet, 472
 pseudoobstruction, 67–68
 series, 55–56
 shock, 371
 obtuse marginal (OM) artery, 480
 occult fractures, 352
 occult hernia, 339
 ocular ultrasound, 324
 anatomy, 324
 diagnostic capabilities, 324
 images, 326
 techniques, 324–325
 odontoid fracture, 542
 Ogilvie syndrome. *See* pseudoobstruction
 olecranon, 237–238
 bursa, 593
 OM artery. *See* obtuse marginal artery
 optic nerve, 236–237
 sheath, 328
 optic neuritis, 329
 orbital blowout fractures, 443, 444
 facial CT
 diagnostic capabilities, 440
 indications, 440
 pitfalls, 440–441
 types of, 440
 mechanisms of, 440

Index

- orchitis, 331
 Osgood–Schlatter disease, 118
 ossification sequence variant, 117
 osteoarthritis (OA), 192
 hip, 193
 of knee, 23
 osteomyelitis, 11, 37, 99, 628
 osteopenia, 142, 143, 627
 osteophytes, 178–179, 539
 osteoporosis, 178–179, 408
 osteoporotic lumbar compression fracture, 180
 osteosarcoma, 25
 ovarian cyst, 478
 ovarian malignancy, 478
- pacemakers, 562
 Paget's disease, 179, 187
 pancreas
 abdominal ultrasound of, 339
 contents, 144
 pancreatic calcifications, 75
 pancreatic cancer, 417, 581
 pancreatic pseudocyst, 343, 580
 pancreatitis, 339, 470
 acute, 475
 chronic, 475
 necrotizing, 475
 paracentesis ultrasound
 anatomical considerations, 298–299
 clinical images, 299
 indications, 298
 pitfalls, 299
 procedure, 299
 parasternal short-axis view, 250–251
 parvalbumin, 403
 patella
 alta, 18
 subluxation of, 17
 PCP, 52
 PE. *See* pulmonary embolism
 PECARN. *See* Pediatric Emergency Care Applied Research Network
 pediatric abdomen plain radiography
 abdominal contents, 144
 appendicitis, 155–157
 bony abnormalities, 172–173
 bowel obstruction, 144–147
 diagnostic capabilities, 144
 foreign bodies, 166–169
 ileus, 144–147
 imaging pitfalls, 144
 indications, 144
 intussusception, 157–166
 lungs, 173
 malrotation, 147–155
 midgut volvulus, 147–155
 pneumatosis intestinalis, 165–166
 urolithiasis, 169–171
 pediatric chest plain radiography
 aorta in, 121
 bones in, 121
 clinical images, 121
 diagnostic capabilities, 120
 heart in, 121
 imaging pitfalls, 120
 indications, 120
 lungs in, 120–121
 mediastinum in, 121
 Pediatric Emergency Care Applied Research Network (PECARN), 404–405
 pediatric extremity plain radiography
 clinical images, 107–119
 diagnostic capabilities, 107
 imaging pitfalls, 107
 indications, 107
 pediatric patients
 abdominal MRI in, 568
 CT, 404–405
 of head, 422
 of spine, 408–409
 pelvic CT
 diagnostic capabilities, 469–471
 indications, 469
 limitations and pitfalls, 471
 pelvic plain radiography
 clinical images, 99–100
 diagnostic capabilities, 99–100
 in elderly, 179
 imaging pitfalls, 99–100
 indications, 99–100
 normal pelvis, 102
 pelvis injury, 603–604
 perforated viscus, 56
 pericardial effusion
 chest CT of, 462
 tamponade in, 369
 pericardial tamponade, 302
 pericardiocentesis
 traditional blind, 302
 ultrasound
 anatomical considerations, 302
 clinical images, 303
 indications, 302
 pitfalls, 303
 procedure, 302–303
 in ultrasound resuscitation, 375
 pericholecystic fluid, 218
 perilunate dislocations, 9
 perinephric fat, 266
 peripheral testicular blood flow, 332
 perispinal infection, 407
 peritoneum, 144
 peritonsillar abscess, 366
 ultrasound of, 362
 diagnostic capabilities, 362
 imaging, 362
