

Numbers in **boldface** refer to pages on which images, figures, and tables appear.

- A**
- Abscess**, 147, **147**
 of adrenal cortex, 353
 of brain, 119
 of breast, 259-260, **260**
 of kidney, 338
 of liver, 49, 310, **310**
 of pancreas, 325
 subareolar, 260, **260-261**
 subdiaphragmatic, 49
- Absorptive cells**
 of colorectum, 89-90
 of small intestine, 87, **87**
- Acellular material**, in respiratory specimen, 31-32, **31-32**
- Acid-fast stain**, 374, **374**
- Acinar cells**. See **Acinic cell(s)**
- Acinic cell(s)**, 157, **157**
 of pancreas, 323-324, **323-324**
 of salivary gland, 187-188, **187-188**
 mucous, 188, **188**
 serous, 187-188, **187**
- Acinic cell carcinoma**, 156-157, **157**
 hepatocellular, 316
 of pancreas, 333, **333**, 335
 of salivary gland, 199-200, **199-200**
- Acinic cell tumor**, of lung, 295
- Actin**, **177**
- Actinomyces**, 15-16, **15**, 36-37, 74, 83, 120, 374, **374**, 383, **383**
- Acute lymphoblastic leukemia (ALL)**, 125, **125**, 242, 302, 362, **362**
- Acute monocytic leukemia**, 125
- Acute myelogenous leukemia**, 125
- Acute nonlymphocytic leukemia**, 125
- Adenocarcinoma**, 143, **143**
 acinar arrangement of cells in, 146, **146**
 of ampulla of Vater, 88
 of breast, 146
 bronchogenic, 288-289, **288**
 of cervix, 22, 24, 388-390, **389**
 of colorectum, 91, **91**
 of endocervix, 11, **11**, 20, **20**
 adenoma malignum, 20, **20**
 clear cell, 20
 endometrioid, 20
 intestinal, 20
 serous, 20
 of endometrium, 21-22, **21**
 cytology in peritoneal washings, 66, **66**
 of esophagus, 79-81, **80**
 of extrahepatic biliary tract, 93
 hepatocytoid, 320, **320**
 of kidney, 146, 346
 of lung, 40-42, **40-42**, 57, 63-64, **65**, 146, 283, 287-290, **288-289**, 297-298
 malignant effusion in, 56-59, **56-59**
 mucin in, 144
 of ovary, cytology in peritoneal washings, 66
 of pancreas, 327-329, **327-329**
 well-differentiated, 327-328, **327-328**
 of prostate, 146
 urine cytology in, 111-112, **112**
 of salivary gland, 201, **201**
 basal cell, 201
 mucus-producing, 201
 papillary, 201
 polymorphous low-grade, 201
 signet ring, 143-144
 small cell, 61
 of small intestine, 88, **88**
 of stomach, 84-85, **84**
 gastric-type, 84-85, **85**
 intestinal-type, 84, **84**
 unknown primary tumor, 139
 of urinary tract, 110, **110**
 signet ring, 110, **110**
- Adenocarcinoma in situ**, of endocervix, 20, **20**, 389, **389**
- Adenoid cystic carcinoma**, 145, **145**
 of breast, 276
 of lung, 46, 295
 of salivary gland, 197-198, **197-198**
- Adenoid hepatocellular carcinoma**, 316
- Adenoma**
 of adrenal cortex, 353-354
 cystic, 352
 of bile duct, 312
 of breast
 lactating, 261-262, **262**
 pleomorphic, 276
 of colorectum, villous, **90-91**, 91
 of kidney, papillary, 341
 liver cell, 308, 311-312, **312**
 of lung, pleomorphic, 295
 of parathyroid gland, 183, 217
 of pituitary gland, 123
 of salivary gland
 basal cell, 195, **195**
 monomorphic, 194-196
 pleomorphic, 188, 191-193, **192-194**, 200, 203, **203**
 trabecular, 195, **195**
 of thyroid gland, 216
 follicular, 210-214, **211**, 221
 hyalinizing trabecular, 222, **222**
- Adenoma malignum**, of endocervix, 20, **20**
- Adenomatoid tumor**, paratesticular, 362
- Adenomatous nodule**, of adrenal cortex, 353-354
- Adenomatous polyp**, of colorectum, **90-91**, 91
- Adenosarcoma**, 370
- Adenosquamous carcinoma**, 146, **146**
 of breast, 272-273, **273**
 of lung, 45, **45**
 of pancreas, 329, **329**
 of stomach, 86-87
- Adipose tissue**, in salivary gland, 188
- Adrenal cortex**, 351, **351**
 abscess of, 353
 adenoma of, 353-354
 adenomatous nodules of, 353-354
 carcinoma of, 146, 354, **354-355**, 357



- cells of, 351-352, **351-352**
 cystic adenoma of, 352
 cyst of, 352
 mesothelial, 352
 fine needle aspiration biopsy of, 354
 hyperplasia of, 353-354, **353**
 inflammatory lesions of, 352-353
 myelolipoma of, 352, **352**
 pseudocyst of, 352
 spindle cell carcinoma of, 347
- Adrenal gland**
 echinococcal cyst of, 352
 evaluation of adrenal mass, 351
- Adrenal medulla, 351, 351**
 cells of, 355
 fine needle aspiration biopsy of, 356
 ganglioneuroblastoma of, 357, **357**
 ganglioneuroma of, 357
 metastatic disease of, 357-358
 neuroblastoma of, 356-357, **357**
 paraganglioma of, 355-356
 pheochromocytoma of, 355-356, **355-356**
- Adult-T-cell leukemia/lymphoma, 244**
- Aflatoxin, 313**
- AIDS**
 central nervous system manifestations of, 120-121
 lymphoma in, 240-241, 243
 parotid gland in, 192-193
 Pneumocystis carinii infection in, 376, **376-377**
- Air, in body cavity, 51, 53**
- Albumin, 315**
- Alcohol abuse, 73, 77, 79-80, 188-189, 308, 313, 324**
- Aldosteronoma, 354**
- ALK. See Anaplastic large cell lymphoma kinase.**
- ALL. See Acute lymphoblastic leukemia**
- Alternaria*, 374, 375**
- Alveolar macrophages**
 multinucleated, 31, **31**
 in respiratory specimen, 30-31, **31**
- Alveolar pneumocytes, 30, 30**
- Alveolar proteinosis, 32**
- Alveolar rhabdomyosarcoma, 153, 171**
- Alveolar soft part sarcoma, 164**
- Amelanotic melanoma, 160**
- Ampulla of Vater, adenocarcinoma of, 88**
- Amylase**
 crystals in salivary gland aspirates, 189, **189**
 in pancreatic pseudocyst, 330
 in pancreatitis, 325
- Amyloid, 161, 161**
 in medullary carcinoma of thyroid, 218, **218-219**
 in respiratory specimen, 32
- Amyloidosis, 161**
- Anabolic steroids, 312-313**
- Anal cytology (anal pap test), 89**
- Anaplastic carcinoma. See also Giant and spindle cell carcinoma**
 of pancreas, 328-329, **329**
- Anaplastic hepatoblastoma, 317**
- Anaplastic large cell (CD30/ALK) lymphoma, 227, 234, 246, 246, 249**
- Anaplastic large cell lymphoma kinase, 238, 247**
- Anaplastic lymphoma, 297**
- Anaplastic Reed-Sternberg cells, 251**
- Anaplastic seminoma, 364, 364**
- Anaplastic Wilms tumor, 348, 349**
- Ancient schwannoma, 173**
- Angiocentric T-cell lymphoma, 244**
- Angioimmunoblastic lymphoma, 244**
- Angioleiomyoma, 163**
- Angiolipoma, 163**
- Angiomyolipoma, of kidney, 339-340, 339-340, 347**
- Angiosarcoma, 164, 166, 169, 171, 177**
 of liver, 319, **319**
- Angiostrongylus*, 120**
- Anthraxosis, 31**
- α_1 -Antichymotrypsin, 172, 177**
- Anticoagulant therapy, 54, 134**
- Antithyroid therapy, 224**
- α_1 -Antitrypsin, 177, 315**
 deficiency of, 308, 313
- Anucleate squames**
 in hyperkeratosis, 4
 in nipple discharge, 69
 of oral cavity, 73, **73**
 in urine, 110
- Apocrine carcinoma, of breast, 157, 271, 271, 276**
- Apocrine cells, of breast, 259, 259**
- Apocrine metaplasia**
 of breast, 258, 266, 271, 275
 cells in nipple discharge, 69, **69**
- Arias-Stella reaction, 23, 23, 383**
- Arsenic, 319**
- Arthritis. See also specific types of arthritis**
 synovial fluid in, 67-68, **67-68**
- Arthropods, 378, 378**
- Asbestos exposure, 28, 32, 53, 62-63, 297**
- Ascites, 49-50, 55**
- ASC-US. See Atypical squamous cells-undetermined significance**
- Aspergillus*, 36, 37, 100, 120, 283, 375, 375**
- Aspiration biopsy. See Fine needle aspiration biopsy**
- Aspiration pneumonia, 31**
- Asteroid bodies, 35, 36, 152, 191**
- Asterosclereids, 378, 378**
- Asthma, 31-32, 37, 42**
- Astrocytes, in cerebrospinal fluid, 117-118**
- Astrocytoma, 121-122, 122**
 gemistocytic, 122
- Atrophic gastritis, 82-83**
- Atrophy**
 androgenic, 382
 of cervix, 17
 of stomach, 82-83
 of vaginal mucosa, 2-3, **2**
 with inflammation, 2, **2**
 pseudokeratinization, 2, **2**
 transitional metaplasia, 2, **2**
- Atypical Burkitt lymphoma, 150, 150, 153, 242-244, 243**
- Atypical carcinoid tumor, 157-159, 158-159**
 of lung, 46, 294, **294**
 of thymus gland, 300
- Atypical leiomyoma, 173**
- Atypical parakeratosis, of oral cavity, 74**
- Atypical squamous cells, 386-387, 387**

- Atypical squamous cells-undetermined significance (ASC-US), 13, **13**, 15, 387, **387**
- Auer rods, 125, **125**
- Autoimmune sialadenitis, 191-192
- Azurophilic granules, 125
- B**
- BAC. See Bronchioloalveolar carcinoma
- Bacillary dysentery, 90
- Bacillus Calmette-Guérin therapy, 339
urine cytology and, 100, 104, **104**
- Bacillus vaginalis*, 14, **14**, 374
- Bacteria, 373-374, **374**
- Bacterial vaginosis, 15, 374
- "Bacteria morphologically consistent with shift in vaginal flora," 15
- Bacteroides*, 260
- BAL. See Bronchoalveolar lavage
- Balloon cell(s), 13
- Balloon cell melanoma, 156, **156**
- Barr body, 3, **3**, 73
- Barrett esophagus, 73, 76-77, **77**, 80
glandular dysplasia in, 80-81, **81**
- Basal cell(s), of cervix, 1
- Basal cell adenocarcinoma, of salivary gland, 201
- Basal cell adenoma, of salivary gland, 195, **195**
- bcl*, 248
- B cell(s), 227
- B-cell lymphoma, 234
monocytoid, 247, **247**
- Benign fibrous histiocytoma, 168, **168**
- Benign lymphoepithelial lesion (BLL), of salivary gland, 189, 191-192, **192**
- Berylliosis, 28
- Bethesda System, 4-5
- BG-8, 64
- Bile, 308, **309**
production in hepatocellular carcinoma, 314, 315, 320, **320**
- Bile canaliculus, 307
- Bile duct
adenoma of, 312
hamartoma of, 312, **312**
- Bile duct cells, 307-308, **308-309**
- Bile-stained effusion, 50
- Biliary tract, extrahepatic
adenocarcinoma of, 93
benign tumors of, 93
cells of, 92, **92**
granular cell tumor of, 93
malignant tumors of, 93, **93**
- Biliary tract disease, 324
- B-immunoblastic lymphoma, 241-242, **242**
- Biphasic epithelial and mesenchymal tumor, of lung, 295-296, **295-296**
- Biphasic synovial sarcoma, 176
- Biphasic tumors, of soft tissue, 175-177
- Birbeck granules, 248
- Birth control pills, 312-313
- Bismuth poisoning, 102
- Bladder, 95
cancer of, 95
condyloma of, 110, **110**
obstruction of, 109
squamous cell carcinoma of, 101
squamous metaplasia of, 98, **98**
- Bladder washing, 99
- Blast cells, 125, **125**
- Blastema, **347-348**, 348
- Blastic cells, 150, **150**
- Blastic lymphoma, 150, **150**
- Blastoma, pulmonary, 47, 295-296, **295-296**
- Blastomyces*, 100, 120, 375, **375**
- BLL. See Benign lymphoepithelial lesion
- Blood-brain barrier, 115
- Blood cells
in cerebrospinal fluid, 116-117, **116-117**
in urine, 98
- Bloody effusion, 51-52
- "Blue blobs," 2, 2
- Blue bodies, 153, **153**, 291, **291**
- Body cavity fluids
ascites, 49-50
cells in, 51-54, **51-55**
malignant effusions, 55-62, **55-62**
in mesothelioma, 62-64, **62-64**
miscellaneous findings in, 53-54, **54**
pericardial effusions, 50
pleural effusions, 49
special benign effusions, 54-55
types of effusions, 50-51
- Body cavity washings
gynecologic cytology in peritoneal washes, 64-66, **65-66**
mesothelial cells in, 64, **64**
- Bone marrow, 254, **254**
- Bowman capsule, 338, **338**
- Brain abscess, 119
- Branchial cleft cyst, 180, **180**
- Breast
abscess of, 259-260, **260**
adenocarcinoma of, 146
adenoid cystic carcinoma of, 276
adenoma of
lactating, 261-262, **262**
pleomorphic, 276
adenosquamous carcinoma of, 272-273, **273**
apocrine carcinoma of, 157, 271, **271**, 276
apocrine metaplasia of, 258, 266, 271, 275
benign neoplasms of, 264-267, **264-267**
cancer of
ascites in, 50
cellularity of, 267-268, **267-269**
combined glandular and squamous differentiation in, 147
cytologic atypia in, 268-269, **267-269**
diagnosis of metastases in urine specimens, 112
fine needle aspiration biopsy of, 267-269, **267-269**
intracytoplasmic lumens in, 144
male breast, 279, **279**

- malignant effusion in, **58, 58**
 - metastatic to adrenal gland, **357**
 - metastatic to central nervous system, **127-128, 128**
 - metastatic to kidney, **347**
 - metastatic to liver, **319**
 - metastatic to lung, **47, 47, 297**
 - metastatic to mediastinum, **305**
 - metastatic to ovary, **370**
 - metastatic to pancreas, **329**
 - metastatic to stomach, **87**
 - metastatic to thyroid gland, **224**
 - nipple discharge in, **71, 71**
 - pericardial effusion in, **50**
 - plasmacytoid cells in, **151**
 - pleural effusion in, **49**
 - single file cell chain in, **145, 145**
 - carcinoid tumor of, **271-272, 272**
 - carcinosarcoma of, **272-273, 273**
 - cells of, **258-259, 258-259**
 - collagenous spherulosis in, **145**
 - colloid carcinoma of, **270-271, 270**
 - cyst of, **259, 263, 263, 270**
 - ductal carcinoma of, **270-274, 270-273, 279**
 - infiltrating, **269-270**
 - scirrhou, **257**
 - small cell infiltrating, **257**
 - epithelial hyperplasia of, **258**
 - epithelial proliferation of, **263, 264**
 - fat necrosis of, **261, 261**
 - fibroadenoma of, **258-259, 264-266, 264-265, 270**
 - fibrocystic disease of, **257, 259, 262-265, 263**
 - fine needle aspiration biopsy of, **257**
 - galactocele, **261**
 - granular cell tumor of, **276-277, 276**
 - inflammatory carcinoma of, **260, 275-276**
 - large duct tumors of, **274-275, 275**
 - leukemia of, **276, 277**
 - lipid-rich carcinoma of, **272, 272**
 - lobular carcinoma of, **273-274, 274, 279**
 - infiltrating, **257**
 - lymphoma of, **277, 277**
 - male, **278-279, 278-279**
 - mastitis, **259-261**
 - medullary carcinoma of, **257, 273, 273**
 - metaplastic carcinoma of, **272-273, 273**
 - metastatic disease of, **277-278, 277**
 - mucoepidermoid carcinoma of, **276**
 - nipple discharge, **69-71, 69-71**
 - nonneoplastic disease of, **259-264**
 - normal tissue, **257**
 - Paget disease of, **71**
 - papillary carcinoma of, **71, 71, 274-275, 275**
 - papilloma of, **70-71, 70, 262-264, 263, 270, 274-275, 275**
 - phyllodes tumor of, **265-266, 266**
 - plasmacytoma of, **277**
 - posttherapy mass in, **278**
 - radiation effect on, **278, 278**
 - salivary gland analog tumors of, **276**
 - sarcoma of, **276, 277**
 - sclerosing adenosis of, **262, 263**
 - signet ring carcinoma of, **274, 275**
 - soft tissue tumors of, **276-277, 276**
 - spindle cell carcinoma of, **272, 273**
 - squamous cell carcinoma of, **273, 273**
 - squamous metaplasia of, **266, 275**
 - sweat gland analog tumors of, **276**
 - triple test, **257-258**
 - tubular carcinoma of, **271, 271**
 - Brenner tumor, **368**
 - Bronchial brushing, **28**
 - Bronchial cells, **29, 30-31**
 - Bronchial cytology, **27-28**
 - Bronchial hyperplasia, **34, 34**
 - Bronchial washing, **28**
 - Bronchiectasis, **42**
 - Bronchioalveolar carcinoma (BAC), **29, 36, 41-42, 41-42, 288-290, 289**
 - intranuclear cytoplasmic invaginations in, **289, 289**
 - mucinous, **41, 42, 289, 289**
 - nonmucinous, **41, 42, 289-290**
 - psammoma bodies in, **289, 290**
 - sclerosing, **289**
 - Bronchoalveolar lavage (BAL), **27-28, 31**
 - Bronchogenic adenocarcinoma, **40, 41-42, 288-289, 288**
 - Bronchogenic carcinoma, **28**
 - Brown tumor, **183**
 - Brunner gland neoplasm, **93**
 - Brunn nests, **100**
 - Burkitt lymphoma, **126, 150, 150, 153, 235, 242-244, 243, 346**
 - endemic (African), **242**
 - sporadic (American), **242**
 - Busulfan (Myleran), urine cytology and, **103**
- ## C
- Cajal, interstitial cells of, **86**
 - Calcification, **166-167**
 - Calcitonin, **217-218**
 - Calcium oxalate crystals, **191, 375**
 - Calcium pyrophosphate crystals, **68, 68**
 - Calcospherites. See Psammoma bodies
 - Call-Exner bodies, **363, 363, 367**
 - Calretinin, **357**
 - Candida*, **375**
 - in esophagus, **78, 78**
 - in liver abscess, **310**
 - in oral cavity, **74**
 - Pap test and, **15, 15**
 - pulmonary infection, **36-37**
 - in stomach, **83**
 - in urinary tract, **100**
 - Cannonballs, **57**
 - Capillaries, in cerebrospinal fluid, **118, 118**
 - Carbon histiocytes, **31**
 - Carcinoembryonic antigen (CEA), **64, 315, 320, 330**
 - Carcinoid syndrome, **45, 89, 158, 300**
 - Carcinoid tumor, **157-158, 158, 166, 172**
 - atypical, **157-159, 158-159**
 - of breast, **271-272, 272**
 - of colorectum, **92**

