

Definition

Pulmonary disorder characterized by increased resistance to airflow • $FEV_1/FVC < 70\%$.

► Epidemiology

Among smokers 15–20% develop COPD.

► Etiology, pathophysiology, pathogenesis

Inflammatory reaction of the large and small airways caused by inhaled noxious agents and involving bronchial obstruction, mucociliary dysfunction, and structural changes (destruction) • Disruption of the physiologic balance between proteases and protease inhibitors • Oxidative stress.

Imaging Signs

► Modality of choice

CT.

► Radiographic findings

Often normal • Bronchial walls may appear more pronounced (“tramline” shadows) • Signs of right heart strain.

► CT findings

Thickened bronchial walls • Mucus retention • Centrilobular emphysema may be present • Enlarged central pulmonary arteries.

► Pathognomonic findings

Chronic bronchitis and COPD are not radiologic diagnoses • Morphologic findings on the radiograph essentially depend on the severity of the disorder.

Clinical Aspects

► Typical presentation

Productive cough • Dyspnea • Hemoptysis • Clubbed fingers.

Reduced FEV_1 , abnormal blood gases, elevated C-reactive protein.

Functional grading FEV_1 (GOLD): Stages 0–IV (I: mild, $\geq 80\%$; II: moderate, 50–79%; III: severe, 30–49%; IV: very severe, $< 30\%$).

Systemic components of COPD: weight loss, cachexia (“pink puffer” • pulmonary cachexia in COPD with emphysema) • osteoporosis, muscle atrophy • heart failure, atherosclerosis.

► Therapeutic options

Tobacco abstinence • Bronchodilators • Inhalational corticosteroids • Oxygen therapy.

► Course and prognosis

Chronic progressive disorder • Mortality depends on the stage.

► What does the clinician want to know?

The diagnosis is based on clinical and especially functional parameters • Radiology plays a supporting role by determining the extent of emphysema and identifying complications.

Fig. 2.5 COPD in a 48-year-old woman smoker. Morphologic findings on the radiograph are hardly impressive except in advanced cases with recurrent infection. The plain chest radiograph shows a low-lying, flattened diaphragm consistent with hyperinflation and a slightly increased bronchovascular shadowing in the basal lung segments. Vascularity is minimal in the upper fields due to emphysematous changes.



Differential Diagnosis

<i>Asthma</i>	– Hyperinflation without parenchymal destruction
<i>Emphysema</i>	– Centrilobular emphysema is often a component of COPD
<i>Bronchiectasis</i>	– Frequent complication of chronic bronchitis

Selected References

- Takasugi JE, Godwin JD. Radiology of chronic obstructive pulmonary disease. *Radiol Clin North Am* 1998; 36: 29–55
- Vogelmeier C et al. [Pathogenese der COPD.] *Internist* 2006; 47: 885–894 [In German]

Definition

Diffuse pulmonary and alveolar hemorrhages from various causes.

▶ Epidemiology

The most common cause is Goodpasture syndrome (affects young adults, more common in men than women by a ratio of 9:1) • Less common causes include collagen vascular diseases (more common in women than men), idiopathic disease (pulmonary hemosiderosis), hemorrhagic diathesis, and diffuse coagulation disorder.

▶ Etiology, pathophysiology, pathogenesis

Bleeding into the alveoli due to immune-mediated capillary damage (antibodies to glomerular and alveolar basement membranes in Goodpasture syndrome) or due to nonimmune-mediated capillary damage • Leads successively to recurrent hemorrhage, hemosiderin deposits, and fibrosis.

Imaging Signs

▶ Modality of choice

CT is preferable to plain radiography.

▶ Radiographic findings

Nodular, confluent to patchy, edemalike shadows • Predominantly basal and central • In the acute stage there is alveolar shadowing • In the subacute stage there is an interstitial reticulonodular pattern • Resolves within 1–2 weeks • Chronic stage (recurrent hemorrhages) leads to fibrosis.

▶ CT findings

Findings in the acute stage include ill-defined acinar nodules, circumscribed ground-glass opacities, or diffuse bilateral consolidation that spares the pulmonary periphery • The subacute stage includes micronodules and septal thickening • In the chronic stage there are signs of fibrosis.

▶ Pathognomonic findings on CT

Acute nodular or interstitial shadowing that rapidly resolves spontaneously.

Clinical Aspects

▶ Typical presentation

Hemoptysis (in 80% of cases but not invariably), dyspnea, cough, and iron-deficiency anemia • Goodpasture syndrome also includes hematuria, renal insufficiency, hypertension • Bronchoalveolar lavage shows hemosiderin-laden macrophages.

▶ Therapeutic options

Treatment of the underlying disorder • Immunosuppressives • Glucocorticoids • Plasmapheresis.

▶ Course and prognosis

Variable • Depend on the underlying disorder.

▶ What does the clinician want to know?

Diagnosis and differential diagnosis • Stage • Follow-up.

Fig. 7.6 Goodpasture syndrome in a 35-year-old man. The CT scans show bilateral, homogeneously dense, ground-glass opacification that has spared only the subpleural parenchyma.





Fig. 7.7 Acute pulmonary hemorrhage in a 70-year-old woman with dyspnea and hemoptysis. Moderately dense, homogeneous, bilateral perihilar and basal shadows resembling a butterfly edema.