 indications, 362
 phased array, 196–197
 transducer, 205
 physeal fractures, 107
 PIE. *See* pulmonary interstitial pneumonia
 PIOPED study, 561
 plain radiography. *See also* chest radiograph
 abdomen
 bladder stone, 73
 cecal volvulus, 63
 Chilaiditi finding, 68–69
 diagnosis, 56
 diagnostic capabilities, 55–56
 examining, 55
 feeding tube replacement, 78
 fluid collection, 58
 free air, 59–60
 GI tract pathology, 57
 ileus, 56–57, 59–60
 imaging pitfalls, 58–78
 indications, 55
 large bowel obstruction, 65–66
 obstruction, 56–57
 pancreatic calcifications, 75
 perforated viscus, 56
 pneumatosis intestinalis, 71
 pneumobilia, 69–70
 porcelain gallbladder, 75
 portal venous gas, 70–71
 pseudoobstruction, 67–68
 renal stone, 72
 retroperitoneal air, 71–72
 retroperitoneal processes, 58
 sentinel loop with appendicitis, 60–63
 sigmoid volvulus, 63–65
 small bowel obstruction in, 60
 soft tissue masses, 58
 solid organ conditions, 57
 staghorn calculus, 72
 toxic megacolon, 66–67
 ureteral stone, 72–73
 uterine fibroid calcifications, 72
 vascular calcifications, 75–76
 child abuse
 clinical images, 174
 diagnostic capabilities, 174
 imaging pitfalls, 174
 indications, 174
 of C-spine
 capabilities, 79–80
 clinical images, 96
 diagnostic capabilities, 96
 imaging pitfalls, 96
 of C-spine injury
 AP view, 79
 capabilities, 79–80
 CT compared with, 81–82
 diagnostic pitfalls, 81
 F/E view, 79
 inadequate imaging, 81
 indications, 80–81
 lateral view, 79
 open-mouth odontoid view, 79
 pediatrics, 81
 elbow
 clinical images, 4–5
 imaging pitfalls, 4
 indications for, 2–4
 elderly
 abdominal imaging, 179
 chest imaging, 179
 clinical images, 179
 diagnostic capabilities, 178
 imaging pitfalls, 179
 indications, 178
 pelvic imaging, 179
 rheumatologic conditions, 179
 forearm
 clinical images, 4–5
 diagnostic capabilities, 4
 imaging pitfalls, 4
 indications for, 2–4
 hand
 clinical images, 7

Index

- diagnostic capabilities, 6
- imaging pitfalls, 6–7
- indications, 5–6
- pediatric abdomen
 - abdominal contents, 144
 - appendicitis, 155–157
 - bony abnormalities, 172–173
 - bowel obstruction, 144–147
 - diagnostic capabilities, 144
 - foreign bodies, 166–169
 - ileus, 144–147
 - imaging pitfalls, 144
 - indications, 144
 - intussusception, 157–166
 - lungs, 173
 - malrotation, 147–155
 - midgut volvulus, 147–155
 - pneumatosis intestinalis, 165–166
 - urolithiasis, 169–171
- pediatric chest
 - aorta in, 121
 - bones in, 121
 - clinical images, 121
 - diagnostic capabilities, 120
 - heart in, 121
 - imaging pitfalls, 120
 - indications, 120
 - lungs in, 120–121
 - mediastinum in, 121
- of pediatric extremity
 - clinical images, 107–119
 - diagnostic capabilities, 107
 - imaging pitfalls, 107
 - indications, 107
- pelvis
 - clinical images, 99–100
 - diagnostic capabilities, 99–100
 - imaging pitfalls, 99–100
 - indications, 99–100
 - normal pelvis, 102
- of shoulder
 - clinical images, 2
 - diagnostic capabilities, 1–2
 - imaging pitfalls, 2
 - indications, 1
- of spine, 96
- upper extremity, 1
- wrist
 - clinical images, 7
 - diagnostic capabilities, 6
 - imaging pitfalls, 6–7
 - indications, 5–6
- pleural effusion, 126, 294
 - in CXR, 49
- pleural space, 459
- plicae circulares, 55
- pneumatosis, 57
- pneumatosis intestinalis
 - abdominal radiography, 71