- of extrahepatic biliary tract, 93
- of lung, 45-46, **45**, 293-294, **293-294**
 - atypical, 46, 294, **294**
 - spindle cell, 46, 294, **294**
 - typical, **45**, 46, 293-294, **293**
- lymphoplasmacytoid cells in, 158, **158**
- malignant effusion in, 61
- of pancreas, 333-335, **334-335**
- of small intestine, 89
- spindle cells in, 158, **158**
- of stomach, 87
- of thymus gland, 300, 305
 - atypical, 300
 - spindle cell, 300
- Carcinoma, 139-140, **139-140**. See also *specific types and sites*
 - immunocytochemical markers in, **177**
- Carcinoma ex pleomorphic adenoma, of salivary gland, 200, **200**
- Carcinoma in situ
 - of cervix, 4-8, **5-9**, 385
 - of colorectum, 91
 - of lung, 40
 - of stomach, 85
 - of urinary tract, 107-108, **109**
- Carcinosarcoma, 155, 167. See also *Mixed müllerian tumor, malignant*
 - of breast, 272-273, **273**
 - of lung, 47, 296, **296**
 - of salivary gland, 200
- Caroli disease, 318
- Carotid body tumor, 181
- Carpet beetle parts, 378, **378**
- "Carrot cells," 35
- Cartilage, in cerebrospinal fluid, 118, **119**
- Cartilage cells. See *Chondrocytes*
- Casts, in urine, 99, **99**
- Catecholamines, 355
- "Caterpillars," 58
- Cat-scratch disease, 191, 233
- Cauterization, urine cytology and, 104, **104**
- Cavernous hemangioma, of liver, 311
- Cavitary carcinoma, 39
- CD2, **238**, 245
- CD3, **238**, 245
- CD4, **238**, 245
- CD5, 86, **238**, 239, 245, 248
- CD7, **238**, 245
- CD8, **238**, 245
- CD10 (CALLA), 125, 235, **238**, 243, 320, 342, 357
- CD11c, 254
- CD15 (Leu M1), **238**, 251
- CD19, **238**, 239-240, 243
- CD20, 86, **238**, 239-240, 243
- CD22, 254
- CD23, **238**, 239
- CD25, 254
- CD30 (Ki-1 or CD30/ALK), **238**, 246-247, **246**, 249
- CD31, **177**, **319**
- CD34, **177**, **319**
- CD43, 86, **238**, 245, 247
- CD45 (leukocyte common antigen), **128**, 153-154, 232, **238**, 251
- CD56, 245, 291
- CD68, 172, **177**
- CD103, 254
- CD117, 86
- CD138, **238**
- CEA. See *carcinoembryonic antigen*.
- Celiac disease, 85
- Cell balls, 21, **21**, 146
- Cellules grumelées, 239, **239**
- Central nervous system (CNS). See also *Cerebrospinal fluid*
 - in AIDS, 120-121
 - astrocytoma of, 121-122, **122**
 - choroid plexus tumors, 122, **122**
 - craniopharyngioma of, 123, **123**
 - differential diagnosis of tumors of, **128**
 - ependymoma of, 122, **122**
 - germ cell tumors of, 124
 - gliomas of, 121-122, **122**
 - hemorrhage in, 119-121
 - histiocytic proliferations involving, 126
 - infection of, 119-121. See also *Meningitis*
 - inflammation of, 119-121
 - leukemia of, 124-125, **125**, **128**
 - lymphoma of, 124, 126, **126**, **128**
 - meningioma of, 127
 - metastatic disease of, 127-129, **127-129**
 - midline tumors of, 123-124
 - mycosis fungoides of, 126-127
 - neural crest tumors of, 123, **123**, **128**
 - oligodendroglioma of, 122
 - reactive conditions in, 119-121
 - tumors of, 121-127, **122-126**
- Centroblasts, **229**, 230, 239-240, **240**
- Centrocytes, 148, **229**, 230, 239-240, **240**
- Cerebrospinal fluid (CSF)
 - cells in, 116-118, **116-118**
 - central nervous system cells in, 117-118, **117-118**
 - cytology of, 115-118, **116-118**
 - glucose level in, 115
 - miscellaneous elements in, 118, **118**
 - physiology of, 115
 - pressure of, 115
 - protein level in, 115
- Cervical (neck) cysts, 179-181, **179-181**
- Cervical intraepithelial neoplasia (CIN), 4-7, 16. See also *Dysplasia; Carcinoma in situ; Squamous intraepithelial lesion*
- Cervical (neck) paraganglioma, 181, **181**
- Cervicitis, 15
 - follicular, 16, **16**
- Cervix. See also *Endocervix; Pap test*
 - adenocarcinoma of, 22, 24
 - clear cell, 20
 - atrophy of, 17
 - atypical squamous cells of undetermined significance from, 13, **13**, 15
 - benign metaplasia of, 13
 - cancer of
 - precursor lesions, 4-8, **5-8**
 - smoking and, 11



- carcinoma in situ of, 4-8, **5-9**
 cells of, 1-2, **1**
 dysplasia of, 4-8, **5-8**
 grading of, 7, **7**
 mild, 5, 7, **7, 13**
 moderate, 5
 morphologic types of, 7-8
 severe, 5, 7
 glassy cell carcinoma of, 157
 human papillomavirus infection of, 11-13, **12-13**
 hyperkeratosis of, 4, **4**
 inflammation of, 14, **14, 16-18, 16-17**
 keratinizing dysplasia of, 7-8, **8, 11, 14**
 high-grade, **8, 8**
 low-grade, **8, 8**
 metaplastic dysplasia of, 7-8, **8, 13**
 immature, **8, 8**
 mature, **8**
 metastatic disease of, 22-23, **22-23**
 microinvasive carcinoma of, 8-9, **9**
 postradiation dysplasia of, 18
 pregnancy-associated changes in, 23, **23**
 radiation effect on, 17, **17**
 repair/regeneration reaction of, 16-17, **17**
 reserve cell hyperplasia of, 3, **3**
 small cell carcinoma of, 11, **11**
 squamous atypia of, 13, **13**
 squamous cell carcinoma of, 9-12, **9-11, 24**
 keratinizing, 10-11, **10-11**
 nonkeratinizing, 10, **10**
 poorly differentiated, 10, **10**
 small cell, 10, **10**
 squamous dysplasia of, 17
 squamous metaplasia of, 3-4, **3-4, 13, 13**
- Charcot-Leyden crystals, 32, **32, 54**
- Chemotherapy effect
 on body cavity fluids, 52
 on esophagus, 77-78, **78**
 on respiratory cytology, **34, 35**
 on urinary tract cytology, 103-104, **103**
- Chief cells
 of parathyroid gland, 183
 of stomach, 82, **82**
- Child. See also Small blue cell tumors of childhood
 malignant effusions in, 62
 malignant renal tumors in, 347-349, **347-349**
 neuroblastoma in, 356
 salivary gland masses in, 203, **203**
 sarcoma in, **163**
- Chlamydia*, 15-16, 68
Chlamydia trachomatis, 374
- Chloroma. See Granulocytic sarcoma
- Chocolate effusion, 50-51
- Cholangiocarcinoma, 316-318, **318**
 mixed hepatocellular/cholangiocarcinoma, 318
- Cholangitis
 pyogenic, 318
 sclerosing, 318
- Cholecystitis, 50
- Cholestasis, **309**
- Cholesterol crystals, 180, 197, **225, 352**
- Chondrocalcinosis. See Pseudogout
- Chondrocytes, in synovial fluid, 67, **67**
- Chondrosarcoma, **166, 175, 175, 177**
 mesenchymal, 171
 myxoid, 167, 175, **175**
- Chordoma, **177**
- Choriocarcinoma, 87, 301, **302, 365-366, 366**
- Choroid plexus
 cells in cerebrospinal fluid, 117-118, **117**
 tumors of, 122, **122**
- Chromatin, inflamed red, 14, **14**
- Chromogranin, 181, 291, 335, 356
- Chromophobe cell renal cell carcinoma, 344-345, **345**
- Chromosome abnormalities, in lymphoma, 234
- Chronic lymphocytic leukemia (CLL), 234-235
- Chronic myelogenous leukemia, 125
- Chylous effusion, 50
- Cigarette smoking. See Smoking
- Ciliated cells
 in ovarian cyst, 367, **367**
 in respiratory specimen, 29, **29**
 of thyroid gland, 207
- Ciliated respiratory-type glandular cells, in salivary gland, 188
- Ciliocytophthoria, 29, 54, **54, 367, 367**
- CIN. See Cervical intraepithelial neoplasia
- Cirrhosis, 49, 52, 55, 59, 64, 308-309, 311, 313, 319
 macronodular, 309
 micronodular, 309
- Clear cell(s), **141, 155-156, 156**
- Clear cell adenocarcinoma, of endocervix, 20
- Clear cell carcinoma
 of endometrium, 22
 hepatocellular, 316, **316**
 of kidney, 156, **156**
 of ovary, 369-370, **370**
 renal cell, **341-342, 342**
- Clear cell melanoma of soft parts. See Clear cell sarcoma
- Clear cell sarcoma, 156, 164, 170, 176
 of kidney, 349
- Clear cell tumor
 of lung, 295, **295**
 of thyroid gland, 221
- Clinging diathesis, 9, 386
- CLL. See Chronic lymphocytic leukemia
- Clonorchis sinensis*, 318
- Clue cells, 15, **15**
- CNS. See Central nervous system
- Coccidioides*, 120, 375
- Cockleburs, in Pap test, 23, **23**
- “Coffee bean” nuclei, 363, **363**
- Colitis
 infectious, 90, **90**
 ulcerative, 73, 90
- Collagen, young, 161
- Collagen balls, 54, **55, 63, 63**
- Collagen crystals, 189, **189**
- Collagenous spherulosis, of breast, 145
- Collecting duct carcinoma, 344, **345**
- Colloid, 161
 dense, 207-208, **208**
 gummy, 217, **217**
 of thyroid gland, 207-208, **207-208**
 watery, 207, **207**

- Colloid carcinoma, 144, 175
 of breast, 270-271, **270**
 mucinous effusions in, 51
- Colloid nodule, **211-212**, 212
- Colorectum
 adenocarcinoma of, 91, **91**
 adenomatous polyps of, **90-91**, 91
 benign disease of, 90-91, **90-91**
 cancer of
 diagnosis of metastases in urine specimens, 112, **112**
 malignant effusion in, 58, **59**
 metastatic to adrenal gland, 357
 metastatic to central nervous system, 129, **129**
 metastatic to liver, 319, **319**
 metastatic to lung, **46**, 47, 297
 metastatic to ovary, 369-370
 terminal bars in, 145, **145**
- carcinoid tumor of, 92
 carcinoma in situ of, 91
 cells of, 89-90, **89-90**
 dysplasia of, 90-91
 inflammatory bowel disease of, 90, **90**
 leiomyosarcoma of, 92, **92**
 lymphoma of, 90, 92
 malignant disease of, 91-92, **91-92**
 signet ring cell carcinoma of, 91
 squamous metaplasia of, 90
 villous adenoma of, **90-91**, 91
- Columnar cells, in urine, 97, **97**
- "Comet cells," 101, **101**
- Common acute lymphoblastic leukemia antigen (CD10), 125, 235, **238**, 243
- Condyloma, 8, 11-13, **12-13**, 101
 of bladder, 110, **110**
 of esophagus, 79
- Conn syndrome, 353
- Contaminants, 373-378
- Copper sulfate, 319
- Corpora amylacea
 in cerebrospinal fluid, 118
 in respiratory specimen, 32, **32**
 in urine, 98-99, **98**
- Corpus luteum cyst, 367, **367**
- Cortical thymoma, 299
- Corticotropin, 334
- Crack artifact, 161, 207
- Cracked cells, 13
- Craniopharyngioma, 123
- Creola bodies, 34, **34**
- Crescentic histiocytes, 231, **231**
- Crohn disease, 83, 90
- Crush artifact, 44-45, **44**, 291, **291**
- Cryptococcus*, 100, 120, **120**, 352, 375, **375**
- Cryptosporidium*/cryptosporidiosis, 88, **88**, 376, **377**
- Crystals. *See also specific types of crystals*
 in salivary gland, 189
 in urine, 99, **99**
- CSF. *See* Cerebrospinal fluid
- Curschmann spirals
 in body cavity fluids, 54
 in Pap test, 24, **24**
 in respiratory specimen, 31-32, **31**
 in salivary gland, 189
- Cushing syndrome, 158, 300, 353
- Cutaneous T-cell lymphoma, 246
- Cyclophosphamide (Cytoxan), urine cytology and, 103, **103**
- Cyclosporine, urine cytology and, 103-104
- Cyst, 161. *See also specific types and sites*
- Cystadenocarcinoma, of pancreas, mucinous, 332
- Cystadenofibroma, gynecologic cytology in peritoneal washing, 65
- Cystadenoma
 of ovary
 mucinous, 369, **369**
 serous, 368-369
 of pancreas, serous, 330-331, **330**
 serous, gynecologic cytology in peritoneal washings, 65
- Cystectomy, 108
- Cystic adenoma, of adrenal cortex, 352
- Cysticercus, 120
- Cystic hygroma, 179
- Cystitis, 97, **97**, 100
- Cystitis cystica, 97, 100
- Cystitis glandularis, 97, 100, **100**
- Cystoscopy, 108
- Cytodiagnosis, building blocks of, 140-141, **141**
- Cytokeratin. *See* Keratin
- Cytomegalovirus, 78-79, 90, **100**, 101, 353, 373, **373**
- Cytospin artifact, 124, **124**
- Cytotrophoblasts, 366, **366**
- Cytoxan. *See* Cyclophosphamide

D

- "Daisy cells," 64-65, **64**
- Dawson syndrome, 77
- Decidual cells, in Pap test, 23
- "Decoy cells," 101, **101**
- DeMay classification
 for cervical cancer precursor lesions, 5
 for urothelial neoplasia, 105
- Degenerative processes
 in small intestine, 87
 in stomach, 82, **82**
 urine cytology, 97
- Demons, 160, **160**
 bug-eyed, 160
- Dense colloid, 207-208, **208**
- de Quervain thyroiditis. *See* Granulomatous thyroiditis
- Dermatofibrosarcoma protuberans, 164, 168, **168**, **177**
- Dermatopathic lymphadenopathy, 248
- Dermoid cyst, 179, 181
- Desmin, **154**, **177**
- Desmoid tumor, 165, 167
- Diabetes mellitus, 325, 327, 330, 353
- Dialysis, 52-53, 338, 341
- Diverticulitis, 90
- Döderlein bacilli, 374
- Down syndrome, 3