Differential Diagnosis

Pulmonary hemorrhage

- Goodpasture syndrome: antibodies to basement membrane
- Wegener granulomatosis: ANCA-positive involvement of the paranasal sinuses
- Churg–Strauss syndrome: asthma, blood eosinophilia
- Systemic lupus erythematosus: ANCA-positive
- Polyangiitis: pulmonary and renal syndrome, fever, myalgia, joint pain, 80% of patients are ANCA-positive
- Idiopathic hemosiderosis: occurs in children, no renal involvement, no antibodies

Pulmonary edema (cardiac, not cardiac)

- Hemoptysis rare
- Associated pleural effusion

Interstitial pneumonia

- Fever, inflammation parameters
- No hemoptysis
- No renal involvement

Tips and Pitfalls

Can be misinterpreted as pulmonary edema or atypical pneumonia.

Definition

Lymphoma limited to the chest and lungs, with or without mediastinal lymphadenopathy • No extrathoracic manifestation for at least 3 months.

► Epidemiology

Rare compared with secondary lymphoma arising via hematogenous dissemination or by direct extension from hilar or mediastinal lymphomas.

► Etiology, pathophysiology, pathogenesis

Forms:

- In combination with intrathoracic lymphadenopathy • 10–15% of lymphomas • More common in Hodgkin disease than in non-Hodgkin lymphoma.
- Primary pulmonary lymphoma (at most with minimal lymph node involvement) • Rare, < 1% of all malignant lymphomas • Either Hodgkin or non-Hodgkin lymphoma • In primary pulmonary non-Hodgkin lymphoma, a distinction is made between low-grade MALT B-cell lymphoma, high-grade non-Hodgkin lymphoma of B-cell type (about two-thirds of cases, usually associated with Epstein–Barr virus; risk groups—HIV-infected patients and organ transplant recipients), and the angioimmunoblastic lymphomas of T-cell type.

Imaging Signs

► Modality of choice

CT is preferable to plain radiography.

► Radiographic findings

Broad spectrum of findings ranging from miliary foci to nodules, pneumonia-like infiltrates (with or without air bronchogram), and interstitial and even ground-glass changes.

► CT findings

Broad spectrum of findings (in two-thirds of cases there are bilateral and/or multiple foci)—one or more nodules with or without cavitation • Round or segmental infiltrates (with or without an air bronchogram) • Up to 50% of high-grade lymphomas include liquefaction that may be rapidly progressive • Reticulonodular changes.

► Pathognomonic findings

Rapidly progressive consolidations with an air bronchogram and elongated bronchovascular structures (CT angiogram sign).

Clinical Aspects

► Typical presentation

Low-grade lymphoma: Asymptomatic in > 50% of cases, otherwise mild nonspecific symptoms (cough, slight dyspnea, chest pain) • *High-grade lymphoma:* Generally symptomatic (symptoms of hepatitis B infection).

► Confirmation of the diagnosis

Biopsy.

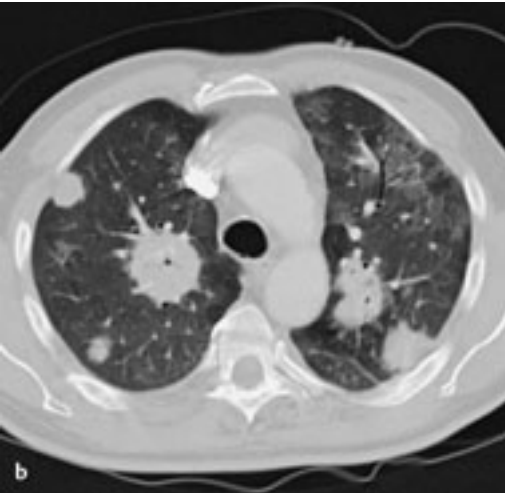
Fig. 8.9 Highly malignant Epstein–Barr virus-associated B-cell non-Hodgkin lymphoma in a 39-year-old man with HIV infection. Two-week history of fever, nonproductive cough, and rapid deterioration of general health.

- a** The plain chest radiograph shows an extensive, relatively homogeneous infiltration of the right lower lobe, enclosing a small radiolucency consistent with liquefaction.
- b** On CT (coronal MIP slices) the finding also appears relatively homogeneous. The major vessels and bronchi are intact (CT angiogram sign and air bronchogram).





Fig. 8.10 MALT lymphoma in a 40-year-old man with HIV infection and weight loss and limited exercise tolerance. Both lungs show large infiltrates resembling round focal lesions that are partially confluent in the basal segments, forming pneumonia-like areas of consolidation. The bronchovascular structures coursing through these areas appear intact; they are not significantly shifted, compressed, or obstructed. These findings suggest lymphoma infiltrates. There may be hilar lymphadenopathy on the right side.



► Therapeutic options

Low-grade lymphoma: Watch and wait, resection, or single-modality therapy •
High-grade lymphoma: Treatment depends on the underlying disorder, chemotherapy, modulation of immunosuppression.

► Course and prognosis

Low-grade lymphoma has a good prognosis (5-year survival rate is over 80%) •
 High-grade lymphoma has a poor prognosis, depending on the initial situation (HIV infection, organ transplantation).

► What does the clinician want to know?

Staging after diagnosis by biopsy.

