



# Index

- A**
- A-a gradient  
by age, 685  
restrictive lung disease, 694
- Abacavir  
HIV therapy, 198
- Abaloparotide, 497
- ABCD1 gene mutation, 46
- Abdominal aorta  
atherosclerosis in, 303  
bifurcation of, 681  
branches, **370**
- Abdominal aortic aneurysm, 304
- Abdominal pain  
acute mesenteric ischemia, 393  
bacterial peritonitis, 397  
electrolyte disturbances, 609  
gastric cancer, 386  
hyperparathyroidism an, 349  
Mallory-Weiss syndrome, 384  
pancreas divisum, 367  
pancreatic cancer, 405  
Postprandial, 370  
renal vein compression, 370  
RLQ pain, 390  
RUQ pain, 403  
with Spigelian hernia, 376
- Abdominal wall  
caput medusae, 372  
hernias, **376**  
ventral defects in, **365**
- Abducens nerve (CN VI)  
damage to, 556  
function and type, 519  
ocular motility, 555  
palsy, 558
- Abduction  
arm, 451  
hip, **455**, 457
- Abductor digiti minimi muscle, 453
- Abductor pollicis brevis muscle, 453
- Abetalipoproteinemia, **92**, 420
- Abiraterone, 676
- Abnormal motor posturing, **524**
- Abnormal uterine bleeding, **651**, 660
- ABO hemolytic disease, 411
- Abortion  
antimetabolites for, 444  
ethical situations, 274  
with antiphospholipid syndrome, 476
- Abscesses  
brain, 153, **176**  
cold staphylococcal, 114  
*Klebsiella* spp, 143  
liver, 152, 175  
lung, **702**, 703  
of skin, 487  
psoas, **463**  
*Staphylococcus aureus*, 133  
treatment of lung, 188
- Absence (petit mal) seizures, 531
- Absence seizure anticonvulsants, 560
- Absolute risk reduction, 258
- AB toxin, 130
- Abuse  
child, **573**  
confidentiality exception in, 270  
intimate partner violence, 275
- Acalculia, 524
- Acalculous cholecystitis, 403
- Acamprosate, 590
- Acanthocytes (“spur cells”), 420
- Acanthocytosis, 68, 92
- Acantholysis, characteristics/  
examples, 483
- Acanthosis, characteristics/examples,  
483
- Acanthosis nigricans  
characteristics, 492  
paraneoplastic syndrome, 224
- Acarbose, 359
- Accessory nerve (CN XI)  
functions, 519  
lesions of, 546
- Accommodation (eye), 519
- Accountable care organization, 277
- Accuracy (validity), 261, 267
- Accuracy vs precision (diagnostic  
tests), **261**
- ACE2 receptor, 163
- ACE inhibitors  
cough from, 628  
for diabetic nephropathy, 628  
for hypertension, 628  
for proteinuria, 628  
heart failure treatment, 316  
naming conventions for, 253
- Acetaminophen  
drug reactions with, 248  
free radical injury, 206  
hepatotoxicity of, 374  
mechanism, use, and adverse  
effects, **495**  
patent ductus arteriosus, 286  
toxicity treatment, 247  
vs aspirin for pediatric patients, 495
- Acetazolamide  
adverse effects, 251  
glaucoma therapy, 568  
mechanism, use, and adverse  
effects, **626**
- Acetoacetate metabolism, 88
- Acetylation  
chromatin, 32  
drug metabolism, 230  
histones, 32  
posttranslational, 43
- Acetylcholine (ACh)  
pacemaker action potential and, 296  
synthesis and change with diseases,  
505
- Acetylcholine (ACh) receptors  
autoantibodies to, 480  
types of, **235**
- Acetylcholinesterase (AChE)  
inhibitors  
naming conventions for, 253  
toxicity treatment, 247
- Acetyl-CoA carboxylase  
fatty acid synthesis, 71  
vitamin B<sub>7</sub> and, 66
- Achalasia  
esophageal cancer and, 385  
etiology, **383**  
nitric oxide secretion and, 378
- Achilles reflex, 523
- Achlorhydria  
stomach cancer and, 386  
VIPomas and, 378
- Achondroplasia, **467**  
chromosome disorder, 62  
inheritance, 58  
ossification in, 461
- Acid-base physiology, type and  
compensation, **609**
- Acidemias  
organic, **83**
- Acid-fast oocysts, 152, 173
- Acid-fast organisms, 123
- Acid amino acids, 79
- Acid maltase, 84
- Acidosis  
alkalosis and, **610**  
cardiac contractility in, 288  
metabolic, 83  
renal tubular, 611
- Acid phosphatase in neutrophils, 412
- Acid suppression therapy, 405
- Ace  
causes, symptoms and treatment,  
**485**  
danazol, 675  
lesions characteristics, 483  
tetracyclines, 188
- Acinetobacter* spp  
healthcare-associated infections,  
181
- Aconitine alkaloids, 246
- Acral lentiginous melanoma, 494
- Acrodermatitis enteropathica, 69
- Acromegaly  
carpal tunnel syndrome and, 463  
findings, diagnosis and treatment,  
343  
growth hormone in, 333  
octreotide for, 407
- Actin  
cytoskeleton, 46  
muscular dystrophies, 59
- Acting out, 570
- Actinic keratosis  
imiquimod, 498  
squamous cell carcinoma, 494
- Actinomyces* spp  
vs *Nocardia* spp, **137**
- Actinomyces israelii*  
penicillin G, V, 183  
pigment production, 126
- Action potential  
motoneuron, **459**  
myocardial, **296**  
neurons, **504**  
pacemaker, **296**  
ventricular, 296
- Action/willpower, 586
- Activated carriers, **73**
- Active errors, 278
- Active immunity, 108  
mechanism and examples, **108**
- Acute adrenal insufficiency, 353
- Acute angle-closure glaucoma, 551
- Acute chest syndrome, 428
- Acute cholangitis, 402, 403
- Acute cholestatic hepatitis  
drugs causing, 248  
macrolides, 189
- Acute coronary syndrome  
ADP receptor inhibitors for, 442  
nitrates for, 322  
treatments, **314**
- Acute cystitis, 612, **619**
- Acute cytokines, 106
- Acute disseminated  
encephalomyelitis, 167
- Acute dystonia  
causes and treatment, 587  
treatment of, 240
- Acute gastritis, 386
- Acute grief, 572
- Acute hemolytic transfusion reaction,  
112
- Acute hemorrhagic cystitis, 161
- Acute infective endocarditis, 318

- Acute inflammation response, 210  
 Acute inflammatory demyelinating polyneuropathy, 538  
 Acute intermittent porphyria, 430  
 Acute interstitial nephritis, 251, 620  
 Acute iron poisoning, 431  
 Acute kidney injury, 620  
 Acute laryngotracheobronchitis, 167  
 Acute lymphoblastic leukemia/  
 lymphoma characteristics, 437  
 Acute lymphoblastic leukemia, oncogenes, 220  
 Acute mesenteric ischemia, 393  
 Acute myelogenous leukemia antimetabolites for, 444  
 epidemiology and findings, 437  
 Acute pancreatitis causes and complications, 404  
 necrosis with, 205  
 Acute pericarditis, **319**  
 Acute-phase proteins, 106  
 Acute phase reactants, **209**  
 Acute-phase reaction, **209**  
 Acute promyelocytic leukemia, vitamin A for, 64  
 Acute pulmonary edema, opioid analgesics, 567  
 Acute pyelonephritis, 619  
 Acute radiation pneumonitis, 694  
 Acute radiation syndrome, 207  
 Acute respiratory distress syndrome causes, diagnosis and management, **697**  
 eclampsia, 660  
 restrictive lung disease, 694  
 Acute rhinosinusitis, 690  
 Acute stress disorder, 581  
 Acute transplant rejection, 117  
 Acute tubular necrosis casts in urine, 612  
 etiology, **621**  
 Acyclovir mechanism and use, **196**  
 Adalimumab for Crohn disease, 389  
 mechanism, use, and adverse effects, 498  
 Adaptive immunity age-related changes, 97  
 components and mechanism, **97**  
 lymphocytes in, 415  
 Addison disease causes of, 353  
 HLA subtype, 99  
 Additive drug effects, 234  
 Adduction fingers, 450  
 hip, 455, 456  
 thigh, 456  
 Adductor brevis, 455  
 Adductor longus, 455, 456  
 Adductor magnus, 455  
 Adenine in nucleotides, 33  
 Shiga/Shiga-like toxins and, 130  
 Adenocarcinomas carcinogens for, 221  
 esophageal, 385  
 gastric, 212, 222, 386  
 lung, 703  
 nomenclature, 216  
 pancreas, **405**  
 paraneoplastic syndromes, 224  
 prostatic, **672**  
 Adenohypophysis (anterior pituitary) embryologic derivatives, 631  
 hypothalamus and, 508  
 secretions from, 331  
 sensitivity to TRH, 335  
 Adenomas nomenclature, 216  
 thyroid, **346**  
 Adenomatous polyps, 394  
 Adenomyosis (endometrial), 666  
 Adenosine as antiarrhythmic drug, 328  
 pacemaker action potential and, 296  
 Adenosine deaminase deficiency, 35  
 Adenosine triphosphate (ATP) activated carrier, 73  
 production of, 76  
 Adenovirus conjunctivitis with, 549  
 pneumonia, 701  
 structure and medical importance, 161  
 Adherens junction, 482  
 Adhesive atelectasis, 699  
 Adipose tissue adrenergic receptors in, 236  
 estrogen production, 648  
 in starvation, 89  
 lipolysis, 325  
 Adjustment disorder, 581  
 Adnexal torsion, **643**  
 Adoption study, 256  
 Ado-trastuzumab emtansine (T-DM1), 443  
 ADPKD (PKD1), chromosome association, 62  
 ADP ribosyltransferases, 130  
 Adrenal (addisonian) crisis, 353  
 Adrenal adenomas Cushing syndrome, 352  
 hyperaldosteronism, 354  
 Adrenal carcinomas, Li-Fraumeni syndrome, 220  
 Adrenal cortex derivation of, **331**  
 smooth endoplasmic reticulum, 45  
 Adrenal insufficiency acute hemorrhagic, 140  
 adrenoleukodystrophy, 46  
 fludrocortisone for, 360  
 mechanism and types of, **353**  
 T cell differentiation and, 100  
 vitamin B<sub>5</sub> deficiency, 65  
 Adrenal medulla derivation of, **331**  
 innervation of, 234  
 pheochromocytomas in, 354  
 Adrenal steroids, deficiency, labs and presentation, **339**  
 Adrenal zona fasciculata, 340  
 Adrenergic receptors second messenger functions, 237  
 tissue distribution of, **236**  
 Adrenocortical insufficiency, drug reaction and, 248  
 Adrenocorticotrophic hormone (ACTH) in Cushing syndrome, 224, 352  
 paraneoplastic secretion of, 352  
 secretion of, 331, 332  
 signaling pathways for, 341  
 Adrenoleukodystrophy, 46, 538  
 Adults cancer incidence and mortality, 218  
 common meningitis causes by age, 176  
 diaphragmatic hernia in, 377  
 intussusception in, 392  
 primary brain tumors, **540**  
 Adult T-cell leukemia, oncogenic microbes, 222  
 Adult T-cell lymphoma, 435  
 Advance directives, **269**  
 Advance directives, written, 269  
 Adventitia (digestive tract), 369  
*Aedes* mosquitoes arbovirus transmission, **168**  
 yellow fever transmission, 168  
 Zika virus transmission, 168  
 Aerobic metabolism, fed state, 89  
 Afatinib, 447  
 Afferent arteriole, ANP/BNP effect on, 606  
 Afferent arteriole constriction, 601  
 Aflatoxins, 150  
 Aflatoxins carcinogenicity, 221  
 African sleeping sickness, 153  
 Afterload, approximation of, 288  
 Agenesis in morphogenesis, 633  
 Müllerian duct, 639  
 Age-related macular degeneration, 552  
 Aging internal hemorrhoids, 373  
 normal changes, **225**  
 pathology by system, 225  
 pharmacokinetic changes with, **229**, 230  
 sick sinus syndrome, 311  
 sleep architecture, 507  
 Agonists indirect cholinomimetic, 239  
 indirect general, 241  
 partial, 233  
 Agoraphobia, 580  
 Agranulocytosis dapsone, 190  
 drug causing, 249  
 drugs causing, 360  
 Agraphia, 524, 526  
 AIDS (acquired immunodeficiency syndrome) brain abscess, 176  
*Candida albicans*, 150  
*Cryptosporidium*, 152  
 mycobacteria, **138**  
*Pneumocystis jirovecii*, 151  
 primary CNS lymphoma in, 435  
 retinitis, 162  
 retroviruses, 164  
 sexual transmission of, 179  
 Air emboli, 691  
 Airway obstruction atelectasis with, **699**  
 choanal atresia, 678  
 Hurler syndrome, 86  
 Akathisia, 533, 591  
 ALA dehydratase, 425, 430  
 Alanine ammonia transport, **80**  
 gluconeogenesis in starvation, 89  
 pyruvate dehydrogenase complex deficiency, 75  
 Alanine aminotransferase hepatitis, 170  
 in liver damage, 397  
 pyruvate metabolism, 75  
 toxic shock syndrome, 133  
 Alar plate development, 500  
 Albendazole, cestodes, 157  
 Albinism epistasis in, 54  
 locus heterogeneity, 55  
 mechanism of, 484  
 ocular, 59  
 Albright hereditary osteodystrophy, 348  
 Albumin as liver marker, 397  
 calcium binding, 337  
 in inflammation, 209  
 transfusion therapy, 434  
 Albuminocytologic dissociation (CSF), 538  
 Albuterol, 241, 704  
 Alcohol dehydrogenase, 70  
 Alcohol for sterilization/disinfection, 197  
 Alcoholic cirrhosis, 398. See also Cirrhosis  
 Alcoholic hepatitis, 398  
 Alcoholic liver disease, **398**  
 Alcohol use disorder diagnostic criteria, 590  
 esophageal cancer and, 385  
 gastritis in, 386  
 Korsakoff syndrome, 575  
 Mallory-Weiss syndrome in, 384  
 pancreatitis with, 248  
 sideroblastic anemia, 425  
 site of hepatitis from, 374  
 vitamin B<sub>9</sub> deficiency, 67  
 Alcohol use/overuse common pneumonia causes, 175  
 cytochrome P-450 interactions, 251  
 effects on ADH secretion, 332  
 gout and, 473  
 head/neck cancer risk, 690  
 hypertension risk with, 302  
 intoxication and withdrawal, 588  
 in utero exposure, 302  
 ketone bodies with, 88  
*Klebsiella* spp in, 143  
 teratogenic effects of, 632  
 Alcohol withdrawal delirium tremens, 587  
 hallucinations with, 576, 587  
 Aldesleukin, 119  
 Aldose reductase in diabetes mellitus, 350  
 sorbitol metabolism, 79  
 Aldosterone functions of, 606  
 in renal disorders, 605  
 in SIADH, 342  
 secretion of, 354  
 signaling pathways for, 341  
 Aldosterone antagonists, 321

- Aldosterone resistance, 611  
 Alectinib, 447  
 Alemtuzumab, 446  
 Alendronate, 496  
 Alexia, 526  
 Aliskiren, **628**  
 ALK gene  
   lung adenocarcinoma, 220  
 Alkaline phosphatase  
   bone disorder lab values, 469  
   in liver damage, 397  
   osteitis deformans, 468  
   serum tumor marker, 222  
   with hyperparathyroidism, 349  
 Alkaptonuria, **82**  
 Alkylating agents  
   carcinogenicity of, 221  
   mechanism, use, and adverse effects, **445**  
   teratogenicity of, 632  
 All-trans retinoic acid, promyelocytic leukemia, 64  
 Allantois, 636  
 Allantois urachus, 286  
 Allelic drift, 55  
 Allelic heterogeneity, 55  
 Allergic bronchopulmonary aspergillosis, 150  
   in cystic fibrosis, 58  
 Allergic contact dermatitis, 485  
 Allergic reactions  
   mast cells in, 414  
   Type I hypersensitivity, 110  
 Allergic (urticarial) reaction, 112  
 Allopurinol  
   DRESS with, 249  
   for gout, 497  
   kidney stones, 617  
   with tumor lysis syndrome, 440  
 Alopecia  
   epistaxis in, 54  
   tinea capitis, 488  
   trichotillomania comparison, 580  
   vitamin A toxicity, 64  
   vitamin B<sub>2</sub> deficiency, 65  
   vitamin B<sub>7</sub> deficiency, 66  
 $\alpha_1$ -blockers, 236, 253  
 $\alpha$ -1, 4-glucosidase; alpha-1, 84, 85  
 $\alpha_1$ -antagonists, 672  
 $\alpha_1$ -antitrypsin  
   elastase inhibition by, 50  
 $\alpha_1$ -antitrypsin deficiency  
   codominance in, 54  
 $\alpha_1$ -antitrypsin deficiency cirrhosis with, **400**  
   COPD and, 50  
 $\alpha$ -1-iduronidase, 86  
 $\alpha_1$  selective blockers, 243  
 $\alpha_2$  selective blockers, 243  
 $\alpha_2$ -agonists  
   muscle spasm treatment, 567  
   sympatholytics for, 243  
   Tourette syndrome and, 574  
 $\alpha$ -agonists, 568  
 $\alpha$ -amylase, 380  
 $\alpha$ -antagonists  
   pheochromocytoma treatment, 355  
 $\alpha$ -blockers  
   applications and adverse effects, **243**  
   nonselective, 243  
   phenoxybenzamine, 243  
 $\alpha$  endocrine cells  
   pancreas, 331  
   pancreatic tumors, 357  
 $\alpha$  (type I) error, 266  
 $\alpha$ -fetoprotein (AFP), 222  
   in germ cell tumors, 671  
   levels with germ cell tumors, 671  
   yolk sac tumors, 664  
 $\alpha$ -galactosidase A, 86  
 $\alpha$ -glucosidase inhibitors, 359  
 $\alpha$ -hemolytic bacteria  
   characteristics, 133  
   *Staphylococcus saprophyticus*, 134  
   *Streptococcus pneumoniae*, 134  
 $\alpha$ -hemolytic cocci  
   viridans group streptococci, 134  
 $\alpha$ -intercalated cells, 611  
 $\alpha$ -ketoglutarate dehydrogenase  
   TCA cycle, 74  
   vitamin B<sub>1</sub> and, 64  
 $\alpha$ -ketoglutarate dehydrogenase complex, 75  
 $\alpha$ -methyl dopa  
   applications and adverse effects, 243  
   autoimmune hemolytic anemia, 429  
   gestational hypertension, 660  
 $\alpha$ -oxidation of branched-chain fatty acids, **46**  
 $\alpha$ -thalassemia  
   chromosomal abnormality, 62  
   gene deletions and outcome, **424**  
 $\alpha$ -thalassemia minima, 424  
 $\alpha$ -thalassemia minor, 424  
 Alpha toxin, 131  
 $\alpha$ -toxin, 136  
 $\alpha$ -tubulin, 46  
 Alport syndrome  
   collagen deficiency in, 48  
   immunofluorescence, 615  
   nephritic syndrome, 615  
 Alprazolam, 562  
 Alteplase (tPA), 442  
 Alternative hypothesis, 265  
 Alternative splicing, 41  
 Altitude sickness, 626, 688  
 Altruism, 571  
 Aluminum hydroxide, 406  
 Alveolar cell types, pneumocytes, **679**  
 Alveolar dead space, 682  
 Alveolar gas equation, **685**  
 Alveolar hypoxia, effects of, 299  
 Alveolar macrophages, 679  
 Alveolar PO<sub>2</sub>, 685  
 Alveolar ventilation, 683  
 Alveoli, development, 678  
 Alzheimer disease  
   amyloidosis in, 208  
   drug therapy for, 239, 564  
   neurotransmitter changes with, 505  
   symptoms and histologic findings, 534  
*Amanita phalloides*, effects of, 40  
 Amantadine, 563, 587  
 Amastigotes, 155  
 Amaurosis fugax, 525  
 Amblyomma, 147  
 Amblyopia, 555  
 Amebiasis, 152  
 Amenorrhea  
   1° amenorrhea, 639  
   antiandrogens, 676  
   functional hypothalamic, **663**  
   menopause diagnosis, 653  
   pituitary prolactinomas, 332  
 Amifostine, 447  
 Amikacin, 187  
 Amiloride, 627  
 Amine precursor uptake  
   decarboxylase (APUD), 354  
 Amine whiff test, 147  
 Amino acids  
   blood-brain barrier and, 506  
   branched, 82  
   catabolism of, 46, 80  
   classification of, 79  
   coding of, 35  
   derivatives of, 81  
   genetic code for, 35  
   in histones, 32  
   metabolism of, 88  
   purine synthesis, 33  
   tRNA, 42  
   urea cycle, 80  
 Aminoacyl-tRNA, 43  
 Aminoacyl-tRNA synthetase, 42  
 Aminoglycosides  
   magnesium levels and, 336  
   mechanism and clinical use, **187**  
   pregnancy use, 197  
   protein synthesis inhibitors, 187  
   teratogenicity of, 632  
 Aminopenicillins, mechanism and use, 184  
 Amiodarone  
   antiarrhythmic effects, 328  
   cytochrome P-450 interaction, 251  
   drug-induced thyroiditis, 346  
   drug reactions with, 248, 249, 250  
   hypothyroidism with, 345  
   lung disease with, 694  
 Amitriptyline  
   antidepressant, 593  
   for migraine headaches, 532  
 Amlodipine, 323  
 Ammonia  
   in hepatic encephalopathy, 399  
   ornithine transcarbamylase deficiency, 81  
   transport, **80**  
 Ammonium magnesium phosphate (struvite), 617  
 Amnesias  
   brain lesions with, 524  
   classification of, **575**  
   dissociative, 575  
 Amnionitis, *Listeria monocytogenes*, 137  
 Amniotic fluid, emboli of, 691  
 Amoxapine, 593  
 Amoxicillin  
   clinical use, 184  
   *Haemophilus influenzae*, 140  
   *Helicobacter pylori*, 144  
   Lyme disease, 144  
   prophylactic use, 193  
 Amphetamines  
   intoxication and withdrawal, 588  
   mechanism and use, 241  
 Amphotericin B  
   *Blastomyces* spp, 194  
   *Cryptococcus neoformans*, 150  
   fungal infections, 150  
   *Leishmania* spp, 155  
   mechanism, use, and adverse effects, 194  
   *Naegleria fowleri*, 153  
   systemic mycoses, 149  
 Ampicillin  
   *Clostridioides difficile*, 136  
   drug reactions with, 248  
   *Listeria monocytogenes*, 137  
   mechanism and use, 184  
   meningitis, 176  
   prophylactic use, 193  
 Ampulla of Vater, 375  
 Amygdala  
   lesion effects, 524  
   limbic system, 509  
 Amylase in pancreatitis, 404  
 Amylin analogs, 359  
 Amyloid angiopathy,  
   intraparenchymal hemorrhage, 528  
 Amyloidosis  
   carpal tunnel syndrome and, 463  
   kidney deposition in, 616  
   manifestation and types of, **208**  
   restrictive/infiltrative cardiomyopathy, 314  
 Amyotrophic lateral sclerosis, 544, 564  
 Anabolic (androgenic) steroids, **676**  
 Anaerobic infections  
   clindamycin, 188  
   lung abscesses, 702  
 Anaerobic metabolism  
   in skeletal muscles, 460  
   pyruvate metabolism, 75  
 Anaerobic organisms  
   aspiration and, 175  
   characteristics and examples, **125**  
   Clostridia (with exotoxins), 136  
   metronidazole, 191  
   *Nocardia* vs *Actinomyces*, 137  
   overgrowth in vagina, 147  
 Anal atresia, 631  
 Anal cancer, oncogenic microbes and, 222  
 Anal fissures, 373  
 Anal wink reflex, 523  
 Anaphase, 44  
 Anaphylaxis  
   complement and, 104  
   cyst rupture, 157  
   epinephrine for, 241  
   Type I hypersensitivity, 110  
*Anaplasma* spp  
   disease and transmission, 147  
   Gram stain for, 123  
   transmission, 144  
 Anaplasmosis, transmission and disease, 148  
 Anaplastic cells  
   Ewing sarcoma, 471  
 Anaplastic/undifferentiated thyroid carcinoma, 347  
 Anastrozole, 675  
 Anatomic dead space, 682  
 Anatomic snuff box, 453

- Anatomy  
 endocrinal, 331  
 gastrointestinal, 367  
 musculoskeletal, skin and connective tissue, 450  
 neurological, 503  
 renal, 598  
 reproductive, 642  
 respiratory, 680
- “Anchovy paste” exudate, 152
- Ancylostoma*  
 disease, transmission and treatment, 156  
 infection routes, 155  
 iron deficiency anemia, 158  
 microcytic anemia, 156
- Andersen disease, 85
- Andexanet alfa, 247, 442
- Androblastoma, 671
- Androgen-binding protein, Sertoli cell secretion, 646
- Androgenic (anabolic) steroids, 676
- Androgenic steroid abuse, 653
- Androgen insensitivity syndrome, 656
- Androgen receptor defect, 656
- Androgen receptor inhibitors, naming, 253
- Androgens, source and functions, 653
- Androstenedione, 339, 653
- Anemia  
 blood oxygen in, 687  
 blood transfusion therapy, **434**  
 blood viscosity in, 290  
 diagram, **422**  
 drugs causing, 194  
 ESR with, 210  
 G6PD deficiency, 77  
 HbC disease, 428  
 hereditary spherocytosis, 428  
 infections, 429  
 intrinsic factor and, 379  
 kwashiorkor, 69  
 Mentzner index, **423**  
 orotic aciduria, 426  
 pernicious anemia, 386  
 pyruvate kinase deficiency, 428  
 recombinant cytokines for, 119  
 reticulocyte index, **423**  
 sickle cell anemia, 428  
 sideroblastic, 66, 425  
 vitamin B<sub>9</sub> deficiency, 66  
 vitamin B<sub>12</sub> deficiency, 67, 426  
 Weil disease, 145  
 Wilson disease, 402
- Anemia, classification/taxonomy  
 aplastic, 427  
 sideroblastic, 425  
 extrinsic hemolytic, **429**  
 intrinsic hemolytic, **428**  
 macrocytic, **426**  
 megaloblastic, 426  
 microcytic, hypochromic, 424  
 nonhemolytic normocytic, **427**  
 normocytic, normochromic, **427**  
 pernicious anemia, 379  
 pure red cell aplasia, 224
- Anemia, drugs causing  
 a-methyl dopa, 429  
 aplastic anemia, 427  
 $\beta$ -lactams, 429  
 cephalosporins, 185  
 chloramphenicol, 187  
 penicillin G, V, 183  
 thionamides, 360
- Anemia of chronic disease, 427
- Anemia, organisms causing  
*Ancylostoma*, 156  
*Babesia* spp, 154, 429  
*Diphyllobothrium latum*, 157  
*Escherichia coli*, 143  
 hookworms, 156
- Anencephaly, 501
- Anergy, **101**
- Anesthetics  
 general, **565**  
 local, **565**
- Aneuploidy, 54, 597, 655
- Aneurysms  
 aortic, 304  
 Ehlers-Danlos syndrome, 49  
 superior vena cava syndrome, 702  
 types of, **530**  
 ventricular, 308
- Angelman syndrome  
 chromosome association, 62  
 imprinting disorder in, 56  
 isodisomy in, 55
- Angina  
 $\beta$ -blockers, 244  
 cocaine causing, 589
- Angina, cardiac  
 hydralazine contraindication, 323  
 manifestations of stable, 306  
 refractory, 324  
 treatment goals with, 323  
 types of, 306  
 unstable, 442  
 with atherosclerosis, 303
- Angina, intestinal, 393
- Angiodysplasia, GI bleeding association, 387
- Angiodysplasia (intestinal), 393
- Angioedema  
 ACE inhibitors for, 628  
 hereditary, 105  
 scombroid poisoning, 246
- Angiogenesis  
 in cancer, 217  
 in wound healing, 212
- Angiokeratomas, 86
- Angiomas, spider, 115
- Angiosarcomas  
 characteristics of, 486  
 nomenclature, 216
- Angiotensin-converting enzyme inhibitors  
 C1 esterase inhibitor deficiency, 105  
 drug reactions with, 250  
 for acute coronary syndromes, 314  
 hypertension treatment, 321  
 mechanism, use, and adverse effects, 628  
 preload/afterload effects, 288  
 teratogenicity of, 632
- Angiotensin converting enzyme, source and functions, 606
- Angiotensin II  
 filtration effects of, 601  
 functions of, 606  
 signaling pathways for, 341
- Angiotensin II receptor blockers  
 hypertension treatment, 321  
 mechanism, use, and adverse effects, **628**  
 naming conventions for, 253
- Angle-closure glaucoma, 551
- Anhidrosis, Horner syndrome, 555
- Anidulafungin, 195
- Anisocytosis, 413
- Anitschkow cells, 319
- Ankle sprains, **458**
- Ankylosing spondylitis  
 characteristics of, 475  
 HLA-subtype, 99
- Annular pancreas, 367
- Anogenital warts, 498
- Anopheles* mosquito, disease transmission, 154
- Anorectal varices, portal circulation, 372
- Anorexia  
 pancreatic adenocarcinoma, 405  
 renal failure and, 621
- Anorexia nervosa, 584
- Anorexigenic effect, 340
- Anorgasmia, 584
- Anosmia  
 zinc deficiency, 69
- ANOVA tests, 267
- Anovulatory infertility, 662
- Antacids, 406
- Antagonistic drug effects, 234
- Antagonists, nonselective, 244
- Anterior cerebral artery  
 stroke effects, 526  
 watershed zones, 513
- Anterior circulation strokes, 526
- Anterior communicating artery  
 saccular aneurysm, 530
- Anterior compartment prolapse, 643
- Anterior drawer sign, 454, 457
- Anterior inferior cerebellar artery, stroke effects, 526
- Anterior inferior tibiofibular ligament, 458
- Anterior nucleus (hypothalamus), 508
- Anterior pituitary (adenohypophysis)  
 embryologic derivatives, 631  
 secretions from, 331  
 sensitivity to TRH, 335
- Anterior spinal artery occlusion, 544
- Anterior spinal artery, stroke effects, 527
- Anterior talofibular ligament sprain, 458
- Anterograde amnesia, 575
- Anthracois, 696
- Anthracyclines  
 mechanism, use, and adverse effects, 444  
 naming conventions for, 252
- Anthrax, 130
- Anthrax toxin  
*Bacillus anthracis* and, 135  
 Antiandrogens, mechanism, use, and adverse effects, 676
- Antianginal therapy goals, 323
- Antiapoptotic molecule  
 oncogene product, 220
- Antiarrhythmic drugs  
 torsades de pointes, 247
- Antiarrhythmics  
 adenosine, 328  
 $\beta$ -blockers (Class II), **327**  
 calcium channel blockers (Class IV), **328**  
 ivabradine, **328**  
 Magnesium, 328  
 potassium channel blockers (class III), **328**  
 sodium channel blockers (Class I), **326**
- Anti- $\beta_2$  glycoprotein  
 antiphospholipid syndrome, 476
- Anti- $\beta_2$  glycoprotein autoantibody, 113
- Antibiotic/antimicrobial resistance mechanisms  
 acyclovir, 196  
 aminoglycosides, 187  
 carbapenems, **186**  
 cephalosporins, **185**  
 chloramphenicol, **188**  
 cidofovir, 197  
 fluoroquinolones, 191  
 foscamet, 197  
 ganciclovir, 196  
 isoniazid, 192  
 linezolid, 189  
 macrolides, 189  
 penicillinase-resistant penicillins, 184  
 penicillinase-sensitive penicillins, 184  
 plasmids, 129  
 rifamycin, 192  
 sulfonamides, 190  
 table of, **127**  
 tetracyclines, 188  
 vancomycin, 186
- Antibiotics  
 acne treatment, 485  
 anaerobic coverage, 188  
*Clostridioides difficile* with, 136  
 healthcare-associated infection risk with, 181  
 hyperammonemia with, 80  
 nucleotide synthesis effects of, 34  
 resistance mechanism, 183  
 torsades de pointes, 247
- Antibodies  
 generation of diversity, 102  
 hepatitis viruses, **171**  
 structure and function, 97, **102**
- Antibody-dependent cell-mediated cytotoxicity, 99
- Antibody-drug conjugates, **443**
- Antibody-mediated hypersensitivity, 110
- Anticancer monoclonal antibodies, **446**
- Anticancer small molecule inhibitors  
 target, clinical use and adverse effects, **447**
- Anticardiolipin  
 antiphospholipid syndrome, 476
- Anticardiolipin antibody, 113
- Anti-CCP antibody, 113
- Anti-centromere antibodies  
 scleroderma, 481
- Anticentromere autoantibody, 113

- Anti-CGRP monoclonal antibodies, 532
- Anticholinergic drugs  
delirium with, 575  
toxicity treatment, 247
- Anticholinesterase poisoning  
muscarinic and nicotinic effects, **239**
- Anticipation (genetics), 54
- Anticoagulant drugs  
anticoagulant and reversal agent, 442  
antiphospholipid syndrome, 476  
for acute coronary syndromes, 314
- Anticoagulation  
reversal, **442**  
targets for, 419
- Anticonstipation drugs, **408**
- Anticonvulsants  
drug reactions with, 249  
mechanism and adverse effects of, **560**  
multiple sclerosis treatment, 537
- Antidiuretics, **592**  
fibromyalgia treatment, 477  
monoamine oxidase inhibitors, **593**  
torsades de pointes, 247
- Anti-desmoglein (anti-desmosome) autoantibody, 113
- Anti-digoxin Fab fragments  
for cardiac glycoside toxicity, 326
- Antidiuretic hormone (ADH)  
antagonists, 360  
functions of, 331, 332, 606  
hypothalamus nucleus and, 508  
hypothalamus synthesis, 508  
naming conventions for antagonist, 253  
primary polydipsia and diabetes insipidus, 342  
signaling pathways for, 341  
source, function, and regulation, **333**
- anti-DNAse B titers  
in rheumatic fever, 319
- Anti-DNA topoisomerase I autoantibody, 113
- Anti-dsDNA antibody, 113
- Antiemetic drugs  
mechanism, clinical use and adverse effects, **407**  
torsades de pointes, 247
- Antiepileptic drugs  
rash caused by, 249  
teratogenicity of, 632
- Antifungal drugs  
griseofulvin, 46  
seborrheic dermatitis, 484  
tinea versicolor, 488
- Antifungal therapy  
drugs for, **194**
- Antigen-presenting cells, 101  
antigen capture by, 96  
B cells as, 415  
dendritic cells, 414  
macrophages as, 100, 413
- Antigens  
active immunity, 108  
chronic mucocutaneous candidiasis, 114  
cross-presentation by dendritic cells, 414
- HLA subtypes, 99  
type and memory, **103**
- Antiglobulin test, 416
- Anti-glomerular basement membrane autoantibody, 113
- Anti-glutamic acid decarboxylase autoantibody, 113
- Antigout drugs  
colchicine, 46
- Anti-growth signal, 217
- Anti-helicase autoantibody, 113
- Antihelminthic therapy, **196**  
mebendazole, 46  
naming conventions for, 252
- Anti-hemidesmosome autoantibody, 113
- Antihistamines  
for scombroid poisoning, 246  
for sedation, 591  
mechanism, use, and adverse effects, 704
- Antihistone autoantibody, 113
- Antihypertensive drugs, 660
- Antihypertensive drugs, in pregnancy, 660
- Anti-IgE monoclonal therapy, 704
- Anti-intrinsic factor autoantibody, 113
- Anti-La/SSB autoantibody, 113, 474
- Antileukotrienes for asthma, 704
- Antimicrobial drugs  
antifungal therapy, **194**  
antiprotozoal therapy, **195**  
antituberculous drugs, **192**  
contraindications in pregnancy, **197**  
embryotoxic, 197  
HIV therapy, **198**  
naming conventions for, 252  
prophylaxis, **193**
- Antimicrosomal autoantibody, 113
- Anti-mite/lice therapy, **195**
- Antimitochondrial autoantibody, 113
- Antimuscarinic drugs  
Parkinson disease therapy, 563  
reactions to, 250  
toxicity treatment, 247
- Antimycobacterial therapy  
prophylaxis and treatment, **193**
- Antineoplastic drugs  
naming conventions for, 252  
nucleotide synthesis effects of, 34
- Anti-NMDA receptor paraneoplastic syndrome encephalitis, 224
- Antinuclear (ANA) antibody, 113
- Antioxidants  
free radical elimination, 206
- Antiparasitic drugs  
naming conventions for, 252
- Antiparietal cell autoantibody, 113
- Anti-phospholipase A2 receptor autoantibody, 113
- Antiphospholipid syndrome autoantibodies in, 113  
findings and treatment, **476**
- Antiplatelet drugs  
for acute coronary syndromes, 314  
mechanism, clinical use and adverse effects, **442**
- Anti-postsynaptic ACh receptor autoantibody, 113
- Anti-presynaptic voltage-gated calcium channel autoantibody, 113
- Antiprogesterin drugs, mechanism and clinical use, **675**
- Antiprotozoal therapy, **195**
- Antipseudomonal drugs  
fluoroquinolones, 191  
penicillins, 184
- Antipseudomonal penicillins  
mechanisms and clinical use, **184**
- Antipsychotics  
delirium treatment, 575  
disruptive mood dysregulation disorder, 574  
dopaminergic pathways affected, 509  
drug reactions with, 250  
dystonia with, 587  
mechanism, use, and adverse effects, 591  
naming conventions for, 252  
reactions to, 248  
torsades de pointes, 247  
Tourette syndrome, 574
- Antipsychotics (atypical)  
2nd generation, 591  
drug reactions with, 248  
MDD with psychotic features, 578  
mechanism, 591  
naming conventions for, 252  
postpartum psychosis treatment, 579  
schizophrenia treatment, 577  
serotonin 5-HT<sub>2</sub> receptor and, 591
- Antiretroviral therapy (ART) in HIV, 198
- Antiribonucleoprotein antibodies  
Sjögren syndrome, 474
- Anti-Ro/SSA autoantibody, 474
- anti-Saccharomyces cerevisiae antibodies (ASCA), 389
- Anti-Scl-70 autoantibody, 113
- Anti-Smith autoantibody, 113
- Anti-smooth muscle antibody, 113
- Antisocial personality disorder, 582
- Antisocial personality disorder, early-onset disorder, 574
- Antispasmodics, 567
- Anti-SRP autoantibody, 113
- Anti-streptolysin O (ASO) titers, 319
- Antithrombin  
coagulation cascade and, 419  
deficiency of, 433
- Anti-TNF therapy  
with granulomatous inflammation, 213
- Antitoxins  
antigenicity of, 129  
as passive immunity, 108
- Anti-TSH receptor autoantibody, 113
- Antituberculous drugs  
mechanism and adverse effects, **192**
- Antitumor antibiotics, **444**
- Anti-U1 RNP antibodies, 113, 476
- Antiviral therapy  
hepatitis C, **200**
- Anxiety disorders  
characteristics of, **579**  
drug therapy, 562
- generalized, **580**  
neurotransmitter changes with, 505
- Aorta  
abdominal and branches of, 370  
coarctation of, 302, 655  
diaphragm, 681  
necrosis and dissection of, 50  
syphilitic heart disease, 319  
traumatic rupture, 305  
“tree bark” appearance, 319
- Aortic aneurysm  
hypertension and, 302  
presentation, risk factors and associations, **304**  
syphilitic heart disease, 319
- Aortic dissection, 302, **305**  
hypertensive emergency and, 302  
Marfan syndrome, 305
- Aortic insufficiency  
syphilis, 319
- Aorticopulmonary septum, 284, 285
- Aorticopulmonary septum, embryologic derivatives, 631
- Aortic regurgitation  
aortic dissection and, 305  
heart murmur with, 295  
pressure-volume loops in, 292  
tertiary syphilis association, 304
- Aortic stenosis  
heart murmur with, 295  
macroangiopathic anemia, 429  
pressure-volume loops in, 292  
supravalvular, 63  
Williams syndrome, 302
- Aortic valve  
cardiac cycle, 291  
embryologic development of, 284  
Turner syndrome, 655
- Aortitis  
syphilis, 145, 179
- Aortocaval compression syndrome, 661
- APC gene  
colorectal cancer and, 395  
familial adenomatous polyposis, 394  
gene product and associated condition, **220**
- “Ape hand,” 450
- Ape hand, 450
- Apgar score, **652**
- Aphasia  
MCA stroke, 526  
types of, **529**
- Apthous ulcers, 383
- Apical compartment prolapse, 643
- Apixaban, 247, 441, 442
- Aplasia, 633
- Aplasia cutis  
methimazole, 360
- Aplastic anemia  
chloramphenicol, 188  
description and findings, 427  
drugs causing, 249  
HBV, 171  
NSAIDs and, 496  
pancytopenia with, 427  
Thionamides, 360
- Aplastic crisis  
hereditary spherocytosis, 428  
sickle cell anemia, 428

- Apolipoproteins, functions, 91  
apoptosis  
  Cytotoxic T cell induction, 100  
  in T-cell differentiation, 100
- Apoptosis  
  BCL-2 gene, 220  
  evasion of, 217  
  in atrophy, 202  
  in bone formation, 462  
  malignant tumors, 216  
  of keratocytes, 492  
  of lower motor neurons, 544  
  pathways, **204**  
  vs necrosis, 205
- Appendicitis, causes and signs, **390**
- Appetite regulation, **340**  
  food intake control, 340  
  ghrelin and, 378  
  “Apple core” lesion (X-ray), 395
- Apraclonidine, 568
- Apraxia, gait, 536
- Aprepitant, 407, 447
- Aquagenic pruritus, 438
- Aquaporin-2, 237
- Aquaporin channels  
  in renal collecting duct, 333
- Aqueous humor pathway, **550**
- Arabinofuranosyl cytidine, **444**
- Arachidonic acid pathways, **495**
- Arachnodactyly, 50
- Arachnoid granulations, 514
- Arachnoid mater  
  derivation, 506  
  meningioma, 539
- Arboviruses  
  Aedes mosquito transmission, **168**
- Area postrema, 407, 506, 508
- Arenaviruses  
  structure and medical importance, 164
- Argatroban, 441
- Arginine  
  classification, 79  
  cystinuria, 83  
  kidney stones, 617
- Argyll Robertson pupils  
  in syphilis, 145, 179  
  in tabes dorsalis, 544
- Aripiprazole, 591
- Arnadillos (disease vectors), 147
- Arm movements  
  abduction, **451**, 452  
  adduction, 451  
  brachial plexus injury, **452**  
  rotator cuff in, 451
- Aromatase, 653
- Aromatase deficiency, **656**
- Aromatase inhibitors  
  drug reactions with, 249  
  mechanism and use, **674**  
  naming conventions for, 253
- Aromatic amines, carcinogenicity of, 221
- Aromatic amino acid metabolism, 82
- Arrhythmias  
  amphotericin B, 194  
  conduction blocks, 312  
  diphtheria, 137  
  drug reactions with and, 245  
  electrolyte disturbances, 609  
  macrolides, 189
- McArdle disease, 85
- MI complication, 313
- narrow complex tachycardias, 310
- premature beats, 312
- sleep apnea, 697
- stimulants and, 588
- thyroid hormones and, 360
- tricyclic antidepressant toxicity, 587
- wide complex tachycardias, 311
- Arsenic  
  angiosarcomas, 486  
  carcinogenicity of, 221  
  squamous cell carcinoma, 494  
  toxicity symptoms, 74  
  toxicity treatment, 247
- Arterial smooth muscle  
  adrenergic receptors in, 236
- Arterial ulcer (lower extremity), 491
- Arteriosclerosis, **304**
- Arteriosclerosis, 303
- Arteriovenous malformation, 320
- Arteriovenous shunts  
  osteitis deformans, 468
- Artesunate, 154
- Arthralgias  
  alkaptonuria, 82  
  chondroblastoma, 470  
  coccidioidomycosis, 149  
  hepatitis viruses, 170  
  rubella, 166  
  serum sickness, 111  
  vitamin A toxicity, 64  
  with Whipple disease, 388
- Arthritis  
  carpal tunnel syndrome and, 463  
  celecoxib for, 496  
  chlamydiae, 146  
  gonorrhea, 140, 179  
  immunosuppressants, 118  
  inflammatory polyarthritis, 168  
  Lyme disease, 144  
  psoriatic, 475  
  reactive, 475  
  septic, **474**  
  seronegative, 475  
  Staphylococcus aureus, 133  
  systemic juvenile idiopathic arthritis, **474**  
  ulcerative colitis, 389
- Arthropathy, hemochromatosis, 402
- Arthus reaction  
  defect, presentation, and findings, 115  
  immunosuppression, 119  
  Type III hypersensitivity, 111
- Arylsulfatase A  
  metachromatic leukodystrophy, 86
- Asbestos, carcinogenicity of, 221
- Asbestos-related disease, 696
- Ascaris spp  
  infection route, 155
- Ascaris lumbricoides  
  disease, transmission and treatment, 156
- Ascending colon, 367
- Ascending lymphangitis, 151
- Aschoff bodies, 319
- Ascites  
  cirrhosis and portal hypertension, 396
- diuretic for, 627
- spontaneous bacterial peritonitis, 397
- Ascorbic acid. See Vitamin C (ascorbic acid)
- Asenapine, 591
- Aseptic meningitis  
  mumps, 167  
  picornaviruses, 164
- Aseptic (viral) meningitis, 165
- Asherman syndrome, 666
- Ashkenazi Jews, **86**
- Aspart, 358
- Aspartame  
  in phenylketonuria, 82
- Aspartate  
  in nucleotides, 33
- Aspartate aminotransferase  
  hepatitis, 170  
  in liver damage, **397**  
  toxic shock syndrome, 133
- Aspartic acid, 79
- Aspergillomas, 150
- Aspergillosis  
  echinocandins, 195
- Aspergillus spp  
  aflatoxins carcinogenicity, 221  
  in immunodeficiency, 116
- Aspergillus fumigatus  
  opportunistic infections, 150
- Aspiration  
  ARDS, 697  
  lung abscess, 701  
  of meconium-stained amniotic fluid, 302  
  reflux-related, 384  
  tracheoesophageal anomalies and, 366  
  Zenker diverticulum, 391
- Aspiration (chemical) pneumonitis, 701
- Aspiration pneumonia, 701  
  clindamycin, 188  
  healthcare-associated infections, 181  
  lung anatomy and, 681
- Aspirin  
  as weak acid, 231  
  cyclooxygenase, 417  
  hemolysis in G6PD deficiency, 249  
  mechanism and clinical use, 442  
  mechanism, use, and adverse effects, **496**  
  Reye syndrome, **495**  
  stroke risk reduction, 525  
  thrombogenesis and, 417
- Asplenia  
  RBC inclusions, 421  
  RBC morphology, 420
- Asterixis, 80, 399, 533
- Asteroid bodies, 695
- Asthma  
  albuterol for, 241  
  diagnosis and mechanisms, 693  
  drug therapy, 704  
  hypertension with, 321  
  methacholine challenge test, 239  
  pulsus paradoxus in, 317
- Astigmatism, 550
- As-treated analysis, 257
- Astrocytes, 503
- Ataxia  
  abetalipoproteinemia, 92  
  in tabes dorsalis, 544  
  lithium toxicity, 587  
  metachromatic leukodystrophy, 86  
  of limbs, 524  
  opsoclonus-myoclonus syndrome, 224  
  prion disease, **174**  
  psychoactive drug intoxication, 588  
  Rett syndrome, 60  
  syphilis, 145  
  truncal, 524  
  vitamin E deficiency, 68  
  Wernicke encephalopathy, 64  
  Wernicke-Korsakoff syndrome, 590
- Ataxia-telangiectasia  
  serum tumor marker, 222  
  transplant rejection, 117
- Atazanavir, 198
- Atelectasis  
  causes of, **699**  
  physical findings, 698  
  pleural effusions and, 699
- Atenolol, 244, 327
- Atezolizumab, 218, 446
- Atherosclerosis  
  familial dyslipidemias, 92  
  homocystinuria, 83  
  in diabetes mellitus, 350  
  location, symptoms and progression, **303**  
  renovascular disease, 623  
  subclavian steal syndrome, 305
- Athetosis, 524, 533
- “Athlete’s foot,” 488
- ATM gene, **115–119**
- Atomoxetine, 574
- Atonic seizures, 531
- Atopic dermatitis (eczema), 483, 485
- Atorvastatin, 324
- Atovaquone  
  babesiosis, 154  
  fungal infections, 151  
  malaria, 154  
  prophylaxis with proguanil, 193
- ATP7B gene, 402
- Atracurium, 566
- Atresia  
  anal, 631  
  biliary, **401**  
  choanal, **678**  
  duodenal, 366  
  esophageal, 366  
  intestinal, **366**  
  jejunal and ileal, 366  
  tricuspid, 284, 300
- Atria  
  depolarization, 297  
  embryologic development of, 284
- Atrial fibrillation  
  description and management, 310
- Atrial flutter  
  description and management, 310
- “Atrial kick,” 291
- Atrial myocytes, 297
- Atrial natriuretic peptide  
  secretion, 297
- Atrial natriuretic peptide (ANP)  
  in amyloidosis, 208  
  in SIADH, 342

- signaling pathways for, 341  
source and functions of, 606
- Atrial septal defect (ASD)  
congenital disease, 301  
Down syndrome, 302  
venous thromboemboli with, 284
- Atrioventricular (AV) block  
First-degree, 312  
Lyme disease, 144  
third-degree (complete), 312
- Atrioventricular (AV) node  
action potential, 296  
antiarrhythmic effects, 327, 328  
Class IC antiarrhythmics, 326  
conduction pathway, 297  
ECG and, 296  
supraventricular tachycardia, 310
- Atrioventricular canals, 284
- Atrioventricular valves  
embryologic development of, 284
- Atrioventricular septal defect (ASVD), 285
- Atrophic gastritis  
gastrin in, 378
- Atrophy  
changes with, 202  
motor neuron signs, 543  
skeletal muscle, 460
- Atropine  
antimuscarinic effects of, 239  
 $\beta$ -blocker overdose, 327  
for anticholinergic toxicity, 239  
multiorgan drug reactions with, 250  
organ system and applications, 240  
toxicity treatment, 247  
use and adverse effects, 240
- Atropine/scopolamine, 246
- Atrioventricular septal defect (AVSD), 285
- Attack rate (risk quantification), 259
- Attention-deficit hyperactivity disorder  
early onset disorder, 574  
preferred medications for, 590
- Attributable risk, 258
- Atypical antidepressants, 592, **594**
- Atypical pneumonias  
chlamydiae, 146  
organisms causing, 175  
typical organisms, 701
- Atypical venous thrombosis  
nocturnal hemoglobinuria, 105
- Auditory anatomy and physiology, **547**
- Auditory cortex  
thalamic relay for, 508
- Auerbach (myenteric) nerve plexus, 383, 391
- Auer rods  
in AML, 437
- Auramine-rhodamine stain, 123
- Auscultation of heart  
Hamman sign, 691  
maneuvers and changes with, **294**  
murmurs and clinical associations, **295**
- Auspitz sign, 485
- Autism spectrum disorder, 574  
double Y males, 655  
fragile X syndrome, 60
- Autoantibodies  
disorders associated with, **113**  
interferon-induced, 107  
self-antigen in, 97
- Autoclaves  
disinfection/sterilization, 197  
for spore-forming bacteria, 126
- Autodigestion, 404
- Autoimmune  
myocarditis, 320
- Autoimmune cytopenias, 204
- Autoimmune diseases  
blistering skin disorders, 489  
diabetes mellitus Type 1, 351  
rheumatoid arthritis, 472  
Sjögren syndrome, 474  
systemic lupus erythematosus, 476
- Autoimmune gastritis, 386
- Autoimmune hemolytic anemia  
causes and findings, 429  
cephalosporins, 185  
risk with hepatitis B and C, 171
- Autoimmune hepatitis, 113, **399**
- Autoimmune hypothyroidism  
risk with hepatitis B and C, 171
- Autoimmune lymphoproliferative syndrome, 204
- autoimmune regulator (AIRE)  
protein, 100
- Autoimmune thrombocytopenia, 119  
hyper-IgE syndrome, 114
- Autonomic drugs  
actions and applications, **238**  
 $\beta$ -blockers, **244**  
bladder dysfunction action on, 236  
cholinomimetic agents, **239**  
muscarinic antagonist applications, **240**  
naming conventions for, 253  
sympatholytics ( $\alpha_2$ -agonists), **243**  
sympathomimetics, **241**
- Autonomic insufficiency, 241
- Autonomic nervous system  
delirium tremens, 587  
dysregulation in inflammatory demyelinating polyradiculopathy, 538  
in diabetes mellitus, 350  
in serotonin syndrome, 587  
limbic system in, 508  
male sexual response, **645**
- Autonomic receptors, **234**
- Autonomy (ethics), 268
- Autophagy  
atrophy with, 202
- Autoregulation of blood flow, **299**
- Autosomal dominant diseases  
achondroplasia, 467  
acute intermittent porphyria, 430  
Brugada syndrome, 311  
Charcot-Marie-Tooth disease, 538  
defects, presentation, and findings, 114  
elastin syndrome, 49  
familial adenomatous polyposis, 394  
familial dyslipidemias, 92  
familial hypocalciuric hypercalcemia, 349  
hereditary hemorrhagic telangiectasia, 320  
hereditary spherocytosis, 428  
hereditary thrombophilias, 433  
juvenile polyposis syndrome, 394  
Liddle syndrome, 604  
listing of, **58**  
Lynch syndrome, 395  
Marfan syndrome, 50  
multiple endocrine neoplasias, 356  
neurofibromatosis, 539  
Peutz-Jeghers syndrome, 394  
pseudohypoparathyroidism, 348  
Romano-Ward syndrome, 311  
tuberous sclerosis, 539  
von Hippel-Lindau disease, 539  
von Willebrand disease, 433
- Autosomal dominant hyper-IgE syndrome  
adenosine deaminase deficiency, 115  
Chédiak-Higashi syndrome, 115
- Autosomal dominant inheritance, 57
- Autosomal dominant polycystic kidney disease, 622  
associated disorders, 622  
chromosome association, 62  
saccular aneurysms and, 530
- Autosomal dominant tubulointerstitial kidney disease, 622
- Autosomal recessive disease  
hemochromatosis, 402  
Jervell and Lange-Nielsen syndrome, 311
- Autosomal recessive diseases  
5 $\alpha$ -reductase deficiency, 656  
abetalipoproteinemia, 92  
alkaptonuria, 82  
bare lymphocyte syndrome, 98  
Bernard-Soulier syndrome, 432  
Cystinuria, 83  
Friedreich ataxia, 545  
galactokinase deficiency, 78  
Glanzmann thrombasthenia, 432  
hemochromatosis, 402  
hereditary hyperbilirubinemias, 401  
homocystinuria, 50, 83  
Kartagener syndrome, 47  
kidney diseases, 604  
listing of, **58**  
maple syrup urine disease, 82  
mutations in hepatocyte, 402  
pyruvate kinase deficiency, 428  
SCID, 35  
Zwilling syndrome, 46
- Autosomal recessive disorder  
MUTYH-associated polyposis syndrome, 394
- Autosomal recessive inheritance, 57
- Autosomal recessive polycystic kidney disease, 622  
associated disorders, 622  
Potter sequence, 596
- Autosomal trisomies  
karyotyping for, 53  
types and findings with, **61**
- Avanafil, 245
- Avascular necrosis (bone), **469**  
femoral head, 466  
Gaucher disease, 86  
scaphoid bone, 453  
Sickle cell anemia, 428  
Avelumab, 218, 446
- Aversive stimulus (positive punishment), 570
- Avibactam, 185
- Avoidant personality disorder, 582
- Axilla/lateral thorax, 458
- Axillary nerve  
injury and presentation, 450  
neurovascular pairing, 458
- Axonal injury  
diffuse, **29**  
neuronal response to, **505**
- Axonal trafficking, 46
- Axonemal dynein, 47
- Azathioprine  
drug reactions with, 248  
mechanism, use, and adverse effects, 444  
purine synthesis effects, 34
- Azithromycin, 189
- Chlamydia* spp, 146  
babesiosis, 154  
in cystic fibrosis, 58
- Azoles  
mechanism and clinical use, **195**  
vaginal infections, 178
- Azotemia  
leptospirosis, 145
- Aztreonam  
mechanism and clinical use, **186**
- B**
- B19 virus, 161
- Babesia* spp  
hematologic infections, 154, 429  
vector for, 144
- Babesiosis, 154
- Babinski reflex/sign  
motor neuron lesions, 543  
upper motor neuron lesions, 523
- Bacillary angiomatosis, 486  
animal transmission, 147  
HIV-positive adults, 173
- Bacillus anthracis*, 130, **135**
- Bacillus cereus*, **136**  
food poisoning, 174
- Bacitracin  
sensitivity to, 134
- Baclofen  
cerebral palsy treatment, 545  
mechanism and use, 567  
multiple sclerosis treatment, 537
- Bacteremia  
brain abscesses, 176  
cutaneous anthrax, 135  
daptomycin, 191  
*Streptococcus gallolyticus*, 135
- Bacteria  
biofilm-producing, **126**  
Gram stain for, 123  
Hemolytic, 134  
infections in immunodeficiency, 116  
normal microbiota, 174  
phage infection of, 128  
pigment-producing, **126**  
spore-forming, **126**  
structures of, **122**  
trimethoprim effects in, 34  
virulence factors, 133, 141  
with exotoxins, **130**  
zoonotic, **147**

- Bacterial exotoxin mechanisms  
 cell membrane lysis, 131  
 increase fluid secretion, 130  
 neurotransmitter release inhibition, 130  
 phagocytic ability inhibition, 130  
 protein synthesis inhibition, 130  
 superantigens, 131
- Bacterial genetics, **128**  
 transduction, 128  
 transposition, 129
- Bacterial infections, **487**  
 B-cell deficiencies, 116  
 granulomatous inflammation, 213  
 myocarditis with, 320
- Bacterial peritonitis (spontaneous), **397**
- Bacterial structures, **122**  
 bacterial toxins  
 elongation factor effects of, 43  
 main features of, **129**
- Bacterial vaginosis  
 characteristics of, 155  
 signs and symptoms, 178  
 vs vaginitis, 147
- Bacterial virulence factors, **127**
- Bacteria virulence factors  
*Escherichia coli*, 143
- Bacteroides* spp  
 alcohol use disorder, 175  
 Bacteroides, 125  
 clindamycin, 188  
 healthcare-associated infections, 181  
 lung abscesses, 702  
 metronidazole, 191
- Bacteroides fragilis*  
 neonatal microbiota, 174
- “Bag of worms,” 669
- Baker cyst, 457
- BAK protein, 204
- Balanced translocations, **62**
- Baloxavir  
 mechanism and use, **196**
- Bamboo spine, 475
- Band cells, 412
- B and T cells  
 immunodeficiency disorders, 115  
 major functions of, **99**
- Barbiturates  
 intoxication and withdrawal, 588  
 mechanism, use, and adverse effects, **561**  
 naming conventions for, 252
- Bare lymphocyte syndrome, 98
- Bariatric surgery, 381
- Barlow maneuver, 466
- Baroreceptors and chemoreceptors, 298
- Barr bodies, 32, 655
- Barrett esophagus, 385  
 dysplasia with, 384  
 esophageal cancer and, 385  
 metaplasia with, **384**  
 progression of, 202
- Bartholin cyst/abscess, 661
- Bartonella* spp  
 bacillary angiomatosis, 486  
 disease and transmission, 147  
 Gram stain for, 123  
 HIV positive adults, 173
- Bartonella quintana*  
 transmission, 158
- Bartter syndrome  
 renal disorder features, 605  
 renal tubular defects, 604
- Basal body (cilium), 47
- Basal cell carcinoma  
 antimetabolites for, 444  
 characteristics of, 494
- Basal ganglia, **511**  
 intraparenchymal hemorrhage, 528  
 lesions of, 524  
 thalamic connections, 508
- Basal lamina, 48
- Basal metabolic rate, 335
- Basal nucleus of Meynert, 505
- Basal plate, 500
- Base excision repair, 37
- Basement membrane  
 blood-brain barrier and, 506  
 collagen in, 48
- Basic amino acids, 79
- Basilar artery  
 herniation syndromes, 543  
 stroke effects, 526
- Basiliximab, 118
- Basophilia, 414
- Basophilic stippling, 421, 430
- Basophils  
 functions, **414**  
 IgE binding of, 103
- Batson (vertebral) venous plexus, 672
- B-cell lymphomas  
 HIV-positive adults, 173  
 risk with hepatitis B and C, 171
- B cells  
 activation, 101, 103  
 adaptive immunity, 97  
 anergy, 101  
 cell surface proteins, 108  
 functions of, 97, 99, **415**  
 immunodeficiency disorders, **114**  
 infections in immunodeficiency, 116  
 maturation, 94  
 neoplasms of, 435, 437  
 non-Hodgkin lymphoma, 434  
 spleen, 96
- BCG vaccination, 138
- BCL gene  
 associated neoplasm, 220  
 mutation in lymphoma, 435
- Bcl-2 protein, 204
- BCR-ABL (*t(9;22)*), 438
- BCR-ABL gene  
 associated neoplasm, 220
- Bead-like costochondral junctions, 468
- Becker muscular dystrophy  
 findings with, 59  
 inheritance of, 59
- Beck triad, 317
- Beckwith-Wiedemann syndrome, 365
- Bed bugs, 158
- Behavioral therapy, 590
- Behavior disorder, REM sleep, **507**
- Behavior modulation  
 hypothalamus and, 508  
 limbic system and, 509
- Behçet syndrome, 479
- “Bell clapper” deformity, 669
- Bell-shaped distribution, 265
- Bence Jones proteinuria, 436
- Benzodiazepines, 156
- Bends, 469
- Beneficence (ethics), 268
- Benign capillary hemangioma, 486
- Benign neonatal hyperbilirubinemia, **400**
- Benign prostatic hyperplasia, 236, **672**  
 urinary symptom treatment, 243
- Benign scrotal lesions, **670**
- Benign tumors, 216  
 bones, 470  
 breast, 667
- Benralizumab, 705
- Benzathine penicillin G, 193
- Benzene  
 drug reactions with, 249
- Benzydine, 221
- Benznidazole, 155
- Benzocaine, 565
- Benzodiazepines  
 cocaine overdose, 589  
 in anxiety disorders, 580  
 in psychiatric emergencies, 587  
 intoxication and withdrawal, 588  
 mechanism, use, and adverse effects, **562**  
 naming conventions for, 252  
 phobia treatment, 580  
 serotonin syndrome treatment, 587  
 toxicity treatment, 247
- Benzoyl peroxide, 485
- Benzotropine, 240, 563, 587
- Berger disease (IgA nephropathy), 614
- Berkson bias, 263
- Bernard-Soulier syndrome, 417, 432
- Berry aneurysm, 530
- Berylliosis, 696
- Beryllium carcinogenicity, 221
- $\beta_1$ -blockade, 288
- $\beta_2$ -agonists  
 asthma therapy, 704  
 naming conventions for, 253
- $\beta_2$ -microglobulin
- $\beta$ -adrenergic effects  
 of T<sub>3</sub>, 335
- $\beta$ -amyloid protein, 208
- $\beta$ -blockers  
 adverse effects of, 244  
 angina, 327  
 antiarrhythmics, 327  
 aortic dissection treatment, 305  
 applications and actions, **244**  
 for acute coronary syndromes, 314  
 for anticholinergic toxicity, 239  
 for cocaine intoxication, 241  
 for migraine headaches, 532  
 for thyroid storm, 346  
 glaucoma therapy, 244, 568  
 heart failure therapy, 244, 316  
 in antianginal therapy, 323  
 naming conventions for, 253  
 overdose treatment, 327  
 pheochromocytoma treatment, 355  
 phobias, 580  
 selectivity, 244  
 Starling curves, 289  
 T<sub>3</sub> in peripheral tissues, 335  
 thyrotoxicosis, 335  
 toxicity treatment, 247
- $\beta$ -cell numbers  
 in Type 2 diabetes mellitus, 351
- $\beta$  cells  
 insulin secretion by, 338  
 pancreatic tumors, 357  
 Type 1 and Type 2 diabetes mellitus, 351
- $\beta$  endocrine cells, 331  
 MHC I and II and, 98
- $\beta$ -endorphin, 331
- $\beta$  (Type II) error (statistical testing), 266
- $\beta$ -globin gene defects  
 chromosomal abnormalities, 62
- $\beta$ -glucan, 195
- $\beta$ -glucuronidase, 412
- $\beta$ -hemolysis, 131
- $\beta$ -hemolytic bacteria, **133**  
 common colonization sites, 133  
*Streptococcus agalactiae* (group B strep), 135  
*Streptococcus pyogenes* (Group A strep), 134
- $\beta$ -hydroxybutyrate, 88
- $\beta$ -interferon  
 multiple sclerosis treatment, 537
- $\beta$ -lactam antibiotics, 429
- $\beta$ -lactam antibiotics, 183
- $\beta$ -lactamase inhibitors, 184, **185**
- $\beta$ -oxidation of VLCFA  
 in adrenoleukodystrophy, 46
- $\beta$ -pleated sheet protein configuration, 208
- $\beta$ -prophage  
 Corynebacterium exotoxin encoding, 137
- $\beta$ -thalassemia  
 allelic heterogeneity, 55  
 chromosome abnormality, 62  
 mutations and clinical outcome, **425**
- $\beta$ -tubulin, 46
- Betaxolol, 244, 568
- Bethanechol  
 action and applications, 239  
 urinary retention treatment, **236**
- Bevacizumab, 446
- Bias and study errors, **263**
- Bicalutamide, 676
- Bicarbonate  
 overdose treatment, 231  
 pancreatic insufficiency, 388  
 salicylate toxicity, 247  
 source, action and regulation, 379  
 tricyclic antidepressant toxicity, 231
- Biceps brachii muscle, 452
- Biceps femoris, 456, 457
- Biceps reflex, 523
- Bicornuate uterus, 640
- Bictegravir, 198
- Bicuspid aortic valve  
 aortic dissection and, 305  
 coarctation of aorta and, 302  
 thoracic aortic aneurysms and, 304  
 Turner syndrome, 302
- Bifid ureter, 597
- Bilateral renal agenesis  
 Potter sequence, 596
- Bile  
 composition and functions of, **382**  
 secretin effect on, 378