Ductal adenocarcinoma, of pancreas, 327-329, **327-329**
 Ductal carcinoma, of breast, 270-274, **270-273**, 279
 infiltrating, 269-270
 scirrhous, 257
 small cell infiltrating, 257
 Ductal cells
 of breast, 258, **258**
 in nipple discharge, 69, **69**
 of pancreas, 324, **324**
 of salivary gland, 188
 Duct ectasia, 70
 "Dust bunnies," 15, 374
 "Dust cells," 31
 Dutcher bodies, 239, 252, **252**
 Dysentery, bacillary, 90
 Dysgerminoma, 161, 301, 363-364
 Dysmorphogenetic goiter, 224-225, **224**
 Dyskeratocytes, 12-13
 Dysplasia. *See specific types and sites*

E

E2, 6
 E6/E7, 6
 Eccrine spiradenoma, 163
Echinococcus granulosus, 352, 376-377, **377**
 Effusion, 49. *See also specific types and sites*
 malignant. *See Malignant effusion*
 of unknown or occult etiology, 51
 Embryonal carcinoma, 301, 364-365, **364-365**
 Embryonal cells, in hepatoblastoma, 317, **317**
 Embryonal rhabdomyosarcoma, 62, 153, **153**, 171, 174, 348, 362
 Emphysema, contradiction to fine needle aspiration biopsy, 134
 Endocervical adenocarcinoma in situ, 389, **389**
 Endocervical cells, 18-20, **18-20**
 in Pap test, 18, **18**
 reactive, 18, **18**
 Endocervix
 adenocarcinoma in situ of, 20, **20**
 adenocarcinoma of, 11, **11**, 20, **20**
 adenoma malignum, 20, **20**
 endometrioid, 20
 intestinal, 20
 serous, 20
 glandular neoplasia of, 19-20, **20**
 Endodermal sinus tumor. *See Yolk sac tumor*
 Endolymphatic stromal myosis. *See Endometrial stromal sarcoma*
 Endometrial adenocarcinoma, 389-390, **390**
 Endometrial cell(s), 20-22, **20-22**
 glandular, 20, 387-389, **388-389**
 in Pap test, 20, 387-389, **388-389**
 Endometrial cell balls, 21, **21**
 Endometrial stromal cells
 deep, 21, **21**, 388
 superficial, 21, **21**, 388
 Endometrial stromal sarcoma, 22, 370, **371**
 Endometrioid carcinoma, 20, 369, **369**
 Endometriosis, 368, **368**
 body cavity effusions in, 55
 cytology in peritoneal washings, 66, **66**
 Endometriotic cyst, 368
 Endometrium
 adenocarcinoma of, 21, **21**
 cytology in peritoneal washings, 66, **66**
 with squamous differentiation, 22
 cancer of, 55
 metastatic to breast, **277**
 risk factors for, 21-22
 clear cell carcinoma of, 22
 mucinous carcinoma of, 22
 papillary serous carcinoma of, 22
 secretory carcinoma of, 22
 Endosalpingiosis, 54
 cytology of peritoneal washing, 65, **65**
Entamoeba gingivalis, 74, 377
Entamoeba histolytica, 90, **90**, 310, 377
Enterobius vermicularis, 377
 Enteropathy lymphoma, 244
 Eosinophil(s)
 in body cavity fluids, 53, **53**
 in cerebrospinal fluid, 117, **117**
 Eosinophilic granuloma, 248
 Eosinophilic pneumonia. *See Löffler pneumonia*
 Ependymal cells, in cerebrospinal fluid, 117-118, **117**
 Ependymoma, 122, **122**
 Epidermoid cyst, 179, 181
 Epididymitis, 362
 Epimyoepithelial islands, 192, **192**
 Epithelial cells, in Wilms tumor, 348, **348**
 Epithelial hepatoblastoma, 317
 Epithelial hyperplasia, of breast, 258
 Epithelial-myoepithelial carcinoma, of salivary gland, 201, **201**
 Epithelial proliferation, of breast, **263**, 264
 Epithelial thymoma, 299
 Epithelioid giant cells, 217, **217**
 Epithelioid histiocytes, 35-36, **35**, 55, 83, 100, **119**, 151-152, **152**, 191, 233, **233**, 282, **282**
 Epithelioid leiomyosarcoma, 155, **166**, 177, **177**
 Epithelioid sarcoma, 164, 170, 176, **177**
 Epstein-Barr virus, 182, 202, 250
 Erythrophagocytosis, 116, **116**
 Erythroplasia of Queyrat, 73
Escherichia coli, 100, 310, 339
 Esophagitis, 76-77, **76-77**
 bacterial, 78
 reflux, 77
 Esophagus
 adenocarcinoma of, 79-81, **80**
 Barrett, 73, 76-77, **77**, 80-81, **81**
 benign disease of, 76-79, **76-78**
 cells of, 76, **76**
 chemotherapy effect on, 77-78, **78**
 condyloma of, 79

- granular cell tumor of, 81, **81**
 - infection of, 78-79, **78**
 - leukoplakia of, 76
 - malignant disease of, 79-81, **79-81**
 - papilloma of, squamous, 79
 - radiation effect on, 77-78, **78**
 - rare tumors of, 81, **81**
 - repair/regenerative processes in, 80
 - small cell carcinoma of, 81
 - squamous cell carcinoma of, 79-80, **79-80**
 - keratinizing, 79, **79**
 - nonkeratinizing, 79, **79**
 - spindle, 80
 - ulcers of, 76-77
- Estrogen test, 17
- EUS-FNA biopsy, 86
- Ewing/PNET, 62, 127, **127**, 153-154, **153-154**, 158, **158**
163, 164, **166**, 171, **171**, 317, 348, 356
- Extramedullary hematopoiesis, 54, 152, 253-254, **254**
- Exudate, 49
- F**
- Factor VIII, **177**
- Fasciitis
 - nodular, 155, **155**, 165, 167, **167**, 175
 - proliferative, 167
- Fat embolism, 31
- Fat necrosis, 250
 - of breast, 261, **261**
 - in pancreatitis, 325
- Female pelvis, 367-371
- Ferruginous bodies, in respiratory specimen, 32, **32**
- Fetal cells, in hepatoblastoma, 317, **317**
- α -Fetoprotein
 - in germ cell tumors, 43
 - in gonadal tumors, 363, 365
 - in hepatoblastoma, 317
 - in hepatocellular carcinoma, 313, 315, 320
- Fibroadenoma, of breast, 258-259, 264-266, **264-265**, 270
 - “antler,” 265, **265**
 - focal atypia in, 265, **265**
 - monolayered sheet in, 264, **264**
 - naked oval nuclei in, 265, **265**
 - stromal fragments in, 264, **264-265**
- Fibrochondrolipoma. See Hamartoma
- Fibrocystic disease, of breast, 257, 259, 262-265, **263**
- Fibrolamellar hepatocellular carcinoma, 157, 311, 315-316, **315**
- Fibroma/thecoma, of ovary, 362, **362**
- Fibromatosis, 165, 167
- Fibrosarcoma, **163**, 164-165, **166-167**, 167-168, 175
- Fibrosis, reactive, 170
- Fibroxanthoma, of lung, 284-285
- Fine needle(s), 131
- Fine needle aspiration (FNA) biopsy
 - of adrenal cortex, 354
 - of adrenal medulla, 356
 - advantages of, 131-132, **132**
 - background/extracellular material in, 161, **161**
 - of breast, 257, 267-269, **267-269**
 - building blocks of cytodiagnosis, 140-141, **141**
 - cell types, 141-160
 - complications of, 132-134
 - contraindications to, 134
 - of Hodgkin lymphoma, 251, **251**
 - interpretation of, 134-136
 - of kidney, 337
 - of lung, 281
 - in lymphoma, 235, **235**
 - of pancreas, 323
 - performance of, 134-136
 - of pheochromocytoma, 355-356
 - reporting of, 134-136
 - of soft tissue tumors, 163-167, **165-166**
 - of testis, 361
 - of thyroid gland, 205-206, **205**, 211-215, **211-215**
 - transrectal, 131, 133
 - transvaginal, 131
 - tumor classification, 139-140, **139-140**
- Flame cells, 146
 - in plasma cell myeloma, 252, **252**
 - of thyroid gland, 206-207, **206**, 225
- FMC7, 254
- FNA biopsy. See Fine needle aspiration biopsy
- Foam cells
 - of breast, 259, **259**
 - in nipple discharge, 69, **69**
 - of thyroid gland, 206
- Focal nodular hyperplasia, of liver, 311-312, **311**
- Folate deficiency, 17, 75, 83
- Follicular adenoma, of thyroid gland, 210-214, **211**, 221
 - colloid, 213
 - embryonal, 211
 - fetal, 211
 - macrofollicular, 211
 - simple, 211
- Follicular carcinoma, of thyroid gland, 211-215, **211-212**, **215**, **220**
 - microinvasive, 211
 - widely invasive, 211
- Follicular cells, of thyroid gland, 206, **206**
- Follicular center cell(s), of lymph nodes, 230, **230**
- Follicular center cell lymphoma, 60, 227
- Follicular cervicitis, 16, **16**, 383, **383**
- Follicular hyperplasia, of lymph node, 227, 231-232
- Follicular lesions, of thyroid gland, 210-215, **211-214**, 219
 - fine needle aspiration biopsy of, 211-215, **211-215**
- Follicular lymphoma, 231, **234**, 235
- Food particles, in respiratory specimen, 32
- football, ii
- Fungi/fungal infection, 374-376, **375-377**
 - of central nervous system, 120, **120**
 - of oral cavity, 74
 - of urinary tract, 100



- G**
- Galactocele, 261, 263
- Galactorrhea, 70
- Ganglion cells, 154, 356-357
- Ganglioneuroblastoma, of adrenal medulla, 357, **357**
- Ganglioneuroma
 of adrenal medulla, 357
 of mediastinum, 303, **303**
- Gardnerella vaginalis*, 15, 374
- Gastrinoma, **334-335**, 335
- Gastritis
 atrophic, 82-83
 chronic, 85
 granulomatous, 83
- Gastrointestinal tract, 73-93. *See also specific organs*
 cancer of
 ascites in, 50
 metastatic to breast, 277
 metastatic to pancreas, 329
 pleural effusion in, 49
 stromal tumors, **86, 86**
- Gaucher disease, 37, **37**
- Gemistocytic astrocytoma, 122
- Genital herpes, 15, **15**
- Geotrichum*, 375
- Germ cell tumor
 of central nervous system, 124
 extragonadal, 363
 of gonads, 363-366, **364-366**
 of lung, 43, 47, 292
 malignant effusion in, 62, **62**
 of mediastinum, 301, **302**
 of pineal gland, 123
- Germinal matrix cells. *See* Leptomeningeal cells.
- Germinoma
 of central nervous system, 124
 of gonads, 363-365, **364**
 of mediastinum, 301
 tigroid background in, 364, **364**
- “Ghost cells,” 75, 287
- Giant and spindle cell carcinoma
 of lung, 43, 293, **293**
 of pancreas, 328
 of thyroid gland, 219, **219-220**, 223
- Giant cell(s), **141**, 152, **152**
 in cerebrospinal fluid, 118, **119**
 Langhans, 35
- Giant cell carcinoma, 152, **152**
 hepatocellular, 316, **316**
 of lung, 43, **43**, 286, 292-293, **293**
 of pancreas, pleomorphic, 328, **329**
- Giant cell histiocytes, 31, **31**, 53, 78, 100
- Giant cell interstitial pneumonia, 37
- Giardia lamblia*, **88, 88**
- Glandular and squamous differentiation, 146-147, **146-147**
- Glandular cells, **141-147**, 142-147
 of esophagus, 76, **76**
 in posthysterectomy Pap test, 23-24
 radiation effect on, 34-35
 in respiratory specimen, 29-30, **29**
- Glandular dysplasia, in Barrett esophagus, 80-81, **81**
- Glandular epithelium, 18-22
- Glandular neoplasia, endocervical, 19-20, **20**
- Glandular schwannoma, malignant, 176-177, **177**
- Glassy cell carcinoma, of cervix, 157
- Gleevec, 86
- Glioblastoma multiforme, 122
- Glioma, 123, 128
- Globular inclusion bodies, in urine, 99
- Glomerulus, 338, **338**
- Glomus jugulare, 181
- Glomus tumor, 163, 166, 172
- Glycogen, in hepatocytes, 307, **308**
- Glycogenated cells, 12, **12**
- Glycogen-rich cystadenoma. *See* Serous cystadenoma
- Goblet cells
 of colorectum, 89-90
 in intestinal metaplasia, 83
 in respiratory specimen, 29, **29**
 of salivary gland, 188
 of small intestine, 87
- Goiter, 184, 210, 213, **213-215**, 216, 220-222
 dyshormonogenetic, 224-225, **224**
 hemorrhagic degeneration in, 213, **213**
 honeycomb sheet in, 213, **213**
 multinodular, 210
 nontoxic, 207
 perifollicular fibrosis in, 213, **213**
 repair/regeneration in, 213-214, **213**
 simple, 210
- Gonadal sex cord stromal tumor, 362-363, **362-363**
- Gonadal tumor, 362-366
- Gout, synovial fluid in, 68, **68**
- Granular cell(s), **141**, 156-157, **156-157**
- Granular cell lymphoma, 157
- Granular cell renal cell carcinoma, 157, **342**, 343
- Granular cell tumor, 156-157, **156**
 of breast, 276-277, **276**
 of esophagus, 81, **81**
 of extrahepatic biliary tract, 93
 of lung, 46
- Granulation tissue, 147, **147**
- Granulocytic sarcoma, 253, **253**
- Granuloma, 152
 eosinophilic, 248
 lactating sinus, 70, **70**
 of liver, 310, **310**
 of lung, 282-283, **282**
 rheumatoid, 36, 55
- Granulomatous gastritis, 83
- Granulomatous lymphadenitis, 233, **233**
- Granulomatous mastitis, 260-261
- Granulomatous sialadenitis, 191, **191**
- Granulomatous thyroiditis, 208-209, **208-209**
- Granulosa cells, 367, **367**
- Granulosa cell tumor, 363, **363**
- Graves disease, 221, 225, **225**
- Gummy colloid, 217, **217**
- Gynecomastia, 278-279, **278**