Differential Diagnosis

<i>Nodular lesions</i>	– Bronchial neoplasm – Metastases
<i>Areas of consolidation</i>	– Pneumonia – Distinguished by history, clinical findings, and course
<i>Interstitial changes</i>	– Pulmonary interstitial disorder
<i>Kaposi sarcoma</i>	– Radiographically indistinguishable

Tips and Pitfalls

Because pulmonary lymphomas are rare, radiographic findings may variously be misinterpreted as pneumonia, malignancy (lung carcinoma, metastases), or pulmonary interstitial disease.

Selected References

- Cadranel J, Wislez M, Antoine M. Primary pulmonary lymphoma. *Eur Respir J* 2002; 20: 750–762
- Gimenez A et al. Unusual primary lung tumors: a radiologic-pathologic overview. *Radiographics* 2002; 22: 609–619
- Lee DK et al. B-cell lymphoma of bronchus-associated lymphoid tissue (BALT): CT features in 10 patients. *J Comput Assist Tomogr* 2000; 24: 30–34

A

- abdomen, blunt trauma 317
- abscess
mediastinal 283
paraspinal 248
pulmonary 294
- acceleration/deceleration forces 307, 311, 313
- achalasia
esophageal 268, 269–270
secondary 270
- Actinomyces israelii* 298
- actinomycosis 298–300
- acute coronary syndrome 217
- acute myeloid leukemia 106, 334
- adenocarcinoma 48, 49, 180, 182, 187, 194, 196
- adenoma, bronchial 192
- adenoviruses 64, 70
- adult respiratory distress syndrome (ARDS) 69, 72, 228, 320–322
- air bronchogram 187, 197, 198
- air crescent sign 105, 107, 108, 109, 214
- air trapping 25, 28, 29, 30, 33, 51
- alveolar cell carcinoma 187–190
- alveolar proteinosis 99, 113, 128, 170–172, 228
- alveolitis
extrinsic allergic 153–156
 associated with aspergillosis 105
 differential diagnosis 113, 116, 122, 125, 128, 131
 not associated with smoking 25, 30, 122, 125
 fibrosing 132, 140
 toxic 156
- amiodarone, drug reactions 323, 326
- anemia, hemolytic 259
- aneurysm
aortic 265–268, 271
 subclavian artery 206
- angiography
 traditional 6
 see also CT angiogram sign; digital subtraction angiography (DSA)
- anorexia 87
- anthracosilicosis 57, 58–59
- antiarrhythmic agents, drug reactions 323
- antibodies see anticytoplasmic antibodies; antinuclear antibodies
- anticytoplasmic antibodies 138, 144
- antiinflammatory agents, drug reactions 323
- antinuclear antibodies 135, 138, 140, 144, 166
- antiseptic agents, drug reactions 323
- antitopoisomerase I antibodies 140
- α_1 -antitrypsin deficiency 37
- aorta
 aneurysm 265–268, 271
 coarctation 12, 268, 274–276
 dissection 271–273
 ectasia 273
 pseudocoarctation 274
 rupture 311–312
- aortic arch, anomalies 12, 13, 277–278, 279
- aortic valve
 bicuspid 274
 disease 227
 stenosis 268
- arteriovenous malformation 1–2, 214
- artificial respiration, barotrauma 98, 313
- asbestos exposure 44, 45, 180, 292
- asbestos-associated changes 62, 296
- asbestosis 61–63, 133, 143
- aspergilloma 105, 107, 109–111
- aspergillosis
 allergic 36, 50, 105, 151–152
 associated phenomena 105
 differential diagnosis 93
 imaging signs 102
 invasive 105
 noninvasive 109–111

Page locators in *italics* indicate illustrations.

- Aspergillus* 70, 102, 105, 109
 hypersensitivity reaction
 see aspergillosis, allergic
 aspiration, sequelae 81–83, 310
 aspiration pneumonia 69
 aspiration pneumonitis 81
 asthma
 atopic 151, 157
 bronchial 24, 40, 105, 151
 differential diagnosis 32, 81, 152
 atelectasis 41–43, 69, 310
 platelike 8
 round (folded lung) 41, 44–46, 214
 atopic disorders 157
 autoimmune disorders 129, 135, 140
 azygos vein, dilation 279–281
- B**
- bare area sign 289
 barotrauma, due to artificial
 respiration 98, 313
 bat wing sign 99, 170, 226
 blast injuries 307
 blastomycosis 102
 bleomycin, drug reactions 323
 “blue bloater” 38
 Bochdalek hernia 262, 264, 317
 Boerhaave syndrome 282, 315
 bone marrow transplantation
 334, 336
 breast carcinoma, metastases
 207, 211, 252, 256, 303, 304
 bridging symptoms 61, 62
 bronchial atresia 15–17, 151
 bronchial carcinoma
 central 14, 18, 19
 differential diagnosis 150
 lymphangitis carcinomatosa 210
 metastases 215, 252, 256, 257,
 303, 304
 peripheral 181, 182, 190
 with poststenotic pneumonia 75
 radiation pneumonitis 329
 and smoking 296, 300
 bronchial rupture 313–314
 bronchiectasis 20, 22–24
 in allergic bronchopulmonary
 aspergillosis 151, 152
 asbestos-related 61
 aspiration-related 81
 in bronchial carcinoid 191
 in chronic pneumonia 86
 in chronically ill patients 94
 in common variable immunodeficiency (CVID) 54
 complication of chronic bronchitis
 32
 in cystic fibrosis 33, 34, 35, 54, 203
 imaging 6, 22
 in immotile cilia syndrome/
 Kartagener syndrome 51, 52
 and mycobacterial infection 94
 in nonobstructive middle lobe
 syndrome 47
 in nonspecific interstitial
 pneumonitis 126, 127
 postinfectious 36, 91
 reversible 24
 in rheumatoid arthritis 132
 in scimitar syndrome 6
 in Sjögren syndrome 138
 “string of pearls” appearance 115
 traction 114, 153, 167, 328
 in viral pneumonia 97
 bronchioalveolar carcinoma 119, 172,
 187–190
 bronchiolectasis 126, 127
 bronchiolitis 25–27, 120, 122
 allergic 25, 153
 postinfectious 28
 respiratory 25, 120, 122, 123–125,
 156
 in rheumatoid arthritis 132
 bronchiolitis obliterans 25, 28–30, 40
 differential diagnosis 119
 in MacLeod/Swyer-James
 syndrome 8
 with organizing pneumonia 25, 30,
 323, 325
 result of drug reaction 323, 324
 syndrome 28, 333–335