- Bile acid resins, 324
- Bile acids  
synthesis of, 46
- Bile canaliculus, 90
- Bile ducts  
in gastrointestinal ligaments, 368  
in portal triad, 374  
obstruction of, 375
- Biliary atresia, **401**
- Biliary cholangitis, primary  
autoantibody, 113
- Biliary cirrhosis, 402
- Biliary colic, 403
- Biliary structures, **375**
- Biliary tract disease  
*Clonorchis sinensis*, 157, 158  
enterococci infections, 135  
gallstones, 375  
hyperbilirubinemia with, 401  
pathology and epidemiology, **402**
- Bilirubin, **382**  
excretion, 382  
excretion defect, 400  
hereditary hyperbilirubinemias, **401**  
liver function marker, 397  
toxic shock syndrome, 133
- Biliverdin, 382
- Bimatoprost, 568
- Bimodal distribution, 265
- Binding globulins, 341
- Binge-eating disorder, 584, 590  
SSRIs for, 593
- Bioavailability (F), 229
- Biochemistry  
cellular, 44  
genetics, 53  
laboratory techniques, 50  
metabolism, 71  
molecular, 32  
nutrition, 63–92
- Biochemistry laboratory techniques  
CRISPR/Cas9, 51  
enzyme-linked immunosorbent  
assay, 52  
fluorescence in situ hybridization,  
53  
gene expression modifications, 54  
karyotyping, **53**  
microarrays, 52  
molecular cloning, **53**  
polymerase chain reaction, **50**  
RNA interference, 54
- Biofilm-producing bacteria  
in vivo, **126**  
*Pseudomonas aeruginosa*, 141  
*Staphylococcus epidermidis*, 133
- Biologic agent naming conventions,  
**254**
- Biomarkers  
cardiac, **297**, 306
- Biotin. See Vitamin B<sub>7</sub> (biotin)
- Bipolar disorder  
diagnostic criteria, **578**  
lithium for, 592
- Bipolar I, 578
- Bipolar II, 578
- Birbeck granules  
Langerhans cell histiocytosis, 439
- Bird's beak sign (X-ray), 383
- Birth rate, 259
- Bisacodyl, 408
- Bismuth  
mechanism and clinical use, **406**
- Isopropolol, 244
- Bisphosphonates  
mechanism, use, and adverse  
effects, **496**  
naming conventions for, 253  
osteogenesis imperfecta treatment,  
49  
osteoporosis treatment, 467
- “Bite cell,” 77, 420, 429
- Bitemporal hemianopia  
optic chiasm compression, 530  
pituitary adenoma, 540
- Bitot spots, 64
- Bitter almond odor (breath), 689
- Bivalirudin, 441
- Black lung disease, 696
- Bladder  
BPH and, 672  
carcinogens affecting, 221  
development of, 636  
exstrophy, 641  
genitourinary trauma, 645  
squamous cell carcinoma, **624**  
urgency in cystitis, 240  
urothelial carcinoma, **24**
- Bladder cancer  
cisplatin/carboplatin for, 445  
hypercalcemia, 224  
*Schistosoma haematobium*, 222
- Bladder outlet obstruction  
common causes of, 597
- “Blast crisis,” 437
- Blastomyces* spp  
treatment, 194
- Blastomycosis  
unique symptoms and features, 149
- Blebbing, 203
- Bleeding  
adenomatous polyps, 394  
direct factor Xa inhibitors, 441  
glycoprotein IIb/IIIa inhibitors, 442  
thrombolytics, 442  
variceal, 378
- Bleeding time, 432
- Bleomycin  
drug reactions with, 250  
lung disease with, 694  
mechanism, use, and adverse  
effects, 444
- Blepharitis, 559
- Blindness  
*Chlamydia trachomatis*, 146  
*Onchocerca volvulus*, 155  
neonatal, 140
- Blistering skin disorders, **489**
- Blood  
carcinogens affecting, 221  
coagulation and kinin pathways,  
**418**  
in placenta, 634  
oxygen content of, 687  
viscosity of, 684
- Blood-brain barrier  
at hypothalamus, 508  
function and mechanism, **506**
- Blood cells  
nomenclature, 216
- Blood flow  
autoregulation by organ/system, **299**  
exercise response, **688**  
renal autoregulation mechanisms,  
**600**
- Blood groups, **411**
- Blood-nerve permeability barrier, 505
- Blood pH  
diuretic effects on, 625
- Blood pressure  
angiotensin II effects, 606  
antidiuretic hormone regulation  
of, 333  
cortisol effect on, 340  
in antianginal therapy, 323  
renal disorders and, 605  
sympathomimetic effect on, 241
- Blood products  
infections from, 181
- Blood-testis barrier, 646
- Blood transfusions  
components for therapy, **434**  
reactions, **112**  
risks of, 434
- Blood vessels  
collagen in, 48  
hereditary hemorrhagic  
telangiectasia, 320  
nomenclature, 216
- Blood volume  
regulation, 606
- Bloody diarrhea. See also Diarrhea  
amebiasis, 152  
*Campylobacter* spp, 147  
*Campylobacter jejuni*, 143  
organisms causing, 175  
*Shigella*, 142  
ulcerative colitis vs Crohn disease, 389  
*Yersinia enterocolitica*, 142
- Blotting procedures, **51**
- Blown pupil  
CN III damage, 556  
in herniation syndromes, 543  
saccular aneurysms, 530
- Blowout fracture, 555
- “Blue babies,” 300
- “Blueberry muffin” rash  
*Toxoplasma gondii*, 180  
Cytomegalovirus, 180  
rubella, 166, 180
- Blue sclerae, 49
- Blue-tinged vision, 250
- Blue toe syndrome, 304
- Blumer shelf, 386
- BMPR2 gene, 698
- Body compartments, 229
- Body dysmorphic disorder, 580
- Body louse, 147
- Body surface area estimation, **493**
- Boerhaave syndrome, 384
- Bombesin, 354
- Bone crises, 86
- Bone disorders  
adult T-cell lymphoma and, 435  
avascular necrosis, 469  
Burkitt lymphoma, 435  
lab values in, **469**  
Langerhans cell histiocytosis, 439  
lytic lesions of, 436  
osteogenesis imperfecta, 49
- Bone formation  
cell biology of, **462**  
ossification, **461**
- Bone marrow  
cytokine stimulation of, 119  
immune system organs, 94  
in osteopetrosis, 468  
myelofibrosis, 438  
RBC inclusions in, 421
- Bone mineral density scan, 467
- Bone morphogenic protein  
neural development, 500
- Bone pain  
hyperparathyroidism and, 349
- Bones  
collagen in, 48  
lytic/blastic metastases in, 219  
renal osteodystrophy, 621  
resorption, 337, 467
- Bone tumors  
malignant, 471  
nomenclature, 216  
primary, **470**
- Boot-shaped heart (chest x-ray), 300
- Borderline personality disorder, 582
- Bordetella pertussis*  
culture requirements, 124  
findings and treatment, **141**  
macrolides, 189  
toxin production, 130  
vaccines, 141
- Bordet-Gengou agar, 124
- Borrelia* spp  
stains for, 123
- Borrelia burgdorferi*  
coinfection with, 154  
disease and transmission, 147  
Lyme disease, 144  
tetracyclines, 188
- Borrelia recurrentis*  
animal transmission, 147  
transmission, 158
- Bortezomib, 447
- Bosentan, 706
- Botox injections, 136
- Bottleneck effect (genetics), 55
- Botulinum toxin  
cerebral palsy treatment, 545  
for migraine headaches, 532  
lysogenic transduction, 128  
multiple sclerosis treatment, 537  
symptoms of, 136  
toxin effects, 130
- Bouchard nodes, 472
- Boutonniere deformity, 472
- Bovine spongiform encephalopathy  
(BSE), 174
- Bowen disease, 669
- Bowenoid papulosis, 669
- Bow legs (genu varum), 468
- “Boxer's fracture,” 463
- Brachial artery, 458
- Brachial plexus  
divisions of, **452**
- Brachial plexus lesions/injury  
deficits and presentation, **452**  
Pancoast tumor, 702
- Brachiocephalic syndrome, 702
- Brachiocephalic vein, 702
- Bradford Hill criteria, **257**
- Bradycardia  
amiodarone and, 328  
atropine for, 240  
β-blockers, 244

- Bradycardia (*continued*)  
 electrolyte disturbances, 609  
 in Cushing reflex, 298
- Bradykinin  
 angiotensin-converting enzyme inhibitor effects, 628  
 C1 esterase inhibitor deficiency, 105
- BRAF gene  
 associated neoplasm, 220  
 melanomas and, 494  
 papillary thyroid carcinoma and, 347  
 serrated polyps and, 394
- BRAF inhibitor  
 naming conventions for, 254
- Brain  
 bilirubin deposition in, 401  
 blood flow autoregulation, 299  
 common lesions and complications, **524–568**  
 copper accumulation in, 402  
 embryologic derivation, 631  
 immune privilege of, 97  
 ischemia of, 206  
 ischemic disease/stroke, **525**  
 malformations of, **501**  
 metastasis, 513  
 thyroid hormone effects on, 335  
 tumor metastasis, 219  
 Zika virus effects, 168
- Brain abscesses  
*Staphylococcus aureus*, 176  
*Toxoplasma gondii*, 173  
 otitis media, 176  
 Viridans streptococci, 176
- Brain cysts, 158
- Brain death, 274
- Brain injury  
 arterial supply and stroke effects, **526**  
 central diabetes insipidus with, 342  
 gastritis with, 386
- Brain natriuretic peptide (BNP)  
 in SIADH, 342  
 signaling pathways for, 341  
 source and functions, 606
- Brain stem  
 cross sections of, **516**  
 dorsal view, **515**  
 in herniation syndromes, 543  
 ventral view, **515**
- Brain stem/cerebellar syndromes, 537  
 multiple sclerosis, 537
- Brain tumors  
 adult primary, **540**  
 childhood primary, **542**  
 hallucinations with, 576
- Branched-chain ketoacid dehydrogenase  
 vitamin B<sub>1</sub> and, 64
- Branchial clefts, arches and pouches, 637
- Branch retinal vein occlusion, 552
- BRCA1/BRCA2 genes  
 chromosome association, 62  
 DNA repair in, 37  
 gene product and associated condition, 220
- Breast  
 carcinogens affecting, 221
- Breast cancer  
 aromatase inhibitors for, 674  
 carcinogens for, 221  
 hypercalcemia, 224  
 incidence/mortality of, 218  
 invasive carcinomas, 668  
 noninvasive carcinomas, 668  
 oncogenes, 220  
 paclitaxel for, 445  
 paraneoplastic cerebellar degeneration and, 224  
 serum tumor marker, 222  
 trastuzumab for, 446  
 types and characteristics, **668**
- Breast diseases  
 benign, **667**
- Breastfeeding failure jaundice, 400
- Breast milk  
 prolactin and, 332
- Breast milk jaundice, 400
- Breast/ovarian cancer  
 BRCA2 mutation, 62  
 incomplete penetrance, 54
- Breast pathology, **667**
- Breathing  
 respiratory muscle weakness, 694  
 work of, **682**
- Breath odor  
 bitter almond, 689  
 fruity, 351
- Breath sounds  
 bronchial, 698  
 diminished, 700  
 physical findings, 698
- Brenner tumor, 664
- Breslow thickness, 494
- Brief psychotic disorder, 577
- Brimonidine, 568
- Brittle bone disease  
 gene defects in, 49
- “Broad collar” rash, 65
- Broad ligament, 643
- Broad spectrum anticonvulsants, 560
- Broca area, 529
- Broca (expressive) aphasia, 529
- Brodalumab, 498
- Bromocriptine, 334, 540, 563
- Bronchi, 680
- Bronchial carcinoid tumor, 703
- Bronchiectasis  
*Aspergillus fumigatus*, 150  
 diagnosis and pathophysiology, 693  
 Kartagener syndrome, 47
- Bronchioles  
 adrenergic receptors in, 236
- Bronchiolitis obliterans, 117, 701
- Bronchitis  
*Haemophilus influenzae*, 140
- Bronchitis, chronic  
 diagnosis and mechanisms, 692
- Bronchoconstriction, 704
- Bronchodilation  
 methylxanthines, 704  
 sympathetic receptors and, 237
- Bronchogenic carcinomas  
 asbestosis and, 696  
 carcinogens for, 221
- Bronchogenic cysts, 679
- Bronchopneumonia, 701
- Bronchopulmonary dysplasia  
 free radical injury, 206
- Bronchospasm  
 scombroid poisoning, 246  
 “Bronze diabetes,” 402, 431
- Brown fat, 76
- Brown-Séquard syndrome, **545**  
 Horner syndrome, 545
- “Brown tumor” (bone), 349, 469
- Brucella* spp  
 culture requirements, 124  
 disease and transmission, 147  
 transmission and treatment, **141**
- Brucellosis, 147
- Brugada syndrome, 311
- Brugia malayi*  
 disease, transmission and treatment, 156
- Bruising  
 scurvy, 67
- Brunner glands  
 bicarbonate production, 379  
 duodenum, 369
- Brushfield spots, 61
- Bruton agammaglobulinemia  
 inheritance mode, 59
- Bruxism, 589, 590
- BTK gene, 114
- B-type (brain) natriuretic peptide, **297**
- Buboes, 146, 179
- Budd-Chiari syndrome, 206  
 findings and etiology, **397**  
 polycythemia vera, 438
- Budesonide, 704
- Buerger disease (thromboangiitis obliterans), 478
- Buffalo hump, 352
- Bulbar palsy, 544
- Bulbus cordis, 285
- Bulimia nervosa, 584  
 Mallory-Weiss syndrome in, 384  
 SSRIs for, 593
- Bulk-forming laxatives, 408
- Bullae  
 characteristics/examples, 483  
 dermatitis herpetiformis, 490  
 impetigo, 487
- Bull neck lymphadenopathy, 130, 137
- Bullous impetigo, 487
- Bullous pemphigoid, 483  
 autoantibodies in, 113, 482  
 pathophysiology and morphology, 489
- Bulls-eye erythema, 144
- Bumetanide, 626
- BUN (blood urea nitrogen)  
 ornithine transcarbamylase deficiency, 81
- Bundle branch block, 312
- Bundled payment, 277
- Bundle of His, 297
- Bunyaviruses  
 structure and medical importance, 164
- Bupivacaine, 565
- Buprenorphine  
 analgesic effects, 567  
 mechanism, use, and toxicity, 588  
 morphine and, 233  
 opioid relapse prevention, 594
- Bupropion  
 depressive disorders, 578  
 drug reactions with, 250  
 mechanism, use, and toxicity, 594
- Burkitt lymphoma  
 chromosomal translocations and, 439  
 EBV, 162  
 occurrence and genetics, 435  
 oncogenes, 220  
 oncogenic microbes, 222
- Burkholderia cepacia*  
 cystic fibrosis, 175
- Burkholderia cepacia* complex  
 lab algorithm, **140**
- Burn classification, **493**
- Burning feet syndrome, 65
- Burnout, medical errors from, 278
- “Burr cells,” 420
- Bursitis  
 prepatellar, c464
- Burton line, c425
- Bupirone  
 mechanism and use, **c592**
- Busulfan  
 lung disease with, c694  
 mechanism, use, and adverse effects, c445
- Butorphanol, 567, **568**
- “Butterfly glioma,” 540
- C**
- C1 esterase inhibitor deficiency, 105
- CA 15-3/CA27-29 (tumor markers), 222
- CA 19-9 (tumor marker), 222, 405
- CA 125 (tumor marker), 222
- CAAT box, 40
- Cabergoline, 343
- Clinical use of, 540  
 effects of, 334
- Cachexia  
 TNF- $\alpha$ , 106
- Café-au-lait spots  
 McCune-Albright syndrome, 55  
 neurofibromatosis, 539
- Caffeine *intoxication* and withdrawal, 589
- Calciferol. See Vitamin D (calciferol)
- Calcification  
 intracranial, 180  
 types of, **207**
- Calcineurin, 118
- Calcinosis cutis, 481
- Calcitonin  
 amyloidosis, 208  
 source, function, and regulation, **337**  
 tumor marker, 222
- Calcitonin gene-related peptide, 532
- Calcitriol, 607
- Calcium  
 in bone disorders, 469  
 in osteomalacia/rickets, 468  
 kidney stones and, 67, 617  
 lab values with hypocalcemic disorders, **348**  
 low vs high serum concentration effects, 609
- Calcium carbonate, 406
- Calcium channel blockers  
 angina, 323  
 antiarrhythmics, **328**  
 drug reactions with, 249

- hypertension, 323  
hypertension treatment, 321  
mechanism, use, and adverse effects, **323**  
Raynaud phenomenon, 480
- Calcium channels, 459  
Lambert-Eaton myasthenic syndrome, 224  
muscle contraction, 459  
myocardial action potential, 296  
pacemaker action potential and, 296
- Calcium homeostasis, **337**  
Calcium pyrophosphate deposition disease, **473**  
Calcium saponification, 205  
Calcium-sensing receptor (CaSR), 361  
Calculous cholecystitis, 403  
Caliciviruses  
structure and medical importance, 164
- California encephalitis, 164  
Calluses (dermatology), 483  
Calor, 209  
Calretinin, 695  
CALR/MPL, 438  
Calymmatobacterium, 179  
cAMP (cyclic adenosine monophosphate)  
endocrine hormone messenger, 341  
heat-labile/heat-stable toxin effects, 130  
hyperparathyroidism, 349  
*Vibrio cholerae*, 144
- CAMP factor, 135  
*Campylobacter* spp  
bloody diarrhea, 175  
disease and transmission, 147  
reactive arthritis, 475
- Campylobacter jejuni*  
clinical significance, **143**  
Guillain-Barré syndrome, 143
- Canagliflozin, 359  
Cancer  
carcinogens, **221**  
ESR with, 210  
GI bleeding with, 387  
hallmarks and mechanism, **217**  
hypertrophy progression, 202  
immune evasion in, 217  
incidence and mortality of, **218**  
oncogenic microbes, **222**  
origin and metastatic sites, **219**  
pneumoconioses, 696  
testing for, **223**
- Cancer therapy  
alkylating agents, 445  
antibody-drug conjugates, 443  
anticancer monoclonal antibodies, 446  
antimetabolites, 444  
antitumor antibiotics, 444  
cell cycle, 443  
microtubule inhibitors, 445  
platinum compounds, 445  
targets, 443  
topoisomerase inhibitors, 445
- Candesartan, 628  
*Candida* spp  
echinocandins, 195  
esophagitis, 384  
infections in immunodeficiency, 116  
in immunodeficiencies, 114  
osteomyelitis, 176  
treatment, 194  
vulvovaginitis, 178
- Candida albicans*  
HIV-positive adults, 173  
opportunistic infections, 150  
skin infections, 114
- Candidiasis  
*Candida albicans*, 150  
cortisol and, 340  
nystatin, 194  
T-cell differentiation and, 100
- Cannabis/cannabinoids  
intoxication and withdrawal, 589
- Cannibalism, 174  
“Cannonball” metastases, 660
- Capacity-limited elimination, 230  
Capecitabine  
5-F-dUMP, 34
- Capillary fluid exchange, **299**  
Capitate bone, 453  
Capitation, 277  
Caplan syndrome, 472, 696  
Capping (of RNA), 40  
Capsaicin, **568**
- Capsular polysaccharide  
bacterial virulence factors, 127
- Capsule (bacterial), 122  
Captain’s wheel formation  
Paracoccidioidomycosis, 149
- Captopril, 628  
Caput medusae, 372  
Caput succedaneum, 527  
Carbachol, 568  
action and applications, 239
- Carbamazepine  
cytochrome P-450 interaction, 251  
DRESS with, 249  
drug reactions with, 249  
eosinophilia and systemic symptoms with, 249  
in SIADH, 342  
mechanism and adverse effects, 560
- Carbamoyl phosphate, 81  
Carbamoyl phosphate synthetase I  
urea cycle, 71  
Carbamoyl phosphate synthetase II, 71
- Carbapenems  
mechanism and use, **186**  
*Pseudomonas aeruginosa*, 141
- Carbidopa/levodopa  
mechanism, use, and adverse effects, **564**
- Carbohydrate absorption, **381**  
Carbohydrate breath test, 393  
Carbol fuchsin, 123  
Carbon dioxide (CO<sub>2</sub>)  
retention, 697  
transport, **686**
- Carbonic anhydrase inhibitors, 625, 626
- Carbon monoxide  
blood oxygen in poisoning, 687  
poisoning vs cyanide toxicity, **689**  
toxicity treatment, 247
- Carbon tetrachloride  
free radical injury, 206
- Carboplatin  
mechanism, use, and adverse effects, 445
- Carboxylases, 71  
Carcinoembryonic antigen (CEA)  
(tumor marker), 222
- Carcinogens  
griseofulvin, 195  
toxins, organs, and impacts, **221**
- Carcinoid syndrome  
bronchial carcinoid tumors, 703  
drugs used for, 360  
somatostatin in treatment, 378
- Carcinoid tumors  
histology and treatment, **357**  
immunohistochemical stains for, 223  
octreotide for, 407  
serum tumor marker, 222  
stomach, 386
- Carcinoma in situ, 202, 215  
ductal, 668  
penis, 669
- Carcinomas  
invasive, 215  
metastasis, 215, 219  
nomenclature of, 216  
thyroid, 347  
vulvar, 661
- Cardiac abnormalities  
gene associations with, 62  
Cardiac and vascular function  
curves, **290**
- Cardiac arrest  
antacid adverse effects, 406  
hypermagnesemia, 609
- Cardiac arrhythmia, 313  
“Cardiac cirrhosis,” 316
- Cardiac contractility  
sodium-potassium pump in, 47
- Cardiac cycle  
cardiac and vascular function  
curves, **290**  
pressure-volume loops, **291**
- Cardiac depression, 323  
Cardiac glycosides, 246  
Cardiac looping, **284**
- Cardiac muscle  
adrenergic receptors in, 236
- Cardiac output  
exercise and, 685  
V/Q mismatch and, 685
- Cardiac output equations  
cardiac and vascular function  
curves, **290**  
Fick principle, **289**  
resistance, pressure, flow, **290**  
Starling curves, **289**  
variables, **288**
- Cardiac oxygen demand, 288  
Cardiac pressures, normal resting, **298**
- Cardiac syncope, 318  
Cardiac tamponade  
aortic dissection and, 305  
jugular venous pulse in, 291  
mechanism and treatment, **317**
- Cardiac tumors, **320**  
Cardinal ligament, 643  
Cardinal signs (inflammation), 209  
Cardinal veins  
embryologic derivatives of, 285
- Cardiogenic shock, 317  
Cardiomyopathies  
β-blockers, 244  
Chagas disease, 155  
dilated, 314  
hypertrophic, 314  
Pompe disease, 85  
restrictive/infiltrative, 314  
types, causes and treatment, 314
- Cardiotoxicity  
methylxanthines, 704  
tricyclic antidepressant adverse effects, 593
- Cardiovascular agents and molecular targets, **322**  
Cardiovascular drugs  
naming conventions for, 253  
reactions to, **247**
- Cardiovascular system  
aging effects on, 225  
anatomy of, 287  
cardiac output variables, **288**  
embryology, **285**  
pathology, **300**  
pharmacology, **321**  
physiology, 288  
systemic sclerosis and, 481  
thyroid disease effects, 344
- Carditis  
Lyme disease, 144
- Carfilzomib, 447  
Carina (trachea), 681  
Carmustine  
drug reactions with, 250  
mechanism, use, and adverse effects, 445
- Carnitine acyltransferase, fatty acid oxidation, 71  
Carnitine deficiency, systemic primary, 87  
Carnitine-dependent transport, 87  
Carotid artery  
atherosclerosis in, 303  
Carotid-cavernous fistula, 557  
Carotid sinus  
in syncope, 318
- Carpal bones, 453  
Carpal tunnel syndrome, 463  
lunate dislocation, 453  
nerve injury, 450  
Carteolol, 568  
Cartilage  
collagen in, 48  
fluoroquinolone damage to, 249  
Cartilage damage, 197, 249  
Carvedilol, 244, 327  
Casal necklace, 65  
Caseating granulomas, 213  
in tuberculosis, 138  
Case-control study, 256  
Case fatality rate, 258  
Caseous necrosis, 205  
Case series study, 256  
Caspases, 204  
Caspofungin, 195  
Casts in urine, **612**  
Catabolite activator protein (CAP)  
transcription, 39  
Catalase-positive organisms  
characteristics, list, **126**  
Cataplexy, 585

- Cataracts  
 diabetes mellitus and, 350  
 infantile, 78  
 muscular dystrophy, 59  
 risk factors and disease associations for, 550  
 rubella, 180  
 sorbitol, 79
- Catecholamine (hypertensive) crisis, 243
- Catecholamines  
 amphetamines and, 241  
 ephedrine and, 241  
 metabolites of, 354  
 pacemaker action potential and, 296  
 with pheochromocytoma, 355
- Catecholamine synthesis/tyrosine catabolism  
 homocystinuria, 83  
 phenylketonuria, **81**
- Cation exchange resins, **361**
- Cat scratch disease, 147
- Cats (disease vectors)  
*Campylobacter jejuni*, 143  
 Cat scratch disease, 147  
*Pasteurella multocida*, 147  
 Tinea corporis, 488  
*Toxoplasma gondii*, 153, 180
- Cattle/sheep amniotic fluid, 147, 148
- Cauda equina, 520
- Cauda equina syndrome, **520**
- Caudate  
 basal ganglia, 508
- Cavernous sinus, 557
- Cavernous sinus syndrome, **557**, 690
- Cavernous sinus thrombosis, 150, 557
- CCR5 protein  
 viral receptor, 163  
 CD41 cell count  
 disease associations by levels, 173  
 prophylaxis for protozoal infection, **153**  
 prophylaxis initiation, 151
- CD41 T cells  
 functions, 99
- CD41 Th  
 acute inflammation, 210
- CD4 protein, 98  
 viral receptor, 163
- CD5 protein in CLL, 437
- CD81 T cells  
 functions, 99
- CD8 protein, 98
- CD16 protein, 99
- CD20 protein in CLL, 437
- CD21 protein, viral receptor, 163
- CD23 protein  
 in CLL, 437
- CD25 protein  
 cell surface protein, 108
- CD34 protein, 108
- CD40 protein, 101
- CDKN2A gene  
 product and associated condition, 220
- CEA tumor marker, 395
- Cefazolin  
 mechanism and use, 185  
 prophylactic use, 193
- Cefepime, 185
- Cefotetan, 185
- Cefoxitin, 185
- Ceftaroline, 185
- Ceftazidime  
 mechanism and use, 185  
*Pseudomonas aeruginosa*, 141
- Ceftriaxone, 176  
*Chlamydia* spp, 144  
*Salmonella typhi*, 142  
 for gonococci, 140  
 for *Haemophilus influenzae*, 140  
 gonococci treatment, 140  
 mechanism and use, 185  
 meningococci, 140  
 prophylaxis use, 193
- Celecoxib  
 adverse effects, 251  
 mechanism, use, and adverse effects, **496**
- Celiac artery/trunk  
 branches of, **371**  
 structures supplied, 371
- Celiac disease  
 autoantibody, 113  
 dermatitis herpetiformis  
 association, 490  
 HLA subtype association, 99  
 IgA deficiency, 113  
 mechanism and associations, 388
- Celiac sprue, 388
- Cell cycle phases  
 regulation of, **44**
- Cell death pathways, 204
- Cell envelope (bacteria), **122**
- Cell-mediated hypersensitivity  
 reaction, 111
- Cell-mediated immunity, 99
- Cell membrane, exotoxin lysis of, 131
- Cell surface proteins  
 association and functions, **108**
- Cell trafficking, **45**
- Cell types, 44
- Cellular adaptations  
 mechanisms of, 202
- Cellular biochemistry, 44
- Cellular destruction hypersensitivity  
 reaction, 110
- Cellular injury  
 axonal injury, 529, 538  
 free radical injury, 206  
 hypoxia (brain), 525  
 infarcts, 206  
 types of, 203
- Cellulitis, 487  
*Pasteurella multocida*, 147
- Cell wall (bacteria), 122
- Cemiplimab, 218, 446
- Central clearing  
 nuclei, 347  
 rash, 488
- Central diabetes insipidus  
 nephrogenic diabetes comparison, 342
- Central/downward transtentorial  
 herniation, 543
- Central nervous system (CNS)  
 antiarrhythmic adverse effects, 326, 327  
 anticholinesterase poisoning, 239  
 brain malformations, 501  
 cancer epidemiology, 218  
 common brain lesions and complications, 524  
 damage in Wernicke-Korsakoff syndrome, 64  
 depression, 562  
 drug name conventions for, 252  
 muscarinic antagonist effects, 240  
 nitrosoureas effect on, 445  
 origins of, 500  
 pathology of infarcts, 205  
 posterior fossa malformations, 502  
 protozoal infections, 153  
 SIADH and head trauma, 342  
*Toxocara canis*, 156
- Central nervous system stimulants, 590
- Central post-stroke pain, 529
- Central precocious puberty, 654
- Central retinal artery occlusion, 552
- Central retinal vein occlusion, 552
- Central sleep apnea, 697
- Central tendency measures, 265
- Central venous pressure  
 in shock, 317
- Central vertigo, 549
- Centrilobular necrosis, 206
- Cephalexin, 185
- Cephalohematoma, 527
- Cephalosporins  
 disulfiram-like reaction with, 250  
 drug reactions with, 248, 249  
 hemolytic anemia with, 429  
 interstitial nephritis with, 250  
 mechanism, use, and adverse effects, 185  
*Pseudomonas aeruginosa*, 141  
 resistance mechanism, 185
- Ceramide trihexoside, 86
- Cerebellar degeneration  
 paraneoplastic, 224
- Cerebellar tonsillar herniation, 543
- Cerebellar vermis, lesions of, 524
- Cerebellum  
 agenesis of vermis, 502  
 brain abscess, 176  
 hemispheric lesions in, 524  
 herniation of, 502  
 input/output of, **510**  
 lesions of vermis, 524
- Cerebral arteries  
 cortical distribution, **513**
- Cerebral cortex  
 arterial distribution, **513**  
 hemineglect, 526  
 regions of, **512**  
 visual field defects, 526
- Cerebral edema, **525**  
 therapeutic hyperventilation, 512
- Cerebral malaria, 154
- Cerebral palsy  
 etiology and presentation, **545**
- Cerebral perfusion, **512**
- Cerebral perfusion pressure (CPP), 512
- Cerebroside sulfate, 86
- Cerebrospinal fluid  
 albuminocytologic dissociation, 538  
 blood-brain barrier and, 506  
 circulation of, 506, 514  
 findings in meningitis, **176**  
 hydrocephalus, 536  
 multiple sclerosis, 537
- Cereulide, 136
- Cervical cancer  
 epidemiology of, 661  
 hydronephrosis with, 618  
 oncogenic microbes, 222
- Cervical rib, 452
- Cervical subluxation, 472
- Cervicitis  
*Chlamydia* spp, 179
- Cervix  
 carcinogens affecting, 221  
 epithelial histology, 644  
 pathology of, **663**  
 punctate hemorrhages, 155
- Cestode infections  
 diseases and treatment, **157**
- Cestodes, 157
- Cetirizine, 704
- Cetuximab, 446
- CF-related diabetes, 58
- CFTR gene  
 cystic fibrosis, 58  
 linked disequilibrium, 55
- CFTR modulator  
 naming conventions for, 253
- cGMP (cyclic guanosine monophosphate)  
 endocrine hormone messenger, 341  
 male sexual response, 645
- CH50 test, 104
- Chagas disease  
 achalasia in, 383  
*Trypanosoma cruzi*, 155
- Chalazion, 559
- Chalk-stick fractures, 468
- Chancere, painless, 179
- Chancroid  
 clinical features and organisms, 179
- Chaperone protein, **43**
- Charcoal yeast extract agar, 124
- Charcoal yeast extract culture  
*Legionella pneumophila*, 141
- Charcot-Bouchard microaneurysm, 528, 530
- Charcot joints  
 cutaneous ulcer association, 491  
 in tabes dorsalis, 544  
 syphilis, 145
- Charcot-Marie-Tooth disease, 538
- Charcot triad, 403
- Charging tRNA, 42
- Checkpoints (cell cycle)  
 cell cycle phases, **44**
- Chédiak-Higashi syndrome  
 defect, presentation, and findings, 115
- Cheilosis, 65, 424
- Chelation  
 hemochromatosis, 402  
 lead poisoning, 425
- Chemical pneumonitis, 701
- Chemokines  
 late hypersensitivity, 110  
 secretion of, 106
- Chemoprophylaxis, **276**
- Chemoreceptors, 298
- Chemoreceptors and baroreceptors, **298**

- Chemoreceptor trigger zone, 407, 506  
 Chemotactic factors, 211  
 Chemotherapy  
   cell types affected by, 44  
   MDR1 and responsiveness to, 223  
   neutropenia with, 429  
   toxicity amelioration, **447**  
 Chemotherapy-induced vomiting  
   treatment, 506  
 Chemotoxicity  
   key toxicities, **448**  
 Cherry angioma, 486  
 “Cherry red” epiglottitis, 140  
 Cherry-red skin, 689  
 Cherry-red spot (macula/fovea), 86, 552  
 Chest pain  
   angina, 306  
   antiarrhythmics and, 328  
   costochondritis, 465  
   Kussmaul sign with, 320  
   pericarditis, 319  
   peri-infarction pericarditis, 313  
   pneumothorax, 700  
   ventricular pseudoaneurysm, 313  
 Chest wall, 50  
   bowel sounds on auscultation, 377  
   deformities of, 50  
   elastic properties, 683  
   expansion with pneumothorax, 700  
   in restrictive lungs disease, 694  
 Chest x-rays  
   aortic dissections on, 305  
   boot-shaped heart, 300  
   “egg on a string,” 300  
   “eggshell” calcification, 696  
   gasless abdomen on, 366  
   in cystic fibrosis, 58  
   widened mediastinum on, 135  
 Cheyne-Stokes respirations  
   sleep apnea, 697  
 Chiari II malformation, 502  
 Chiari malformation, 502  
 Chickenpox  
   rash, 177  
   VZV, 162  
 “Chicken-wire” capillary pattern, 540  
 Chief cells (parathyroid), 336  
 Chief cells (stomach), 379  
 Chikungunya virus, 164  
   diagnosis and treatment, **168**  
 Child abuse  
   osteogenesis imperfecta and, 49  
   types, signs and epidemiology, **573**  
 Childbirth  
   brachial plexus injury in, 452  
   clavicle fractures with, 463  
   oxytocin and uterine contractions, 332, 653  
   peripartum mood disturbances, **579**  
   prematurity and cryptorchidism risk, 669  
 Childhood diseases/disorders  
   hip dysplasia, 466  
   leukocoria, 553  
   musculoskeletal conditions, 466  
   pathogens and findings in unvaccinated, 182  
   primary brain tumors, **542**  
 Childhood/early-onset behavior disorders, **574**  
 Child neglect  
   signs, 573  
 Children  
   aspirin use in, 398  
   benign laryngeal tumors, 690  
   cancer epidemiology, 218  
   clavicle fractures, **463**  
   common cause of blindness, 552  
   common fractures, **467**  
   common meningitis causes, 176  
   common pneumonia causes, 175  
   diseases of unvaccinated, **182**  
   growth hormone excess, 333  
   hemolytic-uremic syndrome, 432  
   hypophosphatemic rickets, 609  
   indirect inguinal hernia in, 377  
   infection-associated  
   glomerulonephritis, 614  
   intussusception in, 392  
   kyphoscoliosis in, 545  
   leukocoria in, 553  
   lymphoid hyperplasia, 390  
   paramyxoviruses in, 166  
   red rashes and clinical presentation, **177**  
   sleep terror disorder, 585  
   volvulus in, 392  
 Chimeric human-mouse monoclonal antibody naming, 254  
 Chi-square ( $\chi^2$ ) test, 267  
*Chlamydiae* spp  
   clinical significance, **146**  
   macrolides, 189  
   reactive arthritis, 475  
   sexually transmitted infection, 179  
   stains for, 123  
   tetracyclines, 188  
*Chlamydia pneumoniae*  
   atypical pneumonia, 146, 701  
   pneumonia, 175  
*Chlamydia psittaci*  
   atypical pneumonia, 146, 701  
   disease and transmission, 147  
 Chloramphenicol  
   cytochrome P-450 interaction, 251  
   drug reactions with, 249  
   mechanism, clinical use, and adverse effects, 188  
   pregnancy contraindication, 197  
   protein synthesis inhibition, 187  
 Chlordiazepoxide, 562  
 Chlorhexidine for sterilization/disinfection, 197  
 Chlorine, 197  
 Chloroprocaine, 565  
 Chloroquine  
   for prophylaxis, 193  
   mechanism, use, and adverse effects, **195**  
   *Plasmodium*, 154  
 Chlorpheniramine, 704  
 Chlorpromazine, 591  
 Chlorpropamide, 359  
 Chlorthalidone, 627  
 Choanal atresia, **678**  
 Chocolate agar  
   *Haemophilus influenzae*, 124, 140  
 Cholangiocarcinomas  
   *Clonorchis sinensis*, 157, 158  
   location and risk factors, **404**  
   oncogenic microbes, 222  
 Cholangitis, 375, 389, 403  
 Cholecalciferol (D3). See Vitamin D (calciferol)  
 Cholecystectomy, 403  
 Cholecystitis, 403  
 Cholecystokinin  
   source, action, and regulation, 378  
 Choledocholithiasis, 403  
 Cholelithiasis  
   octreotide and, 407  
   stone types and related pathologies, **403**  
 Cholera toxin  
   lysogenic phage infection, 128  
   mechanism, 130  
 Cholescintigraphy (HIDA scan), 403  
 Cholestasis serum markers, 397  
 Cholesteatoma, **548**  
 Cholesterol  
   cholelithiasis and, 403  
   in bile, 382  
   lipid-lowering agents, **324**  
   rate-limiting enzyme for synthesis, 71  
   synthesis of, 72  
 Cholesterol emboli syndrome, **304**  
 Cholesteryl ester transfer protein, 91  
 Cholestyramine, 324  
 Cholinergic agonists  
   naming conventions for, 253  
   Cholinergic effects  
   cardiac glycosides, 326  
   Cholinergic receptors  
   second messenger functions, 237  
 Cholinesterase inhibitors  
   drug reactions with, 248  
   neuromuscular blockade reversal, 566  
 Cholinomimetic agents  
   action and applications, **239**  
   glaucoma therapy, 568  
 Chondroblastoma, 470  
 Chondrocalcinosis, 473  
 Chondrocytes  
   achondroplasia, 467  
   bone formation, 461  
 Chondrosarcoma  
   epidemiology and characteristics, 471  
 Choreia  
   orofacial, 591  
   presentation, 533  
 Choriocarcinoma, **660**  
   antimetabolites for, 444  
   hormone levels with, 671  
   metastasis, 219  
   methotrexate, 660  
   serum tumor marker, 222  
   testicular, 671  
 Chorionic villi  
   hydatidiform moles, 659  
   placenta, 634  
 Chorioretinitis  
   congenital toxoplasmosis, 180  
   TORCH infections, 180  
   *Toxoplasma gondii*, 153  
 Choristomas, 216  
 Choroid layer (eye)  
   inflammation, 549  
   neovascularization of, 552  
 Christmas tree distribution, 492  
 Chromaffin cells  
   pheochromocytomas, 355  
 Chromatin  
   cell injury changes, 203  
 Chromatin structure, **32**  
 Chromium carcinogenicity, 221  
 Chromogranin, 222, 703  
   tumor identification, 223  
 Chromones for asthma, 705  
 Chromosomal abnormalities  
   Robertsonian translocation, 62  
 Chromosomal instability pathway, 395  
 Chromosomal translocations  
   hematologic disorders, **439**  
 Chromosome 6  
   hemochromatosis, **402**  
 Chromosome 7  
   D<sup>F</sup>508 deletion, 58  
 Chromosome 11  
   mutation with  $\beta$ -thalassemia, 425  
 Chromosome 13  
   Wilson disease, 402  
 Chromosome 15  
   Prader-Willi and Angelman syndromes, 56  
 Chromosome 16  
   mutations with  $\alpha$ -thalassemia, 424  
 Chromosome abnormalities  
   Angelman syndrome, 56  
   by chromosome number, **62**  
   Familial adenomatous polyposis, 62  
   hemochromatosis, 402  
   hydatidiform moles, 659  
   in myeloproliferative disorders, 438  
   karyotyping for, 53  
   nephroblastoma, 624  
   nondisjunction (meiosis), 61  
   omphaloceles, 365  
   polyposis syndrome, 394  
   Prader-Willi syndrome, 56  
   renal cell carcinoma, 623  
   sex chromosomes, **655**  
 Chronic bronchitis  
   diagnosis and mechanisms, 692  
 Chronic disease, anemia of  
   iron study interpretation, 423  
 Chronic gastritis  
   causes of, 386  
 Chronic gout drugs (preventive), 497  
 Chronic granulomatous disease  
   defect, presentation, and findings, 115  
   recombinant cytokines for, 119  
   respiratory burst in, 107  
 Chronic inflammation processes, **212**, **213**  
 Chronic iron poisoning, 431  
 Chronic ischemic heart disease, **307**  
 Chronic kidney disease  
   erythropoietin in, 607  
 Chronic lymphocytic leukemia/small lymphocytic lymphoma, 437  
 Chronic mesenteric ischemia, 393  
 Chronic mucocutaneous candidiasis  
   defect, presentation, and findings, 114  
   T-cell differentiation and, 100  
 Chronic myelogenous leukemia  
   basophilia in, 414  
   chromosomal translocations and, 439

- Chronic myelogenous leukemia (*continued*)
- gene associations, 438
  - leukemoid reaction comparison, 439
  - risks for, incidence, and presentation, 437
- Chronic obstructive pulmonary disease, 692
- Chronic pancreatitis
- pancreatic insufficiency, 388
  - risk factors and complications, 404
- Chronic prostatitis, 672
- Chronic pyelonephritis, 619
- Chronic renal failure, 621
- Chronic respiratory diseases
- pneumoconioses, 694
- Chronic thromboembolic pulmonary hypertension, 698
- Chronic transplant rejection, 117
- Chvostek sign, 609
- hypocalcemia, 609
  - hypoparathyroidism, 348
- Chylomicron remnants, 92
- Chylomicrons, 92
- lipoprotein lipase in, 91
- Chylothorax, 699
- Chymotrypsin, 380
- Cidofovir
- mechanism, use, and adverse effects, **197**
- Cilastatin
- drug reactions with, 250
  - imipenem and, 186
- Ciliary dyskinesia, primary, **47**
- Ciliary ganglia, 554
- Ciliospinal center of budge, 554
- Cilostazol, 245, 442
- Cimetidine
- cytochrome P-450 interaction, 251
  - histamine blockers, 406
  - inhibitor of cytochrome P-450, 406
  - reactions to, 248
- Cimex hemipterus*, 158
- Cimex lectularius*, 158
- Cinacalcet, 361
- Cinchonism
- antiarrhythmic causing, 326
  - neurologic drug reaction, 250
- Cingulate gyrus
- limbic system, 509
- Cingulate (subfalcine) herniation, 543
- Ciprofloxacin
- cytochrome P-450 interaction, 251
  - fluoroquinolones, 191
  - for Crohn disease, 389
  - meningococci, 140
  - prophylaxis, 193
- Circadian rhythm
- hypothalamic control, 508
  - suprachiasmatic nucleus, 508
- Circle of Willis, **514**
- saccular aneurysms, 530
- Circulatory (blood)
- fetal circulation, **286**
- Circumoral pallor
- group A streptococcal pharyngitis, 134
- Cirrhosis
- cardiac, 316
  - esophageal varices, 384
  - gynecomastia, 667
  - high-output heart failure with, 317
  - hyperbilirubinemia in, 400
  - infantile, 85
  - portal hypertension and, **396**
  - systemic changes with, **396**
  - Vibrio cholerae*, 144
- Cisatracurium, 566
- Cisplatin
- drug reactions with, 250
  - mechanism, use, and adverse effects, **445**, 604
  - targets of, 445
- Citalopram, 593
- c-KIT* gene
- associated neoplasm, 220
  - Mutations, 414
- Cl<sup>-</sup>/HCO<sub>3</sub><sup>-</sup> antiporter, 413
- Cladribine, 444
- for hairy cell leukemia, 437
  - mechanism, use, and adverse effects, 444
- Clarithromycin, 189
- cytochrome P-450 interaction, 251
  - Helicobacter pylori*, 144
  - pregnancy contraindication, 197
- Clasp knife spasticity, 543
- Class IA antiarrhythmics, 326
- Class I antiarrhythmics, 326
- Class IB antiarrhythmics, 326
- Classical conditioning, 570
- Class IC antiarrhythmics, 327
- Classic galactosemia, 78
- Classic (IgG/M) complement pathway, 104
- Class II antiarrhythmics, 327
- Class III antiarrhythmics, 328
- Class IV antiarrhythmics, 328
- Class switching
- B cells, 101
  - thymus-dependent antigens, 103
- Clathrin, 45
- Claudication
- with atherosclerosis, 303
  - Clavicle fractures, **463**
- Clavulanate
- Haemophilus influenzae*, 140
- Clavulanic acid, 185
- Clawing (hand), 454
- Klumpke palsy, 452
- Claw toes, 491
- Clearance (CL) of drugs, 229
- Clear cell adenocarcinoma, 662
- Cleavage (collagen synthesis), 48
- Cleft lip, 639
- Patau syndrome, 61
- Cleft palate, 639
- Patau syndrome, 61
- Clevidipine, 323
- for hypertensive emergency, 323
- Clindamycin
- bacterial vaginosis, 147
  - Clostridioides difficile* and, 136
  - drug reactions with, 248
  - mechanism, use, and adverse effects, 188
  - metronidazole vs, 188
  - vaginal infections, 178
- Clinical reflexes, **523**
- Clinical therapeutic trial, **257**
- Clinical vs statistical significance, **266**
- “Clock-face” chromatin, 415, 436
- Clofazimine
- lepomatous leprosy, 139
- Clomiphene
- drug reactions with, 248
  - estrogen receptor modulators, 674
- Clomipramine, 580, 593
- Clonidine, 243, 574
- cholangiocarcinoma, 158, 222
  - Clonorchis sinensis*, 157
- Clopidogrel
- for ischemic stroke, 525
  - mechanism and clinical use, 442
  - thrombogenesis and, 417
- Closed-angle glaucoma, 239
- Clostridia, **136**
- Clostridioides difficile*
- antibiotic use, 248
  - healthcare-associated infections, 181
  - infection risk with proton pump inhibitors, 406
  - metronidazole, 191
  - PPI association, 136
  - toxins and effects of, **136**, 188
  - vancomycin, 186
  - watery diarrhea, 175
- Clostridium* spp
- exotoxins, 136
- Clostridium botulinum*, **136**
- food poisoning, 174
  - therapeutic uses, 136
  - toxin production, 130
- Clostridium perfringens*, **136**
- clindamycin, 188
  - exotoxin production, 131
  - food poisoning, 174
  - watery diarrhea, 175
- Clostridium septicum*, 136
- Clostridium tetani*
- toxin effects, 136
  - toxin production, 130
  - unvaccinated children, 182
- Clostridioides difficile*, 136
- Clotrimazole, 195
- Clotting factors
- maturation of, 69
- Clozapine, 249, 591
- Clubbing (digital)
- Eisenmenger syndrome, 301
  - paraneoplastic syndromes, 224
  - pathophysiology, **698**
  - pulmonary fibrosis, 694
- Club cells, **679**
- Clue cells
- bacterial vaginosis, 147, 178
- Cluster A personality disorders, 582
- Cluster B personality disorders, 582
- Cluster C personality disorders, 582
- Cluster headaches
- characteristics and treatment, 532
- CNS lymphomas
- HIV-positive adults, 173
  - oncogenic microbes, 222
- Coagulation and kinin pathways, **418**
- Coagulation disorders
- defect in Chédiak-Higashi syndrome, 115
  - hemophilia, 431
  - mixed platelet/coagulation, **433**
  - tests for, **431**
  - vitamin K-dependent, **419**, 431
- Coagulative necrosis, 205
- with MI, 308
- Coal workers’ pneumoconiosis, 696
- Coarctation of the aorta, **302**
- Cobalamin. See Vitamin B<sub>12</sub> (cobalamin)
- Cocaine
- local anesthetic action, 565
  - mechanism and use, 241
  - overdose/intoxication treatment, 589
  - teratogenicity of, 632
- Coccidioides* spp
- stain for, 123
  - treatment, 194
- Coccidioidomycosis
- erythema nodosum, 492
  - unique symptoms and features, 149
- Cochlea
- collagen in, 48
  - inner ear, 547
- Codeine, 567
- Codominance, 54
- Codons
- amino acid specification by, 35
  - start and stop, **42**
- Coenzyme A (CoA)
- activated carrier, 73
  - production, 72
  - vitamin B<sub>5</sub> and, 65
- Cofactors
- biotin, 66
  - copper, 49
  - Menkes disease, 49
  - methionine synthase, 67
  - panthothenic acid, 65
  - pyridoxine, 66
  - pyruvate dehydrogenase complex, 74
  - thiamine, 64
- Coffee bean sign (X-ray), 392
- Cognitive behavioral therapy (CBT), 590
- anxiety disorders, 580
  - for conduct disorder, 574
  - major depressive disorder, 578
  - obsessive-compulsive disorder, 580
  - postpartum depression, 578
- Cogwheel rigidity, 250
- Cohort study, 256
- Coin lesion (x-ray), 703
- Colchicine
- calcium pyrophosphate deposition disease, 473
  - drug reactions with, 248, 249
  - gout, 497
  - in karyotyping, 53
  - microtubules and, 46
- Cold autoimmune hemolytic anemia, 429
- “Cold enrichment,” 137
- Cold staphylococcal abscesses, 114
- Colectomy
- adenomatous polyposis, 394
  - inflammatory bowel disease, 389
- Colesevelam, 324
- Colestipol, 324
- Colistin, 189
- Neisseria* spp, 124
  - Pseudomonas aeruginosa*, 189
- Colitis
- Clostridioides difficile*, 136

- pseudomembranous, 175, 184
- Collagen**  
decreased/faulty production, 48  
epithelial cell junctions and, 482  
in wound healing, 212  
osteoblast secretion of, 462  
polyostotic fibrous dysplasia and, 55  
scar formation, 214  
synthesis and structure, 48  
types of, 48  
vitamin C in synthesis, 67
- Collarette scale**, 492
- Collecting system, duplex**, **597**
- Collecting tubules**  
potassium-sparing diuretics and, 627  
vasopressin effects, 237
- Colles fracture**, 467
- Colon**  
histology, 369  
ischemia of, 206
- Colon cancer**, 395  
adenomatous polyposis and, 394  
antimetabolites for, 444  
incidence/mortality of, 218  
Lynch syndrome, 37  
serrated polyps and, 394  
tumor suppressor genes, 220  
with *S bovis* endocarditis, 135
- Colonic ischemia**, 370, 393
- Colonic polyps**, 394  
histologic types and characteristics, **394**  
potentially malignant, 394
- Colony stimulating factors**, 119
- Color blindness, red-green**, 192
- Colorectal cancer**  
adenomatous polyposis progression, 394  
molecular pathogenesis of, **395**  
oncogenes, 220  
risks, presentation, and diagnosis, **395**  
tumor marker for, 222
- Colovesical fistulas**, 390
- Coma**  
electrolyte disturbances, 609  
hepatic encephalopathy, 398  
in herniation syndromes, 543  
rabies, 169  
thyroid storm, 346  
*Trypanosoma brucei*, 153
- Comedones**, 485
- Commaless genetic code**, 35
- Comma-shaped rods**, 143
- Common bile duct**  
development of, 364  
in gastrointestinal ligaments, 368  
obstruction of, 375
- Common cold**, 164
- Common (fibular) peroneal**, 457
- Common peroneal nerve**, 456
- Common variable immunodeficiency (CVID)**  
defects, presentation, and findings, 114
- Communicating hydrocephalus**, 536
- Communicating with patients**, 269
- Communicating with patients with disabilities**, **271**
- Compartment syndrome**, 465
- Competitive antagonist**, 233
- Competitive inhibitors**, 228
- Complement**  
activation pathways and functions, 104  
endotoxin activation, 131  
immunodeficiency infections, 116  
infections in immunodeficiency, 116  
innate immunity, 97  
pathway testing, 105  
transplant rejection, 118
- Complementation (viral genetics)**, 159
- Complement disorders**  
protein deficiencies, **105**  
regulatory protein deficiencies, 105
- Complex renal cysts vs simple cysts**, 622
- Compliance (lung and chest wall)**, 683
- Compressive atelectasis**, 699
- COMT inhibitors**, 252
- Conditional expression**, 54
- Conduct disorder**, 574
- Conducting zone (respiratory tree)**, 680
- Conduction aphasia**, 529
- Conduction blocks, description and treatment**, **312**, **313**
- Conductive hearing loss**, 49, 548
- Condylomata acuminata**  
HPV and, 485  
sexual transmission, 179
- Condylomata lata**  
syphilis, 145, 179
- Confabulation**, 575  
Korsakoff syndrome, 64
- Confidence intervals**, **267**
- Confidentiality**, 268  
exceptions to, **270**
- Confounding vs effect modification**, **264**
- Congenital adrenal hyperplasias**, **339**
- Congenital cardiac anomaly**  
ventricular septal defect, 285
- Congenital cardiac diseases**  
pulmonary arterial hypertension, 698
- Congenital GI tract anomalies**, 391
- Congenital heart diseases**  
defect associations, **302**  
defect types, **300**  
diabetes during pregnancy, 302  
rubella, 180
- Congenital hydrocele**, 670
- Congenital hypothyroidism**  
causes and findings, 345  
GI abnormality association, 365
- Congenital lactase deficiency**, 79
- Congenital long QT syndrome**, 311
- Congenital lung malformations**, **679**
- Congenital megacolon**, 391
- Congenital microdeletion**, 63
- Congenital penile abnormalities**, **641**
- Congenital rubella**  
cardiac defect associations, 302  
findings, 166
- Congenital solitary functioning kidney**, **597**
- Congenital syphilis**, 145
- Congenital umbilical hernia**, 365
- Congenital Zika syndrome**, 168
- Congestion**  
with lobar pneumonia, 700
- Congo red stain**  
amyloidosis, 616  
medullary carcinoma, thyroid, 347
- Coniine (hemlock)**, 246
- Conivaptan**, 360  
SIADH, 360  
SIADH treatment, 342
- Conjugated (direct)**  
hyperbilirubinemia, 400
- Conjugate horizontal gaze palsy**, 558
- Conjugate vaccines**, 109
- Conjugation (bacterial genetics)**, 128
- Conjunctival pallor**, 424
- Conjunctival suffusion/injection**  
eye disorders, 145
- Conjunctivitis**  
causes of, **549**  
chlamydia, 179  
*Chlamydia trachomatis*, 146  
gonococcal prophylaxis, 193  
*Haemophilus influenzae*, 140  
*Loa loa*, 156  
measles (rubeola) virus, 167, 177  
Zika virus, 168
- Connective tissue**  
anatomy and physiology, 450  
bluish-black color, 82  
drug reactions with, **249**  
tumor nomenclature, 216
- Connective tissue diseases**  
aortic dissection and, 304  
pulmonary arterial hypertension, 698  
thoracic aortic aneurysms and, 304
- Connexons (gap junctions)**, 482
- Corn syndrome**, 354
- Conotruncal abnormalities**, 284
- Consensual light reflex**, 554
- Consensus sequence**, 36
- Consent**  
for minors, **269**  
healthcare proxy, 275
- Consolidation (lung)**  
physical findings, 698
- Constipation**  
anal fissures with, 373  
drugs causing, 248  
from loperamide, 407  
Hirschsprung disease, 391  
irritable bowel syndrome, 391  
ranolazine, 324  
vincristine, 445
- Constitutive expression**, 54
- Constriction of ureter**, 601
- Constrictive pericarditis**, 291, **319**
- Contact dermatitis**  
Type IV hypersensitivity, 111
- Contemplation (change model)**, 586
- Continuous heart murmurs**, 295
- Contraception**, **675**  
parental consent for minors and, 269
- Contractility (heart)**  
factors affecting, 288  
in antianginal therapy, 323
- Contraction alkalosis**, 625
- Contraction (cicatrization) atelectasis**, 699
- Contrast-induced thyroiditis**, 346
- Convergence-retraction nystagmus**, 542
- Conversion disorder**, 583
- Coombs test**, 429
- COPD (chronic obstructive pulmonary disease)**  
organisms causing pneumonia, 175
- COPI/COPII proteins**, 45
- Copper**  
deficiency, 212, 425  
impaired absorption, 49  
toxicity treatment, 247
- Copper metabolism**  
Wilson disease, 402
- Coprolalia**, 574
- Copy number variants (CNVs)**, 52
- Cord factor**, 138
- Cori disease**, 85
- “Corkscrew” esophagus**, 384
- Corkscrew fibers**, 542
- “Corkscrew” hair**, 67
- Cornea**  
astigmatism, 550  
clouding of, 45, 86  
collagen in, 48  
Wilson disease, 402
- Corneal arcus**  
familial hypercholesterolemia, 92  
hyperlipidemia signs, 303
- Corneal reflex**, 519
- Corneal vascularization**, 65
- Coronary arteries**  
atherosclerosis in, 303
- Coronary artery disease**, **306**
- Coronary blood supply**, 287
- Coronary sinus**  
anomalous pulmonary return, 300  
deoxygenated blood in, 288
- Coronary steal syndrome**, **307**
- Coronary vasospasm**  
causal agents for, 247  
triptans and, 562
- Coronaviruses**  
structure and medical importance, 164
- Cor pulmonale**  
heart failure and, 316  
pneumoconiosis, 696  
pulmonary hypertension, 697
- Corpus luteal cyst**, 663
- Correct result (hypothesis testing)**, 266
- Correlation coefficient (r)**, **268**
- Corrosive esophagitis**, 384
- Cortical bone overgrowth**, 468
- Cortical signs**, 526
- Corticopapillary osmotic gradient**, 606
- Corticospinal tracts**, 522  
Brown-Séquard syndrome, **545**  
functions of, 522  
in subacute combined degeneration, 544
- Corticotropin-releasing hormone (CRH)**  
cortisol regulation, 340  
function and clinical notes, 332  
signaling pathways for, 341

- Cortisol  
in Cushing syndrome, 352  
signaling pathways for, 341  
source, function, and regulation, **340**
- Corynebacterium diphtheriae*, **137**  
culture requirements, 124  
exotoxin effects, 137  
exotoxin production, 130  
unvaccinated children, 182
- Costochondritis, 465
- Costovertebral angle tenderness, 619  
acute interstitial nephritis, 620  
kidney stones, 617  
urinary catheterization, 181  
urinary tract infections, 178
- Cotton-wool spots/exudates, 162, 552
- Cough  
from ACE inhibitors, 250, 628  
gastroesophageal reflux disease, 384  
hypersensitivity pneumonitis, 694  
lung cancer, 703  
nonproductive, 138  
seal-like barking, 167  
staccato, 146  
whooping, 130, 141
- Cough reflex, 519
- Councilman bodies  
yellow fever, 168
- Countertransference, **570**
- Courvoisier sign, 375, 405
- Covalent alterations (protein synthesis), 43
- Cowpox, 161
- COX-2 gene  
colorectal cancer and, 395
- COX-2 inhibitor
- Coxiella burnetii*  
disease and transmission, 147  
naming conventions for, 254  
pneumonia with, 701  
Q fever, 148
- Coxsackievirus  
rashes of childhood, 177  
RNA translation in, 165
- Coxsackievirus A infection, 148
- C-peptide  
endogenous insulin secretion, 338  
insulin and, 338  
with insulinomas, 357
- CpG island methylator phenotype (CIMP), 394
- CPS (carbamoyl phosphate synthetase)  
location and function of, 34
- Crackles  
physical findings, 698
- Cranial dysraphism, 501
- Cranial nerve nuclei  
location of, **516**
- Cranial nerve palsies  
CN III, IV, VI, **556**  
osteopetrosis and, 468  
with Schwannoma, 540
- Cranial nerves  
acute inflammatory demyelinating polyradiculopathy effects, 538  
common lesions of, **546**  
function and type, **519**  
pharyngeal arch derivation, **637**  
reflexes of, **519**  
ventral brain stem view, **515**
- Cranial nerves and arteries, **518**
- Cranial nerves and vessel pathways, **518**
- Craniofacial dysmorphism  
Diamond-Blackfan anemia, 426  
Zwelliger syndrome, 46
- Craniopharyngioma, 631  
description and histology, 542
- Craniotabes, 468
- C-reactive protein (CRP), 97  
with inflammation, 209
- Creatine kinase, 198
- Creatinine clearance  
glomerular filtration rate and, 600
- Cremasteric reflex, 456, 523, 669
- Crepitus  
necrotizing fasciitis, 487  
soft tissue, 136
- Crescendo/decrecendo murmurs, 295
- Crescentic glomerulonephritis, 614
- CREST syndrome  
autoantibody, 113  
Raynaud syndrome and, 480  
scleroderma, **481**  
sclerodermal esophageal dysmotility, 384
- Creutzfeldt-Jakob disease  
prion disease, 174  
symptoms and histologic findings, 535
- “Crew cut” (skull X-ray), 428
- Cricothyroid muscle, 638
- Cri-du-chat syndrome, 62
- Crigler-Najjar syndrome, 400, 401
- Crimean-Congo hemorrhagic fever, 164
- CRISPR/Cas9, 51
- Critical illness myopathy, 538
- Critical illness polyneuropathy, 538
- Crizotinib, 447
- Crohn disease  
azathioprine, 119  
granulomatous inflammation, 213  
manifestations of, 389  
spondyloarthritis association with, 475  
sulfasalazine for, 407  
vitamin B<sub>12</sub> deficiency, 67
- Cromolyn, 414, 705
- Cross-linking (collagen synthesis), 48
- Crossover clinical trial, 257
- Crossover studies, 264
- Cross-sectional study, 256
- Croup, 166  
acute laryngotracheobronchitis, **167**  
pulsus paradoxus in, 317
- Crust (skin)  
basal cell carcinoma, 494  
characteristics/examples, 483  
impetigo, 487  
varicella zoster virus, 487
- Cryoprecipitate  
transfusion of, 434
- Cryptococcosis, 150
- Cryptococcus* spp  
amphotericin B for meningitis, 194  
in immunodeficiency, 116  
meningitis in HIV, 176
- Cryptococcus neoformans*  
HIV-positive adults, 173  
opportunistic infections, 150  
stains for, 123
- Cryptogenic organizing pneumonia, 701
- Cryptorchidism, **669**
- Cryptosporidium* spp  
in HIV-positive adults, 173  
stain for identification, 123  
transmission, diagnosis and treatment, 152  
watery diarrhea, 175
- Crypts of Lieberkühn, 369
- C-section deliveries  
neonatal microbiota, 174
- Culture requirements, **124**  
*Legionella pneumophila*, 141
- Curling ulcer, 386
- “Currant jelly” stools, 392, 393
- “Currant jelly” sputum, 143
- Cushing disease, 352  
hyperpigmentation in, 332
- Cushing ulcer, 386
- components of, **298**
- Cushing syndrome, 224  
etiology, findings and diagnosis, **352**
- Cutaneous anthrax, 135
- Cutaneous flushing  
drugs causing, 195, 247
- Cutaneous leishmaniasis, 155
- Cutaneous mycoses, 488
- Cutaneous paraneoplastic syndromes, 224
- Cutaneous small-vessel vasculitis, 479
- Cutaneous T-cell lymphoma, 435
- Cutaneous ulcers, 491
- Cutibacterium acnes* colonization, 485
- Cutis aplasia  
Patau syndrome, 61
- CXCR4/CCR5 protein  
presence on cells, 108
- Cyanide toxicity  
blood oxygen in, 687  
nitroprusside, 323  
treatment for, 247  
vs carbon monoxide poisoning, **689**
- Cyanosis  
congenital heart diseases, 300  
Eisenmenger syndrome, 301  
esophageal atresia, 366  
methemoglobinemia presentation, 688  
patent ductus arteriosus, 301
- Cyclin-CDK complexes, 44
- Cyclin-dependent kinase inhibitor  
naming conventions for, 254
- Cyclin-dependent kinases, 44
- Cyclobenzaprine, 567
- Cyclooxygenase inhibition  
aspirin effect on, 417  
irreversible, 496  
reversible, 495  
selective, 496
- Cyclophosphamide  
drug reactions with, 248, 250  
in SIADH, 342  
mechanism, use, and adverse effects, 445  
transitional cell carcinoma, 624
- Cycloplegia  
atropine for, 240
- Cyclosporine  
drug reactions with, 249  
gout, 249  
immunosuppression, 118
- Cyclothymic disorder, 578
- Cyproheptadine, 587
- CysLT1 receptor blocker  
naming conventions for, 253
- Cystathionine  
vitamin B<sub>6</sub> and, 66
- Cystathionine synthase deficiency, 83
- Cysticercosis, 157
- Cystic fibrosis  
chromosomal abnormalities, 62  
clinical findings with, **58**  
intestinal atresia association, 366  
meconium ileus and, 393  
organisms causing pneumonia in, 175  
pancreatic insufficiency, 388  
*Pseudomonas aeruginosa*  
pneumonia, 141  
vitamin deficiencies and, 63
- Cystic hygroma, 655
- Cystine  
kidney stones, 617
- Cystine-tellurite agar, 137
- Cystinuria  
causes and treatment, **83**
- Cystitis  
presentation and cause, 178
- Cystitis, acute, **619**
- Cystocele, 643
- Cytarabine  
mechanism, use, and adverse effects, 444
- Cytochrome C, 204
- Cytochrome P-450  
azoles, 195  
drug interactions with, **251**  
griseofulvin, 195  
macrolides, 189  
universal electron acceptors, 73
- Cytokeratin, 695  
tumor identification, 223
- Cytokines  
agents and clinical use, 119  
Graves disease and, 346  
immunotherapy, 119  
rejection reactions, 117  
secretion of, **106**  
T cell production, 100  
Type IV hypersensitivity, 111
- Cytokinesis, 44
- Cytomegalovirus  
AIDS retinitis, 162  
cholecystitis and, 403  
HIV positive adults, 173  
immunodeficient patients, 115, 116  
pneumonia, 701  
receptors, 163  
TORCH infection, 180  
transmission and clinical significance, 162  
treatment, 196
- Cytopenias  
autoimmune lymphoproliferative syndrome, 204
- Cytoplasm  
cell cycle phase, 44  
cytoskeletal elements, 46  
glycolysis, 74  
metabolism in, 72
- Cytoplasmic ANCA (c-ANCA)  
autoantibody, 113
- Cytoplasmic membrane (bacteria), 122