- H**
- Hairy cell leukemia, 253-254, **253**
- Hamartoma
 of bile duct, 312, **312**
 of lung, 284, **284**
- Hand-Schüller-Christian disease, 126, 248
- hannah montana, ii
- Hashimoto thyroiditis, 179, 207, 209-210, **209-210**, 220-223, 241
- HCC. See Hepatocellular carcinoma
- Head and neck region
 cancer of
 metastatic to mediastinum, 305
 metastatic to salivary gland, 203
 cervical cysts, 179-181, **179-181**
 neoplasms of, **180-183**, 181-182
 parathyroid disorders, 182-185
- Heart failure, 31, 53, 55, 60
- Heavy metal poisoning, urinary tract cytology in, 102, **102**
- Helicobacter pylori*, 83, **83**, 85
- Hemangioma, 167
 of liver, 310-311, **310-311**
 of lung, sclerosing, **284-285**, 285
 of mediastinum, 305
 of salivary gland, 202-203, **203**
- Hemangiopericytoma, 166-167, **166**, 170, 175
- Hematocele, 362
- Hematoma
 complication of fine needle aspiration biopsy, 133
 of liver, 310
- Hematopoiesis, extramedullary, 152, 253-254, **254**
- Hemochromatosis, 309, 319
- Hemorrhage
 in central nervous system, 119-121
 complication of fine needle aspiration biopsy, 134
 subarachnoid, 124
- Hemosiderosis, 31, 309
- HepPar-I gene, 315
- Hepatitis, 52, 308-309, 313
- Hepatoblastoma, 316-317, **317**
 anaplastic, 317
 embryonal cells in, 317, **317**
 epithelial, 317
 fetal cells in, 317, **317**
 mixed, 317
- Hepatocellular carcinoma (HCC), 146-147, 157, 308-309, 312-318, **313-316**
 acinar or adenoid, 316
 bile production in, **314**, 315, 320, **320**
 clear cell, 316, **316**
 fibrolamellar, 311, 315-316, **315**
 giant cell, 316, **316**
 growth patterns of, 314
 hyaline globules in, 315, **315**, 320, **320**
 INCLs in, **313**, 314
 malignant effusion in, 59, **59**
 Mallory bodies in, 315, **315**
 metastatic cancer versus, 320
 metastatic to bone, 313, **313**
 mixed hepatocellular/cholangiocarcinoma, 318
 mucin in, 320, **320**
 naked nuclei in, 314, **314**
 sclerotic, 316
 small cell, 316
 spindle cell, 316, **316**, 318
 trabecular growth pattern in, 314, **314**
- Hepatocytes, 307, **307-308**
- Hepatocytoid adenocarcinoma, 320, **320**
- Hepatosplenic lymphoma, 244
- Herpes simplex infection
 of esophagus, 78
 genital, 15, **15**, 383, **383**
 oral, 74
- Herpes virus, 353, 373, **373**, 383, **383**
 in urine, 101
- Herxheimer spirals, 38
- High fat diet, 327
- High-grade squamous intraepithelial lesion (HSIL), 4, **7**, 384-385, **385**
- Histiocytes
 in body cavity fluids, 52-53, **53**
 carbon, in respiratory specimen, 31
 crescentic, 231, **231**
 epithelioid, 35-36, **35**, 55, 83, 100, **119**, 151-152, **152**, 191, 233, **233**, 282, **282**
 giant cell, 31, **31**, 53, 78
 Langerhans, 248
 of lymph nodes, 230-231, **231-232**
 in Pap test, 16, **16**, 21
- Histiocytic proliferations, involving central nervous system, 126
- Histiocytoid carcinoma. See Lipid-rich carcinoma
- Histiocytoma
 benign fibrous, 168, **168**
 malignant fibrous, 61, **163**, 164, 166-168, **166**, 172, **172**, **177**
 inflammatory, 172, **172**
 myxoid, 172, **172**, 174-175
- Histiocytosis
 Langerhans, 28, 117, 126, 223, 248, **248**
 malignant, 117, 126, 227, 249
 malignant fibrous, 152, 165
 sinus, 232
 sinus histiocytosis with massive lymphadenopathy, 231, **231**
- Histiocytosis X. See Langerhans cell histiocytosis
- Histoplasma*/histoplasmosis, 120, 352, 375-376, **376**
- HLA-DR, 239
- HMB-45, **128**, 160, 171, **177**, 320, 340
- Hodgkin cells, 60, 250, **250**
- Hodgkin lymphoma, 54, 126, 148, 151, **151**, 231, 234, 249-251, **249-251**
 fine needle aspiration biopsy in, 251, **251**
 of liver, 319
 of lung, **46**, 47
 lymphocyte-rich, 251
 malignant effusion in, 60
 nodular lymphocyte-predominant, 250
 of mediastinum, 301-302
 mixed cellularity, 251
 nodular sclerosis, 251, **251**, 301
 of salivary gland, 202
 subtypes of, 151
 of thyroid gland, 223
 urine cytology in, 111
- Hormone receptors, 270



- HSIL. See High-grade squamous intraepithelial lesion
 β -Human chorionic gonadotropin, 43, 363-366
 HPV-DNA testing, 17
 Human papillomavirus/human papillomavirus infection, 373
 of cervix, 6, 11-13, **12-13**
 of esophagus, 79
 in urine, 101
 Human polyomavirus, 101, **101**, 373
 Hürthle cell(s)
 in Hashimoto thyroiditis, 209-210, **209-210**
 of thyroid gland, 207, **207**
 Hürthle cell carcinoma, 221, **221**
 Hürthle cell nodule, 221
 Hürthle cell tumor, 184, 219-221, **221**
 Hyaline cells, of salivary gland, 188, **188**
 Hyaline cytoplasmic inclusions, in Pap test, 13
 Hyaline globules, **140**, 145, **145**
 in anaplastic lymphoma, 247
 in breast cyst, 263, **263**
 in clear cell carcinoma of ovary, 370, **370**
 in hepatocellular carcinoma, 315, **315**, 320, **320**
 in liver, 308
 in salivary gland neoplasms, 194-195, **194**, 197-198
 in solid and papillary epithelial neoplasm, 332, **333**
 in urine, 99
 in yolk sac tumor, 365, **365**
 Hyalinizing trabecular adenoma, of thyroid gland, 222, **222**
 Hydatid cyst, 310, 377
 Hydatid disease, 53, 134, 376-377, **377**
 Hydralazine, 54
 Hydrocele, 361
 Hydrocephalus, 117
 Hyperchromatic crowded groups, 382, 384, 389
 Hypergammaglobulinemia, 235
 Hyperkeratosis
 of cervix, 4, **4**, 382, **382**, 383
 of oral cavity, 74
 Hyperparathyroidism, 184
 Hyperplasia. See *specific sites and types*
 Hypersensitivity pneumonia, 28
 Hypoglycemia, 334
 Hysterectomy, Pap test after, 23-24
- I**
 Ileal conduit urine, 108
 Immature teratoma, 301, 366
 Immunoblast(s), 230, **230**, 246, 250-251
 Immunoblastic lymphoma, 85, **85**, **126**, 149, **149**, 252, 296
 Immunocytochemical markers, **177**
 Immunoglobulin, **238**
 Immunophenotyping, of lymphoma, **238**
 Inclusion bodies, in urine, 99, **99**
 Infarction. See *specific sites*
 Infection. See *also specific sites*
 of breast, nipple discharge in, 70
 Infectious arthritis, synovial fluid in, 67-68
 Infectious colitis, 90, **90**
 Infectious mononucleosis, 250
 Infiltrating ductal carcinoma, of breast, 269-270
 Infiltrating lobular carcinoma, of breast, 257
 Inflamed red chromatin, 14, **14**
 Inflammation
 of adrenal cortex, 352-353
 of breast, nipple discharge in, 70
 of central nervous system, 119-121
 of cervix, 14, **14**, 16-18, **16-17**
 of lung, 282, **282**
 respiratory, granulomatous, 35-36, **35**
 of stomach, 86
 of thyroid gland, 208-210, **208-210**
 Inflammatory atypia, of oral cavity, 74, **74**
 Inflammatory bowel disease, 85, 90, **90**, 318
 Inflammatory carcinoma, of breast, 260, 275-276
 Inflammatory cells
 in nipple discharge, 69
 in synovial fluid, 67, **67**
 in urine, 98
 Inflammatory malignant fibrous histiocytoma, 172, **172**
 Inflammatory pseudotumor, of lung, 284-285
 Informed consent, 134-135
 "Ink dots," 44
 Insular carcinoma, of thyroid gland, 221-222, **221**
 Insulinoma, **334**, 335
 Intermediate cells, of cervix, 1, **1**
 Interstitial cell tumor. See Leydig cell tumor
 Intestinalization, 82-83, **83**
 Intestinal metaplasia, 82-83, **83**
 Intestinal T-cell lymphoma, 244
 Intestine. See Colorectum; Small intestine
 Intracytoplasmic lumens, 144, **144**, 146
 in breast cancer, 58, **58**, 128, 268, 273, **274**
 in hepatocellular carcinoma, **313**, 314
 Intraductal papilloma, nipple discharge in, 70-71, **70**
 Intranuclear cytoplasmic invaginations, 147, **147**, 151, 160
 artifacts that mimic, 216, **216**
 in bronchioloalveolar carcinoma, 289, **289**
 in cervical paraganglioma, 181
 in hepatocytes, 307, **308**
 in insular carcinoma of thyroid, 222
 in papillary thyroid carcinoma, 216-217, **216**
 in thyroid neoplasms, 215, 217
 Intrauterine device (IUD), 15-16, **16**, 389, **389**
 Intravenous pyelogram, 337
 Iodine deficiency, 211
 Iron, in liver, 309
 Islet cell(s), 324
 Islet cell hyperplasia, 335
 Islet cell tumor, 93, 158, **158**, 333-335, **334-335**
 IUD. See Intrauterine device
- J**
 "Jelly belly," 51, 59, 144
 Joints, synovial fluid in diseases of, 67-68, **68**

- K**
- Kaposi sarcoma, 166, 170
- Karyorrhexis, massive, 60, **60**
- Keratin, 44, 64, **64**, **128**, 175-176, **177**, 291, 298, 320, 369
- Keratinization, 38-40, 75, 146, 182, 286
- Keratinizing dysplasia, of cervix, 7-8, **8**, 11, 14
 high-grade, **8**, **8**
 low-grade, **8**, **8**
- Keratinizing squamous cell carcinoma, 141-142, **142**
 of cervix, 10-11, **10-11**
 of esophagus, 79, **79**
 of lung, 38-39, **38**, 41, 286-287, **286**
 of oral cavity, 75
 of urinary tract, 110, **110**
- Ki-1. See CD30
- Kidney
 abscess of, 338
 adenocarcinoma of, 146, 346
 adenoma of, papillary, 341
 angiomyolipoma of, 339-340, **339-340**, 347
 benign disease of, 338-340, **338-340**
 cancer of, **146**, 340-347, **341-347**
 in children, 347-349, **347-349**
 metastatic to liver, 319
 metastatic to lung, 297
 metastatic to mediastinum, 305
 metastatic to pancreas, 329
 metastatic to thyroid gland, 224
 cancer of renal pelvis, 108-109
 cells of, 337-338, **338**
 clear cell carcinoma of, 156, **156**
 clear cell sarcoma of, 349
 collecting duct carcinoma of, 344, **345**
 cyst of, 338, **338**
 fine needle aspiration biopsy of, 337
 infarction of, 339
 leiomyosarcoma of, 347
 lymphoma of, 346-348, **346**
 mesoblastic nephroma of, 349
 metastatic disease of, 347, **347**
 oncocytic carcinoma of, 346
 oncocytic neoplasms of, 345-346, **346**
 oncocytoma of, 341, 343, 345-346, **346**
 papillary carcinoma of, 343, **343-344**
 renal cell carcinoma of. See Renal cell carcinoma
 rhabdoid tumor of, 348-349, **349**
 sarcoma of, 347
 squamous cell carcinoma of, 346
 stones of, 109
 urothelial carcinoma of, 346, **346**
 Wilms tumor of, 347-348, **347-349**
 xanthogranulomatous pyelonephritis of, 339, **339**
- Kidney transplant
 rejection of, 98
 urinary tract cytology after, 98, 102-103, **102**
- Kikuchi lymphadenitis, 231, **231**
- Kite cells, 13, **13**
- Klebsiella*, 310
- Klinefelter syndrome, 279
- Koilocytes, 6, 12, **12**, 110, **110**, 373, 381, 385, **385**
- Krukenberg tumor, 370
- Kulchitsky cells, 44-45, 81
- L**
- lacrosse, ii
- Lactating adenoma, of breast, 261-262, **262**
- Lactating sinus granuloma, 70, **70**
- Lactational hyperplasia. See Lactating adenoma
- Lactobacilli, 374, 382, **382**
- Lacunar cells, 250-251, **250**
- Langerhans histiocytes, 248
- Langerhans histiocytosis, 28, 117, 126, 223, 248, **248**
- Langhans giant cells, 35
- Large cell cleaved lymphoma, 241, **241**
- Large cell lymphoma, 126, **126**, 149, **149**, 240-242, **241-242**, 244, 249, 296, 301-302, **302-303**
- Large cell neuroendocrine carcinoma, 159, **159**
 of lung, 291-292, **291**
- Large cell noncleaved lymphoma, 241, **241**
- Large cell undifferentiated carcinoma
 of lung, **42**, 43, 288, 292, **292**
 of stomach, 86-87
- Large cleaved cells, of lymph nodes, 230
- Large duct tumor, of breast, 274-275, **275**
- Large noncleaved cells, of lymph nodes, 230
- Laser therapy, urine cytology and, 104, **104**
- LCR, 239
- Lead poisoning, 102, **102**
- LE cells
 in body cavity fluids, 54, **54**
 in lymph nodes, 231
 in synovial fluid, 67
- Leiomyoma, 163, 169
 atypical, 173
- Leiomyosarcoma, 22, 61, 163, **163**, **166**, 169, **169**, 175, **177**
 of colorectum, 92, **92**
 epithelioid, 155, **166**, 177, **177**
 of kidney, 347
 poorly differentiated, 173, **173**
- Lennert lymphoma, 149, 244-245
- Leptomeningeal cells
 in cerebrospinal fluid, 118, **118**
 undifferentiated, 118, **118**
- Leptothrix*, 15
- Letterer-Siwe disease, 126, 248
- Leukemia, 172
 acute lymphoblastic, 125, **125**, 242, 302, 362
 acute monocytic, 125
 acute myelogenous, 125
 acute nonlymphocytic, 125
 of breast, **276**, **277**
 of central nervous system, 124-125, **125**, **128**
 chronic lymphocytic, 234
 chronic myelogenous, 125
 hairy cell, 253-254, **253**
 lymphosarcoma cell, 149
 malignant effusion in, 60-61
 myelogenous, 61
 of testis, 362, **362**
- Leukemic lymphadenopathy, 252-254, **253**
- Leukocyte(s), **141**, 147-152, **147-152**
- Leukocyte common antigen. See CD45

- Leukoplakia
 of esophagus, 76
 of oral cavity, 73-74
 of urinary tract, 109-110
- Leydig cells, 361
- Leydig cell tumor, 363, **363**
- L&H cells, 250-251
- Liesegang rings, 338, **338**
- Lipid, cytoplasmic, 146, **146**
- Lipid pneumonia, 31, 283, **283**
- Lipid-rich carcinoma, of breast, 272, **272**
- Lipoblasts, 171, 174, **174**
- Lipofuscin
 in adrenal cortical cells, 352, **352**
 in liver, 308, **309**
- Lipoma, 163, 166
 of mediastinum, 305
 pleomorphic, 172
 of salivary gland, 202
 spindle cell, 168, **168**
- Lipophages
 in benign fibrous histiocytoma, 168
 in cerebrospinal fluid, 117
 in fat necrosis, 261
 in lipid pneumonia, 283
 in malignant effusion, 57
 in respiratory specimen, 31
- Liposarcoma, **163**, 164, **166**, 167-168, **177**
 myxoid, 174, **174**
 pleomorphic, 164, 166, 172, **173**
 round cell, 164, **170**, 171
- Liquid-based techniques, 27
- Lithiasis, intrahepatic, 318
- Liver
 abscess of, 49, 310, **310**
 angiosarcoma of, 319, **319**
 benign tumors of, 310-312, **310-312**
 bile duct adenoma and hamartoma of, 312, **312**
 cancer of, 313-320
 metastatic to pancreas, 329
 cells of, 307-308, **307-309**
 cholangiocarcinoma of, 317-318, **318**
 cirrhosis of. See Cirrhosis
 cysts of, 310, **310**
 diffuse disease of, 309
 fibrolamellar carcinoma of, 157
 focal nodular hyperplasia of, 311-312, **311**
 granuloma of, 310, **310**
 hemangioma of, 310-311, **310-311**
 hematoma of, 310
 hepatoblastoma of, 316-317, **317**
 hepatocellular carcinoma of. See Hepatocellular carcinoma
 inclusions and pigments in, 308-309, **309**
 lymphoma of, 319
 metastatic disease of, 319-320, **319-320**
 nodular disease of, 310-320
 sarcoma of, 318-319, **319**
- Liver cell adenoma, 308, 311-312, **312**
- Liver sinusoid, 307
- Lobular carcinoma, of breast, 273-274, **274**, 279
 infiltrating, 257
 intracytoplasmic lumens in, 273, **274**
 plasmacytoid cells in, 273, **274**
 single file chains in, 273, **274**
- Löffler pneumonia, 37, **37**, 53
- Low-grade squamous intraepithelial lesion (LSIL), 4, **5**, **7**, 384-385, **385**
- LSIL. See Low-grade squamous intraepithelial lesion
- Lubricant, 378
- Lung. See also Respiratory cytology
 acinic cell tumor of, 295
 adenocarcinoma of, 40-42, **40-42**, **57**, 63-64, **65**, 146, 283, 287-290, **288-289**, 297-298
 adenoid cystic carcinoma of, 46, 295
 adenoma of, pleomorphic, 295
 adenosquamous carcinoma of, 45, **45**
 benign diseases of, 282-285, **282-285**
 biphasic epithelial and mesenchymal tumors of, 295-296, **295-296**
 cancer of, 38-47, 285-297
 cell of origin in, 294-295, **294-295**
 diagnosis of metastases in urine specimens, 112
 malignant effusion in, **57-58**, 58
 metastatic to adrenal gland, 357
 metastatic to breast, **277**, **277**
 metastatic to central nervous system, 127-128, **128**
 metastatic to kidney, 347
 metastatic to liver, 319, **319**
 metastatic to mediastinum, 305
 metastatic to pancreas, 329
 metastatic to stomach, 87
 metastatic to thyroid gland, 224
 pericardial effusion in, 50
 pleomorphic tumor cells in, 174
 pulmonary effusion in, 49
 tumor heterogeneity, 294-295, **294-295**
 carcinoid tumor of, 45-46, **45**, 293-294, **293-294**
 atypical, 46, 294, **294**
 spindle cell, 46, 294, **294**
 typical, **45**, 46, 293-294, **293**
 carcinoma in situ of, 40
 carcinosarcoma of, 47, 296, **296**
 clear cell tumors of, 295, **295**
 fibroxanthoma of, 284-285
 fine needle aspiration biopsy of, 281
 germ cell tumor of, 43, 47, 292
 giant and spindle cell carcinoma of, 43, 293, **293**
 giant cell carcinoma of, 43, **43**, 286, 292-293, **293**
 granular cell tumor of, 46
 granuloma of, 282-283, **282**
 hamartoma of, 284, **284**
 Hodgkin lymphoma of, **46**, 47
 infections of, 36-37, **36**, 49
 inflammatory disease of, 282, **282**
 inflammatory pseudotumor of, 284-285
 large cell neuroendocrine carcinoma of, 291-292, **292**
 large cell undifferentiated carcinoma of, **42**, 43, 288, **292**, **292**
 in lipid pneumonia, 283, **283**