- bronchiolitis obliterans*
 see also cryptogenic organizing pneumonia
- bronchitis, chronic 24, 31–32
- bronchoceles 151
- bronchopneumonia 76–77
- bronchopneumonic infiltrate 11
- bronchopulmonary infections 6, 9, 70, 156, 298
 recurrent 6, 33, 38, 54, 193
- bronchoscopy, indicated 55, 56
- Broviak catheter 339
- bulging fissure sign 73
- C**
- calcifications
 eggshell 58–59
 goiter 234, 235, 236
 lymph nodes 256
 parenchymal 344–345
 popcorn 183, 195, 214
 tuberculoma 214
- calcified foci 91, 92
- Candida* 70, 102
- candidiasis, imaging signs 102
- capillary hemangiomatosis 219
- capillary leak syndrome 336, 338
- carcinoid
 bronchial 191–194
 differential diagnosis 183, 215
 metastases 256
 thymic 237, 239
- cardiac anomalies 12
- cardiac pacemaker 342–343
- cardiomegaly 223, 226
- cardiomyopathy 221, 222
- carmustine, drug reactions 323
- Castleman disease 235, 252, 253–255
- catheters 339–341
- Ceelen–Gellerstedt syndrome 165–166
- central venous catheters 339–341
- Chagas disease 270
- chemotherapy agents, drug reactions 323
- chest pain
 acute 216
 in esophageal rupture 315
 in Langerhans cell histiocytosis 177
 localized 298
 in mediastinitis 282
 neoplastic 181, 184, 197, 239, 242
 in pleural empyema 294
 in pneumonia 64, 73, 86, 103
 in pneumothorax 286
 in pulmonary embolism 216
 radiating into the back 271
 in systemic lupus erythematosus 135
 unilateral 301
- chest trauma 307, 311, 313
- Chlamydia pneumoniae* 64
- chlamydial infection 64, 78, 90
- chloride transport, defective 33
- chondrohamartoma 214
- choriocarcinoma 240, 256
- chronic obstructive pulmonary disease (COPD) 31–32
- Churg–Strauss syndrome 160
- chylothorax 291
- coagulation disorder 280
- coccidiomycosis 102
- collagen diseases
 and aortic aneurysm 265
 differential diagnosis 129, 137, 143, 144, 166
 nonspecific interstitial pneumonitis 126
 pleural effusion 289, 291
 and pneumothorax 286
 pulmonary involvement 116, 117, 119, 122, 128
 see also rheumatoid arthritis;
 systemic lupus erythematosus
- comet tail 44, 45, 46
- common variable immunodeficiency (CVID) 54
- connective tissue disorders
 see collagen disease

- consolidations
 in collagen diseases 135, 137, 144, 147, 149
 intrapulmonary 10
 in middle lobe syndrome 47, 52
 in pneumonia 64, 80, 83, 97, 100, 101, 112, 113
 subpleural or peribronchial 117, 128
 in tuberculosis 91, 93
 contusions 307–310
 coronary heart disease 221
 cough
 chronic 47, 94
 productive 25, 31, 64, 76, 79, 171
 smoker's 123
 crazy paving pattern 112, 113, 128, 170, 171, 187
 Crispin–Norman score 33
 cryptococci, opportunistic pneumonia 70
 cryptococcosis, imaging signs 102
Cryptococcus neoformans 102
 cryptogenic organizing pneumonia 117–119, 323, 325
 differential diagnosis 116, 128, 190
 CT angiogram sign 188, 189, 197, 198
 Cushing syndrome 239
 cyclophosphamide, drug reactions 323
 cystic changes 80, 114, 138, 142, 153, 155, 174, 201, 202, 203
 in Langerhans cell histiocytosis 60, 177, 178
 cystic fibrosis 33–36, 50, 54, 151, 152, 203
 cysts 229–233
 bronchogenic 229, 231
 developmental anomalies 229
 differential diagnosis 40
 esophageal duplication 229
 isolated lesions 229
 neuroenteric 229
 pericardial 230, 231
 pulmonary 138
 thin-walled 131, 173, 174, 178
 thymic 231, 232, 233, 237, 239
 cytomegalovirus 70, 100
 cytomegalovirus pneumonia 80, 97, 100–101, 104, 112
- D**
- dependent viscera sign 317
 dermatomyositis 144–146
 desquamative interstitial pneumonia 120–122, 125, 128
 developmental anomaly 274
 dextrocardia 51
 dialysis catheter 339
 diaphragm
 relaxation 317
 rupture 317–319
 digital subtraction angiography (DSA) 7
 displaced crus sign 289
 drug abusers, septic embolism 84, 85
 drug reactions 122, 323–327, 338
 dust inhalation, chronic 57
 dystelectasis 136
- E**
- edema
 at high altitude 12
 atypical 69, 75
 butterfly 163, 166, 226
 differential diagnosis 72
 in engraftment syndrome 336, 338
 imaging 330
 reperfusion 330–332
see also pulmonary edema
 eggshell calcification 58–59
 Ehlers–Danlos syndrome 265, 271, 286
 Eisenmenger reaction 3
 emphysema
 bullous 23, 179, 288
 centrilobular 32, 37
 local 15, 16
 mediastinal 313, 314