- Cytoplasmic processing bodies (P-bodies), 40
- Cytosine  
in nucleotides, 33
- Cytoskeletal elements, **46**
- Cytoskeleton  
filaments, **46**  
in atrophy, 202
- Cytotoxic edema (cerebral), 525
- Cytotoxic T cells, **100**  
cell surface proteins, 108  
MHC I and II, 98
- Cytotrophoblast, 634
- D**
- Dabigatran, 441  
reversal of, 442  
toxicity treatment, 247
- Dabrafenib, 447
- Dacrocytes (“teardrop cells”), 420
- Dactinomycin (actinomycin D)  
mechanism, use, and adverse effects, 444  
RNA polymerase effects, 40
- Dactylitis  
seronegative spondyloarthritis, 475  
sickle cell anemia, 428
- Dalteparin, 440
- Damage-associated molecular patterns (DAMPs), 97
- Danazol, **675**
- “Dancing eyes-dancing feet,” 224, 354
- Dandy-Walker malformation, 502
- Dantrolene  
mechanism and use, 567  
neuroleptic malignant syndrome treatment, 587
- Dapagliflozin, 359
- Dapsone  
*Pneumocystis jirovecii*, 151  
drug reactions with, 249  
hemolysis in G6PD deficiency, 249  
Leprosy treatment, 139  
mechanism, use, and adverse effects, **190**
- Daptomycin  
mechanism, use, and adverse effects, **191**
- “dark curtain” vision loss, 552
- Darkfield microscopy, *Treponema* spp., 144
- Darunavir, 198
- Dasatinib, 447
- Datura*, 240
- Daunorubicin, 247, 444
- Daytime stimulants, 585
- DCC gene  
product and associated condition, 220
- D cells  
somatostatin production, 378
- d-dimer test, 321
- Deacetylation, histones, 32
- Deafness, 311. See Hearing loss
- Deamination reaction  
Base excision repair and, 37  
of nucleotides, 33
- Death  
common causes with SLE, 476  
explaining to children, 275  
sudden cardiac death, 307
- thyroid storm, 346
- Death cap mushrooms, 40
- Debranching enzyme  
glycogen metabolism, 84, 85
- Decay-accelerating factor (DAF), 104
- Deceleration injury, 305
- Decerebrate (extensor) posturing, 524
- Decidua basalis, 634
- Decision-making capacity  
of patients, **268, 269**  
surrogate for, **270**
- Decorticate (flexor) posturing, 524
- Decubitus ulcers, 181
- Deep brachial artery, 458
- Deeper injury burn, 493
- Deep partial-thickness burn, 493
- Deep peroneal nerve, 457
- Deep venous thrombosis  
direct factor Xa inhibitors for, 441  
effects and treatment, **321**  
glucagonomas and, 357  
tamoxifen and, 446
- Defense mechanisms  
mature, 571
- Defensins, 97
- Deferasirox, 247
- Deferiprone, 203, 247
- Deferoxamine, 20, 247
- Deformation (morphogenesis), 633
- Degarelix, 674
- Degenerate/redundant genetic code, 35
- Degludec, 358
- Degmacytes (“bite cells”), 420
- Dehydration  
changes in glomerular dynamics, 601  
gout exacerbation, 473  
loop diuretics for, 626
- Dehydroepiandrosterone (DHEA), 653
- Dehydrogenases, 71
- Delayed puberty, **654**
- Deletions  
with muscular dystrophies, 59
- Delirium, **575**  
barbiturate withdrawal, 588  
phencyclidine, 589  
thyroid storm, 346
- Delirium tremens  
alcohol withdrawal, 587
- Delivering bad news, **273**
- δ cells  
pancreatic tumors, 357
- δ endocrine, 331
- Delta virus  
hepatitis D, 170  
structure and medical importance, 164
- Deltoid muscle  
Erb palsy, 452
- Delusional disorder, 577
- Delusions  
types of, 576
- Demeclocycline, 360  
drug reaction with, 248  
SIADH treatment, 342
- Dementia  
HIV-positive adults, 173  
metachromatic leukodystrophy, 86  
prion disease, 174  
types and findings, **534**  
vitamin B<sub>3</sub> deficiency, 65
- Demographic transition in development, **259**
- Demyelinating/dysmyelinating disorders, **537**  
metachromatic leukodystrophy, 86
- Dendritic cells  
function, **414**  
IL-10, 106  
innate immunity, 97  
T- and B-cell activation, 97, 101
- Dengue virus, 164  
diagnosis and treatment, **168**
- Denial, 570
- Denosumab  
osteoporosis and, 467
- De novo mutations, 59
- De novo pyrimidine/purine synthesis  
rate-limiting enzymes and regulators, 71
- De novo synthesis  
pyrimidine and purine, **34**
- Dental caries, 134
- Dental infection  
brain abscess from, 176
- Dental plaque  
normal microbiota, 174  
viridans streptococci, 126
- Dentate nucleus, 510
- Dentin  
collagen in, 48  
osteogenesis imperfecta, 49
- Dentinogenesis imperfecta, 49
- Denys-Drash syndrome, 624
- Deoxythymidine monophosphate (dTMP)  
inhibition of, 34
- Dependent personality disorder, 582
- Depersonalization/derealization disorder, 575, 580
- Depolarizing neuromuscular blocking drugs, 566
- Depot medroxyprogesterone acetate  
drug reactions with, 249
- Depressants  
intoxication and withdrawal, 588
- Depression  
atypical features in, 578  
drug therapy, 589  
electroconvulsive therapy, 578  
neurotransmitter changes with, 505  
peripartum mood disturbances, 579  
seasonal pattern with, 578  
serotonin-norepinephrine reuptake inhibitors (SNRIs) for, 593  
SSRIs for, 593
- De Quervain tenosynovitis, 465
- Dermacentor, 147
- Dermal extramedullary hematopoiesis, 166
- Dermatitis  
B-complex deficiency, 63  
radiation dermatitis, 492  
Type IV hypersensitivity reaction, 111  
vitamin B<sub>3</sub> deficiency, 65  
vitamin B<sub>5</sub> deficiency, 65  
vitamin B<sub>7</sub> deficiency, 65, 66
- Dermatitis herpetiformis, 388, 490
- Dermatologic terms  
macroscopic, **483–498**  
microscopic, **483**
- Dermatome landmarks, **523**
- Dermatomyositis/polymyositis, **477**  
autoantibody, 113  
paraneoplastic syndrome, 224  
Dermatophytes, 488
- Dermatophytes treatment, 195
- Dermis, 481
- Descending colon, 367
- Descent of testes and ovaries, **642**
- Desert bumps, 149
- Desert rheumatism, 149
- Desflurane, 565, 566
- Desipramine, 593
- Desloratadine, 704
- Desmin, 46  
tumor identification, 223
- Desmopressin  
central diabetes insipidus, 333  
clinical use of, 333, 360, 585  
diabetes insipidus treatment, 342  
for hemophilia, 431  
in SIADH, 342  
release of VWF and factor VIII, 417
- Desmosome, 482
- Desquamation  
staphylococcal toxic shock syndrome, 133
- Desvenlafaxine, 593
- Detemir, 358
- Developmental delay  
renal failure and, 621
- Developmental milestones, 572
- Dexamethasone  
Cushing syndrome diagnosis, 352
- Dexlansoprazole, 406
- Dexrazoxane, 444, 447
- Dextroamphetamine, 590
- Dextrocardia, 284
- Dextromethorphan, 587, **704, 706**
- Diabetes insipidus  
causal agents for, 248  
lithium toxicity, 587, 592  
polydipsia, central and nephrogenic comparison, 342  
potassium-sparing diuretics for, 627  
primary polydipsia comparison, 342  
thiazides for, 627
- Diabetes mellitus  
atherosclerosis and, 303  
hypertension risk with, 302  
hypertension treatment with, 321  
hypoglycemia in, **352**  
manifestations, complications and diagnosis, **350**  
restless leg syndrome and, 533  
risk with hepatitis B and C, 171  
Type 1 vs Type 2, **351**
- Diabetes mellitus therapy  
decrease glucose absorption, 359  
mechanisms and adverse effects, **358**  
thionamides, **360**
- Diabetes mellitus Type 1  
autoantibody, 113  
HLA subtype, 99
- Diabetes mellitus Type 2  
localized amyloidosis in, 208
- Diabetic glomerulonephropathy, 616
- Diabetic ketoacidosis (DKA)  
ketone bodies, 88

- Diabetic ketoacidosis (DKA)  
(*continued*)
- Mucor* and *Rhizopus* infections, 150
  - pathogenesis, signs/symptoms, and treatment, 351
- Diabetic nephropathy  
ACE inhibitors for, 628
- Diabetic neuropathy  
SSNRIs for, 593
- Diabetic retinopathy, 552
- Diagnostic criteria, by symptom  
duration, **581**
- Diagnostic errors, 278
- Diagnostic test evaluation  
terminology and computations, **260**
- Dialectical behavioral therapy, 590
- Dialysis-related amyloidosis, 208
- Diamond-Blackfan anemia, 426
- Diapedesis (transmigration), 211
- Diaper rash  
*Candida albicans*, 150  
nystatin, 194
- Diaphoresis  
acromegaly, 343  
MI signs, 308
- Diaphragm  
structures penetrating, **681**
- Diaphragmatic hernia, 377
- Diarrhea, 152, 388
- B-complex deficiency, 63
  - bismuth/sucralfate for, 406
  - Campylobacter jejuni*, 143
  - Clostridioides difficile*, 136
  - Cryptosporidium*, 152
  - cholera toxin, 130
  - clindamycin, 188
  - drugs causing, 248
  - graft-versus-host disease, 117
  - healthcare-associated infections, 181
  - HIV-positive adults, 173
  - inflammatory bowel disease, 389
  - irritable bowel syndrome, 390
  - lactase deficiency, 79
  - Leflunomide, 496
  - loperamide for, 407
  - malabsorption syndromes, 388
  - opioids for, 567
  - organisms causing, **175**
  - organisms causing watery, 175
  - rice-water, 130
  - rotavirus, 164, 165
  - Salmonella*, 142
  - Shigella*, 142
  - thyroid storm and, 344
  - Vibrio cholerae*, 144
  - VIPomas and, 378
  - viruses causing, 175
  - vitamin C toxicity, 67
  - watery, 130
  - with antacid use, 406
  - with misoprostol, 406
- Diastole  
cardiac cycle, 291  
heart sounds of, 291
- Diastolic dysfunction  
heart failure with preserved  
ejection fraction, 216
- Diastolic heart murmurs, 295
- Diazepam, 562
- Diclofenac, 496
- Dicloxacillin  
mechanism and use, 184
- Dicyclomine, 240
- Diencephalon, 500
- Dietary vitamin supplementation, 63
- Diethylcarbamazine, 196  
*Loa loa*, 156
- Diethylstilbestrol  
teratogenicity of, 632
- Differentiation of T cells, **100**
- Diffuse axonal injury, **529**
- Diffuse cortical necrosis, **621**
- Diffuse gastric cancer, 386
- Diffuse glomerular disorders, 612
- Diffuse large B-cell lymphoma, 435
- Diffuse proliferative  
glomerulonephritis, 612
- Diffuse proliferative  
glomerulonephritis  
(DPGN), 614
- Diffuse scleroderma, 481
- Diffusion-limited gas exchange, 684
- DiGeorge syndrome, 348
- chromosome association, 62
  - lymph node paracortex in, 94
  - lymphopenia with, 429
  - thymic aplasia, 114
  - thymic shadow in, 96
- Digestion  
bile functions in, 382  
carbohydrate absorption, **381**  
malabsorption syndromes, **388**  
vitamin and mineral absorption, **381**
- Digestive tract  
anatomy, **369**  
basal electric rhythm, 369  
histology, **369**
- Digital clubbing, **698**
- Digital ischemia, 304
- Digoxin  
arrhythmias induced by, 326  
contractility effects of, 289  
mechanism and clinical use, **326**  
toxicity treatment, 247, 328  
visual disturbances, 250
- Dihydroergotamine, 532
- Dihydrofolate reductase inhibition, 34
- Dihydroorotate dehydrogenase  
leflunomide effects, 34
- Dihydropyridine calcium channel  
blockers, 253
- Dihydropyridine receptor, 459
- Dihydropyridines, 323
- Dihydroxodamine (flow cytometry)  
test, 115
- Dihydrotestosterone (DHT), 653  
sexual differentiation, 640  
source and function, 653
- Diiodotyrosine (DIT), 335
- Dilated cardiomyopathy, 314  
carnitine deficiency, 87  
doxorubicin, 444  
drugs causing, 247  
heart failure and, 316  
hemochromatosis, 402  
muscular dystrophy, 59
- Diltiazem, 323, 328
- Dimenhydrinate, 704
- Dimercaprol  
for arsenic toxicity, 247  
for lead poisoning, 247  
for mercury poisoning, 247
- Dipalmitoylphosphatidylcholine  
(DPPC), 679
- Diphenhydramine, 587, 704
- Diphenoxylate, **407**, 567
- Diphtheria  
*Corynebacterium diphtheriae*, 137  
exotoxins, 130  
vaccine for, 137
- Diphtheria toxin, 128
- Diphyllobothrium latum*  
disease, transmission and  
treatment, 157
- vitamin B<sub>12</sub> deficiency, 67, 158, 426
- Diplopia  
brain stem/cerebellar syndromes, 537  
central vertigo, 549  
drug-related, 250  
myasthenia gravis, 480
- Dipyridamol  
platelet inhibition, 245
- Dipyridamole  
mechanism, use, and adverse  
effects, 442
- Direct bilirubin, 382
- Direct cell cytotoxicity  
hypersensitivity, 111
- Direct coagulation factor inhibitors  
mechanism, clinical use and  
adverse effects, **441**
- Direct (conjugated)  
hyperbilirubinemia, 400
- Direct Coombs-positive hemolytic  
anemia  
drug reactions with, 249
- Direct Coombs test  
Type II hypersensitivity, 110
- Direct factor Xa inhibitors  
naming conventions for, 253  
reversal of, 442  
toxicity treatment, 247
- Direct fluorescent antibody (DFA)  
microscopy, 144
- Direct inguinal hernia, 377
- Direct light reflex, 554
- Direct sympathomimetics, 241
- Discolored teeth, 197
- Discounted fee-for-service, 277
- Disease prevention, **276**
- Disease vectors  
*Aedes* mosquitoes, 168  
*Anopheles* mosquito, 154  
armadillos, 147  
birds, 147  
cattle/sheep amniotic fluid, 147  
*Dermacento* (dog tick), 147  
dogs, 143, 147  
Ebola virus, 169  
fleas, 148  
flies, 142, 147, 156  
for zoonotic bacteria, 147  
*Ixodes* ticks, 144  
kissing bug, 155  
mosquito, 156  
pigs, 143  
rabies virus, 169  
rodents, 164
- sandfly, 155  
tick, 148  
ticks, 144, 148  
triatomine insect (kissing bug), 155  
Tsetse fly, 153  
*Yersinia enterocolitica*, 142
- Disinfection and sterilization  
methods, **197**
- Disopyramide, 326
- Disorganized thought, 576
- Dispersion measures, 265
- Displacement, 570
- Disruption (morphogenesis), 633
- Disruptive mood dysregulation  
disorder, 574
- Disseminated candidiasis, 150
- Disseminated gonococcal infection, 474
- Disseminated intravascular  
coagulation  
acute myelogenous leukemia, 437  
causes, treatment, and labs, 433  
Ebola, 169  
endotoxins, 129  
microangiopathic anemia, 429
- Dissociation, 570
- Dissociative amnesia, 575
- Dissociative disorders, **575**
- Dissociative identity disorder, 575
- Distal esophageal spasm, 384
- Distal humerus, 458
- Distal renal tubular acidosis (RTA  
type 1), 611
- Distortions of the hand, **454**
- Distributive shock, 317
- Disulfiram  
alcohol use disorder, 590  
ethanol metabolism, 70
- Disulfiram-like reaction  
drugs causing, 250, 359  
griseofulvin, 195  
metronidazole, 191  
procarbazine, 445
- Diuresis  
atrial natriuretic peptide, 297
- Diuretics  
drug reactions with, 248, 250  
effects on electrolytes, **625**  
for SIADH, 342  
glaucoma therapy, 568  
hypertension treatment, 321  
potassium-sparing, 627  
sites of action, **625**  
thiazide, 627
- Diversity (antigen independent), 102
- Diverticula (GI tract), **390**
- Diverticulitis, 390
- Diverticulosis, 390  
GI bleeding association, 387
- Diverticulum  
GI tract, 390  
Thyroid, 330
- Dizygotic (“fraternal”) twins, 635
- Dizziness  
calcium channel blockers, 323  
in subclavian steal syndrome, 305  
nitrates, 322  
ranolazine, 324  
sacubitril, 324  
vertigo and, 549
- DMD gene, 59
- DMPK gene, 59

- DNA  
cloning methods, 53  
free radical injury, 206  
laddering in apoptosis, 204  
methylation in, 32  
mutations in, **38**  
plasmid transfer, 128  
repair, **37**
- DNA gyrase (TOP II), 36  
DNA ligase, 36  
DNA polymerase I, 36  
DNA polymerase III, 36  
DNA replication, **36**  
DNA topoisomerases, 36  
DNA viruses, 160  
herpesviruses, 161  
medical importance, **161**
- Dobutamine, 241  
Docetaxel  
mechanism, use, and adverse effects, 445
- Docusate, 408  
Dofetilide, 328  
Döhle bodies, 412  
Dolor, 209  
Dolutegravir, 198  
Dominant negative mutations, 55  
Donepezil, 239, 564  
Do not resuscitate (DNR) order, 269  
Donovan bodies, 179  
Dopamine, 593  
kidney functions and, 607  
L-DOPA, 563  
pheochromocytoma secretion, 355  
second messenger functions, 237  
sympathomimetic effects, 241  
synthesis and change with diseases, 505  
vitamin B<sub>6</sub> and, 66
- Dopamine agonists  
acromegaly treatment, 343  
in prolactinoma treatment, 334  
Parkinson disease therapy, 563  
pituitary adenoma, 540
- Dopamine antagonists  
prolactin secretion and, 334
- Dopamine β-hydroxylase  
vitamin C and, **67**
- Dopamine receptors (D2)  
vomiting center input, 506
- Dopaminergic pathways  
Parkinson disease therapy, **563**  
projection, function, and altered activity, **509**
- Doravirine, 198  
Dorsal columns  
Brown-Séquard syndrome, **545**  
function of, 522  
in subacute combined degeneration, 544  
in tabes dorsalis, 544  
thalamic relay for, 508  
tracts in, 522
- Dorsal interossei muscle, 453  
Dorsal midbrain lesions, 524  
Dorsal motor nucleus  
function and cranial nerves, 516  
Dorsal optic radiation, 557  
Dorsiflexion (foot), 457  
Dorsocervical fat pad, 352  
Double-blinded study, 257
- “Double bubble” sign (x-ray), **366**  
Double duct sign, 375  
Double strand DNA repair, 37  
Double Y males, 655  
“Down-and-out eye,” 530, 556  
Down syndrome  
ALL and AML in, 437  
α-fetoprotein association, 222  
aneuploidy in, 54  
annular pancreas association, 367  
cardiac defect association, 301  
chromosome association, 62  
GI abnormality association, 365, 366  
Hirschsprung disease and, 391
- Doxazosin, 243  
Doxepin, 593  
Doxorubicin, 247  
mechanism, use, and adverse effects, 444
- Doxycycline  
*Brucella* spp, 141  
Lyme disease, 144  
lymphogranuloma venereum, 146  
*Mycoplasma pneumoniae*, 148  
mechanism and clinical use, 188  
*Plasmodium* spp, 154  
prophylactic use, 193  
ricketsial/vector-borne disease, 148  
tetracyclines, 188
- Doxylamine, 704  
DPP-4 inhibitor  
naming conventions for, 253  
DPP-4 inhibitors, 359  
Dream enactment, 507  
DRESS syndrome, 186  
with anticonvulsants, 560  
Drooling treatment, 240  
“Drop metastases,” 542  
“Drop” seizures, 531
- Drug dosages  
calculations, **231**  
lethal median, 233  
median effective, 233  
toxic dose, 233
- Drug elimination, **230**  
Drug-induced hemolytic anemia, 429  
Drug-induced lupus, 249, **323**  
autoantibody, 113  
Drug-induced thyroiditis, 346  
Drug metabolism, **230**  
Drug name conventions  
α<sub>1</sub> selective blockers, 243  
second-generation histamine blockers, 704
- Drug overdoses  
of weak acids, 231  
of weak bases, 231
- Drug reactions  
cardiovascular, **247**  
endocrine/reproductive, **248**  
gastrointestinal, **248**  
hematologic, **249**  
multiorgan, **250**  
musculoskeletal, **249**  
neurologic, **250**  
pulmonary fibrosis, 250  
renal/genitourinary, **250**  
respiratory, **250**
- Drug reaction with eosinophilia and systemic symptoms (DRESS), 249  
Drug-related myocarditis, 320  
Drug resistance  
plasmids in, 129  
Drugs  
body compartment distribution, 229  
cholinomimetic agents, **239**  
efficacy vs potency, **232**  
modification of effects, **234**  
patient difficulty with, 274  
therapeutic index, **233**  
toxicities and treatments, **247**  
urine pH and elimination, **231**
- Drug safety  
therapeutic index measurement, 233
- “Drunken sailor” gait, 524  
Drusen, 552  
Dry beriberi, 64  
Dry mouth  
Lambert-Eaton myasthenic syndrome, 60  
Dry skin (scaliness)  
vitamin A toxicity, 64  
D-transposition of great arteries, 300  
Dubin-Johnson syndrome, 400, **401**  
Duchenne muscular dystrophy  
findings with, 59  
inheritance, 59
- Ductal adenocarcinomas, 375  
Ductal carcinoma in situ, 668  
Ductal carcinomas (invasive), 668  
Ductus arteriosus, 286  
Ductus deferens, 639  
Ductus venosus, 286  
Duloxetine, 593  
Dumping syndrome, 381  
Duodenal atresia, 366  
Duodenal obstruction, 392  
Duodenal ulcer  
causes of, 387  
hemorrhage, 387  
Duodenal ulcers  
perforation, 387  
Duodenum  
embryology of, 364  
histology, 369  
Duplex collecting system, **597**  
Dupuytren contracture, 465  
Dural venous sinuses, **514**  
Dura mater, 506  
Duret hemorrhages, 543  
Durvalumab, 218, 446  
Duty to protect, 270  
Dwarfism  
achondroplasia, 467  
d-xylose test, 381, 388  
Dynein  
defect in left-right, **284–328**  
movement of, 46  
Dynein motors, 169  
Dysarthria  
brain lesions, 524, 529  
osmotic demyelination syndrome, 538  
Dysbetalipoproteinemia  
familial dyslipidemias, 92  
Dyschezia, 661
- Dysentery  
α-amanitin, 40  
*Entamoeba histolytica*, 175  
*Escherichia coli*, 143  
*Shigella* spp, 130, 142, 175  
Dysgerminoma, 664  
Dysgeusia  
zinc deficiency, 69  
Dyskeratosis  
characteristics/examples, 483  
Dyskinesias  
drugs causing, 250  
type and presentation, **533**  
Dyslipidemias  
familial, **92**  
vitamin B<sub>3</sub> effects, 65  
Dysmenorrhea  
primary, **663**  
Dysmetria  
central vertigo, 549  
with strokes, 526  
Dyspareunia  
Sjögren syndrome, **474**  
Dysphagia  
achalasia in, 383  
aspiration pneumonia, 701  
esophageal cancer, 385  
esophageal pathologies and, 384  
osmotic demyelination syndrome, 538  
pathology location and, 690  
Plummer-Vinson syndrome, 424  
stroke effects, 527  
thyroid cancer, 347  
types of, 384  
Zenker diverticulum, 391  
Dysplasia  
bronchopulmonary, 206  
changes with, 202  
neoplastic progression, 215  
of hip, 466  
Dysplasia and carcinoma in situ, 663  
Dyspnea  
heart failure and, 316  
in α<sub>1</sub>-antitrypsin deficiency, 400  
left heart failure, 316  
pneumomediastinum, 691  
pneumothorax, 700  
Dystonia  
antipsychotics/antiepileptics, 591  
Lesch-Nyhan syndrome, 35  
maple syrup urine disease, 82  
presentation, 533  
treatment of, 240  
treatment of focal, 136  
Dystrophic calcification  
vs metastatic, 207  
Dystrophin (DMD) gene, 59  
Dysuria, 178  
prostatitis, 672  
urinary catheterization, 181  
urinary tract infections, 619
- E**  
Early complement deficiencies, 105  
Early diastolic murmurs, 295  
Ears  
everted, 60  
low-set, 61  
odor of wax, 82  
pharyngeal pouch derivation, 637

- Eastern equine encephalitis  
 medical importance, 164
- Eating disorders  
 characteristics and types of, **584**  
 functional hypothalamic  
 amenorrhea, 663  
 in OCDs, 580
- Eaton agar, 124, 148
- Ebola virus  
 medical importance, **169**  
 structure and medical importance,  
 164
- Ebstein anomaly, 284, 300  
 lithium for, 592
- E-cadherin, 215  
 mutation in gastric cancer, 386  
 tissue invasion in cancer, 217
- Echinocandins  
*Aspergillus fumigatus*, 150  
 mechanism, use, and adverse  
 effects, **195**  
 opportunistic fungal infections, 150
- Echinococcus granulosus*  
 disease association and treatment,  
 158  
 disease, transmission and  
 treatment, 157
- Echinocytes (“burr cells”), 420
- Echothiophate, 568
- Echovirus  
 RNA translation in, 165
- Eclampsia, 302, 660
- Ecological study, 256
- Ecthyma gangrenosum  
*Pseudomonas* spp, 141
- Ectocervix  
 epithelial histology, 644
- Ectoderm  
 derivatives, 631  
 pharyngeal (branchial) clefts, 637
- Ectoparasite infestations, **158**
- Ectopia lentis, 550
- Ectopic beats, 312
- Ectopic pregnancy, **658**  
 antimetabolites for, 444  
 primary ciliary dyskinesia, 47  
 salpingitis, 181
- Ectopic thyroid production, 346
- Eculizumab  
 for paroxysmal nocturnal  
 hemoglobinuria, 428  
 intravascular hemolysis, 105
- Eczema  
 eczematous dermatitis, 483  
 phenylketonuria, 82  
 skin scales in, 483  
 Wiskott-Aldrich syndrome, 115
- Edema  
 Arthus reaction, 111  
 calcium channel blockers, 323  
 capillary fluid exchange and, 299  
 danazol, 675  
 immunosuppressants, 118  
 Kwashiorkor, 69  
 loop diuretics for, 626  
 periorbital, 156  
 peripheral, 316  
 pitting, 316  
 pseudoephedrine/phenylephrine,  
 704  
 vasogenic, 506  
 with fludrocortisone, 360  
 with hyperaldosteronism, 354
- Edinger-Westphal nuclei, 554
- Edoxaban, 441
- Edwards syndrome  
 chromosome association, 62
- Edwards syndrome (Trisomy 18), 61
- Efavirenz, 198
- Effective refractory period  
 Class I antiarrhythmic effect, 326
- Effective renal plasma flow, **600**
- Effect modification vs confounding,  
**264**
- Efferent arteriole constriction, 601
- Efficacy vs potency of drugs, **232**
- EGFR (ERBB1) gene*, 703  
 associated neoplasm, 220  
 “Egg on a string” (chest x-ray), 300  
 “Eggshell” calcification, 696
- Eggshell calcification, 157, 477
- Ego defenses  
 immature defenses, **570–594**  
 mature, 571
- Egophony, 698
- Egonyntonic, 582
- Ehlers-Danlos syndrome  
 aneurysm association with, 530  
 collagen deficiency in, 48  
 findings in, **49**
- Ehrlichia* spp  
 Gram stain for, 123  
 rickettsial/vector-borne, 148
- Ehrlichia chaffeensis*, 147
- Ehrlichiosis, 147  
 transmission, 148
- Eisenmenger syndrome, 301
- Ejaculation  
 innervation of, 645  
 sperm pathway, 644
- Ejaculatory ducts  
 embryology of, 639
- Ejection fraction  
 equation for, 289  
 in heart failure, 316
- Ejection time  
 in antianginal therapy, 323
- Elastase  
 secretion of, 380
- Elastic recoil, 683
- Elastin  
 characteristics and functions of, **50**
- Elbasvir, 200
- Elbow injuries  
 childhood, **466**  
 overuse, **462**
- Electrical alternans, 317
- Electrocardiogram  
 abnormality with pulmonary  
 embolus, 691  
 components of, **297**  
 electrical alternans on, 317  
 electrolyte disturbances, 609  
 findings with conduction blocks, 312  
 left axis deviation, 300  
 MI diagnosis with, 309  
 premature beats on, 312  
 RA hypertrophy, 300  
 sick sinus syndrome, 311  
 STEMI localization, **309**
- Electroconvulsive therapy  
 major depressive disorder, 578  
 MDD with psychotic features, 578  
 use and adverse effects, **579**
- Electrolytes  
 high/low serum concentrations  
 of, **609**
- Electron acceptors (universal), 73
- Electron microscopy  
 in kidney disease, 614
- Electron transport chain  
 oxidative phosphorylation, **76**
- Electrophoresis  
 hemoglobin, **416**
- Elek test, 137
- Elementary bodies (chlamydiae), 146
- Elephantiasis (lymphatic filariasis)  
*Wuchereria bancrofti*, 156
- 11 $\beta$ -hydroxylase, 339
- 11-deoxycorticosterone, 339
- Elfin facies, 63
- Elimination disorders, **585**
- Elliptocytes, 420
- Elongation (protein synthesis), 43
- Eltrombopag, 432
- Emancipated minors, 269
- EMB agar  
 lactose-fermenting enterics, 142
- Emboli  
 atrial septal defect, 301  
 cholesterol emboli syndrome, 304  
 in infective endocarditis, 318  
 paradoxical, 301  
 types of, 691
- Embolic stroke, 525
- Emboliciform nucleus, 510
- Embryogenesis  
 intrinsic pathway, 204
- Embryologic derivatives, **631**
- Embryology  
 early fetal development timeline,  
**630**  
 embryologic derivatives, **631**  
 endocrine system, 330  
 erythropoiesis, **410**  
 gastrointestinal, 364  
 hematology/oncology, 410  
 morphogenesis errors, **633**  
 neurological, 499, 500  
 pancreas and spleen, **367**  
 renal system, 596  
 reproductive, 630  
 respiratory, 678
- Embryonal carcinoma, 671  
 hormone levels with, 671
- Embryonic/developmental age, 651
- Emesis. See Vomiting
- Emission  
 innervation of, 645
- Emollient laxatives, 408
- Emotion  
 neural structures and, 509
- Emotional abuse, 573
- Empagliflozin, 359
- Emphysema  
 diagnosis and mechanisms, 692  
 diffusion-limited gas exchange, 684  
 panacinar, 400
- Empty/full can test, 451
- Emtricitabine, 198
- Enalapril, 628
- Encapsulated bacteria  
 examples list, **125**  
 infections with immunodeficiency,  
 116
- Encephalitis  
 anti-NMDA receptor, 224  
*Cryptococcus neoformans*, 150  
 guanosine analogs, 196  
 herpesviruses, 162, 176  
 HSV identification, 163  
 Lassa fever, 164  
 measles (rubeola) virus, 167
- Encephalomyelitis  
 paraneoplastic syndrome, 224  
 postinfectious (acute disseminated),  
 167
- Encephalopathy  
 hepatic, 372, 398  
 lead poisoning, 425  
 Lyme disease, 144  
 prion disease, 174
- Encephalotrigeminal angiomas, 539
- Encopresis, 585
- Encorafenib, 447
- End-diastolic volume  
 in antianginal therapy, 323
- Endemic typhus, 147
- Endocannabinoids  
 appetite regulation, 340
- Endocardial cushion, 284, 285
- Endocardial fibroelastosis, 314
- Endocervix  
 epithelial histology, 644
- Endochondral ossification, 461
- Endocrine pancreas cell types, **331**
- Endocrine/reproductive drug  
 reactions, **248**
- Endocrine system  
 anatomy, 331  
 embryology, 330  
 extrahepatic manifestations of  
 hepatitis, 171  
 hormones acting on kidney, **608**  
 hormone signaling pathways, **341**  
 paraneoplastic syndrome, 224  
 pathology, 342  
 pharmacology, 358  
 physiology, **332**  
 steroid hormone signaling  
 pathways, **341**
- Endoderm  
 derivatives, 631, 637  
 pharyngeal (branchial) pouch  
 derivation, 637
- Endodermal sinus tumor, 664
- Endolymphatic hydrops, 549
- Endometrial carcinoma, 666  
 epidemiology of, 661  
 estrogens for, 674  
 Lynch syndrome and, 395
- Endometrial hyperplasia, 666  
 follicular cysts, 662
- Endometrioid carcinoma, 666
- Endometriosis  
 characteristics and treatment, 666  
 treatment, 676
- Endometritis, 666  
 pelvic inflammatory disease, **181**
- Endoneurium, 505
- Endonucleases, 37
- Endoplasmic reticulum  
 rough, **45**  
 smooth, **45**

- Endosomes, 45
- Endothelial cells  
immunohistochemical stains, 223  
in wound healing, 211
- Endothelin receptor antagonist  
naming conventions for, 253  
pulmonary hypertension treatment, 706
- Endotoxins  
*E. coli* endotoxin, 143  
effects of, **131**  
features of, **129**  
main features of, 129  
*Pseudomonas aeruginosa*, 141  
*Salmonella typhi*, 142
- Endotracheal intubation, 181
- Enfuvirtide, 198
- Enhancer (gene expression), 40
- Enoxaparin, 440
- Entacapone, 563  
bloody diarrhea, 175
- Entamoeba histolytica*  
metronidazole, 191  
transmission, diagnosis and treatment, 152
- Enteritis  
vitamin B<sub>5</sub> deficiency, 65  
vitamin B<sub>12</sub> deficiency, 67
- Enterobacter aerogenes*, 185
- Enterobius* spp  
diseases association, 158  
infection route, 155
- Enterobius vermicularis*  
disease, transmission and treatment, 156
- Enterocoele, **643**
- Enterochromaffin-like (ECL) cells, 380
- Enterococci, **135**
- Enterococcus* spp, **135**  
penicillins for, 184  
urinary tract infections, 178  
vancomycin, 186
- Enterococcus faecalis*, 135  
Cephalosporins, 185
- Enterococcus faecium*, 135
- Enterocolitis  
necrotizing, 393  
vitamin E excess, 68
- Enterohemorrhagic *Escherichia coli*, 130, 175  
toxin, mechanism and presentation, 143
- Enteroinvasive *Escherichia coli*  
diarrhea with, 175  
toxin, mechanism and presentation, 143
- Enterokinase/enteropeptidase, 380
- Enteropathogenic *Escherichia coli*  
toxin, mechanism and presentation, 143
- Enterotoxigenic *Escherichia coli*, 130  
diarrhea, 175  
toxin, mechanism and presentation, 143
- Enterotoxins, 129  
*Shigella* spp, 142  
*Vibrio cholerae*, 144
- Enterovesical fistulae, 389
- Enteroviral encephalitis, 116
- Enteroviruses, 165
- Enterovirus meningitis, 176
- Enthesitis, 475
- Entorhinal cortex, 509
- Entry inhibitors, HIV therapy, 198
- Enuresis, 585  
tricyclic antidepressant use for, 593
- Envelopes (viral), 160
- Enzyme kinetics, 228
- Enzyme-linked immunosorbent assay, 52
- Enzymes  
lipid transport and, 90, **91**  
rate-determining and regulators, **71**  
terminology for, **71**
- Eosin–methylene blue (EMB) agar, 124
- Eosinopenia, cell counts and causes, 340, 429
- Eosinophilia  
causes of, 414  
*Chlamydia trachomatis*, 146  
drugs causing, 249  
in immunocompromised patients, 434  
macrolides, 189
- Eosinophilic apoptotic globules, 168
- Eosinophilic esophagitis, 384
- Eosinophilic granuloma, 694
- Eosinophilic granulomatosis with polyangiitis, 113, 478
- Eosinophils  
functions, 414  
immunity to parasites, 103
- Ependymal cells, 503
- Ependymoma  
description and histology, 542
- Ephedrine, 241
- Ephelis, 483
- Epicanthal folds  
cri-du-chat syndrome, 62  
Down syndrome, 61
- Epidemic typhus, 147
- Epidemiology  
biliary tract disease, 402  
cancer incidence and mortality, **218**  
colorectal cancer, 395  
gynecologic tumors, **661**  
peripartum mood disturbances, **579**
- Epidemiology and biostatistics, 256–278
- Epidermal growth factor (EGF)  
in wound healing, 212
- Epidermal hyperplasia, 492
- Epidermis, 481  
embryologic derivatives, 631  
hyperplasia, 485
- Epidermolysis bullosa, 490
- Epidermophyton*, 488
- Epididymis  
embryology of, 639
- Epididymitis, 179, 671
- Epididymitis and orchitis, **671**
- Epidural hematomas, 528
- Epidural space, 506
- Epigastric pain  
chronic mesenteric ischemia, 393  
Ménétrier disease, 386  
pancreatitis, 404
- Epigastric veins, 372
- Epigenetics, 40
- Epiplottitis  
*Haemophilus influenzae*, 140  
unvaccinated children, 182
- Epilepsy  
gustatory hallucinations in, 576  
seizures, 531
- Epinephrine, 241  
glaucoma treatment, 568  
glycogen regulation by, 84  
pheochromocytoma secretion, 355  
unopposed secretion of, 350  
vitamin B<sub>6</sub> and, 66
- Epinephrine response, 242
- Epineurium, 505
- Epiphysis  
slipped capital femoral, 466, 469  
testosterone effects on, 675  
widening of, 468
- Episcleritis  
inflammatory bowel disease, 389
- Epispadias, 641
- Epistaxis, 54
- Epistaxis, 320, 433, 690
- Epithelial cell junctions, 482
- Epithelial cells  
female reproductive system, **644**  
immunohistochemical stains, 223  
tumor nomenclature, 216
- Epithelial reticular cells, 96
- Epithelial tumors  
ovarian, 664
- Eplerenone, 627
- Epoetin alfa, 119, 447  
drug reactions with, 249
- Epstein-Barr virus (EBV)  
aplastic anemia, 427  
Burkitt lymphoma, 435  
hairy leukoplakia and, 487  
head and neck cancer, 690  
Hodgkin lymphoma, 434  
in HIV positive adults, 173  
in immunodeficient patients, 116  
nasopharyngeal carcinomas, 162  
oncogenicity, 222  
paracortical hyperplasia in, 94  
receptors, 108, 163
- Epstein-Barr virus (HHV-4)  
transmission and clinical significance, 162
- Eptifibatid, 442  
thrombogenesis and, 417
- Erb palsy  
injury and deficits, 452
- Erectile dysfunction, 584  
β-blockers, 244
- Erection  
autonomic innervation, 645  
ischemic priapism, 669
- Ergocalciferol, 68
- Ergosterol synthesis inhibitors  
naming conventions for, 252
- Ergot alkaloids, 247
- Erlotinib, 447
- Erosions (gastrointestinal), 369, 386
- Erosion (skin)  
characteristics/examples, 483
- Errors (medical), **278**
- Ertapenem, 186
- Erysipelas, 487  
*Streptococcus pyogenes*, 134
- Erythema  
complicated hernias, 376  
in Lyme disease, 144
- Erythema infectiosum (fifth disease), 177
- Erythema marginatum, 319
- Erythema migrans  
in Lyme disease, 144
- Erythema multiforme  
causes of, 490  
coccidioidomycosis, 149
- Erythema nodosum  
disease associations of, 492  
histoplasmosis, 149  
inflammatory bowel disease, 389
- Erythrocyte casts in urine, 612
- Erythrocytes  
hereditary spherocytosis, 428  
metabolism and functions, **413**  
transfusion of, 434
- Erythrocyte sedimentation rate (ESR)  
fibrinogen and, 209  
inflammation, **210**  
subacute granulomatous thyroiditis, 345
- Erythrocytosis, 413
- Erythrotoxic exotoxin A, 131
- Erythrogenic toxin, 134
- Erythromelalgia, 438
- Erythromycin, 189  
cytochrome P-450 interaction, 251  
prophylaxis, 193  
protein synthesis inhibition, 187  
reactions to, 248
- Erythroplasia of Queyrat, 669
- Erythropoiesis  
fetal, **410**
- Erythropoietin, 697  
anemia of chronic disease, 427  
clinical use, 119  
high altitude response, 688  
polycythemia and, 224  
release and function, 607  
renal failure and, 621  
signaling pathways for, 341  
with pheochromocytoma, 355
- Eschar, 130  
in cutaneous anthrax, 135  
with mucormycosis, 150
- Escherichia coli*,/i.  
healthcare-associated infection, 181
- Escherichia coli*  
cephalosporins, 185  
culture requirements, 124  
*lac* operon, 39  
neonatal microbiome, 174  
O157-H7, 174  
penicillins for, 184  
polymyxins, 189  
prostatitis, 672  
strains of, **143**  
urinary tract infections, 178, 619
- Escherichia coli* serotype O157-H7  
food poisoning, 174  
Shiga-like toxin production, 175  
toxin production, 143
- Escitalopram, 593
- E-selectin, 211
- Esmolol, 244, 327
- Esomeprazole, 406
- Esophageal adenocarcinoma, 385
- Esophageal atresia, 366
- Esophageal cancer  
achalasia in, 383

- Esophageal cancer (*continued*)  
 location and risk factors, **385**
- Esophageal pathologies, **384**, 481
- Esophageal perforation  
 perforation, 384
- Esophageal reflux  
 H<sub>2</sub> blockers for, 406  
 proton pump inhibitors for, 406
- Esophageal rings, 384
- Esophageal varices, 384  
 drug treatment of, 360  
 portosystemic anastomoses and, 372
- Esophageal webs, 384
- Esophagitis, 384  
 herpes simplex virus, 162  
 HIV-positive adults, 173  
 medication-induced, 248
- Esophagus  
 blood supply and innervation, 371  
 carcinogens affecting, 221  
 diaphragm, 681  
 histology, 369  
 pathologies of, **384**  
 portosystemic anastomosis, 372
- Esotropia, 555
- Essential amino acids, 79
- Essential fatty acids  
 characteristics and sources, **63**
- Essential fructosuria, 78
- Essential hypertension risk, 302
- Essential mixed cryoglobulinemia, 171
- Essential (primary) hypertension, 321
- Essential thrombocythemia, 438
- Essential tremor, 533
- Establishing rapport, 271
- Estradiol, 648
- Estriol, 648
- Estrogen, 649, 656  
 androgen conversion to, 653  
 bone formation, 462  
 epiphyseal plate closure, 653  
 gynecomastia (males), 667  
 in ovulation, **649**  
 menopause, 653  
 signaling pathways for, 341  
 source and function of, **648**  
 Turner syndrome, 655
- Estrogen receptor modulators  
 (selective), **674**
- Estrone, 648
- Eszopiclone, 562
- Etanercept, 498
- Ethacrynic acid, 626
- Ethambutol, 193  
 drug reactions with, 250  
 mechanism and adverse effects, 192
- Ethanol  
 carcinogenicity of, 221  
 catabolism of, 46  
 lactic acidosis and, 70  
 metabolism of, **70**
- Ethical and patient scenarios, **274**
- Ethical principles (core), 268
- Ethics  
 advanced directives, **269**  
 consent, **269**  
 core principles of, **268**  
 religious beliefs and, 275
- Ethinyl estradiol, **674**
- Ethosuximide, 560
- Ethylenediaminetetraacetic (EDTA)  
 metal toxicity treatment, 247
- Ethylene glycol toxicity treatment,  
 70, 247
- Ethylene oxide sterilization/  
 disinfection, 197
- Etomidate, 565
- Etonogestrel, 675
- Etoposide, 445
- Etoposide/teniposide  
 topoisomerase effects, 36
- Euchromatin, 32
- transcriptional activity, 32
- Eukaryotes  
 DNA replication in, 36  
 irinotecan/topotecan effects in, 36  
 mRNA start codons, 42  
 ribosomes in, 43  
 RNA polymerase in, 40  
 RNA processing, **40**
- Eukaryotic gene, functional  
 organization, **39**
- Eukaryotic initiation factors (eIFs), 43
- Eukaryotic release factors (eRFs), 43
- Eustachian tubes, 47  
 embryonic derivation, 637
- Euthyroid sick syndrome, 345
- Evasion of apoptosis, 217
- Ewing sarcoma  
 dactinomycin for, 444  
 epidemiology and characteristics,  
 471
- Exanthem subitum  
 HHV-6/7, 162, 177
- Excessive daytime sleepiness, 585
- “Excision” event, 128
- Exclusive provider organization, 277
- Exemestane, 675
- Exercise  
 blood flow autoregulation, 299  
 peripheral resistance, 290  
 respiratory response, **688**  
 Tetralogy of Fallot, 300
- Exercise-induced amenorrhea, 663
- Exocrine glands, 235, **482**
- Exocytosis, 48
- Exogenous thyrotoxicosis, 346
- Exons  
 deletions in muscular dystrophies, 59  
 vs introns, **41**
- Exotoxin A, 130, 141
- Exotoxins  
*Bacillus anthracis*, 135  
 bacteria with, **130**  
*Corynebacterium diphtheriae*, 137  
 features of, **129**  
*Pseudomonas aeruginosa*, 130  
*Streptococcus pyogenes*, 131  
 tetanospasmin, 136
- Expiratory reserve volume (ERV), 682
- Expressive (Broca) aphasia, 529
- Extension, hip, 455
- External hemorrhoids, 373
- External rotation, hip, 455
- Extinction (conditioning), 570
- Extracellular volume measurement,  
 599
- Extracranial injuries (neonatal), **527**
- Extragenital germ cell tumors, **670**
- Extrahepatic manifestations of  
 hepatitis B and C, **171**
- Extramammary Paget disease, 661
- Extramedullary hematopoiesis, 468
- Extravascular hemolysis, 105  
 autoimmune hemolytic anemia,  
 429  
 causes and findings with, 427  
 HbC disease, 428  
 hereditary spherocytosis, 428  
 pyruvate kinase deficiency, 428
- Extrinsic (death receptor) pathway  
 (apoptosis)  
 mechanism and regulation, 204
- Extrinsic hemolytic anemias  
 causes and findings, **429**
- Extrinsic pathway  
 warfarin and, 441
- Exudate  
 “anchovy paste,” 152  
 pleural effusion, 699
- Ex vacuo ventriculomegaly, 536
- Eye disorders  
 retinal hemorrhages, 573
- Eye lid disorders, **559**
- Eye movements  
 cranial nerve palsies, **556**  
 medial longitudinal fasciculus, 558  
 with stroke, 526
- Eyes  
 aqueous humor pathway, 550  
 drugs affecting pupil size, 251  
 immune privilege of, 97  
 lens disorders, 550  
 misalignment of, 555  
 muscarinic antagonist effects, 240  
 normal anatomy of, 549  
 ocular anomalies, 168  
 thyroid disease effects, 344
- Ezetimibe, 248, 324
- F**
- F1 3 F<sup>-</sup> plasmid, 128
- Fab fragment, 102
- Fabry disease, 59
- Facial flushing  
 excess niacin, 65
- Facial nerve (CN VII)  
 function and type, 519  
 lesions and causes of, **546**  
 palsy with, 144  
 pharyngeal arch derivation, 638
- Facial wrinkle reduction, 136
- Facies  
 coarse, 45, 114  
 congenital syphilis, 145  
 elfin, 63  
 epicanthal folds, 61  
 “facial plethora,” 702  
 flat, 61  
 fragile X syndrome, 60  
 in fetal alcohol syndrome, 633  
 leonine (lion-like), 139  
 moon facies, 352  
 Potter sequence, 596  
 risus sardonius, 136  
 TORCH infection abnormalities,  
 180  
 twisted face, 596  
 with syphilis, 180
- Facilitated diffusion  
 T<sub>3</sub>/T<sub>4</sub>, 335
- Factitious disorders, 573, **583**
- Factor VIII concentrate, 431
- Factor V Leiden, 419  
 description of, 433  
 venous sinus thrombosis and, 514
- Factor Xa  
 inhibitors of, 419
- Factor XI concentrate, 431
- Facultative anaerobes  
 characteristics, 125
- Facultative intracellular bacteria, 125
- FADH<sub>2</sub> production, 75
- FADH (flavin adenine dinucleotide)  
 activated carrier, 73
- Failure mode and effects analysis, 278
- Failure to thrive  
 SCID, 115
- Falciform ligament, 368
- Fallopian tubes  
 adnexal torsion, 643  
 epithelial histology, 644  
 in primary ciliary dyskinesia, 47
- “False” diverticulum, 390
- False-negative rate, 260
- Famciclovir  
 herpes zoster, 196  
 mechanism and use, **196**
- Familial adenomatous polyposis, 394  
 chromosome association, 62
- Familial dyslipidemia, **92**
- Familial hypercholesterolemia, 58, 92
- Familial hypocalciuric  
 hypercalcemia, **349**
- Famotidine, 406
- Fanconi anemia, 427  
 nonhomologous end joining and, 37
- Fanconi syndrome, 604  
 urinalysis with, 611
- Fanconi syndrome, drug-related, 250
- Farsightedness, 550
- Fascia, collagen in, 48
- Fasciculations, 543
- Fas-FasL interaction, 204
- Fasted vs fed state, **88**
- Fastigial nucleus, 510
- Fasting and starvation, 89
- Fasting plasma glucose test  
 diabetes mellitus diagnosis, 350
- Fasting state, 89  
 fructose-2, 6-bisphosphate in, 74  
 migrating motor complexes  
 production in, 378
- Fat  
 nomenclature, 216
- Fat emboli, 691
- Fatigue  
 heart failure and, 316  
 MI signs, 308
- Fatigue, medical errors from, 278
- Fat necrosis, 205, 667
- Fat redistribution, 249
- Fat-soluble vitamins, 63  
 absorption with orlistat, 407
- Fatty acid oxidation  
 carnitine acyltransferase in, 71  
 rate-limiting enzyme for, 71
- Fatty acids  
 metabolism of, 72, **87**  
 oxidation of, 72  
 synthesis, 70
- Fatty acid synthase  
 vitamin B<sub>5</sub> and, 65

- Fatty acid synthesis  
rate-determining enzyme, 71
- Fatty casts, 612
- Fatty casts (urine), 612
- Fatty liver disease  
Metabolic dysfunction–associated, 398
- Fava beans, 77, 428
- FBN1 gene mutation  
dominant negative mutation, 50
- Fear  
inappropriate experiences of, 579  
panic disorder and, 580  
phobias and, 580
- Febrile nonhemolytic transfusion reaction, 112
- Febrile pharyngitis, 161
- Febrile seizures, 530
- Febuxostat, 497  
Lesch-Nyhan syndrome, 35
- Fecal antigen test  
*Helicobacter pylori* diagnosis, 144
- Fecal calprotectin, 389
- Fecal elastase, 388
- Fecal immunochemical testing (FIT), 395
- Fecalith obstruction, 390
- Fecal microbiota transplant, 136
- Fecal occult blood testing (FOBT), 395
- Fecal retention, 575
- Feces, explosive expulsion of, 391
- Fed state, 89
- Fee-for-service, 277
- “Female athlete triad,” 663
- Female genital embryology, 639
- Female reproductive anatomy  
epithelial histology, **644**  
ligaments and structure, **643**
- Femoral epiphysis, slipped, 466
- Femoral head  
avascular necrosis of, 469
- Femoral hernia, 377
- Femoral neck fracture, 467
- Femoral nerve, 456
- Femoral region, **375**
- Femoral sheath, 375
- Femoral triangle, 375, 456
- Fenestrated capillaries, 506
- Fenofibrate, 325
- Fenoldopam, 241, 323
- Fentanyl, 567
- Fenton reaction, 206
- Ferritin, 427  
acute phase reactants, 209  
iron deficiency anemia, 424  
iron study interpretation, 423  
lab values in anemia, 425
- Ferrochelatase, 425, 430
- Ferropoiesis, **203**
- Ferrostatin, 203
- Fertility  
double Y males, 655
- Fertilization, 649, 651
- Fetal alcohol syndrome  
developmental effects in, **633**  
heart defects in, 302
- Fetal circulation, **286**
- umbilical cord, **636**
- Fetal erythropoiesis, **410**
- Fetal lung maturity, 675
- Fetal-postnatal derivatives, **286**
- Fetal tissue  
collagen in, 48
- Fever  
amphotericin B, 194  
*Bordetella pertussis*, 182  
clindamycin, 188  
complicated hernias, 376  
Ebola virus, 169  
endotoxins, 129  
epiglottitis, 182  
exotoxins, 131  
genital herpes, 179  
high fever, 168  
human herpesvirus 6, 177  
human herpesviruses, 162  
Legionnaires’ disease, 141  
low-grade, 141, 168  
measles (rubeola) virus, 167  
mononucleosis, 162  
neuroleptic malignant syndrome, 587  
pathophysiology and management, 530  
pulmonary anthrax, 135  
recurring, 153  
*Rickettsia rickettsii*, 147  
*Salmonella* spp, 147  
severe, irregular pattern, 154  
spiking, 155  
Tetralogy of Fallot, 300  
thyroid storm, 346  
toxic shock syndrome, 133  
undulant, 141  
vs heat stroke, 530  
Weil disease, 145  
with inflammation, 209  
with meningococci, 140
- Fexofenadine, 704
- Fibrates, 324, **325**  
drug reactions with, 249
- Fibrin protein (amyloidosis), 208
- Fibrinogen, 210, 413  
ESR with, 209  
in cryoprecipitate, 433
- Fibrinoid necrosis, 205, 302
- Fibrinous pericarditis, 308
- Fibroadenoma, 667
- Fibroblast growth factor (FGF)  
in wound healing, 212  
signaling pathways for, 341
- Fibroblast growth factor receptor (FGFR3), 467
- Fibroblasts  
cortisol and, 340  
in wound healing, 212
- Fibrocystic breast changes, 667
- “Fibro fog,” 477
- Fibroid (leiomyoma)  
leuprolide for, 674
- Fibromas, 216, 665
- Fibromuscular dysplasia, 302
- Fibromyalgia, **477**, 593
- Fibronectin  
in cryoprecipitate, 434  
thrombocytes, 413
- Fibrosarcomas, 216
- Fibrosis  
silicosis, 696
- Fibrous plaque in atherosclerosis, 303
- Fibular neck fracture, 457
- Fick principle, 289
- Fidaxomicin  
*Clostridioides difficile*, 136
- Field cancerization, 690
- Field defect (morphogenesis), 633
- Fifth disease rash, 177
- 50S inhibitors, 187
- Filament. See Cytoskeletal elements
- Filgrastim (G-CSF), 119, 447
- Filoviruses  
characteristics and medical importance, 164
- Filtration (renal), **601**
- Fimbria/pilus, 122
- Financial considerations in treatment, 275
- Finasteride, 653, 672, 676
- Finger agnosia, 524
- Finger drop, 450
- Finger movements  
adduction, 450  
extension, 450  
finger drop, 450
- Finkelstein test, 465
- First-degree AV block, 312
- First-order elimination, 229, 230
- First-order kinetics, 229
- Fisher’s exact test, 267
- Fish oil/marine omega-3 fatty acids, 325
- Fishy odor, 147
- Fitz-Hugh-Curtis syndrome, 140, 181
- 5 $\alpha$ -reductase, 653  
hypospadias, 641
- 5 $\alpha$ -reductase deficiency, **656**  
sexual differentiation, 640
- 5 $\alpha$ -reductase inhibitor  
naming conventions for, 253
- 5 $\alpha$ -reductase inhibitors, 672
- 5-aminosalicylic acid drugs, 389
- 5-aminosalicylic drugs, 407
- 5-fluorouracil (5-FU)  
mechanism, use, and adverse effects, 444  
pyrimidine synthesis and, 34
- 5-HT  
in carcinoid tumors, 357  
MAO inhibitor effects, 593  
trazodone effects, 594  
vilazodone effects, 594  
vortioxetine effects, 594
- 5-HT<sub>1B/1D</sub> agonists, 252
- 5-HT<sub>3</sub> blocker  
naming conventions for, 253
- 5-methylcytosine  
in nucleotides, 33
- Fixation, 571
- Fixed splitting, 293
- Flaccid paralysis  
acute asymmetric, 164  
botulinum toxin, 136  
motor neuron signs, 543
- Flagellin, 97
- Flagellum, 122
- Flask-shaped ulcers, 152
- Flavin nucleotides, 73
- Flaviviruses  
hepatitis C, 170  
structure and medical importance, 164
- Flavoxate, 240
- Fleas (disease vectors), 147
- Flecainide, 327
- Flexion  
foot, 457  
hip, 455
- Flexor digiti minimi muscle, 453
- Flexor pollicis brevis muscle, 453
- Flies (disease vectors)  
*Shigella* spp, 142
- Floppy baby syndrome  
*Clostridium botulinum*, 136  
splicing of pre-mRNA in, 41
- Flow cytometry, **52**
- Flow-volume loops, **692**
- FLT3-ITD/FLT3-TKD, 438
- Fluconazole  
*Cryptococcus neoformans*, 150  
cytochrome P-450 interaction, 251  
mechanism and use, 195  
opportunistic fungal infections, 150  
systemic mycoses, 149
- Flucytosine  
*Cryptococcus neoformans*, 150  
mechanism and clinical use, **194**
- Fludrocortisone, **360**
- Fluid compartments, **599**
- Flumazenil  
benzodiazepine overdose, 247, 562, 588
- Fluorescence in situ hybridization, **53**
- Fluorescent antibody stain, 123
- Fluoroquinolones  
drug reactions with, 248, 249  
mechanism, use, and adverse effects, 191  
*Mycoplasma pneumoniae*, 148  
naming conventions for, 252  
pregnancy contraindication, 197  
*Pseudomonas aeruginosa*, 141  
*Salmonella typhi*, 142  
teratogenicity of, 632  
TOP II (DNA gyrase) and TOP IV inhibition in prokaryotes, 36
- Fluoxetine, 593
- Fluphenazine, 591
- Flutamide, 676  
polycystic ovarian syndrome, 662
- Fluticasone, 704
- Flvoxamine, 593
- FMRI gene, 60
- Foam cells  
in atherosclerosis, 303  
Niemann-Pick disease, 86
- Focal aware seizures, 531
- Focal glomerular disorders, 612
- Focal hepatic necrosis  
drug reactions with, 248
- Focal impaired awareness seizures, 531
- Focal nodular hyperplasia, 399
- Focal segmental glomerulosclerosis, 612, 616
- Focal seizures  
types of, 531
- Folate. See Vitamin B<sub>9</sub> (folate)
- Folate antagonists  
teratogenicity of, 632
- Folate synthesis  
inhibition/block, 190
- Follicles (lymph node), 94
- Follicles (spleen), 96

- Follicle-stimulating hormone (FSH)  
 clomiphene effect, 674  
 in menstrual cycle, 650  
 PCOS, 662  
 secretion of, 331
- Follicular carcinoma  
 causes and findings, 347
- Follicular cyst (ovary), 663
- Follicular lymphoma  
 chromosomal translocations and, 439  
 occurrence and genetics, 435
- Fomepizole  
 methanol or ethylene glycol  
 overdose, 70  
 methanol or ethylene glycol  
 toxicity, 247
- Fondaparinux, 440
- Food-borne illness  
*Bacillus cereus*, 136  
*Campylobacter jejuni*, 143  
*Clostridium perfringens*, 136  
 organisms causing, **174**  
*Staphylococcus aureus*, 133, 174  
 toxic shock syndrome toxin, 131  
*Vibrio cholerae*, 144
- Foot drop, 457
- Foot movements  
 dorsiflexion, 457  
 eversion, 457  
 flexion, 457  
 inversion, 457
- Foramen cecum, 330
- Foramen ovale, 286  
 embryology, 284  
 retained patency of, 300
- Forced expiratory volume (FEV)  
 obstructive lung disease, 692  
 restrictive lung disease, 694
- Foregut  
 blood supply/innervation of, 371  
 development of, 364
- Foreign body inhalation, 681
- Formoterol, 704
- 46,XX/46,XY DSD, 655  
 46,XX DSD, 655
- Fosaprepitant, 407, 447
- Foscarnet  
 HIV-positive adults, 197  
 mechanism, use, and adverse  
 effects, **197**  
 retinitis in immunosuppressed  
 patients, 197
- Fossa ovalis, 286
- Founder effect (genetics), 55
- FOXP3 protein, 100
- Fractures  
 chalk-stick, 468  
 Colles, 467  
 common pediatric, **467**  
 femoral neck, 467  
 pathologic, 471  
 scaphoid, 453  
 vertebral compression, 467
- Fragile X syndrome  
 chromosome abnormality, 62  
 diagnostic test, 51  
 DNA methylation in, 32  
 trinucleotide repeats in, **60**
- Frameshift mutation, 38
- muscular dystrophy and, 59
- Francisella* spp  
 culture requirements, 124  
*Francisella tularensis*  
 disease and transmission, 147
- Frataxin, 545
- Free fatty acids  
 fast/starvation states, 89
- Free nerve endings, 504
- Free radical injury, **206**  
 reperfusion, 206
- Fremitus (tactile), 698
- Fresh frozen plasma/prothrombin  
 complex  
 transfusion of, 434
- “Fried egg” cells, 540, 664
- Friedreich ataxia, **545**  
 chromosome association, 62  
 trinucleotide repeat in, 60
- Frontal bossing, 343
- Frontal eye fields, 524
- Frontal lobe  
 abscess, 150  
 stroke effects, 526
- Frontal lobe syndrome, 524
- Frontotemporal dementia  
 symptoms and histologic findings,  
 535
- Frothy urine, 613
- Fructose  
 absorption of, 381
- Fructose-1,6-bisphosphatase  
 gluconeogenesis, 76  
 rate-determining enzyme, 71
- Fructose-1,6-bisphosphatase 1  
 gluconeogenesis regulation, 71
- Fructose-2,6-bisphosphate, 71
- Fructose metabolism  
 disorders of, **78**
- Fruity breath odor, 351
- FTA-ABS, 145
- Full-thickness burn, 493
- Fumarate, 82
- Functio laesa, 209
- Functional hyposplenia, 421
- Functional hypothalamic  
 amenorrhea, **663**
- Functional liver markers, 397
- Functional neurologic symptom  
 disorder, 583
- Functional organization of a  
 eukaryotic gene, **39**
- Functional residual capacity (FRC),  
 682
- Funduscopy examination  
 sausage link appearance on, 436  
 with glaucoma, 551  
 with retinal disorders, 552
- Fungal infections  
 dermatophytes, 488  
 granulomatous inflammation, 213  
 infections with  
 immunodeficiencies, 116  
 opportunistic, 150  
 T-cell deficiencies, 116  
 treatment of systemic, 194
- Fungi  
 culture requirements, 124  
 immunocompromised patients, 175  
 topical infections, 194
- “Funny” current/channels, 296, 328
- Furosemide  
 adverse effects, 251
- drug reactions with, 248, 249  
 mechanism, use, and adverse  
 effects, 626
- Fusion protein EWS-FLI1, 471
- Fusobacterium* spp  
 alcohol use disorder, 175  
 gram staining of, 125  
 healthcare-associated infections,  
 181  
 lung abscesses, 702
- G**
- G1-S progression inhibition, 44
- G20210A gene mutation, 433
- G6PD deficiency  
 drugs causing hemolysis with, 249
- GABAA action  
 barbiturates, 561  
 benzodiazepine effects, 562
- Gabapentin, 560
- Gabapentinoids, mechanism and  
 adverse effects, 560
- GABA ( $\gamma$ -aminobutyric acid)  
 multiple sclerosis treatment, 537  
 synthesis and change with diseases,  
 505  
 vitamin B<sub>6</sub> and, 66
- Gag reflex, 519
- Gait disturbance  
 Friedreich ataxia, 545  
 hydrocephalus, 536  
 steppage, 457  
 Trendelenburg sign/gait, 457  
 waddling, 59
- Galactitol, 78, 79
- Galactocerebrosidase, 86
- Galactocerebroside, 86
- Galactokinase deficiency, 78
- Galactorrhea  
 antipsychotic drugs and, 332
- Galactose metabolism  
 absorption of, 381  
 disorders of, **78**
- Galactosemia, 78
- Galactosuria, 78
- Galantamine, 239, 564
- Galant reflex, 523
- Gallbladder  
 biliary structures, 375  
 blood supply and innervation of, 371  
*Salmonella typhi* colonization, 142  
 with bile duct obstruction, 375
- Gallbladder cancer  
 porcelain gallbladder, 403  
 sclerosing cholangitis, 402
- Gallstone ileus, 403
- Gambling disorder, **586**
- $\gamma$ -glutamyl transpeptidase  
 in liver damage, 397
- Ganciclovir  
 drug reactions with, 249  
 mechanism, use, and adverse  
 effects, **196**
- Ganglion cyst, 465
- Ganglioneuromatosis, oral/intestinal,  
 356
- Gangrene  
 of toes, 140
- Gangrenous necrosis, 205
- Gap junctions, ciliary movement, 47
- Gap junctions (connexons), 482
- Gardener’s pupil, 240
- Gardnerella vaginalis*, **147**, 191
- Gardner syndrome, 394
- Gartner duct, 639
- Gas gangrene  
 alpha toxin, 131  
*Clostridium perfringens*, 136, 175
- Gastrectomy, 426
- Gastric acid  
 histamine receptors and, 237  
 secretion, action and regulation,  
 379
- Gastric bypass surgery  
 ghrelin and, 378  
 superior mesenteric artery  
 syndrome with, 370  
 vitamin B<sub>12</sub> deficiency, 67
- Gastric cancer  
 carcinogens for, 221  
*Helicobacter pylori*, 144  
 oncogenic microbes, 222  
 sign of Leser-Trélat and, 224  
 types of, **386**
- Gastric inhibitory peptide (GIP), 357
- Gastric outlet obstruction, 366
- Gastric ulcers  
 causes of, 387, 496  
 NSAID toxicity, 496
- Gastric vessels, 368
- Gastric volvulus, 392
- Gastrin  
 effects on acid secretion, 380  
 signaling pathways for, 341  
 somatostatinomas and, 357  
 source, action, and regulation of,  
 378
- Gastrinomas, 378  
 drug treatment for, 360
- Gastrin-releasing peptide, 378
- Gastritis  
 gastrin in, 378  
 H<sub>2</sub> blockers for, 406  
*Helicobacter pylori*, 144  
 proton pump inhibitors for, 406  
 stomach cancer and, 386  
 types and causes, **386**
- Gastrocolic ligament, 368
- Gastroenteritis  
 caliciviruses, 164  
*Listeria monocytogenes*, 137  
 rotavirus, 165
- Gastroepiploic arteries, 368
- Gastroesophageal reflux disease  
 Barrett esophagus, **385**  
 esophageal cancer and, 385  
 presentation, 384
- Gastrohepatic ligament, 368
- Gastrointestinal bleeding  
 acute, **387**
- Gastrointestinal drug reactions, **248**
- Gastrointestinal infections  
 protozoa, **152**
- Gastrointestinal secretions  
 cell locations, **380**  
 regulatory substances, **378**  
 source and actions, **379**
- Gastrointestinal stromal tumors  
 gene association, 220
- Gastrointestinal system  
 aging effects on, 225  
 blood supply and innervation, **371**