 - pediatric abdominal plain radiography, 165–166
- pneumobilia, 225
 - abdominal radiography, 69–70
- Pneumocystis carinii*, 458–459
- pneumomediastinum, 52, 137, 138
 - chest CT of, 461
- pneumonia, 458–459
- pneumopericardium, 42
- pneumothorax, 48, 235, 236, 293, 303
 - apical, 129
 - tension, 129, 134, 373
- popliteal DVT, 244
- popliteal fossa, 240, 241, 243
- popliteal vein (PV), 240
- popliteal vessels, 243
- porcelain gallbladder, 57, 221
 - abdominal radiography, 75
- portal venous gas, 70–71
- posterior dislocation, 3
- posterior fat pad, 5
- posterior hip dislocation, 12
- posterior malleolar fracture, 28
- posterior rib fractures, 176
- postlaminectomy arachnoiditis, 557
- postlaminectomy pseudomeningocele, 557
- Pott disease, 540
- power Doppler, 197, 204
- precession, 515
- pregnancy, 315
 - appendicitis in, 581
 - CT angiography of abdominal vasculature and, 487
 - extremity MRI and, 583
 - gadolinium and, 540
 - hip pain and, 609
 - IV contrast and, 401
 - molar, 323
 - MRI and, 404
 - no definitive, 315–323
 - radiation and, 404
 - spine MRI and, 540
 - trauma ultrasound in, 228
 - ultrasound and, 315, 404
- preload, 247
- prostate cancer, 553
- prostatic hypertrophy, 274
 - urinary tract and kidney ultrasound, 263
- protons, 515
- proximal DVT, 244
- proximal humerus, 349
- proximal plantar fascia, 626
- proximal tibia, 11
- pseudoobstruction, 67–68
- pubic rami fractures, 103, 104, 106
- pulmonary contusion, 52, 479
 - chest CT, 457–458
- pulmonary edema, 47
- pulmonary embolism (PE), 53, 373, 559–560
 - focused cardiac ultrasound and, 371–373
- pulmonary infiltrates, 123
- pulmonary interstitial pneumonia (PIE), 130
- pulmonary nodules, 191
- pulsed wave Doppler, 197
- Purcell, Edward, 516, 519
- PV. *See* popliteal vein
- pylorus, 341
- quality improvement (QI), 198–199
 - ultrasound, 198
- radial collateral ligament (RCL), 590
- radial head subluxation, 116
- radiation
 - in chest CT, 456
- childhood cancer and, 404
- in CT angiography of abdominal vasculature, 487
- in CT angiography of head and neck, 499
- dose, 404
- fetal exposure to, 404
- pregnancy and, 404
- radiculopathies, 407
- radiocapitellar line, 5, 112
- radiocarpal joint, 597
- radiographic contrast-induced nephropathy (RCIN), 401
 - contrast dye in, 402
 - diabetes mellitus and, 401
 - epidemiology, 401
 - hemodialysis for, 403
 - hydration therapy, 402
 - NAC for, 403
 - prevention of, 402
 - risk factors, 401
- radiography. *See* plain radiography
- radiolucent foreign body, 37
- radiopaque foreign body, 36
- radioulnar joint, 597
- RCA. *See* right coronary artery
- RCIN. *See* radiographic contrast-induced nephropathy
- RCL. *See* radial collateral ligament
- RDS. *See* respiratory distress syndrome
- refraction, 206
- relaxation times, 517
- renal arteries, 484
 - stenosis, 574
- renal carcinoma, 272, 574
- renal cysts and masses, 271
 - kidney and urinary tract ultrasonography, 263
- renal replacement therapy (RRT), 403
- renal stone, 269
 - abdominal radiography, 72
- renal vascular hypertension, 486
- resolution, 202
- respiratory distress syndrome (RDS), 129, 130
- resuscitation
 - thoracic disease etiologies sought during, 373–374
 - trauma and, 408
- ultrasound in
 - clinical interpretation, 376
 - concept, 368
 - CVC tip placement, 375