- lymphoma of, **46**, 47, 296-297
- melanoma of, 43
- metastatic disease of, 43, **46-47**, 47, 297
- mucoepidermoid carcinoma of, 46-47, 295
- mycosis fungoides of, 47
- non-small cell carcinoma of, 128, **128**, 146
- oncocytoma of, 295
- parakeratosis of, 33-34, **33**
- plasma cell granuloma of, 284-285
- poorly differentiated adenocarcinoma/undifferentiated carcinoma of, 43, 292
- pseudokeratosis of, 40, 287
- pulmonary blastoma of, 47
- pulmonary infarction, 283-284, **283**
- repair/regeneration processes in, 39-40
- reserve cell hyperplasia of, 33, **33**
- rheumatoid disease of, 36, 50
- salivary gland analog tumors of, 46-47, 295
- sarcoma of, 43, 47, 296
- sclerosing hemangioma of, **284-285**, 285
- small cell carcinoma of, 33, 40, 43-46, **43-44**, **153**, 286-287, 290-291, **290-291**, 294, **319**, 356
 - differential diagnosis of, 45
 - intermediate type, 44-45, **44**
 - metastatic to central nervous system, 127-128, **128**
 - oat cell type, 44, **44**
 - variants of, 45
- squamous cell carcinoma of, 28, 38-40, **38-39**, 283-284, 286-288, **286-287**
 - keratinizing, 38-39, **38**, 41, 286-287, **286**
 - nonkeratinizing, 39-40, **39**, 287-288, **287**
- squamous dysplasia of, 40
- squamous metaplasia of, 33, **33**, 37, 40
- transbronchial needle biopsy of, 281-282
- Lupus lymphadenitis, 231
- Luteinized cells, 367, **367**
- Lyme disease, 120
- Lymphadenitis, 232-233
 - acute, 232, **232**
 - chronic, 147-148, **147**, 232-233, **233**
 - granulomatous, 233, **233**
 - Kikuchi, 231, **231**
 - lupus, 231
- Lymphadenopathy
 - dermatopathic, 248
 - leukemic, 252-254, **253**
- Lymphangioma, of mediastinum, 305
- Lymph node, 227, **227**. See also Lymphoma
 - anatomic and functional compartments of, 227, **228-229**
 - cells of, 227-232
 - follicular hyperplasia of, 227
 - lymphadenitis, 232-233, **232-233**
 - metastatic disease of, 234, **234**
 - reactive, 248
 - reactive hyperplasia of, 240
- Lymphoblast(s), 118, 125, **125**, 230, 242
- Lymphoblastic lymphoma, 60, **60**, 126, 150, **150**, 153, 242-244, **242**, 301-302, **303**
- Lymphocytes
 - in body cavity fluids, 53
 - in cerebrospinal fluid, 116, **116**
 - in Hashimoto thyroiditis, 209
 - in lymph nodes, 230, **230**
 - small, 148, **148**, 230, **230**
 - in urine, 102
- Lymphocytic thymoma, 299
- Lymphocytosis, reactive, 60
- Lymphoepithelial cyst, 179-180, **180**
- Lymphoepithelial T-cell lymphoma. See Lennert lymphoma
- Lymphoepithelioma. See Nasopharyngeal carcinoma
- Lymphoglandular bodies, 161, 231-232, **232**
- Lymphohistiocytic aggregates, 231, **231**
- Lymphoid follicle, 227
- Lymphoid hyperplasia, benign reactive, 252
- Lymphoid immunophenotypes, **228-229**
- Lymphoid morphology, **228-229**
- Lymphoid tissue, in salivary gland, 188
- Lymphoma, 53, 139-140, **139-140**, 148, **148**, 172, 231. See also Hodgkin lymphoma; Non-Hodgkin lymphoma
 - in AIDS, 240-241, 243
 - anaplastic, 297
 - anaplastic large cell (CD30/Ki-1), 227, 234, 246-247, **246**, 249
 - angiocentric T-cell, 244
 - B-cell, 234
 - B-immunoblastic, 241-242, **242**
 - biology of, 234-235
 - of breast, 277, **277**
 - Burkitt, 126, 150, **150**, 153, 235, 242-244, **243**, 346
 - of central nervous system, 124, 126, **126**, **128**
 - in child, 153, **154**
 - classification of, 234
 - of colorectum, 90, 92
 - cutaneous T-cell, 246
 - fine needle aspiration biopsy in, 235, **235**
 - follicular, 231, **234**, 235
 - follicular center cell, 227, 234
 - granular cell, 157
 - hepatosplenic, 244
 - immunoblastic, 85, **85**, **126**, 149, **149**, 252, 296
 - immunophenotyping of, **238**
 - intestinal T-cell, 244
 - of kidney, 346-348, **346**
 - large cell, 126, **126**, 149, **149**, 240-242, **241-242**, 244, 249, 296, 301-302, **302-303**
 - large cell cleaved, 241, **241**
 - large cell noncleaved, 241, **241**
 - Lennert, 149, 244-245
 - of liver, 319
 - of lung, **46**, 47, 296-297
 - lymphoblastic, 60, **60**, 126, 150, **150**, 153, 242-244, **242**, 301-302, **303**
 - lymphoepithelial T-cell. See Lymphoma, Lennert
 - lymphoplasmacytic, 148, **148**, 239, **239**, 252, 296
 - lymphoplasmacytoid, 227
 - malignant effusion in, 56, **56**, 60-62, **60-61**
 - mantle cell, 234, 239, 247-248, **248**, 296
 - marginal zone, 247, **247**
 - of mediastinum, 301-302, **302-303**
 - mixed, 148-149, 235, 240, 244
 - monocytoid B-cell, 247, **247**
 - atypical Burkitt, 150, **150**, 153, 242-244, **243**



- peripheral T-cell, 244-245
 - REAL classification of, 234, **236**
 - of salivary gland, 191, 202, **202**
 - small cell, 235
 - small cleaved, 60, 126, 148-149, **149**, 239-240, **240**, 244, 296
 - of small intestine, 88-89
 - small lymphocytic, 148, **148**, 235-239, **235**, **239**, 244
 - small noncleaved, 126, 234, 242-244, **243**, 296-297
 - of stomach, 85-86, **85**
 - T-cell, 227, 234-235, 244-246, **244-245**
 - of testis, 362, **362**
 - of thyroid gland, 219, 222-223, **222**
 - T-immunoblastic, 246
 - true histiocytic. See Malignant histiocytosis
 - of urinary tract, 111, **111**
 - WHO classification of, 234, **237**
 - Lymphoplasmacytic lymphoma, 148, **148**, 239, **239**, 252, 296
 - Lymphoplasmacytoid cells, 158, **158**
 - Lymphoplasmacytoid lymphoma, 227
 - Lymphoreticular system, cancer of
 - ascites in, 50
 - malignant effusion in, 60-61
 - pleural effusion in, 49
 - Lymphosarcoma cell leukemia, 149
- M**
- Macroblasts, 242
 - Macrocytes, **12**, 13, 17, 75, **75**
 - Macroglobulinemia, Waldenström, 151, 239, 252
 - Macronodular cirrhosis, 309
 - Macronucleus, 182, **183**
 - Macrophages. See *also* Histiocytes
 - alveolar, 30-31, **31**
 - in cerebrospinal fluid, 116-117
 - hemosiderin-laden, 31, **31**, 55
 - lipid-laden, 31
 - tingible body, 147-148, 150, 209, **210**, 231, **231**
 - Major leukocyte antigens, **238**
 - Malakoplakia, of urinary tract, 102, **102**
 - Male breast
 - cancer of, 279, **279**
 - gynecomastia, 278-279, **278**
 - Male genital system, 361-362
 - Malignant effusion, 52, 55-62, **55-62**
 - in adenocarcinoma, 56-59, **56-59**
 - in breast cancer, 58, **58**
 - in carcinoid tumor, 61
 - in child, 62
 - in colorectal cancer, 58, **59**
 - in gastric cancer, 58
 - general features of, 56, **56**
 - in germ cell tumor, 62, **62**
 - in hepatocellular carcinoma, 59, **59**
 - in leukemia, 60-61
 - in lung cancer, **57-58**, 58
 - in lymphoma, 56, **56**, 60-62, **60-61**
 - in melanoma, 56, 61, **61**
 - in myeloma, 60
 - in ovarian cancer, 56-59, **57**, **59**
 - in pancreaticobiliary cancer, 58
 - in prostate cancer, 59
 - in pseudomyxoma peritonei, 59
 - in renal cell cancer, 58, **58**
 - in sarcoma, 56, 59, 61-62, **61-62**
 - in small cell carcinoma, 59-60, **60**
 - in squamous cell carcinoma, **56**, 59, **59**, 61
 - synovial, 68
 - in thyroid cancer, 59
 - tumor diagnosis, 56-57, **56-57**
 - “Malignant fibrous histiocytoma,” 61, 152, **163**, 164, 165-168, **166**, 172, **172**, **177**
 - inflammatory, 172, **172**
 - myxofibrosarcoma, 172, **172**, 174-175
 - Malignant glandular PNST, 176
 - Malignant histiocytosis, 117, 126, 149, 227, 249
 - Malignant lymphoma. See Lymphoma
 - Malignant mixed tumor; of salivary gland, 200, **200**
 - Malignant peripheral nerve sheath tumor (MPNST), 155, **163**, 165, **166**, 170, **170**, 173, **173**, 175-176, 304, **304**
 - Mallory bodies, 308, 315, **315**
 - Malnutrition, 189
 - MALToma, 85-86, 223, 247, 277, 296
 - Mammography, 257-258
 - Mammoplasia, 278
 - Mantle cell lymphoma, 234, 239, 247-248, **248**, 296
 - Marginal vacuoles. See Flame cells
 - Marginal zone lymphoma, 247, **247**
 - Martian popping thing, 328, **328**
 - Mast cells, 176, 196, **196**
 - Mastitis
 - acute, 259-260
 - granulomatous, 260-261
 - Maturation index, 2-3, **2-3**
 - Mature teratoma
 - cystic, 366, **366**
 - of mediastinum, 301, **302**
 - Mediastinum
 - choriocarcinoma of, 301, **302**
 - cyst of, 298, **300**
 - embryonal carcinoma of, 301
 - endodermal sinus tumor of, 301
 - germ cell tumors of, 301, **302**
 - hemangioma of, 305
 - lipoma of, 305
 - lymphangioma of, 305
 - lymphoma of, 301-302, **302-303**
 - mesenchymal tumors of, 305
 - metastatic disease of, 305
 - neurogenic tumors of, 302-304
 - teratoma of
 - immature, 301
 - mature, 301, **302**
 - thymic carcinoid of, 300
 - thymoma of, 298-300, **300-301**
 - Medullary carcinoma
 - of breast, 257, 273, **273**

- of thyroid gland, 158, **158**, 161, 184, 217-219, **218-220**
 - amyloid in, 218, **218-219**
 - granular, 218
 - plasmacytoid cells in, 218, **218**
 - pleomorphic, 218, **218**
 - spindle cells in, 218, **218**
- Medullary thymoma, 299
- Medulloblast(s), 118
- Medulloblastoma, 123, **123**, 128
- Megakaryocytes, 54, **54**, 152, **152**, 254, 352, **352**
- Meigs syndrome, 49
- Melan-A, 357
- Melanin, 160
- Melanoma, 139-140, **139-141**, 159-160, **160**, 172, 249
 - amelanotic, 160
 - anaplastic tumor cells in, 174
 - balloon cell, 156, **156**
 - cytoplasmic lipid in, 146
 - cytoplasmic texture in, 157
 - D-MINS, 160, **160**
 - gland-like cells in, **142**
 - immunocytochemical markers in, **177**
 - intracellular cytoplasmic invaginations in, 147, **147**, 160
 - of lung, 43
 - malignant effusion in, 56, 61, **61**
 - metastatic
 - to adrenal gland, 357
 - to breast, 277-278, **277**
 - to central nervous system, 128-129, **129**
 - to cervix, 23
 - to kidney, 347
 - to liver, 320
 - to lung, 47, **47**, 297
 - to lymph nodes, 234
 - to mediastinum, 305
 - to pancreas, 329
 - to salivary gland, 203, **203**
 - to stomach, 87
 - myxoid stroma in, **161**
 - of nipple, 71
 - of oral cavity, 75
 - spindle cell, 165, 170-171
 - unknown primary tumor, 140
 - of urinary tract, 112, **112**
- Meningioma, 127, 166
- Meningitis
 - bacterial, 119, **119**
 - Mollaret, 121
 - tuberculous, 119
 - viral, 119-120
- Menstrual cycle, changes in vaginal mucosa, 2, **2**
- "Mercury droplets," 60, **60**
- Mesenchymal cells, reactive, 77, **77**
- Mesenchymal chondrosarcoma, 171
- Mesenchymal tumor, 163
 - of mediastinum, 305
 - of salivary gland, 202-203, **202**
- Mesoblastic nephroma, 349
- Mesothelial cells, 141, **141**, 324
 - in body cavity fluids, 51-52, **51-52**
 - in body cavity washings, 64, **64**
 - "hugging," 52, **52**
 - multinucleate, 52
 - reactive, 51-52, **51**, 64, 141
 - signet ring appearance of, 52, **52**
 - "skirt," 52, **52**
 - "window" between adjacent cells, 51, **52**
- Mesothelial cyst, of adrenal cortex, 352
- Mesothelial hyperplasia, 54
- Mesothelioma, 52, 61-64, **62-64**
 - biphasic pattern in, 298, **298**
 - collagen balls in, 63, **63**
 - epithelial cells in, 298, **298-299**
 - giant tumor cells in, 298, **299**
 - immunoreactions of, 64, **65**
 - myxoid stroma in, 298, **299**
 - of pleura, 297-298, **298-299**
 - pleural effusion in, 49
 - "skirts," 63, **63**
 - special studies in, 63-64, **64**
 - spindle cells in, 298, **298-299**
 - "window" between adjacent cells, 63, **63**
- Metaplasia. See *specific types and sites*
- Metaplastic carcinoma, of breast, 272-273, **273**
- Metaplastic dysplasia, of cervix, 7-8, **8**, 13
 - immature, **8**, **8**
 - mature, **8**
- Metastatic disease
 - of adrenal medulla, 357-358
 - of breast, 277-278, **277**
 - cells in Pap test, 22-23, **22-23**
 - of central nervous system, 127-129, **127-129**
 - diagnosis in urine specimen, 112, **112**
 - of kidney, 347, **347**
 - of liver, 319-320, **319-320**
 - of lung, 43, **46-47**, 47, 297
 - of lymph nodes, 234, **234**
 - of mediastinum, 305
 - of ovary, 370
 - of pancreas, 329
 - of salivary gland, 203, **203**
 - of stomach, 87
 - of thyroid gland, 224, **224**
- Methimazole, 224, **224**
- Michaelis-Gutmann bodies, 102, **102**
- Microacinar complex, 146, **146**
- Microbiology, 373-378
- Microcystic adenoma. See Serous cystadenoma
- Microglandular hyperplasia, 19, **19**
- Microinvasive carcinoma, of cervix, 8-9, **9**
- Micronodular cirrhosis, 309
- Microorganisms, 373-378
 - in body cavity fluids, 54, **54**
- Midline tumor, 123-124
- Mikulicz disease, 191
- Milk cyst, 261, 263
- Mite, 378
- Mitomycin, urine cytology and, 103
- Mixed hepatoblastoma, 317
- Mixed lymphoma, 148-149, 235, 240, 244
- Mixed müllerian tumor, malignant (MMMT), 22, **22**, 370-371, **371**
 - carcinomatous component of, **371**
 - cytology in peritoneal washings, 66, **66**