- embryology, **364**  
innervation of, 373  
ligaments, **368**  
muscarinic antagonist effects, 240  
pathology, 383  
pharmacology, 405  
physiology, 378  
regulatory substances, **378**  
retroperitoneal structures, **367**  
*Salmonella* spp vs *Shigella* spp, 142  
thyroid disease effects, 344
- Gastrointestinal tract  
diverticula of, **390**  
intestinal disorders, **393**
- Gastroschisis, 365
- Gastrosplenic ligament, 368
- Gaucher cells, 86
- Gaucher disease, 86, 469
- Gaussian distribution, 265
- Gaze palsy, upward/vertical, 542
- G cells, 378
- Gefitinib, 447
- Gemfibrozil, 325
- Gender- and sexuality-inclusive  
history taking, 272
- Gender dysphoria, 584
- Gene associations  
celiac disease, 388  
chronic myelogenous leukemia,  
438  
colorectal cancer, 395  
myeloproliferative neoplasms, **438**
- Gene expression  
DNA methylation, 32  
enhancers, 40  
histone deacetylation in, 32  
histone modification, 32  
modifications, **54**  
promoters, 40  
regulation, **40**  
silencer, 40
- Gene promoter (CpG islands),  
methylation in, 32
- Generalized anxiety disorder, **580**  
bupirone, 592  
SSNRIs for, 593  
SSRIs for, 593
- Generalized seizures  
anticonvulsants for, 560  
types of, 531
- Generalized transduction, 128
- General paresis, 145, 179
- Genetic/antigenic shift/drift, 166
- Genetic code features, 35
- Genetic drift, 55
- Genetics  
anticipation, 60  
autosomal trisomies, 61  
bacterial, **128**  
chromosome disorders, **62**  
code features, **35**  
CRISPR, **51**  
diabetes mellitus predisposition, 351  
gain of function mutation, 220  
inheritance modes, **57**  
introns vs exons, 41  
loss of function mutation, 220  
muscular dystrophies, 59  
mutations in cancer, 217  
population concepts, **55**  
response to environment, 39
- terms, **54–92**  
trinucleotide repeat expansion  
diseases, 59
- viral, **159**
- Genitalia  
atypical, 640, 656  
embryology, **639**  
male/female homologs, **641**
- Genital ulcers, 179
- Genital warts, 179
- Genitofemoral nerve, 456
- Genitourinary/renal drug reactions, 250
- Genitourinary system  
drug reactions with, **250**  
muscarinic antagonist effects, 240  
trauma, **645**
- Gentamicin, 187
- Genu varum, vitamin D and, 68
- Geriatric patients  
age-related pharmacokinetics, **229**  
aneurysm risk, **530**  
atropine effects in, 240  
colorectal cancer, 395  
common causes of pneumonia, 175  
common meningitis causes, 176  
drug dosages in, 230  
elder abuse and, 583  
gastroenteritis in, 137  
healthcare-associated infections,  
181  
impaired accommodation in, 550  
myeloid neoplasms in, 437  
prostatitis, 672  
recurrent lobar hemorrhagic stroke,  
528  
suicidal/homicidal ideation in, 270  
testicular tumors, 671  
volvulus in, 392
- Germ cell tumors  
cryptorchidism risk for, 669  
extragonadal, 670  
hormone levels with, 670, 671  
ovarian, 664  
testicular, 671
- Germinal center, 94
- Germline (gonadal) mosaicism, 55
- Gerstmann syndrome, 524
- Gestational age, 651
- Gestational diabetes  
glucokinase in, 73
- Gestational hypertension, 660
- Gestational trophoblastic disease  
serum tumor marker, 222  
theca lutein cyst, 663
- GH (growth hormone), 360
- Ghrelin  
appetite regulation, 340  
hypothalamus effects of, 508  
source, action and regulation of, 378
- Giant cell pneumonia, 167
- Giant cell (temporal) arteritis, 478  
ESR with, 210  
polymyalgia rheumatica  
association, 477
- Giant cell tumor, 470
- Giant roundworm, 156
- Giardia* spp  
metronidazole, 191  
stain for identification, 123  
watery diarrhea, 175
- Giardia lamblia*, transmission,  
diagnosis, and treatment, 152
- Giardiasis  
gastrointestinal infections, 152  
in immunodeficiency, 116
- Giemsa stain, 53, 123, 144
- Gifts from patients, accepting, 270
- Gigantism, 333
- Gilbert syndrome, 400, 401
- Gingival hyperplasia  
cyclosporine, 118  
drugs causing, 249, 323  
inclusion cell disease, 45
- Gingivostomatitis, 162
- Gitelman syndrome  
renal disorder features, 605  
renal tubular defects, 604
- Glanzmann thrombasthenia, 432
- Glargine, 358
- Glatiramer, 537
- Glaucoma  
 $\beta$ -blockers, 244  
drug reaction, 240  
pilocarpine for, 239  
sympathomimetics for, 241  
therapy, **568**  
treatment, 239, 626  
types and treatment, **551**
- Glecaprevir, 200
- Glial cells  
of CNS, 503  
of PNS, 503
- Glial fibrillary acidic protein (GFAP)  
cytoskeletal elements, 46  
tumor identification, 223
- Glioblastoma  
description and histology, 540  
treatment of multiforme, 445
- Global aphasia, 529
- Global cognitive deficits, 574
- Global payment, 277
- Globoid cells, 86
- Globose nucleus, 510
- Globotriaosylceramide, 86
- Glomerular anatomy, diagram of, 598
- Glomerular disorders/disease  
nomenclature, **612**  
types of, **613**
- Glomerular filtration  
changes in dynamics, **601**
- Glomerular filtration barrier, **599**
- Glomerular filtration rate, **600**
- Glomerulonephritis  
*Streptococcus pyogenes*, 134  
azathioprine for, 119  
infection-associated, 614  
RBC casts in, 612
- Glomus tumor, 486
- Glossitis  
B-complex deficiency, 63  
iron deficiency, 424  
Plummer-Vinson syndrome  
association, 384  
vitamin B<sub>3</sub> deficiency, 65  
vitamin B<sub>9</sub> deficiency, 66
- Glossopharyngeal nerve (CN IX)  
function and type, 519  
pharyngeal arch derivative, 638
- “Glove and stocking” sensation loss,  
139, 350
- GLP-1 analogs
- diabetes therapy, 359  
naming conventions for, 253
- Glucagon  
 $\beta$ -blocker overdose treatment, 327  
fructose biphosphatase-2, 74  
glycogen regulation, 84  
somatostatinomas and, 357  
source, function and regulation, **337**
- Glucagonomas  
occurrence, 354  
presentation and treatment, 357  
treatment for, 360  
with MEN1, 356
- Glucocerebrosidase, 86
- Glucocerebroside, 86
- Glucocorticoid-binding globulin, 340
- Glucocorticoids  
apoptosis, 429  
asthma therapy, 704  
avascular necrosis of bone, 469  
calcium pyrophosphate deposition  
disease, 473  
Cushing syndrome, 119  
cytokines, 119  
drug reactions with, 248, 249  
eosinophil count with, 429  
gout, 497  
immunosuppression, 119  
non-Hodgkin lymphoma, 119  
osteoporosis, 119  
psychosis, 119  
rheumatoid arthritis, 472  
T<sub>3</sub> in peripheral tissues, 335
- Glucogenic amino acids, 79
- Glucogenic/ketogenic amino acids, 79
- Glucokinase vs hexokinase, **73**
- Gluconeogenesis  
cortisol and, 340  
ethanol metabolism and, 70  
irreversible enzymes, 76  
metabolic site, 72  
organic acidemias, **83**  
rate-determining enzyme for, 71  
smooth endoplasmic reticulum, 45  
thyroid hormone and, 335
- Glucose  
blood-brain barrier and, 506  
clearance of, **602**  
glycogen metabolism, 85  
metabolism of, 39  
phosphorylation of, 73
- Glucose-6-phosphatase  
gluconeogenesis, 76  
Von Gierke disease, 85
- Glucose-6-phosphate dehydrogenase  
(G6PD)  
HMP shunt and, 71
- Glucose-6-phosphate dehydrogenase  
(G6PD) deficiency, **77**  
causes and findings, 428  
RBC inclusions, 421  
RBCs in, 420  
X-linked recessive disease, 59
- Glucose-dependent insulinotropic  
peptide (GIP)  
insulin regulation, 338  
source, action and regulation, 378
- Glucose intolerance, in Type 1 vs  
Type 2 diabetes, 351
- Glucosuria, 602  
threshold for, 602

- Glulisine, 358  
 Glutamic acid, classification of, 79  
 Glutamine  
   in nucleotides, 33  
 Glutathione  
   glucose-6-phosphate dehydrogenase deficiency, 77  
   Vitamin B<sub>6</sub> in synthesis, 66  
 Glutathione peroxidase, 206  
 Gluteus maximus, 455, 457  
 Gluteus medius, 455  
 Gluteus minimus, 455, 457  
 GLUT transporters, 338  
 Glycerol, in starvation, 89  
 Glycine, in nucleotides, 33  
 Glycogen  
   metabolism and storage, 71  
   regulation, **84**  
   stain for, 123  
   tissue metabolism, **84**  
 Glycogenesis, 71  
 Glycogenolysis  
   rate-determining enzyme for, 71  
   smooth endoplasmic reticulum, 45  
   thyroid hormone and, 335  
 Glycogen phosphorylase, 71  
 Glycogen storage diseases, findings and deficient enzymes, **85**  
 Glycogen synthase  
   rate-limiting enzyme, 71  
 Glycolysis regulation  
   fructose-2,6-bisphosphate, 74  
   hexokinase/glucokinase in, 74  
   key enzymes in, 74  
   metabolic site, 72  
   pyruvate dehydrogenase, 74  
   rate-determining enzyme, 71  
 Glycopyrrolate, 240  
 Glycosylation  
   collagen synthesis, 48  
   protein synthesis, 43  
 Glycyrrhetic acid, 604  
 GNAQ gene mutation, 539  
 GNAS gene mutation, 348  
 GnRH agonists, drug reactions with, 249  
 Goblet cells, 369, 680  
 Goiter, causes of, **346**  
 Golgi apparatus, cell trafficking, 45  
 Golgi tendon organ, 461  
 Gonadal (germline) mosaicism, 55  
 Gonadotropin-releasing hormone analogs  
   mechanism, use, and adverse effects, **673**  
 Gonadotropin-releasing hormone (GnRH)  
   function and notes, 332  
   neurons producing, 508  
   prolactin and, 332  
   pulsatility, 654  
   signaling pathways for, 341  
 Gonads  
   atrophy of, 59  
   dysgenesis of, 624  
   smooth endoplasmic reticulum, 45  
 Gonococci vs meningococci, 140  
 Gonorrhea  
   ceftriaxone, 185  
   *Neisseria*, 140  
   sexually transmitted infection, 179  
 Goodpasture syndrome  
   autoantibody, 113  
   collagen defect in, 48  
   glomerulonephritis with, 614  
   hematuria/hemoptysis, 614  
   type II hypersensitivity, 110  
 Good syndrome  
   paraneoplastic syndrome, 224  
   thymoma and, 96  
 Goserelin, 674  
 Gottron papules, 224, 477  
 Gout. See also Hyperuricemia  
   acute treatment drugs, 497  
   drugs causing, 249  
   findings, symptoms, and treatment, **473**  
   hypertension with, 321  
   kidney stones, 617  
   Lesch-Nyhan syndrome, 35  
   loop diuretics for, 626  
   preventive therapy, **497**  
   Von Gierke disease, 85  
 Gower maneuver/sign, 59  
 G-protein-linked 2nd messengers, 237  
 Gracilis muscle, 456  
 Graft-versus-host disease, 111, 117  
 Graft-versus-tumor effect, 117  
 Gram-negative organisms  
   infections in immunodeficiency, 116  
   lab algorithm, 139  
   membrane attack complex, 104  
 Gram-positive organisms  
   cephalosporins, 185  
   lab algorithm, **132**  
   vancomycin, 186  
 Grand mal (tonic-clonic) seizures, 531  
 Granisetron, 407, 447  
 Granular casts  
   acute tubular necrosis, 621  
   in urine, 612  
   “muddy brown” in urine, 612  
 Granular (“starry sky”) appearance, 614  
 Granulocyte-colony stimulating factor (G-CSF), 341  
 Granulocytes  
   autoantibody, 113  
   morulae, 148  
 Granulocytopenia, trimethoprim, 190  
 Granuloma inguinale (Donovanosis), 179  
 Granulomas  
   in systemic mycoses, 149  
   in tuberculosis, 138  
   macrophages and, 413  
   syphilis, 145  
 Granulomatosis infantiseptica, *Listeria monocytogenes*, 137  
 Granulomatosis with polyangiitis, 479  
   lung disease with, 694  
 Granulomatous disease  
   excess vitamin D in, 68  
   hypervitaminosis D with, 469  
   infectious vs noninfectious etiology, 213  
 Granulomatous inflammation, histology, mechanism and etiologies, 213  
 Granulosa cell tumor, 665  
 Granzymes, 99, 100, 204  
 Grapefruit juice, cytochrome P-450 interaction, 251  
 Grape-like odor, 141  
 Graves disease  
   autoantibody, 113  
   causes and findings, 346  
   HLA subtype, 99  
   ophthalmopathy, 344  
   thyroid cellular action in, 335  
   type II hypersensitivity, 110  
 Gravidity (“gravida”), 651  
 Grayanotoxin, 246  
 Gray baby syndrome, 188, 197  
 Gray hepatization, 700  
 Grazoprevir, 200  
 Greenstick fracture, 467  
 Grief, **572**  
 Griffith point, 206  
 Griseofulvin  
   cytochrome P-450 interaction, 251  
   disulfiram-like reaction, 250  
   mechanism, use, and adverse effects, **195**  
   microtubules and, 46  
   pregnancy contraindication, 197  
 “Ground-glass” appearance (X-ray)  
   neonatal respiratory distress syndrome, **679**  
   *Pneumocystis jirovecii*, 151, 173  
 “Ground glass” appearance, 170  
 Group A streptococci, 134  
 Group A streptococci, clindamycin for invasive infection, 188  
 Group B streptococci, 135, 175, 176  
 Growth factors, tumor suppressor gene mutations and, 44  
 Growth hormone (GH), 333  
   drug reactions with, 250  
   function and secretion of, **333**  
   secretion and diabetes mellitus, 350  
   secretion of, 331  
 Growth hormone inhibiting hormone (GHIH), 332  
 Growth hormone-releasing hormone (GHRH), function and clinical notes, 332, 333  
 Growth restriction (fetal), with phenylketonuria, 82  
 Growth signal self-sufficiency, 217  
 GTP (guanosine triphosphate), 75  
 Guanfacine, 243, 574  
 Guanine, in nucleotides, 33  
 Guanosine analogs, mechanism and use, 196  
 Guanylate cyclase-C agonists, 408  
 Gubernaculum, 642  
 Guide RNA (gRNA), 51  
 Guillain-Barré syndrome  
   *Campylobacter jejuni*, 143  
   peripheral nerves in, 505  
   Zika virus, 168  
 Gummas, 145, 179  
 Guselkumab, 498  
 Gustatory hallucinations, 576  
 Gustatory pathway, 508  
 Guyon canal syndrome, 453, 463  
 Gynecologic tumor epidemiology, 661  
 Gynecomastia  
   azoles, 195  
   causal agents for, 248  
 causes of, 667  
 ketoconazole, 676  
 sex hormone-binding globulin and, 341  
 spironolactone, 676  
 testicular choriocarcinoma, 671  
 with cimetidine, 406  
**H**  
 H<sub>1</sub>-blockers  
   drug reactions with, 250  
   mechanism, use, and adverse effects, **704**  
   naming conventions for, 253  
 H<sub>2</sub>-antagonist  
   cimetidine, 406  
   naming conventions for, 253  
 H<sub>2</sub>-blockers, mechanism, clinical use and adverse effects, **406**  
   *Haemophilus ducreyi*, sexual transmission of, 179  
*Haemophilus influenzae*  
   biofilm production, 126  
   cephalosporins, 185  
   chloramphenicol, 188  
   lab algorithm, **140**  
   meningitis, 176  
   pneumonia, 175  
   pneumonia with, 701  
   vaccine, 96, 175  
 Hair  
   frontal balding, 59  
   “kinky,” 49  
   vitamin C deficiency, 67  
 Hairy cell leukemia, 437  
   antimetabolites for, 444  
   immunohistochemical stains, 223  
   oncogenes, 220  
 Hairy leukoplakia  
   HIV-positive adults, 173  
   skin infection, 487  
 Half-life (t<sub>1/2</sub>), 229  
 Halitosis, 391  
 Hallucinations  
   alcohol withdrawal, 576  
   brain tumors, 576  
   cocaine, 589  
   delirium, 575  
   postpartum psychosis, 579  
   schizophrenia, 576  
   tricyclic antidepressants, 593  
   types of, 576  
 Hallucinogen intoxication and withdrawal, 589  
 Haloperidol, 575, 591  
 Hamartin protein, 220, 539  
 Hamartomas, 216, 320  
 Hamartomatous colonic polyps, 394  
 Hamate bone  
   hook fracture, 450, 453, **463**  
 Hamman sign crepitus, 691  
 Hand  
   blue fingers and toes, 429  
   claw deformity, 45  
   dactylitis, 428  
   injuries to, **463**  
   squamous cell carcinoma, 494  
 Hand/foot dysmorphism  
   blue fingers and toes, 429  
   dactylitis, 428  
   keratoderma blennorrhagica, 475

- Hand-foot-mouth disease, 148, 177  
 Hand grip, 294  
 Hand movements  
   lesions and distortions of, **454**  
   muscles of, **453**  
 “Hand of benediction,” 454  
 Hand-wringing (stereotyped), 60  
 Hantavirus, hemorrhagic fever, 164  
 Haptens  
   acute interstitial nephritis, 620  
   amiodarone as, 328  
 Haptoglobin, 209, 427  
 Hardy-Weinberg principle, **56**  
 Hartnup disease  
   amino acids in, 65  
   vitamin B<sub>3</sub> deficiency, 65  
 Hashimoto thyroiditis, 345  
   autoantibody, 113  
   HLA subtype, 99  
 Hassall corpuscles, 96  
 Hazard ratio, **260**  
 HbA<sub>1c</sub> test, 350  
 HbC disease  
   anemia in, 428  
   target cells in, 420  
 HBV, oncogenicity, 222  
 HCV, oncogenicity, 222  
 HDL (high-density lipoprotein), 92  
 Headaches  
   adverse drug effects, 195  
   classification and treatment, 532  
   “thunderclap headache,” 530  
   “worst headache of my life,” 530  
 Head and neck cancer  
   types of, **690**  
 Healthcare  
   medical insurance plans, **277**  
   payment models, **277**  
 Healthcare-associated infections, 141  
   *Clostridioides difficile*, 181  
   common pneumonia causes, 175  
   Ebola, 169  
   enterococci, 135  
   legionella, 181  
   *Pseudomonas aeruginosa*, 141  
   risk factors, pathogens and  
     symptoms, **181**  
 Healthcare delivery, 276  
 Healthcare payment models, **277**  
 Health maintenance organization, 277  
 Hearing loss  
   Alport syndrome, 615  
   CN VIII, 180  
   congenital syphilis, 145  
   cytomegalovirus, 180  
   diagnosis of, 548  
   osteitis deformans, 468  
   osteogenesis imperfecta, 49  
   rubella, 180  
   sensorineural deafness, 615  
   types and common causes, 548  
 Hearing loss  
   Jervell and Lange-Nielsen  
     syndrome, 311  
 Heart  
   adrenergic receptors in, 236  
   anatomy of, **287**  
   auscultation of, **294**  
   blood flow autoregulation by, 299  
   blood supply, 287  
   embryology, **284, 85**  
   ischemia of, 206  
   myocardial action potential, **296**  
   normal pressures in, **298**  
   pacemaker action potential, **296**  
   septation of chambers, 284  
 Heartburn, 384  
 Heart disease  
   congenital, 61, 300  
   Fabry disease, 86  
   Vitamin B<sub>1</sub> deficiency, 64  
   with Whipple disease, 388  
 Heart failure  
   ACE inhibitors for, 628  
   β-blockers, 244  
   findings and treatment, **316**  
   high-output, **317**  
   hypertension treatment, 321  
   left heart failure, 316  
   right heart, 316  
   with reduced ejection fraction  
     (HFrEF), 324, 328  
 Heart morphogenesis  
   chambers, 284  
   fetal-postnatal derivatives, 286  
   outflow tract formation, 284  
   valve development, 284  
 Heart murmurs, **295**  
   continuous, 295  
   diastolic, 295  
   systolic, 295  
 Heart rate  
   in antianginal therapy, 323  
   sympathomimetic effects, 242  
 Heart sounds  
   cardiac cycle, 291  
   in heart failure, 316  
   splitting of S<sub>2</sub>, **293**  
 Heat-labile toxin, *Clostridium*  
   *botulinum*, 136  
 Heat shock proteins, 43  
 Heat-stable toxin (ST), source and  
   effects of, 130  
 Heat stroke  
   pathophysiology and management,  
     **530**  
   vs fever, 530  
 Heberden nodes, 472  
 Heel pain, 465  
 Heinz bodies, 77, 421  
 Helicase, 36  
*Helicobacter pylori*  
   as oncogenic microbe, 222  
   clinical significance, 144  
   disease association, 386  
   gastric cancer, 386  
   in gastric vs duodenal ulcer, 387  
   metronidazole, 191  
   oncogenicity, 222  
   penicillins for, 184  
   silver stain, 123  
   stains for, 123  
 Heliotrope rash, 224, 477  
 HELLP syndrome  
   microangiopathic anemia, 429  
   preeclampsia, 660  
 “Helmet cells,” 420, 429  
 Helminthic infections, eosinophils  
   and, 414  
 Helper T cells  
   cell surface proteins, 108  
   cytokine secretion, 106  
 Hemagglutinin  
   influenza viruses, 166  
   parainfluenza viruses, 167  
 Hemangioblastoma, characteristics  
   and histology, 540  
 Hemangiomas, 216  
   pyogenic granuloma, 486  
   strawberry, 486  
 Hemarthroses, hemophilias, 431  
 Hematemesis  
   esophageal varices, 384  
   GI bleeding, 387  
   with Mallory-Weiss syndrome, 384  
 Hematin, 140  
 Hematochezia  
   colorectal cancer, 395  
   intestinal disorders, 393  
   Meckel diverticulum, 391  
   painless, 390  
   with angiodysplasia, 393  
   with GI bleeding, 387  
 Hematologic abnormalities, laboratory  
   techniques for, 52  
 Hematologic disorders  
   hepatic B and C manifestations,  
     171  
   paraneoplastic syndromes, 224  
 Hematologic drug reactions, **249**  
 Hematologic infections  
   *Plasmodium* spp, 154  
   protozoal, **154**  
 Hematologic malignancies, **438**  
 Hematology/oncology  
   anatomy, 412  
   pathology, 420  
   pharmacology, 440  
   physiology, 416  
 Hematopoiesis  
   dermal extramedullary, 166  
   extramedullary, 468  
   summary, **412**  
   with myelodysplastic syndromes,  
     436  
 Hematopoietic stem cells  
   cell surface proteins, 108  
 Hematopoietic system, aging effects  
   on, 225  
 Hematuria  
   bladder cancer, 624  
   gross, 370  
   hereditary hemorrhagic  
     telangiectasia, 320  
   kidney stones, 617  
   painless, 624  
   renal papillary necrosis, 621  
   transitional cell carcinoma, 624  
   urinary tract infections, 178  
   with flank pain, 622  
 Heme  
   chloroquine, 195  
   metabolism of, 382  
   porphyria and, 430  
   vitamin B<sub>6</sub> and, 66  
 Heme synthesis  
   iron deficiency, 424  
   lead poisoning, 425  
   metabolic site, 72  
   porphyrias, lead poisoning, **430**  
 Hemianopia, 526  
 Hemiballismus, 524, 533  
 Hemidesmosome, 482, 489  
 Hemineglect, 526  
 Hemiparesis, saccular aneurysms, 530  
 Hemisection of spinal cord, 545  
 Hemispatial neglect syndrome, 524  
 Hemochromatosis  
   calcium pyrophosphate deposition  
     disease, 473  
   chromosome association, 62  
   findings and presentation, **402**  
   free radical injury, 206  
   iron study interpretation, 423  
   restrictive/infiltrative  
     cardiomyopathy, 314  
   *Vibrio cholerae*, 144  
 Hemoglobin  
   development, 410  
   electrophoresis, **416**  
   structure and oxygen affinity, **687**  
 Hemoglobin Barts disease, 424  
 Hemoglobin H disease (HbH), 424  
 Hemoglobinuria  
   acute tubular necrosis and, 621  
   G6PD deficiency, 428  
   intravascular hemolysis, 428  
 Hemolysis  
   *Clostridium perfringens*, 136  
   alpha toxin, 131  
   G6PD deficiency, 77  
   HELLP syndrome, 660  
   in G6PD deficiency, 249  
 Hemolytic anemia  
   autoimmune, 185  
   babesiosis, 154  
   direct Coombs-positive, 249  
   due to infection, 429  
   extrinsic, 429  
   folate deficiency and, 426  
   G6PD deficiency, 77  
   intravascular and extravascular  
     findings, 427  
   intrinsic, 428  
   penicillin G, V, 183  
   spherocytes in, 420  
   vitamin E deficiency, 68  
   Wilson disease, 402  
 Hemolytic bacteria, 133  
 Hemolytic disease of fetus/newborn, 411  
   mechanism, presentation and  
     treatment/prevention, **411**  
   Type II hypersensitivity, 110  
 Hemolytic-uremic syndrome  
   epidemiology, presentation and  
     labs, 432  
 Hemolytic-uremic syndrome (HUS)  
   *Escherichia coli*, 143  
   exotoxins, 130  
 Hemophilia, 431  
   culture requirements, 124  
*Hemophyllis influenzae*  
   unvaccinated children, 182  
   X-linked recessive disorder, 59  
 Hemoptysis  
   lung cancer, 703  
   tuberculosis, 138  
 Hemorrhage  
   acute pancreatitis, 404  
   AIDS retinitis, 162  
   delirium caused by, 575  
   Ebola virus, 169  
   intracranial, 528  
   neonatal vitamin K deficiency, 69

- Hemorrhage (*continued*)
- petechial, 140
  - pulmonary, 135
  - subarachnoid hemorrhage, 530
  - ulcer disease, 387
  - Weil disease, 145
- Hemorrhagic cystitis
- adenovirus, 161
  - drugs causing, 250
- Hemorrhagic disease of the newborn
- vitamin K administration, 69
- Hemorrhagic fever
- bunyaviruses, 164
  - filovirus, 164
  - hantavirus, 164
- Hemorrhoids
- GI bleeding association, 387
  - internal, 373
- Hemosiderin-laden macrophages (HG cells), 316
- Hemosiderinuria, 427
- Hemostasis
- platelet plug formation, **417**
  - thrombocytes (platelets), 413
- Hepadnavirus
- hepatitis B, 170
- Hepadnaviruses
- genome, 160
  - structure and medical importance, 161
- Heparan sulfate, 86
- Heparin
- adverse effects of, 440
  - deep venous thrombosis, 440
  - drug reactions with, 249
  - in basophils, 414
  - in coagulation cascade, 419
  - mechanism, use, and adverse effects, **440**
  - reversal of, **442**
  - toxicity treatment, 247
  - warfarin comparison, 441
- Heparin-induced thrombocytopenia (HIT), 440
- Hepatic adenoma, 399
- Hepatic angiosarcoma, 399
- carcinogens for, 221
- Hepatic arteries, 368
- Hepatic ascites, 627
- Hepatic encephalopathy, **399**
- Reye syndrome, 398
- Hepatic fibrosis, 374
- Hepatic hemangioma, 399
- Hepatic lipase
- IDL modification by, 92
  - in lipid transport, 91
- Hepatic necrosis, 495
- causal agents for, 248
- Hepatic steatosis, 398
- Hepatic stellate (Ito) cells, 374
- Hepatic subcapsular hematomas, 660
- Hepatic toxicity, Vitamin A, 64
- Hepatitis
- alcohol-associated, 398
  - autoimmune, **399**
  - drugs causing, 248
  - extrahepatic manifestation of B and C, **171**
  - healthcare-associated infections, 181
  - hyperbilirubinemia in, 400
  - liver zones and, 374
- Hepatitis A
- Anti-HAV (IgG), 171
  - Anti-HAV (IgM), 171
- Hepatitis A (HAV)
- characteristics, 170
  - picornavirus, 164
  - RNA translation in, 165
  - serologic markers, 171
- Hepatitis antigens, **171**
- Hepatitis B (HBV)
- Anti-HBs, 171
  - characteristics, 170
  - chemo- and postexposure prophylaxis, 276
  - extrahepatic manifestations, 171
  - HBcAg, 171
  - HBsAg, 171
  - HBsAg (hepatitis B surface antigen), 171
  - medical importance, 161
  - passive antibodies for, 108
  - serologic marker phases, 171
  - sexually transmitted infection, 179
- Hepatitis C (HCV)
- characteristics, 170
  - extrahepatic manifestations, 171
  - lichen planus, 492
- Hepatitis C (HVC), Anti-HBc, 171
- Hepatitis D (HDV)
- characteristics, 170
- Hepatitis E (HEV)
- characteristics, 170
  - picornavirus, 164
- Hepatitis serologic markers
- Anti-HBc, 171
  - Anti-HBe, 171
  - Anti-HBs, 171
  - HBsAg, 171
  - HBsAg, 171
- Hepatitis viruses
- presentation and characteristics, **170**
  - serologic markers for, **171**
- Hepatocellular carcinoma
- serum tumor marker, 222
- Hepatocellular carcinoma (HCC)
- Aspergillus fumigatus*, 150
  - carcinogens causing, 221
  - characteristics of, 399
  - chronic inflammation, 212
  - hemochromatosis, 402
  - oncogenic microbes, 222
  - risk with hepatitis, 170
- Hepatocytes
- glycogen in, 84
  - smooth endoplasmic reticulum, 45
- Hepatoduodenal ligament, 368
- Hepatolenticular degeneration. See Wilson disease
- Hepatomegaly
- Budd-Chiari syndrome, 397
  - congestive, 316
  - glycogen storage diseases, 85
  - organic acidemias, 83
  - Zellweger syndrome, 46
- Hepatosplenomegaly
- Andersen disease, 85
  - autoimmune lymphoproliferative syndrome, 204
- extrinsic (death receptor) pathway, 204
- Gaucher disease, 86
- hyper-chylomicronemia, 92
- organ transplant rejection, 117
- Hepatosclerosis, ethanol metabolism and, 70
- Hepatotoxicity
- $\alpha$ -amanitin, 40
  - amiodarone, 328
  - bosentan, 706
  - danazol, 675
  - isoniazid, 192
  - leflunomide, 496
  - thionamides, 360
  - with anticonvulsants, 560
  - zileuton, 676, 704
- Hepcidin, 209
- anemia of chronic disease, 427
  - in hemochromatosis, 402
- Hepevirus
- hepatitis E, 170
  - structure and medical importance, 164
- HER2 (ERBB2)* gene, associated neoplasms, 220
- “Herald patch” (pityriasis rosea), 492
- Hereditary angioedema
- complement disorder and, 105
  - treatment, 676
- Hereditary elliptocytosis, 420
- Hereditary hemorrhagic telangiectasia
- autosomal dominance of, 58
  - findings, **320**
- Hereditary hyperbilirubinemias, **401**
- Hereditary (ion) channelopathies, **311**
- Hereditary motor and sensory neuropathy, 538
- Hereditary nonpolyposis colorectal cancer (HNPCC). See Lynch syndrome
- Hereditary spherocytosis
- causes and findings, 428
  - RBCs in, 420
- Hereditary thrombophilias, **433**
- Heritable pulmonary arterial hypertension, **698**
- Hernias
- diaphragmatic, 679
  - gastrointestinal, **376**
- Herniation syndromes, 536, 543
- Herniation syndromes (brain), **543**
- Herpes genitalis, 162, 179, 487
- Herpes labialis, 162, 487
- Herpes simplex virus
- CN VII lesions with, 546
  - envelope, 161
  - foscarnet, 197
  - HSV-1/HSV-2, 162, 487
  - identification, **163**
  - meningitis caused by, 176
  - TORCH infection, 180
  - transport of, 46
- Herpesviruses
- cytomegalovirus, 162
  - Epstein-Barr virus (HHV-4), 162
  - human herpesviruses, 162
  - structure and medical importance, 161
  - transmission and clinical significance, 162
  - varicella-zoster virus (HHV-3), 162
- Herpes zoster, dorsal root latency, 162
- Herpes zoster ophthalmicus, 162
- Herpetic whitlow, 162, 487
- Heterochromatin, 32
- Heterodimer, 46
- Heterodisomy, 55
- Heterogeneous nuclear RNA (hnRNA), 40
- Heteroplasmy, 55
- Heterotopic ossification, 477
- Heterozygosity loss, 54
- Hexokinase vs glucokinase, 73
- “HF” cells (in lungs), 316
- HFE* gene, hemochromatosis and, 402
- Hfr 3 F-plasmid, 128
- HGPRT (hypoxanthine guanine phosphoribosyltransferase) adenosine deaminase deficiency, 35
- HHV-8, 173
- Hiatal hernia, 377
- High altitude respiratory response, 688
- High-deductible health plan (HDHP), 277
- High-frequency recombination (Hfr) cells, 128
- High-output heart failure, 317
- Hilar lymph node calcification, 696
- Hilar mass (lung), 703
- Hindgut
- blood supply and innervation, 371
  - embryology of, 364
- Hinge region (antibody), 102
- Hip
- developmental dysplasia, 466
  - nerve injury with dislocation, 456
- Hip movements
- extension, 457
  - muscles and actions of, **455**
- Hippocampus
- ischemia effects, 206
  - lesions of, 524
  - limbic system, 509
- Hippurate test for *Streptococcus agalactiae*, 135
- Hirschsprung disease, **391**
- Hirsutism
- cyclosporine, 118
  - danazol, 675
  - in females, 341
  - menopause, 653
  - mucopolysaccharidoses, 86
  - polycystic ovarian syndrome, 662
  - sex hormone-binding globulin, 341
- Histaminase, production of, 414
- Histamine
- cortisol effect on, 340
  - signaling pathways for, 341
  - vitamin B<sub>6</sub> and, 66
- Histamine blockers, 406
- Histamine (H1-receptor), 341

- Histamine receptors (H1-receptor) vomiting center input, 506
- Histamine receptors, second messenger functions, 237
- Histamine (scombroid poisoning), 246
- Histiocytosis (Langerhans cell), **439**
- Histology
- adrenal cortex and medulla, 331
  - adult primary brain tumors, 540–568
  - anaplastic cells, 471
  - carcinoid tumors, 357
  - childhood primary brain tumors, 542–568
  - colonic polyps, 394
  - Crohn disease vs ulcerative colitis, 389
  - diabetes mellitus Type 1 vs Type 2, 351
  - digestive tract, **369**
  - endometrial carcinoma, 666
  - female reproductive epithelial, **644**
  - glioblastoma, 540
  - granulomatous inflammation, 213
  - Graves disease, 346
  - hydatidiform moles, 659
  - idiopathic pulmonary fibrosis, 694
  - in apoptosis, 204
  - in tumor grades, 216
  - ischemic brain disease/stroke, 525
  - liver tissue architecture, **374**
  - lung cancer, 703
  - meningiomas, 540
  - mesothelioma, 695
  - microscopic colitis, **389**
  - myositis ossificans, 477
  - myxomas, 320
  - necrosis appearance, **205**
  - nephritic syndrome, **614**
  - polygonal clear cells, 623
  - Psamomma bodies, 207
  - rhabdomyosarcoma, 320
- Histones
- amino acids in, 79
  - deacetylation, 32
  - methylation, 32
- Histoplasma* spp, treatment, 194
- Histoplasma capsulatum*
- Histoplasmosis
- erythema nodosum, 492
  - symptoms and features, 149
- Histrelin, 674
- Histrionic personality disorder, 582
- HIV-1/2 Ag/Ab immunoassays, 172
- HIV-associated dementia
- in HIV-positive adults, 173
  - symptoms and histologic findings, 535
- HIV (human immunodeficiency virus)
- aplastic anemia, 427
  - characteristics, **172**
  - chemo- and post exposure prophylaxis, 276
  - diagnosis, **172**
  - flow cytometry diagnosis, 52
  - Human herpesvirus 8, 162
  - in HIV-positive adults, 173
  - Kaposi sarcoma, 486
  - lymphopenia with, 429
  - NNRTIs, 198
  - NRTIs, **198**
  - pulmonary arterial hypertension, 698
  - receptors, 108, 163
  - screening for infection, 52
  - T cells and, 415
  - TORCH infections, 180
- HIV (human immunodeficiency virus) therapy
- antiretroviral therapy, 198
  - entry inhibitors, 198
  - protease inhibitors, 198
- HIV-positive adults
- common diseases in, **173**
  - necrosis with, 205
- HIV RNA tests, 172
- HLA-B8, Graves disease and, 346
- HLA B27, disease associations, 99
- HLA DR3, disease associations, 99
- HLA-DR4, 472
- HLA DR4, disease associations, 99
- HLA-DRB1 disease association, 472
- HLA gene, 55
- HLA genes
- disease associations, 346, 475
  - DM type 1 association, 351
  - seronegative spondyloarthritis, 475
- HLA subtypes, disease associations, 99
- HLA system, and diabetes mellitus, 351
- HMG-CoA reductase, cholesterol synthesis, 71
- HMG-CoA reductase inhibitors, naming conventions for, 253
- HMG-CoA synthase, 71
- HMP shunt. See Pentose phosphate pathway (HMP shunt)
- HNPCC. See Lynch syndrome
- Hoarseness
- gastroesophageal reflux disease, 384
  - lung cancer, 703
  - Ortner syndrome, 287
  - Pancoast tumor, 703
  - thyroid cancer, 347
- Hodgkin lymphoma
- bleomycin for, 444
  - paraneoplastic cerebellar degeneration, 224
  - subtypes of, 434
  - vinca alkaloids for, 445
  - vs non-Hodgkin, 434
- Holistic medical therapy, 275
- Holoprosencephaly
- characteristics of, 501
  - fetal alcohol syndrome, 633
  - Patau syndrome, 61
- Holosystolic murmurs, 295
- Homatropine, 240
- Homeostasis
- glucagon in, 337
  - hypothalamic function in, 508
- Homer-Wright rosettes, 354, 542
- Homocysteine methyltransferase deficiency in, 83
- Homocysteine, vitamin B<sub>9</sub> deficiency, 66
- Homocystinuria
- causes of, **83**
  - Marfan syndrome comparison, 50
  - presentation and characteristics, 50
- Homologous recombination
- deficiency testing, 223
- Homologous recombination repair, 37
- Homunculus, 513
- “Honeycomb” appearance, 694
- “Honey-crusted” lesions, 134
- Hookworms, 156
- Hordeolum (stye), 559
- Hormonal birth control, 675
- Hormone replacement therapy
- for hypopituitarism, 343
  - thrombotic complications, 249
- Hormones
- acting on kidney, **608**
  - hypothalamic-pituitary, 332
- Hormone-sensitive lipase, 91
- Horn cysts, 485
- Horner syndrome, 241
- Brown-Séquard syndrome, 545
- cavernous sinus, 557
- headache and, 532
- ipsilateral, 526
- lung cancer, 703
- Pancoast tumor, 703
- sympathetic nervous system and, **555**
- Horseshoe kidney, **597**, 655
- Hospice care (end-of-life care), 278
- Hot flashes
- drug reactions, 248
- Hot tub folliculitis, 141
- “Hourglass stomach,” 377
- Howell-Jolly bodies, 96, 421, 428
- HPV-related vulvar carcinoma, 661
- HTLV-1, oncogenicity, 222
- Human chorionic gonadotropin (hCG)
- dysgerminoma, 664
  - ectopic pregnancy, 658
  - germ cell tumors, 671
  - hydatidiform moles, 659
  - secretion of, 630, 634
  - serum tumor markers, 222
  - signaling pathways for, 341
  - source and functions of, **652**
  - testicular tumors, 671
  - theca lutein cyst, 663
- Human evolution, 55
- Human herpesvirus
- HHV-5, 162
  - HHV-6, 177
  - HHV-6 and HHV-7, 162
  - HHV-8, 162, 173, 486
- Human herpesvirus (HHV-8)
- in HIV-positive adults, 173
  - oncogenicity of, 222
- Human immunodeficiency virus (HIV). See HIV (human immunodeficiency virus)
- Humanized monoclonal antibodies
- active vs passive immunity, 108
  - naming conventions for, 254
- Human metapneumovirus, 166
- Human monoclonal antibody, naming conventions for, 254
- Human papillomavirus (HPV)
- cervical pathology, 663
  - HIV-positive adults, 173
  - HPV-6, 179
  - HPV-11, 179
- HPV-16, 663, 690
- HPV-18, 663
- laryngeal tumors in children, 690
- oncogenicity, 222
- squamous cell carcinoma of penis, 669
- tumor epidemiology, 661
- verrucae, 485
- warts, 161
- Human placental lactogen (hPL), 652
- Human protein production, 53
- Humerus fractures
- axillary nerve, 450
  - radial nerve, 450
- Humoral immune response, 99, 415
- Humor (ego defense), 571
- Hunger/satiety regulation, 508
- Hunter syndrome
- inheritance, 59
  - lysosomal storage disease, 86
- Huntington disease
- chromosomal abnormality, 62
  - drug therapy for, 564
  - histone deacetylation in, 32
  - neurotransmitter changes with, 505
  - symptoms and histologic findings, 534
  - trinucleotide repeat expansion diseases, 60
- Hurler syndrome, lysosomal storage disease, 86
- Hürthle cells, 345
- Hyaline arteriosclerosis, 350
- Hyaline arteriosclerosis, 304
- Hyaline casts (urine), 612
- Hydatid cysts, 157, 158
- Hydatidiform mole
- complete vs partial, **659**
  - serum tumor marker, 222
- Hydralazine
- drug reactions with, 249
  - in heart failure, 316
  - in pregnancy, 660
  - mechanism, use, and adverse effects, **323**
- Hydrocele (scrotal), congenital, 670
- Hydrocephalus
- childhood tumors, 542
  - mimics of, 536
  - noncommunicating, 502
  - obstructive, 542
  - risk for developing, 528
  - Toxoplasma gondii*, 153, 180
  - types and presentation, **536**
- Hydrochlorothiazide (HCTZ)
- drug reactions with, 248
  - mechanism and clinical use, 627
- Hydrogen peroxide, 126, 197
- Hydronephrosis
- causes and effects of, 618
  - duplex collecting system, 597
  - kidney stones, 617
  - prenatal, 596
  - with horseshoe kidney, 597
- Hydrophobia, 169
- Hydrops fetalis, 424
- parvovirus B19, 180
  - syphilis, 180
- Hydrosalpinx, pelvic inflammatory disease, 181

- Hydroxocobalamin, 247  
 Hydroxyapatite, 496  
 Hydroxychloroquine, drug reactions with, 249, 250  
 Hydroxylases, 71  
 Hydroxylation  
   in protein synthesis, 43  
   Vitamin C and, 48  
 Hydroxyurea  
   drug reactions with, 249  
   mechanism, use, and adverse effects, 444  
   polycythemia vera, 438  
   purine and pyrimidine synthesis, 34  
   sickle cell anemia, 428  
 Hyoscyamine, 240  
 Hyperacute transplant rejection, 110, 117  
 Hyperaldosteronism  
   clinical features, **354**  
   hypertension with, 302  
   potassium-sparing diuretics for, 627  
 Hyperammonemia  
   causes and management, **80**, 426  
   fatty acid metabolism and, 87  
   ketone levels, 88  
   organic acidemias, 83  
 Hyperbilirubinemia  
   conjugated (direct), 400, 401  
   jaundice with, 401  
   unconjugated (indirect), 400  
 Hypercalcemia  
   acute pancreatitis and, 404  
   adult T-cell lymphoma, 435  
   bisphosphonates, 496  
   calcium carbonate antacid effects, 406  
   familial hypocalciuric hypercalcemia, 349  
   hyperparathyroidism, 349  
   lung cancer, 703  
   metastatic calcification, 207  
   paraneoplastic syndrome, 224  
   succinylcholine, 566  
   thiazides, 627  
   Williams syndrome, 62, 63  
 Hypercalciuria  
   hyperparathyroidism, 349  
   thiazides for, 627  
 Hypercapnia, effects of, 684  
 Hypercholesterolemia  
   corneal arcus with, 303  
   familial, 58  
 Hyper-cholesterolemia, familial, 92  
 Hyper-chylomicronemia, familial dyslipidemias, 92  
 Hypercoagulability  
   advanced malignancy, 318  
   deep venous thrombosis, 321  
   dural venous sinus thrombosis, 514  
   nonbacterial thrombotic endocarditis with, 318  
 Hyperemesis gravidarum, treatment, 506  
 Hyperemia, pseudoephedrine/phenylephrine use, 704  
 Hyperglycemia  
   drugs causing, 248  
   pancreatic cell tumors, 357  
   protease inhibitors, 198  
   thiazides, 627  
   vitamin B<sub>3</sub> toxicity, 65  
 Hyperglycemic emergencies, **351**  
 Hypergonadotropic (1°)  
   hypogonadism, 654  
 Hypergranulosis, 492  
   characteristics/examples, 483  
 Hyperhidrosis, treatment of, 136  
 Hyper-IgM syndrome, defect, presentation, and findings, 115  
 Hyperinfection syndrome, 156  
 Hyperkalemia  
   aldosterone in, 606  
   aliskiren, 628  
   angiotensin II receptor blockers, 628  
   blood transfusion risk, 434  
   cardiac glycosides, 326  
   cation exchange resins for, 361  
   potassium-sparing diuretics, 627  
   tumor lysis syndrome, **440**  
 Hyperkalemic tubular acidosis (RTA type 4), 611  
 Hyperkeratosis  
   characteristics/examples, 483  
   verrucae, 485  
 Hyperlipidemia  
   immunosuppressants, 118  
   signs of, **303**  
   thiazides, 627  
 Hyperopia, 550  
 Hyperorality, 524  
 Hyperosmolar hyperglycemic state  
   DM type 2, 350  
   pathogenesis, signs/symptoms and treatment, 351  
 Hyperparathyroidism  
   calcium pyrophosphate deposition disease, 473  
   cinacalcet for, 361  
   lab values in, 469  
   metastatic calcification, 207  
   types and presentation, **349**  
 Hyperphagia  
   brain lesions, 508, 524  
   depression with, 578  
   imprinting disorders, 56  
 Hyperphosphatemia  
   calcification with, **207**  
   hypoparathyroidism, 348  
   renal osteodystrophy and, 622  
   tumor lysis syndrome, 440  
   with chronic kidney disease, 349  
 Hyperpigmentation  
   bleomycin, 444  
   busulfan, 445  
   fludrocortisone, 360  
   hemochromatosis, 402  
   Peutz-Jeghers syndrome, 394  
   primary adrenal insufficiency, 353  
 Hyperplasia  
   adrenal, 352  
   cellular adaptations, 202  
   of parathyroid, 349  
   parathyroid, 356  
 Hyperplastic arteriosclerosis, 304  
 Hyperplastic polyps, 394  
 Hyperprolactinemia  
   antipsychotics, 591  
   causal agents for, 248  
   dopamine, 332  
   drug reactions with, 323  
   effects, 332  
   infertility, 662  
   pituitary adenoma, 540  
 Hyperpyrexia, 593  
 Hyperreactio luteinalis, 663  
 Hyperresonance (chest percussion), 700  
 Hypersalivation, 169  
 Hypersensitivity pneumonitis, 694  
 Hypersensitivity reactions  
   cephalosporins, 185  
   immune complex-mediated, 111  
   in rheumatic fever, 319  
   mast cells in, 414  
   organ transplants, 117  
   penicillins, 183  
   piperacillin, 184  
   types of, **110**  
 Hypersexuality, 524  
 Hypersomnia, 578  
 Hypertension  
   ACE inhibitors for, 628  
   aortic dissection risk with, 305  
    $\beta$ -blockers, 244  
   episodic, 355  
   intracranial hemorrhage with, 528  
   in upper extremities, 302  
   risk factors, features and predisposition, **302**  
 Hypertension treatment  
   associated disorders and, **321**  
 Hypertensive crisis  
   as psychiatric emergency, 587  
   MAO inhibitors, 593  
   phenoxybenzamine for, 243  
   pheochromocytoma with, 355  
 Hypertensive emergency  
   acute end-organ damage, 302  
   RBC casts in, 612  
   treatment, **323**  
 Hypertensive retinopathy, 552  
 Hypertensive urgency, 302  
 Hyperthermia  
   atropine causing, 240  
   MDMA, 589  
   psychiatric emergencies, 587  
 Hyperthyroidism  
   amiodarone and, 328  
    $\beta$ -blocker use, 244  
   causal agents for, 248  
   causes and findings, **346**  
   symptoms with testicular choriocarcinoma, 671  
   systemic effects of, **344**  
   thionamides for treatment, 360  
 Hypertriglyceridemia  
   familial dyslipidemias, 92  
   steatotic liver disease, 398  
 Hypertriglyceridemia, acute pancreatitis and, 404  
 Hypertrophic cardiomyopathy  
    $\beta$ -blockers, 244  
   characteristics of, **314**  
   Friedreich ataxia, 545  
 Hypertrophic osteoarthropathy  
   adenocarcinoma and, 703  
   paraneoplastic syndromes, 224  
 Hypertrophic pyloric stenosis, **366**  
 Hypertrophic scars, 214  
 Hypertrophy  
   cellular adaptations, 202  
   skeletal muscle, 460  
 Hyperuracemia. See also Gout  
 Hyperuricemia  
   drugs causing, 249  
   gout and, 473  
   kidney stones, 617  
   Lesch-Nyhan syndrome, 35  
   thiazides, 627  
   vitamin B<sub>3</sub> toxicity, 65  
 Hyperventilation  
   metabolic acidosis compensatory response, 609  
   therapeutic, 512  
 Hypervitaminosis D, 469  
 Hypnagogic hallucinations, narcolepsy, 576, 585  
 Hypnopompic hallucinations, narcolepsy, 576, 585  
 Hypnozoites, 154  
 Hypoaldosteronism, 611  
 Hypocalcemia  
   acute pancreatitis, 404  
   cinacalcet causing, 361  
   hypoparathyroidism, 348  
   lab values with disorders, **348**  
   magnesium with, 609  
   renal osteodystrophy, **622**  
   secondary hyperparathyroidism, 349  
   thyroidectomy, 347  
   tumor lysis syndrome, 440  
 Hypochlorhydria hypergastrinemia, 386  
 Hypocomplementemia, 614  
 Hypocomplementemic urticarial vasculitis (anti-C1q vasculitis), 479  
 Hypocretin, 585  
 Hypodermis, 481  
 Hypofibrinogenemia, 210  
 Hypogammaglobulinemia, 224  
 Hypogastric nerve, 645  
 Hypoglossal nerve (CN XII)  
   function, 519  
   lesions of, 546  
   with stroke, 527  
 Hypoglycemia  
   gluconeogenesis and, 76  
   hypoketotic, 87  
   in diabetes mellitus, 352  
   in ethanol metabolism, 70  
   Von Gierke disease, 85  
   with insulinoma, 357  
 Hypogonadism  
   causes of, 402  
   common causes, 655  
   diagnosis of, 656  
   disorders of imprinting, 56  
   estrogens for, 674  
   gynecomastia, 667  
   Kallmann syndrome, 656  
   pituitary prolactinomas, 332  
   testosterone/methyltestosterone, 675  
   zinc deficiency, 69  
 Hypogonadotropic (2°) hypogonadism, 654, 656, 662  
 Hypohidrosis, 86  
 Hypokalemia  
   antacid use and, 406  
   loop diuretics for, 626

- on ECG, 297
  - VIPomas and, 378
  - Hypoketosis, 88
  - Hypoketotic hypoglycemia, 87
  - Hypomaniac episode, 578
  - Hyponatremia
    - as paraneoplastic syndrome, 224
    - euvolemic, 342
    - MDMA, 589
    - thiazides, 627
  - Hypoparathyroidism
    - lab values with, 348
    - T-cell differentiation and, 100
    - types and findings, **348**
  - Hypophosphatemia, hyperparathyroidism, 349
  - Hypophosphatemic rickets, 609, 611
  - Hypopituitarism, causes and treatment, 343
  - Hypoplasia, 633
  - Hypopyon, 553
  - Hyporeflexia, magnesium hydroxide and, 406
  - Hypospadias, 641
  - Hyposplenism
    - Streptococcus pneumoniae* infections, 134
  - Hypotension
    - adrenal insufficiency, 353
    - aliskiren, 628
    - angiotensin II receptor blockers, 628
    - drugs causing, 194
    - endotoxins, 129
    - ephedrine for, 241
    - hypermagnesemia, 609
    - in pregnancy, 661
    - magnesium hydroxide and, 406
    - midodrine for, 241
    - norepinephrine for, 241
    - orthostatic, 353
    - phenylephrine for, 241
    - scombroid poisoning, 246
    - sympatholytic drugs and, 243
  - Hypothalamic/pituitary drugs, clinical use, **360**
  - Hypothalamic–pituitary–gonadal axis
    - GnRH analog effects on, 332
  - Hypothalamic-pituitary hormones
    - adrenal insufficiency, 353
    - functions and clinical notes, **332**
  - Hypothalamus
    - endocannabinoid effects, 340
    - functions and nuclei of, **508**
    - in narcolepsy, **585**
    - nuclei of, 508
    - primary polydipsia and, 342
    - reproductive hormone control, 674
    - secretions from, 331
  - Hypothenar muscles, 452, 453
  - Hypotheses (statistical) testing, **265**
  - Hypothyroidism
    - amiodarone and, 328
    - carpal tunnel syndrome and, 463
    - causes and findings, **345**
    - drug reaction and, 248
    - hormone replacement for, 360
    - iodine deficiency or excess, 345
    - lithium for, 592
    - systemic effects of, **344**
  - Hypothyroid myopathy, 344
  - Hypotonia
    - splicing of pre-mRNA in, 41
    - Zellweger syndrome, 46
  - Hypoventilation
    - causes of, 686
    - metabolic alkalosis compensatory response, 609
  - Hypovolemic shock, 317, 620
  - Hypoxanthine, in nucleotides, 33
  - Hypoxia and hypoxemia, **686**
    - erythropoietin production, 607
    - exercise response, 688
    - high altitude response, 688
    - lung diseases, 698
    - nocturnal, 697
    - susceptible regions, 206
    - vasoconstriction, 698
    - vasoconstriction/vasodilation and, 299
    - with limited oxygen diffusion, 684
  - Hypoxia inducible factor 1a, 220
  - Hypoxic stroke, 525
  - Hypoxic vasoconstriction (pulmonary), 684, 688
- I**
- Iatrogenic CJD, 174
  - Ibandronate, 496
  - IBD-associated arthritis, HLA subtype, 99
  - Ibuprofen, 286, 496
  - Ibutilide, 328
  - ICAM-1 protein
    - leukocyte extravasation, 211
    - viral receptor, 163
  - I cells, cholecystokinin secretion, 378
  - Ichthyosis vulgaris, 485, 492
  - Icterohemorrhagic leptospirosis, 145
  - Idarucizumab, 247, 442
  - Idealization, 571
  - Identification (ego defense), 571
  - Idiopathic intracranial hypertension
    - acetazolamide for, 626
    - associations and findings, **536**
    - danazol, 675
    - drugs causing, 250
  - Idiopathic pulmonary fibrosis, **694**
  - Idiopathic thrombocytopenic purpura (ITP), risk with hepatitis B and C, 171
  - IDL (intermediate-density lipoprotein), 92
  - Iduronate-2, 86
  - IFN- $\alpha$  (Interferon- $\alpha$ ), 107, 119, 249
  - IFN- $\beta$  (Interferon- $\beta$ ), 107, 119
  - IFN- $\gamma$  (Interferon- $\gamma$ )
    - clinical use, 119
    - effects of, 212
    - mechanism, use, and adverse effects, 100
  - Ifosfamide, 604
    - drug reactions with, 250
    - mechanism, use, and adverse effects, 445
  - IgA antibodies
    - anti-tissue transglutaminase autoantibody, 113
    - functions of, 103
    - Peyer patches and, 381
  - IgA deficiency, ataxia-telangiectasia, 115
  - IgA nephropathy (Berger disease)
    - nephritic syndrome, 614
  - IgA protease, bacterial virulence, 127
  - IgD antibodies, B cells and, 103
  - IgE antibodies
    - allergen-specific, 110
    - atopic dermatitis, 485
    - functions of, 103
    - type I hypersensitivity, 110
  - IgE-independent mast cell degranulation, 414
  - IgG4-related disease, **477**
  - IgG antibodies
    - as passive immunity, 108
    - bullous pemphigoid, 489
    - pemphigus vulgaris, 489
    - response to antigen, 103
    - type III hypersensitivity reactions, 111
  - IgM antibodies
    - hepatitis A (HAV), 171
    - response to antigen, 103
  - IL-12 receptor deficiency, defect, presentation, and findings, 114
  - Ileum, histology of, 369
  - Ileus
    - bacterial peritonitis (spontaneous), 397
    - cause and treatment, 393
    - treatment of, 239
  - Iliac, 456
  - Iliohypogastric nerve, 456
  - Ilioinguinal nerve, 456
  - Iliopsoas, 455
  - Iliotibial band syndrome, 465
  - Ilium
    - atresia, 366
  - Illness anxiety disorder, 583
  - Iloperidone, 591
  - Imatinib, mechanism, use, and adverse effects, 447
  - Imipenem
    - drug reactions with, 250
    - mechanism and adverse effects, 186
  - Imipramine
    - naming conventions for, 252
  - Imiquimod, **498**
  - Immature ego defenses, 570
  - Immature teratoma, 664
  - Immediate hypersensitivity reaction, 110
  - Immune checkpoint interactions (cancer), **218**
  - Immune complex
    - fibrinoid necrosis, 205
    - Type III hypersensitivity, 111
  - Immune complex hypersensitivity, 111
  - Immune privilege organs, **97**
  - Immune responses
    - acute-phase reactants, 97
    - antigen type and memory, **103**
    - cell surface proteins, 108
    - cortisol in, 340
    - cytokines, 106
    - evasion in bacteria, 127
    - evasion in cancer, 217
    - immunoglobulin isotypes, **103**
  - Immune system
    - aging effects on, 225
    - organs, **94**
  - Immune thrombocytopenia
    - mechanism and findings, 432
    - Type II hypersensitivity, 110
  - Immunity
    - adaptive, 415
    - innate, 415
    - in neonates, 653
    - passive vs active, **108**
  - Immunocompromised patients
    - Candida albicans* in, 150
    - common organisms affecting, 175
    - invasive aspergillosis, 150
    - Listeria monocytogenes*, 137
  - Immunodeficiencies
    - defects, presentation, and findings, **114**
    - flow cytometry diagnosis, 52
    - infections in, **116**
    - Th1 response, 114
    - Th17 cell deficiency, 114
    - thymus in, 96
  - Immunofluorescence
    - membrano-proliferative glomerulonephritis, 615
    - nephritic syndrome, 614
    - nephrotic syndrome, 616
    - “starry sky” appearance, 614
  - Immunofluorescence, pemphigus vulgaris vs bullous pemphigoid, 489
  - Immunoglobulin A vasculitis, 479
  - Immunoglobulin isotypes, **103**
  - Immunoglobulins
    - adaptive immunity and, 97
    - breast milk and, 653
  - Immunohistochemical stains, tumor identification, **223**
  - Immunologic memory, 99
  - Immunology
    - blood transfusion reactions, **112**
    - cellular components, 97
    - immune responses, 102
    - immunosuppressants, **118**
    - lymphoid structures, 94
  - Immunophenotype assessment, 52
  - Immunosenescence, 97
  - Immunosuppressants
    - mechanism, indications and toxicity, **118**
    - nucleotide synthesis effects of, 34
  - Immunosuppression
    - squamous cell carcinoma and, 494
    - vitamin A deficiency, 64
  - Immunotherapy, recombinant cytokines, 119
  - Impaired automobile drivers, confidentiality and, 270
  - Impaired colleague, 275
  - Imperforate hymen, **662**
  - Impetigo
    - characteristics of, 487
    - crusts with, 483
    - Streptococcus pyogenes*, 134
  - Implantable cardioverter-defibrillator (ICD), 311
  - Implantation (zygote), 651
  - Imprinting disorders
    - mechanism of, **56**
    - Prader-Willi and Angelman syndrome comparison, 56
  - Inactivated (killed) vaccine, 109