- emphysema*, panlobular 30, 37, 176
 paraseptal 37
 pulmonary 37–40
 quantification and classification 39
 and smoking 37
empyema 73, 84, 291, 294, 300, 303, 306
endobronchial tumor 19
endocarditis 227
endometriosis 303
engraftment syndrome 336–338
Enterobacteriaceae 67
eosinophilic lung disease 157–160
eosinophilic pneumonia
 119, 157–160, 323
Epstein–Barr virus 70, 129, 197, 198
Escherichia coli 67
esophagus
 dilatation 140, 212
 fistula 316
 rupture, usually iatrogenic 282, 315–316
 stenosis 270
 varices 260
extralobar sequestration 9, 11
extrapulmonary infections 72
- F**
- fallen lung sign* 313
falls 307
farmer's lung 153
feeding vessel sign 207
fertility/sterility 51
fibrosing alveolitis 132, 140
fibrosing mediastinitis 282
fibrosis
 honeycomb 153
 often not recognized as sarcoidosis 169
 pleural 292–293
 radiation-induced 206
 see also idiopathic pulmonary fibrosis
fibrothorax 292, 306
 filling defects 216, 218
 finger in glove shadows 151
 focal lesions
 in anthracosilicosis 58
 aspergilloma 109
 in cryptogenic organizing pneumonia 117, 118
 extrapulmonary 292
 in Langerhans cell histiocytosis 177, 178
 in nonsmall cell lung cancer 180, 186
 pulmonary 147, 148
 in rheumatoid arthritis 133, 134
 in sarcoidosis 167
 traumatic 309
 in Wegener granulomatosis 147, 148
 folded lung 41, 44–46, 214
 foreign body aspiration 14, 19, 55–56, 81
 fungal infections
 chronic 93
 differential diagnosis 150, 169, 209, 300
 endemic to North America 102
 radiographic findings 72, 102
 septic embolisms 84
 see also aspergillosis
 fungal pneumonia 70, 78, 80, 86, 102–104
 secondary to sigmoid colon perforation 68
- G**
- ganglioneuroblastomas* 244, 248
ganglioneuromas 244
gastric juice, aspirated 81
germ cell tumors 239, 240–243, 256
goiter, retrosternal 234–236, 239, 243
Golden's sign 41
Goodpasture syndrome 161–164
graft-versus-host disease 29, 30, 334, 336

- granulomas
 differential diagnosis 183
 noncaseating 167
 postinfectious 215
- granulomatosis
 bronchocentric 152
see also Wegener granulomatosis
- gunshot wounds 307
- H**
- Haemophilus influenzae* 51, 64, 70, 76
- halo sign 105, 108, 147, 189, 190
- hamartoma 183, 194, 214
 pulmonary 195–196
- Hampton hump 46
- Hashimoto disease 129
- heart failure 226
 chronic 224
- hemangioendothelioma 303
- hematoma, paraspinal 248
- hemithorax 12, 13
 hypertransradiant 18–21, 55
- hemopoiesis, extramedullary 248, 259–261
- hemoptysis 12, 161, 163, 165, 166
- hemothorax 292
 traumatic 310, 311
- hepatitis B 84
- hepatization, red, yellow, gray 73
- hereditary hemorrhagic telangiectasia
see Osler–Weber–Rendu disease
- hernia
 diaphragmatic 262–264, 317
 hiatal 262–264, 316
 paraesophageal 316
- herpesviruses 70
 in viral pneumonia 97
- Hickman catheter 339
- histoplasmosis 102
- HIV/AIDS
 and Castleman disease 253
 opportunistic infections 70, 71
 pneumocystis pneumonia 112
see also immunocompromised patients; pneumocystis pneumonia
- Hodgkin disease 197, 250–252
- honeycomb lung 153, 177
- honeycombing
 in asbestosis 61
 in idiopathic pulmonary fibrosis 114, 115, 122, 143
 in Jo-1 syndrome 145
 in rheumatoid arthritis 132
 in systemic sclerosis 140, 142
- Horner syndrome 204
- hot tub lung 94
- hypercalcemia 344
- hypereosinophilia syndrome 157, 160
- hyperhydration 223, 226
- hyperinflation 55
- hyperparathyroidism 344, 345
- hypersensitivity pneumonia 179
- hypersensitivity pneumonitis 153–156
see also alveolitis, extrinsic allergic
- hypertension 271
- hypertensive crisis 224
- hypervolemia 279
- hypogammaglobulinemia 237
- I**
- iceberg tumor 191
- immotile cilia syndrome 36, 51–54, 53
- immunocompromised patients
 cytomegalovirus pneumonia 100, 101
 fungal pneumonia 102
 lymphocytic interstitial pneumonitis 129
 pneumocystis pneumonia 101, 112
 pneumonia 70
 pulmonary lymphoma 197, 199
 tuberculosis 91
 viral pneumonia 97
- immunodeficiency 23, 78
- immunosuppressants, drug reactions 324
- infarct pneumonia 217