- MMMT. See Mixed müllerian tumor, malignant
MOC-31, 64
Mollaret meningitis, 121
Molluscum contagiosum virus, 373, **373**
Monoblasts, **125**
Monoclonal gammopathy, 251
Monocytes, in cerebrospinal fluid, 116, **116**
Monocytoid B-cell lymphoma, 247, **247**
Monomorphic adenoma, of salivary gland, 194-196
Monophasic synovial sarcoma, 165, **166**, 169
Mott cells. See Russell bodies
Mucicarmine stain, 120, **120**, 143-144
Mucin, 143-144, **144**, 320, **320**
Mucinous carcinoma. See also Colloid carcinoma
 bronchioloalveolar, 289, **289**
 of endometrium, 22
 of ovary, 369
Mucinous cystadenocarcinoma, of pancreas, 332
Mucinous cystadenoma, of ovary, 369, **369**
Mucinous cystic neoplasms
 bland cells in, 331, **331**
 of pancreas, 331-332, **331-332**
Mucinous effusion, 51
Muciphages, 190, 199
Mucoepidermoid carcinoma
 of breast, 276
 of lung, 46-47, 295
 of salivary gland, 190, 198-199, **198-199**, **203**
 high-grade, 198-199, **198-199**
 low-grade, 198-199, **198**
 of thyroid gland, 223, **223**
Mucor, 375-376, **376**
Mucous acinic cells, of salivary gland, 188, **188**
Mucous cells, of stomach, 81-82, **82**
Mucus-producing adenocarcinoma, of salivary gland, 201
Müllerian tumor. See Mixed müllerian tumor, malignant
Multinucleated giant cells, 55
Multiple endocrine neoplasia, 89, 158, 218, 293, 300, 304, 334, 355
Multiple myeloma, 54, 251
Multiple sclerosis, 117, 124
Mummified Reed-Sternberg cells, 250
Mumps, 190
Myasthenia gravis, 299
Mycobacteria, 353, 373-374, **374**
Mycosis fungoides, 47, 126-127, 244, 246, **246**
Myeloblasts, 125, **125**, 253
Myelocytes, 253
Myelogenous leukemia, 61
Myeloid metaplasia. See Extramedullary hematopoiesis
Myelolipoma, 152, 253
 of adrenal cortex, 352, **352**
Myeloma, 128
 malignant effusion in, 60
 multiple, 54, 251
 plasma cell, 251-252, **251-252**
 urine cytology in, 111
Myeloproliferative disorder, 54
Myleran. See Busulfan
Myoepithelial cells, 194
 of breast, 258-259
 of salivary gland, 188, **188**
Myoepithelioma, of salivary gland, 195-196
Myofibroblast(s), 147, **155**, 167, 284-285
Myofibroblastoma, 284
Myositis, proliferative, 167
Myxedema, 50
Myxofibrosarcoma, 172, **172**, 174-175
Myxoid chondrosarcoma, 167, 175, **175**
Myxoid liposarcoma, 174, **174**
Myxofibrosarcoma, 172, **172**, 174-175
Myxoid sarcoma, 166
Myxoid tumor, of soft tissue, 174-175, **174-175**
Myxolipoma, 174
Myxoma, 174, **174**
- ## N
- Naegleria fowleri*, 120
Naked nuclei
 in adrenal cortical cells, 352, **352**
 in breast, 258-259, **258**
 in hepatocellular carcinoma, 314, **314**
Nasopharyngeal carcinoma, 155, 182, **182-183**
 Regaud pattern, 182
 Schmincke pattern, 182
Navicular cells, 23, **23**
Necrosis, 161
Necrotizing pneumonia, 33
Nephritis, 98
Nephroblastoma. See Wilms tumor
Nephroma, mesoblastic, 349
Nerve sheath tumor, 165-167, **177**
 benign, 169
 of salivary gland, 202-203, **202**
Neural crest tumor, 123, **123**, **128**
Neuroblast(s), 357
Neuroblastoma, 62, **62**, 123, 127, 154, **154**, 158, **158**, **163**, 164, 166, **166**, 171, **171**, 348
 of adrenal medulla, 356-357, **357**
 of mediastinum, 303
Neuroectodermal tumor, 171, **171**
Neuroendocrine cells, **141**, 157-159, **157-159**
Neuroendocrine markers, 44
Neuroepithelioma, 158, **158**
Neurofibroma, 166, 169, 303
Neurofilaments, **177**
Neurogenic tumor, of mediastinum, 302-304
Neuroglial cells, in cerebrospinal fluid, 117
Neuroma, traumatic, 163, 175
Neurons, in cerebrospinal fluid, 117-118, **118**
Neuron-specific enolase, 171, **177**, 291, 335
Neuropil, 154
Neurosecretory granules, 157, 159, **159**, 291, 335, 356
Neurosyphilis, 117
Neutrophils
 in body cavity fluids, 53
 in cerebrospinal fluid, 116, **116**
Newborn, vaginal mucosa of, 3
Nipple, melanoma of, 71

- Nipple discharge
 in breast cancer, 71, **71**
 cells in, **69, 69**
 cytology of abnormal discharge, 70-71, **70**
 in Paget disease, 71
- NK cell lymphoma, 244
- Nocardia*, 374, **374**
- Nodular fasciitis, 155, **155**, 165, 167, **167**, 175
- Nongonococcal urethritis, 15
- Non-Hodgkin lymphoma, 126, 148-150, **148-150, 238**
 biology of, 234-235
 centroblastic, **238**, 240-242, **240-241**
 centrocytic, 240-241, **240-242**
 immunoblastic, **238**
 of breast, 277
 of gastrointestinal tract, 85-86
 of kidney, 346
 of liver, 319
 of lung, 47
 of mediastinum, 302, **302-303**
 of salivary gland, 202, **202**
 of thyroid gland, **222, 223**
- Nonkeratinizing squamous cell carcinoma, 141, **141**
 of cervix, 10, **10**
 of esophagus, 79, **79**
 of lung, 39-40, **39, 287-288, 287**
 of oral cavity, 75
- Nonmucinous bronchioloalveolar carcinoma, 289-290
- Non-small cell carcinoma, of lung, 146
 metastatic to central nervous system, 128, **128**
- Nuclear grooves
 in papillary thyroid carcinoma, 216, **216**
 in solid and papillary epithelial neoplasm, 332, **333**
- Nuclear pseudoinclusions, 147
- Nucleocytoplasmic polarity, 142-143, 288
- O**
- Oat cell carcinoma, of lung, 44, **44**
- Oleic acid crystals, 261
- Oligodendrocytes, in cerebrospinal fluid, 117
- Oligodendroglioma, 122
- Oncocytes, 196, **196, 207**
 of salivary gland, 188, **188**
- Oncocytic carcinoma
 of kidney, 346
 of salivary gland, 197, **197**
- Oncocytic metaplasia, of thyroid gland, 220
- Oncocytic neoplasm, 156-157, **157**
 of kidney, 345-346, **346**
- Oncocytoma
 of kidney, 341, 343, 345-346, **346**
 of lung, 295
 of salivary gland, 188, 197, **197, 200**
- Oral cavity
 cancer of, 73
 cells of, 73, **73**
 erythroplasia of Queyrat of, 73
 hyperkeratosis of, 74
 inflammatory atypia of, 74, **74**
 leukoplakia of, 73-74
 malignant disease of, 75, **75**
 melanoma of, 75
 parakeratosis of, 74
 pemphigus vulgaris of, 74, **74**
 radiation effect on, 75, **75**
 repair/regenerative processes in, 74, **74**
 squamous cell carcinoma of, 73, 75, **75**
 keratinizing, 75
 nonkeratinizing, 75
- Orchitis, 362
- Ossification, 167
- Osteoarthritis, synovial fluid in, 67
- Osteoclast(s), 152
- Osteoclastic giant cell tumor, of pancreas, 328, **329**
- Osteogenic sarcoma, 164
- Osteoid, 173
- Osteosarcoma, **163, 166**, 167, 170, 173, **173**
 small cell, 171, **171**
- Ovary
 Brenner tumor of, 368
 cancer of
 ascites in, 50
 cytology in peritoneal washings, 66
 effusions in, 54
 malignant effusion in, 56-59, **57, 59**
 metastatic to breast, 277
 metastatic to cervix, 23
 clear cell carcinoma of, 369-370, **370**
 cyst of
 benign, 367, **367**
 corpus luteum, 367, **367**
 endometriotic, 368
 functional, 367, **367**
 dysgerminoma of, 363-364
 endometrioid carcinoma of, 369, **369**
 epithelial tumors of, 368-370, **368-370**
 fibroma/thecoma of, 362, **362**
 metastatic disease of, 370
 mucinous carcinoma of, 369
 mucinous cystadenoma of, 369, **369**
 ovarian failure, 3
 papillary mesothelial hyperplasia of, 369
 serous carcinoma of, 368-369, **368**
 papillary, 63, 65, **65**
 serous cystadenoma of, 368-369
 serous tumor of, cytology in peritoneal washings,
 65, **65**
 small cell carcinoma of, 370
 undifferentiated carcinoma of, 370
- “Owl’s eye,” 143, 288
- Oxyphilic cells, of parathyroid gland, 183

- P**
- p53 gene, 6, 270, 348
- Paget disease, nipple discharge in, 71
- Palpation thyroiditis, 209
- Pancreas
- abscess of, 325
 - acinar cell carcinoma of, 333, **333**, 335
 - adenocarcinoma of
 - ductal, 327-329, **327-329**
 - well-differentiated, 327-328, **327-328**
 - adenosquamous carcinoma of, 329, **329**
 - anaplastic carcinoma of, 328-329, **329**
 - cancer of
 - metastatic to kidney, 347
 - metastatic to liver, 319
 - metastatic to ovary, 370
 - pleomorphic tumor cells in, 174
 - carcinoid tumor of, 333-335, **334-335**
 - cells of, 323-324, **323-324**
 - endocrine neoplasms of, 333-335, **334-335**
 - fine needle aspiration biopsy of, 323
 - giant and spindle cell carcinoma of, 328
 - islet cell tumor of, 333-335, **334-335**
 - metastatic disease of, 329
 - mucinous cystadenocarcinoma of, 332
 - mucinous cystic neoplasms of, 331-332, **331-332**
 - neoplastic cysts of, 329-332, **330-333**
 - osteoclastic giant cell tumor of, 328, **329**
 - pancreatitis, 324-326, **325-326**
 - pleomorphic giant cell carcinoma of, 328, **329**
 - pseudocyst of, 326, 330-331, **330**
 - serous cystadenoma of, 330-331, **330**
 - small cell carcinoma of, 329, 335
 - solid and papillary epithelial neoplasm of, 332, **332-333**
 - spindle cell carcinoma of, 328, **329**
- Pancreatic ductal carcinoma, 146
- Pancreaticobiliary cancer, 93, **93**
- malignant effusion in, 58
- Pancreatitis, 49, 52, 64, 324-326, **325-326**
- acute, 31, 50, 325
 - chronic, 325-326, **325-326**
- Papillae, 57, 145-146
- in papillary thyroid carcinoma, 216, **216**
 - in solid and papillary epithelial neoplasm, 332, **332**
- Papillary adenocarcinoma, of salivary gland, 201
- Papillary adenoma, of kidney, 341
- Papillary carcinoma
- of breast, 71, **71**, 274-275, **275**
 - of kidney, 343, **343-344**
 - of thyroglossal duct, 179
 - of thyroid gland, 147, 184, 209, 213, 215-217, **215-217**, 219, **220**, 222, 225
 - “cap,” 216, **216**
 - epithelioid giant cells in, 217, **217**
 - fibrovascular papillae in, 215, **215**
 - follicular variant of, 215
 - gummy colloid in, 217, **217**
 - intranuclear cytoplasmic invaginations in, 215-217, **216**
 - nuclear grooving in, 216, **216**
 - psammoma bodies in, 217, **217**
 - squamoid cytoplasm in, 217, **217**
- Papillary clusters, in urine, 97, **97**
- from retrograde urinary catheterization, 109
- Papillary mesothelial hyperplasia, of ovary, 369
- Papillary serous carcinoma
- of endometrium, 22
 - of ovary, 63, 65, **65**
- Papilloma
- of breast, 70-71, **70**, 262-264, **263**, 270, 274-275, **275**
 - of choroid plexus, 122, **122**
 - of esophagus, squamous, 79
 - of urinary tract, 105-106, **105**
- Pap test, 1-25. See also Cervix
- atypical squamous cells-undetermined significance in, 13, **13**, 15
 - benign cellular changes in, 14-18
 - benign proliferative reactions in, 3-4, **3-4**
 - cytology of glandular epithelium, 18-22
 - cytology of rare tumors, 22-23, **22-23**
 - cytology of squamous epithelium, 1-3
 - diagnostic errors in, 24
 - endocervical cells in, 18, **18**
 - endometrial cells in, 20
 - failure of, 24-25, **25**
 - failure of women to be screened, 25
 - high-risk patients, 25
 - after hysterectomy, 23-24
 - metastatic cells in, 22-23, **22-23**
 - miscellaneous findings in, 23-24, **24**
 - in postpartum period, 16
 - sampling errors in, 24
 - vaginal mucosal cells in, 2-3
- Parabasal cells, of cervix, 1, **1**
- Paracoccidioides*, 376
- Paracortical hyperplasia, of lymph node, 232
- Paranglioma, 158, **158**
- of adrenal medulla, 355-356
 - of extrahepatic biliary tract, 93
 - of mediastinum, 304-305
 - in neck, 181, **181**, 184, 217
- Paragonimus*, 377
- Parakeratosis
- of cervix, 383
 - of lung, 33-34, **33**
 - of oral cavity, 74
- Paraneoplastic syndrome, 44, 286, 292, 299, 341
- Parasites, 376-378, **377-378**
- Parathormone, 184, 334
- Parathyroid gland, 182-185
- adenoma of, 183-184, 217
 - carcinoma of, 184-185, **184-185**
 - cyst of, 179-181
 - hyperplasia of, 183, **183**
- Paravacuolar granules, 206, **206**
- Parietal cells, of stomach, 82, **82**
- Parotid gland, 187
- in HIV infection, 192-193
- PAX-5, **238**
- Pearls, 38, 59, **59**, 75, 142, **142**, 286
- Pelvic inflammatory disease, 15
- Pelvis, female, 367-371

- Pemphigus vulgaris, 74, **74**
Penicillium infection, 120
 Perforated viscus, 50
 Pericardial effusion, 50
 Perinephric abscess, 338
 Perinuclear halo, 14
 Peripheral T-cell lymphoma, 244-246
 Peritoneal washing, gynecologic cytology in, 64-66, **65-66**
 Pernicious anemia, 83
 Pessary, 4
 Phenelzine, 319
 Pheochromocytoma, 158
 of adrenal medulla, 355-356, **355-356**
 extra-adrenal, 304, 355
 fine needle aspiration biopsy in, 355-356
 Phycomycetes, 120
 Phyllodes tumor; of breast, 265-266, **266**
 Physaliphorous cells, 175, **175**
 Pia-arachnoid cells, in cerebrospinal fluid, 118, **118**
 "Pick and smear" technique, 27
 Pigmented villonodular synovitis, 68
 Pineal gland, tumors of, 123-124
 Pineoblastoma, 123-124
 Pineocytoma, 124
 Pinworm, 377
 Pituitary gland, adenoma of, 123
 Plant material, 378, **378**
 Plasma cell(s), 151, **151, 230**
 in cerebrospinal fluid, 117
 in Hashimoto thyroiditis, 209, **210**
 Plasma cell dyscrasias, 151
 Plasma cell granuloma, of lung, 284-285
 Plasma cell myeloma, 251-252, **251-252**
 crystals in, 252, **252**
 Dutcher bodies in, 252, **252**
 flame cells in, 252, **252**
 Russell bodies in, 252, **252**
 Plasmacytoid cells, 151, **151**
 in lobular carcinoma of breast, 273, **274**
 in medullary carcinoma of thyroid, 218, **218**
 Plasmacytoma, 227, 242
 of breast, 277
 of thyroid gland, 223
 urine cytology in, 111
 Pleomorphic adenoma
 of breast, 276
 of lung, 295
 of salivary gland, 188, 191-193, **192-194**, 200, 203, **203**
 cartilage in, **193**, 194
 epithelial cells in, 194, **194**
 fibrillar stroma, **193**, 194
 metachromatic stroma, 193, **193**
 sebaceous cells in, 194, **194**
 Pleomorphic giant cell carcinoma, of pancreas, 328, **329**
 Pleomorphic lipoma, 172
 Pleomorphic liposarcoma, 164, 166, 172, **173**
 Pleomorphic Reed-Sternberg cells, 250
 Pleomorphic rhabdomyosarcoma, 172-173
 Pleomorphic sarcoma, 160, **165-166**
 Pleomorphic tumor, of soft tissue, 172-174, **172-173**
 Pleura, mesothelioma of, 297-298, **298-299**
 Pleural effusion, 49
 Plummer-Vinson syndrome, 79
 PNET. See Primitive neuroectodermal tumor
 Pneumoconiosis, 37
Pneumocystis jiroveci (*P. carinii*), **26**, 27-28, 376, **376-377**
 Pneumocytoma. See Sclerosing hemangioma
 Pneumonia, 28, 53
 aspiration, 31
 giant cell interstitial, 37
 hypersensitivity, 28
 lipid, 31, 283, **283**
 Löffler, 37, **37**
 necrotizing, 33
 viral, 30, 36, **36, 42**
 Pneumothorax, complication of fine needle aspiration biopsy, 133
 Polka-dot cells, 13, **13**
 Pollen, 32, 378
 Polyarteritis nodosa, 53
 Polycystic kidney disease, 338
 Polymorphous low-grade adenocarcinoma, of salivary gland, 201
 Polyomavirus, 101
 Polyp
 of colorectum, adenomatous, **90-91**, 91
 of stomach, 83, **83**
 Polyploid cells, 250
 Polyvinyl chloride, 319
 Poorly differentiated adenocarcinoma/undifferentiated carcinoma, of lung, 43, 292
 Poorly differentiated adenoid cystic carcinoma, of salivary gland, 198
 Poorly differentiated leiomyosarcoma, 173, **173**
 Poorly differentiated squamous cell carcinoma, of cervix, 10, **10**
 Popcorn cells, 250
 Postmenopausal women, vaginal mucosa of, 3, 16
 Postpartum period, Pap test in, 16
 Postradiation dysplasia, of cervix, 18
 Powder, 378
 Pregnancy
 cervical changes in, 23, **23, 383**
 thyroid gland in, 225, **225**
 vaginal mucosa in, 2, **2**
 Primitive neuroectodermal tumor (PNET), 123, 154, **154**, 158, **158**, 164, 166, **166**, 171, **171**, **177**, 303, 356
 Procainamide, 54
 Proliferation center cells, 148, 239, **239**
 Proliferative fasciitis, 167
 Proliferative myositis, 167
 Prolymphocytes, 242
 Prostate
 adenocarcinoma of, 146
 urine cytology in, 111-112, **112**
 cancer of
 malignant effusion in, 59
 metastatic to breast, 277, 279
 metastatic to kidney, **347**
 metastatic to lung, 47, **47**
 metastatic to mediastinum, 305
 microacinar complexes in, 146, **146**
 Prostate-specific antigen, 279