- Incidence vs prevalence, **262**
- Inclusion bodies, 45
- Inclusion cell (I-cell) disease, cell trafficking, 45
- Inclusions  
Cowdry A, 163  
Negri bodies, 169  
“owl eye,” 162  
RBCs, 421  
reticulate bodies, 146
- Incomplete penetrance, 54
- Incontinence (fecal/urinary), 457
- Increased intracranial pressure  
venous sinus thrombosis, 514  
vitamin A toxicity, 64
- Incus (ossicles), 547, 638
- India ink stain, 123
- Indirect bilirubin, 382
- Indirect cholinomimetic agonists,  
actions and applications,  
239
- Indirect inguinal hernia, 377
- Indirect sympathomimetics, actions  
and applications, 241
- Indirect (unconjugated)  
hyperbilirubinemia, **400**
- Indomethacin, 286, 496
- Infant and child development, **572**
- Infant development, 572
- Infantile cataracts, 78
- Infantile cirrhosis, 85
- Infantile gastroenteritis, 165
- Infantile hemangioma, 486
- Infection  
bone and marrow, 469  
hypoxia/ischemia in, 206  
in kidney, 621
- Infarcts  
atherosclerosis, 303  
cortical areas, 513  
pituitary, 343  
types of, **206**
- Infection-related glomerulonephritis,  
614
- Infections  
brain abscess with, **176**  
common vaginal, 178  
ESR with, 210  
fungal, **150**  
healthcare-associated, **181**  
IL-12 receptor deficiency, 114  
in immunocompromised patients,  
137  
in immunodeficiency, **116**  
TORCH, **180**
- Infectious esophagitis, 384
- Infective dementia, 535
- Infective endocarditis  
*Candida albicans*, 150  
causes, presentation, **318**  
coarctation of aorta, 302  
culture-negative, 148  
daptomycin, 191  
enterococci, 135  
nonbacterial thrombotic, 224  
prophylaxis, 193  
*Staphylococcus aureus*, 133  
*Streptococcus gallolyticus*, 135
- Inferior gluteal nerve, 457
- Inferior oblique muscle, 555
- Inferior rectal artery, 372
- Inferior rectus muscle, 555
- Inferior vena cava (IVC), derivation  
of, 285
- Infertility  
clomiphene, 674  
Kallmann syndrome, 656  
leuprolide for, 674  
mumps, 671  
salpingitis, 181  
varicoceles, 669  
with uterine anomalies, 640
- Infiltrative cardiomyopathy, 314
- Inflammasome, 210
- Inflammation  
acute-phase reactants, **209**  
characteristics of acute, **210**  
chronic, **212**  
cortisol in, 340  
CRP with, 209  
ESR with, 210  
granulomatous, **213**  
in atherosclerosis, 303  
in wound healing, 212  
neutrophils in, 412  
signs and manifestations, **209**  
systemic manifestations, 209
- Inflammatory bowel diseases  
antimetabolites for, 444  
colorectal cancer and, 394  
Crohn disease vs ulcerative colitis,  
389  
microscopic colitis, 389  
sclerosing cholangitis and, 402  
spondyloarthritis with, 475
- Inflammatory breast disease, 667, 668
- Inflammatory hypersensitivity  
reaction, 111
- Inflammatory pseudopolyps, 394
- Infliximab  
for Crohn disease, 389  
mechanism, use, and adverse  
effects, 498
- Influenza  
pneumonia, 701
- Influenza viruses  
bacterial superinfections, 166  
structure and medical importance,  
164, **166**  
treatment/prevention, 196
- Informed consent requirements, 268,  
**269**
- Infraspinatus muscle  
Erb palsy, 452  
pitching injury, **451**
- Infundibulopelvic ligament, 643
- Inguinal canal, **376**
- Inguinal hernia, 377
- Inguinal ligament, 375
- Inguinal triangle, 377
- Inhaled anesthetics  
mechanism and adverse effects,  
565  
naming conventions for, 252
- Inhaled glucocorticoids, 704
- Inhaled psychoactive drugs, 588
- Inheritance modes, 57
- Inherited epidermolysis bullosa, 490
- Inhibin B, secretion of, 646
- Initiation (protein synthesis), 43
- Injection drug use, pneumonia  
causes, 175
- Innate immune system  
components and mechanism, 97,  
415  
in acute inflammation, 210  
natural killer cells in, 415
- Innate vs adaptive immunity  
dendritic cell functions, 414  
mechanism and response, **97**
- Inner ear, 547
- Inotropy, 290
- INR (international normalized ratio),  
431
- Insomnia  
terminal, 507  
therapy for, **562**
- Inspiration, 294
- Inspiratory capacity (IC), 682
- Inspiratory reserve volume (IRV), 682
- Inspiratory stridor, 167, 182
- Insulin  
glycogen regulation, 84  
preparations, mechanism and  
adverse effects, 358  
serum level in Type 2 diabetes  
mellitus, 351  
synthesis, function, and regulation,  
**338**  
Type 1 and Type 2 diabetes  
mellitus, 351
- Insulin-dependent glucose  
transporters, 338
- Insulin-like growth factor 1 (IGF-1)  
acromegaly, 343  
signaling pathways for, 341
- Insulinoma, 357
- Insulin resistance  
acanthosis nigricans and, 492  
cortisol and, 340  
GH, 333
- Insulin sensitivity, diabetes mellitus  
Type 1 vs Type 2, 351
- Insurance  
financial coverage, 275  
types of plans, **277**
- Integrase inhibitors, **198**, 252
- Integrins  
epithelial cell junctions and, 482  
viral receptor, 163
- Intellectual disability  
autism and, 574  
childhood and early-onset  
disorders, **574**  
cri-du-chat syndrome, 62  
fragile X syndrome, 60  
Patau syndrome, 61  
phenylketonuria, 82  
Williams syndrome, 63
- Intellectualization, 571
- Intention-to-treat analysis, 257
- Intention tremor, 533
- Intercellular bridges, 703
- Interdigital tinea pedis, 488
- Interferon- $\gamma$   
secretion, 106
- Interferons  
clinical use, 119  
mechanism, clinical use and  
adverse effects, **107**
- Interferon- $\gamma$  release assay (IGRA), 138
- Interleukin 1 (IL-1), 106
- Interleukin-2 agonist/analog, naming  
conventions for, 254
- Interleukin 2 (IL-2)  
clinical use, 119  
functions of, 106  
sirolimus and, 118  
tacrolimus and, 118
- Interleukin 3 (IL-3), functions of, 106
- Interleukin-4, functions of, 106
- Interleukin 5 (IL-5), functions of, 106
- Interleukin 6 (IL-6), functions of,  
106, 209
- Interleukin 8 (IL-8), functions of, 106
- Interleukin-8 (IL-8), functions of, 210
- Interleukin 10 (IL-10), functions of,  
106
- Interleukin-10 (IL-10), functions of,  
210
- Interleukin 12 (IL-12), functions of,  
106
- Interleukin-13 (IL-13), functions of,  
106
- Interleukin receptor antagonist,  
naming conventions for,  
254
- Interleukin receptor modulators, 254
- Interleukin receptor modulators,  
naming conventions for,  
254
- Intermediate acting insulin, 358
- Intermediate filaments, cytoskeletal  
element, 46
- Intermediate lobe (pituitary),  
secretions of, 331
- Intermediate zone (Zone II), 374
- Intermittent explosive disorder, 574
- Internal carotid artery, cavernous  
sinus, 557
- Internal hemorrhoids, 373
- Internal jugular vein, 514
- Internal oblique muscle, 456
- Internal rotation, hip, 455
- Internuclear ophthalmoplegia, 524,  
558
- Interossei muscles, Klumpke palsy,  
452
- Interpersonal therapy, 590
- Interpretation of study results  
bias in, 263  
confounding vs effect modification,  
264  
statistical outcomes and, **265**
- Interpreters, use of, **273**
- Intersex states, 655
- Interstitial (atypical) pneumonia, 701
- Interstitial cells of Cajal, 369
- Interstitial fluid, 298
- Interstitial fluid oncotic pressure, 299
- Interstitial lung disease, 694
- Interstitial nephritis  
as drug reaction, 250  
NSAID toxicity, 496  
penicillins, 184
- Interstitial pneumonia, 701
- Interventricular foramen, 285
- Interventricular septal rupture, 308,  
313
- Intervertebral disc herniation, 458
- Interviewing  
cultural formulation, **272**  
delivering bad news, **273**

- establishing rapport, **271**  
 history taking, **272**  
 interpreter use, **273**  
 motivational, **272**  
 patient-centered, **271**  
 "Intestinal angina," 393  
 Intestinal atresia, presentation and causes of, **366**  
 Intestinal disorders, **393**  
 Intestinal gastric cancer, 386  
 Intestinal infections  
   cestodes, **157**  
   nematodes, 156  
   trematodes, **157**  
 Intestinal microbiota  
   *Klebsiella* spp in, 143  
   vitamin K synthesis, 69  
 Intestinal obstruction, intermittent, 370  
 Intimate partner violence, 275  
 Intoxication (psychoactive drugs), **588**  
 Intracellular bacteria, **125**  
 Intracellular receptors, endocrine hormone signaling pathways, 341  
 Intracranial calcifications, *Toxoplasma gondii*, 153  
 Intracranial hemorrhage  
   eclampsia, 660  
   types and findings, **528**  
 Intracranial hypertension  
   idiopathic, **536**  
   vitamin A toxicity, 64  
 Intracranial pressure  
   ex vacuo ventromegaly, 536  
   hydrocephalus, 536  
   in Cushing reflex, 298  
   in perfusion regulation, 512  
   superior vena cava syndrome, 702  
 Intraductal papilloma, 667  
 Intraepithelial adenocarcinoma, 661  
 Intraocular pressure (IOP), 551  
 Intraparenchymal hemorrhage, 528  
 Intrauterine adhesions, 666  
 Intrauterine device (IUD), 675  
 Intravascular catheters, 181  
 Intravascular hemolysis, 105  
   causes and findings with, 427  
   G6PD deficiency, 428  
 Intravenous anesthetics, mechanism and adverse effects, 565  
 Intraventricular hemorrhage, neonatal, 527  
 Intrinsic factor, source, action and regulation, 379  
 Intrinsic hemolytic anemias, types and findings, 428  
 Intrinsic (mitochondrial) pathway (apoptosis), 204  
 Intrinsic pathway  
   coagulation disorders, 431  
   heparin and, 441  
 Intrinsic renal failure, 620  
 Introns  
   splicing out, 40  
   vs exons, **41**  
 Intussusception, 391, **392**  
 Inulin  
   clearance, 600  
   glomerular filtration rate and, 599  
   in proximal convoluted tubules, 605  
 Invariant chain, 98  
 Invasive carcinomas, cervix, 663  
 Invasive ductal carcinomas, 668  
 Invasive lobular carcinomas (breast), 668  
 Inverse agonist, 233  
 Inversion (foot), 457  
 Involuntary treatment, 270  
 Iodine  
   infection control, 197  
   teratogenic effects of, 632  
 Iodophors, 197  
 Ionizing radiation  
   carcinogenicity, 221  
   toxicity, **207**  
 IP3, endocrine hormone signaling pathways, 341  
 IPEX syndrome, 100  
 Ipilimumab, 446, 494  
 Ipratropium, 240, 704  
 Irinotecan/topotecan, 36, 445  
 Iritis, 553  
 Iron  
   absorption and vitamin C, 67  
   absorption of, 67, 381  
   excess, 66  
   granules in RBCs, 421  
   in hemochromatosis, 402  
   interpretation of studies, **423**  
   restless leg syndrome and, 533  
   toxicity of, 67  
   toxicity treatment, 247  
 Iron deficiency anemia  
   colorectal cancer, 395  
   iron study interpretation, 423  
   lab findings with, 424  
   organisms associated with, 157, 158  
 Iron granules, 421  
 Iron poisoning, acute vs chronic, **431**  
 Iron studies, interpretation, **423**  
 Irreversible cellular injury, 203  
 Irritable bowel disease (IBD)  
   fecal calprotectin and, 389  
   GI bleeding with, 387  
 Irritable bowel syndrome  
   antispasmodic drugs, 240  
   criteria and symptoms, **390**  
 Isavuconazole, 150, 195  
 Ischemia  
   acute tubular necrosis, 621  
   acute tubular necrosis from, 620  
   coagulative necrosis, 205  
   colonic, 370  
   digital, 480  
   liver effects of, 374  
   mesenteric and colonic, 393  
   of bowel, 397  
   vulnerable organs and mechanisms, **206**  
   watershed areas, 206  
 Ischemic brain disease/stroke  
   consequences and time course, **525**  
   types of, 525  
 Ischemic heart disease  
   contraindicated antiarrhythmics, 327  
   manifestations of, **307**  
 Ischemic priapism, 669  
 Islet amyloid polypeptide, 208, 351  
 Islets of Langerhans, 331  
 Isocarboxazid, 593  
 Isocitrate dehydrogenase, rate-determining enzyme, 71  
 Isodisomy, 55  
 Isoflurane, 565, 566  
 Isolated atrial amyloidosis, 208  
 Isolation (of affect), 571  
 Isoleucine  
   classification of, 79  
   maple syrup urine disease and, 79  
 Isoniazid  
   cytochrome P-450 interaction, 251  
   drug reactions with, 250  
   mechanism and adverse effects, 192  
   visual disturbance, 250  
   Vitamin B<sub>6</sub> (pyridoxine) deficiency, 66  
 Isoproterenol  
   sympathomimetic action, 242  
   tachyarrhythmia evaluation, 241  
 Isosorbide dinitrate, 322  
 Isosorbide mononitrate, 322  
 Isotretinoin  
   cystic acne, 64  
   teratogenicity of, 632  
 Isovolumetric contraction, 291  
 Isovolumetric relaxation, 291  
 Ito (hepatic stellate) cells, 374  
 Itraconazole  
   mycoses treatment, 195  
   systemic mycoses, 149, 151  
 Ivabradine  
   drug reactions with, 250  
   mechanism, use, and adverse effects, **328**  
 Ivacaftor, in cystic fibrosis, 58  
 Ivermectin, 156, 158, 195, 196  
 IVIG therapy, 108, 432  
 "Ivory white" plaques, 696  
 Ixazomib, 447  
 Ixekizumab, 498  
 Ixodes ticks, diseases transmitted, 144, 147, 154  
**J**  
 JAK2 gene  
   associated neoplasm, 220  
   in myeloproliferative disorders, 438  
 JAK2 V617F, 438  
 Janeway lesions, 318  
 Jarisch-Herxheimer reaction, 144  
 Jaundice  
   biliary tract disease, **400**  
   cholangitis, 403  
   drugs causing, 248  
   graft-versus-host disease, 117  
   hereditary hyperbilirubinemias, 401  
   painless, 375  
   pancreatic cancer, 405  
   yellow fever, 168  
 Jaw jerk reflex, 519  
 JC virus (John Cunningham virus)  
   HIV-positive adults, 173  
   immunocompromised patients, 116  
   in demyelination disorders, 538  
   polyomaviruses, 161  
 Jejunum  
   atresia, 366  
   histology, 369  
 Jimson weed, 240  
 Job syndrome, 114  
 "jock itch," 488  
 Jod-Basedow phenomenon, 346  
 Joints  
   angle change sensation, 504  
   Chikungunya virus, 168  
   hypermobility, 49  
   restricted movements of, 45  
 J point (ECG), 297  
 Jugular venous distention  
   heart failure and, 316  
   with Budd-Chiari syndrome, 397  
 Jugular venous pressure tracings, 292  
 Jugular venous pulse, 320  
 "jumping" process (transposon), 129  
 Justice (ethics), 268  
 Juvenile polyposis syndrome, 394  
 Juxtaglomerular apparatus,  
   components and functions, 607  
 Juxtaglomerular cells, tumors in, 354  
**K**  
 KI-sparing diuretics, 625  
 K<sub>m</sub> (enzyme kinetics), 228  
 Kallikrein, 105  
 Kallmann syndrome, 508, 654, **656**  
 Kaplan-Meier curve, **259**  
 Kaposi sarcoma  
   bacillary angiomatosis vs, 486  
   HHV-8, 162  
   HIV-positive adults, 173  
   oncogenic microbes, 222  
   skin tumors, 486  
 Kartagener syndrome, dextrocardia, 284  
 Karyolysis, 203  
 Karyorrhexis, 203, 204  
 Karyotyping, **53**  
 Kawasaki disease, 478  
 Kayser-Fleischer rings, 402  
 K cells, GIP production, 378  
 Kegel exercises, 618  
 Keloid scars, 214  
 Keratinocytes, 212  
 Keratin pearls, 494, 703  
 Keratoconjunctivitis, 162  
 Keratoconjunctivitis sicca, 474  
 Keratoderma blennorrhagica, 475  
 Keratomalacia, 64  
 Keratosis  
   hyperkeratosis, 483  
   parakeratosis, 483  
   seborrheic, 485  
 Keratosis pilaris, 485  
 Kernicterus, 197, 400, 401  
 Ketamine, 565, 578  
 Ketoacidosis  
   diabetes Type 1 vs Type 2, 351  
   ethanol metabolism, 70  
   in ethanol metabolism, 70  
 Ketoconazole  
   cytochrome P-450 interaction, 251  
   mechanism, use, and adverse effects, 195, 676  
   reactions to, 248  
 Ketogenesis  
   ethanol metabolism, 70  
   metabolic site, 72  
   rate-determining enzyme for, 71  
 Ketogenic amino acids, 79

- Ketone bodies  
in starvation, 89  
metabolism of, **88**
- Ketorolac, 496
- Kidney disease  
acute injury, 143, **620**  
acute interstitial nephritis, **620**  
acute tubular necrosis, **621**  
diffuse cortical necrosis, **621**  
extrahepatic manifestations of hepatitis, 171  
glomerular diseases, **613**  
nephritic syndrome, 614  
nephrotic syndrome, 616  
pyelonephritis, **619**  
renal papillary necrosis, **621**  
renal tubular defects, **604**  
renal tumors, 623  
vitamin D deficiency and, 68
- Kidneys  
adrenergic receptors in, 236  
blood flow autoregulation by, 299  
carcinogens affecting, 221  
changes in glomerular dynamics, **601**  
chronic graft nephropathy, 117  
collecting system anomalies, 597  
congenital solitary, **597**  
electrolyte disturbances, **609**  
embryology, **596**  
filtration, **601**  
glucose clearance, **602**  
hormonal functions of, **607**  
hormones acting on, **608**  
ischemia of, 206  
reabsorption and secretion calculation, **602**  
transplant prophylaxis, 118
- Kidney stones  
content and findings, **617**  
cystine stones, 83  
electrolyte disturbances, 609  
hyperparathyroidism, 349  
*Proteus mirabilis*, 143  
risk factors for, 611  
urinary tract infections, 178  
urine casts with, 612
- Kiesselbach plexus, 690
- Killed (inactivated) vaccine, 109
- Killian triangle, 391
- Kimmelstiel-Wilson lesions, 616
- Kinases, 71
- Kinesin, movement of, 46
- Kinin pathways, **418**
- KIT (D816V), 438
- Klebsiella* spp  
acute cystitis, 619  
alcohol use disorder, 175  
effects of, **143**  
healthcare-associated infections, 181  
kidney stones, 617  
pneumonia with, 701
- Klebsiella pneumoniae*  
cephalosporins, 185  
polymyxins, 189  
urinary tract infections, 178
- Klinefelter syndrome  
characteristics of, 655  
chromosome association, 62  
gynecomastia, 667
- Klumpke palsy, injury and deficits, 452
- Klüver-Bucy syndrome, brain lesions with, 524
- Knee conditions  
calcium pyrophosphate deposition disease, 473  
common, 464  
examination for, 454  
iliotibial band syndrome, 465  
ligament and meniscus, 464  
Osgood-Schlatter disease, 466  
overuse injury, 466  
popliteal cyst, 464  
prepatellar bursitis, 464
- Knockdown experiments, 54
- Knock-in, 54
- Knock-out, 54
- Knudson 2-hit hypothesis, 220
- KOH preparation, 488
- Koilocytes  
condylomata acuminata, 179  
verrucae, 485
- Koilonychia, 424
- Koplik spots, 167, 177
- Korsakoff syndrome, 64, 575
- Kozak sequence, 40
- Krabbe disease, 86, 538
- KRAS gene  
adenomatous colonic polyps and, 394  
associated neoplasm, 220  
lung cancer and, 703
- Krebs cycle, 75
- Krukenberg tumor, 386
- Kulchitsky cells, 703
- Kupffer cells, 374
- Kuru, 174
- Kussmaul respirations, 351
- Kussmaul sign, 320
- Kwashiorkor, 69
- Kyphoscoliosis  
I-cell disease, 45  
in childhood, 545
- Kyphosis  
in homocystinuria, 83  
osteoporosis and, 467
- L**
- “La belle indifférence,” 583
- Labetalol, 244, 323, 660
- Labile cells, 44
- Lac* operons, **39**
- Lacrimation reflex, 519
- Lactase deficiency  
malabsorption syndromes, 388  
types, findings and treatment, **79**
- Lactase-persistent allele, **79**
- Lactation, **653**
- Lactational mastitis, 667
- Lactic acid dehydrogenase  
pyruvate metabolism, 75
- Lactic acidosis  
ethanol metabolism and, 70  
pyruvate dehydrogenase complex deficiency, 75
- Lactobacillus* spp, neonatal microbiota, 174
- Lactose-fermenting enteric bacteria  
culture requirements, 124  
types and culture, **142**
- Lactose hydrogen breath test, 79, 388
- Lactose intolerance, 388
- Lactose metabolism, environmental change and, 39
- Lactulose  
gut microbiota effects, 408  
in hepatic encephalopathy, 399  
in hyperammonemia, 80
- Lacunar infarcts, 526
- Ladd bands, 392
- Lambert-Eaton myasthenic syndrome  
as paraneoplastic syndrome, 224  
autoantibody, 113  
pathophysiology, symptoms and treatment, 480
- Lamina propria  
in Whipple disease, 388  
Peyer patches in, 381
- Lamins, 46
- Lamivudine, 198
- Lamotrigine  
mechanism and adverse effects, 560  
rash caused by, 249
- Lancet-shaped diplococci, 134
- Landmarks (anatomical)  
for dermatomes, **523**  
structures penetrating diaphragm, 681  
vertebral, 371
- Langerhans cell histiocytosis, **439**  
pulmonary, 694
- Langerhans cells, 101, 138
- Langhans giant cell, 138
- Lansoprazole, 406
- Laplace’s law, 288, 679
- Large cell carcinoma of lung, 703
- Large-vessel vasculitis, 478
- Larva migrans, 156
- Laryngeal papillomatosis, 690
- Laryngopharyngeal reflux, 384
- Laryngospasm  
drug-induced, 587  
tracheoesophageal anomalies, 366
- Larynx  
carcinogens affecting, 221  
intrinsic muscles of, 638  
respiratory tree, 680
- Lassa fever encephalitis, 164
- Latanoprost, 568
- Late hypersensitivity reaction, 110
- Latent errors (medical), 278
- Lateral collateral ligament (LCL)  
injury, 454
- Lateral corticospinal tract, **521**
- Lateral femoral cutaneous nerve, 456
- Lateral geniculate nucleus (thalamus), 508
- Lateral medullary (Wallenberg) syndrome, 527
- Lateral meniscal tear, 454
- Lateral nucleus (hypothalamus), 508
- Lateral rectus muscle, 555
- Lateral (tennis) elbow tendinopathy, 462
- Lateral thoracic artery, 458
- LD50 (lethal median dose), 233
- LDL (low-density lipoprotein)  
functions of, 92  
PCSK9 enzyme, 91  
receptor binding, 91  
serum tumor marker, 222
- Lead paralysis, 578
- Lead lines, 425
- “Lead pipe” appearance (colon), 389
- Lead poisoning  
anemia with, 425  
mechanism and presentation, **430**, 604  
signs/symptoms and treatment, 425  
treatment for, 247
- Lead-time bias, 263
- Leber hereditary optic neuropathy (LHON), 55, 57, 60
- Lecithinase, 131, 136
- Lecithin-cholesterol acetyltransferase (LCAT), activation of, 91
- Ledipasvir, 200
- Leflunomide  
dihydroorotate dehydrogenase inhibition, 34  
mechanism, use, and adverse effects, **496**
- Left bundle branch, 297
- Left circumflex coronary artery, 308
- Left heart disease, pulmonary hypertension, 698
- Left heart failure, 316
- Left-right disorientation, 524
- Left shift, 412
- Left-to-right shunts, 301
- Legally incompetent patient, 269
- Legg-Calvé-Perthes disease, 466, 469
- Legionella* spp  
atypical organism, 175  
culture requirements, 124  
Gram stain for, 123  
macrolides, 189  
pneumonia with, 701  
stain for, 123
- Legionella pneumophila*, findings and treatment, **141**
- Legionnaires’ disease, 141
- Leiomyoma (fibroid), 666  
nomenclature, 216
- Leiomyosarcoma, 216
- Leishmania* spp, visceral infections, 155
- Length-time bias, **263**
- Lens  
collagen in, 48  
galactitol deposition, 78
- Lens dislocation  
causes and disease association, 550  
in homocystinuria, 83  
Marfan syndrome and homocystinuria, 50
- Lenticulostriate artery, stroke effects in, 526
- Lentigo maligna, 494
- Leonine facies, 139
- Lepromatous leprosy, 139
- Leprosy, 139  
animal transmission, 147  
characteristics of, **139**  
dapson, 190  
erythema nodosum, 492
- Leptin  
appetite regulation, 340  
in hypothalamus, 508
- Leptospira* spp  
disease and transmission, 147  
Gram stain for, 123

- Leptospira interrogans*, clinical significance, **145**
- Leptospirosis, 145, 147
- Lesch-Nyhan syndrome  
gout, 473  
inheritance, 59  
metabolic error and findings, 35
- Leser-Trélat sign, 224, 485
- Lesser omental sac, 368
- Letrozole, 675
- Leucine, classification of, 79
- Leucovorin, 444, 447
- Leukemias  
antimetabolites for, 444  
carcinogens for, 221  
cyclophosphamide for, 444  
epidemiology in children, 218  
lymphoma comparison, 434  
mucormycosis, 150  
nomenclature, 216  
suppressor genes, 220  
types and characteristics, 437  
vinca alkaloids for, 445
- Leukemoid reaction, **439**
- Leukocoria, **553**
- Leukocyte adhesion deficiency types, 115, 211
- Leukocyte alkaline phosphatase (LAP), 412
- Leukocyte esterase, 178, 619
- Leukocyte extravasation, steps of, 210, **211**
- Leukocytes  
in leukemias, 437  
in urine (pyuria), 178, 612
- Leukocytoclastic vasculitis, 171
- Leukocytosis  
healthcare-associated infections, 181  
inflammation, 209  
psoas abscess, 463  
systemic juvenile idiopathic arthritis, 474
- Leukoerythroblastic reaction, 412
- Leukopenias  
cell types, counts and causes, **429**  
ganciclovir, 196  
trimethoprim, **190**
- Leukoplakia  
hairy, 487  
squamous cell carcinoma of penis, 669  
vulvar carcinoma and, 661
- Leukostasis, 437
- Leuprolide, 332, 674
- Luteinizing hormone(LH),  
clomiphene effects on, 674
- Levator veli palatini muscle, 638
- Levetiracetam, 560
- Levodopa (l-DOPA)/carbidopa, 563
- Levofloxacin, 191
- Levomilnacipran, 593
- Levonorgestrel, 675
- Levothyroxine, **360**
- Lewy body dementia, 507, 535
- Leydig cells  
cryptorchidism and, 669  
endocrine function, 639, 654  
secretions of, 646  
tumors of, 671
- Libido, testosterone and, 653
- Libman-Sacks endocarditis, 318, 476
- Lice  
head/scalp, 158  
treatment, 195
- Lichen planus, 171, 483, 492
- Lichen sclerosus, 661
- Lichen simplex chronicus, 661
- Liddle syndrome  
renal disorder features, 605  
renal tubular defects, 604
- Lid lag/retraction, 344
- Lidocaine  
Class IB sodium channel blockers, 565  
mechanism, use, and adverse effects, 326
- Life expectancy, 259
- Life support withdrawal, 275
- Li-Fraumeni syndrome  
chromosomal abnormality, 62  
tumor suppressor genes, 44, 54
- Ligaments  
female reproductive anatomy, 643  
gastrointestinal anatomy, **368**
- Ligamentum arteriosum, 286
- Ligamentum teres hepatis (round ligament), 286, 368
- Ligamentum venosum, 286
- Lighththeadness, 549
- Light-near dissociation, 542
- Likelihood ratio (LR), **259**
- Limb ataxia, 524
- Limb compartment syndrome, 465
- Limb deformities, fetal, 596
- Limbic system  
behavior modulation, 508  
structures and function of, **509**
- Limited scleroderma, autoantibody, 113, 481
- Linaclotide, 408
- Linagliptin, 359
- Lines of Zahn, 691
- Lineweaver-Burk plot, 228
- Linezolid  
drug reactions with, 249  
mechanism, use, and adverse effects, **189**
- Lingual thyroid, 330
- Lingula (lung), 681
- Linitis plastica, 386
- Linkage disequilibrium, 55
- Linoleic acid, 63
- Linolenic acid, 63
- Liothyronine, **360**
- Lipases  
in pancreatitis, 404  
pancreatic secretion, 380
- Lipid-lowering agents  
drug reactions with, 248  
mechanism and adverse effects, **324**
- Lipids, transport of, 87
- Lipid transport, key enzymes in, **90**
- Lipoamide, activated carrier, 73
- Lipodystrophy, tesamorelin for, 332
- Lipofuscin, **225**
- Lipolysis  
cortisol and, 340  
sympathetic receptors and, 237  
thyroid hormone and, 335
- Lipomas, 216
- Lipooligosaccharides  
*Neisseria* spp, 131
- Lipooligosaccharides (LOS),  
endotoxin activity, 140
- Lipophilic hormones, 335
- Lipoprotein lipase, 91
- Lipoproteins  
functions of, **92**
- Liposarcomas, 216
- Lipoteichoic acid, cytoplasmic membrane, 122
- Liproxstatin, 203
- Liquefactive necrosis, 205, 525
- Liquid biopsy, 223
- Lisch nodules, 539
- Lisdexamfetamine, 584, 590
- Lisinopril, 628
- Lispro, 358
- Lissencephaly, 501
- Listeria monocytogenes*  
food poisoning, 174  
medical importance, **137**
- Listeriolysin, 137
- Lithium  
drug-induced thyroiditis, 346  
drug reactions with, 248  
mechanism, use, and adverse effects, **592**  
prenatal exposure, 302  
teratogenicity of, 632  
toxicity of, 587
- Live attenuated vaccines, 109
- Livedo reticularis, **304**, 563
- Liver  
adrenergic receptors in, 236  
blood supply to, 374  
carcinogens affecting, 221  
functional liver markers, 397  
in gastrointestinal anatomy, 368  
ischemia of, 206  
lipid transport and, 92  
sources of metastases, 399  
tissue architecture, **374**  
tumor metastases from, 219
- Liver/biliary disease  
alcohol-associated, 398  
biopsy with hepatitis, 170  
Budd-Chiari syndrome and, 397  
drug dosages in, 231  
hepatosteatois, 70  
hereditary, 401  
hyperammonemia with, 80  
protein-energy malnutrition, 69  
serum markers, 397  
“violin string” adhesions, 181  
vitamin D deficiency with, 68  
Wilson disease, 402
- Liver disease  
enzymes released with, 397  
RBC morphology with, 420
- Liver fluke, hyperbilirubinemia with, 400
- Liver function tests  
cholestatic pattern of, 402  
thyroid storm, 346
- Liver transplants, graft-versus-host disease, 117
- Liver tumors, **399**
- Loading wills, 269
- Loading dose calculations, 231
- Loa loa*  
disease, transmission and treatment, 156
- infection routes, 155
- Lobar pneumonia  
natural history of, **700**  
organisms and characteristics, 701  
physical findings with, 698
- Lobular carcinoma in situ, 668
- Local anesthetics  
classes, mechanism, use, and adverse effects, **565**  
naming conventions for, 252
- Localized amyloidosis, 208
- Locked-in syndrome, stroke and, 526
- Locus ceruleus, 505
- Locus heterogeneity, 55
- Löffler syndrome, 156
- Löffler endocarditis, restrictive/  
infiltrative cardiomyopathy, 314
- Löffler medium, *Corynebacterium diphtheriae*, 124, 137
- Lomustine, 445
- Lone Star tick, 147
- Long-acting insulin, 358
- Long-chain fatty acid (LCFA),  
metabolism of, 87
- Long thoracic nerve, neurovascular pairing, 458
- Loop diuretics  
effects on electrolyte excretion, 625  
for heart failure, 316  
mechanism, use, and adverse effects, **626**
- Loop of Henle  
Bartter syndrome and, 604  
ethacrynic acid effect on, 626  
loop diuretics, 626
- “Loose associations,” 576
- Loperamide  
for diarrhea, 567  
mechanism, clinical use and adverse effects, **407**
- Lopinavir, 198
- Loratadine, 704
- Lorazepam, 562
- Losartan, 628
- Lovastatin, 324
- Löwenstein-Jensen medium, 124
- Lower esophageal sphincter (LES)  
achalasia and, 378, 383  
nitric oxide and, 378
- Lower extremity  
nerves, injury and presentation, **456**
- Lower extremity, neurovascular pairing in, 458
- Lower GI bleeding, 387
- Lower left quadrant (LLQ) pain, 390
- Lower motor neuron (LMN)  
effects of injury, 543  
facial nerve lesion, 546  
facial paralysis, 526  
in amyotrophic lateral sclerosis, 544  
lesion signs in, 543  
pathways for, 522
- Low-molecular-weight heparin,  
naming conventions for, 253
- LPS  
*E coli* endotoxin, 143  
lipid A component, 129

- LTB<sub>4</sub> (Leukotriene B<sub>4</sub>), 412, 495  
 Lubiprostone, 408  
 Lumacaftor, in cystic fibrosis, 58  
 Lumbar puncture  
   hydrocephalus, 536  
   site for, 520  
 Lumbosacral radiculopathy, **458**  
 Lumbrical muscles  
   functions, 453, 454  
   Klumpke palsy and, 452  
 Luminous phenomena/visual  
   brightness, 328  
 Lunate bone, 453  
 Lung abscess, **702**  
 Lung adenocarcinoma  
   oncogenes, 220  
 Lung and chest wall properties, **683**  
 Lung cancer  
   carcinogens for, 221  
   cisplatin/carboplatin for, 445  
   hypercalcemia, 224  
   incidence/mortality in, 218  
   metastases from, 219  
   non–small cell, 703  
   presentation and complications,  
     703  
   small cell, 224, 703  
   types, location and characteristics,  
     **703**  
 Lung diseases  
   in SIADH, 342  
   obstructive, **692**  
   physical findings with, **698**  
   pulmonary hypertension, 698  
   restrictive, **694**  
 Lungs  
   anatomy, **681**  
   blood flow regulation, 299  
   carcinogens for, 221  
   congenital malformation of, **679**  
   development stages, **678**  
   parenchyma of, 680  
   physical findings, **698**  
   respiratory zones, 685  
   sclerosis of, 481  
   structural development, **678**  
   volumes and capacities, **682**  
 Lupus  
   drug-induced, 249  
   microangiopathic hemolytic  
     anemia, 429  
   nephritis, 476  
 Lupus anticoagulant, 113  
 Lurasidone, 591  
 Luteinizing hormone (LH)  
   secretion of, 331  
   estrogen/progesterone regulation,  
     648  
   in menstrual cycle, 650  
   in ovulation, 649  
   signaling pathways for, 341  
 Lyme disease  
   animal transmission, 147  
   ceftriaxone, 185  
   findings and treatment, **144**  
 Lymphadenopathy  
   autoimmune lymphoproliferative  
     syndrome, 204  
   *Corynebacterium diphtheriae*, 130  
   extrinsic (death receptor) pathway,  
     204  
   hilar, 694  
   in viral infections, 94  
 Lymphogranuloma venereum, 179  
 measles (rubeola) virus, 167  
   mediastinal, 695  
   mononucleosis, 162  
   postauricular, 166, 177  
   regional, 179  
   rubella, 180  
   serum sickness, 111  
   syphilis, 179  
   tinea capitis, 488  
   *Toxoplasma gondii*, 180  
   *Trypanosoma brucei*, 153  
 Lymphatic drainage, reproductive  
   organs, 642  
 Lymphatic filariasis (elephantiasis),  
   *Wuchereria bancrofti*, 156  
 Lymphedema (feet and hands), 655  
 Lymph nodes  
   anatomy and function, **94**  
   drainage sites, **95**  
 Lymphocutaneous sporotrichosis, 151  
 Lymphocyte depleted lymphoma, 434  
 Lymphocyte rich lymphoma, 434  
 Lymphocytes  
   breast milk and, 653  
   CLL/small cell lymphocytic  
     lymphoma, 437  
   lichen planus, 492  
   macrophage interactions, **100**  
   non-Hodgkin lymphoma, 435  
   spleen, 94  
   thymus, 94, 96  
   types of, **415**  
 Lymphocytic choriomeningitis virus  
   (LCMV), arenaviruses, 164  
 Lymphocytosis  
   *Bordetella pertussis*, 141  
   postsplenectomy, 96  
 Lymphogranuloma venereum  
   *Chlamydia trachomatis*, 146  
   clinical features and pathogen, 179  
 Lymphoid hyperplasia, 390  
 Lymphoid neoplasms, types of, 437  
 Lymphoid structures, Peyer patches,  
   381  
 Lymphomas  
   antimetabolites for, 444  
   Burkitt, 435  
   carcinogens for, 221  
   diffuse large B-cell lymphoma, 435  
   doxorubicin for, 444  
   EBV and, 162  
   follicular, 435  
   Hodgkin vs non-Hodgkin, **434**  
   hypercalcemia, 224  
   leukemia comparison, **434**  
   mantle cell, 435  
   nomenclature, 216  
   non-Hodgkin, **435**  
   of stomach, 386  
   oncogene for, 220  
   oncogenic microbes, 222  
   paraneoplastic syndromes, 224  
   primary testicular, 671  
   treatment, 445  
 Lymphopenias  
   ataxia-telangiectasia, 115  
   cell counts and causes, 429  
 Lynch syndrome, 37, 54, **395**  
 Lyonization (X-inactivation), Barr  
   body formation, 59  
 Lysergic acid diethylamide (LSD),  
   589  
 Lysine  
   classification of, 79  
   cystinuria, 83  
   for pyruvate dehydrogenase  
     complex deficiency, 75  
   kidney stones, 617  
 Lysogenic phage infection, 128  
 Lysosomal storage diseases, 45, 86  
 Lysosomal  $\alpha$ -1 4-glucosidase, 84, 85  
 Lysosomes  
   cell trafficking, 45  
   onion skin appearance, 86  
 LYST gene, 115  
 Lytic bone lesions  
   adult T-cell lymphoma and, 435  
   Langerhans cell histiocytosis, 439  
   multiple myeloma, 436  
**M**  
 MacConkey agar, 124, 142  
 Machinelike murmur, 295, 301  
 Macroangiopathic hemolytic anemia,  
   causes and findings, 429  
 Macrocytic anemias  
   description and findings, **426**  
   megaloblastic anemia, 426  
   Vitamin B<sub>12</sub> deficiency, 426  
   with orotic aciduria, 426  
 Macroglobulinemia, Waldenström,  
   436  
 Macrolides  
   *Bordetella pertussis*, 141  
   *Helicobacter pylori* treatment, 144  
   hypertrophic pyloric stenosis  
     association, 366  
   *Legionella pneumophila*, 141  
   mechanism, use, and adverse  
     effects, **189**  
   *Mycoplasma pneumoniae*, 148  
   naming conventions for, 252  
 Macroorchidism, 60  
 Macro-ovalocytes, 420  
 Macrophage activation, 106  
 Macrophage-lymphocyte interaction,  
   100  
 Macrophages  
   apoptosis, 205  
   breast milk and, 653  
   caseous necrosis, 205  
   cell surface proteins, 108  
   cytokines secreted by, 106  
   endotoxin activation, 131  
   functions of, **413**  
   hemosiderin-laden (alveolar), 679  
   in chronic inflammation, 210  
   in heart failure, 316  
   in MI, 308  
   innate immunity, 97  
   in rheumatic fever, 319  
   in Whipple disease, 388  
   in wound healing, 210, 212  
   Kupffer cells, 374  
   pneumoconioses, 696  
   toll-like receptor binding, 498  
   vitamin D excess and, 68  
 Macrosomia, 652  
 Macula adherens, 482  
 Macula densa, juxtaglomerular  
   apparatus, 607  
 Macula (eye), age-related  
   degeneration of, 552  
 Macular cherry-red spot, 86  
 Macular sparing, 526  
 Macules  
   characteristics/examples, 483  
   junctional nevi, 485  
 Maculopapular rash  
   graft-versus-host disease, 117  
   measles (rubeola) virus, 167  
   rubella virus, 166  
   syphilis, 145  
 Mad cow disease, 174  
 Magenta tongue, 65  
 Magnesium  
   antiarrhythmic treatment, 328  
   cardiac glycoside overdose, 326  
   digoxin toxicity, 328  
   low vs high serum concentration  
     effects, 609  
 Magnesium citrate, 408  
 Magnesium hydroxide, 406, 408  
 Magnesium sulfate  
   cerebral palsy treatment, 545  
   preeclampsia/eclampsia, 660  
 Magnetic gait, 536  
 Maintenance (change model), 586  
 Maintenance drug dose, 231  
 Major apolipoproteins, **91**  
 Major basic protein (MBP), 414  
 Major depressive disorder  
   diagnostic symptoms for, **578**  
   peripartum onset, 579  
   with psychotic features, 578  
   with seasonal pattern, 578  
 Major histocompatibility complex, 98  
 MCH I and II comparison, **98**  
 Malabsorption syndromes/malnutrition  
   anemias with, 426  
   effects and diagnosis, **388**  
   fat-soluble vitamin deficiencies, 63  
   inflammatory bowel diseases, 389  
   pancreatic adenocarcinoma, 405  
   with Whipple disease, 388  
 Malaria, *Plasmodium*, 154  
   chemo- and postexposure  
     prophylaxis, 276  
*Malassezia* spp  
   cutaneous mycoses, 488  
   seborrheic dermatitis, 484  
 Malathion, 158, 195  
 Male genital embryology, 639  
 Male reproductive anatomy, 644  
 Male sexual response, 645  
 Malformation (morphogenesis), 633  
 Malignant carcinoid syndrome, 65  
 Malignant hyperthermia  
   dantrolene use, 567  
   inhaled anesthetics, 565  
   neuromuscular blocking drugs, 566  
   with inhaled anesthetics, **566**  
 Malignant mesothelioma  
   carcinogens for, 221  
 Malignant (necrotizing) otitis externa,  
   547  
 Malignant osteoblasts, 471  
 Malignant transformation, 202  
 Malignant tumors, 216  
   of bone, 471

- Malingering  
 factitious and somatic symptom comparison, **583**  
 symptoms and motivation for, **583**
- Malleus (ossicles), 547, 638
- Mallory bodies, in alcoholic hepatitis, 398
- Mallory-Weiss syndrome, 384
- Malnutrition  
 measles mortality in, 167  
 protein-energy, 69
- Malrotation, **392**
- “Maltese cross” appearance, 154
- MALT lymphoma  
*Helicobacter pylori*, 144, 386  
 oncogenic microbes, 222  
 Sjögren syndrome, 474
- Mammary glands, 631
- Mammillary bodies  
 lesions in, 524  
 limbic system, 509
- Mandibular process, 638
- Manic episode, **577**
- Mannitol  
 blood-brain barrier effects of, 506  
 extracellular volume measurement, 599  
 mechanism, use, and adverse effects, **626**
- Mantle cell lymphomas  
 chromosomal translocations and, 439  
 occurrence and genetics, 435
- MAO-B inhibitor  
 naming conventions for, 252
- Maple syrup urine disease  
 cause and treatment, **82**  
 leucine, 79
- Marasmus, 69
- Maraviroc, 198
- Marburg hemorrhagic fever, virus  
 structure and medical importance, 164
- Marfanoid habitus  
 homocystinuria, 83  
 MEN2B syndrome and, 356
- Marfan syndrome  
 aortic aneurysm with, 304  
 cardiac defect association, 302  
 chromosome association, 62  
 elastin and, 50  
 homocystinuria comparison, 50
- Marginal zone lymphoma  
 chromosomal translocations and, 439  
 occurrence and causes, 435
- Marginal zone (spleen), 96
- Marine omega-3 fatty acids, 325
- Marjolin ulcer, 494
- MASLD/MASH, 203
- Masseter muscle, 519
- Massive RNA (mRNA), 40
- Mast cells  
 functions, **414**  
 stabilizers, 414
- Mast cell stabilizers, 705
- Mastectomy, winged scapula with, 452
- Mastication muscles, 519, **520**
- Mastocytosis, 414
- Mastoid air cells, 637
- Mastoiditis  
 brain abscesses, 176
- Maternal diabetes  
 fetal insulin effects of, 338  
 teratogenicity of, 632
- Maternal PKU, teratogenicity of, 632
- Maternal (postpartum) blues, 579
- Matonavirus, 164, 166
- Mature cystic teratoma, 664
- Mature ego defenses, 571
- Maturity onset diabetes of the young (MODY), glucokinase in, 73
- Maxillary process, 638
- Mayer-Rokitansky-Küster-Hauser syndrome, 639
- McArdle disease, 85
- McBurney point, 390
- McMurray test, 454
- MDMA intoxication and withdrawal, 589
- Mean arterial pressure  
 equation for, 289  
 gradient with intracranial pressure, 512
- Mean (statistics), 265
- Measles (rubeola) virus  
 medical importance, **167**  
 rash with, 177  
 unvaccinated children, 182  
 vitamin A for, 64
- Measurement bias, 263
- Measures of central tendency, 265
- Measures of dispersion, 265
- Mebendazole, microtubules and, 46
- mecA* gene, penicillin resistance and, 133
- Mechanical ventilation, 181
- Meckel diverticulum, 391, 636
- MECP2* gene, Rett syndrome, 60
- Medial collateral ligament (MCL)  
 injury, in “unhappy triad,” 464
- Medial elbow (golfer’s) tendinopathy, 462
- Medial epicondyle fracture, 450
- Medial femoral circumflex artery, 469
- Medial geniculate nucleus (thalamus), 508
- Medial lemniscus, 527
- Medial longitudinal fasciculus  
 lesion effects, 524  
 ophthalmoplegia and, 558
- Medial medullary syndrome, 527
- Medial meniscal tear, 454
- Medial tibial stress syndrome, 465
- Medial umbilical ligament, 286
- “Median claw,” 454
- Median nerve  
 carpal tunnel syndrome, 463  
 injury and presentation, 450  
 neurovascular pairing, 458  
 recurrent branch, 450
- Median (statistics), 265
- Median umbilical ligament, 286
- Mediastinal masses, 691
- Mediastinal pathology  
 common sites of, 691  
 lymphadenopathy, 694, 695  
 mediastinitis, 135  
 widened (x-ray), 305
- Mediastinitis, 691
- Medical abortion  
 antimetabolites for, 444  
 ethical situations, 274
- Medical equipment  
 infections from, 181
- Medical errors  
 analysis of, 278  
 causes of, **278**  
 types and causes, **278**
- Medical insurance plans, **277**
- Medical power of attorney, 269
- Medicare/Medicaid, **277**
- Medication-induced esophagitis, 248, 384
- Medium-chain acyl-CoA dehydrogenase deficiency, 87
- Medium-vessel vasculitis, 478
- Medroxyprogesterone, 675
- Medulla (brain)  
 cranial nerves and nuclei, 515  
 cross-sections of, **517**
- Medulla (lymph nodes), 94
- Medullary carcinoma (thyroid), 347
- Medullary cystic kidney disease, 622
- Medullary thyroid carcinomas  
 amyloid deposits in, 208  
 multiple endocrine neoplasias, 356  
 serum tumor marker, 222
- Medulloblastoma, 354, 542
- “Medusa head” appearance, 135
- Mefloquine, 154, 193
- Megaesophagus, *Trypanosoma cruzi*, 155
- Megakaryocytes, 413, 438
- Megaloblastic anemia  
 causes and findings, 426  
*Diphyllobothrium latum*, 157  
 drugs causing, 249  
 RBCs and PMNs with, 420  
 trimethoprim, 190  
 tropical sprue, 388  
 vitamin B<sub>9</sub> deficiency, 66
- Megestrol, 675
- Meglitinides, 253, 359
- Meissner corpuscles, 504
- Meissner plexus, 391
- Melanocytes  
 destruction of, 484  
 tumor nomenclature, 216
- Melanocyte-stimulating hormone (MSH)  
 function and notes, 332  
 signaling pathways for, 341
- Melanocytic nevus, 485
- Melanoma  
 nomenclature, 216  
 oncogenes, 220  
 recombinant cytokines for metastatic, 119  
 tumor suppressor gene, 220  
 types of, 494
- Melanotropin, 331
- Melarsoprol, 153, 195
- Melasma (chloasma), 484
- MELAS syndrome, 60
- Melena  
 GI bleeding, 387  
 Meckel diverticulum, 391
- Meloxicam, 496
- Memantine, 564
- Membrane attack complex (MAC), 104
- Membranoproliferative glomerulonephritis, 612
- hepatitis B and C, 171
- nephritic syndrome, 615
- Membranous glomerular disorders  
 hepatitis B and C, 171  
 types of, 612
- Membranous interventricular septum, 285
- Membranous nephropathy, 612  
 mechanism and histology, 616  
 primary autoantibody, 113
- Membranous ossification, 461
- Memory  
 neural structures and, 509
- Memory loss  
 anti-NMDA receptor encephalitis, **224**
- MEN1  
 characteristics of, **356**  
 chromosomal abnormality, 62
- MEN1* gene, product and associated condition, 220, 356
- MEN2A  
 characteristics of, 356
- MEN2A/2B  
 oncogenes, 220
- MEN2B  
 characteristics of, 356
- Menaquinone, 69
- Ménétrier disease, 386
- Ménière disease, 549
- Menin, 220
- Meninges, 506
- Meningioma, characteristics and histology, 540
- Meningitis  
*Hemophilus influenzae*, 140  
*Listeria monocytogenes*, 137  
 chloramphenicol, 188  
 coccidioidomycosis, 149  
 common causes by age, 176  
 cryptococcal, 150  
 CSF findings in, 176  
 hemorrhagic, 135  
 mumps, 167  
 picornavirus, 165  
*Streptococcus agalactiae*, 135  
 unvaccinated children, 182  
 viruses causing, 162, 176  
 with rhinosinusitis, 690
- Meningocele, 501
- Meningococcal prophylaxis, 193
- Meningococci vs gonococci, 140
- Meningoencephalitis  
 herpes simplex virus, 180  
*Naegleria fowleri*, 153  
 West Nile virus, 164
- Menkes disease  
 collagen crosslinking in, 48  
 mechanism and symptoms, **49**
- Menopause  
 diagnosis and treatment, **653**  
 Turner syndrome, 655
- Menorrhagia  
 coagulation disorder presentation, 433
- Menstrual cycle, phases of, **650**
- Mentzer index, **423**
- Meperidine, 567
- Mepivacaine, 565

- Mepolizumab, 705  
 Meralgia paresthetica, **456**  
 Mercury poisoning, 247  
 Merkel discs, 504  
 Merlin protein, 220  
 Meropenem, 186  
 MERRF syndrome, 60  
 MERS (Middle East respiratory syndrome), structure and medical importance, 164  
 Mesalamine, 389  
 Mesangial cells, juxtaglomerular apparatus, 607  
 Mesencephalon, 500  
 Mesenchymal tissue, immunohistochemical stains, 223  
 Mesenchymal tumor nomenclature, 216  
 Mesenteric ischemia, 393  
 Mesna, 447  
 Mesocortical pathway, 509  
 Mesoderm  
 derivatives, 631  
 pharyngeal (branchial) arches derivation, 637  
 Mesolimbic pathway, 509  
 Mesonephric (Wolffian) duct, 639  
 Mesothelioma, **695**  
 Meta-analysis, **267**  
 Metabolic acidosis  
 laboratory findings, 609  
 renal failure and, 621  
 Metabolic alkalosis  
 in hypertrophic pyloric stenosis, 366  
 laboratory findings with, 609  
 renal tubular defects, 604  
 thiazides, 627  
 Metabolic compartmentation. See also Metabolism  
 metabolism sites, **72**  
 summary of pathways, 72  
 urea cycle, 80  
 Metabolic disorders  
 glycogen storage, **85**  
 Metabolic drug naming conventions, 253  
 Metabolic fuel use, **89**  
 Metabolic syndrome  
 in Cushing syndrome, 352  
 Metabolism  
 disorders of galactose, 78  
 dyslipidemias, 92  
 enzyme terminology, 71  
 fasted vs fed state, **88**  
 fatty acids, 87  
 fructose disorders, 78  
 gluconeogenesis, 76  
 hormonal regulation of, 335  
 ketone bodies, 88  
 lipoprotein functions, 92  
 pyruvate, **75**  
 rate-determining enzymes and regulators, **71**  
 TCA cycle, **75**  
 thyroid disease effects, 344  
 tyrosine catabolism, 81  
 Metabolism sites. See Metabolic compartmentation  
 Metacarpal neck fracture, 463  
 Metachromatic granules, 137  
 Metachromatic leukodystrophy, 86, 538  
 Metalloproteinases, 212  
 Metal storage diseases, 206  
 Metamorphosis, 552  
 Metanephric diverticulum, 596  
 Metanephric mesenchyme, 596  
 Metanephric, in pheochromocytoma, 355  
 Metanephros, 596  
 Metaphase, 44  
 Metaplasia  
 changes with, 202  
 esophagus, 385  
 intestinal, 386  
 specialized intestinal, 385  
 Metastases, 216  
 common sites, 219  
 from prostatic adenocarcinomas, 672  
 gastric cancer, 386  
 heart tumors from, 320  
 lung cancer, 703  
 mechanisms, 217  
 melanoma, 494  
 neoplastic progression, 215  
 testicular choriocarcinoma, 671  
 to liver, 399  
 Metastatic calcification  
 electrolyte disturbances, 609  
 vs dystrophic, 207  
 Metatarsophalangeal (MTP) joints in gout, 473  
 Metencephalon, 500  
 Metformin  
 drug reactions with, 248  
 mechanism and adverse effects, 359  
 Methacholine, action and applications, 239  
 Methadone  
 opioid analgesics, 567  
 opioid detoxification/maintenance, 594  
 opioid withdrawal treatment, 588  
 Methamphetamine, 588, 590  
 Methanol toxicity, 70, 247  
 Methemoglobin, 688  
 Methemoglobinemia  
 blood oxygen in, 687  
 dapsone, 190  
 local anesthetics and, 565  
 presentation, 688  
 toxicity and treatment, 247, 688  
 Methenamine silver stain, 151  
 Methimazole  
 drug reactions with, 249  
 mechanism, use, and adverse effects, 360  
 teratogenicity of, 632  
 Methionine  
 classification of, 79  
 genetic coding for, 35  
 start codons, 42  
 Methotrexate  
 mechanism, use, and adverse effects, 444  
 rheumatoid arthritis, 472  
 Methotrexate (MTX)  
 drug reactions with, 249, 250  
 effects in humans, 34  
 hydatidiform moles, 659  
 lung disease with, 694  
 purine and pyrimidine synthesis, 34  
 toxicity treatment, 247  
 vitamin B<sub>9</sub> deficiency, 66  
 Methylation  
 histones, 32  
 in heterochromatin, 32  
 protein synthesis, 43  
 Methylcellulose, 408  
 Methylidopa  
 drug reactions with, 249  
 Methylene blue, 247, 688  
 Methylene tetrahydrofolate reductase (MTHFR) deficiency, 83  
 Methylmalonic acid  
 vitamin B<sub>9</sub> deficiency, 66  
 vitamin B<sub>12</sub> deficiency, 67  
 Methylmalonic acidemia, 83, 88  
 Methylmalonyl-CoA mutase, 67, 83  
 Methylmercury, 632  
 Methylphenidate, 574, 590  
 Methyltestosterone, 675  
 Methylxanthines, 704  
 Metoclopramide  
 drug reactions with, 250  
 extrapyramidal symptoms, 407  
 with chemotherapy, 447  
 Metolazone, 627  
 Metoprolol, 244, 327  
 Metronidazole  
 bacterial vaginosis, 147  
 clindamycin vs, 188  
 disulfiram-like reaction, 250  
*Entamoeba histolytica*, 152  
 for Crohn disease, 389  
*Helicobacter pylori*, **144**  
 mechanism and clinical use, **191**  
 protozoal GI infections, 152  
 vaginal infections, 178  
 vaginitis, 155  
 Mexiletine  
 Class IB sodium channel blockers, 326  
 Meyer loop, 557  
 Micafungin, 195  
 Michaelis-Menten kinetics, 228  
 Miconazole, 195  
 Microangiopathic hemolytic anemia  
 causes and findings, 429  
 hypertensive emergency and, 302  
 intravascular hemolysis in, 427  
 Microarrays, **52**  
 Microbiology  
 antimicrobial therapy, 183  
 bacteriology, 122  
 clinical bacteriology, 132  
 mycology, 149  
 oncogenic organisms, 222  
 parasitology, 152  
 systems, 174  
 virology, 159  
 Microcephaly  
 cri-du-chat syndrome, 62  
 fetal alcohol syndrome, 633  
 maternal phenylketonuria, 82  
 Patau syndrome, 61  
 phenylketonuria, 82  
 Zika virus, 168  
 Microcytic, hypochromic anemias  
*Ancylostoma*, 156  
 description and causes, 424  
 iron deficiency, 424  
 lead poisoning, 425, 430  
 sideroblastic anemia, 425  
 thalassemias, 424  
 Microcytosis, 210  
 Microdeletion  
 22q11, 114  
 congenital, 63  
 Microembolization (cholesterol), 304  
 Microfilaments, 46  
 Microfold (M) cells, 381  
 Microglia, 503  
 Micrognathia  
 Edwards syndrome, 61  
 Microphthalmia, 61  
 MicroRNA (miRNA), 40, 54  
 Microsatellite instability pathway, 395  
 Microsatellite instability testing, 223  
 Microscopic polyangiitis, 478  
 autoantibody, 113  
 Microsomal transfer protein (MTP), 92  
*Microsporium* spp, 488  
 Microtubule inhibitors, **445**  
 Microtubules  
 cytoskeletal elements, 46  
 drugs acting on, 46  
 dysfunction of, 115  
 structure and function of, **46**  
 Micturition center, 236  
 Micturition control, **236**  
 Midazolam, 562  
 Midbrain, 516  
 Middlebrook medium, 124  
 Middle cerebral artery  
 saccular aneurysms, 530  
 stroke effects, 526  
 watershed zones, 513  
 Middle ear, 547  
 Middle meningeal artery  
 epidural hematoma and, 528  
 Middle rectal vein, 372  
 Midgut, blood supply and innervation, 371  
 Midgut volvulus, 392  
 Midodrine, 241  
 Midsystolic click (MC), 295  
 Mifepristone, 675  
 Miglitol, 359  
 Migraine  
 $\beta$ -blockers for prevention, 244  
 Migraine headaches  
 characteristics and treatment, 532  
 Migrating motor complexes (MMC), 378  
 Migratory polyarthritis, 319  
 Milestones in development, 572  
 Milnacipran, 593  
 Milrinone, 245  
 Mineralocorticoids  
 adrenal insufficiency, 353  
 adrenal steroids and, 340  
 Mineral oil intake, 63  
 Minimal change disease, 612, 616  
 Minocycline, 188  
 DRESS with, 249  
 Minor consent for, **269**  
 Minute ventilation, 683  
 Miosis  
 drugs producing, 251

- pupillary control pathway, 554  
 Mirabegron, 236, 241  
 miRNA (microRNA), 54  
 Mirtazapine  
   depressive disorders, 578  
   physiologic effects, 243  
   use and toxicity, 594  
 Mismatch repair, 37  
 Misoprostol  
   mechanism and clinical use, **406**  
   off-label use, 406  
 Missense mutation, 38, 416  
 Mites/louse treatment, 195  
 Mitochondria  
   genetic code in, 35  
   high altitude and, 688  
   with ferroptosis, 203  
 Mitochondrial diseases, **60**  
 Mitochondrial DNA (mtDNA),  
   heteroplasmy, 55  
 Mitochondrial inheritance, 57  
 Mitochondrial myopathies, 60  
 Mitosis, 44, 195  
 Mitral regurgitation  
   heart murmur with, 295  
   in myocardial infarction, 308  
   pressure-volume loops in, 292  
 Mitral stenosis  
   murmur and clinical associations,  
     295  
   murmurs caused by, 294  
   pressure-volume loops in, 292  
 Mitral valve closure, 291  
 Mitral valve, in cardiac cycle, 291  
 Mitral valve prolapse  
   heart murmur with, 295  
   Marfan syndrome, 50  
   renal cyst disorders and, 622  
 Mittelschmerz, 649  
 Mixed cellularity lymphoma, 434  
 Mixed connective tissue disease  
   antibodies with, 476  
   anti-U1 RNP antibodies, **476**  
   autoantibody, 113  
 Mixed cryoglobulinemia, 479  
 Mixed (direct and indirect)  
   hyperbilirubinemia, 400  
 Mixed germ cell tumor, serum tumor  
   marker, 222  
 Mixed platelet and coagulation  
   disorders, 433  
*MLH1* and *MSH2* gene mismatch,  
   395  
 MMR vaccine, 167  
 Mobitz type I and II blocks, 312  
 Modafinil  
   clinical use of, 585  
   cytochrome P-450 interaction, 251  
 Modes of inheritance, **57**  
 Mode (statistics), 265  
 Molecular cloning, **53**  
 Molecular mimicry, 127, 538  
 Molecular motor proteins, 46  
 Molluscum contagiosum, 161, 487  
 "Monday disease," 322  
 Monoamine oxidase inhibitors  
   atypical depression, 578  
   mechanism, use, and adverse  
     effects, **593**  
   Parkinson disease, 564  
 Monoarthritis, 473, 474  
 Monobactams, *Pseudomonas*  
   *aeruginosa*, 141  
 Monoclonal antibodies, 254  
 Monoclonal antibodies naming  
   conventions, 254  
 Monoclonal gammopathy of  
   undetermined significance,  
   436  
 Monoclonal immunoglobulin, 436  
 Monocytes  
   differentiation of, **413**  
   innate immunity, 97  
   morulae in, 148  
 Monoiodotyrosine (MIT), 335  
 Monozygotic twinning, 635  
 Montelukast, 704  
 Mood disorder  
   characteristics of, **576**  
   hypomanic episode, **578**  
   manic episode, **577**  
   schizoaffective disorder and, 577  
 Moro reflex, 523  
 Morphine, 233, 314, 567  
 Morphogenesis, errors in, 633  
 Mortality rate, 259  
 Morulae, 148  
 Mosaic bone architecture, 469  
 Mosaicism, 55  
 Mosquitoes (disease vectors)  
   malaria, 154  
   Zika virus, 168  
 Motilin, source, action, and  
   regulation of, 378  
 Motion sickness, 240, 506  
 Motivational interviewing, **272**, 590  
 Motor cortex  
   thalamic relay for, 508  
   topographic representation, 513  
 Motor function  
   abnormal posturing, **524**  
   conversion disorder, 583  
   dysarthria, 529  
   upper and lower motor neuron  
     signs, **543**  
 Motor innervation  
   to tongue, **364**  
 Motor neuron signs  
   Brown-Séquard syndrome, 545  
   in amyotrophic lateral sclerosis, 544  
   in anterior spinal artery occlusion,  
     544  
   upper compared to lower lesions,  
     **543**  
 Movement disorders  
   abnormal posturing, **524**  
   neurodegenerative, **534**  
 Moxifloxacin, 191  
 M phase, 44  
 M protein  
   bacterial virulence, 127  
   rheumatic fever and, 134  
 mRNA  
   aminoglycosides, 187  
   hepatitis viruses, 170  
   pre-mRNA splicing, 40  
   protease inhibitors, 198  
   splicing error detection, 51  
   start codons, 42  
   stop codons, 42  
   translation of, 40  
   vaccines, 109  
 MRSA (methicillin-resistant  
   *Staphylococcus aureus*)  
   cephalosporins, 185  
   daptomycin, 191  
   healthcare-associated infections, 181  
   medical importance, 133  
   prophylaxis for, 193  
 Mucicarmine stain, polysaccharide  
   capsule staining, 123  
 Mucinous carcinoma, 664  
 Mucinous cystadenoma, 664  
 Mucociliary escalator, 680  
 Mucoepidermoid carcinoma, 383  
 Mucopolidosis type II, 45  
 Mucopolysaccharidoses, 86  
*Mucor* spp  
   in immunodeficiency, 116  
   opportunistic infection, 150  
   treatment, 194  
 Mucormycosis, 150  
 Mucosa-associated lymphoid tissue  
   (MALT), 474  
 Mucosa (digestive tract), 369  
 Mucosal cells, 379  
 Mucosal neuromas, 356  
 Mucosal polyps, 394  
 Mucositis  
   methotrexate, 444  
 "Muddy brown" casts (urine), 612  
 Mulberry molars, 145  
 Müllerian (paramesonephric) duct  
   agenesis, 639  
   derivatives of, 639  
 Multicystic dysplastic kidney, 596, 597  
 Multidrug resistance (MDR),  
   *Klebsiella* spp, 143  
 Multidrug resistance protein 1  
   (MDR1), 223  
 Multifactorial pulmonary  
   hypertension, 698  
 Multifetal gestation, 660  
 Multifocal atrial tachycardia  
   description and management, 310  
 Multiple endocrine neoplasias  
   subtypes and characteristics of, **356**  
   Zollinger-Ellison syndrome, 356  
 Multiple myeloma  
   clinical features, 436  
   plasma cell dyscrasia, 415  
 Multiple sclerosis  
   drug therapy for, 567  
   findings and treatment, **537**  
   internuclear ophthalmoplegia, 558  
   recombinant cytokines for, 119  
 Mumps virus  
   acute pancreatitis with, 404  
   medical importance, **167**  
 Munro microabscesses, 485  
 Murphy sign, 403  
 Muscarinic ACh receptors, 235  
 Muscarinic agonists, 236  
 Muscarinic antagonists  
   atropine, 240  
   for asthma, 704  
   micturition control, 236  
   multiple sclerosis treatment, 537  
   organ system and applications, **240**  
 Muscarinic effects, 239  
 Muscarinic receptors  
   in airway, 239  
   vomiting center input, 506  
 Muscle  
   immunohistochemical stains, 222  
 Muscle atonia, loss of, 507  
 Muscle contraction  
   motoneuron action potential and,  
     **459**  
 Muscles  
   in starvation, 88  
   mastication, **520**, 638  
   metabolism in, 85  
   motor neuron signs, 543  
   of facial expression, 638  
   proprioceptors in, **461**  
 Muscle spasm treatment  
    $\alpha_2$ -agonists, 567  
   botulinum toxin, 136  
 Muscle stretch receptors, 461  
 Muscle wasting, **476**  
 Muscular dystrophies  
   frameshift mutation, 59  
   types of, **59**  
   X-linked recessive disorder, 59  
 Musculocutaneous nerve, injury and  
   presentation, 450  
 Musculoskeletal/skin/connective  
   tissue  
   dermatology, **481**  
   pharmacology, 495  
 Musculoskeletal system  
   aging effects on, 225  
   common conditions, **465**  
   drug reactions with, **249**  
   paraneoplastic syndromes, **224**  
   paraneoplastic syndromes in, 224  
   thyroid disease effects, 344  
 Musty body odor, 82  
 Mutases, 71  
 Mutations  
   *COL3A1*, 49  
   *COL5A1*, 49  
   *COL5A2*, 49  
   *WT1* deletion, 624  
   allelic heterogeneity, 55  
   *BRAF*, 437  
   cancer and genetic linkage  
     analysis, 52  
   cardiac ion channels, 311  
   hematologic malignancies, 438  
   in cancer, 217  
   in DNA, **38**  
   in HbS and HbC, 416  
   in PBPs, 183  
   *JAK2*, 438  
   locus heterogeneity in, 55  
   mosaicism, 55  
   muscular dystrophies, 59  
   myelodysplastic syndromes, 436  
   non-Hodgkin lymphoma, 435  
   *STAT3*, 114  
   tumor suppressor genes, 44  
*MUTYH* gene  
   associated disorders, 394  
   associated polyposis syndrome, 394  
 Myalgias  
   Ebola virus, 169  
   fluoroquinolones, 191  
   *Leptospira interrogans*, 145  
   Lyme disease, 144  
   meningitis, 182  
   polymyalgia rheumatica, 477  
   trichinosis, 156