 - endotracheal tube placement, 375
 - indications, 368, 376
 - needle and guidewire insertion, 375
 - pericardiocentesis in, 375
 - pitfalls in, 376
 - procedural guidance, 374–375
 - technical limitations, 376
- retinal detachment, 325
 - mac-off, 327
 - mac-on, 327
- retroperitoneal air, 71–72
- retroperitoneal processes, 58
- retroperitoneum, 374
- reverse compression, 243
- rheumatoid arthritis, 39, 412, 600

Index

- rheumatologic conditions, 179
 rib fractures
 chest CT, 463–466
 musculoskeletal ultrasound, 351
 posterior, 176
 rib fx, 53
 right coronary artery (RCA), 481
 right hepatic artery, 222
 right lower quadrant, 470
 right upper quadrant (RUQ), 160
 pain, 338
 right ventricle (RV), 368
 focused cardiac ultrasound, 370–371
 Rigler's sign, 56
 ring enhancing lesion, 437
 ring of fire sign, 338, 340
 ring-down artifact, 287
 RRT. *See* renal replacement therapy
 RUQ. *See* right upper quadrant
 RV. *See* right ventricle
 RV strain, 248
- S5 transverse fracture, 105
 saccular aneurysm, 374
 sacroiliac joint diastases, 104
 sail sign, 4, 111–112
 saline bag, 346
 saline echo-contrast medium, 303
 Salter–Harris classification, 107
 type 1, 107
 type 2, 108, 109
 type 3, 109
 type 4, 110
 type 5, 110
 scaphoid fracture, 6, 8
 scapula, 2
 scapular fracture, 53
 chest CT, 466
 scatter, 207
 SCFE. *See* slipped capital femoral epiphysis
 Schmorl's node, 186
 SCIWORA. *See* spinal cord injury without
 radiographic abnormality
 scrotal ultrasound, 331
 SDI. *See* spectral Doppler imaging
 sentinel loop, 60–63
 septic arthritis of hip, 119
 septic joint, 192
 severe myocardial insufficiency, 373
 shellfish allergies, 403
 Shenton's arc, 173
 shock states
 cardiogenic, 371
 distributive, 371
 focused cardiac ultrasound in, 371
 hypovolemic, 371
 obstructive, 371
 shoulder
 dislocation, 586
 fracture, 192
 normal anatomy, 585
 pain, 587
 plain radiography of
 clinical images, 2
 diagnostic capabilities, 1–2
 imaging pitfalls, 2
 indications, 1
- sigmoid volvulus, 63–65
 SIN sign, 217
 skin infection ultrasound, 359–360
 diagnostic capabilities, 359–360
 imaging considerations, 360
 imaging pitfalls, 360
 indications, 359
 skull
 axial view of, 410
 complex skull fracture, 176
 linear skull fracture, 176
 slipped capital femoral epiphysis (SCFE),
 119
 sludge, gallbladder, 216
 small bone fractures, 351–352
 small bowel, 55
 obstruction, 57, 473
 abdominal radiography, 60
 small curved linear array, 196–197
 small interstitial central pulmonary
 infiltrates, 122
 smash fracture, 441, 452, 453
 Smith's fracture, 8
 soft tissue foreign body ultrasound
 diagnostic capabilities, 360–361
 imaging considerations, 361
 imaging pitfalls, 361
 indications, 360
 soft tissue gas, 35
 soft tissue infection ultrasound, 359–360
 diagnostic capabilities, 359–360
 imaging considerations, 360
 imaging pitfalls, 360
 indications, 359
 soft tissue masses, 58
 soft tissue ultrasound
 clinical images, 362–366
 foreign bodies, 360–361
 normal subcutaneous tissue, 362
 solid organs, 57
 sonar, 201
 space occupying lesion, 436
 spectral Doppler, 204, 240, 243–244
 spectral Doppler imaging (SDI), 331
 spinal cord injury without radiographic
 abnormality (SCIWORA), 81, 409
 spinal stenosis, 407, 539
 spine. *See also* C-spine; C-spine injury