- Prostatic cells, in urine, **98, 98**
- Proteinosis, alveolar, 32
- Proteus*, 339
- Psmammoma bodies
 in body cavity fluids, **54, 54, 63**
 in bronchioloalveolar carcinoma, **289, 290**
 in cerebrospinal fluid, 118
 in fine needle aspirate, 161
 in malignant effusion, 59
 in papillary thyroid carcinoma, 217, **217**
 in Pap test, 24
 in respiratory specimen, 32, **32, 42**
 in salivary gland, 189
 in urine, 99
- Pseudochylous effusion, 50, 54
- Pseudocolloid, **161**
- Pseudocyst
 of adrenal cortex, 352
 of pancreas, 326, 330-331, **330**
- Pseudogout, synovial fluid in, **68, 68**
- Pseudokeratinization, of vaginal mucosa, **2, 2**
- Pseudokeratosis, of lung, 40, 287
- Pseudolymphoma, of stomach, 86
- Pseudomaturation, of vaginal mucosa, 3
- Pseudomonas*, 339
- Pseudomyxoma peritonei, 51, 59, 144
- Pseudoparakeratotic cells, 19, **19**
- Pseudosarcoma, 155
- Pulmonary blastoma, 295-296, **295-296**
- Pulmonary edema, 32
- Pulmonary embolism, 30, 37, 52
- Pulmonary fibrosis, idiopathic, 28
- Pulmonary hemorrhage, 28
- Pulmonary hypertension, 134
- Pulmonary infarction, 30, 37, 42, 49, 52-53, 283-284, **283**
- "Pumpkin cells," 38
- Pyelogram
 effect on urinary cytology, 102
 intravenous, 337
- Pyelonephritis, xanthogranulomatous, 339, **339**
- R**
- RA cells. See Ragocytes
- Rb, 6
- Radiation effect
 in body cavity fluids, 52
 on breast, 278, **278**
 on cervix, 17, **17, 383, 383**
 on esophagus, 77-78, **78**
 on glandular cells, 34-35
 on oral cavity, 75, **75**
 on respiratory cytology, 34-35, **34**
 on squamous cells, 34
 on stomach, 83
 on thyroid gland, 224
 on urinary tract cytology, 104, **104**
- Radium, 319
- Ragocytes, 67
- RCC. See Renal cell carcinoma
- RCC marker, 320, 342, 357
- RCH. See Reserve cell hyperplasia
- Reactive atypia, benign, in respiratory specimen, 29, **29**
- Reactive cellular changes, 383
- Reactive fibrosis, 170
- Reactive hyperplasia, of lymph node, 240
- Reactive lymph node, 248
- REAL classification, 234, **236**
- Red blood cells, in cerebrospinal fluid, 116
- Reed-Sternberg cells, 151, **151**, 245, 249-251, **249-250**
 anaplastic, 251
 mummified, 250
 pleomorphic, 250
- Reflux esophagitis, 77
- Reinke crystalloids, 363, **363**
- Reiter syndrome, 68
- Renal cell carcinoma (RCC), 165, 337-338, 340-343, **341-343, 353**
 chromophobe cell, 344-345, **345**
 clear cell, **341-342, 342**
 granular cell, 157, **342, 343**
 granular center of, 157, **157**
 malignant effusion in, 58, **58**
 metastatic
 to adrenal gland, 357
 to central nervous system, 129, **129**
 to liver, 320
 to ovary, 370
 to salivary gland, 203, **203**
 to thyroid gland, 224, **224**
 papillary, 343, **343-344**
 sarcomatoid, 155, 343, **343, 347**
 urine cytology in, 98, 111, **111**
- Renal infarction, 111, **111**
- Renal pelvis
 cancer of, 108-109
 urothelial carcinoma of, 346, **346**
- Renal tubular cells, 98, 337-338, **338**
- Repair/regenerative processes and atypia
 in bronchial cells, 30, **30**
 in cervix, 16-17, **17, 383, 383**
 in esophagus, 80
 in goiter, 213-214, **213**
 in lung, 39-40
 in oral cavity, 74, **74**
 in small intestine, 87, **87**
 in stomach, 82, **82**
 urine cytology and, 97
- Reserve cell hyperplasia (RCH)
 of cervix, 3, **3**
 of lung, 33, **33**
- Respiratory cytology
 acellular material, 31-32, **31-32**
 in benign disease, 37, **37**
 benign proliferation, 32-34, **33-34**
 cells, 28-32, **28-32**
 diagnostic, 27-28
 granulomatous inflammation and, 35-36, **35**
 in infections, 36-37, **36**
 in malignant disease, 38-47
 in pulmonary embolism/infarction, 37
 therapeutic agents affecting, 34-35, **34-35, 42**
- Retention cyst, of salivary gland, 190
- Retinoblastoma, 123, **123**

- Reverse zoning, 173
 Revised European-American Lymphoma (REAL) classification, 234, **236**
 Rhabdoid cells, 349, **349**
 Rhabdoid sarcoma, 145, **145**
 Rhabdoid tumor, 164
 of kidney, 348-349, **349**
 Rhabdomyosarcoma, 22, 61, 127, **127**, **154**, **163**, 164, **166**, **169**, **170**, 177, **177**, **203**
 alveolar, 153, 171
 embryonal, 62, 153, **153**, 171, 174, 348, 362
 pleomorphic, 172-173
 Rheumatoid arthritis, 191-192
 rheumatoid effusion, 55, **55**, 58-59, 61
 synovial fluid in, 67
 Rheumatoid granuloma, 36, 55
 Rheumatoid lung disease, 36, 50
Rhizopus, 376
 Richter syndrome, 148, 239, 253, **253**
 Ring nucleus, **246**, 247
 Robin's egg blue cells, 142, **142**
 Rosai-Dorfman disease. See Sinus histiocytosis with massive lymphadenopathy
 rosebud
 Rosettes, 154, **154**, 158, 166, 181
 Round cell liposarcoma, 164, **170**, 171
 Round cell sarcoma, 165-166, **165-166**
 Round cell tumor, of soft tissue, **170-171**, 171-172
 Russell bodies, **67**, 151, 239, 252, **252**
- S**
 S-100 protein, **128**, 160, 168-177, **177**, 248, 270, 278, 320
 Saccomanno technique, 27
 Salivary duct carcinoma, 201
 Salivary gland
 acinic cell carcinoma of, 199-200, **199-200**
 adenocarcinoma of, 201, **201**
 basal cell, 201
 mucus-producing, 201
 papillary, 201
 polymorphous low-grade, 201
 adenoid cystic carcinoma of, 197-198, **197-198**
 adenoma of
 basal cell, 195, **195**
 monomorphic, 194-196
 pleomorphic, 188, 191-193, **192-194**, 200, **203**, **203**
 trabecular, 195, **195**
 benign lymphoepithelial lesion of, 191-192, **192**
 benign tumors of, **192-197**, 193-197
 carcinoma ex pleomorphic adenoma of, 200, **200**
 carcinosarcoma of, 200
 cells of, 187-188, **187-189**
 cysts of, 179, 189-190, **190**
 diseases of, 189-193, **189-192**
 epithelial-myoepithelial carcinoma of, 201, **201**
 hemangioma of, 202-203, **203**
 lipoma of, 202
 lymphoma of, 191, 202, **202**
 malignant mixed tumor of, 200, **200**
 malignant tumors of, 197-203, **197-203**
 masses in children, 203, **203**
 mesenchymal tumors of, 202-203, **202**
 metastatic disease of, 203, **203**
 mucoepidermoid carcinoma of, 190, 198-199, **198-199**, **203**
 high-grade, 198-199, **198-199**
 low-grade, 198-199, **198**
 myoepithelioma of, 195-196
 nerve sheath tumor of, 202-203, **202**
 normal, 187-189, **187-189**
 oncocytic carcinoma of, 197, **197**
 oncocytoma of, 188, 197, **197**, 200
 sialadenitis of, 190-192, **190-191**
 small cell carcinoma of, 202, **202**
 squamous cell carcinoma of, 201, **201**
 squamous metaplasia of, 188
 tumor of, 145
 undifferentiated carcinoma of, 202
 Warthin tumor of, 188-189, 191, 196-197, **196-197**
 mast cells in, 196, **196**
 mucoid cyst content of, 196, **196**
 oncocytes/lymphocytes in, 196, **196**
 Salivary gland analog tumor, 46-47
 of breast, 276
 of lung, 295
 Sarcoïd, 28, 31, **35**, 36, 83, 118, **119**, 152, 189, 191, 209, 233, 260, 339, **339**
 Sarcoma, 139-140, **139-140**. See also *specific types of sarcoma*
 in child, **163**
 immunocytochemical markers in, **177**
 malignant effusion in, 56, 59, 61-62, **61-62**
 metastatic
 to lung, 297
 to lymph nodes, 234
 two-grade system, 164
 unknown primary tumor, 140
 Sarcoma bodies, 166, **166**
 Sarcomatoid carcinoma. See also Spindle cell carcinoma
 renal cell, 155, 343, **343**, 347
 Scar, 170
 Scar cancer, 290
 Schaumann bodies, **35**, 36, 152, 191
 Schiller-Duval bodies, 365, **365**
Schistosoma/schistosomiasis, 98, 100-101, 109-110, 310, **377**, **377**
 Schwannoma, 166, 169, **169**
 ancient, 173
 malignant peripheral nerve sheath tumor, 155, **163**, **165**, **166**, 170, **170**, 173, **173**, 175, 304
 glandular, 176-177, **177**
 of mediastinum, 303-304
 Scirrhus ductal carcinoma, of breast, 257
 Sclerosing adenosis, of breast, 262, **263**
 Sclerosing bronchioloalveolar carcinoma, 289
 Sclerosing hemangioma, of lung, **284-285**, 285
 Sclerotic hepatocellular carcinoma, 316
 Scrotal lesion, 361
 Sebaceous cells
 in salivary gland, 188, 194, **194**
 in teratoma, 366, **366**



- Secretory carcinoma, of endometrium, 22
- Seminal vesicle cells
in Pap test, 24, **24**
in urine, 98, **98**
- Seminoma, 161, 363-364
anaplastic, 364, **364**
of mediastinum, 301
spermatocytic, 364
- Septic arthritis, synovial fluid in, 67, **67**
- Serous acinic cells, of salivary gland, 187-188, **187**
- Serous adenocarcinoma, of endocervix, 20
- Serous carcinoma, of ovary, 368-369, **369**
- Serous cystadenoma
gynecologic cytology in peritoneal washings, 65
of ovary, 368-369
of pancreas, 330-331, **330**
- Sertoli cells, 361
- Sertoli cell tumor, 363
- Sézary syndrome, 246
- Sialadenitis, 189-192, **190-191**
acute, 190, **190**
autoimmune, 191-192
chronic, 190-191, **190-191**
granulomatous, 191, **191**
- Sialadenosis, 189, **189**
- Sicca syndrome, 191-192
- Sickle cells, 54, **54**
- Siderophages, 168
in cerebrospinal fluid, 117, **117**
in respiratory specimen, 31, **31**
- Signet ring adenocarcinoma, 143-144
of urinary tract, 110, **110**
- Signet ring carcinoma
of breast, 274, **275**
of colorectum, 91
of stomach, 319, **319**
- Signet ring cells, 143-144, **143**
in malignant effusion, 57, **57**
- Silicosis, 37
- Single file cell chains, 58, **58**, 59, **60**, 145, **145**, 273, **274**
- Sinus histiocytosis, 232
- Sinus histiocytosis with massive lymphadenopathy, 231, **231**
- Sjögren syndrome, 189, 191-192, 241
- Small B-cell lymphoma/chronic lymphocytic leukemia, 234
- Small blue cells, in urine, 111
- Small blue cell tumors of childhood, 62, 128, 153-155, **153-154**, 171, 356-357
- Small cell(s), **141**, 153-155, **153-154**
- Small cell adenocarcinoma, 61
- Small cell carcinoma, 61, 157-159, **158**, 172
of cervix, 11, **11**
of esophagus, 81
hepatocellular, 316
of lung, 33, 40, 43-46, **43-44**, **153**, 286-287, 290-291, **290-291**, 294, **319**, 356
blue bodies in, 291, **291**
crush artifact in, 291, **291**
differential diagnosis of, 45
intermediate type, 44-45, **44**
metastatic to central nervous system, 127-128, **128**
oat cell type, 44, **44**
variants of, 45
malignant effusion in, 59-60, **60**
of ovary, 370
of pancreas, 329, 335
of salivary gland, 202, **202**
of stomach, 86-87
of thyroid gland, 223-224
of urinary tract, 110-111, **111**
- Small cell infiltrating ductal carcinoma, of breast, 257
- Small cell lymphoma, 235
- Small cell osteosarcoma, 171, **171**
- Small cell squamous cell carcinoma, of cervix, 10, **10**
- Small cell tumor, differential diagnosis of, **154**
- Small cleaved cells, of lymph nodes, 230
- Small cleaved lymphoma, 60, 126, 148-149, **149**, 239-240, **240**, 244, 296
- Small intestine
adenocarcinoma of, 88, **88**
carcinoid tumor of, 89
cells of, 87, **87**
degenerative processes in, 87
infections of, 88, **88**
lymphoma of, 88-89
malignant disease of, 88-89, **88**
repair/regenerative processes in, 87, **87**
- Small lymphocytic lymphoma, 148, **148**, 235-239, **235**, **239**, 244
cellules grumelées in, 239, **239**
proliferation center cell, 239, **239**
- Small noncleaved cells, of lymph nodes, 230
- Small noncleaved lymphoma, 126, 242-244, **243**, 296-297
- Smoking, 11, 31-32, 40-41, 43, 77-80, 104, 285, 288, 290, 292, 327, 341
- Smooth muscle tumor, 172
- Soft tissue tumor
biphasic tumors, 175-177
of breast, 276-277, **276**
fine needle aspiration biopsy in, 163-167, **165-166**
myxoid tumors, 174-175, **174-175**
pleomorphic tumors, 172-174, **172-173**
round cell tumors, **170-171**, 171-172
spindle cell tumors, 167-171, **167-170**
- Solid and papillary epithelial neoplasm (SPEN), of pancreas, 332, **332-333**
- Solitary fibrous tumor, 166-167, 170, 175-176, **176**
- SPEN. See Solid and papillary epithelial neoplasm
- Sperm
in Pap test, 24, **24**
in urine, 99
- Spermatids, 361
- Spermatocoele, 362
- Spermatocytes, 361
- Spermatocytic seminoma, 364
- Spermatogonia, 361
- Spherulosis, collagenous, in breast, 145
- Spindle cell(s), **141**, 155, **155**, 158, **158**
in medullary carcinoma of thyroid, 218, **218**
in mesothelioma, 298, **298-299**
- Spindle cell carcinoid
of lung, 46, 294, **294**
of thymus gland, 300
- Spindle cell carcinoma, **165**, 170
of adrenal cortex, 347
of breast, 272, **273**
hepatocellular, 316, **316**, 318
of pancreas, 328, **329**