- Myasthenia gravis  
 as paraneoplastic syndrome, 224  
 autoantibody, 113  
 neostigmine for, 239  
 pathophysiology, symptoms and treatment, 480  
 pyridostigmine for, 239  
 restrictive lung diseases, 694  
 thymus association with, 96  
 Type II hypersensitivity, 110
- MYCC (*c-myc*) gene, associated neoplasm, 220
- MYCN (*N-myc*) gene, associated neoplasm, 220
- Mycobacteria, **138**
- Mycobacterial infections, II-12  
 receptor deficiency, 114
- Mycobacterium* spp  
 characteristics of, **138**  
 Gram stain for, 123  
 Ziehl-Neelsen stain, 123
- Mycobacterium avium* complex, HIV-positive adults, 173
- Mycobacterium avium-intracellulare*  
 HIV positive adults, 173  
 prophylaxis and treatment, 193
- Mycobacterium leprae*  
 diagnosis, 139  
 disease and transmission, 147  
 prophylaxis and treatment, 193
- Mycobacterium marinum*, hand infections, 138
- Mycobacterium scrofulaceum*, 138
- Mycobacterium tuberculosis*  
 culture requirements, 124  
 HIV-positive adults, 173  
 prophylaxis and treatment, 193  
 symptoms of, 138  
 vertebral osteomyelitis, 176
- Mycolic acid, isoniazid, 123
- Mycology, 149
- Mycophenolate, inosine monophosphate dehydrogenase inhibition, 34
- Mycophenolate mofetil, 119
- Mycoplasma* spp  
 atypical organisms, 175  
 Gram stain for, 123  
 macrolides, 189  
 pneumonia caused by, 701
- Mycoplasma pneumoniae*  
 culture requirements, 124  
 presentation and findings, **148**
- Mycoses  
 cutaneous, **488**  
 systemic, **149**
- Mydriasis  
 drugs producing, 251  
 glaucoma treatment and, 568  
 meperidine, 567  
 muscarinic antagonists for, 240  
 pupillary control pathway, 554  
 saccular aneurysm, 530
- Myelencephalon, 500
- Myeloblasts (peripheral smear), 437
- Myelodysplastic syndromes  
 sideroblastic anemia, 425  
 types and causes of, 436
- Myelofibrosis, 420, 438
- Myeloid neoplasms, 437
- Myelomeningocele, 61, 501
- Myeloperoxidase  
 H<sub>2</sub>O<sub>2</sub> degradation, 126  
 in neutrophils, 412  
 in sputum, 107
- Myeloperoxidase-antineutrophil cytoplasmic antibody (MPO-ANCA)  
 autoantibody, 113
- Myeloproliferative disorders  
 antimetabolites for, 444
- Myeloproliferative neoplasms  
 effects and gene associations, **438**  
 gene association, 220
- Myeloschisis, 501
- Myelosuppression  
 alkylating agents, 445  
 antimetabolites, 444  
 flucytosine, 194
- Myocardial action potential, **296**, 311
- Myocardial infarction  
 angina and NSTEMI vs STEMI, **306**  
 β-blockers, 244  
 complication and findings, **313**  
 diagnosis of, **309**  
 evolution and complications, **308**
- Myocardial O<sub>2</sub> consumption/demand  
 angina treatment, 323  
 in antianginal therapy, 323
- Myocarditis  
 adenovirus, 161  
 causes and complications, **320**  
 coxsackievirus, 164  
 diphtheria, 137  
*Toxocara canis*, 156
- Myoclonic seizures, 531
- Myoclonus, 533
- Myofibrils, 460
- Myofibroblasts, in wound healing, 212
- Myogenic blood flow (kidney), **600**
- Myoglobin, 687
- Myoglobinuria  
 McArdle disease, 85  
 neuroleptic malignant syndrome, 587
- Myonecrosis, 136
- Myonuclei, 460
- Myopathy  
 daptomycin, 191  
 drugs causing, 249  
 with hypo- and hyperthyroidism, 344
- Myopectineal orifice, **376**
- Myopia, 550
- Myositis ossificans, **477**
- Myotonic dystrophy  
 findings with, 59  
 inheritance, 60
- Myxedema treatment, 360
- Myxomas, 320
- N**
- N-acetylcysteine  
 for acetaminophen toxicity, 247
- N-acetylglucosaminyl-1-phosphotransferase, 45
- N-formylmethionine (fMet), 42
- N-myc* oncogene, 354
- N<sub>2</sub>O, 565
- NAAT (nucleic acid amplification test), 140  
 Chlamydiae diagnosis, 146  
 HIV diagnosis, 172  
 severe acute respiratory syndrome coronavirus 2, 169
- NADH (reduced nicotinamide adenine dinucleotide), 75  
 electron transport chain, 76
- Nadolol, 244
- NADPH production  
 pentose phosphate pathway (HMP shunt), **77**
- NADPH (reduced nicotinamide adenine dinucleotide phosphate)  
 source of, 77  
 universal electron acceptors, 73
- Naegleria fowleri*  
 CNS infection, 153
- Nafarelin, 674
- Nafcillin, 184
- Nails  
 clubbing, 58  
 fungal infections, 195  
 glomus body tumors, 486  
 pitting, 485  
 splinter hemorrhages in, 318  
 Tinea unguium, 488  
 with psoriatic arthritis, 475
- Nalbuphine, 567, **568**
- Naloxone  
 dextromethorphan overdose, 704  
 for opioid toxicity, 247, 588  
 opioid detoxification, 594
- Naltrexone  
 alcohol use disorder, 590  
 opioid toxicity, 567  
 relapse prevention, 594
- Naming conventions for drugs, **252**
- Naproxen, 496
- Narcissistic personality disorder, 582
- Narcolepsy  
 amphetamines for, 241  
 characteristics and treatment, **585**  
 CNS stimulants for, 590  
 HLA subtype association, 99
- Narrow complex tachycardias, 310
- Narrow spectrum anticonvulsants, 560
- Nasal angiofibromas, 690
- Nasal congestion/decongestion, 241, 704
- Nasal nitric oxide (screening test), 47
- Nasal polyps  
 cystic fibrosis, 58
- Nasopharyngeal carcinoma, **690**  
 EBV and, 162  
 oncogenic microbes, 222
- Natalizumab, 537, 538
- Nateglinide, 359
- Natural contraception, 332
- Natural killer (NK) cells, 97  
 activation of, 106  
 cell surface proteins, 108  
 functions, **99**, **415**
- Natural selection, 55
- Nausea  
 adverse drug effects, 407  
 appendicitis, 390  
 biliary colic, 403
- migraine headaches, 532
- myocardial infarction, 308
- vitamin A toxicity, 64
- vitamin C toxicity, 67
- Near miss (medical errors), 278
- Nearsightedness, 550
- Nebivolol, 244  
*Necator* spp  
 disease associations, 158  
 infection routes, 155
- Necator americanus*  
 disease, transmission and treatment, 156
- Neck and head cancer, **690**
- Necrosis  
 acute pancreatitis, 404  
*Amanita phalloides*, 40  
 Arthus reaction, 111  
 causes and histology of, 205  
 enterocolitis, 393  
 femoral head, 119  
 glioblastoma, 540  
 granulomatous inflammation, 213  
 hepatic, 495  
 saponification, 205  
 transplant reaction, 119
- Necrotizing enterocolitis, 393
- Necrotizing fasciitis, 134, 144, 487
- Needlesticks  
 infections from, 181
- Negative predictive value, 260
- Negative reinforcement, 570
- Negative selection (T cells), 100
- Negative skew distribution, 265
- Negri bodies, 169
- Neisseria* spp  
 bacteremia with complement deficiency, 105  
 cephalosporins, 185  
 gonococci vs meningococci, **140**  
 lipooligosaccharides in, 131  
 transformation, 128
- Neisseria gonorrhoeae*  
 culture requirements, 124  
 cystitis, 619  
 epididymitis and orchitis, 671  
 osteomyelitis, 176  
 pelvic inflammatory disease, 181  
 prostatitis, 672  
 septic arthritis, 474  
 sexually transmitted infections, 179
- Neisseria meningitidis*  
 chemo- and postexposure prophylaxis, 276  
 chloramphenicol, 188  
 culture requirements, 124  
 meningitis, 176
- Nematode (roundworm) infections  
 disease, transmission and treatment, 156  
 infection routes and sites, 155  
 intestinal, 156  
 tissue infections, 156
- Neomycin, 187
- Neonatal abstinence syndrome, 567, **633**
- Neonatal birth weight, **652**
- Neonatal conjunctivitis  
*Chlamydia trachomatis* serotype, 146
- Neonatal lupus, 476

- Neonatal respiratory distress syndrome, **679**  
 adhesive atelectasis with, 699
- Neonates, 633  
 abstinence syndrome, 633  
 birth weight of, 652  
*Candida albicans* in, 150  
 coagulation cascade in, 419  
 common meningitis causes, 176  
 conjunctivitis, 140  
 cytopenias, 476  
*E coli* sepsis predisposition, 78  
 extracranial injuries, 527  
 gastric outlet obstruction in, 366  
 Group B streptococcal meningitis, 176  
 hemolytic anemia in, 428  
 hemolytic disease of, 411  
 hepatitis B, 170  
 hemias in, 377  
 herpes in, 162  
 hyperbilirubinemia in, 400  
 hyperthermia in, 240  
 hypertrophic pyloric stenosis in, 366  
 intraventricular hemorrhage, 527  
*Listeria monocytogenes* in, 137  
 lupus risk, 474  
 necrotizing enterocolitis and, 393  
 normal microbiota, 174  
 obesity risk factors, 653  
 ornithine transcarbamylase deficiency, 81  
 persistent jaundice in, 401  
 physiologic gynecomastia, 667  
 pneumonia, 302  
 pneumonia causes, 146, 175  
 pulmonary vascular resistance in, 301  
*Streptococcus agalactiae* in, 135  
 TORCH infection manifestations, 180  
 tracheoesophageal anomalies in, 366  
 vitamin K deficiency in, 69  
 vitamin K synthesis in, 69  
 Zika virus effects, 168
- Neoplasia/neoplastic progression, 202, **215**
- Neoplasms  
 mature B cells, **434**  
 mature T cells, **435**  
 myelodysplastic syndromes, 437
- Neoplastic transformation  
 chronic inflammation, 212
- Nephritic-nephrotic syndrome, 613
- Nephritic syndrome, 613, 614  
 mechanism and histology, **614**
- Nephroblastoma, 220, **624**
- Nephrocalcinosis, 207
- Nephrogenic diabetes insipidus, 207  
 central diabetes insipidus  
 comparison, 342  
 lithium toxicity, 587  
 treatment, 627
- Nephrolithiasis  
 calcium oxalate, 67
- Nephron transport physiology, **603**
- Nephropathy  
 hypertension and, 302  
 transplant rejection, 118
- Nephrotic syndrome, 613  
 early-onset, 624  
 ESR with, 210  
 fatty casts in, 612  
 mechanism and histology, **616**
- Nephrotoxicity  
 acute tubular necrosis, 621  
 aminoglycosides, 186, 187  
 amphotericin B, 194  
 cidofovir, 197  
 drug reactions with, 250  
 goscarnet, 197  
 ganciclovir, 196  
 immunosuppressants, 118  
 platinum compounds, 445  
 polymyxins, 189
- Neprilysin inhibitor, 324
- Nerve fibers, 505
- Nerve injury  
 peripheral nerve regeneration, 46
- Nerves  
 lower extremity, **457**  
 upper extremity, **450, 451**
- Nervous system  
 aging effects on, 225  
 cells of, **503**  
 drug reactions in, **250**
- Neural crest  
 immunohistochemical stains, 223
- Neural crest cells, 500, 631
- Neural development, **500**
- Neuralgia  
 post-herpetic, 162  
 trigeminal, **532**
- Neural tube, 500  
 defect prevention, 66  
 defects, **501**  
 derivatives, 631  
 regionalization of, **500**
- Neural tube defects  
 serum tumor marker, 222
- Neuraminidase inhibitors  
 naming conventions for, 252
- Neuroblastomas  
 incidence and mortality, 218  
 oncogenes, 220  
 paraneoplastic syndromes, 224  
 presentation, **354**  
 serum tumor marker, 222
- Neurocutaneous disorders  
 genetics and presentation, **539–568**
- Neurocysticercosis, 157, 158
- Neurodegenerative disease therapy, **564**
- Neurodegenerative disorders  
 dementia, 534  
 drug therapy for, **564**  
 movement disorders, **534**
- Niemann-Pick disease, 86  
 Tay-Sachs disease, 86  
 ubiquitin-proteasome system  
 defects, 46
- Neuroendocrine cells  
 secretions of, 354, 357  
 serum tumor markers for, 222  
 tumors of, **354, 357**
- Neuroendocrine tumors, **354**
- Neurofibromatosis  
 chromosome association, 62  
 types I and II, 539  
 variable expressivity, 54
- Neurofilaments  
 cytoskeletal element, 46  
 tumor identification, 223
- Neurogenic (autonomic) symptoms, 352
- Neurogenic bladder  
 multiple sclerosis, 537
- Neurogenic ileus, 239
- Neuroglia  
 immunohistochemical stains, 223
- Neuroglycopenic symptoms, 352
- Neurohypophysis  
 hypothalamus and, 508
- Neurohypophysis (posterior pituitary)  
 functions, 331
- Neurokinin receptors (NK-1)  
 vomiting center input, 506
- Neuroleptic malignant syndrome, 567, 587
- Neurologic defects  
 pyruvate dehydrogenase complex  
 deficiency, 75
- Neurologic drug reactions, **250**
- Neurologic signs/symptoms  
 unvaccinated children, 182
- Neurology and special senses  
 anatomy and physiology, 503  
 embryology, 499  
 ophthalmology, 499, 549  
 otology, 499, 547  
 pathology, 524  
 pharmacology, 560
- Neuromuscular blocking drugs  
 types and use, **566**
- Neuromuscular junction  
 diseases of, **480**  
 in reflex pathways, 522
- Neuromuscular junction blockade  
 acetylcholinesterase poisoning, 239  
 nondepolarizing, 252  
 reversal, 239
- Neuromuscular junction, skeletal  
 muscle, 235
- Neuromuscular paraneoplastic  
 syndromes, 224
- Neuron action potential, **504**
- Neurons  
 immunohistochemical stains, 223  
 in spinal tracts, 522  
 response to axonal injury, **505**  
 vitamin E protection of, 68
- Neuron-specific enolase, 222
- Neuron-specific enolase (NSE), 354
- Neuropathic pain, 235, 477
- Neuropathic ulcer, 491
- Neurophysins, 331
- Neuropsychiatric dysfunction  
 electrolyte disturbances and, 609  
 in hepatic encephalopathy, 399  
 primary central nervous system  
 lymphoma, 435  
 thyroid disease effects, 344  
 vitamin B<sub>12</sub> (cobalamin)  
 deficiency, 426  
 Wilson disease, 402  
 with porphyria, 430
- Neurosyphilis, 145
- Neurotoxicity  
 methylxanthines, 704
- Neurotransmitters  
 bacterial toxin effects, 130  
 synthesis and changes with disease, **505**
- Neurovascular pairing, **458**
- Neutropenia  
 cell counts and causes, 429  
 disseminated candidiasis, 150  
 ganciclovir, 196
- Neutrophils, **412**  
 chemotactic agents, 106, 412, 495  
 chemotactic agents, 104  
 in leukocyte adhesion deficiency, 115  
 in myocardial infarction, 308  
 innate immunity, 97  
 in wound healing, 212  
 liquefactive necrosis, 205  
 megaloblastic anemia, 426  
 nonmegaloblastic anemia, 426  
 pseudo-Pelger-Huët anomaly, 436  
 stimulation of chemotaxis, 42
- Never event (medical error), 278
- Nevi  
 dysplastic, 494  
 intradermal, 485
- Nevirapine  
 cytochrome P-450 interaction, 251
- Nevus flammeus, 539
- Nevus/mole, 216
- Newborns. See Neonates
- NF1* gene  
 product and associated condition, 220
- NF2* gene  
 product and associated condition, 220
- NF- $\kappa$ B activation, 97
- NHE3 inhibitor, 408
- Niacin  
 deficiency, 357  
 drug reactions with, 249  
 lipid lowering agents, 325
- Nicardipine, 323
- Nickel carcinogenicity, 221
- Niclosamide, 157
- Nicotinamides, 73
- Nicotine intoxication and withdrawal, 589
- Nicotine replacement therapy, 594
- Nicotinic acetylcholine receptors, 163
- Nicotinic ACh receptors, 235
- Nicotinic acid, 65
- Nicotinic effects, 239
- Niemann-Pick disease, 86
- Nifedipine, 323, 660
- Nifurtimox, 155, 195
- Night blindness, 64
- Nightmares  
 occurrence, 585
- Nigrostriatal pathway, 509
- Nikolsky sign  
 blistering skin disorders, 487, 490  
 scalded skin syndrome, 487
- Nilotinib, 447
- Nimodipine, 323, 528
- Nipple  
 intraductal papilloma, 667  
 lactational mastitis, 667
- Nissl bodies, 45
- Nitazoxanide, 152
- Nitrates  
 and hydralazine in heart failure, 316  
 in antianginal therapy, 323

- Nitrates (*continued*)  
 mechanism, use, and adverse effects, **322**
- Nitric oxide source and action, 378
- Nitrites in urine, 619
- Nitrite test, 178
- Nitroblue tetrazolium dye reduction test, 115
- Nitrofurantoin  
 drug reactions with, 249  
 in glucose-6-phosphate dehydrogenase deficiency, 77
- Nitrogen mustards  
 mechanism, use, and adverse effects, 445
- Nitroglycerin, 322  
 for acute coronary syndromes, 314
- Nitroprusside, 323
- Nitrosamines  
 carcinogenicity of, 221  
 stomach cancer and, 386
- Nitrosoureas  
 mechanism, use, and adverse effects, 445  
 naming conventions for, 252
- Nivolumab, 218, 446
- Nizatidine, 406
- NK1 blocker naming convention, 253
- NNRTIs in HIV therapy, **198**
- Nocardia* spp  
 caseous necrosis, 205  
 stain for identification, 123  
 sulfonamides, 190  
 vs *Actinomyces* spp, **137**
- Nociceptive pain, 235
- Nocturia, 672
- Nocturnal enuresis, 333, 585
- Nocturnal perianal pruritus, 158
- Nodular goiter, 346
- Nodular melanoma, 494
- Nodular sclerosis, 434
- Noise-induced hearing loss, 548
- Nonalcoholic fatty liver disease, **398**
- Non- $\alpha$ , non- $\beta$  islet cell pancreatic tumor, 378
- Nonbacterial thrombotic endocarditis, 224, 318
- Nonbenzodiazepine hypnotics, 562
- Noncaseating granulomas, 213, 695
- Noncommunicating hydrocephalus, 536, 542
- Noncompetitive agonists, 228
- Noncompetitive antagonist, 233
- Noncompetitive inhibitors, 228
- Noncompliant patient, 274
- Nondepolarizing neuromuscular blocking drugs, 252, 566
- Nondihydropyridine CCBs, 323
- Nondihydropyridines, 323
- Nonenzymatic glycation, 350
- Non-frameshift mutations, deletions  
 Becker muscular dystrophy, 59
- Nonhemolytic normocytic anemia, **427**
- Non-Hodgkin lymphoma, 435  
 HIV-positive adults, 173  
 oncogenes, 220  
 rituximab for, 445  
 vinca alkaloids for, 445  
 vs Hodgkin, **434**
- Nonhomologous end joining, 37
- Non-HPV vulvar carcinoma, 661
- Nonmaleficence (ethics), 268
- Nonmegaloblastic anemia, 426
- Nonmotile (primary) cilia, 47
- Non-neoplastic malformations, 216
- Nonnormal distributions, 265
- Nonoverlapping genetic code, 35
- Nonoxidative (reversible) reactions, 77
- Nonproliferative diabetic retinopathy, 552
- Nonreceptor tyrosine kinase, 341
- Non-REM sleep stage, 507, 585
- Nonrhegmatogenous retinal detachment, 552
- Nonselective  $\alpha$ -blockers, 243
- Nonselective antagonists, 244
- Nonsense mutation, 38
- Nonspecific PDE inhibitor, 245
- Nonspecific screening antibody, 113
- Nonsteroidal anti-inflammatory drugs (NSAIDs)  
 acute gout treatment, 497  
 calcium pyrophosphate deposition disease, 473  
 chemopreventive for CRC, 395  
 drug reactions with, 249, 250  
 gastritis with, 386  
 GFR effects of, 607  
 gout, 473, 497  
 headaches, 532  
 hemolytic anemia with, 429  
 loop diuretics and, 626  
 mechanism, use, and adverse effects, **496**  
 misoprostol use, 406  
 osteoarthritis, 472  
 peptic ulcer disease and, 387  
 renal papillary necrosis, 621  
 rheumatoid arthritis, 472
- Non-ST-segment elevation MI (NSTEMI)  
 ECG changes with, 309  
 STEMI comparison, 309  
 treatment, 309  
 treatments, 314
- Nonthyroidal illness syndrome, 345
- Norepinephrine  
 actions and applications, 241  
 bupropion effect on, 594  
 MAO inhibitor effects, 593  
 pheochromocytoma secretion, 355  
 reuptake inhibition of, 567  
 synthesis and change with diseases, 505  
 vitamin B<sub>6</sub> and, 66
- Norethindrone, 675
- Normal aging, **225**
- Normal distribution, 265
- Normal microbiota  
 colonic, 135  
 female genital tract, 133  
 neonates, 174  
 skin, 133
- Normal pressure hydrocephalus, 536
- Normocytic, normochromic anemias  
 causes and findings, **427**
- Norovirus, 164, 175
- Northern blot, 51
- Nortriptyline, 593
- Notched (Hutchinson) teeth, 145
- Novobiocin  
*Staphylococcus saprophyticus* resistance, 133
- NPH insulin, 358
- NRTIs in HIV therapy, **198**
- NS3/4A inhibitors  
 mechanism and toxicity, 200  
 naming conventions for, 252
- NS5A inhibitors  
 mechanism and toxicity, **200**  
 naming conventions for, 252
- NS5B inhibitors  
 mechanism and toxicity, 200  
 naming conventions for, 252
- NSTEMI manifestations, 306
- Nuchal translucency, 61
- Nucleosome, 32
- Nucleotide excision repair, 37
- Nucleotides  
 composition of, **33**  
 deamination reactions, 33  
 ribose for synthesis of, 77  
 synthesis, 72
- Nucleus accumbens, 505
- Nucleus ambiguus, 516  
 stroke effects, 527
- Nucleus pulposus, collagen in, 48
- Nucleus tractus solitarius, 506, 516
- Null hypothesis, 265
- Number needed to harm, 258
- Number needed to treat, 258
- Nutcracker syndrome, **370**
- Nutmeg liver, 316, 397
- Nutrition, 63–92
- Nyctalopia, 64
- Nystagmus  
 cerebellum, 524  
 Friedreich ataxia, 545  
 internuclear ophthalmoplegia, 558  
 retinoblastoma presentation, 552  
 Wernicke encephalopathy, 64
- Nystatin, **194**
- O**
- Obesity, 403  
 amphetamines for, 241  
 DM type 2 and, 351  
 esophageal cancer and, 385  
 hypertension risk with, 302  
 hypoventilation syndrome, 697  
 lateral femoral cutaneous nerve injury, 456  
 osteoarthritis/rheumatoid arthritis, 472  
 renal cell carcinoma, 623  
 sleep apnea, 697  
 stress incontinence and, 618
- Obesity hypoventilation syndrome, 697
- Obligate intracellular bacteria  
 characteristics, 125
- Obliterative endarteritis, 304
- Observational studies, **256**
- Observer-expectancy bias, 263
- Obsessive-compulsive disorder  
 characteristics, **580**  
 trichotillomania, 580
- Obsessive-compulsive personality disorder, 582
- Obstructive crystalline nephropathy, 196
- Obstructive hydrocephalus, 542
- Obstructive jaundice, 405
- Obstructive lung disease  
 flow volume loops in, 692  
 pulsus paradoxus in, **317**  
 types, presentation and pathology, **692**
- Obstructive shock, 317
- Obstructive sleep apnea, 697  
 hypertension risk with, 302  
 pulse pressure in, 289  
 pulsus paradoxus in, 317
- Obstructive uropathy, 596
- Obturator externus muscle, 455
- Obturator internus muscle, 455
- Obturator nerve, 456
- Obturator sign, 390
- Occipital lobe, 508, 526
- Occult bleeding, FOBT for, 395
- Ochronosis, 82
- Octreotide, 360  
 acromegaly treatment, 343  
 carcinoid tumor treatment, 357  
 growth hormone excess treatment, 333  
 islet cell tumor treatment, 357  
 mechanism, use, and adverse effects, **407**
- Ocular motility, **555**
- Oculomotor nerve (CN III)  
 causes of damage to, 556  
 functions of, 519  
 in herniation syndromes, 543  
 internuclear ophthalmoplegia, 558  
 ocular motility, 555  
 palsy of, 528  
 pharyngeal arch derivation, 638  
 pupillary contraction, 554
- Oculosympathetic pathway, 545
- Odds ratio, 256, 258
- Odors  
*Gardnerella vaginalis* (fishy), 147  
 in maple syrup urine disease, 82  
 musty body, 82  
*Pseudomonas aeruginosa*, 141
- Odynophagia, 384
- Off-label drug use, **257**
- Ofloxacin, 191
- Okazaki fragment, 36
- Olanzapine, 591
- Olaparib, 447
- Olfaction  
 hallucinations with, 576  
 limbic system in, **508**, 509
- Olfactory bulbs  
 developmental failure of, 656
- Olfactory nerve (CN I)  
 function and type, 519
- Oligodendrocytes, 503  
 in progressive multifocal leukoencephalopathy, 538
- Krabbe disease, 86
- Oligodendroglioma, description and histology, 540
- Oligohydramnios  
 associations with, 634  
 posterior urethral valves and, **597**  
 Potter sequence, 596
- Oligospermia, 407

- Olive-shaped mass, 366  
 Omalizumab, 704  
 Omeprazole, 406  
   cytochrome P-450 interaction, 251  
 Omphalocele, 365  
*Onchocerca volvulus*  
   disease, transmission and treatment, 156  
 Oncogenes  
   gene product and neoplasm, **220**  
   hematological malignancies, 438  
 Oncogenesis  
   aneuploidy, 54  
 Oncogenic microbes, **222**  
 Ondansetron, 407, 447  
 1-25-(OH)<sub>2</sub>D<sub>3</sub>  
   kidney endocrine function, 607  
 “100-day cough,” 130  
 “Onion skin” periosteal reaction, 471  
 “Onion skinning” (arteriosclerosis), 304  
 Onychomycosis  
   terbinafine, 195  
   tinea unguium, 488  
 Oocysts  
   acid-fast stain, 152  
   toxoplasmosis, 153  
 Oogenesis, **649**  
 Opalescent teeth, 49  
 Open-angle glaucoma, 551  
   pilocarpine for, 239  
 Opening snap (OS), 295  
 Operant conditioning, 570  
 OPG (osteoprotegerin), 462  
 Ophthalmic drugs  
   atropine, 240  
   glaucoma treatment, 241  
   mydriasis, 241  
   pupil size effects, 251  
 Ophthalmoplegia  
   internuclear, **558**  
   Wernicke encephalopathy, 64  
   Wernicke-Korsakoff syndrome, 590  
 Opioid analgesics  
   intoxication and withdrawal, 588  
   mechanism, use, and adverse effects, **567**  
   overdose, 588  
   sleep apnea, 697  
   toxicity treatment, 247  
   withdrawal/relapse prevention, **594**  
 Opioid receptors, 567  
 Opioid withdrawal  
   symptom control with, 243  
 Opisthotonus, 130, 182  
 Opponens pollicis muscle, 453  
 Opportunistic fungal infections, **150**  
 Oppositional defiant disorder, 574  
 Opposition (thumb), 450  
 Opsoclonus-myoclonus syndrome, 354  
 Oponins, 209  
   functions of, 104  
 Oponization, 127  
   complement activation and, 104  
 Optic nerve (CN II)  
   function and type, **519**  
   Krabbe disease, 86  
 Optic neuritis  
   drug-related, 250  
   multiple sclerosis, 537  
 Optic neuropathy, 551  
   ethambutol, 192  
 Optochin, 134  
 Oral advance directives, 269  
 Oral contraceptives (OCPs)  
   SHBG effects on, 341  
   vitamin B<sub>6</sub> deficiency, 66  
 Oral glucose tolerance test  
   diabetes mellitus diagnosis, 350  
 Oral hairy leukoplakia, 173  
 Oral/intestinal ganglioneuromatosis,  
   356  
 Oral pathologies, 383, 389  
 Oral thrush, 173  
 Orbital cellulitis, 559  
 Orchiectomy, 670  
 Orchiopexy, 669  
 Orchitis, 167, 671  
 Orchitis and epididymitis, 671  
 Orexigenic effect, 340  
 Orexin, 585  
 Organ failure in acute pancreatitis, 404  
 Organic acidemias, 83  
 Organogenesis  
   teratogens in, **632**  
 Organophosphates  
   acetylcholinesterase poisoning, 239  
   toxicity treatment, 247  
 Organ transplants  
   Kaposi sarcoma with, 486  
   rejection prevention, 444  
   TORCH infections, 180  
 Orientation (mental status), **575**  
 Origin of DNA replication, 36  
 Orlistat  
   drug reactions with, 248  
   mechanism, clinical use and adverse effects, **407**  
 Ornithine  
   cystinuria, 83  
   kidney stones, 617  
 Ornithine transcarbamylase  
   deficiency, **81**  
 Ornithine transcarbamylase (OTC)  
   deficiency  
     Inheritance, 59  
 Orofacial clefts, **639**  
 Oropharynx  
   carcinogens affecting, 221  
 Orotic acid, 81  
 Orotic aciduria, 426  
 “Orphan Annie” eyes, 347  
 Orthomyxoviruses  
   structure and medical importance,  
     164  
 Orthopedic conditions  
   common knee conditions, **464**  
 Orthopnea  
   heart failure and, 316  
 Orthostatic syncope, 318  
 Ortner syndrome, 287  
 Ortolani maneuver, 466  
 Oseltamivir  
   mechanism and use, **196**  
 Osgood-Schlatter disease, 466  
 Osler nodes, 318  
 Osler-Weber-Rendu syndrome,  
   320. See Hereditary  
     hemorrhagic telangiectasia  
 Osmoreceptors, 506  
 Osmotic demyelination syndrome,  
   538  
 Osmotic diarrhea, 388  
 Osmotic laxatives, 408  
 Ossicles, 49, 547, 548  
 Ossification, 461  
 Osteitis deformans, 468  
 Osteitis fibrosa cystica  
   characteristics, 349  
   lab values in, 469  
 Osteoarthritis  
   celecoxib for, 496  
   pathogenesis, findings and treatment, **472**  
 Osteoarthropathy, hypertrophic, 224  
 Osteoblastoma, 470  
 Osteoblasts  
   bone formation, 461, 462  
   cortisol effect on, 340  
 Osteochondroma, 470  
 Osteoclast-activating factor, 106  
 Osteoclasts  
   bone formation, 461  
   dysfunction in osteopetrosis, 468  
   mechanism, 462  
 Osteodystrophy, renal, **622**  
 Osteogenesis imperfecta  
   bisphosphonates, **496**  
   collagen synthesis in, 48  
   findings in, **49**  
 Osteoid osteoma, 470  
 Osteoma, 216, 470  
 Osteomalacia  
   lab values in, 469  
   phosphate and, 609  
   vitamin D and, 68  
 Osteomalacia/rickets, presentation  
   and lab values, **468**  
 Osteomyelitis  
   associated infection and risk, **176**  
   common organisms in, **474**  
   *Pseudomonas aeruginosa*, 141  
   *Staphylococcus aureus*, 133  
 Osteopenia, 468  
 Osteopetrosis  
   characteristics of, **468**  
   lab values in, 469  
 Osteophytes, 472  
 Osteoporosis  
   bisphosphonates, 496  
   causes of, 332  
   diagnosis and complications of, 467  
   drugs causing, 249  
   Gaucher disease, 86  
   homocystinuria, 83  
   hypertension with, 321  
   lab values in, 469  
   teriparatide for, 497  
 Osteo-/rheumatoid arthritis  
   comparison, **472**  
 Osteosarcoma  
   epidemiology and characteristics,  
     471  
   risk with osteitis deformans, 468  
   vs osteoma, 216  
 Ostium primum, 284  
 Ostium secundum, 284  
 Otitis externa (swimmer’s ear)  
   presentation, **547**  
   *Pseudomonas aeruginosa*, 141  
 Otitis media  
   brain abscess from, 176  
   *Haemophilus influenzae*, 140  
   Langerhans cell histiocytosis, 439  
   presentation and complications, **547**  
   *Streptococcus pneumoniae*, 134  
 Otology  
   anatomy and physiology, 547  
 Otorrhea, painless, 548  
 Ototoxicity  
   aminoglycosides, 187, 197  
   ethacrynic acid, 626  
   loop diuretics for, 626  
   platinum compounds, 445  
   vancomycin, 186  
 Outer ear, 547  
 Outer membrane (bacteria), 122  
 Outflow tract formation, **284**  
 “Oval fat bodies,” 612  
 Ovarian cancer  
   cisplatin/carboplatin for, 445  
   epidemiology of, 661  
   hypercalcemia, 224  
   Lynch syndrome and, 395  
   microtubule inhibitors, 445  
   serum tumor marker, 222  
 Ovarian cycle, 650  
 Ovarian cysts, **663**  
 Ovarian dysgerminoma  
   serum tumor marker, 222  
 Ovarian insufficiency  
   primary, 60  
 Ovarian ligament, 642, 643  
 Ovarian teratomas, paraneoplastic  
   syndrome, 224  
 Ovarian tumors, **664**  
 Ovaries  
   descent of, 642  
   epithelial histology, 644  
   estrogen production, 648  
 Overflow incontinence, 618  
 Overuse injuries  
   carpal tunnel syndrome and, 463  
   elbow, **462**  
   knee, 465, 466  
   radial nerve, 450  
 Ovotesticular DSD, 655  
 Ovulation  
   process of, **649**  
   prolactin effect on, 332  
 “Owl eyes” inclusions, 434  
 Oxacillin, 184  
 Oxaliplatin, 445  
 Oxazepam, 562  
 Oxidative (irreversible) reactions, 77  
 Oxidative phosphorylation  
   ATP production, 76  
   electron transport chain, 76  
   in mitochondrial diseases, 60  
   metabolic site, 72  
   skeletal muscle types and, 460  
 Oxybutynin  
   bladder spasm treatment, 240  
   for micturition control, 236  
 Oxygen  
   exercise and, 685  
   for carbon monoxide poisoning, 247  
 Oxygen content of blood, **687**  
 Oxygen-hemoglobin, cyanide effects,  
   689  
 Oxygen toxicity, 206  
 Oxyhemoglobin dissociation curve,  
   **687**  
 Oxytocin, 360  
   function and notes, 332

- Oxytocin (*continued*)
- hypothalamus production, 508
  - lactation and, 653
  - secretion of, 331
  - signaling pathways for, 341
- P**
- p21, cell cycle regulation, 44
- p53 gene
- cell cycle regulation, 44
  - dominant negative mutation of, 55
- Pacemaker action potential, **296**
- Pacinian corpuscles, 504
- Packed RBCs, transfusion of, 434
- Paclitaxel
- drug reactions with, 250
  - mechanism, use, and adverse effects, 445
- Paget disease
- breast, 668
  - extramammary, 661
- Paget disease of bone
- bisphosphonates, 496
  - lab values in, 469
  - serum tumor marker, 222
  - woven bone in, 461
- Pain
- multiple sclerosis treatment, 537
  - neuropathic, 477
  - periorbital, 532
  - referred, 287, 403, 681
  - retro-orbital, 168
  - sensory receptors for, 504
  - thalamic nuclei and, 508
  - transmission of, **235**
  - with peptic ulcer disease, 387
- Painless chancre, 145
- Palbociclib, 447
- Pale infarct, 206
- Paliperidone, 591
- Palivizumab
- pneumonia prophylaxis, 166
- Palliative care, 278
- Pallor in aplastic anemia, 427
- Palmar interossei, 453
- Palmar reflex, 523
- PALM-COEIN, 651
- Panacinar emphysema, 400
- Pancoast tumor
- characteristics of, **702**
  - lung cancer, 703
  - superior vena cava syndrome, 702
  - thoracic outlet syndrome, 452
- Pancreas
- adrenergic receptors in, 236
  - annular, 367
  - carcinogens affecting, 221
  - divisum, 367
  - endocrine cell types, **331**
  - tumors arising from, 375
- Pancreas and spleen embryology, **367**
- Pancreatic adenocarcinoma
- carcinogens for, 221
  - location, risk factors and presentation, **405**
  - nonbacterial thrombotic endocarditis with, 318
  - serum tumor marker, 222
- Pancreatic cancer
- adenocarcinomas, 375
  - biliary cirrhosis and, 402
  - 5-Fluorouracil for, 444
  - hyperbilirubinemia with, 400
  - oncogenes, 220
  - paraneoplastic syndromes, 224
- Pancreatic ducts
- development, 367
  - obstruction of, 375
  - tumors from, 405
- Pancreatic insufficiency
- chronic pancreatitis, 404
  - malabsorption with, **388**
- Pancreatic islet cell tumors, **357**
- Pancreatic secretions
- enzymes and role of, **380**
  - lipase, 91
- Pancreatitis
- acute, 404
  - ARDS, 697
  - causal agents for, 248
  - characteristics of, **404**
  - chronic, 404
  - hyperchylomicronemia, 92
  - hyperparathyroidism and, 349
  - hypertriglyceridemia, 92
  - mumps, 167
- Pancuronium
- function of, 566
- Pancytopenia
- characteristics of, 427
  - Chédiak-Higashi syndrome, 115
  - Diamond-Blackfan anemia, 426
  - Gaucher disease, 86
  - hairy cell leukemia, 437
  - histoplasmosis, 149
  - leishmaniasis, 155
  - osteopetrosis and, 468
- Paneth cells, secretions of, 369
- Panic disorder
- SSRIs for, 580, 593
  - symptoms and treatment, **580**
- Panitumumab, 446
- Panniculitis, 492
- Panton-Valentine leukocidin (PVL), 133
- Pantoprazole, 406
- Pantothenic acid, 65
- Papillary carcinoma
- causes and findings, 347
  - nomenclature, 216
- Papillary cystadenoma
- lymphomatosum, 383
- Papillary muscle rupture, 308, 313
- Papillary thyroid carcinoma
- carcinogens for, 221
  - oncogenes, 220
- Papilledema
- cause and funduscopic appearance, **553**
  - hydrocephalus, 536
  - hypertensive emergency and, 302
  - medulloblastoma and, 542
- Papillomas, 216
- Papillomaviruses
- genome, 160
  - structure and medical importance, 161
- Pappenheimer bodies, 421
- Papules
- actinic keratosis, 494
  - capillary, 486
  - characteristics/examples, 483
  - dermatitis herpetiformis, 490
  - molluscum contagiosum, 161, 487
  - rosacea, 485
- Para-aminohippuric acid (PAH), 600
- Paracoccidioidomycosis, unique symptoms and features, 149
- Paracortex (lymph node), 94
- Paracrine renal functions, 607
- Paradoxical emboli, with patent foramen ovale, 284
- Paradoxical splitting, 293
- Paraesophageal hiatal hernia, 377
- Parafollicular cells, 330, 637
- Parainfluenza
- croup, 167
  - paramyxovirus, 166
- Parakeratosis
- characteristics/examples, 483
  - psoriasis, 485
- Paralysis
- face, 526
  - inflammatory demyelinating disorders, 538
  - inflammatory demyelinating polyneuropathy, 538
  - limb compartment syndrome, 465
  - osmotic demyelination syndrome, 538
  - rabies, 169
  - stroke, 526
  - tetanic, 136
  - unvaccinated children, 182
- Paramedian pontine reticular formation, lesions in, 524
- Paramesonephric (Müllerian) duct, 639
- Paramyxoviruses
- croup, 166
  - medical importance, **166**
  - mumps, 166
  - structure and medical importance, 164
- Paranasal sinus infections, 690
- Paraneoplastic syndromes
- manifestation and associated tumors, **224**
  - renal cell carcinoma, 623
  - small cell (oat cell) carcinoma, 703
- Paranoia
- LSD, 589
- Paranoid personality disorder, 582
- Parasites
- with immunodeficiencies, 116
- Parasitic infestations
- granulomatous inflammation, 213
  - IgE in, 103
  - infections with immunodeficiency, 116
  - myocarditis with, 320
  - sign/symptom and organism hints, **158**
- Parasitology, 152
- Parasympathetic nervous system
- cranial nerves supply of, 234
  - gastrointestinal innervation by, 371
  - male erection, 645
  - thoracoabdominal viscera innervation, 519
  - vagus nerve and, 516
  - VIP and, 378
- Parathyroid adenomas, MEN1/MEN2A syndromes, 356
- Parathyroid disease, 348
- Parathyroid glands
- adenomas of, 349
  - derivation of, 637
  - disease diagnosis and causes, **348**
- Parathyroid hormone
- bone formation and disorders, 462
  - calcium homeostasis, **337**
  - osteomalacia, 468
  - signaling pathways for, 341
  - source, function, and regulation, **336**
- Paraumbilical veins, 368
- Paraventricular nucleus
- secretions of, 331, 508
- Parent-of-origin effects (genetics), 56
- Paresthesias
- acetazolamide use, 626
  - fibromyalgia, 477
  - in upper extremity, 450
  - lumbosacral radiculopathy, 458
  - vitamin B<sub>12</sub> deficiency, 67
- Parietal cells, 379
- Parietal cortex/lobe
- lesions in, 524
  - projections to, 508
- Parinaud syndrome, 524
- Parity (“para”), 651
- Parkinson disease
- benztropine for, 240
  - dream enactment, 507
  - MAO inhibitors, 593
  - neurotransmitter changes with, 505
  - seborrheic dermatitis association, 484
  - symptoms and histologic findings, 534
  - therapy, 564
  - therapy for, **563**
  - trihexphenidyl for, 240
- Parkinson-like syndrome, drugs causing, 250
- Paromomycin, 152
- Parotid gland
- embryologic derivation, 631
  - enlargement of, 474
  - mumps, 167
- Parotitis, 167
- Paroxetine, 593
- Paroxysmal nocturnal dyspnea, 316
- Paroxysmal nocturnal hemoglobinuria
- causes and findings, **428**
  - diagnostic procedures, 52
  - intravascular hemolysis in, 427
  - mechanism and treatment, 105
- Paroxysmal supraventricular tachycardia, description and management, 310
- Partial agonist, 233
- Partial (focal) seizures
- anticonvulsants for, 560
- Partial thromboplastin time (PTT), 431
- Parvoviridae
- genome, 160
  - structure and medical importance, 161
- Parvovirus B19
- hereditary spherocytosis, 428

- hydrops fetalis, 177  
rash, 180  
receptors, 163  
Passive aggression, 571  
Passive immunity  
  mechanism and examples, **108**  
Passive leg raise, 294  
*Pasteurella* spp, culture requirements, 124  
*Pasteurella multocida*  
  disease and transmission, 147  
  osteomyelitis, 176  
Patau syndrome (trisomy 13)  
  chromosome association, 62  
  findings with, 61  
Patches (skin), characteristics/  
  examples, 483  
Patellar reflex, 523  
Patellofemoral syndrome, 466  
Patent ductus arteriosus  
  heart murmur with, 295  
  indomethacin for, 496  
  mechanism and treatment, 301  
  neonatal respiratory distress  
  syndrome and, 679  
Patent foramen ovale  
  atrial septal defect vs, 300  
  emboli with, 284  
Patent urachus, 636  
Patent vitelline duct, 636  
Pathogen-associated molecular  
  patterns (PAMPs), 97, 108  
Pathologic hyperplasia, 202  
Pathology  
  aging, 225  
  cardiovascular, **300**  
  cellular injury, **202–225**  
  endocrine system, 342  
  gastrointestinal, 383  
  hematology/oncology, 420  
  inflammation, **209–225**  
  musculoskeletal/skin/connective  
  tissue, 462  
  neoplasia, **215**  
  neural, **505**  
  oral, **383**  
  renal, 612  
  reproductive, 655  
  respiratory, 690  
Patient and ethical scenarios  
  alternative/holistic medicine trial,  
  275  
  angry about waiting, 274  
  assisted suicide request, 274  
  attraction to physician, 274  
  continued life support after brain  
  death, 275  
  feels guilt for sibling death, 275  
  feels ugly, 274  
  giving child up for adoption, 274  
  impaired colleague, 275  
  intimate partner violence, 275  
  invasive test on wrong patient, 275  
  pharmaceutical company  
  sponsorship, 275  
  possible abuse, 275  
  religious beliefs and, 275  
  suicidal patient, 274  
  treatment cost discussions, 275  
  treatment from another physician,  
  274  
  vaccination refusal, 275  
Patient-centered interviewing  
  techniques, 271  
Patient information disclosure, 274  
Patient prognosis disclosure, 274  
Patients with disabilities,  
  communication with, 271  
Patiromer, 361  
Pattern recognition receptors, 97  
Payment models for healthcare, 277  
P-bodies (cytoplasmic processing  
  bodies), 40  
PCR (polymerase chain reaction) test  
  arbovirus diagnosis, 168  
  *Babesia* spp diagnosis, 154  
  Chlamydiae diagnosis, 146  
  *Clostridioides difficile* diagnosis, 136  
  Ebola diagnosis, 169  
  for protozoa GI infections, 152  
  HSV identification, 163  
  leprosy diagnosis, 139  
  *Neisseria meningitidis*, 140  
  of amniotic fluid, 153  
  severe acute respiratory syndrome  
  coronavirus 2, 169  
  Zika virus diagnosis, 168  
PCSK9, 91  
PCSK9 inhibitors, 325  
PDE-3 inhibitor, 245  
PDE-4 inhibitor, 245  
PDE-4 inhibitors, asthma therapy, 705  
PDE-5 inhibitors  
  drug reactions with, 250  
  for pulmonary hypertension, **706**  
  mechanism and use, 245  
  naming conventions for, 253  
PD-L1 expression patterns, 223  
Peau d'orange, 668  
PECAM-1/CD-31, tumor  
  identification, 223  
Pectinate line, **373**  
Pectineus, 455  
Pectoriloquy (whispered), 698  
Pectus carinatum, **50**  
Pectus deformity. See Chest wall  
Pectus excavatum, 50  
Pediatric patients  
  abuse, **573**  
  brachial plexus injury, 452  
  common fractures, **467**  
  growth retardation in, 621  
  infant and child development, **572**  
  intraventricular hemorrhage, 527  
  juvenile polyposis syndrome in,  
  394  
  lead poisoning treatment, 247  
  leukocoria in, 553  
  liver transplantation, 401  
  neglect in, 573  
  pathogens affecting, 182  
  precocious puberty, 55  
  primary brain tumors, **542**  
  rhabdomyomas in, 320  
  scalded skin syndrome in, 487  
  sleep terror disorder in, 585  
  tetracycline adverse effects, 188  
  volvulus in, 392  
  Wilms tumors in, 624  
*Pediculus humanus*, disease and  
  treatment, 158  
Pegloticase, 497  
Pegvisomant, 343  
Pellagra, 65  
Pelvic inflammatory disease (PID)  
  *Neisseria* spp, 140  
  common organisms, **181**  
Pelvic organ prolapse, **643**  
Pelvic splanchnic nerves, 234  
Pelvis  
  fracture and nerve injury, 456  
  nerve injury with surgery, 456  
Pembrolizumab, 218, 446  
Pemphigus vulgaris  
  acantholysis and, 483  
  autoantibodies in, 113, 482  
  pathophysiology and morphology,  
  489  
  type II hypersensitivity, 110  
Penicillamine  
  drug reactions with, 249  
  Wilson disease, 402  
Penicillin  
  Actinomyces treatment, 137  
  antipseudomonal, 184  
  drug reactions with, 249, 250  
  penicillinase-resistant, 184  
  penicillinase-sensitive, 184  
Penicillinase-resistant penicillins  
  mechanism, use, and adverse  
  effects, **184**  
Penicillinase-sensitive penicillins  
  mechanism, use, and adverse  
  effects, **184**  
Penicillin G  
  syphilis treatment, 145  
Penicillin G, V  
  mechanism, use, and adverse  
  effects, **183**  
  meningococci treatment, 140  
  prophylactic use, 193  
Penicillins  
  antipseudomonal, 141  
Penile cancer, 222  
Penile pathology, **669**  
Penis  
  carcinoma in situ, 669  
  congenital abnormalities, **641**  
  squamous cell carcinoma, 669  
Pentamidine, 151  
Pentobarbital, 561  
Pentose phosphate pathway (HMP  
  shunt)  
  functions, sites and reactions, **77**  
  metabolic site, 71  
  NADPH production, 72  
  rate-determining enzyme, 71, 72  
  vitamin B<sub>1</sub> deficiency, 64  
Pentostatin  
  clinical use, 437  
  mechanism, use, and adverse  
  effects, 444  
PEP carboxykinase, 76  
Pepsinogen  
  location of, 379  
Pepsin, source, action and regulation,  
  379  
Peptic ulcer disease  
  *Helicobacter pylori*, 144  
  glycopyrrolate for, 240  
  H<sub>2</sub>-blockers for, 406  
  *H. pylori* risk for, 386  
  mechanism and presentation, **387**  
  misoprostol for, 406  
  proton pump inhibitors for, 406  
Peptidoglycan, in gram negative  
  bacteria, 123  
*Peptostreptococcus* spp  
  alcohol use disorder, 175  
  lung abscesses, 702  
Percussion, 698  
Perforation (GI)  
  inflammatory bowel disease, 389  
  necrotizing enterocolitis and, 393  
  ulcer complications, 387  
Perforin, 99, 100  
Perforin/granzyme B pathway, 204  
Performance anxiety, 580  
Perfusion-limited gas exchange, 684  
Periarteriolar lymphatic sheath, 96  
Pericardial effusion, 313, 317  
Pericardial friction rub, 313  
Pericarditis  
  acute, 319  
  constrictive, 319  
  fibrinous, 308  
  jugular venous pulse in, 291  
  picornaviruses, 164  
  postinfarction, 308  
  pulsus paradoxus in, 317  
  referred pain from, 287  
Pericardium, anatomy of, 287  
Pericentral (centrilobular) zone of  
  liver, 374  
Pericytes, 506  
Perihepatitis, 181  
Peri-infarction pericarditis, 313  
Perinephric abscesses, 619  
Perineurium, 505  
Perinuclear ANCA (p-ANCA)  
  autoantibody, 113  
Periodic acid-Schiff stain, 123  
Periodic acid–Schiff stain, 85  
Perioral numbness, 246  
Periorbital edema  
  thyroid disease and, 344  
  *Trichinella spiralis*, 156, 158  
  trichinosis, 156  
Periostosis (tubular bones), 224  
Peripartum mood disturbances, **579**  
Peripheral blood smear  
  basophilic stippling, 425  
  in plasma cell dyscrasias, 436  
  RBC inclusions, 421  
  schistocytes, 429  
  smudge cells, 437  
  spherocytes and agglutinated  
  RBCs, 429  
  with acute myelogenous leukemia,  
  437  
  with HbC disease, 428  
Peripheral edema  
  calcium channel blockers, 323  
  calcium channel blockers with, 247  
  heart failure and, 316  
  right heart failure, 316  
Peripheral facial palsy, 546  
Peripheral nervous system  
  glial cells, 503  
  nerve structures, **505**  
  origins of, **500**  
Peripheral neuropathy, 538  
  alcohol use disorder, 590  
  drugs causing, 250

- Peripheral neuropathy (*continued*)
- Fabry disease, 86
  - Krabbe disease, 86
  - linezolid, **189**
  - Lyme disease, 144
  - sorbitol, 79
  - vitamin B<sub>6</sub> deficiency, 66
- Peripheral precocious puberty, 654
- Peripheral resistance, 290
- Peripheral tolerance (T/B cells), **101**
- Peripheral vascular disease, with atherosclerosis, 303
- Peripheral vertigo, 549
- Periplasm, in bacteria, 122
- Periportal zone (Zone I), 374
- Peristalsis
- motilin receptor agonists and, 378
  - visible, 366
- Peritoneum
- hernias and, 377
  - in gastroschisis vs omphalocele, 365
  - “violin string” adhesions, 181
- Peritonitis
- appendicitis, 390
  - diverticulitis, 390
  - spontaneous bacterial, **397**
- Periventricular calcifications (brain), **180**
- Periventricular plaques, 537
- Permanent cells, 44
- Permethrin
- anti-mite/lice therapy, 195
  - for scabies, 158
- Permissive drug effects, 234
- Pernicious anemia
- autoantibody, 113
  - gastritis and, 379
  - HLA subtype association, 99
  - vitamin B<sub>12</sub> deficiency, 67, 426
- Peroxisome functions, 46
- Per-protocol analysis, 257
- Persistent depressive disorder (dysthymia), 578
- Persistent metaplasia, 202
- Persistent pulmonary hypertension of the newborn, 302
- Persistent truncus arteriosus, 284, 300
- Personality disorders classification, 582
- Pertussis toxina, 130
- Pertussis, unvaccinated children, 182
- Pes cavus, Friedreich ataxia, 545
- Petechiae, aplastic anemia, 427
- Petit mal (absence) seizures, 531
- Peutz-Jeghers syndrome, 216, 394
- PEX genes, 46
- Peyer patches
- features and functions, 381
  - histology, 369
  - IgA antibody production, 103, 381
  - immune system organ, 94
- Peyronie disease, 669
- PGI<sub>2</sub>, 495
- P-glycoprotein, **223**
- Phagocyte dysfunction
- defect, presentation, and findings, 115
  - exotoxin inhibition in, 130
- Phagocytosis
- alveolar macrophages, 679
  - defect, presentation, and findings, 115
  - exotoxin inhibition, 130
  - inhibition by bacteria, 127
- Phalen maneuver, 463
- Phantom limb pain, **529**
- Pharmaceutical company sponsorship, 275
- Pharmacokinetics
- administered drugs, **229**
  - age-related changes in, **229**
- Pharmacology
- autonomic drugs, **234, 238**
  - cardiovascular, **321**
  - cardiovascular agents/molecular targets, 322
  - endocrine system, 358
  - gastrointestinal, 405
  - hematologic/oncologic, 440
  - musculoskeletal/skin/connective tissue, **495**
  - neurology, 560
  - pharmacokinetics/pharmacodynamics, 228
  - renal, 625
  - respiratory, 704
  - toxicities and adverse effects, 246
- Pharyngeal apparatus, 637
- Pharyngeal arch derivatives, 638
- Pharyngeal arch syndromes, 638
- Pharyngeal (branchial) cleft cyst, 637
- Pharyngeal cleft derivatives, 637
- Pharyngeal pouch derivatives, 637
- Pharyngitis
- adenovirus, 161
  - group A β-hemolytic streptococci, 319
  - mononucleosis, 162
  - prophylaxis (rheumatic fever), 193
  - Streptococcus pyogenes*, 134
  - strep prophylaxis, 193
  - unvaccinated children, 182
- Pharyngoesophageal false diverticulum, 391
- Pharynx, 680
- Phencyclidine, intoxication and withdrawal, 589
- Phenelzine, 593
- Phenobarbital
- cytochrome P-450 interaction, 251
  - mechanism, use, and adverse effects, 561
- Phenotypic mixing (viral genetics), 159
- Phenoxybenzamine, for pheochromocytomas, 355
- Phentolamine
- in hypertensive crisis, 587
  - reversible block, 243
- Phenylalanine, classification of, 79
- Phenylalanine embryopathy, 82
- Phenylalanine hydroxylase (PAH), 82
- Phenylephrine, 241, **704**
- Phenyl ketones
- in urine, 82
- Phenylketonuria, **82**
- Phenytoin
- cytochrome P-450 interaction, 251
  - DRESS with, 249
  - drug reactions with, 249, 250
  - mechanism and adverse effects, 560
  - vitamin B<sub>6</sub> deficiency, 66
- Pheochromocytoma, 321
- etiology, symptoms, findings, and treatment, **355**
  - gene association, 220
  - MEN2A/MEN2B and, 355
  - phenoxybenzamine for, 243
- Philadelphia chromosome
- in myeloproliferative disorders, 437, 438
  - translocations of, 439
- Phlebitis, drugs causing, 194
- Phlebotomy, for hemochromatosis, 402
- Phobias, diagnosis of, **580**
- Phosphatases, 71
- Phosphate
- low vs high serum concentration effects, 609
- Phosphodiesterase (PDE) inhibitors for pulmonary hypertension, 706
- type, clinical use and adverse effects, **245**
- Phosphoenolpyruvate carboxykinase gluconeogenesis, 76
- Phosphofructokinase-1 (PFK-1) metabolic pathways, 71
- Phospholipid bilayer sac, in bacteria, 122
- Phosphorus, values in bone disorders, 469
- Phosphorylases, 71
- Phosphorylation, posttranslational, 43
- Photodermatitis, 328
- Photophobia/photosensitivity
- drugs causing, 188
  - migraine headaches, 532
  - rabies, 169
- Photosensitivity, drugs causing, 249
- Phototherapy for jaundice, 401
- Phrenic nerve, 681, 702
- Phthirus pubis*, disease and treatment, 158
- Phylloides tumor, 667
- Phylloquinone, 69
- Physical abuse (child), 573
- in factitious disorders, 583
- Physician-assisted suicide, 268
- Physiologic dead space determination, **682**
- Physiologic splitting (S2), 293
- Physiology
- cardiovascular, 288
  - endocrine, 332
  - gastrointestinal, 378
  - hematology/oncology, 416
  - musculoskeletal, skin, and connective tissue, 450
  - neurological, 499
  - renal, 599
  - reproductive, 647
  - respiratory, 682
- Physostigmine, 568
- anticholinergic toxicity treatment, 247
  - anticholinesterase toxicity antidote, 239
- Phytanic acid, 46
- Phytomenadione, 69
- Phytonadione, 69
- Pia mater, 506
- Pibrentasvir, 200
- Pica, 424, 584
- Picornaviruses
- characteristics, **165**
  - hepatitis A, 170
  - structure and medical importance, 164
- Pierre Robin sequence, 638
- PIGA gene mutation, 105
- Pigmented skin disorders, **484**
- Pigment-producing bacteria
- listing of, **126**
- Pigment stones, 403
- Pilocarpine
- action and applications, 239
  - uses of, 568
- Pilocarpine-induced sweat test, 58
- Pilocytic astrocytoma, 542
- Pilus/fimbria, 122
- Pimozide, 591
- Pineal gland
- location of, 515
  - tumor histology, 542
- Pinworms, 156
- Pioglitazone, 359
- Pipecolic acid, 46
- Piperacillin
- mechanism, use, and adverse effects, **184**
  - Pseudomonas aeruginosa*, with tazobactam, 141
- Piriformis muscle, 455
- Piroxicam, 496
- Pisiform bone, 453
- Pitolisant, 585
- Pitting edema, 316
- Pituitary adenoma
- acromegaly, 343
  - characteristics and histology, 540
  - growth hormone secretion with, 333
- Pituitary apoplexy, 540
- Pituitary gland, **331**
- Pituitary tumors, MEN1 and, 356
- Pityriasis, 488
- Pityriasis rosea, 492
- Pityrosporum* spp, cutaneous mycoses, 488
- pKa, 231
- Placenta
- estrogen production, 648
  - fetal component, 634
  - hormone secretion by, 651
  - immune privilege in, 97
  - maternal component, 634
  - twin-twin transfusion syndrome, 635
- Placenta accreta, 657
- Placenta accreta spectrum, 657
- Placenta increta, 657
- Placental abruption
- features of, 657
  - preeclampsia, 660
  - pregnancy complications, 657
- Placental alkaline phosphatase, with germ cell tumors, 671
- Placental disorders
- chronic placental insufficiency, 596

- insufficiency with preeclampsia, 660  
types of, **657**
- Placental hormones, **652**
- Placenta percreta, 657
- Placenta previa, 657
- Plague, 147
- Plant toxins, **246**
- Plantar aponeurosis, 465
- Plantar fasciitis, 465
- Plantar flexion, 457
- Plantaris, 457
- Plantar reflex, 523
- Plaques (skin)  
actinic keratosis, 494  
characteristics/examples, 483  
hairy leukoplakia and, 487  
lichen planus, 492  
pityriasis rosea, 492  
psoriasis, 483  
seborrheic dermatitis, 484
- Plasma acute-phase reactants (inflammation), 209
- Plasma cells  
antibody production, 99, 415  
dyscrasias of, **436**  
functions of, **415**
- Plasmalogens, 46
- Plasma membrane  
in cell injury, 203
- Plasma membrane structure, 47
- Plasma protein concentration, 601
- Plasma volume, measurement of, 599
- Plasmids, in drug resistance, 129
- Plasminogen, 442  
chloroquine use, 195  
hematologic infections, **154**
- Plasmodium* spp  
stains for, 123
- Plasmodium falciparum*, 154
- Plasmodium malariae*, hematologic infection, 154
- Plasmodium ovale*, 154
- Plasmodium vivax*, 154
- Platelet-activating factor, 412
- Platelet-derived growth factor (PDGF)  
in wound healing, 212  
signaling pathways for, 341
- Platelet disorders, **432**
- “Platelet inhibitors,” 245
- Platelet plug formation (primary hemostasis), **417**
- Platelets  
essential thrombocythemia, 438  
functional liver markers, 397  
in wound healing, 212  
transfusion of, 434
- Platinum compounds  
drug reactions with, 250  
mechanism, use, and adverse effects, **445**  
naming conventions for, 252
- Plectanotide, 408
- Pleiotropy, 54
- Pleomorphic adenoma, 383
- Pleomorphism, characteristics of, 202
- Pleural effusions, **699**  
asbestosis, 696  
mesothelioma, 695  
physical findings, 698
- Pleuritic chest pain, 313
- Pleuroperitoneal membrane defect, 377
- Plicae circulares, 369
- Plummer-Vinson syndrome, 384, 424
- Pneumatoceles, 151
- Pneumatosis intestinalis, 393
- Pneumoconioses, types, 696
- Pneumocystis jirovecii*  
asymptomatic infections, 151  
HIV-positive adults, 173  
opportunistic infections, **151**  
prophylaxis, 190  
stain for, 123  
stain for identification, 123
- Pneumocytes, Types I and II, 679
- Pneumomediastinum, 691
- Pneumonia  
ARDS, 697  
common causes by age, **175**  
common causes in adults by age, **175**  
giant cell, 167  
*Haemophilus influenzae*, 140  
HIV/AIDS prophylaxis, 199  
injectable drug use, 175  
*Klebsiella* spp, 143  
measles-associated death, 167  
pneumococcal, 134  
*Pneumocystis jirovecii*, 151  
PPI adverse effects, 406  
*Pseudomonas aeruginosa*, 141  
Q fever, 147  
*Streptococcus agalactiae*, 135  
type, organisms and characteristics of, **701**  
VZV, 162
- Pneumoperitoneum, 387, 393
- Pneumothorax  
physical findings, 698  
presentation and types of, **700**
- Pneumoviruses  
structure and medical importance, 164
- Podagra, 65, **473**
- Podocyte damage, 613, 616
- Poikilocytosis, 413
- Point of service plan, 277
- Point (single nucleotide) mutation, 38
- Poliavirus/poliomyelitis  
immunodeficient patients, 116  
RNA translation in, 165  
spinal cord effects, 544  
unvaccinated children, 182
- Polyadenylation signal, 40
- Poly(ADP-ribose) polymerase  
inhibitor, naming conventions for, 254
- Polyarteritis nodosa, 478  
risk with hepatitis B and C, 171  
Type III hypersensitivity, 111
- Polyarthralgias  
gonococcal arthritis, 474  
rubella, 180
- Polychromasia, 413
- Polycystic ovarian syndrome  
antiandrogens, 676  
clomiphene, 674  
diagnosis of, **662**
- Polycythemia  
blood oxygen in, 687
- Eisenmenger syndrome, 301  
lab/test findings, **439**  
paraneoplastic syndromes, 224  
with pheochromocytoma, 355
- Polycythemia vera, 438  
Budd-Chiari syndrome and, 397  
causes and symptoms, 438  
vs essential thrombocythemia, 438
- Polydactyly, 61
- Polydipsia, 350, 351
- Polydipsia (primary), 342
- Polyethylene glycol, 408
- Polyhydramnios  
causes of, 634  
esophageal atresia and, 366
- Polymerase chain reaction (PCR), **50**
- Polymorphic ventricular tachycardia, 311
- Polymorphonuclear cells (PMNs)  
hypersegmented, 66, 67
- Polymyalgia rheumatica  
ESR with, 210  
symptoms, findings and treatment, **477**
- Polymyositis  
autoantibody, 113  
mixed connective tissue disease, 476
- Polymyositis/dermatomyositis, **477**
- Polymyxin B, 189
- Polymyxin E, 189
- Polymyxins, mechanism, use, and adverse effects, **189**
- Polyneuropathy, 430
- Polyomaviruses, structure and medical importance, 161
- Polyostotic fibrous dysplasia, 55
- Polyphagia  
diabetes Type 1 vs Type 2, 351  
in diabetes mellitus, 350
- Polyposis syndromes, **394**
- Polyps  
adenomatous, 394  
APC gene, 394  
colonic, **394**  
hyperplastic, 394  
inflammatory pseudopolyps, 394  
KRAS gene, 394  
mucosal, 394  
neoplastic transformation of, 394  
serrated, 394  
submucosal, 394
- Polysaccharide vaccine, 109
- Polyuria  
hyperparathyroidism, 349  
in diabetes mellitus, 350  
lithium for, 592
- POMC derivatives, production of, 353
- Pompe disease, 85
- Pons, 517
- Pontiac fever, 141
- Pontine syndrome, 526
- “Pope’s blessing,” 454
- Popliteal artery  
atherosclerosis in, 303  
neurovascular pairing, 458
- Popliteal cyst, 464
- Popliteal fossa, 458
- Popliteus, 457
- Population demographics, 259
- Population genetics concepts, 55
- Population pyramid, 259
- Porcelain gallbladder, 403
- Porphobilinogen deaminase, 430
- Porphyria cutanea tarda  
features of, 430  
with hepatitis B and C, 171
- Porphyria types and symptoms, **430**
- Portal hypertension  
ARPKD, 622  
etiologies of, 396  
pulmonary arterial hypertension, 698  
*Schistosoma* spp, 157, 158  
serum markers for, 397  
varices and, 372
- Portal triad, 368, 374
- Portal vein, 368
- Portal vein thrombosis, 397
- Portal venous gas, 393
- Portosystemic anastomoses, 372
- Positive predictive value, 260
- Positive reinforcement, 570
- Positive selection (T cells), 100
- Positive skew distribution, 265
- Postauricular lymphadenopathy, 166, 177
- Postcardiac injury syndrome, 313
- Posterior cerebral artery  
stroke effects, 526  
watershed zones, 513
- Posterior circulation strokes, 526
- Posterior circumflex artery, 458
- Posterior compartment prolapse, 643
- Posterior cruciate ligament (PCL) injury, 454
- Posterior descending artery (PDA)  
area supplied, 287
- Posterior drawer sign, 454
- Posterior fossa, malformations, 502
- Posterior inferior cerebellary artery, stroke effects, 527
- Posterior interosseus nerve, 450
- Posterior nucleus (hypothalamus), 508
- Posterior pituitary (neurohypophysis), functions of, 331
- Posterior tibial artery, 458
- Posterior urethral valves, 596, 597
- Posterior vitreous detachment, 552
- Post-exposure prophylaxis, 276
- Post-herpetic neuralgia, 162
- Postoperative ileus treatment, 239
- Postpartum blues, 579
- Postpartum hemorrhage, 658
- Postpartum psychosis  
electroconvulsive therapy, 579  
features of, 579
- Postpartum thyroiditis, 345
- Postradiation fibrosis (heart), 314
- Postrenal azotemia, 620
- Poststreptococcal glomerulonephritis, Type III hypersensitivity, 111
- Posttranslational modification (proteins), **43**
- Post-traumatic stress disorder (PTSD)  
characteristics and treatment, 581  
diagnostic criteria/treatment, 581  
prazosin for, 243
- Posttussive emesis, 130
- Posttussive vomiting, 141