- influenza viruses 70
 in viral pneumonia 97
 inhalation
 chronic, of dust 57
 of noxious/toxic substances
 122, 153
 interface sign 289
 International Labour Organization
 classification 61, 296
 interstitial pneumonia 225
 idiopathic 137
 secondary 122, 128
 interstitial shadowing 89, 97, 99,
 113, 224
 perihilar 171
 invasive pulmonary aspergillosis
 105–108
 inverse ϵ sign 274
 iodine deficiency 234
- J**
- Jo-1 syndrome 145
- K**
- Kaposi sarcoma 200, 254
 Kartagener syndrome 22, 36,
 51–54, 52
 Kerley B lines 223, 224
Klebsiella 64, 67, 70, 73
- L**
- lacerations 307–310
 Lady Windermere syndrome 94
 Langerhans cell histiocytosis 177–179
 cystic changes 60, 125, 131,
 169, 176
 nodular changes 40
 predilection for upper and middle
 lung fields 203
 large cell carcinoma 180, 181
 laryngeal papillomatosis 201–203
 left heart failure 221, 222, 223,
 224, 227
 left-to-right shunt 3, 6, 219
Legionella 64, 67, 73
 leukocytosis with left shift 64, 73
 lipoma, thymic 237, 239
Listeria 70
 lobar pneumonia 65, 73–75, 77
 Loeffler infiltrate 157
 lung
 accessory 9
 congenital hypoplasia 6
 lung cancer *see* nonsmall cell lung
 cancer; small cell lung cancer
 lung transplantation 295
 bronchiolitis obliterans syndrome
 28, 29
 rejection or other complications
 101, 295
 sequela 330–332
 lupus pneumonitis 135
 lymph nodes
 benign hyperplasia 253–255
 calcifications 256
 central necrosis 256
 metastases 169, 186, 252, 256–258
 lymphadenopathy
 asymmetric 169
 benign 186
 hilar 220
 inflammatory infectious 252, 258
 mediastinal 173, 188
 normal venous anatomy 279
 in sarcoidosis 167, 168, 169, 279
 lymphangioleiomyomatosis
 40, 173–176, 179
 lymphangioma 231
 lymphangitis carcinomatosa
 207, 210–212, 225
 lymphocytic interstitial pneumonitis
 122, 129–131, 138, 176
 lymphomas 250–252
 angioimmunoblastic 197
 differential diagnosis 119, 169, 186,
 235, 243
 generalized 239
 MALT 129, 197, 199
 mediastinal involvement 250, 251

non-Hodgkin 197, 198, 250–252
 pleural metastases 304
 primary malignant 258
 pulmonary 190, 197–200, 209

M

- Mach effect 288
 MacLeod/Swyer-James syndrome 8, 14, 18, 19, 20–21, 37
 malignancy
 signs of 301, 304
 suspected 213
 MALT lymphoma 129, 197, 199
 Marfan syndrome 265, 271, 286
 measles virus, in viral pneumonia 97
 meconium ileus 33
 mediastinal mass
 goiter 234, 236
 thymic tumor 237, 238
 mediastinitis 282–283
 mediastinum
 cysts 229–233
 germ cell tumors 240
 infiltration 205, 244, 251, 298, 299, 301
 involvement in lymphoma 250, 251
 involvement in neurogenic tumors 245
 involvement in small cell lung cancer 184, 185
 widening 41, 43, 242, 246, 271, 273, 311, 312
 melanoma 256
 meningocele 206, 231, 248
 meniscus sign 289, 290
 mesothelioma 61, 260, 301–303, 304
 metastases
 brain 184
 differential diagnosis 150
 hematogenous spread 207, 211, 304
 lymphatic spread 304
 miliary 207, 208
 mucinous adenocarcinoma 256
 osteochondral tumors 256
 pleural 304–306
 pulmonary 207–209
 solitary 207, 209
 spinal 185
 thyroid carcinoma 208, 305
 of unknown primary 256
 methotrexate, drug reactions 323
 microabscesses, pleural 86
 microlithiasis, alveolar 345
 middle lobe syndrome 47–50
 mitral valve
 defect 221, 222
 prolapse 284
 stenosis 219
 Monday morning fever 153
 Morgagni hernia 262, 264, 317
 mosaic pattern 25, 28, 30, 33, 40, 335
 motor vehicle accidents 307, 311, 314
 mucinous adenocarcinoma, metastases 256
 mucociliary dysfunction 22
 mucoepidermoid carcinoma 194
Mucoraceae 70
 multiple endocrine neoplasia (MEN) 1 syndrome 239
 myasthenia gravis 129, 237, 239
 mycetoma 214
 see also aspergilloma
 mycobacterial infections 33, 70
 atypical 50, 70, 104
 nontuberculous 80, 94–96
Mycobacterium abscessus 94
Mycobacterium avium-intracellulare 94
Mycobacterium bovis 91
Mycobacterium kansasii 94
Mycobacterium malmoense 95
Mycobacterium tuberculosis 91
 mycoplasma pneumonia 64, 75, 77, 79, 80, 88
 mycoplasmas 73, 76
 mycoses *see* actinomycosis; aspergilliosis; fungal infections
 myelofibrosis 259
 myeloproliferative syndrome 259
 myocardial infarction 221