 cervical, 541
 complex spine fractures, 539
 CT of
 clinical indications, 407
 criteria, 408
 diagnostic capabilities, 408
 in pediatric population, 408–409
 pitfalls, 408–409
 injury, 408
 lumbar, 96, 408, 415, 416
 imaging, 408
 normal, 541
 lumbosacral, 297
 plain film imaging, 178–179
 plain radiography of, 96
 sign, 42
 thoracic, 96, 408, 415
 spine MRI
 clinical images, 541
- clinical indications, 538–539
 contraindications, 540
 diagnostic capabilities, 539–540
 imaging pitfalls, 540
 pregnancy and, 540
 spleen, 235
 abdominal ultrasound of, 339
 accessory, 344
 contents, 144
 enlargement of, 57
 hemangioma, 344
 splenic infarct, 578
 splenomegaly, 344, 577
 splenorenal recess, 230
 spondylolysis, 179
 Staghorn calculus, 72
 Staphylococcus aureus, 359
 sternal fractures, 466
 sternoclavicular dislocations, 463–466
 sternum, 351
 steroids, 403
 stress imaging, 11–12
 string of pearl sign, 57
 subarachnoid hemorrhage, 432, 496, 498
 subchondral sclerosis, 194
 subclavian approach, 375
 subclavian vein, 240
 subcostal four-chamber view, 249
 subcutaneous abscess, 363
 subdural hematoma, 177, 428, 549
 isodense, 429
 subluxation
 C1–C2, 543
 Lisfranc's fractures, 34–35
 of patella, 17
 radial head, 116
 submucosal fibroids, 320
 subxiphoid view, 252, 253, 254, 302, 304
 superior mesenteric artery, 484
 superior vena cava, 240
 supracondylar fracture, 112, 113
 suprapubic bladder catheterization
 ultrasonography
 anatomical considerations, 284
 indications, 284
 pitfalls, 285
 procedure, 284–285
 Swimmer's View, 79
 symphyseal diastases, 104
 synovial cyst, 548
 syringomyelia, 556
 systolic function, 369
- T1 weighted, 517–518
 T2 weighted, 517–518
 T8 compression/wedge fracture, 97
 T12 compression/wedge fracture, 98
 T12 superior end plate fracture, 98
 tamponade, 373
 in pericardial effusion, 369
 target sign, 161–162, 163–164
 TEE. *See* transesophageal echocardiography
 Tegaderm, 324
 Teisen, H. G., 361
 temporozygomatic suture, 445
 tendons
 Achilles, 354–355

- injury, 354–355
 musculoskeletal ultrasound, 347
 tenosynovitis, 356
 tension pneumothorax, 129, 134, 373
 chest CT of, 459
 Terry-Thomas sign, 8
 testicular blood flow
 central, 332
 peripheral, 332
 testicular torsion, 334
 testicular ultrasound
 clinical images, 332–336
 benign masses, 335
 calcifications, 336
 extratesticular fluid, 333
 inflammatory states, 334
 malignant masses, 336
 normal, 332
 testicular torsion, 334
 diagnostic capabilities, 331
 imaging pitfalls, 332
 indications, 331
 sonographic anatomy, 331
 technique, 331–332
 TGC. *See* Time Gain Compensation
 thermal index (TI), 203
 thigh pain, 606
 thoracentesis ultrasound
 anatomical considerations, 294
 clinical images, 294
 indications, 293
 pitfalls, 294
 procedure, 294
 thoracic aorta, 563
 aneurysm, 189
 dissection, 368, 374, 559
 thoracic disease, 373–374
 thoracic sonography, 209
 thoracic spine, 96, 408, 415
 thrombolytic therapy, 247
 thrombosis, 374
 thumbprinting, 57
 thymus, 140
 TI. *See* thermal index
 tibial fracture, 26
 tibial plafond fracture, 30
 tibial plateau fracture, 20
 tibial spline avulsion, 21
 Time Gain Compensation (TGC), 196
 controls, 202
 far, 202
 near, 202
 in ultrasound, 201–202
 toddler fracture, 26, 118, 177
 toe swelling, 628
 torus fracture, 111
 toxic megacolon, 66–67