- Postural hypotension  
midodrine for, 241  
trazodone and, 594
- Posturing, abnormal motor, **524**
- Postviral infections  
pneumonias, 175
- Potassium  
low vs high serum concentration  
effects, 609
- Potassium channels  
blockers, 328  
myocardial action potential, 296  
opioid effect, 567
- Potassium chloride, 248
- Potassium iodide  
*Sporothrix schenckii*, 151  
for thyroid storm, 346
- Potassium shifts, hypokalemia/  
hyperkalemia, **608**
- Potassium-sparing diuretics  
mechanism, use, and adverse  
effects, **627**
- Potency vs efficacy of drugs, **232**
- Potentiation drug effects, 234
- Pott disease, 176
- Potter sequence, **596**  
ARPKD, 622  
pulmonary hypoplasia, 679  
with oligohydramnios, **634**
- Poxvirus  
molluscum contagiosum, 487  
structure and medical importance,  
161
- PPAR- $\gamma$  activator naming convention,  
253
- PR3-ANCA/c-ANCA autoantibody, 113
- Prader-Willi syndrome  
chromosome association, 62  
ghrelin in, 378  
imprinting disorder in, 56  
isodisomy in, 55
- Pralidoxime, 239
- Pramipexole, 563
- Pramlintide, 248, 359
- Prasugrel, 417, 442
- Pravastatin, 324
- Praziquantel  
anthelmintic therapy, 196  
trematodes, 157
- Prazosin  
clinical use, 243  
in PTSD, 581
- Precision (reliability), 261
- Precision vs accuracy  
diagnostic tests, **261**  
statistical tests, 266
- Precocious puberty  
adrenal steroids and, 339  
causes, **654**  
leuprolide for, 674
- Precontemplation, 586
- Precursor mRNA (pre-mRNA), 41
- Predictive value, 260
- Predenisolone for thyroid storm, 346
- Preeclampsia, 660  
hydatidiform moles, 659
- Preferred provider organization, 277
- Prefrontal cortex lesions, 524
- Pregabalin, 560
- Pregnancy  
aliskiren contraindication, 628  
anemia caused by, 424  
carpal tunnel syndrome and, 463  
contraindicated antimicrobials, 197  
ectopic, 658  
ESR with, 210  
estrogen in, 648  
folate deficiency caused by, 426  
folic acid supplementation, 66  
Graves disease with, 346  
heparin in, 440  
hypertension and treatment in,  
243, 321, 660  
intrapartum prophylaxis, 193  
iron study interpretation, 423  
*Listeria monocytogenes* in, 137  
lithium in, 302  
physiologic changes in, 651  
pituitary infarcts with, 343  
pyelonephritis, 619  
pyogenic granulomas and, 486  
risks with SLE, 476  
sex hormone-binding globulin, 341  
Sjögren syndrome and, 474  
stages of, 651  
stillbirth, 180  
*Streptococcus agalactiae* screening,  
135  
syphilis in, 145  
termination of, 675  
thyroxine-binding globulin, 335  
Turner syndrome, 655  
urinary tract infections, 178  
uterine rupture, 658  
vitamin B<sub>9</sub> deficiency, 66  
Zika virus in, 168
- Pregnancy complications  
ectopic pregnancy, 658  
hypertension, 660  
placental disorders, 657  
postpartum hemorrhage, **658**
- Prehn sign, 669, 671
- Preload  
approximation of, 288
- Premature atrial contraction, 312
- Premature beats, **312**
- Premature ejaculation, 584, 593
- Premature ovarian failure, 653, 662
- Premature ventricular contraction,  
312
- Premenstrual dysphoric disorder, 593
- pre-mRNA splicing, **41**
- Preoptic nucleus, GnRH release, 508
- Preparation/determination, 586
- Prepatellar bursitis, 464
- Preprocollagen, 48
- Preproinsulin, 338
- Prerenal azotemia, 620
- Presbycusis, 548
- Presbyopia, **550**
- Preschool age development, 572
- Preseptal cellulitis, 559
- “Pre-signal” proinsulin cleavage, 338
- Pressure injury (skin), 491
- Pressure sensation  
thalamic relay for, 508
- Pressure-volume loops, 291, 292
- Presynaptic terminals, adrenergic  
receptors in, 236
- Pretectal nuclei, 554
- Pretest probability, 259
- Prevalence vs incidence, **262**  
alcohol use, 175  
healthcare-associated infections,  
181
- Prevotella* spp
- Priapism  
ischemic, 669  
sickle cell anemia, 428  
trazodone and, 594
- Prilocaine, 565
- Primaquine  
drug reactions with, 249  
for prophylaxis, 193  
in G6PD deficiency, 77
- Primary adrenal insufficiency, 353
- Primary amyloidosis, 208
- Primary biliary cholangitis, 400, 402
- Primary bone tumors, 471
- Primary central nervous system  
lymphoma, occurrence and  
associations, 435
- Primary ciliary dyskinesia, clinical  
findings, 47
- Primary disease prevention, 276
- Primary dysmenorrhea, 663
- Primary (essential) hypertension, 321
- Primary glomerular disease, 612
- Primary hemostasis, 413, 417
- Primary hyperaldosteronism  
causes of, 354  
hypertension with, 302  
renal disorder features, 605
- Primary hyperparathyroidism  
lab values in, 469  
neuropsychiatric disturbances, 349  
presentation, 349
- Primary lactase deficiency, 79
- Primary ovarian insufficiency, 653,  
**662**
- Primary polydipsia, **342**
- Primary sclerosing cholangitis, 402  
autoantibody, 113  
jaundice with, 400
- Primary spontaneous pneumothorax,  
700
- Primary syphilis, 145
- Primary testicular lymphoma, 671
- Primase, replication initiation by, 36
- Primitive atrium, 285
- Primitive pulmonary vein, 285
- Primitive reflexes, **523**
- Primitive ventricle, 285
- PR interval  
antiarrhythmic effects, 327  
time of, 297
- Prinzmetal angina, 306
- Prion protein (PrPc), 174
- Prions, diseases caused by, **174**
- Probenecid, 497  
adverse effects, 251
- Procainamide  
antiarrhythmic effects, 326  
drug reactions with, 249
- Procalcitonin, 209
- Procarbazine  
disulfiram-like reaction with, 250  
mechanism, use, and adverse  
effects, 445
- Procedure bias, 263
- Processus vaginalis, 642
- Prochlorperazine, 407, 447
- Procoagulation, 419  
Procollagen peptidase deficiency, 49
- Proctitis, 393
- Progeria, 36
- Progesterone  
lactation and, 653  
signaling pathways for, 341  
source and function, 652
- Progestins  
mechanism and use, **674**
- Progressive multifocal  
leukoencephalopathy  
(PML)  
features of, 538  
HIV-positive adults, 173  
polyomaviruses, 161
- Projection, 571
- Prokaryotes  
DNA replication in, 36  
fluoroquinolones effect in, 36  
mRNA start codons, 42  
RNA polymerases in, 40
- Prolactin  
function and notes, 332  
lactation and, 653  
secretion of, 331, 509  
signaling pathways for, 341  
source, function, and regulation,  
**334**
- Prolactin-inhibiting factor, 332
- Prolactinoma, treatment, 334
- Proliferative diabetic retinopathy, 552
- Proliferative glomerular disorders, 612
- Proliferative phase (wound healing),  
212
- Prolonged grief disorder, 572
- Prometaphase, 44
- Promoters (gene expression), 40
- Pronephros, 596
- Proopiomelanocortin, 331
- Propafenone, 327
- Proper hepatic artery, 368
- Prophase, 44
- Prophylaxis  
antimicrobial therapy, 193  
asthma, 414  
calcium pyrophosphate deposition  
disease, 473  
chemoprophylaxis, 276  
for migraine headaches, 532  
indications and medication, **193**  
infections in HIV/AIDS, **199**  
in rheumatic fever, 319  
in strep pharyngitis, 193  
*Pneumocystis jirovecii*, 151  
pneumonia, 166  
post-exposure, **276**  
rabies postexposure, 169  
RSV in premature infants, 166  
*Trichomonas vaginalis*, 155
- Propionic acidemia, 83, 88
- Propionyl-CoA carboxylase, vitamin  
B<sub>7</sub> and, 66
- Propofol, 565
- Propranolol, 244, 327, 346
- Proprioception  
Friedreich ataxia, 545  
muscle receptors for, **461**
- Propylthiouracil  
drug reactions with, 249  
for thyroid storm, 346  
T<sub>3</sub> in peripheral tissues, 335

- thionamides, 360
- Prostacyclin analogues  
clinical use, 706
- Prostaglandin analogs  
naming conventions for, 253
- Prostaglandins  
aspirin effects, 496  
cortisol effect on, 340  
glaucoma therapy, 568  
kidney effects of, 607
- Prostate cancer  
adenocarcinomas, 672  
immunohistochemical stains, 223  
incidence/mortality of, 218  
leuprolide for, 674  
serum tumor marker, 222
- Prostate-specific antigen (PSA)  
serum tumor marker, 222  
stains for, 223
- Prostatic acid phosphatase (PAP), 672
- Prostatic adenocarcinoma, **672**
- Prostatitis  
characteristics of, **672**  
*Escherichia coli*, 672  
gonorrhea, 179
- Prosthetic devices  
*Staphylococcus epidermidis*, 126
- Prosthetic heart valves, 429
- Protamine sulfate, 247, 440
- Protease inhibitors  
drug reactions with, 249  
HIV therapy, **198**  
naming conventions for, 252
- Proteases, pancreatic secretion, 380
- Proteasome inhibitors, naming  
conventions for, 254
- Proteasome, in immune response, **46**
- Protective autoregulation (thyroid),  
335
- Protein A, bacterial virulence, 127
- Proteinases, 412
- Protein C/S deficiency, hereditary  
thrombophilias, 433
- Protein-energy malnutrition, **69**
- Protein kinase A, fructose  
biphosphatase-2 and, 74
- Protein metabolism, amino acids, 79
- Protein synthesis  
exon coding for, 41  
exotoxin inhibition of, 130  
metabolic site, 72  
posttranslational modification, **43**  
RNA polymerases in, 40  
sequence of, **43**
- Protein synthesis inhibitors  
naming conventions for, 252
- Protein transcription, histone  
deacetylation in, 32
- Proteinuria  
ACE inhibitors for, 628  
glomerular disease and, 613  
nephritic-nephrotic syndrome, 613  
nephrotic syndrome, 613  
preeclampsia, 660  
serum sickness, 111
- Proteolysis, cortisol and, 340
- Proteolytic processing (collagen  
synthesis), 48
- Proteus* spp  
struvite stones, 125
- Proteus mirabilis*
- cephalosporins, 185  
clinical significance, **143**  
penicillins for, 184  
urinary tract infections, 178, 619
- Prothrombin G20210A mutation, 433
- Prothrombin, complex concentrate  
transfusion, 434
- Prothrombin time  
functional liver markers, 397
- Proton pump inhibitors  
drug reactions with, 249, 250  
mechanism, use, and adverse  
effects, **406**  
naming conventions for, 253
- Protoporphyrin, 430
- Protozoa  
CNS infections, 153  
gastrointestinal infections, 152  
hematologic infections, 154  
pyrimethamine effects in, 34  
stains for identification, 123  
visceral infections, 155  
watery diarrhea, 175
- Proximal renal tubular acidosis (RTA  
type 2), 611
- Proximal renal tubule, relative  
concentrations along, **605**
- PRPP aminotransferase  
glycogenolysis, 71  
in Lesch-Nyhan syndrome, 35
- Prucalopride, 408
- Pruritus  
anal, 156  
aquagenic, 438  
atopic dermatitis, 485  
biliary tract disease, 402  
chloroquine, 195  
cutaneous mycoses, 488  
dermatitis herpetiformis, 490  
ectoparasites, 158  
lice, 158  
lichen planus, 492  
lichen sclerosus, 661  
nocturnal perianal, 158  
otitis externa, 547  
pseudofolliculitis barbae, 485
- Prussian blue stain, 402, 696
- Pyridoxine. See Vitamin B<sub>6</sub>  
(pyridoxine)
- Psammoma bodies  
characteristics, **207**  
mesothelioma, 695  
serous carcinoma, 664  
thyroid cancer, 347
- Pseudoappendicitis (*Yersinia  
enterocolitica*), 142
- Pseudobulbar palsy, 544
- Pseudodiverticulum, 390
- Pseudoephedrine, **704**
- Pseudofolliculitis barbae, 485
- Pseudofractures, 468
- Pseudohypoparathyroidism  
lab values with, 348  
type 1A, 348
- Pseudomembranous colitis  
clindamycin, 188  
*Clostridioides difficile*, 136  
drugs causing, 248  
penicillins, 184  
watery diarrhea, 175
- Pseudomembranous pharyngitis, 137
- epididymitis and orchitis, 671
- fluoroquinolones, 191
- immunodeficient patients, 116
- osteomyelitis, 176
- otitis externa (swimmer's ear), 547
- Pseudomonas* spp  
pyocyanin of, 107
- Pseudomonas aeruginosa*  
biofilm production, 126  
exotoxin in, 130  
findings and treatment, 141  
healthcare-associated infections,  
181  
in cystic fibrosis, 58  
osteomyelitis, 474  
pigment production, 126  
polymyxins, 189  
Swimmer's ear (otitis externa), 141  
urinary tract infections, 178
- Pseudo-Pelger-Huët anomaly, 436
- Pseudostratified ciliated cells, 680
- Pseudovirion, 159
- Psittacosis, 147
- Psoas abscess, **463**
- Psoas sign, 390, 463
- Psoriasis  
antimetabolites for, 444  
characteristics of, 485  
cyclosporine, 118  
etanercept for, 498  
hyperkeratosis, 483  
hyperkeratosis/parakeratosis, 483  
infiximab/adalimumab for, 498  
skin lesions, 483
- Psoriasis biologics, **498**
- Psoriatic arthritis  
arthritis with, 485  
HLA subtype, 99  
leflunomide, 496  
seronegative spondyloarthritis, **475**
- Psychiatric emergencies  
cause, manifestation and treatment,  
**587**  
delirium tremens, 587
- Psychiatric overtones,  
hyperparathyroidism, 349
- Psychiatry  
diagnostic criteria by symptom  
duration, **581**  
pathology, 573  
pharmacology, 590
- Psychoactive drug intoxication/  
withdrawal, **588**
- Psychoactive drugs  
intoxication and withdrawal, **589**
- Psychogenic nonepileptic events, 531
- Psychology/psychiatry, **569**
- Psychosis  
characteristics of, **576**  
LSD, 589  
postpartum, 579
- Psychosocial impact  
of strabismus, 555
- Psychotherapy, techniques, **590**
- Psyllium, 408
- PTEN* gene  
product and associated condition,  
220
- PTH-related peptide (PTHrP)  
functions, 336
- PTHrP (parathyroid hormone-related  
protein), 224
- Ptoxis  
CN III damage, 556  
Horner syndrome, 555  
myasthenia gravis, 480  
saccular aneurysm, 530
- Pubarche, 654
- Puberty  
Kallmann syndrome and, 656  
precocious, 55
- Public health sciences  
communication skills, 271  
ethics, 268
- Pudendal nerve, 373, 457, 645
- Pulmonary anthrax, 135
- Pulmonary arterial hypertension,  
301, 698
- Pulmonary artery, 681
- Pulmonary artery stenosis  
Williams syndrome, 63
- Pulmonary capillary wedge pressure  
(PCWP), 317
- Pulmonary circulation  
features of, **684**  
persistent pulmonary hypertension,  
302  
uncorrected left-to-right shunt, 301  
vascular resistance, **684**  
ventilation/perfusion mismatch,  
**685**
- Pulmonary edema  
left heart failure, 316  
loop diuretics for, 626  
nitrates for, 322  
opioids for, 567  
physical findings, 698
- Pulmonary emboli  
presentation and treatment, **691**  
treatment of, 440
- Pulmonary eosinophilia, 156
- Pulmonary fibrosis  
diffusion limited gas exchange, 684  
drugs causing, 250  
idiopathic, 694
- Pulmonary hypertension  
acute respiratory distress syndrome,  
697  
chronic thromboembolic, 698  
etiologies, **698**  
hypoxia or lung disease, 698  
hypoxic vasoconstriction, 684  
left heart disease, 698  
multifactorial, 698  
*Schistosoma haematobium*, 157  
sildenafil, 706
- Pulmonary hypertension drugs, **706**
- Pulmonary hypoplasia, 596, 679
- Pulmonary Langerhans cell  
histiocytosis, 694
- Pulmonary vascular resistance (PVR),  
**684**
- Pulmonary vasculature  
alveolar hypoxia effects on, 299  
resistance in, 286
- Pulmonic stenosis  
wide splitting in, 293
- Pulmonic valves  
physiologic splitting, 293
- Pulse pressure  
equation for, 289

- Pulse-temperature dissociation], 142  
Pulsus paradoxus, cardiac tamponade, **317**  
“Pulsus parvus et tardus,” 295  
“Punched out” bone lesions, 436  
Punishment (conditioning), 570  
Pupil  
  CN III palsy, 556  
  control of, **554**  
  drugs affecting size, **251**  
  light reflex, 554  
  relative afferent pupillary defect, **554**  
Pupillary reflex, 519  
Pure motor stroke, 526  
Pure red cell aplasia, 96, 224, 426  
Purines  
  de novo synthesis, 34  
  de novo synthesis rate-limiting enzyme, 71  
  drug actions on synthesis, 34  
  gout and, 473  
  Lesch-Nyhan syndrome, 35  
  salvage deficiencies, 35  
  structure, 33  
Purkinje cells  
  ischemia effects, 206  
  paraneoplastic cerebellar degeneration, 224  
Purkinje fibers, 297  
Purpura  
  aplastic anemia, 427  
Pustular psoriasis, 483  
Pustules  
  acne, 485  
  characteristics/examples, 483  
  pseudofolliculitis barbae, 485  
  rosacea, 485  
P value, 265  
P wave (ECG), 297  
Pyelonephritis  
  acute and chronic, **619**  
  kidney stones, 617  
  urinary tract infections, 178  
Pygmalion effect, 263  
Pyknosis, 203, 204  
Pyloric channel  
  hypertrophic stenosis, **366**  
  obstruction with ulcer, 387  
Pyloromyotomy, 366  
Pyoderma gangrenosum, inflammatory  
  bowel disease, 389  
Pyogenic granulomas, 486  
Pyramidal cells, ischemia, 206  
Pyramidal tract demyelination, 537  
Pyrantel pamoate, 156, 196  
Pyrazinamide  
  adverse effects, 192  
  drug reactions with, 249  
Pyrethroids, 158  
Pyridostigmine, myasthenia gravis  
  treatment, 239, 480  
Pyridoxal phosphate, 66  
Pyridoxine, 66  
Pyrimethamine, 195  
  effects in protozoa, 34  
  purine and pyrimidine synthesis, 34  
Pyrimidines  
  de novo synthesis, **34**  
  structure, 33  
Pyrimidine synthesis  
  de novo rate-limiting enzyme, 71  
  drug actions on, 34  
  leflunomide, 496  
Pyruvate carboxylase  
  gluconeogenesis, 76  
  vitamin B<sub>7</sub> and, 66  
Pyruvate dehydrogenase  
  deficiency, 75  
  vitamin B<sub>1</sub> and, 64  
Pyruvate dehydrogenase complex  
  cofactor requirements, 75  
  glycolysis regulation, **74**  
Pyruvate dehydrogenase complex  
  deficiency, **75**  
Pyruvate kinase deficiency  
  anemia with, 428  
  RBC morphology with, 420  
Pyruvate metabolism, **75**  
Pyuria  
  acute interstitial nephritis, 620  
  sterile, 619  
**Q**  
Q fever  
  ricketsial disease, 147  
  transmission and presentation, 148  
QRS complex, 297  
QT interval, 297  
Quantifying risk, terminology for, 258  
Quaternary amines, 197  
Quetiapine, 252, 591  
Quiescent (stable) cells, 44  
Quinidine  
  antiarrhythmic effects, 326  
  drug reactions with, 249  
Quinine  
  drug reactions with, 250  
  hematologic infection treatment, 154  
Quinolone, *Legionella pneumophila*,  
  141  
**R**  
Rabies virus  
  chemo- and postexposure  
  prophylaxis, 276  
  medical importance, **169**  
  receptors, 163  
  structure and medical importance,  
  164  
Rachitic rosary, 468  
Radial head subluxation, 466  
Radial nerve  
  injury and presentation, 450  
  neurovascular pairing, 458  
Radiation dermatitis, 492  
Radiation exposure  
  aplastic anemia, 427  
  apoptosis, 204  
  free radical injury, 206  
  myelodysplastic syndromes, 436  
Radiation therapy  
  angiosarcomas, 486  
  lymphopenia with, 429  
  papillary thyroid carcinoma risk,  
  347  
Radiculopathy, lumbosacral, **458**  
Radon, carcinogenicity of, 221  
RAG mutation, immunodeficiency,  
  115  
Rales, in heart failure, 316  
Raloxifene, clinical use, 674  
Ramelteon, 562  
Ramipril, 628  
Ramsay Hunt syndrome, 546  
Randomized clinical trials, 257  
Random plasma glucose, diabetes  
  mellitus diagnosis, 350  
RANK-L (RANK ligand), 336, 462  
Ranolazine, mechanism, use, and  
  adverse effects, **324**  
Raphe nucleus, 505  
Rapid acting insulins, 358  
Rapid automated broth cultures, 124  
Rapidly progressive (crescentic)  
  glomerulonephritis, 614  
Rasagiline, 563  
Rasburicase, 440, 447  
RAS gene, 347  
Ras GTPase, 220  
Rashes  
  acral tips, 69  
  “blueberry muffin,” 166  
  “broad collar,” 65  
  carbapenems, 186  
  fluoroquinolones, 191  
  heliotrope, 224  
  macrolides, 189  
  malar, 476  
  palms and soles, 148  
  penicillinase-sensitive penicillins,  
  184  
  periorificial, 69  
  petechial, 180  
  ricketsial infections, 148  
  rubella virus, 166, 180  
  salmon-pink macular, 474  
  unvaccinated children, 182  
  with childhood diseases, **177**  
Rathke pouch, 331, 631  
Rationalization, 571  
Raynaud phenomenon  
  calcium channel blockers for, 323  
  disease vs syndrome, 480  
“Razor bumps,” 485  
RB1 gene  
  mutation effects, 552  
  product and associated condition,  
  220  
RBC casts in urine, 612  
RBC inclusions, associated pathology,  
  **421**  
RBC morphology, **420–448**  
Reabsorption and secretion rate  
  calculation, **602**  
Reaction formation, 571  
Reactive arthritis  
  *Campylobacter jejuni*, 143  
  chlamydia, 179  
  classic triad of, 475  
  HLA subtype, 99  
  Type III hypersensitivity, 111  
  *Yersinia enterocolitica*, 142  
Reactive oxygen species (ROS), 107  
Reassortment  
  influenza viruses, 166  
  viral genetics, 159  
Recall bias in studies, 263  
Receiver operating characteristic  
  curve, 261  
Receptive (Wernicke) aphasia, 529  
Receptor binding, potency and  
  efficacy with antagonists,  
  233  
Receptor-mediated endocytosis, 45  
Receptor tyrosine kinase, 341  
Receptors used by viruses, 163, 169  
Recklinghausen disease, 539  
Recombinant cytokines, clinical uses,  
  119  
Recombinant parathyroid hormone,  
  497  
Recombinant uricase naming  
  convention, 252  
Recombinant vaccine, 109  
Recombination  
  bacterial genetics, 128  
  viral genetics, 159  
Rectal prolapse, 156  
Rectal sparing, 389  
Rectocele, 643  
Rectum  
  familial adenomatous polyposis,  
  394  
  portosystemic anastomosis, 372  
Rectus abdominis muscle, 377  
Recurrent branch of median nerve,  
  injury and presentation, 450  
Recurrent laryngeal nerve  
  compression of, 287, 703  
  Pancoast tumor, 702  
Recurrent respiratory papillomatosis,  
  690  
Red blood cell pathology  
  inclusions, **421**  
  pathologic morphology, **420**  
Red hepatization, 700  
Red infarct, 206  
Redox reactions, vitamin B<sub>2</sub> and, 65  
Redundant/degenerate genetic code,  
  35  
Reed-Sternberg cells, 434  
Refeeding syndrome (anorexia  
  nervosa), 584  
Referred pain  
  cholecystitis, 403  
  diaphragm irritation, 681  
  pericardium/pericarditis, 287  
Reflex bradycardia, 606  
Reflexes  
  cranial nerves, **519**  
  grading of, 523  
  motor neuron signs, 543  
  primitive, **523**  
  spinal (clinical), **523**  
Reflex syncope, 318  
Reflex tachycardia, 243, 322  
Reflux (erosive) esophagitis, 384  
Refractive errors (vision), 550  
Refractory angina, 324  
Refractory (autonomous)  
  hyperparathyroidism, 349  
Refsum disease, 46  
Refusing care, minors, 269  
Regan-Lowe medium, 124  
Regression, 571  
Regulation of cell cycle  
  cyclin-dependent kinases (CDKs),  
  44  
Regulation of gene expression, **40**  
Regulatory T cells  
  cell surface proteins, 108  
  functions, **100**  
Regurgitation, in GERD, 384  
Reheated rice syndrome, 136

- Reichert cartilage, 638  
 Reinforcement, 570  
 Relapse (change model), 586  
 Relapsing fever  
   animal transmission, 147  
   transmission, 158  
 Relationship with patients, 274  
 Relative afferent pupillary defect, 554  
 Relative risk (RR), 256, 258  
 Relative risk reduction, 258  
 Reliability (precision), 261  
 Remdesivir, mechanism and use, **196**  
 Remodeling (tissue), 212  
 REM (rapid eye movement) sleep,  
   **507**, 585  
 Renal agenesis  
   causes of, 596  
   Potter sequence, 596  
   pulmonary hypoplasia association,  
     679  
 Renal artery stenosis, causes and  
   effects, **623**, 628  
 Renal blood flow  
   autoregulation, **600**  
   diagram, **598**  
   renal artery stenosis, 623, 628  
   renal plasma flow and, 600  
 Renal cell carcinoma  
   carcinogens for, 221  
   chromosome association, 62  
   hypercalcemia, 224  
   metastases, 219  
   presentation and treatment, **623**  
   PTH-related peptide (PTHrP)  
     functions, 336  
   recombinant cytokines, 119  
   risk with complex cysts, 622  
 Renal clearance calculation, **600**  
 Renal cyst disorders, **622**  
 Renal disorders/failure  
   conditions and features of, **605**  
   consequences of, **621**  
   drug dosages in, 231  
   ESR with, 210  
   Fabry disease, 86  
   genitourinary trauma, 645  
   gout and, 473  
   ischemia, 496  
   renin-secreting tumor, 605  
   staphylococcal scalded skin  
     syndrome, 487  
   tetracycline use in, 188  
   waxy casts in, 612  
   Wilson disease, 402  
 Renal/genitourinary drug reactions,  
   **250**  
 Renal oncocytoma, **624**  
 Renal osteodystrophy, 349, 621, **622**  
 Renal papillary necrosis  
   characteristics and associations, **621**  
   pyelonephritis, 619  
   sickle cell anemia, 428  
 Renal plasma flow, effective, **600**  
 Renal stones. See Kidney stones  
 Renal sympathetic discharge, 606  
 Renal system  
   aging effects on, 225  
   embryology, 596  
   genitourinary drug reactions with,  
     **250**  
 Renal tubular acidosis, types and  
   findings with, **611**  
 Renal tubular defects, effects and  
   causes, **604**  
 Renin, 354  
   aliskiren effect on, 628  
   source and effects, **606**  
 Renin-angiotensin-aldosterone  
   system, **606**  
 Renomegaly, 85  
 Renovascular disease, **623**  
 Renovascular hypertension, 354  
 Reoviruses  
   genome, 160  
   structure and medical importance,  
     164  
 Repaglinide, 359  
 Repair of DNA, 37  
 Reperfusion injury, 206, 308  
 Reperfusion therapy, 314  
 Replication fork, 36  
 Replicative potential (cancer), 217  
 Reportable diseases, confidentiality  
   exceptions, 270  
 Repression, 571  
 Repressor proteins, lactose effects  
   on, 39  
 Reproductive/endocrine drug  
   reactions, 248  
 Reproductive hormones, control of,  
   673  
 Reproductive organs, drainage of, 642  
 Reproductive system  
   aging effects on, 225  
   anatomy, 642  
   female anatomy, **643**  
   male anatomy, **644**  
   pathology, 655  
   pharmacology, 673  
   physiology, 647  
   thyroid disease effects, 344  
 Residual volume, 682  
 Resistance, pressure and flow in  
   vessels, **290**  
 Reslizumab, 705  
 Respiration  
   exercise response, **688**  
   high altitude response, **688**  
 Respiratory  
   fluoroquinolones, 191  
   organisms in unvaccinated  
     children, 182  
 Respiratory acidosis  
   laboratory findings with, 609  
 Respiratory alkalosis  
   high altitude and, 688  
   laboratory finding with, 609  
 Respiratory burst, 107, 115  
 Respiratory depression  
   barbiturates, 588  
   benzodiazepines, 588  
   opioids, 588  
   psychoactive drug intoxication, 588  
   tricyclic antidepressants, 593  
 Respiratory failure  
   inflammatory demyelination  
     disorders, 538  
   polymyxins, 189  
 Respiratory syncytial virus (RSV)  
   pneumonia, 701  
 Respiratory system  
   aging effects on, 225  
   drug reactions with, **250**  
   muscarinic antagonist effects, 240  
   pharmacology, 704  
 Respiratory tract infections, C3  
   deficiency, 105  
 Respiratory tree, **680**  
 Respiratory zone, 680  
 Resting tremor, 533  
 Restless legs syndrome, **533**  
 Restricting type (anorexia nervosa),  
   584  
 Restrictive cardiomyopathy,  
   hemochromatosis, 402  
 Restrictive/infiltrative  
   cardiomyopathy, 314  
 Restrictive lung diseases  
   ankylosing spondylitis, 475  
   flow volume loops in, 692  
   types of, **694**  
 Reteplase (rPA), 442  
 Rete testis, 670  
 Reticular activating system, lesion  
   effects, 524  
 Reticulate body, 146  
 Reticulin, 48  
 Reticulocytes  
   aplastic anemia, 427  
   intravascular hemolysis, 427  
   production index, 423  
   RBC proliferation, 413  
 Retinal, 64  
 Retinal artery occlusion, 552  
 Retinal detachment, 552  
 Retinal disorders, 552  
 Retinal hemorrhages, 573  
 Retinal vein occlusion, 552  
 Retinitis  
   cidofovir, 197  
   foscarnet, 197  
 Retinitis pigmentosa, 92, 552  
 Retinoblastoma  
   cause and presentation, 552  
   chromosome association, 62  
   heterozygosity loss, 54  
   tumor suppressor genes, 220  
 Retinoic acid, 64  
 Retinoids, 485  
 Retinol, 64  
 Retinopathy  
   chloroquine, 195  
   diabetic, 552  
   hemorrhage, 552  
   hemorrhages and exudates in, 302,  
     318  
   in diabetes mellitus, 350  
   of prematurity, 679  
   retinitis, 553  
   sorbitol, 79  
   vein occlusion, 552  
   with hypertensive emergency, 302  
 Retinopathy of prematurity, 206, 552  
   associated neoplasm, 220, 355  
   Hirschsprung disease, 391  
 RET gene  
 RET/PTC rearrangements, 347  
 Retrograde amnesia, 575  
 Retro-orbital pain, 168  
 Retroperitoneal fibrosis, 618  
 Retroperitoneal structures, **367**  
 Retrospective studies, 256, 263, 278  
 Retroviruses, structure and medical  
   importance, 164  
 Rett syndrome, **60**  
 Reverse transcriptase, telomerase, 36  
 Reverse T<sub>3</sub> (rT<sub>3</sub>), 335  
 Reversible cellular injury, 203  
 Reye syndrome, **398**, 495, 496  
 Reynolds pentad, 403  
 Rhabdomyolysis  
   daptomycin, 191  
   refeeding syndrome and, 584  
 Rhabdomyomas, 216, 320  
 Rhabdomyosarcomas  
   dactinomycin for, 444  
   origin, 216  
   variant, 662  
 Rhabdoviruses  
   structure and medical importance,  
     164  
 Rhagades, 145  
 Rhegmatogenous retinal detachment,  
   552  
 Rheumatic fever  
   cause, findings and treatment, **319**  
   myocarditis with, 320  
   strep prophylaxis in, 193  
   *Streptococcus pyogenes*, 134  
   streptolysin O, 131  
   type II hypersensitivity, 110  
 Rheumatoid arthritis  
   antimetabolites for, 444  
   autoantibody, 113  
   carpal tunnel syndrome and, 463  
   celecoxib for, 496  
   etanercept for, 498  
   HLA subtype, 99  
   immunosuppressants, 119  
   infliximab/adalimumab for, 498  
   leflunomide, 496  
   pathogenesis, findings and  
     treatment, **472**  
 Rheumatoid factor, 113  
 Rh hemolytic disease of newborn, 411  
 Rhinitis medicamentosa, 704  
 Rhinitis, phenylephrine for, 241  
 Rhinocerebral abscess, 150  
 Rhinophyma, 485  
 Rhinosinusitis, 690  
 Rhinovirus  
   characteristics, **165**  
   picornavirus, 164  
   receptors, 163  
*Rhizopus* spp, opportunistic  
   infections, 150  
   RNA translation in, 165  
 Ribavirin  
   contraindicated in pregnancy, 197  
   mechanism and toxicity, 200  
   purine synthesis, 34  
 Ribose production, 77  
 Ribosomes  
   free, 45  
   protein synthesis, 43  
 Rice-water diarrhea  
   organisms causing, 175  
   *Vibrio cholerae*, 144  
 Richter transformation, 437  
 Rickets  
   hypophosphatemic, 609, 611  
   lab values in, 469  
   metaphyseal cupping/fraying, 468

- Ricketts (*continued*)  
 vitamin D and, 68
- Rickettsia* spp  
 stains for, 123  
 tetracyclines, 188
- Rickettsia prowazekii*  
 disease and transmission, 147  
 transmission of, 148, 158
- Rickettsia rickettsii*  
 chloramphenicol, 188  
 disease and transmission, 147  
 Rocky Mountain spotted fever, 148
- Rickettsia typhi*  
 disease and transmission, 147  
 transmission, 148
- Rickettsial diseases  
 rash common, 148  
 transmission and symptoms, **148**  
 with rash rare, 148
- Riedel thyroiditis, 345
- Rifabutin, 192, 193
- Rifampin  
 antituberculous drugs, 192  
*Brucella* spp, 141  
 cytochrome P-450 interaction, 251  
 drug reactions with, 250  
*Haemophilus influenzae*  
 prophylaxis, 140  
 hepatotoxicity of, 374  
 prophylactic use, 193  
 tuberculous leprosy, 139
- Rifamycins  
 antituberculous, 192  
 RNA polymerase effects, 40
- Rifapentine, 192
- Rifaximin, hepatic encephalopathy  
 treatment, 399
- Rift Valley fever/Sandfly fever, 164
- Right anterior cardinal vein, 285
- Right bundle branch, 297
- Right bundle branch block, 293
- Right common cardinal vein, 285
- Right coronary artery (RCA),  
 occlusions of, 308
- Right heart failure, 316
- Right lower quadrant (RLQ) pain,  
 391
- Right-to-left shunt  
 paradoxical emboli, 284
- Right-to-left shunts, 284, 300
- Right upper quadrant (RUQ) pain,  
 403
- Right ventricle  
 “atrializing” of, 300  
 traumatic injury to, 287
- Right ventricular hypertrophy (RVH),  
 high altitude, 688
- Rilpivirine, 198
- Riluzole, 544, 564
- Ringed sideroblasts, 430
- Ring-enhancing lesions (MRI),  
*Toxoplasma gondii*, 153
- Ringworm  
 griseofulvin, 195  
 tinea corporis, 488
- Risankizumab, 498
- Risedronate, 496
- Risk quantification terminology, **258**
- Risperidone, 591
- Ristocetin, 417
- Risus sardonius, 130
- Ritonavir, 198, 251
- Rituximab, 429, 432, 446
- Rivaroxaban, 441, 442
- Rivastigmine, 239, 564
- River blindness, 156
- RNA  
 capping, 40  
 interference, 54  
 processing, **40**
- RNA polymerase inhibition, *Amanita phalloides*, 40
- RNA polymerases, **40**  
 types and functions of, **40**
- RNA processing (eukaryotes), **40**
- RNA viruses  
 genome, 160  
 structure and medical importance,  
**164**
- Robertsonian translocation, **62**
- Rocker-bottom feet, 61
- “Rocket tails,” 137
- Rocky Mountain spotted fever  
 animal transmission, 147  
 chloramphenicol, 188  
 vector-borne illness, 148
- Rocuronium, 566
- Roflumilast, 245, 705
- Romaña sign, 155
- Romberg sign, 544
- Romiplostim, 432
- Romiplostim (TPO analog), 119
- Root cause analysis, 278
- Rooting reflex, 523
- Ropinirole, 563
- Ropivacaine, 565
- Rosacea, 485
- Rose gardener’s disease, 151
- Rosenthal fibers, 542
- Roseola infantum, HHV-6/HHV-7, 162
- Roseola, rash, 177
- Rosuvastatin, 324
- Rotator cuff muscles, **451**
- Rotavirus  
 diarrhea with, 175  
 medical importance, **165**
- Roth spots, 318
- Rotor syndrome, 400, 401
- Rough endoplasmic reticulum, **45**
- Rouleaux formation, 436
- Round ligament of uterus, 643  
 male/female homologs, 642
- Rovsing sign, 390
- Rubella virus, 166  
 cardiac defect association, 302  
 medical importance, 164, **166**  
 rashes, 177  
 TORCH infection, 180  
 unvaccinated children, 182
- Rubeola (measles) virus, 177  
 medical importance, **167**
- Rubor, 209
- Ruffini corpuscles, 504
- “Rusty” sputum, 134
- Ruxolitinib, 438, 447
- Ryanodine receptor, 459
- S**
- S-100  
 immunohistochemical stain, 223  
 tumor marker, 494
- Saber shins, 145, 180
- Sabin poliovirus vaccine, 164
- Sabouraud agar, 124
- Saccular aneurysms  
 Ehlers-Danlos syndrome, 49  
 presentation, 530
- Sacrococcygeal teratomas, 670
- Sacubitril  
 mechanism, use, and adverse  
 effects, **324**
- Saddle embolus, 691
- Saddle nose, syphilis, 180
- S-adenosylmethionine (SAM), 73
- sail-shaped thymus, 96
- Salicylates, toxicity treatment, 247
- Salivary glands, adrenergic receptors  
 in, 236
- Salivary gland tumors, 383
- Salmeterol, 241, 704
- Salmonella  
 osteomyelitis, 474
- Salmonella* spp, virulence factors, 142
- Salmonella* spp  
 bloody diarrhea, 175  
 disease and transmission, 147  
 food poisoning, 174  
 in immunodeficiency, 116  
 osteomyelitis, 176  
 penicillins for, 184  
 reactive arthritis, 475  
 TMP-SMX, 190  
 vs *Shigella* spp, 142
- Salmonella typhi* (ty-Vi)  
*Shigella* comparison, 142
- Salpingitis, 181
- Salvage deficiencies, purines, **35**
- Sampling bias, 263
- Sandfly fever/Rift valley fever, 164
- SA node, 296  
 action potential, 296  
 aging effects, 311  
 antiarrhythmic effects, 328  
 cardiac glycoside effects, 326  
 conduction pathway, 297  
 premature beats on, 312
- Saponification, 205
- Sarcoidosis  
 cardiomyopathy with, 314  
 characteristics and associations, **695**  
 erythema nodosum, 492  
 myocarditis with, 320
- Sarcoma, 216
- Sarcoma botryoides, 662
- Sarcoplasmic reticulum, 459
- Sarcoptes scabiei*  
 disease and treatment, 158
- Sargramostim (GM-CSF), 119, 447
- SARS-CoV-2 (severe acute respiratory  
 syndrome coronavirus 2)  
 receptors, 163  
 remdesivir for, **196**
- SARS (sudden acute respiratory  
 syndrome), 164
- Satellite cells, 503
- Satiety/hunger regulation, 508
- Saturday night palsy, 450
- “Sausage fingers,” 475
- Sausage link appearance  
 (funduscopy), 436
- “Saw-tooth” crypt pattern, 394
- Saxagliptin, 359
- Scabies, 195
- Scalded skin syndrome  
 characteristics, 487  
*Staphylococcus aureus*, 131
- Scales (skin)  
 characteristics/examples, 483  
 seborrheic dermatitis, 484
- Scar formation, **214**
- Scarlet fever  
 rash with, 177  
*Streptococcus pyogenes*, 134
- S cells, 378
- Schaumann bodies, 695
- Schiller-Duval bodies, 664, 671
- Schilling test, 426
- Schistocytes, 420, 429  
 disseminated intravascular  
 coagulation, 433  
 HELLP syndrome, 660  
 in intravascular hemolysis, 427
- Shiga toxin, 143
- Schistosoma* spp  
 disease, transmission and  
 treatment, 157  
 portal hypertension, 157
- Schistosoma haematobium*  
 bladder cancer, 222  
 disease association, 158  
 pulmonary hypertension, 157  
 squamous cell carcinoma of  
 bladder, 622
- Schistosoma japonicum*  
 portal hypertension, 157, 158
- Schistosoma mansoni*  
 portal hypertension, 158
- Schistosomiasis  
 pulmonary arterial hypertension, 698
- Schizoaffective disorder, 577
- Schizoid personality disorder, 582
- Schizophrenia  
 diagnostic criteria and treatment,  
 577  
 hallucinations with, 576  
 neurotransmitter changes with, 505  
 preferred medications for, 591
- Schizophrenia spectrum disorders, **577**
- Schizophreniform disorder, 577
- Schizotypal personality disorder, 577,  
 582
- Schüffner stippling, 154
- Schwann cells, 503, 538
- Schwannomas  
 characteristics and histology, 540  
 neurofibromatosis, 539
- Sciatic nerve, 456
- SCID (severe combined  
 immunodeficiency)  
 causes of, 35  
 lymphopenia with, 429
- Sclerae  
 alkaptonuria, 82  
 osteogenesis imperfecta, 48, 49
- Sclerodactyly, 481
- Scleroderma, **481**  
 autoantibody, 113  
 diffuse vs limited, 481  
 esophageal involvement, 384
- Sclerosing adenosis, 667
- Sclerosing cholangitis  
 jaundice with, 400

- ulcerative colitis association, 389
- Scoliosis
  - restrictive lung disease with, 694
  - Rett syndrome, 60
- Scombroid poisoning, 246
- Scopolamine, motion sickness
  - treatment, 240
- Scorpion sting, 404
- Scrotal lesions
  - benign, 670
  - scrotal enlargement, 669
  - varicocele, **669**
- Scurv
  - collagen synthesis, 48
  - vitamin C deficiency, 67
- Seal-like barking cough, 167
- Seasonal affective disorder, 578
- Seborrheic dermatitis, **484**
- Seborrheic keratosis, 485
- Sebum, 485
- Secondary amyloidosis, 208
- Secondary and tertiary adrenal
  - insufficiency, 353
- Secondary biliary cholangitis, 402
- Secondary glomerular disease, 612
- Secondary hyperaldosteronism, 354
- Secondary hyperparathyroidism
  - lab values in, 469
  - lab values with, 348
  - presentation and findings, 349
- Secondary lactase deficiency, 79
- Secondary spontaneous
  - pneumothorax, 700
- Secondary syphilis, 145
- Second-degree AV block, 312
- Second messengers, G-protein linked, 237
- Second-wind phenomenon, 85
- Secretin
  - secretory cell locations, 379
  - somatostatinomas and, 357
  - source, action and regulation, 378
- Secretory (exported) protein synthesis, 45
- Secukinumab, 498
- Seizures
  - anti-NMDA receptor encephalitis, 224
  - benzodiazepine withdrawal, 562
  - febrile, 530
  - neurologic drug reactions with, 250
  - Rett syndrome, 60
  - types and phases of, 531
  - vitamin B<sub>6</sub> deficiency, 66
- Selection bias, 263
- Selective  $\alpha_1$ -blockers, 243
- Selective  $\alpha_2$ -blockers, 243
- Selective dorsal rhizotomy, 545
- Selective estrogen receptor modulators (SERMs), 446, **674**
- Selective IgA deficiency, defects, presentation, and findings, 114
- Selective mutism, 574
- Selegiline, 563, 593
- Selenium sulfide, 488
- Self-mutilation
  - fragile X syndrome, 60
  - Lesch-Nyhan syndrome, 35
- Self-peptides, selection, 100
- Self-reacting lymphocytes, 204
- Self-tolerance (T/B cells), 101
- Semaglutide, 359
- Semimembranosus, 455
- Seminal vesicles, 639
- Seminiferous tubules, cells and functions, **646**
- Seminoma (PLAP), 222, 671
- Semitendinosus, 455
- Senna, 408
- Sensitivity (true-positive rate), 260
- Sensorineural hearing loss, 311
- Sensory cortex
  - stroke effects in, 526
  - topographic representation, 513
- Sensory innervation
  - tongue, 364
- Sensory loss
  - Brown-Séquard syndrome, **545**
  - conversion disorder and, 583
  - stroke effects, 526
- Sensory modalities/pathways, thalamus in, 508
- Sensory receptors, fiber type, location and modality, **504**
- Separation anxiety disorder, 574
- Sepsis
  - ARDS, 697
  - immunodeficient patients, 116
  - lymphopenia with, 429
  - neutropenia with, 429
  - Pseudomonas aeruginosa*, 141
  - Streptococcus agalactiae*, 135
- Septate uterus, 640
- Septation of heart chambers, 284
- Septic arthritis, *Neisseria gonorrhoeae*, 140
- Septic shock
  - diffuse cortical necrosis (renal), 621
  - norepinephrine for, 241
- Septum primum, 284
- Septum secundum, 284
- Sequence (morphogenesis), 633
- Serine, 220
- SERMs, drug reactions with, 249
- Serologic markers
  - hepatitis, 171
- Seronegative spondyloarthritis, **475**
- Serosa (digestive tract), 369
- Serotonergic agonists, enteric nerve stimulation, 408
- Serotonin
  - reuptake inhibition of, 567
  - synthesis and change with diseases, 505
  - vomiting center input, 506
- Serotonin syndrome
  - cause, manifestation and treatment, 587
  - dextromethorphan, 704
  - MDMA, 589
  - oxazolidinones, 189
- Serous carcinoma, 664
- Serous cystadenoma, 664
- Serpentine cord, 138
- Serpiginous burrows (lines), 158
- Serrated polyps, 394
- Serratia* spp, immunodeficient patients, 116
- Serratia marcescens*
  - in immunodeficiency, 126
  - treatment of, 185
- urinary tract infections, 178
- Sertoli cells
  - secretions of, 639, 646
  - sexual differentiation, 640
  - tumors of, 671
- Sertoli-Leydig cell tumor, 665
- Sertraline, 593
- Serum amyloid A, acute phase reactants, 209
- Serum iron, iron study interpretation, 423
- Serum markers (liver pathology), **397**
- Serum osmolality
  - primary polydipsia and diabetes insipidus, 342
  - regulation of, 333
- Serum sickness
  - Type III hypersensitivity, 111
- Serum tumor markers
  - $\alpha$ -fetoprotein (AFP), 664
  - dysgerminoma, 664
  - pancreatic adenocarcinomas, 405
  - placental alkaline phosphatase, 671
  - prostatic acid phosphatase, 672
  - use and associations of, **222**
  - yolk sac tumors, 664
- Sevelamer, 361
- 17 $\alpha$ -hydroxylase, 339
- 17-hydroxyprogesterone, 339
- Severe acute respiratory syndrome
  - coronavirus 2, 169
- Severe combined immunodeficiency (SCID), defect, presentation, and findings, 115
- Sevoflurane, 565, 566
- Sex chromosome disorders
  - karyotyping for, 53
  - types of, **655**
- Sex cord stromal tumors, 664
- ovarian, 665
- Sex hormone-binding globulin (SHBG), steroid hormone signaling pathways, 341
- Sex steroid replacement, 343
- Sexual abuse (child), 573
- Sexual development/disorders
  - diagnosis by physical characteristics, **656**
  - diagnosis by sex hormones, **656**
  - 46,XX DSD, 655
  - 46,XY DSD, 655
  - other disorders of, **655**
  - ovotesticular DSD, 655
- Sexual differentiation, **640**
- Sexual dysfunction, **584**
- Sexually transmitted infections, 155
  - chemo- and postexposure prophylaxis, 276
  - clinical feature and pathogens, 179
  - molluscum contagiosum, 487
  - parental consent with, 269
- Sexual maturity rating, 654
- SGLT-2 inhibitor, naming conventions for, 253
- Shaken baby syndrome, 573
- Shawl and face rash, 477
- Sheehan syndrome, 343
- Shiga toxin
  - enterotoxin, 142
  - genes encoding for, 128
  - hemolytic-uremic syndrome, 143
  - mechanism, 130
- Shigella* spp
  - bloody diarrhea, 175
  - comparison with *Salmonella* spp, 142
  - penicillinase-sensitive penicillins for, 184
  - reactive arthritis, 475
  - TMP-SMX, 190
  - toxin, 130
  - vs *Salmonella* spp, **142**
- Shigella dysenteriae*, 142
- Shigella flexneri*, 142
- Shigella sonnei*, 142
- Shine-Dalgarno sequence, 43
- Shingles (zoster), 162, 483
- Shock
  - cardiogenic, 289, 308, 313, 321
  - Ebola, 169
  - endotoxins, 129
  - norepinephrine for, 241
  - superantigens causing, 131
  - types, causes, signs, and treatment, **317**
- Short acting insulin, 358
- Short bowel syndrome, 381, **392**
- Shoulder drop, 463
- Shoulder dystocia, 652
- Shunts
  - fetal circulation, 286
  - left-to-right, 301
  - right-to-left, 300
- Sialadenitis, 383, 474
- Sialolithiasis, 383
- Sialyl Lewis<sup>x</sup>, 211
- Sickle cell anemia
  - causes and findings, **428**
  - ischemic priapism, 669
- Sickle cell disease
  - antimetabolites for, 444
  - chromosomal abnormality, 62
  - iron poisoning with, 431
- Sickle cells, 420
- Sick sinus syndrome, **311**
- Sideroblastic anemia
  - causes and lab findings, 425
  - RBC inclusions in, 421
  - vitamin B<sub>6</sub> deficiency, 66
- Sigmoid colon, 390
- Sigmoid volvulus, 392
- Signaling pathways
  - hematologic malignancies, 438
  - of endocrine hormones, **341**
  - steroid hormones, **341**
- Signal recognition particle (SRP), 45
- Signet ring cells, 386
- Sign of Leser-Trélat, 224
- Sildenafil, 245, 669
- Silencer (gene expression), 40
- Silent mutation, 38
- Silica
  - carcinogenicity of, 221
  - inflammation stimulus, 212
- Silicosis, 696
- Silver stain, 123
- Simple pneumothorax physical findings, 698
- Simple vs complex renal cysts, 622
- Simvastatin, 324

- Single nucleotide (point) mutation, 38
- Single nucleotide polymorphisms (SNPs), 52
- Single nucleotide substitutions, 38
- Single strand DNA repair, 37
- Single-stranded binding proteins, 36
- Single umbilical artery, 636
- Sinuses  
opacification of, 58
- Sinusitis  
brain abscesses, 176  
Kartagener syndrome, 47  
*Streptococcus pneumoniae*, 134
- Sinus venarum, 285
- Sinus venosus, horns of, 285
- siRNA (small interfering RNA), 54
- Sirolimus (Rapamycin), immunosuppression, 118
- Sister Mary Joseph nodules, 386
- Sitagliptin, 359
- Situational syncope, 318
- 6-mercaptopurine  
for ulcerative colitis, 389  
mechanism, use, and adverse effects, 444  
purine synthesis, 34
- Sjögren syndrome  
autoantibody, 113  
characteristics, complications, and labs, **474**  
pilocarpine for, 239
- Skeletal muscle  
ACh receptors in, 235  
atrophy and hypertrophy in, **460**  
blood flow autoregulation to, 299  
fiber types and metabolism, **460**  
glycogen in, 84  
ossification in, 477
- Skeletal muscle relaxants, **567**
- Skewed distributions, 265
- Skin  
aging effects on, 225  
anatomy and physiology, 450  
blood flow autoregulation to, 299  
carcinogens affecting, 221  
collagen in, 48  
drug reactions with, **249**  
epithelial cell junctions, **482**  
exocrine glands, **482**  
extrahepatic manifestations of hepatitis, 171  
hyperextensible, 49  
inflammatory diseases, 133  
layers of, 481  
normal microbiota, 174  
normal microbiota of, 133  
thyroid disease effects, 344  
warfarin-induced necrosis, 433
- Skin cancer  
albinism and, 484  
Lynch syndrome and, 394  
paraneoplastic syndromes, 224  
types and epidemiology, **494**
- Skin disorders/lesions  
blistering, **489**  
blue/gray deposits, 328  
café-au-lait spots, 55  
common, **485**  
erythema multiforme, 149  
Gottron papules, 224  
hyperkeratotic, 475  
hyperlipidemia signs, 303  
hyperpigmentation, 360  
inflammatory bowel disease, 389  
Kaposi sarcoma, 162  
kwashiorkor, 69  
macroscopic terms, **483**  
microscopic terms, **483**  
miscellaneous, **492**  
nodules in, 319  
petechiae, 413  
pigmentation disorders, **484**  
scaling, 488  
scaly, 64  
seborrheic dermatitis, 484  
seborrheic keratoses, 224  
target lesions, 490  
T-cell lymphoma, 435  
telangiectasia, 320, 481  
ulcers, 155  
vascular tumors, **486**  
with carbon monoxide poisoning, 689
- Skin infections  
bacterial infections, 487  
HSV1 and HSV2, 487  
*Pseudomonas aeruginosa*, 141  
viral, 487
- Skip lesions, 389
- Skull thickening, 468
- Slapped cheek rash, 177
- Sleep  
architecture, **507**  
growth hormone secretion, 333  
physiology and stages, **507**  
stages of, 507
- Sleep apnea, types of, **697**
- Sleep deprivation, leptin production with, 340
- Sleep disturbance  
sleep terror disorder, **585**
- Sleep-onset latency, 507
- Sleep paralysis, 585
- Sleep terror disorder, **585**
- SLE-like syndrome, procainamide, 326
- Sliding hiatal hernia, 377
- Slime (S) layer (bacteria), 122
- Slipped capital femoral epiphysis  
avascular necrosis, 469  
osteonecrosis, 466
- Slipped strand mispairing, 38
- Slow acetylators, 230
- Slow-wave sleep  
sleep terror disorder, 585
- SMAD4 (DPC4)* gene, product and associated condition, 220
- Small bowel obstruction, 393
- Small cell carcinoma  
immunohistochemical stain, 223  
Lambert-Eaton myasthenic syndrome, 480  
location and characteristics, 703  
paraneoplastic syndromes, 224  
serum tumor marker, 222
- Small interfering RNA (siRNA), 54
- Small intestinal bacterial overgrowth, 393
- Small intestine, migrating motor complexes production, 378
- Small/medium-vessel vasculitis, 478
- Small molecule inhibitors, 254
- Small molecule inhibitors, naming conventions for, 254
- Small nuclear RNA (snRNA), 40
- Smallpox, 161
- Small-vessel vasculitis (immune complex mediated), 479
- Small-vessel vasculitis (MPO-ANCA/p-ANCA), 478
- SMN1* mutation, 544
- Smooth/diffuse goiter, 346
- Smooth endoplasmic reticulum, **45**
- Smooth muscle  
adrenergic receptors in, 236  
 $\alpha_1$ -blocker relaxation of, 236  
cell migration and proliferation, 303  
contraction and relaxation, **460**  
glomus tumors, 486  
relaxation of, 245  
tumor nomenclature, 216
- Smudge cells, 437
- SNARE proteins, 130, 136
- SNC (substantia nigra pars compacta), 505
- SNRIs (serotonin-norepinephrine reuptake inhibitors)  
major depressive disorder, 578  
mechanism and clinical use, **593**
- snRNP assembly, 544
- spinal muscular atrophy, 41
- Snuffles, 145
- “Soap bubble” appearance/lesions, 150
- Social anxiety disorder  
features of, 580  
SSRIs for, 593
- SOD1 mutations, 544
- Sodium  
low vs high serum concentration effects, 609
- Sodium channel blockers  
Class IA, **326**  
Class IB, 326  
mechanism, use, and adverse effects, **326**
- Sodium channels  
ciguatoxin effects, 246  
pacemaker action potential and, 296
- Sodium-cyanide nitroprusside test (urinary), 83
- Sodium-glucose co-transporter 2 inhibitors, 359
- Sodium-glucose cotransporter 2 (SGLT2) inhibitors, 602
- Sodium oxybate (GHB), narcolepsy treatment, 585
- Sodium polystyrene sulfonate, 361
- Sodium-potassium pump, **47**
- Sodium stibogluconate, 155, 195
- Sodium urate crystals, 35
- Sofosbuvir, 200
- Solifenacin, 240
- Solriamfetol, 585
- Somatic hypermutation, 99
- Somatic mosaicism  
causes of, 55  
Sturge-Weber syndrome, 539
- Somatic nerves, male sexual response, 645
- Somatic symptom disorders, 583  
and related disorders, **583**
- factitious and malingering comparisons, **583**
- Somatomedin C, effects of, 333
- Somatosensory cortex, 508
- Somatostatin  
function of, 332  
secretory cell locations, 379  
source, action, and regulation of, 378
- Somatostatinoma, 357
- Sonic hedgehog (*SHH*)  
basal plate development, 500
- Sorbitol  
tissue accumulation, 350
- Sorbitol metabolism, **79**
- Sotalol, 328
- Southern blot, 51
- Southwestern blot, 51
- Space of Disse, 374
- Spaghetti and meatballs appearance, 488
- Spasticity  
motor neuron lesions, 543  
tizanidine, 243  
Zika virus, 168
- Spastic paralysis  
tetanospasmin, 130  
unvaccinated children, 182
- Spastic paresis, 543
- Specialized transduction, 128
- Special senses  
aging changes, 225  
ophthalmology, 549  
otology, 547
- Specificity (antigen dependent), 102
- Specificity (true-negative rate), 260
- Specific learning disorder, 574
- Speckled ANA, 476
- Spermatocoele, 670
- Spermatocytes, 646
- Spermatogenesis  
cryptorchidism and, 669  
features of, **647**  
regulation of, 646
- Spermatogonia, 646
- Spermatozoa, immobile, 47
- Sperm, ejaculation pathway, 644
- Sphenopalatine artery, epistaxis and, 690
- Spherocytes, 420, 429
- Spherocytosis  
extrinsic hemolytic anemia, 427  
hereditary, 428
- Spherule, 149
- Sphincter of Oddi, 378
- Sphingolipidoses, 86
- Sphingomyelinase, 86
- Spigelian hernia, 376
- Spina bifida occulta, 501
- Spinal cord  
anterior horn degeneration, 41  
lesions and syndromes of, **544**  
lower extent, **520**  
reflexes and nerve roots, 523  
tracts and functions of, **522**  
tracts in, **521**
- Spinal cord lesions/syndromes  
causes of, **544**  
multiple sclerosis, 537
- Spinal dysrhythmia types, 501
- Spinal muscular atrophy  
presentation, 544

- splicing of pre-mRNA in, 41  
 Spinal nerves, 520  
 Spinal reflexes/nerve roots, clinical reflexes, 523  
 Spinal tract anatomy/function, ascending tracts, 522  
 Spinocerebellar degeneration, abetalipoproteinemia, 92  
 Spinocerebellar tracts  
   diseases of, 544  
 Spinothalamic tracts  
   Brown-Séquard syndrome, 545  
   in anterior spinal artery occlusion, 544  
   location and functions, 522  
   organization of, 521  
   syringomyelia, **502**  
 Spirochetes, clinical significance, **144**  
 Spirolactone, 627, 676  
 Splay phenomenon, 602  
 Spleen  
   anatomy, **96**  
   embryology, 367  
   in leukemias, 437  
   platelet destruction in, 432  
   platelet storage in, 413  
 Splenectomy  
   findings with, 96  
   hereditary spherocytosis, 428  
   with autoimmune hemolytic anemia, 429  
 Splenic artery, 368  
 Splenic flexure, 370  
 Splenomegaly  
   hairy cell leukemia, 437  
   hereditary spherocytosis, 428  
   histoplasmosis, 149  
   myelofibrosis, 437  
   visceral leishmaniasis, 155  
 Splenorenal ligament, 368  
 Spliceosome, 41  
 Splice site mutation, 38  
 Splicing errors, Duchenne muscular dystrophy, 59  
 Splinter hemorrhages, 318  
 Splitting (ego defense), 571  
 Splitting of S2 heart sound, **293**  
 Splitting (twinning), 635  
 Spondyloarthritis (seronegative), **475**  
 Spongiform cortex, 535  
 Spongiosis, characteristics/examples, 483  
 Spontaneous abortion, *Listeria monocytogenes*, 137  
 Spontaneous bacterial peritonitis, 397  
 Spontaneous gas gangrene, 136  
 Spontaneous pneumothorax, 700  
 Spore (bacteria), 122  
 Sporicidal agents, 126  
*Sporothrix schenckii*, opportunistic infection, **151**  
 Sporotrichosis, 151  
 Spot desmosome, 482  
 Sprain  
   ankle, 458  
 Sprue, vitamin B<sub>12</sub> deficiency, 67  
 "Spur cells," 420  
 Squalene epoxidase, 195  
 Squamous cell carcinoma  
   anus and cervix, 173  
   associated disorders, 494  
   bladder, 157, 158, 624  
   carcinogens for, 221  
   cervix, 663  
   esophagus, 385  
   head and neck, 690  
   lung, 703  
   of skin, 494  
   oral, 383  
   penis, 669  
   PTH-related peptide (PTHrP)  
     functions, 336  
   vaginal, 662  
 Squamous epithelium  
   epithelial histology, 644  
   vulvar pathology, 661  
 Squamous metaplasia, Vitamin A, 64  
 Squatting (auscultation of heart), 294, 300  
 Squirt sign, 391  
 SRY gene, 639  
 ssDNA, 160  
 SSRIs (selective serotonin reuptake inhibitors)  
   anxiety disorders, 580  
   atypical depression, 578  
   drug reactions with, 248  
   in SIADH, 342  
   major depressive disorder, 578  
   major depressive disorder (peripartum onset), 578  
   mechanism, use, and adverse effects, **593**  
   obsessive-compulsive disorder, 580  
   panic disorder, 580  
   phobias, 580  
 ssRNA  
   viral genomes, 160  
 Stable (quiescent) cells, 44  
 Staghorn calculi, 143, 617  
 Stains, 123  
 Standard deviation, dispersion/variability, 265  
 Standard error of the mean, 265  
 Standing Valsalva (strain phase), 294  
 Stanford type A aortic dissection, 305  
 Stanford type B aortic dissection, 305  
 Stapedius muscle, 638  
 Stapes (ossicles), 547  
 Staphylococcal scalded skin syndrome, 487  
 Staphylococcal toxic shock syndrome (TSS), 133  
*Staphylococcus aureus*  
   acute infective endocarditis, 318  
   brain abscess, 176  
   bronchopneumonia, 701  
   bullous impetigo, 487  
   food poisoning, 174  
   hospital-associated infections, 181  
   in cystic fibrosis, 58  
   inflammatory breast disease, 667  
   lung abscesses, 702  
   medical significance, 133  
   nasal colonization, 174  
   osteomyelitis, 176, 474  
   pigment production, 126  
   postsurgical prophylaxis, 193  
   psoas abscess with, 463  
   skin infections, 487  
   toxin production, 131  
*Staphylococcus epidermidis*  
   biofilm production, 126  
   characteristics of, **133**  
   healthcare-associated infections, 181  
   normal skin microbiota, 174  
   osteomyelitis, 176, 474  
   vancomycin for, 186  
*Staphylococcus pyogenes*  
   skin infections, 487  
*Staphylococcus saprophyticus*  
   acute cystitis, 619  
   characteristics of, **133**  
   kidney stones, 617  
   urinary tract infections, 178  
 Starling curves, **289**  
 Starling forces, 299  
 "Starry sky" appearance, 435  
 Start and stop codons, **42**  
 Startle myoclonus, 535  
 Starvation  
   ketone bodies in, 88  
   leptin production, 340  
   phases of, 89  
 STAT3 mutation, 114  
 Statins  
   drug reactions with, 249  
   for acute coronary syndromes, 314  
   mechanism and adverse effects, 324  
 Statistical hypothesis testing  
   common tests, **267**  
   confidence interval, **267**  
   outcomes, **266**  
   terminology, **265**  
 Statistical tests, common, **267**  
 Statistical vs clinical significance, **266**  
 Status epilepticus, 531, 562  
 Steady state, 229, 231  
 Steatorrhea  
   abetalipoproteinemia, 92  
   celiac disease, 388  
   chronic pancreatitis, 404  
   malabsorption syndromes, 63, 388  
   octreotide effect, 407  
   somatostatinoma, 357  
   with orlistat, 407  
 Steatosis (hepatic), 398  
 Steatotic liver disease, **398**  
 Steeple sign (x-ray), 167  
 Stellate ganglion, 702  
 Stem cells  
   defect in aplastic anemia, 427  
   paroxysmal nocturnal hemoglobinuria, 428  
 STEMI manifestations, 306  
 Steppage gait, 457  
 Sterile pyuria, 619  
 Sterilization/disinfection methods, **197**  
 Steroid diabetes, 350  
 Steroids  
   acute pancreatitis, 404  
   berylliosis, 696  
   binding globulins, 341  
   multiple sclerosis treatment, 537  
   synthesis of, 45  
 Stevens-Johnson syndrome  
   drug reaction and, 490  
   HLA subtype association, 99  
   sulfa drug allergies, 249  
   with anticonvulsants, 560  
 Stimulant laxatives, 408  
 Stimulants, intoxication and withdrawal, 588  
 St. John's wort  
   cytochrome P-450 interaction, 251  
 Stomach  
   carcinogens affecting, 221  
   ghrelin production, 378  
   histology, 369  
   secretin effect on, 379  
 Strabismus, 552, **555**  
 Stratified analysis, 264  
 "Strawberry cervix"  
   *Trichomonas vaginalis*, 155  
   vaginitis, 178, 179  
 Strawberry tongue  
   scarlet fever, 134, 177  
 Streak gonads, 640  
*Streptococcus* spp  
   septic arthritis, 474  
   viridans group, **134**  
*Streptococcus agalactiae* (group B strep)  
   characteristics of, **135**  
   hippurate test for, 135  
*Streptococcus aureus*  
   septic arthritis, 474  
*Streptococcus gallolyticus*, 135  
   characteristics of, **135**  
   in infective endocarditis, 318  
*Streptococcus mitis*, 134  
*Streptococcus mutans*, 134, 174  
*Streptococcus pneumoniae*  
   characteristics of, **134**  
   chloramphenicol, 188  
   hemolysis with, **133**  
   meningitis with, 134  
   types of pneumonia with, 701  
*Streptococcus pyogenes*  
   signs and symptoms, 177  
   toxin production, 131  
*Streptococcus pyogenes*  
   erysipelas, 487  
*Streptococcus pyogenes* (group A strep)  
   characteristics of, **134**  
*Streptococcus sanguinis*, 134  
 Streptolysin O, 131  
 Streptomycin, 187  
   *Brucella* spp, 141  
 Stress cardiomyopathy, 314  
 Stress incontinence, 618  
 Stress-related disorders, 581  
 Stretch receptors, 504  
 Striated muscle, tumor nomenclature, 216  
 Striatum  
   dopamine second messenger functions, 237  
 Stridor, inspiratory, 167  
 "String of beads" appearance (renal artery), 302  
 Stroke  
   central post-stroke pain, **529**  
   coagulation factor inhibitors, 441  
   eclampsia, 660  
   hemorrhagic intraparenchymal, 530  
   homocystinuria, 83  
   hypertension and, 302  
   ischemic, types of, 525