- Spindle cell lipoma, 168, **168**
 Spindle cell melanoma, 170-171
 Spindle cell sarcoma, 61, 155, **155**, 160, **166**
 Spindle cell tumor, of soft tissue, 167-171, **167-170**
 Spindle squamous cell carcinoma, 155
 of esophagus, 80
 Spiradenoma, eccrine, 163
 Spironolactone bodies, 354
 Sputum, 31
 in cancer diagnosis, 27
 cytology of, 27
 postbronchoscopy, 27
 techniques for preparation of, 27
 Squamous atypia, of cervix, 13, **13**
 Squamous cell(s), 141-142, **141-142**
 in cerebrospinal fluid, 118
 of esophagus, 76, **76**
 in nipple discharge, 69
 of oral cavity, 73, **73**
 radiation effect on, 34
 in respiratory specimen, 28-29, **28**
 in urine, 98
 Squamous cell carcinoma
 of bladder, 101
 of breast, 273, **273**
 of cervix, 9-12, **9-11**, 24, 385-386
 keratinizing, 10-11, **10-11**, 386, **386**
 non-keratinizing, 10, **10**, 385-386, **386**
 poorly differentiated, 10, **10**
 small cell, 10, **10**
 with cystic degeneration, 142
 of esophagus, 79-80, **79-80**
 keratinizing, 79, **79**
 nonkeratinizing, 79, **79**
 spindle, 80
 keratinizing, 141-142, **142**
 of kidney, 346
 of lung, 28, 38-40, **38-39**, 283-284, 286-288, **286-287**
 keratinizing, 38-39, **38**, 41, 286-287, **286**
 nonkeratinizing, 39-40, **39**, 287-288, **287**
 malignant effusion in, **56**, 59, **59**, 61
 metastatic
 to central nervous system, 127, **127**
 to salivary gland, 203
 nonkeratinizing, 141, **141**
 of oral cavity, 73, 75, **75**
 keratinizing, 75
 nonkeratinizing, 75
 of salivary gland, 201, **201**
 spindle, 155
 of stomach, 86-87
 of thyroid gland, 223-224
 unknown primary tumor, 139
 of urinary tract, 110, **110**
 keratinizing, 110, **110**
 well-differentiated, 110, **110**
 Squamous dysplasia
 of cervix, 17
 of lung, 40
 Squamous epithelium
 hormonal cytology of, 2-3, **2-3**
 normal cytology of, 1-2, **2**
 Squamous lesion, of urinary tract, 109-110, **110**
 Squamous metaplasia
 of bladder, 98, **98**
 of breast, 266, 275
 of cervix, 3-4, **3-4**, 13, **13**, 382, **382**, 383
 of colorectum, 90
 of lung, 33, **33**, 37, 40
 of salivary gland, 188
 Squamous papilloma, of esophagus, 79
 Squamous pearl, **28**, 29
 Staphylococcus, 232, 310
 Staphylococcus aureus, 190, 208, 260
 Staphylococcus epidermidis, 260
 Starch granules, 378
 in cerebrospinal fluid, 118
 in respiratory specimen, 32
 Steatorrhea, 325
 Steatosis, **308**
 Steroids, 312-313, 319
 Sticky histiocytes, 388, **388**
 Stomach
 adenocarcinoma of, 84-85, **84**
 gastric-type, 84-85, **85**
 intestinal-type, 84, **84**
 adenosquamous carcinoma of, 86-87
 atrophy of, 82-83
 benign diseases of, 82-83, **83**
 cancer of
 early gastric cancer, 85
 malignant effusion in, 58
 metastatic to central nervous system, 128
 metastatic to kidney, 347
 metastatic to liver, 319, **319**
 metastatic to lung, **46**, 47, 297
 metastatic to ovary, 370
 carcinoid tumor of, 87
 carcinoma in situ of, 85
 cells of, 81-82, **81-82**
 degenerative processes in, 82, **82**
 dysplasia of, 85
 gastrointestinal stromal tumor, 86
 inflammation of, 86
 large cell undifferentiated carcinoma of, 86-87
 lymphoma of, 85-86, **85**
 malignant disease of, 84-87
 metastatic disease of, 87
 polyps of, 83, **83**
 pseudolymphoma of, 86
 radiation effect on, 83
 repair/regenerative process in, 82, **82**
 signet ring cell carcinoma of, 319, **319**
 small cell carcinoma of, 86-87
 squamous cell carcinoma of, 86-87
 ulcers of, 82-83
 Storage disease, 37
 Strap cells, **153**
 Streptococcus, 232, 260, 310
 Streptococcus pneumoniae, 208
 Streptococcus pyogenes, 208
 Streptococcus viridans, 190
 Stromal cells, in Wilms tumor, 348, **349**
 Strongyloides, 377
 Sturge-Weber syndrome, 355

Subacute thyroiditis. See Granulomatous thyroiditis
 Subarachnoid hemorrhage, 124
 Subareolar abscess, 260, **260-261**
 Subdiaphragmatic abscess, 49
 Sublingual gland, 187
 Submandibular gland, 187
 Superficial cells
 of cervix, 1-2, **1**, 388, **388**
 of oral cavity, 73, **73**
 Sustentacular cells, 356
 Sweat gland analog tumor, of breast, 276
 Synaptophysin, 171, **177**, 181, 291, 335, 356
 Syncytiotrophoblasts, 366, **366**
 Synovial cells, 66, **67**
 Synovial fluid
 cells in, 66-67, **67**
 in diseases of synovium and joints, 67-68, **68**
 Synovial sarcoma, 68, 155, **163**, 164-167, **166**, 175-176, **176-177**
 biphasic, 176
 monophasic, 165, **166**, 169
 Synovitis, villonodular, 68
 Systemic lupus erythematosus, 54, 67

T

t(11;22), 154, 177
 Targetoid secretory vacuoles, 57
 T cell(s), 227
 T-cell lymphoma, 227, 234-235, 244-246, **244-245**
 angiocentric, 244
 cutaneous, 246
 intestinal, 244
 lymphoepithelial. See Lennert lymphoma
 peripheral, 244-246
 Teratocarcinoma, 366
 Teratoma, 365
 of central nervous system, 124
 of gonads, 366
 immature, 366
 mature cystic, 366, **366**
 of mediastinum
 immature, 301
 mature, 301, **302**
 Terminal bars, 58, **59**, 145, **145**
 Terminal deoxynucleotidyl transferase, 125, 242
 Testicular feminization syndrome, 3
 Testis, 361-362
 cancer of, metastatic to mediastinum, 305
 cells of, 361
 fine needle aspiration biopsy of, 361
 lymphoma/leukemia of, 362, **362**
 seminoma of, 363-364
 soft tissue tumor of, 362
 Thecoma. See Fibroma/thecoma
 Thioimidazole, 224
 Thiotepa, 103, **103**
 Thiouracil, 224
 Thorotrast, 313, 318-319
 Thymoma, 298-300, **300-301**
 cortical, 299
 epithelial, 299
 lymphocytic, 299
 medullary, 299
 metastatic to liver, **301**
 Thymus gland
 carcinoid tumor of, 300, 305
 atypical, 300
 spindle cell, 300
 carcinoma of, 299-300
 cyst of, 179, 298, **300**
 Thyroglobulin, 184, 222
 Thyroglossal duct
 cyst of, 179-180, **179**
 papillary carcinoma of, 179
 Thyroid gland
 adenoma of, 216
 follicular, 210-214, **211**, 221
 hyalinizing trabecular, 222, **222**
 antithyroid therapy effect on, 224, **224**
 cancer of, 215-224, **215-224**
 combined glandular and squamous differentiat-
 ion in, 147
 malignant effusion in, 59
 metastatic to mediastinum, 305
 pleomorphic tumor cells in, 174
 risk factors for, 205, **205**
 cells of, 206-208, **206-208**
 clear cell neoplasms of, 221
 colloid of, 207-208, **207-208**
 cysts of, 179, 225, **225**
 fine needle aspiration biopsy of, 205-206, **205**, 211-
 215, **211-215**
 follicular adenoma of, 213
 follicular carcinoma of, 211-215, **211-212**, **215**,
 220
 microinvasive, 211
 widely invasive, 211
 follicular lesions of, 210-215, **211-215**, 219
 giant and spindle cell carcinoma of, 219, **219-220**,
 223
 goiter of. See Goiter
 Graves disease of, 225, **225**
 Hürthle cell carcinoma of, 221, **221**
 Hürthle cell tumors of, 184, 219-221, **221**
 inflammation of, 208-210, **208-210**
 insular carcinoma of, 221-222, **221**
 Langerhans histiocytosis of, 223
 lymphoma of, 219, 222-223, **222**
 medullary carcinoma of, 158, **158**, 161, 184, 217-
 219, **218-220**
 metastatic disease of, 224, **224**
 mucoepidermoid carcinoma of, 223, **223**
 neoplasms of, 184
 oncocytic metaplasia of, 220
 papillary carcinoma of, 147, 184, 209, 213, 215-217,
 215-217, 219, **220**, 222, 225
 plasmacytoma of, 223
 in pregnancy, 225, **225**
 radiation effect on, 224
 sarcoma of, 219, 223
 small cell carcinoma of, 223-224
 squamous cell carcinoma of, 223-224

- Thyroiditis, 216
 acute, 209
 de Quervain. See Thyroiditis, granulomatous
 granulomatous, 208-209, **208-209**
 Hashimoto, 179, 207, 209-210, **209-210**, 220-223, 241
 palpation, 209
 subacute. See Thyroiditis, granulomatous
- Thyroid nodule, 205
 cold, 205
 colloid, **211-212**, 212
 fine needle aspiration biopsy of, 205-206, **205**
 hot, 205, 225
- Thyroid transcription factor-1, 38, 44, **184**, 185, 291, 297
- T-immunoblastic lymphoma, 246
- Tingible body macrophages, 147-148, 150
 in Hashimoto thyroiditis, 209, **210**
 of lymph nodes, 231, **231**
- Tobacco. See Smoking
- Tombstone cells, 328, **328**
- Touton giant cells, 168
- Toxoplasma gondii*/toxoplasmosis, 120, 191, 233, 378, **378**
- Trabecular adenoma, of salivary gland, 195, **195**
- Tracheostomy tube, 33
- Transbronchial needle biopsy, 281-282
- Transitional epithelium. See Urothelium
- Transudate, 49
- Traumatic arthritis, synovial fluid in, 68
- Traumatic tap, 50-51
- “Trich” halo, 12, **12**, 14
- Trichomes, 378, **378**
- Trichomonas vaginalis*, 14-15, **14**, 377, 383, **383**
- Trichuris trichiura*, 377
- Triple phosphate crystals, **99**
- Triton tumor, 170
- Trophoblastic cells, 23
- True histiocytic lymphoma. See Malignant histiocytosis
- Trypsin, 333
- TTF-1. See Thyroid transcription factor-1.
- Tubal metaplasia, 19-20, **19**
- Tuberculosis, 31, 50, 52-53, 83, 152, 209, 233, 260, 339
 of breast, 70
 of colorectum, 90
 of lung, 282-283
 respiratory cytology in, 35-36
 tuberculous effusion, 54, **55**
 of urinary tract, 100
- Tuberculous arthritis, synovial fluid in, 67
- Tuberculous meningitis, 119
- Tuberous sclerosis, 338, 340
- Tubular carcinoma, of breast, 271, **271**
- Tubules, **154**, 155
- Tumor
 classification of, 139-140, **139-140**
 unknown primary, 139-140, **140**
- Tumor diathesis, 9, 22, 40, 44, 75, 91, 161, 386, **386**
 lack of, 22
- Turner syndrome, 3
- Two-tone cells, 13
- Tyrosine crystals, 189, **189**, 194
- Tyrosinemia, 313
- Tzanck cells, 74, **74**
- U**
- Ulcer
 of esophagus, 76-77
 of stomach, 82-83
- Ulcerative colitis, 73, 90
- Umbrella cells. See Urothelial cells, superficial
- Undifferentiated carcinoma
 of ovary, 370
 of salivary gland, 202
- Urate crystals, **68**, **68**
- Uremia, 52, 64
- Ureter, cancer of, 108-109
- Urethritis, nongonococcal, 15
- Urinary bladder. See Bladder
- Urinary catheter, 98, 100, **100**
 retrograde catheterization, 109
- Urinary tract. See also Urine/urinary tract cytology
 adenocarcinoma of, 110, **110**
 signet ring, 110, **110**
 cancer of, 104-112, **105-112**
 diagnostic equivalents, **105**
 upper urinary tract, 108-109
 carcinoma in situ of, 107-108, **109**
 cystitis, 100
 cytomegalovirus in, **100**, 101
 fungal infections of, 100
 human polyomavirus in, 101, **101**
 infection of, 339
 leukoplakia of, 109-110
 lymphoma of, 111, **111**
 malakoplakia of, 102, **102**
 melanoma of, 112, **112**
 papilloma of, 105-106, **105**
 schistosomiasis, 98, 100-101, 109-110
 secondary tumors of, 111-112, **111-112**
 small cell carcinoma of, 110-111, **111**
 squamous cell carcinoma of, 110, **110**
 keratinizing, 110, **110**
 well-differentiated, 110, **110**
 squamous lesions of, 109-110, **110**
 stones in, 98-100, **99-100**
 urothelial carcinoma of, 97
 glandular, 107, **108**
 high-grade, 101, **101**, 105, **105**, 107, **107-108**, 111
 low-grade, 105-107, **105-106**
 with spindle or giant cells, 107, **108**
 with squamous differentiation, 107, **108**
 tuberculosis of, 100
- Urine specimen, 99
 ileal conduit, 108
- Urine/urinary tract cytology, 95
 bacillus Calmette-Guérin therapy and, 100, 104, **104**
 in benign disease, 99-102, **99-102**
 cells of, 96-99, **96-99**
 chemotherapy effect on, 103-104, **103**
 detection of metastatic disease, 112, **112**
 diagnostic accuracy of, 95
 in heavy metal poisoning, 102, **102**

- after kidney transplant, 98, 102-103, **102**
 laser therapy/cauterization and, 104, **104**
 in prostate cancer, 111-112, **112**
 pyelogram effect on, 102
 radiation effect on, 104, **104**
 in renal cell carcinoma, 111, **111**
 in urinary tract cancer, 104-112, **105-112**
- Urothelial cell(s)**
 basal, **96, 96**
 degenerative, **97, 97**
 intermediate, **96, 96**
 reactive, **97, 97**
 superficial, **96-97, 97, 103**
 from upper urinary tract, 109
 in urine, **96-97, 96-97**
- Urothelial carcinoma**
 metastatic to lung, **47, 47**
 of renal pelvis, **346, 346**
 of urinary tract, **97**
 glandular, **107, 108**
 high-grade, **101, 101, 105, 105, 107, 107-108, 111**
 low-grade, **105-107, 105-106**
 with spindle or giant cells, **107, 108**
 with squamous differentiation, **107, 108**
- Urothelial epithelium**, **95, 95**
- Urothelial metaplasia**, of vaginal mucosa, **2, 2**
- Uterus**. See also Cervix; Pap test
 cancer of, combined glandular and squamous differentiation, **147**
 prolapse of, **4**
- V**
- Vaginal mucosa**
 atrophy of, **2-3, 2**
 with inflammation, **2, 2**
 pseudokeratinization, **2, 2**
 transitional metaplasia, **2, 2**
 maturation index of, **2-3, 2-3**
 of newborn, **3**
 of postmenopausal women, **3, 16**
 pseudomaturations of, **3**
- Vaginosis**, bacterial, **15, 374**
- Villonodular synovitis**, **68**
- Villous adenoma**, of colorectum, **90-91, 91**
- Vimentin**, **177**
- Virus**, **373, 373**
- Vitamin B12 deficiency**, **17, 75, 83**
 von Hippel-Lindau disease, **330, 338, 355**
 von Recklinghausen disease, **163, 165, 169-170, 173, 177, 303-304, 355**
- W**
- Waldenström macroglobulinemia**, **151, 239, 252**
- Wang needle biopsy**, **281-282**
- Warthin tumor**, **188-189, 191, 196-197, 196-197**
 mast cells in, **196, 196**
 mucoid cyst content of, **196-197, 196**
 oncocytes/lymphocytes in, **196, 196**
- Watery colloid**, **207, 207**
- Well-differentiated adenocarcinoma**, of pancreas, **327-328, 327-328**
- Well-differentiated squamous cell carcinoma**, of urinary tract, **110, 110**
- “White plaque.”** See Leukoplakia
- WHO classification**, of lymphoma, **234, 237**
- Wilms tumor**, **62, 127, 154, 155, 166, 172, 347-348, 347-349, 356**
 anaplastic, **348, 349**
 blastema in, **347-348, 348**
 epithelial cells in, **348, 348**
 stromal cells in, **348, 349**
- World Health Organization (WHO) classification**, of lymphoma, **234, 237**
- WT-1**, **64**
- X**
- Xanthogranulomatous pyelonephritis**, **339, 339**
- Xenogenous organisms**, **373-378**
- Y**
- Yolk sac tumor**, **301, 365, 365**
- Z**
- “Zellballen,”** **181, 181, 304, 356**
- Zollinger-Ellison syndrome**, **89, 158, 334**