N

- necrotizing granulomatous vasculitis
 - see Wegener granulomatosis
- Neisseria* 70
- nerve sheath tumors 244
- neurilemmomas 244, 245, 260
- neurinomas 206
- neuroblastomas 244, 248
- neuroendocrine tumors 184
- neurofibromas 206, 244, 246–247, 260
- neurofibromatosis 244
- neurogenic tumors 244–249, 254
- nicotine 25
- nipple shadow 215
- nitrofurantoin, drug reactions
 - 323, 324
- nocardiosis 103
- nodule, solitary 213–215
- non-Hodgkin lymphoma 197, 198, 250–252
- nonsmall cell lung cancer
 - 111, 180–183
- nonspecific interstitial pneumonitis
 - 122, 126–128, 131, 143, 156

O

- occupational exposures 60, 296
- occupational safety regulations 57
- organic dust toxic syndrome 153
- Osler–Weber–Rendu disease 1, 2
- osteochondral tumors, metastases 256
- osteosarcoma, metastases 286

P

- Pancoast tumor 204–206
- pancreatic exocrine insufficiency 33
- pancreatic pseudocyst 231
- papillomatosis 201–203
- papillomaviruses 201
- paraaminosalicylic acid, drug reactions 323

- paragangliomas 254, 260
- parainfluenza virus, in viral pneumonia 97
- paraneoplasia 144
- paraneoplastic syndrome 239
- parasitic infections 157, 160
- paravertebral abscess 260
- parenchymal bleeding 338
- patent ductus arteriosus 3, 12
- pectus excavatum 50, 284–285
- penicillamine, drug reactions 323
- pentamidine prophylaxis 80, 112
- perfusion defect 14, 18, 19, 216, 217
- peribronchial cuffing 223
- peripheral blood stem cell transplantation 336
- peripheral bronchial carcinoma 190
- phrenic palsy 317
- pigeon breeder's lung 153, 155
- “pink puffer” 31, 38
- pleural effusion 43, 289–291, 294, 301, 303
- pleural peel 292–293
- pleural plaques 61, 62, 296–297
- pleural thickening
 - and effusion 289, 304
 - in endometriosis 303
 - and interstitial edema 223
 - in mesothelioma 301
 - nodular 291, 304
 - in pleural fibrosis 292
 - and pleural plaques 296, 297
 - postinfectious or posttraumatic 62, 296
 - in rheumatoid arthritis 132
- pleuritis 132, 135
- pneumatoceles 86, 87, 201, 203, 307, 317, 321
- pneumococci 70, 73
- pneumoconiosis 57–60, 169
 - see also asbestosis
- Pneumocystis jirovecii* 70, 78, 112, 129
- pneumocystis pneumonia 68, 80, 101, 104, 112–113, 122
- pneumomediastinum 313, 315, 316
- pneumonectomy 43

- pneumonia
 age group susceptibility
 75, 77, 79, 90
 aspiration 81–83
 atypical 78–80, 163, 321
 bacterial 75, 77, 79
 chlamydial 78, 80
 chronic 190
 community-acquired 64–66, 73,
 76, 88
 cryptogenic organizing 116,
 117–119, 128, 190, 323, 325
 fungal 102–104
 hospital-acquired (nosocomial)
 67–69, 73, 76, 83
 idiopathic interstitial 114–131, 327
 interstitial 77, 78–80
 lobar 93
 mixed infection 112
 mycoplasma 75, 88–90
 opportunistic 70–72
 organizing 25, 30
 poststenotic 75
 staphylococcal 86–87
 viral 75, 77, 79, 97–99
- pneumonitis
 nonspecific interstitial
 323, 324, 326
 radiation reaction 327, 328
- pneumothorax 74, 174, 177,
 286–288, 310
- polycythemia 259
- polymyositis 144–146
- popcorn calcifications 183, 195, 214
- positive end-expiratory pressure
 (PEEP) respiration 320, 321
- postirradiation aspiration 82
- primary sclerosing cholangitis 129
- protein S deficiency 217, 280
- Proteus* spp. 67, 73
- pseudolesions 215
- Pseudomonas* 33, 51, 67, 70, 76
- pulmonary abscess 73, 111
- pulmonary agenesis 43
- pulmonary arterial hypertension 178,
 219–220
- pulmonary artery
 atresia 12–14
 catheter 339
 dilated 219
 hypoplasia 12–14, 18, 19
 idiopathic ectasia 220
- pulmonary calcinosis 344–345
- pulmonary carcinoma, primary 209
- pulmonary congestion 221–222
- pulmonary contusion and laceration
 307–310
- pulmonary cyst 40
- pulmonary edema
 alveolar 78, 226–228
 in ARDS 320
 differential diagnosis 99, 112,
 163, 172
 in eosinophilic lung disease 157
 hydrostatic 223, 226, 322
 interstitial 78, 212, 223–225
 pathogenetic mechanisms 223, 226
- pulmonary embolism 69, 75,
 216–218
- pulmonary fibrosis, idiopathic 62,
 114–116, 122, 128, 133, 143, 169,
 212
- pulmonary hemorrhage 99, 113,
 161–164, 166, 172, 228
- pulmonary hemosiderosis, idiopathic
 165–166
- pulmonary hypertension 6
- pulmonary hypoplasia 6
- pulmonary infarct 46, 69, 75
- pulmonary infections
 see bronchopulmonary infections
- pulmonary interstitial disease 200
- pulmonary laceration 111, 317
- pulmonary lymphoma 190, 209
- pulmonary parenchyma
 bleeding 338
 calcifications 344–345
 cystic destruction 173, 175
- pulmonary sequestration 6, 8, 9–11
- pulmonary syndrome, idiopathic
 328, 336
- pulmonary valve stenosis 220

