Index

ABC family. *See* ATP-binding cassette family
abciximab, 334
absorbents, carbon dioxide, 126
absorption, 8
  age effects on, 21–22
  disease effects on, 20–21
  drug interactions involving, 37–38
  epidural, 13
  inhalation, 12, 13
  intramuscular, 11
  intrathecal, 13
  local anaesthetics, 160–161
  oral, 8–11
  rectal, 11
  subcutaneous, 11–12
  sublingual, 11
  transdermal, 12
acarbose, 349–350
ACE. *See* angiotensin-converting enzyme
acebutolol, 210, 212, 213
acetazolamide, 299–300
acetylation, 17, 18
acetylcholine (ACh), 168, 169–170
acetylcholine (ACh) receptors, 1–2, 3, 35, 168–169
  general anaesthetic agent interactions with, 95
  muscle relaxant interactions with, 170, 172, 173, 177
acetylcholinesterase (AChE), 168, 169–170. *See also* anticholinesterases
acetylcysteine, 148
acetylsalicylic acid. *See* aspirin
ACh. *See* acetylcholine
AChE. *See* acetylcholinesterase
aciclovir, 326
acid fast bacilli, 301–302
action potential, 156, 157, 217, 218
activated partial thromboplastin time (APTT), 337
active transport, 3–4, 14
acupuncture, 274
adenosine, 221–222
adenylyl cyclase, 26–28
administration routes, 8–13
ADP binding inhibitors, 333–334
adrenal suppression, 356
adrenaline, 12, 13, 35, 39–40, 191, 192, 193, 194
adrenergic neurone blockade, 249–250
adrenoceptor. *See* α-adrenoceptor; β-adrenoceptor
adrenosteroid hormones, 29
affinity, 30–31
agonists, 30–31, 32
albumin, 6–7, 288–289
albumin solutions, 287, 288–289
alcohol dehydrogenase, 17
alcohol use, 293–294
aldosterone, 42
aldosterone antagonists, 298
alfentanil, 6, 68, 133, 136–137
algae, 301, 302
allergy, penicillin, 312
allosteric modulators, 34
alogliptin, 351–352
alpha glucosidase inhibitors, 349–350
α_1 acid glycoprotein, 6–7
α_1-agonists, 196–198, 201–202
α_2-agonists, 250–252
α-adrenoceptor, 192, 193, 195, 196, 208
α-adrenoceptor antagonists, 207, 208
  combined β and, 215–216
  drug interactions of, 39
  non-selective, 207–209
  selective α_1, 209
  selective α_2, 209–210
alteplase (rt-PA), 343
aluminium-containing antacids, 275
alveolar ventilation, 110
amethocaine, 12, 162, 166
amikacin, 313–315
amiloride, 298
amino acids, 81
aminoglycosides, 307, 309, 313–315, 323–324
aminophylline, 202–204
aminosteroids, 84–85, 177
amiodarone, 4, 37–38, 226–227
amitriptyline, 258–259
amoxicillin, 304, 309–310
amphenicols, 315
amphotericin, 329
amphotericin B, 329–330
ampicillin, 304, 309–310
anaesthetic agents. *See also* general anaesthetic agents; local anaesthetics
  diffusion rate of, 5
  lipid solubility of, 93, 94, 158
analgesics, 15–16, 127, 128. *See also* disease modifying anti-rheumatic drugs; non-steroidal anti-inflammatory drugs; opioids
andexanet alfa, 342
angiotensin II, 245–246
angiotensin II receptor antagonists (ARAs), 41, 248–249
angiotensin-converting enzyme (ACE), 17, 245
angiotensin-converting enzyme (ACE) inhibitors, 23, 41, 246–248, 249, 298
anidulofungin, 330
animal insulins, 347–348
ANS. *See* autonomic nervous system
antacids, 23, 275
antagonists, 30–35
anti-arrhythmics. *See also specific agents*
  classification of, 219
  for digoxin toxicity, 231–232
  mechanism of action of, 23
  physiology of, 217–219
  for SVT, 219–224
  for SVT and VT, 226–231
  for VT, 225–226