- Stroke (*continued*)  
 lesion area and symptoms, **526**  
 sickle cell anemia, 428  
 syphilis, 145  
 thrombolytic drugs with, 442  
 Stroke volume  
 equation for, 289  
 factors affecting, 288  
 Stroke work (SW), 288  
*Strongyloides* spp, 155  
*Strongyloides stercoralis*  
 disease, transmission and  
 treatment, 156  
 Struma ovarii, 346  
 Struvite (magnesium ammonium  
 phosphate) stones, 125  
 ST segment, 297  
 ST-segment elevation MI (STEMI)  
 diagnosis of, 309  
 ECG localization of, **309**  
 for acute coronary syndrome  
 treatments, 314  
 NSTEMI comparison, 309  
 “Stuck twin” appearance, **635**  
 Sturge-Weber syndrome,  
 presentation, 539  
 Stylohyoid ligament, 638  
 Stylohyoid muscle, 638  
 Styloid process, 638  
 Stylopharyngeus, 638  
 Subacute combined degeneration,  
 67, 544  
 Subacute granulomatous thyroiditis,  
 213, 345  
 Subacute infective endocarditis, 318  
 Subacute sclerosing panencephalitis  
 (SSPE), 167  
 Subarachnoid hemorrhage  
 aneurysms, 530  
 cause and effects of, 528  
 nimodipine for, 323  
 Subarachnoid space, 506  
 Subclavian steal syndrome, **305**  
 Subcutaneous emphysema, 691  
 Subcutaneous fat  
 erythema nodosum in, 492  
 skin layers, 481  
 Subcutis layer, 481  
 Subdural hematomas, 528, 573  
 Subendocardium, infarction, 206  
 Subgaleal hemorrhage, 527  
 Sublimation, 571  
 Submucosa (digestive tract), 369  
 Submucosal nerve plexus (Meissner),  
 369  
 Submucosal polyps, 394  
 Subscapularis muscle, 451  
 Substance P, 532  
 Substance use disorder, **585**  
 Substance use, teratogenicity of, 632  
 Subthalamic nucleus, lesions, 524  
 Subunit vaccines, 109  
 Succimer, heavy metal toxicity, 247  
 Succinate dehydrogenase, 65  
 Succinylcholine, 566  
 Succinyl-CoA  
 gluconeogenesis, 76  
 TCA cycle, 74  
 Sucking reflex, 523  
 Sucralfate, mechanism and clinical  
 use, **406**  
 Sudden acute respiratory syndrome,  
 164  
 Sudden cardiac death  
 characteristics of, 307  
 hereditary channelopathies, 311  
 with myocarditis, 320  
 Sudden death  
 cocaine use, 589  
 sleep apnea, 697  
 Sudeck point, 206  
 Suicide  
 confidentiality issues and, 270  
 physician-assisted, 274  
 risk factors for death, **579**  
 risk with panic disorders, 580  
 Sulbactam, 185  
 Sulfadiazine  
 mechanism, use, and adverse  
 effects, 190  
*Toxoplasma gondii*, 153  
 Sulfa drugs  
 adverse effects, 251  
 DRESS with, 249  
 drug reactions with, 250  
 megaloblastic, 249  
 rash caused by, 249  
 Sulfamethoxazole (SMX), 190  
 Sulfapyridine, 407  
 Sulfasalazine  
 adverse effects, 251  
 mechanism, clinical use and  
 adverse effects, **407**  
 Sulfatides, 138  
 Sulfisoxazole, 190  
 Sulfonamides  
 adverse effects, 251  
*Bordetella pertussis*, 141  
 cytochrome P-450 interaction, 251  
 drug reactions with, 249  
 glucose-6-phosphate dehydrogenase  
 deficiency, 77  
 hemolysis in G6PD deficiency, 249  
 mechanism, use, and adverse  
 effects, **190**  
 Nocardia treatment, 137  
 pregnancy contraindication, 197  
 trimethoprim, 190  
 Sulfonylureas  
 adverse effects, 251  
 disulfiram-like reaction with, 250  
 mechanism and adverse effects, 359  
 Sulfur granules, 126, 137  
 Sumatriptan  
 cluster headaches, 532  
 mechanism, use, and adverse  
 effects, 562  
 Sunburn, 492  
 Sunburst pattern (X-ray), 471  
 Superantigens, 133  
 causing shock, 131  
 Superficial burn, 493  
 Superficial partial-thickness burn, 493  
 Superficial peroneal nerve, 457  
 Superficial spreading melanoma, 494  
 Superior gluteal nerve, 457  
 Superior mesenteric artery/syndrome  
 embryology of, 364  
 intestinal obstruction with, **370**  
 Superior oblique muscle, 555  
 Superior parathyroids, 637  
 Superior rectus muscle, 555  
 Superior vena cava (SVC)  
 embryologic derivatives of, 285  
 Superior vena cava syndrome  
 cause, presentation and treatment,  
**702**  
 lung cancer, 702, 703  
 Pancoast tumor, 702  
 thymoma, 96  
 Supination  
 deficit in Erb palsy, 452  
 forearm, 450  
 Supine hypertension, 241  
 Supine hypotensive syndrome, 661  
 Supportive therapy, 590  
 Suppression (defense mechanism),  
 571  
 Suprachiasmatic nucleus, circadian  
 rhythm, 508  
 Supracondylar fracture, 450  
 Supraoptic nucleus  
 secretions of, 331, 508  
 Suprascapular nerve, 451  
 Supraspinatus muscle, 451, 452  
 Supraventricular tachycardia  
 adenosine for diagnosing, 328  
 $\beta$ -blockers, 244  
 Suramin, 153, 195  
 Surface ectoderm derivatives, 631  
 Surface F protein, 166  
 Surfactant synthesis  
 atelectasis with lack of, 699  
 thyroid hormone effects, 335  
 Surgical contraception, 675  
 Surgical neck of humerus, 458  
 Surrogate decision-maker, 269, 270  
 Survival motor neuron protein, 544  
 Survival over time estimates, 259  
 Sustained angiogenesis, 217  
 Suvorexant, 562  
 Swallowing  
 motor innervation, 516, 519  
 tongue movement in, 364, 519  
 Swan neck deformity, 472  
 Swarming, 178  
 Swarming motility, 143  
 Sweat  
 odor of, 82  
 Sweat glands, innervation of, 234  
 Sydenham chorea, 319  
 Sympathetic nervous system  
 denervation of face, 555  
 gastrointestinal innervation by, 371  
 male sexual response, 645  
 receptor targets, 234  
 Sympatholytics  
 $\alpha_2$ -agonists, **243**  
 $\alpha$ -blockers, **243**  
 $\beta$ -blockers, **244**  
 Sympathomimetics  
 actions and applications of, **241**  
 direct, 241  
 indirect, 241  
 micturition control, 236  
 physiologic effects of, **242**  
 Synaptophysin  
 tumor identification, 223, 542  
 Syncope  
 atrial tumors, 320  
 types and causes, **318**  
 with aortic stenosis, 295  
 with true ventricular aneurysm, 313  
 Syncytiotrophoblasts, 634, 651  
 Syndrome of apparent  
 mineralocorticoid excess  
 renal disorder features, 605  
 renal tubular defects, 604  
 Syndrome of inappropriate  
 antidiuretic hormone  
 secretion (SIADH)  
 aldosterone, 342  
 atrial natriuretic peptide, 342  
 brain natriuretic peptide, 342  
 characteristics, findings, treatment  
 and causes, 342  
 conivaptan, 360  
 diuretic use, 342  
 drugs causing, 248  
 paraneoplastic syndrome, 224  
 renal disorders feature, 605  
 Synergistic drug effects, 234  
 Synthase, 71  
 Syphilis  
 clinical significance, **145**  
 diagnosis, **146**  
 features of tertiary, 179  
 fetal infection, 180  
 heart disease with, 319  
 painless chancre (primary), 179  
 symptoms with secondary, 179  
 TORCH infection, 180  
 Syphilitic heart disease, **319**  
 Syringomyelia, **502**  
 Systemic amyloidosis, 208  
 Systemic juvenile idiopathic arthritis,  
**474**  
 Systemic lupus erythematosus  
 antiphospholipid syndrome and, 476  
 autoantibody, 113  
 glomerulonephritis with, 614  
 HLA subtypes, 99  
 mixed connective tissue disease,  
 476  
 presentation and findings, 476  
 Raynaud phenomenon, 480  
 Type III hypersensitivity, 111  
 Systemic mycoses  
 azoles, 195  
 caseous necrosis, 205  
 endemic location, pathologic  
 features, **149**  
 treatment, 194  
 Systemic primary carnitine  
 deficiency, 87  
 Systemic sclerosis, mixed connective  
 tissue disease, 476  
 Systemic vascular resistance, in  
 shock, 317  
 Systemic venous emboli, 301  
 Systolic dysfunction  
 heart failure with reduced ejection  
 fraction, 316  
 Systolic ejection, 291  
 Systolic heart murmurs, 295  
**T**  
 Tabes dorsalis  
 spinal cord lesions with, 544  
 syphilis, 145, 179  
 Tachyarrhythmia  
 isoproterenol for evaluating, 241

- thyroid storm, 346
- Tachycardia  
 $\beta$ -blockers for supraventricular, 244  
 narrow complex, 310  
 phenylephrine, 589  
 phenoxybenzamine for, 243  
 stimulants and, 588  
 thyroid hormones, 360  
 wide complex, 311
- Tachyphylactic drug effects, 234
- Tacrolimus  
 drug reactions with, 248  
 immunosuppression, 118
- Tadalafil, 245, 672
- Taenia solium*  
 disease, transmission and treatment, 157  
 neurocysticercosis, 158  
 praziquantel, 157
- Takayasu arteritis, 478  
 subclavian steal syndrome, 305
- Tamm-Horsfall mucoprotein, 612
- Tamoxifen  
 drug reactions with, 248  
 estrogen receptor modulator, 674  
 mechanism, use, and adverse effects, **446**
- Tamsulosin, 236, 243, **676**
- T- and B-cells  
 activation, **101**  
 costimulatory signal (signal 2), 101
- Tanner stage, 654
- Tardive dyskinesia  
 drugs causing, 250, 591  
 treatment, 564
- Target cells, 96, 420, 428
- Target plasma concentration, 231
- “Target sign” (imaging), 392
- Tarsal tunnel syndrome, 457
- Tartrate-Resistant Acid Phosphatase stain, 437
- Taste  
 cortical stroke, 526  
 cranial nerve lesions, 546  
 cranial nerve nuclei, 516  
 cranial nerves and, 519  
 drugs affecting, 191, 195  
 thalamic nuclei, 508  
 tongue development, 364
- TATA box, 40
- Taxane naming convention, 252
- Taxanes  
 mechanism, use, and adverse effects, 445  
 microtubule effects of, 46
- Tay-Sachs disease, 86
- Tazobactam  
 mechanism, 185  
*Pseudomonas aeruginosa*, with piperacillin, 141
- T-cell differentiation, 106
- T cells  
 activation, 101, 218  
 anergy, 101  
 cell surface proteins, 108  
 cytokine secretion, 106  
 cytotoxic, 100  
 diabetes mellitus, 351  
 differentiation of, 100  
 exhaustion/dysfunction, 218  
 functions of, 99, 415  
 glucocorticoid effects, 119  
 hypersensitivity reactions, 111  
 immunodeficiency disorders, 114  
 infections in immunodeficiency, 116  
 in thymus, 96  
 maturation, 94  
 neoplasms of, 435  
 regulatory, 100  
 spleen, 96  
 transplant rejections, 117
- Tea-colored urine, 430
- “Teardrop” RBCs, 420, 438
- Teeth  
 congenital syphilis, 145  
 dentinogenesis imperfecta, 49  
 discoloration, 188, 197, 249  
 opalescent teeth, 49  
 osteogenesis imperfecta, 49
- Telangiectasias  
 basal cell carcinoma, 494  
 hereditary hemorrhagic, **320**
- Telencephalon, 500
- Tellurite agar, 124
- Telomerase, **36**
- Telophase, 44
- Telotristat, 357
- Temazepam, 562
- Temperature control, mechanisms for, 299
- Temperature sensation, receptors, 504
- Temporal (giant) cell arteritis, 478
- Temporal lobe, 508
- Temporal lobe brain abscess, 176
- Temporomandibular disorders, 465
- Tenapanor, 408
- Tendinopathy (rotator cuff), 451
- Tendinous xanthomas, 92, 303
- Tendon damage, 249
- Tendons, collagen in, 48
- Tenecteplase (TNK-tPA), 442
- Teniposide, 445
- Tennis elbow, 462
- “Tennis rackets” (Birbeck) granules, 439
- Tenofovir, 604  
 drug reactions with, 250  
 HIV therapy, 198
- Tenosynovitis, 474
- Tension headaches, 532
- Tension pneumothorax  
 physical findings, 698  
 presentation and treatment, 700
- Tensor fascia latae muscle, 455
- Tensor tympani muscle, 638
- Tensor veli palatini muscle, 638
- Teratogenicity  
 ACE inhibitors for, 628  
 angiotensin II receptor blockers, 628  
 griseofulvin, 195, 197  
 in organogenesis, **632**  
 leflunomide, 496  
 lithium for, 592  
 medications, **632**  
 methimazole in pregnancy, 360  
 ribavirin, 197, 200  
 Vitamin A, 64  
 with anticonvulsants, 560
- Teratoma  
 hormone levels with, 671  
 immature, 664  
 sacrococcygeal, 670  
 testicular, 671
- Terazosin, 243, 672
- Terbinafine, **195**
- Terbutaline, 241
- Teres minor, 451
- Teriparatide, 497
- Terminal complement deficiencies (C5-C9), 105
- Terminal insomnia, 507
- Termination (protein synthesis), 43
- Tertiary hyperparathyroidism, 349
- Tertiary syphilis  
 findings with, 145  
 thoracic aortic aneurysms and, 304
- Tesamorelin, HIV-associated lipodystrophy, 332
- Testes  
 descent of, **642**  
 immune privilege, 97  
 mumps virus, 167
- Testicular atrophy  
 alcohol use disorder, 590  
 muscular dystrophy, 59
- Testicular cancer  
 hormone levels with, 671  
 serum tumor marker, 222
- Testicular germ cell tumors, serum markers for, 222
- Testicular lymphoma, 671
- Testicular torsion, **669**
- Testicular tumors  
 gynecomastia, 667  
 non-germ cell, 671  
 types and characteristics, **670**
- Testis-determining factor, 639
- Testosterone  
 in bilateral cryptorchidism, 669  
 inhibition of synthesis, 195  
 Leydig cell secretion, 646  
 mechanism, use, and adverse effects, 675  
 Sertoli cells, 646  
 source and function, 653
- Testosterone-secreting tumors, 656
- Tetanospasmin, 136
- Tetanospasmin effects, 130
- Tetanus (lockjaw), 182
- Tetanus toxin, 136
- Tetany  
 electrolyte disturbances, 609  
 hypocalcemia, 609  
 hypoparathyroidism, 348
- Tetrabenazine, 252, 574
- Tetracaine, 565
- Tetracyclines  
 drug reactions with, 249, 250  
 mechanism and clinical use, **188**  
 pregnancy contraindication, 197  
 protein synthesis inhibitors, 187  
 teratogenicity of, 188, 632
- Tetrahydrobiopterin (BH4)  
 deficiency, 82
- Tetrahydrofolates, 73
- Tetrahydrofolic acid (THF), 66
- Tetralogy of Fallot, 284, 300
- Tetrodotoxin, 246
- Tezacaftor  
 in cystic fibrosis, 58
- TGF- $\beta$   
 in acute inflammation, 210  
 in wound healing, 212  
 scar formation, **214**
- Th1 cells, cytokine secretion, 106
- Thalamus  
 functions and nuclei of, **508**  
 limbic system and, 509
- Thalassemia  
 gene deletions and clinical outcomes, 424  
 iron poisoning with, 431  
 target cells with, 420
- Thalidomide teratogenicity, 632
- Thayer-Martin agar, 124
- Theca interna cells, 646
- Theca lutein cysts, 659, 663
- Thecoma, 665
- Thelarche, 654
- Therapy muscles, 450, 453, 463
- Theophylline, 245, 704
- Therapeutic index, **233**
- Therapeutic privilege, 269
- Therapeutic window  
 lithium, 587  
 safety and, 233
- Thiamine, 64, 82. See also Vitamin B<sub>1</sub> (thiamine)
- Thiamine pyrophosphate (TPP), 64, 73
- Thiazide diuretics  
 drug reactions with, 249  
 electrolyte excretion effects, 625  
 for heart failure, 316  
 hypertension treatment, 321  
 mechanism, use, and adverse effects, **627**
- Thiazides  
 adverse effects, 251
- Thionamides, mechanism, clinical use and adverse effects, **360**
- Thiopurines, mechanism, use, and adverse effects, 444
- Thioridazine, 591
- Third-degree (complete) AV block, 312
- Thirst center, primary polydipsia and, **342**
- Thoracic aortic aneurysm, 304
- Thoracic outlet syndrome, 452, 703
- Threadworms, 156
- Threonine, 79
- Threonine kinase, 220
- Thrombin, 442
- Thrombocytes (platelets)  
 activation and function, **413**  
 disorders, **432**
- Thrombocytopenia  
 Class IA antiarrhythmics, 326  
 drugs causing, 249  
 ganciclovir, 196  
 linezolid, 189  
 recombinant cytokines, 119  
 Shiga toxin, 143  
 Wiskott-Aldrich syndrome, 115
- Thrombocytosis, 96, 474
- Thrombogenesis, **417**
- Thrombolytic drugs  
 naming conventions for, 253  
 tPA use as, 419
- Thrombolytics  
 mechanism, use, and adverse effects, **442**

- Thrombophilias, hereditary, **433**
- Thrombopoietin, clinical use, 119
- Thrombopoietin, signaling pathways, 341
- Thrombosis
- agents causing, 249
  - celecoxib for, 496
  - contraceptive and hormone replacement, 249
  - homocystinuria, 83
- Thrombotic microangiopathies, **432**, 660
- Thrombotic stroke, 525
- Thrombotic thrombocytopenic purpura, 432
- Thromboxane A<sub>2</sub> (TXA), 417
- Thrush
- Candida albicans*, 150
  - hairy leukoplakia vs, 487
  - in SCID, 115
  - nystatin, 194
- “Thumbprint” sign (imaging) colonic ischemia, 393
- “Thumb sign” (x-ray), 140
- “Thunderclap headache,” 530
- Thymic aplasia, defects, presentation, and findings, 114
- Thymic hyperplasia, 480
- Thymic shadow
- in severe combined immunodeficiency, 115
  - in thymic aplasia, 114
- Thymidine kinase, 196
- Thymidylate synthase (dTMP), inhibition of, 34
- Thymine
- in nucleotides, 33
  - production, 33
- Thymoma, 96
- myasthenia gravis and, 224, 480
- paraneoplastic syndromes, 224
- Thymus
- benign neoplasm, 96
  - derivation of, 637
  - immune system organs, **96**
  - T cell differentiation, 100
  - T cell origination in, 415
- Thymus-dependent antigens, 103
- Thymus-independent antigens, 103
- Thymus involution, 96
- Thyroglossal duct, 330
- Thyroglossal duct cyst, 330
- Thyroid adenoma, **346**
- Thyroid cancer
- diagnosis and treatment, **347**
  - metastasis, 219
  - undifferentiated/anaplastic carcinoma, 347
- Thyroid, carcinogens affecting, 221
- Thyroid carcinoma
- oncogenes, 220
- Thyroid development, **330**
- Thyroid disease, hypothyroidism vs hyperthyroidism, **344**
- Thyroidectomy, 347
- Thyroid follicular cells, 330
- Thyroid gland dysgenesis, 345
- Thyroid hormones
- in toxic multinodular goiter, 346
  - receptor acetylation, 32
  - source, function, and regulation, **335**
  - synergism with GH, 335
- Thyroidization of kidney, 619
- Thyroid peroxidase functions, 335
- Thyroid stimulating hormone (TSH) secretion of, 331
- Thyroid-stimulating immunoglobulin (TSI), in Graves disease, 335
- Thyroid storm, causes and findings, 346
- Thyroid storm,  $\beta$ -blocker use, 244
- Thyrotoxic myopathy, 344
- Thyrotoxicosis
- $\beta$ -adrenergic effects, 335
- Thyrotropin-releasing hormone (TRH)
- function, 332
- Thyroxine-binding globulin (TBC), 335
- Thyroxine (T<sub>4</sub>), 335, 343
- TIBC (total iron-binding capacity) lab values in anemia, 423
- microcytic anemia, 424
- Tibial nerve, 456, 457, 458
- Ticagrelor, 442
- Tidal volume (TV), 682
- Tigecycline, mechanism, use, and adverse effects, 188
- Tight junctions, 482, 506
- Tildrakizumab, 498
- Timolol, 244, 327, 568
- Tinea, 488
- Tinea capitis, 488
- Tinea corporis, 488
- Tinea cruris, 488
- Tinea pedis, 488
- Tinea unguium, 488
- Tinea versicolor, 488
- Tinel sign, 463
- Timidazole, 152
- Tinnitus
- quinidine and, 326
  - with aspirin, 496
- Tiotropium, 240, 704
- Tirofiban, 417, 442
- Tissue factor activation, 131
- Tissue invasion (cancer), 217
- Tissue mediators
- in wound healing, 212
- Tizanidine, 243, 567
- TNM staging system, **216**
- Tobacco smoking
- aneurism risks, 530
  - atherosclerosis and, 303
  - atypical antidepressants for cessation, 594
  - bupropion for cessation, 594
  - carcinogenicity of, 221, 703
  - cessation pharmacotherapies, **594**
  - effects of maternal smoking, **366**
  - esophageal cancer risk, 385
  - hypertension risk with, 302
  - lung cancer, 703
  - menopause onset, 653
  - pancreatic adenocarcinoma risk, 405
  - pulmonary fibrosis association, 694
  - renal cell carcinoma, 623
  - stomach cancer and, 386
  - teratogenic effects of, 632
  - transitional cell carcinoma, 624
- Tobramycin, 187
- Tocolytics, 241, **675**
- Tocopherol, 68
- Tocotrienol, 68
- Toddler development, 572
- Togaviruses, structure and medical importance, 164
- Tolbutamide, 359
- Tolcapone, 563
- Toll-like receptors (TLRs), 97, 210
- Tolterodine, 240
- Tolvaptan, clinical use, 342, 360
- Tongue
- development and innervation of, **364**
  - ectopic thyroid tissue in, 330
  - enlarged, 85
  - fissuring of, 474
  - movement in swallowing, 519
  - pharyngeal arch derivation, 638
  - ulcers, 149
- Tonic-clonic (grand mal) seizure, 531
- Tonic seizure, 531
- Tonsils
- immune system organ, 94
  - pharyngeal pouch derivation, 637
- Tophus formation, 473
- TOP II (DNA gyrase)
- etoposide/teniposide effects, 36
  - fluoroquinolones effects, 36
- Topiramate
- drug reactions with, 250
  - for migraine headaches, 532
  - mechanism and adverse effects, 560
- TOP IV
- fluoroquinolones effect, 36
- Topoisomerase I inhibitor
- naming convention for, 252
- Topoisomerase inhibitors
- mechanism, use, and adverse effects, **445**
  - naming conventions for, 252
- Topoisomerase (TOP) I
- irinotecan/topotecan action, 36
- Topotecan, 445
- TORCH infections, **180**
- Torsades de pointes
- causal agents for, 247
  - description and treatment, 311
  - electrolyte disturbances, 609
  - magnesium for, 328
  - with antiarrhythmics, 326, 328
- Torseamide, 626
- Torus (buckle) fracture, 467
- Total anomalous pulmonary venous return, 300
- Total lung capacity, 682
- Total peripheral resistance, 290
- Touch
- fine/light, 504
- Tourette syndrome
- presentation, 574
  - sympatholytics for, 243
- Toxic epidermal necrolysis
- HLA subtype association, 99
- Toxic epidermal necrolysis (TEN), 490
- Toxicity
- amelioration in chemotherapy, **447**
  - cardiovascular, 565
  - causes and treatments, **247**
  - endotoxins and exotoxins, 129
  - of aspirin, 496
  - seafood toxins, **246**
- Toxic megacolon
- Clostridioides difficile*, 136
  - inflammatory bowel disease, 389
- Toxic multinodular goiter, causes and findings, 346
- Toxic shock-like syndrome, 131, 134
- Toxic shock syndrome
- staphylococcal, 133
  - toxin, 131
- Toxin-mediated disease, 133
- Toxins
- Escherichia coli* strains, 143
  - exotoxins, 128
  - lysogenic phage encoding, 128
  - myocarditis with, 320
  - seafood (ingested), **246**
- Toxocara* spp, infection routes, 155
- Toxocara canis*
- disease, transmission and treatment, 156
- Toxoids, 108, 109, 129
- Toxoplasma* spp, brain abscess, 176
- Toxoplasma gondii*
- CNS infections, 153
  - in HIV positive adults, 173
  - TORCH infection, 180
- Toxoplasmosis
- prophylaxis, 199
  - pyrimethamine, 195
- TP53 gene
- gene product and condition, 220
  - mutations, 150
- tPA, stroke treatment, 525
- TPO receptor agonists, 432
- Tracheal deviation, 698
- Tracheoesophageal fistula (TEF), 366
- Tramadol, **567**
- drug reactions with, 250
- Transcription factor, 220
- Transcription factor motif, 69
- Transduction (bacterial genetics), 128
- Transference, **570**
- Transferrin
- acute phase reactants, 209
  - free radical injury, 206
  - indirect measure of, 423
  - iron study interpretation, 423
  - lab values in anemia, 423
- Transformation (bacterial genetics), 128
- Transformation zone (cervix)
- dysplasia, 663
  - histology of, 644
- Transfusion-associated circulatory overload, 112
- Transfusion reactions without fever, 112
- Transfusion-related acute lung injury, 112
- Transgender, 584
- Transient ischemic attack, 525
- Transitional cell carcinomas, 221, 624
- Transition mutation, 38
- Transjugular intrahepatic portosystemic shunt (TIPS), 372
- Transketolase
- vitamin B<sub>1</sub> and, 64
- Translocations

- Burkitt lymphoma, 435  
 Down syndrome, 61  
 follicular lymphoma, 435  
 in protein synthesis, 43  
 Mantle cell lymphoma, 435  
 Robertsonian, 61  
 spectral karyotyping, 53  
 Transpeptidase inhibitor, naming conventions, 252  
 Transpeptidases, 122  
 Transplants  
 immunosuppressants, 118  
 rejection types, pathogenesis and features, 99, **117**  
 Transposition of great arteries, 284, 302  
 Transposon (bacteria), 129  
 Transtheoretical model of change, **586**  
 Transthyretin, 209  
 Transthyretin amyloidosis, 208  
 Transudate, pleural effusion, 699  
 Transversalis fascia, 377  
 Transversion mutation, 38  
 Transversus abdominis, 456  
 Tranlycypromine, 593  
 Trapezium bone, 453  
 Trapezoid bone, 453  
 TRAP (tartrate-resistant acid phosphatase), tumor identification, 223  
 Trastuzumab, 247, 446  
 Trauma and stress-related disorders, **581**  
 Trauma-induced hearing loss, 548  
 Trauma-informed care, **272**  
 Traumatic aortic rupture, **305**  
 Traumatic pneumothorax, 700  
 Travelers' diarrhea, 143, 175  
 Trazodone, mechanism, use, and toxicity, 594  
 Treacher Collins syndrome, 638  
 "Tree bark" appearance, 319  
 Trematode infections, disease, transmission and treatment, **157**  
 Trematodes, **157**  
 Tremor  
 immunosuppressants, 118  
 intention, 524, 533  
 resting, 524  
 types of, 533  
 Trench fever, 158  
*Treponema* spp  
 dark-field microscopy, 144  
 Gram stain for, 123  
*Treponema pallidum*  
 sexual transmission, 179  
 syphilis, 145  
 Triamterene, 627  
 Triazolam, 562  
 Tricarboxylic acid cycle (TCA)  
 ethanol metabolism, 70  
 metabolic site, 72  
 products and cofactors, **75**  
 pyruvate metabolism, 75  
 rate-determining enzyme for, 71  
 Triceps reflex, 523  
 Triceps surae, 457  
*Trichinella spiralis*, disease, transmission and treatment, 156  
*Trichomonas* spp  
 metronidazole, 191  
 vaginitis, 178  
 Trichinosis, 156  
*Trichomonas vaginalis*  
 sexually transmitted infection, 179  
 signs/symptoms, 178  
 transmission and treatment, 155  
 Trichomoniasis, 179  
*Trichophyton* spp, 488  
 Trichotillomania, 580  
*Trichuris trichiura*, transmission and treatment, 156  
 Tricuspid atresia, 284, 300  
 Tricuspid regurgitation, 291  
 heart murmur with, 295  
 Tricuspid valve closure, 291  
 Tricyclic antidepressants  
 drug reactions with, 250  
 mechanism, use, and adverse effects, **593**  
 multiple sclerosis treatment, 537  
 naming conventions for, 252  
 overdose and treatment, 587  
 torsades de pointes, 247  
 toxicity treatment, 247  
 Trientine  
 Wilson disease, 402  
 Trifluoperazine, 591  
 Trigeminal nerve (CN V)  
 functions of, 519  
 lesions of, 546  
 neuralgia, **532**  
 Triglycerides  
 acute pancreatitis, 404  
 familial dyslipidemias, 92  
 pancreatitis, 92  
 transport and metabolism, 91  
 Von Gierke disease, 85  
 Trihexyphenidyl, 240, 563  
 Triiodothyronine (T<sub>3</sub>), 335  
 Trimethoprim-sulfamethoxazole (TMP-SMX)  
 for *Pneumocystis jirovecii*, 151  
 mechanism, use, and adverse effects, 190  
 prophylactic use, 193  
 Trimethoprim (TMP)  
 mechanism, use, and adverse effects, **190**  
 purine and pyrimidine synthesis, 34  
 Trimming (protein synthesis), 43  
 Trinucleotide repeat expansion diseases, 54, 60  
 Triphalangeal thumbs, 426  
 Triple-blind study, 257  
 "Triple bubble" (X-ray), 366  
 Triptans  
 for migraine headaches, 532  
 mechanism, use, and adverse effects, **562**  
 Triquetrum bone, 453  
 Trismus (lockjaw), 130  
 Trisomies (autosomal)  
 horseshoe kidney with, 597  
 myotonic dystrophy, 59  
 ventral wall defect association, 365  
 Trisomy 13 (Patau syndrome)  
 findings, 61  
 omphalocele association with, 365  
 Trisomy 18 (Edwards syndrome)  
 findings, 61  
 omphalocele association with, 365  
 Trisomy 21 (Down syndrome)  
 findings, 61  
 tRNA, structure and charging, **42**  
 Trochlear nerve (CN IV)  
 damage to, 556  
 function and types, 519  
 ocular motility, 555  
 palsy, 558  
*Tropheryma whipplei*  
 GI disease with, 388  
 stain for, 123  
 Trophozoite ring, 154  
 Tropical sprue, **388**  
 Tropicamide, organ system and applications, 240  
 Troponins  
 levels with angina and MI, 306  
 MI diagnosis, 309  
 muscle contraction, 459  
 Trousseau sign, 348, 609  
 Trousseau syndrome  
 description, **224**  
 pancreatic cancer, 405  
 "True" diverticulum, 390  
 True-negative rate, 260  
 True-positive rate, 260  
 True ventricular aneurysm, 313  
 Truncal ataxia, with medulloblastoma, 542  
 Truncus arteriosus, 285  
*Trypanosoma brucei*  
 CNS infections, 153  
 treatment, 195  
*Trypanosoma cruzi*  
 nifurtimox for, 195  
 visceral infections, 155  
 Trypanosomes, stains for, 123  
 Trypomastigote, 153  
 Trypsin, 380  
 Trypsinogen, secretion of, 380  
 Tryptase, 414  
 Tryptophan, 35, 79  
 TSC1/TSC2 genes, product and associated condition, 220  
 TSST-1, 133  
*t*-test, 267  
 T-tubule membrane, 459  
 Tuberculous leprosy, 139  
 Tuberculosis  
 description, **138**  
 erythema nodosum, 492  
 psoas abscess with, 463  
 Tuberin protein, 220  
 Tuberoeruptive xanthomas, 92  
 Tuberoinfundibular pathway, 509  
 Tuberos sclerosis  
 chromosome association, 62  
 Tuberos sclerosis (TSC1 and TSC2)  
 characteristics of, 539  
 chromosomal abnormality, 62  
 Tubo-ovarian abscess, pelvic inflammatory disease, 181  
 Tubuloglomerular blood flow, 600  
 Tularemia, 147  
 Tumor identification  
 chromogranin, 223  
 immunohistochemical stains, **223**  
 S-100, 494  
 serum markers, **222**

- cell-mediated, 99  
 Type IV hypersensitivity reaction  
 cell-mediated, 111  
 contact dermatitis, 485  
 graft-versus-host disease, 117  
 Typhoid fever, 142  
 Typhus, 147, 148  
 Tyrosinase, 484  
 Tyrosine catabolism/catecholamine  
 synthesis, 81  
 Tyrosine in phenylketonuria, 82  
 Tyrosine kinase  
 BTK gene and, 114  
 endocrine hormone signaling  
 pathways, 341  
 in cell growth, 212  
 inhibitor naming convention, 254  
 in multiple endocrine neoplasias,  
 356  
 in oncogene function, 220  
 insulin receptor binding, 338, 358  
 Tzanck test, 163  
 TVC sequence, 42
- U**
- UBE3A (Chromosome 15), 56  
 Ubiquitination, 43  
 Ubiquitin-proteasome pathway/  
 system, 46, 202  
 UDP-glucuronosyltransferase, 401  
 Ulcerative colitis  
 autoantibody, 113  
 HLA subtype and risk, 99  
 manifestations of, 389  
 spondyloarthritis association with,  
 475  
 sulfasalazine for, 407  
 Ulcers  
 painless (genital), 146  
 Ulcers (gastrointestinal)  
 bismuth/sucralfate for, 406  
 complications, **387**  
 Curling, 386  
 Cushing, 386  
 extent of, 369  
 flask-shaped, 152  
 obstruction of GI tract, 387  
 palatal/tongue, 149  
 Ulcers (skin)  
 characteristics/examples, 483  
 Raynaud syndrome and, 480  
 squamous cell carcinoma, 494  
 Ulipristal, 675  
 Ulnar claw, 450, 454  
 Ulnar finger deviation, 472  
 Ulnar nerve, injury and presentation,  
 450, 454  
 Umbilical cord  
 blood flow in, **636**  
 late separation of, 115  
 postnatal derivative of arteries, 286  
 umbilical vein postnatal derivative,  
 286  
 Umbilical hernia, congenital, 365  
 Umbilicus, portosystemic  
 anastomosis, 372  
 UMP synthase, 426  
 Unambiguous genetic code, 35  
 Unbalanced translocations, 62  
 Uncal transtentorial herniation, 543  
 Uncinate process, 367  
 Unconjugated (indirect)  
 hyperbilirubinemia, 400  
 Uncoupling proteins, 76  
 Undifferentiated/anaplastic thyroid  
 carcinoma, 347  
 Undulant fever, 141, 147  
 “Unhappy triad” (knee injuries), 464  
 Unilateral periorbital swelling, 155  
 Unilateral renal agenesis, 597  
 Uniparental disomy, 55  
 Universal electron acceptors, **73**  
 Universal genetic code, 35  
 Unnecessary procedure requests, 274  
 Unstable angina  
 ECG with, 306  
 manifestations of, 306  
 treatments, 314  
 Unvaccinated children  
*H influenzae* meningitis in, 176  
 organisms affecting, **182**  
 Upper extremities  
 nerve injury and presentation,  
**450–498**  
 neurovascular pairing in, 458  
 Upper motor neuron  
 Babinski sign in adults, 523  
 effects of injury, 543  
 facial nerve lesion, 546  
 facial paralysis, 526  
 in amyotrophic lateral sclerosis,  
 544  
 in cerebral palsy, 545  
 lesion signs in, 543  
 pathways of, 522  
 Urachal cyst, 636  
 Urachus, 286, 636  
 Uracil  
 in nucleotides, 33  
 methylation of, 33  
 Urea breath test, *Helicobacter pylori*  
 diagnosis, 144  
 Urea cycle  
 amino acids in, **80**  
 metabolic site for, 72  
 ornithine transcarbamylase  
 deficiency, **80**  
 rate-determining enzyme, 71  
*Ureaplasma* spp, Gram stain for, 123  
 Urease-positive organisms  
 list of, **125**  
 Uremia, 621  
 Uremic platelet dysfunction, 432  
 Ureteric bud, 596  
 Ureteropelvic junction  
 development of, 597  
 Ureters  
 congenital obstruction, 596  
 course of, **599**  
 damage in gynecologic procedures,  
 599  
 Urethra  
 BPH and, 672  
 genitourinary trauma, 645  
 Urethritis  
 chlamydia, 179  
*Chlamydia trachomatis*, 146  
 Urgency incontinence, 618  
 drug therapy for, 240  
 treatment, 236  
 Uric acid  
 kidney stones, 617  
 Lesch-Nyhan syndrome, 35  
 Von Gierke disease, 85  
 Uridine monophosphate, 426  
 Uridine triacetate, 426  
 Urinalysis  
 acute cystitis, 619  
 in renal tubular acidosis, 611  
 with kidney injury, 620  
 Urinary incontinence  
 drug therapy for, 240  
 ephedrine for, 241  
 mechanism, associations and  
 treatment, **618**  
 Urinary retention  
 atropine for, 240  
 bethanechol, 239  
 bethanechol for, 236  
 delirium, 575  
 neostigmine for, 239  
 sympathetic activity, 236  
 treatment, 236  
 Urinary tract infections  
 antimicrobial prophylaxis, 193  
 BPH, 671  
 catheterization, 181  
 enterovesical fistulae, 389  
 nosocomial, 143  
 organisms causing, **178**  
 Urinary tract obstruction  
 hydronephrosis with, 618  
 pyelonephritis, 619  
 Urinary urgency/ incontinence  
 treatment of, 241  
 Urine  
 cast types and significance, **612**  
 dark, 105  
 drug elimination in, 231  
 odor of, 82  
 polydipsia and DI, 342  
 port-wine colored, 430  
 red/orange crystals in, 35  
 tea-colored, 430  
 turns black on air exposure, 82  
 weak acids, 231  
 weak bases, 231  
 Urine protein electrophoresis, in  
 plasma cell dyscrasias, 436  
 Urobilinogen  
 extravascular hemolysis, 427  
 intravascular hemolysis, 428  
 Urogenital sinus, 639  
 Uromodulin, 612  
 Uroporphyrin, 430  
 Urosepsis, 619  
 Urothelial carcinoma (bladder), **624**  
 Urticaria  
 dermatologic terms, 483  
 mast cell degranulation, 485  
 scombroid poisoning, 246  
 sulfa drug allergies, 251  
 Urticarial (allergic) reaction, 112  
 Ustekinumab, 498  
 Uterine conditions  
 neoplastic, 666  
 non-neoplastic, 666  
 Uterine cycle, 650  
 Uterine (Müllerian duct) anomalies,  
**640**  
 Uterine proclivita, 643  
 Uterine rupture, **658**  
 Utero-ovarian ligament, 643  
 Uterosacral ligament, 643  
 Uterus  
 anomalies of, **640**  
 collagen in, 48  
 epithelial histology, 644  
 zygote implantation, 651  
 Uterus didelphys, 640  
 Uveitis  
 anterior, 474  
 glaucoma, 551  
 inflammatory bowel disease, 389  
 in sarcoidosis, 695  
 seronegative spondyloarthritis, 475  
 types of, **553**  
 U wave in ECG, 297
- V**
- $V_{max}$ , 228  
 V1-receptors, 333, 341  
 V2-receptors, 333, 341, 360  
 Vaccination/vaccines  
 B-cell disorders, 114  
*Bordetella pertussis*, 141  
 dengue virus, 168  
 Ebola contacts, 169  
*Haemophilus influenzae*, 140  
 influenza, 166  
 meningococci, 140  
 mRNA, 109  
 mumps virus, 167  
 pneumococcal, 96, 134  
 postsplenectomy, 96  
 PPSV23, 103  
 rabies virus, 169  
 refusal of, 275  
 rotavirus, 165  
*Salmonella typhi* (ty-V1), 142  
 toxoids as, 129, 137  
 vaccine types, **109**  
 yellow fever, 168  
 Vagal nuclei, **516**  
 Vagina  
 anaerobic bacteria overgrowth, 147  
 candidiasis treatment, 194  
 common infections, **178**  
 epithelial histology, 644  
 postcoital bleeding, 663  
 tumors of, **662**  
 Vaginitis, 155, 178, 179  
 Vaginosis (bacterial), 178  
 Vagus nerve (CN X)  
 cardiac glycoside effects, 326  
 diaphragm innervation, 681  
 functions of, 519  
 gastrointestinal innervation by, 371  
 lesions of, 546  
 pharyngeal arch derivation, 638  
 Valacyclovir  
 mechanism and use, 196  
 Valganciclovir  
 mechanism and use, 196  
 Valgus stress test, 454  
 Validity (accuracy), 261, 267  
 Valine  
 classification of, 79  
 maple syrup urine disease, 79  
 Valproate  
 cytochrome P-450 interaction, 251  
 drug reactions with, 248  
 for migraine headaches, 532  
 mechanism and adverse effects, 560

- pancreatitis with, 248  
 Valsalva maneuver, 294, 669  
 Valsartan, 628  
 Valvular disease  
   pressure-volume loops with, **292**  
   types of anomalies, 284  
 Valvular heart disease  
   carcinoid tumors and, 357  
 Vancomycin  
   DRESS with, 249  
   drug reactions with, 247, 249  
   infusion reaction, 247  
   mast cell degranulation, 414  
   mechanism and clinical use, **186**  
   prophylactic use, 193  
 Vancomycin-resistant enterococci  
   healthcare associated infections,  
   135  
 Vanishing bile duct syndrome, 117  
 Vardenafil, 245  
 Varenicline, use and toxicity, 594  
 Variable expressivity, 54  
 Variable vessel vasculitis, 479  
 Variance, 265  
 Variant CJD, 174  
 Varicella zoster virus  
   HHV-3 transmission and clinical  
   significance, 162  
   immunodeficient patients, 116  
   rash and clinical presentation, 177  
   skin infections, 487  
   vesicles with, 483  
 Varices  
   acute GI bleeding with, 387  
   anorectal, 372  
    $\beta$ -blocker use for bleeding, 244  
   esophageal, 372  
   gastrointestinal system, 372  
 Varicocele, **669**  
 Varus stress test, 454  
 Vasa previa, 657  
 Vasa vasorum (syphilis), 145  
 Vascular dementia, 535  
 Vasculitides, **478, 479**  
   extrahepatic manifestations of  
   hepatitis, 171  
   granulomatous inflammation, 213  
   intraparenchymal hemorrhage, 528  
   risk with hepatitis B and C, 171  
 Vasculopathy, noninflammatory, 481  
 Vasoactive intestinal polypeptide  
   (VIP), source and action  
   of, 378  
 Vasodilators  
   aortic dissection and, 305  
   nitrates as, 322  
 Vasogenic edema (cerebral), 525  
 Vasopressin  
   in septic shock, 333  
   in SIADH, 342  
   second messenger functions, 237  
   secretion of, 331  
 Vasopressors, 290  
 Vasospastic angina, 306  
 Vasovagal syncope, 318  
 VATER/ACTERL defects, 366  
 VCAM-1 protein, 211  
 V(D)J recombination, 97  
 VDJ recombination defect, 115  
 VDRL test  
   false positive results, 146  
   syphilis, 145  
 Vector-borne illnesses, 148  
 Vecuronium, 566  
 Vegetations, 318  
 Vegetative state, 529  
 VEGF, 212  
 Velocardiofacial syndrome, 114  
 Velpatasvir, 200  
 Vemurafenib, 447, 494  
 Venlafaxine, 580, 581, 593  
 Venous drainage  
   reproductive organs, 642  
 Venous return, 290  
 Venous sinus stenosis–induced  
   intracranial hypertension,  
   **536**  
 Venous sinus thrombosis (dural), **514**  
 Venous ulcer (lower extremity), **491**  
 Ventilation (lungs), **683**  
 Ventilation/perfusion mismatch, **685**  
 Ventilator-assisted life support, **270**  
 Ventral (abdominal) wall defects, **365**  
 Ventral anterior nucleus (thalamus),  
   508  
 Ventral lateral nucleus (thalamus), 508  
 Ventral optic radiation (Meyer loop),  
   557  
 Ventral posterolateral nucleus  
   (thalamus), 508  
 Ventral posteromedial nucleus  
   (thalamus), 508  
 Ventral tegmentum, 505  
 Ventricles (heart)  
   embryologic development of, 285  
 Ventricular action potential, 296  
 Ventricular aneurysm, true, 308  
 Ventricular end-diastolic volume  
   (EDV), 288  
 Ventricular fibrillation, 311  
 Ventricular filling  
   early diastole, 291  
   ECG and, 297  
 Ventricular free wall rupture, 313  
 Ventricular myocytes, 297  
 Ventricular noncompliance, 291  
 Ventricular pseudoaneurysm, 313  
 Ventricular septal defect  
   congenital, 301  
   cri-du-chat syndrome, 62  
   Down syndrome, 302  
   heart murmur with, 295  
   morphogenesis, 285  
 Ventricular system (CNS), **515**  
 Ventricular tachycardia, description  
   and treatment, 311  
 Ventriculomegaly (brain), 536  
 Ventromedial nucleus (hypothalamus)  
   leptin effects on, 340  
   satiety, 508  
 Verapamil  
   antiarrhythmic effects of, 328  
   headache therapy, 532  
   mechanism, use, and adverse  
   effects, 323  
 Verrucae, 485  
 Verrucous lesions, 149  
 Vertebral compression fractures, 467  
 Vertebral landmarks, for  
   gastrointestinal innervation,  
   371  
 Vertebrobasilar insufficiency,  
   subclavian steal syndrome,  
   305  
 Vertical gaze palsy, 542  
 Vertigo  
   peripheral vs central, **549**  
   subclavian steal syndrome, 305  
 Very-long-chain fatty acids (VLCFA)  
    $\beta$ -oxidation, 46  
 Vesicles  
   characteristics/examples, 483  
   dermatitis herpetiformis, 490  
   herpes simplex virus-2, 180  
   varicella zoster virus, 162, 487  
 Vesicourachal diverticulum, 636  
 Vesicoureteral reflux, **598**, 618  
 Vesicular monoamine transporter  
   (VMAT), 564  
 Vesicular tinea pedis, 488  
 Vesicular trafficking proteins, 45  
 Vestibular schwannomas, 539  
 Vestibulocochlear (CNVIII), function  
   and type, 519  
 VHL gene  
   deletion of, 539  
   product and associated condition,  
   220  
 Vibration sense  
   high-frequency, 504  
   low-frequency, 504  
   thalamic relay of, 508  
*Vibrio cholerae*  
   clinical significance, **144**  
   toxin in, 130  
   watery diarrhea, 175  
*Vibrio parahaemolyticus*, 174  
*Vibrio vulnificus*, 144, 174  
 Vilazodone, 594  
 Vimentin  
   cytoskeletal element, 46  
   tumor identification, 223  
 Vinblastine, **445**  
 Vinca alkaloids  
   mechanism, use, and adverse  
   effects, 445  
   microtubule effects of, 46  
 Vincristine  
   drug reactions with, 250  
   mechanism, use, and adverse  
   effects, 445  
   toxicities of, 445  
 Vinyl chloride carcinogenicity, 221,  
   486  
 Violaceous facial erythema, 477  
 Violaceous lesions, 318  
 “Violin string” adhesions, 181  
 VIPomas  
   MEN1 syndrome, 356  
   octreotide for, 407  
   regulatory substances, 378  
 Viral Antigen Test (RAT), 169  
 Viral DNA polymerase inhibitor,  
   naming conventions, 252  
 Viral infections  
   anemias with, 427  
   constrictive pericarditis with, 319  
   enteritis, 388  
   of skin, 487  
   Reye syndrome association, 398  
   T-cell deficiencies, 116  
 Viral structures  
   envelopes, **160**  
   general features, **159**  
   genomes, **160**  
 Virchow node, 386  
 Virchow triad, 321  
 Viridans group streptococci  
   biofilm production, 126  
   characteristics of, **134**  
   hemolysis, 133  
   normal microbiota, 174  
   subacute infective endocarditis,  
   318  
 Virilization, 339  
 Virulence factors  
   *Bordetella pertussis*, 141  
   *Salmonella* vs *Shigella* spp, 142  
   *Staphylococcus aureus*, 133  
   *Streptococcus agalactiae*, 135  
   bacterial, **127**  
 Viruses  
   causing meningitis, 176  
   diarrhea, 175  
   genetic/antigenic shift/drift, 166  
   genetics, 159  
   infections in immunodeficiency,  
   116  
   myocarditis with, 320  
   receptors for, 163  
   stain for identification, 123  
   structure of, 159  
 Visceral leishmaniasis, 155  
 Viscosity (blood), 290  
 Vision disturbances  
   Alport syndrome, 615  
   cytomegalovirus, 162  
   drug-related, 250  
   glaucoma, **551**  
   *Toxocara canis*, 156  
 Vision, thalamic relay for, 508  
 Visual cortex, 508, 555  
 Visual field defects  
   drug-related, 250  
   saccular aneurysms and, 526  
   types of, **557**  
   with stroke, 526  
 Visual hallucinations, 576  
 Vital capacity, 682  
 Vitamin and mineral absorption, **381**  
 Vitamin A (retinol)  
   drug reactions with, 250  
   function, deficiency and excess, **64**  
   measles morbidity and mortality, 167  
   storage of, 374  
 Vitamin B<sub>1</sub> (thiamine)  
   alcohol use disorder, 590  
   functions and disorders, **64**  
   solubility, 63  
   Wernicke-Korsakoff syndrome, 590  
   Wernicke-Korsakoff syndrome  
   treatment, 590  
 Vitamin B<sub>2</sub> (riboflavin)  
   function and deficiency, **65**  
   pyruvate dehydrogenase complex,  
   74  
   solubility, 63  
 Vitamin B<sub>3</sub> (niacin)  
   function, deficiency and excess, **65**  
   pyruvate dehydrogenase complex,  
   74  
   solubility, 63  
 Vitamin B<sub>5</sub> (pantothenic acid)

- Vitamin B<sub>5</sub> (pantothenic acid) (*continued*)  
 function and deficiency, **65**  
 pyruvate dehydrogenase complex and, 75  
 solubility, 63
- Vitamin B<sub>6</sub> (pyridoxine), **65**  
 deficiency with isoniazid, 192  
 for sideroblastic anemia, 425  
 functions and deficiency, **66**  
 in homocystinuria treatment, 83  
 solubility, 63
- Vitamin B<sub>7</sub> (biotin), 66  
 activated carriers, 73  
 function and deficiency, **66**  
 pyruvate metabolism, 66  
 solubility, **63**
- Vitamin B<sub>9</sub> (folate), 66  
 absorption of, 381  
 anemia with deficiency, 426  
 depletion with anticonvulsants, 560  
 function and deficiency, **66**  
 in homocystinuria treatment, 83  
 solubility, 63
- Vitamin B<sub>12</sub> (cobalamin), **66**, 67  
 absorption of, 381  
 causes and effects of deficiency, 426  
 deficiency, 157, 158  
 function and deficiency, 67  
 homocystinuria treatment, 83  
 in small intestinal bacterial overgrowth, 393  
 malabsorption, 406  
 methylmalonic acidemia, 83  
 solubility, 63  
 subacute combined degeneration and, 544
- Vitamin C (ascorbic acid), 67  
 functions, deficiency and excess, **48**, **67**  
 in wound healing, 212  
 methemoglobin treatment, 247, 688  
 solubility, 63
- Vitamin D (calciferol), 68  
 functions, regulation, and deficiency/excess, **68**  
 hypocalcemia with, 348  
 in osteomalacia/rickets, 468  
 osteomalacia/rickets, 468  
 osteoporosis and, 467  
 production and functions, 607
- Vitamin deficiencies  
 chronic pancreatitis, 404  
 malabsorption syndromes, 388
- Vitamin E  
 abetalipoproteinemia treatment, 92  
 acanthocytes with, 420  
 deficiency in abetalipoproteinemia, 92  
 functions, deficiency, and excess, **68**  
 solubility of, 63
- Vitamin K  
 coagulation disorder, 431  
 deficiency and coagulation, 419  
 function and deficiency, **69**  
 vitamin E interaction, 68  
 warfarin toxicity treatment, 247
- Vitamin K–dependent coagulation, **419**
- Vitamins  
 dietary supplementation, **63**  
 fat soluble, **63**  
 water soluble, **63**
- Vitelline duct, **636**
- Vitelline duct cyst, 636
- Vitiligo, 484
- Vitreous body, collagen in, 48
- VKORC1 gene, 441
- VLCFA  
 in urine and plasma, 46
- VLDL (very low-density lipoprotein), 92
- VMAT inhibitor naming conventions, 252
- Volume contraction, from diuretics, 625
- Volume of distribution (Vd), 229
- Volumetric flow rate, 290
- Voluntary movement  
 spinal tracts for, 522
- Volvulus  
 Meckel diverticulum, 391  
 onchocerca, 155  
 types and presentation, **392**
- Vomiting  
 annular pancreas, 367  
 area postrema and, 506  
 biliary colic, 403  
 bilious, 366, 391  
 chemotherapy-induced, 506  
*Histoplasma capsulatum*, 173  
 in stroke, 526  
 MI signs, 308  
 nonbilious projectile, 366  
 posttussive, 130, 141, 182  
 toxic shock syndrome, 133  
 trichinosis, 156  
 vitamin C toxicity, 67
- Vomiting center  
 location and function, **506**  
 receptors input for, 506
- Von Gierke disease, 85
- Von Hippel-Lindau disease  
 chromosome association, 62  
 genetics and presentation, 539  
 tumor suppressor genes, 220
- Von Willebrand disease, 417, 433
- Voriconazole, 150, 195
- Vortioxetine, mechanism, use, and toxicity, 594
- Vulnerable child syndrome, **573**
- Vulva  
 carcinoma, 661  
 epithelial histology, 644
- Vulvar pathology, **661**
- Vulvovaginitis  
*Candida* spp, 178  
 opportunistic infection, 150
- W**
- Waardenburg syndrome, 484
- WAGR complex/syndrome, 624
- “Waiter’s tip,” 452
- Waiver (of informed consent), 269
- Waldenström macroglobulinemia  
 clinical features, 436
- “Walking pneumonia,” 148
- Wallenberg syndrome, 527
- Warburg effect, 217
- Warfarin  
 griseofulvin and, 195  
 heparin comparison, 441  
 mechanism, use, and adverse effects, 441  
 PT measurement, 431  
 reversal of, 442  
 teratogenicity of, 632  
 toxicity treatment, 247, 419
- Warm autoimmune hemolytic anemia, 429
- Warthin-Finkeldey giant cells, 167
- Warthin tumor, 383
- Washout period, 257
- Water aerosols, 181
- Waterhouse-Friderichsen syndrome, 140, 353
- Water restriction, as diabetes insipidus treatment, 342
- Watershed areas/regions  
 anterior spinal artery, 544  
 blood supply to, 206  
 cerebral arteries, **513**  
 colon, 370  
 femoral head, 469  
 ischemic stroke, 525
- Water-soluble vitamins, **63**
- Watery diarrhea. See Diarrhea
- Waxy casts (urine), 612
- WBC casts (urine), 612, 619
- Weakness  
 lumbosacral radiculopathy, 458  
 motor neuron signs, 543  
 spinal cord lesions, 544
- “Wear and tear” pigment, 225
- Weber syndrome, 526
- Weight gain  
 danazol, 675  
 with mirtazapine, 594
- Weight loss  
 chronic mesenteric ischemia, 393  
 diabetes mellitus, 350, 351  
 glucagonoma, 357  
*Histoplasma capsulatum*, 173  
 orlistat for, 407  
 pancreatic cancer, 404  
 polymyalgia rheumatica, 173, 477  
 renal cell carcinoma, 623  
 sleep apnea treatment, 697
- Weil disease, 145
- Werdnig-Hoffmann disease, 544. See Spinal muscular atrophy
- Wernicke encephalopathy, **64**, 590
- Wernicke-Korsakoff syndrome  
 alcohol use disorder, 590  
 brain lesions with, 524  
 Vitamin B<sub>1</sub> (thiamine), 64
- Wernicke (receptive) aphasia, 526, 529
- Western blot, 52
- Western blot tests  
 in HIV, 172  
 use, 51
- Western equine encephalitis  
 medical importance, 164
- West Nile virus, 164
- Wet beriberi, 64
- Wheals, characteristics/examples, 483, 485
- Whipple disease, 388
- Whipple triad, 357
- Whipworm, 156
- Whispered pectoriloquy, 698
- White blood cells (WBCs),  
 leukemias, 437
- White matter  
 demyelinating disorders, 538  
 in adrenoleukodystrophy, 46  
 multiple sclerosis, 537
- Whooping cough  
*Bordetella pertussis*, 141  
 pertussis toxin, 130
- Wickham striae, 492
- Wide complex tachycardias, **311**
- Wide splitting, 293
- Williams syndrome, **63**, 302
- Wilms tumor  
 chromosomal abnormality, 62  
 neuroblastomas vs, 354  
 tumor suppressor genes, 220
- Wilson disease  
 chromosome association, 62  
 copper metabolism, **402**  
 copper metabolism in, 49  
 free radical injury, 206
- Winged scapula  
 injury and deficits, 452  
 stab wounds, 452
- Winters formula, 609
- “Wire looping” of capillaries, 614
- Wiskott-Aldrich syndrome  
 defect, presentation, and findings, 115  
 inheritance, 59
- Wobble, in genetic coding, 35
- Wolff-Chaikoff effect, 335, 345, 346
- Wolffian (mesonephric) duct, 639
- Wolff-Parkinson-White syndrome, **310**
- Woolsorter’s disease, 135
- “Word salad,” 576
- Work of breathing, **682**
- “Worst headache of my life,” 530
- Wound healing  
 keratinocytes, 212  
 mediators and roles in, 212  
 phases and effector cells in, 212  
 platelet-derived growth factor, 212  
 zinc deficiency effects, 69
- Woven bone, 461, 468
- Wright effect (genetics), 55
- Wright-Giemsa stain, 413
- Wright stain  
 spirochetes, 144
- Wrist drop  
 lead poisoning, 425  
 with nerve injury, 450
- Wrist region  
 bones and fractures, **453**  
 injuries to, **463**
- Written advance directives, 269
- WT1 gene, product and associated condition, 220
- WT1/WT2 mutations, 624
- Wuchereria bancrofti*  
 disease, transmission and treatment, 156
- X**
- Xanomeline-trospium, **591**
- Xanthelasma, 303, 559
- Xanthine  
 in nucleotides, 33

- Xanthomas  
 familial dyslipidemias, 92  
 hyperlipidemia signs, 303  
 palmar, 92  
 tuberoeruptive, 92
- Xeroderma pigmentosum, 37
- Xerophthalmia, 64
- Xerosis cutis, 64
- Xerostomia, 239, 243, 474
- X-inactivation (lyonization), Barr  
 body formation, 59
- X-linked (Bruton)  
 agammaglobulinemia,  
 defects, presentation, and  
 findings, 114
- X-linked dominant inheritance, 57
- X-linked recessive disease  
 ornithine transcarbamylase  
 deficiency, 81
- X-linked recessive diseases  
 adenosine deaminase deficiency,  
 35  
 adrenoleukodystrophy, 46  
 agammaglobulinemia, 114  
 of  $\beta$ -oxidation, 46  
 G6PD deficiency, 428  
 glucose-6-phosphate dehydrogenase  
 deficiency, 77  
 hyper-IgM syndrome, 115  
 listing of, **59**  
 Menkes disease, 49  
 Wiskott-Aldrich syndrome, 115
- X-linked recessive inheritance, 57
- X-ray/imaging findings  
 bamboo spine, 475  
 Bird's beak sign, 383  
 bone-in-bone, 468  
 Codman triangle, 471  
 Coffee bean sign, 392  
 "Coin" lesion, 703  
 pencil-in-cup, 475  
 Steeple sign (x-ray), 167  
 String sign, 389  
 Sunburst pattern, 471
- X-rays (teratogenicity), 632
- Y**  
 Yellow fever, liver effects of, 374
- Yellow fever virus, 164  
 medical importance, **168**
- Yellow-tinged vision, 250
- Yersinia* spp, reactive arthritis, 475
- Yersinia enterocolitica*, 14, 175
- Yersinia pestis*, disease and  
 transmission, 147
- Yolk sac tumor  
 hormone levels with, 671  
 marker for, 664  
 ovarian, 664  
 serum tumor marker, 222  
 testicular, 671
- Z**  
 Zafirlukast, 704  
 Zaleplon, 562  
 Zanamivir, mechanism and use, **196**  
 Zellweger syndrome, 46  
 Zenker diverticulum, **391**  
 Zero-order elimination, 230  
 Zidovudine, 198  
 Ziehl-Neelsen stain, 123  
 Zika virus  
 medical importance of, **168**  
 Zika virus, medical importance, 164  
 Zileuton, 704  
 Zinc  
 function and deficiency effects, **69**  
 in wound healing, 212  
 Wilson disease treatment, 402  
 Zinc fingers, 69  
 Ziprasidone, 591  
 Zirconium cyclosilicate, 361  
 Zoledronate, 496  
 Zollinger-Ellison syndrome  
 duodenal ulcer, 387  
 effects and diagnosis, **357**  
 gastrin in, 378  
 MEN1 syndrome, 356  
 proton pump inhibitors for, 406  
 Zolpidem, 562  
 Zona fasciculata, 340  
 Zoonosis, 147  
 Zoonotic diseases, **147**  
 Zymogens, 380