- pulmonary venolobar syndrome 6
 pulmonary venous anomalies
 6, 7, 8, 219
 pulmonary venous pressure, elevated
 221–222
 pulsation artifacts 311
- R**
- radiation reaction 328–329
 railroad track sign 22, 24
 Raynaud phenomenon 140
 red cell aplasia 237
 Reid classification 22
 renal cell carcinoma 256
 reperfusion edema 330–332
 respiratory distress, recurrent 192
 respiratory syncytial virus 64, 97
 reticulonodular shadowing 130
 rheumatic disorders 62, 138
 rheumatoid arthritis, pleuropulmonary
 manifestations 132–134
 rheumatoid nodules 132, 134, 150,
 190, 209
 ribs
 destruction by Pancoast tumor
 204
 notching 274, 275
 rickettsia pneumonia 80
 rickettsiae 78
 right aortic arch 12, 13
 right heart failure 219, 222
 RNA viruses 70
- S**
- sarcoidosis 167–169, 190
 differential diagnosis 60, 93, 179,
 190, 212, 254, 258
 and lymphadenopathy 144, 190
 peribronchovascular distribu-
 tion 156
 predilection 119, 122, 167
 staging 167, 168
 schwannomas 244
 scimitar syndrome 6–8
 scleroderma 62, 133, 140–143,
 156, 212
 Seldinger catheterization 339
 seminoma 240
 septal defects 3, 4, 6, 274
 septic embolism 73, 84–85, 150
Serratia marcescens 67
 shock wave trauma 307
 shrinking lung syndrome 135, 137
 shunt 3–5
 sickle cell anemia 259
 signet ring sign 22, 24
 silhouette sign 41, 43, 47, 230, 232
 silicate dust 57
 silicosis 156
 sirolimus, drug reaction 324
 situs inversus 51
 Sjögren syndrome 138–139
 small cell lung cancer 184–186, 258
 smoking
 chronic 120
 and chronic bronchitis 31
 and emphysema 37
 and Langerhans cell histiocytosis
 177
 lung cancer, associated with
 smoking 194
 and nonsmall cell lung cancer 180
 and small cell lung cancer 184
 spinal anomalies 229
 splenosis 303, 306
 split pleura sign 294, 306
 sputum
 analysis 64
 asbestos bodies 61
 blood-tinged 86, 226
 brown 79
 fungal hyphae 151
 mucopurulent 76
 rusty brown 73
 viscous 151
 squamous cell carcinoma
 180, 182, 256
 stab wounds 307
 Stanford classification of aortic
 dissection 271

- staphylococcal infection 76, 295
Staphylococcus aureus 64, 67
 streptococci 76
Streptococcus pneumoniae 64, 67
 string of pearls pattern 22, 115, 210
 subclavian artery, aneurysm 206
 subglottic stenosis 147, 150
 superior vena cava
 location of central venous
 catheter 339
 occlusion 281
 superior vena cava syndrome
 250, 251, 279
 Swan-Ganz catheter 339
 systemic lupus erythematosus
 pleural effusion 289, 291
 pleuropulmonary involvement
 135–137
 systemic sclerosis 140–143

T

- teratocarcinoma 240
 teratoma 235, 239, 240, 241
 testicular tumor 240
 thalassemia 259, 260, 261
 thromboembolic disease 84
 thymic tumors 235, 237–239,
 243, 254
 thymoma 237–239, 243, 306
 thyroid carcinoma 208, 256, 305
 thyroid insufficiency 234
 TNM classification, nonsmall cell lung
 cancer 181–183
 toothpaste shadows 151
 toxic substances, inhalation 122, 153
 tracheal stenosis 147
 tracheobronchial system, injury
 313–314
 traction bronchiectasis 114, 153, 155,
 167, 328
 traction bronchiolectasis 140
 tramline shadows 31
 trauma 307, 311, 313, 317
 tree-in-bud sign
 in aspiration pneumonia 81

- in cystic fibrosis 33
 in immotile cilia syndrome 51, 53
 in mycobacterial infections 94
 nonspecific 22, 25
 in tuberculosis 91
 in viral pneumonia 97
 tuberculoma 183, 195
 calcification 214
 tuberculosis 91–93, 104, 150,
 169, 256
 tuberous sclerosis 173
 tumor cysts 231, 233
 tumors
 benign 303, 304
 often cause atelectasis 43
 solitary 180, 182, 187, 191,
 195, 306
 Turner syndrome 274

U

- urothelial carcinoma, pulmonary
 metastases 208

V

- vanillylmandelic acid 11
 varicella zoster virus 70
 vascular anomalies 341
 vascular permeability, increased
 223, 226
 venous occlusive disease 219
 venous thromboses 280
 ventilator pneumonitis 153
 viruses 78

W

- wasting diseases, chronic 78
 Wegener granulomatosis 79, 86, 102,
 111, 147–150, 190
 Westermark sign 216

Y

- yellow nail syndrome 54