 tracheobronchial injuries, 462
 Trackball, 196
 traditional blind pericardiocentesis, 302
 transabdominal sagittal view, 321
 transabdominal view, 317–318
 transducers
 array, 204–205
 mechanical, 204
 phased array, 205
 ultrasound, 204
 transesophageal echocardiography (TEE),
 248, 376
 transthoracic echocardiography (TTE), 376
 transudates, 459–461
 transversalis fascia, 55
 transverse myelitis, 555
 trauma
 acute cranial, 227
 CT angiography of abdominal vasculature
 and, 485
 head and neck CT angiography in, 497,
 498, 499
 resuscitation and, 408
 ultrasound
 clinical images, 229–238
 diagnostic capabilities, 227–228
 imaging pitfalls, 228
 indications, 227
 in pregnancy, 228
 prehospital medicine, 228
 tactical medicine, 228
 traumatic compression fracture, 546
 traumatic effusions, 459
 traumatic subarachnoid hemorrhage, 430
 Trendelenburg position, 228, 240
 triplex ultrasound, 331
 tropomyosin, 403
 TTE. *See* transthoracic echocardiography
 tuberculosis, 551
 CXR, 48
 miliary, 125
 tunica albuginea, 331
 twinkle artifact, 262
 ulnar neuritis, 593
 ulnar styloid, 601
 ultrasound
 abdominal
 abdominal wall hernias, 339
 for appendicitis, 338, 340, 342
 clinical images, 340
 diagnostic capabilities, 338–339
 GI tract and, 338–339
 for IHPS, 338–339, 341
 indications for, 338
 for intussusception, 339
 of pancreas, 339
 of spleen, 339
 of umbilical hernia, 342
 abdominal aorta
 clinical images, 277–283
 diagnostic capabilities, 276
 imaging pitfalls, 277
 indications, 276
 technique, 276–277
 abdominal-pelvic
 clinical images, 313–323
 diagnostic capabilities, 313
 imaging pitfalls, 313
 indications, 313
 acoustic enhancement, 206–207
 acoustic power, 203
 acoustic shadowing, 206
 acquiring, 199–200
 acute appendicitis, 338
 A-mode, 201
 analysis, 203
 archiving interpretations of, 199
 array transducers, 204–205
 arthrocentesis
 anatomic considerations, 307–308
 clinical images, 308
 indications, 307
 pitfalls, 308
 procedure, 308
 artifacts, 205–206
 attenuation, 206
 beam width, 202–203
 bedside, 195, 228
 biliary
 clinical images, 211–221
 diagnostic capabilities, 211
 imaging pitfalls, 211
 indications, 211
 billing, 198, 199
 biological effects, 209–210
 bladder, 263, 285–286
 B-mode, 201
 cardiac
 clinical images, 249
 diagnostic capabilities, 247–248
 imaging considerations, 248–249
 imaging pitfalls, 249
 indications, 247
 central venous catheter placement, 287
 anatomical placement, 287
 clinical images, 288
 pitfalls, 287–288
 procedure, 287–288
 color flow Doppler, 197
 continuing education, 199
 CT compared with, 338
 depth, 203
 diagnostic, 201
 documentation of, 199
 Doppler, 203–204
 DVT
 clinical images, 241
 diagnostic capabilities, 239
 imaging pitfalls, 240–241
 indications, 239
 technique, 240
 in emergency department, 200
 endovaginal, 313
 endovaginal probe, 196–197
 EPs and, 195
 equipment care, 198
 focused cardiac, 368–371
 cardiac arrest, 373
 IVC in, 370–371
 left ventricle assessment, 369–370
 pericardial effusion, 369
 priorities of, 368
 pulmonary embolism and, 371–373
 RV in, 370–371
 in shock states, 371
 focused lung, 373–374
 foreign bodies
 anatomical considerations, 291
 clinical images, 292–293
 indications, 290
 pitfalls, 291
 procedure, 291
 frequency in, 202

Index

- ultrasound (cont.)