antibiotics, 304. *See also specific agents*
  agents disrupting cytoplasmic cellular membrane, 304–305, 319–320
  agents inhibiting cell wall synthesis, 304–305, 309–313
  agents inhibiting nucleic acid replication, 304–305, 320–323
  agents inhibiting protein synthesis, 304–305, 318
  combinations of, 307
  pharmacodynamics of, 306–307
  pharmacokinetics of, 305–306
  resistance to, 323–324
  therapeutic targets for, 304–305
anticholinergics, 270–272
anticholinesterases, 183
  carbamylated enzyme complex formation by, 184–186
  easily reversible inhibition by, 184
  irreversible inactivation by, 186–187
anticoagulants
  drug interactions of, 4, 145
  heparins, 335–337
  oral, 38, 338–342
anticonvulsants, 23, 38–39, 262. *See also specific agents*
antidepressants, 2–3, 261–262. *See also* monoamine oxidase inhibitors; selective serotonin reuptake inhibitors; tricyclic antidepressants
antidiabetic agents. *See* glucose lowering drugs; insulin
antiemetics, 266, 267. *See also specific drugs*
antifibrinolytics, 343–345
antifungal drugs, 328–330
antihistamines, 272–273
antihypertensives, 245–246. *See also specific drugs*
antimicrobials, 301. *See also* antibiotics
  antifungal drugs, 328–330
  antiviral drugs, 324–328
  bacteria targeted by, 301–302, 303
  fungi targeted by, 301, 302, 328
  viruses targeted by, 301, 302, 324, 325
antiplatelet drugs
  ADP binding inhibitors, 333–334
  COX-1 inhibitors, 332
  dextran, 70, 334–335
  epoprostenol, 335
  glycoprotein IIb/IIIa-receptor antagonists, 334
  platelet phosphodiesterase inhibitors, 332–333
antiport, 3, 4
antiretroviral drugs, 327–328
antiviral drugs, 324–328
anxiolytics. *See* hypnotics and anxiolytics
apixaban, 341, 342
apnoea, suxamethonium, 176–177
aprepitant, 274
aprotinin, 344
APTT. *See* activated partial thromboplastin time
ARAs. *See* angiotensin II receptor antagonists
arrhythmias. *See also* anti-arrhythmics; tachyarrhythmias
  bradyarrhythmias, 219
  local anaesthetic effects on, 160, 163
aspirin, 142
  absorption of, 8
  antiplatelet effects of, 332
  drug interactions of, 39
  effects of, 146
  ionization of, 6
  kinetics of, 143, 147
  mechanism of action of, 23, 146
  metabolism of, 17
  overdose of, 146–147
  side effects of, 143, 144–145
  structure of, 146
  uses of, 146
association constant (K_A), 29–31
asthma, NSAID-sensitive, 145
atazanavir, 328
atenolol, 210, 212, 213
atipamezole, 252
ATP-binding cassette (ABC) family, 3–4
atracurium, 17, 45, 60, 84, 180, 181–182
atrioventricular nodal re-entrant tachycardia, 218
atropine, 14, 271–272
autonomic nervous system (ANS), 189, 190, 191
azithromycin, 317
azoles, 330
aztreonam, 312

baclofen, 253
bacteria, 301–302, 303. *See also* antibiotics
bactericidal antibiotics, 306
bacteriostatic antibiotics, 306
baralyme, 126
barbiturates, 96, 97, 98. *See also specific agents*
  mechanism of action of, 94–95, 96
  structures of, 83, 84
BBB. *See* blood–brain barrier
BDZs. *See* benzodiazepines
bendroflumethiazide, 295–297
benzamides, 270
benzodiazepines (BDZs). *See also specific agents*
  anticonvulsant effects of, 264
  antiemetic effects of, 274
  drug interactions of, 39
  liver disease and, 21
  mechanism of action of, 24, 34, 253
  reversal of, 256
  structures of, 84, 254
  uses of, 253
benzylisoquinoliniums, 84, 177
benzylpenicillin, 304, 309–310
betamethasone, 355–358
β-adrenoceptor, 192, 193, 195, 196
β-adrenoceptor antagonists, 210. *See also specific agents*
  anti-arrhythmic effects of, 223–224
  combined α and, 215–216
  drug interactions of, 38, 39–40
  effects of, 211–212
  intrinsic sympathomimetic activity of, 210, 211
  kinetics of, 212, 213
  mechanism of action of, 34

membrane stabilizing activity of, 210, 211
receptor selectivity of, 210
β-agonists, 12, 26–28, 198–202
β-lactamase, 308–309, 310, 323
β-lactams, 305. *See also* penicillins
allergy to, 312
carbapenems, 311, 323
cephalosporins, 309, 310–311
monobactams, 312
resistance to, 323
bicarbonate solutions, 283, 289–290
biguanides, 350–351
biliary excretion, 19–20
binding, drug–receptor
dynamics of, 29–30
types of, 30–35
bioavailability, 9–10
bioavailable fraction (F_B), 9–10
biological agents, DMARDS, 155
birth, drugs at time of, 15–16
blood–brain barrier (BBB), 1, 3–4, 14
blood:gas partition coefficient, 110
body fluid compartments. *See* fluid compartments
bosentan, 243–244
Bowman's principle, 5
bradyarrhythmias, 219
Bristol model, 70–71
bronchodilators, 12
bumetanide, 297
bupivacaine, 6, 13, 15, 160, 162, 163, 164
buprenorphine, 31, 141, 142
butyrophenones, 269–270

calcium (Ca^{2+}), 37, 206, 291
calcium channel antagonists. *See also specific agents*
cardiovascular effects of, 239
classification of, 238
mechanism of action of, 23
pharmacological properties of, 240
vasodilator effects of, 238–241
calculus. *See* mathematical concepts
cAMP, 26–28
cannabinoids, 274
captopril, 246–247
carbamazepine, 263
carbapenems, 311, 323
carbimazole, 359–360
carbon dioxide (CO_2), 125, 126
carbonic anhydrase inhibitors, 299–300
carboprost, 362
cardiac action potential, 217, 218
cardiac output, 110
carrier proteins, 2–3
caspofungin, 330
catecholamines, 191
naturally occurring, 191–196
structures of, 82–83
synthetic, 196–202
cefotaxime, 309, 310–311
cefradine, 309, 310–311
ceftazidime, 309, 310–311
ceftriaxone, 309, 310–311
cefuroxime, 309, 310–311
celecoxib, 143, 151–152
cell membrane
antibiotics agents disrupting, 304–305, 319–320
factors influencing diffusion across, 5–7
general anaesthetic agent interactions with, 93–94
methods of drug passage across, 1–4
neuronal, 156, 157
receptors in, 24–29
structure of, 1, 2
cell wall synthesis, antibiotics agents inhibiting, 304–305, 309–313
cephalosporins, 309, 310–311
charcoal, 37–38
chelating agents, 23, 38
chemical properties, drug actions dependent on, 23
chemistry. *See* medicinal chemistry
chiral centres, 43–45
chloramphenicol, 315
chlordiazepoxide, 255–256
chloroprocaine, 166–167
chloroquine, 60
chlorothiazide, 295–297
chlorpromazine, 267–268, 269
cholinesterases, 18
cimetidine, 38–39, 275–276
cinchocaine. *See* dibucaine number
ciprofloxacin, 320–321
ciraparantag, 342
cisatracurium, 17, 43, 180, 182
Cl. *See* clearance
clarithromycin, 317
clavulanic acid, 310
clearance (Cl), 52–55, 59–60, 61–62
clindamycin, 318
clobazam, 84
clonidine, 13, 251–252
clopidogrel, 17, 34–35, 38–39, 333
CO_2. *See* carbon dioxide
coagulation, 331–332. *See also* anticoagulants; fibrinolysis; platelets
cocaine, 162, 166
codeine, 16, 85–86, 134–135
colistin, 319
colloids, 286, 287, 288–289
combined α- and β-adrenoceptor antagonists, 215–216
compartmental models, 47
multi-compartment, 53, 56–59
one-compartment, 48, 51, 52–55, 56
competitive antagonists, 33, 34
concentration, pharmacokinetic models of. *See* pharmacokinetic models
concentration effect, 112, 113
concentration gradient, 5
conjugation, 17
context-sensitive half-time (CSHT), 78–79
contraceptives, 360–361
corticosteroid receptors, 29
corticosteroids. *See* glucocorticoids
co-trimoxazole, 321
COX inhibitors. *See* cyclo-oxygenase inhibitors
creatinine clearance, 20
crystalloid solutions, 282, 283, 284–286
CSHT. *See* context-sensitive half-time
cyanide, 233–235
cyclizine, 272–273
cyclodextrins, 183, 187. *See also* sugammadex