 - gain, 202
 - gray scale, 331
 - high-frequency linear array, 196–197
 - image archiving, 199
 - kidneys
 - carcinoma, 263
 - clinical images, 264–275
 - diagnostic capabilities, 261–262
 - hydronephrosis, 262–263
 - indications, 261
 - pitfalls, 263
 - prostatic hypertrophy, 263
 - renal cysts and masses, 263
 - ureteral stones, 262–263
 - limitations of, 338
 - lumbar puncture
 - anatomical considerations, 295–296
 - clinical images, 297
 - indications, 295
 - pitfalls, 297
 - procedure, 296–297
 - magnification, 203
 - measurement, 203
 - mechanical transducers, 204
 - mirror image artifact, 209
 - M-mode, 204–205
 - musculoskeletal
 - arthrocentesis, 353
 - bones, 347
 - of clavicle fractures, 351
 - of elbow effusions, 354
 - facial fractures, 352
 - femur, 349–350
 - for fractures, 348–349
 - hip effusions, 353–354
 - humerus, 349
 - indications, 348–356
 - joint effusions, 353
 - joints, 348
 - of knee effusions, 354
 - ligament, 348
 - limitations, 357
 - for long bone fractures, 349
 - muscle, 347
 - nerves, 348
 - occult fractures, 352
 - rib fractures, 351
 - small bone fractures, 351–352
 - sonographic anatomy, 346–347
 - technical considerations, 346
 - of tendon injury, 354–355
 - tendons, 347
 - tenosynovitis, 356
 - necrotizing fasciitis, 359
 - ocular, 324
 - anatomy, 324
 - diagnostic capabilities, 324
 - images, 326
 - techniques, 324–325
 - options, 196–197
 - paracentesis
 - anatomical considerations, 298–299
 - clinical images, 299
 - indications, 298
 - pitfalls, 299
 - procedure, 299
 - pericardiocentesis
 - anatomical considerations, 302
 - clinical images, 303
 - indications, 302
 - pitfalls, 303
 - procedure, 302–303
 - of peritonsillar abscess, 362
 - diagnostic capabilities, 362
 - imaging, 362
 - indications, 362
 - phased array, 196–197
 - transducer, 205
 - policies, 197
 - power Doppler, 197
 - practice exam, 200
 - pregnancy and, 315, 404
 - principles of, 201
 - privileging, 198, 200
 - process, 198–199
 - probes, 196–197
 - pulsed wave Doppler, 197
 - quality improvement, 198
 - refraction, 206
 - resolution in, 202
 - results reporting, 198
 - in resuscitation
 - clinical interpretation, 376
 - concept, 368
 - CVC tip placement, 375
 - indications, 368, 376
 - needle and guidewire insertion, 375
 - pericardiocentesis in, 375
 - pitfalls in, 376
 - procedural guidance, 374–375
 - technical limitations, 376
 - scatter, 207
 - scrotal, 331
 - side lobes, 209
 - skin infections, 359–360
 - diagnostic capabilities, 359–360
 - imaging considerations, 360
 - imaging pitfalls, 360
 - indications, 359
 - small curved linear array, 196–197
 - soft tissue, 362–366
 - soft tissue foreign bodies
 - diagnostic capabilities, 360–361
 - imaging considerations, 361
 - imaging pitfalls, 361
 - indications, 360
 - soft tissue infections, 359–360
 - diagnostic capabilities, 359–360
 - imaging considerations, 360
 - imaging pitfalls, 360
 - indications, 359
 - suprapubic bladder catheterization
 - anatomical considerations, 284
 - indications, 284
 - pitfalls, 285
 - procedure, 284–285
 - system controls, 201
 - technical fees, 195–196
 - testicular
 - clinical images, 332–336
 - diagnostic capabilities, 331
 - imaging pitfalls, 332
 - indications, 331
 - sonographic anatomy, 331
 - technique, 331–332
 - thoracentesis
 - anatomical considerations, 294
 - clinical images, 294
 - indications, 293
 - pitfalls, 294
 - procedure, 294
 - time gain compensation in, 201–202
 - training, 195, 197, 198, 200
 - transabdominal, 313
 - transducer selection, 204
 - trauma
 - clinical images, 229–238
 - diagnostic capabilities, 227–228
 - imaging pitfalls, 228
 - indications, 227
 - in pregnancy, 228
 - prehospital medicine, 228
 - tactical medicine, 228
 - triplex, 331
 - troubleshooting, 199–200
 - units of measurement in, 202
 - urinary tract
 - carcinoma, 263
 - clinical images, 264–275
 - diagnostic capabilities, 261–262
 - hydronephrosis, 262–263
 - indications, 261
 - pitfalls, 263
 - prostatic hypertrophy, 263
 - renal cysts and masses, 263
 - ureteral stones, 262–263
 - zoom, 203
 - umbilical hernia, 342
 - uncal hemorrhage, 434
 - upper extremity plain radiography, 1
 - upper lobe atelectasis, 190
 - ureteral stone
 - abdominal radiography, 72–73
 - kidney and urinary tract ultrasonography, 262–263
 - ultrasonography, 261–262
 - ureterolithiasis, 72–73, 476
 - ureteropelvic junction, 58
 - ureters, 58
 - urinary retention, 263
 - urinary tract ultrasonography
 - carcinoma, 263
 - clinical images, 264–275
 - diagnostic capabilities, 261–262
 - hydronephrosis, 262–263
 - indications, 261
 - pitfalls, 263
 - prostatic hypertrophy, 263
 - renal cysts and masses, 263
 - ureteral stones, 262–263
 - urolithiasis, 169–171
 - uterine fibroid calcifications, 72
 - vacuum phenomenon, 417
 - Valsalva maneuver, 339, 376
 - valvulae conniventes, 55
 - vascular calcifications, 75–76
 - vascular ring, 135
 - vasovagal symptoms, 559
 - ventral wall hernia, 342, 477

Index

ventricular septal defect (VSD), 132	wheezing, 133, 135	clinical images, 7
vertebral fractures, 466	wide medial and syndesmotic clear spaces, 27	diagnostic capabilities, 6
vitreous detachment, 329	windows	imaging pitfalls, 6–7
vitreous hemorrhage, 325, 329	blood, 425	indications, 5–6
volume averaging artifact, 426	bone, 425	
volvulus	brain, 425	ZMC. <i>See</i> zygomaticomaxillary complex
cecal, 63	Wireless Internet, 199	fracture
midgut, 147–155	wooden foreign body, 365	zoom, 203
sigmoid, 63–65	wound tracks, 466	zygoma, facial CT
VSD. <i>See</i> ventricular septal defect	wrist	diagnostic capabilities, 441
	fat pad, 595	indications, 441
	normal anatomy, 594	pitfalls, 441
	plain radiography	zygomaticomaxillary complex (ZMC)
		fracture, 441, 447