cyclo-oxygenase (COX) inhibitors. *See also specific drugs*
COX-, 1, 332
kinetics of, 143
mechanism of action of, 141–144
non-specific, 142, 146–150
preferential COX-, 2, 142, 151
side effects of, 143, 144–145
specific COX-, 2, 142, 151–153
CYP3A, 4, 3–4
cytochrome P450 system, 16–17, 38–39, 110, 203
cytoplasmic cellular membrane, antibiotics agents disrupting, 304–305, 319–320

dabigatran, 4, 339–340, 341–342
DAG. *See* diacylglycerol
dalteparin, 337
dantrolene, 175–176
daptomycin, 319–320
darunavir, 328
DBS. *See* double burst stimulation
decrement time, 77
δ-receptor, 128, 129, 131
depolarising muscle relaxants (DMRs), 172–177
depot preparations, 11–12
desensitisation, 35
desflurane, 108–109, 111, 116, 117, 118, 119, 121–122
dexamethasone, 38–39, 274, 355–358
dexmedetomidine, 252
dextran, 70, 334–335
dextrose, 37
diabetes mellitus, 346. *See also* glucose lowering drugs
insulin use in, 346–349
peri-operative care for, 353–354
diacylglycerol (DAG), 28
diamorphine, 6, 16, 85–86, 132, 134
diastereoisomers, 45
diazepam, 10–11, 84, 255, 256
diazoxide, 242–243
dibucaine number, 176
diclofenac, 143, 149
dicobalt edetate, 23, 38, 234–235
differentiation (calculus), 51
diffusion. *See* facilitated diffusion; passive diffusion
diffusion hypoxia, 113
digoxin, 39–40, 219–220, 221, 224, 227, 231–232
digoxin-specific Fab, 221
dihydrocodeine, 42, 43, 134, 135
diltiazem, 239, 240, 241
dipeptidylpeptidase-4 inhibitors, 351–352
dipyridamole, 332–333
direct drug interactions, 39
direct factor Xa inhibitors, 340–342
direct thrombin inhibitors, 339–340, 341–342
disease modifying anti-rheumatic drugs (DMARDs), 154–155
disopyramide, 229–230
dissociation constant (K_D), 29–31
dissociative anaesthesia, 105
distal tubules, diffusion at, 19
distribution, 13–14
age effects on, 21–22
across blood–brain barrier, 14
disease effects on, 20–21
drug interactions involving, 38
to fetus, 14–16
local anaesthetics, 161
diuretics, 39–40, 247, 295, 296. *See also specific drugs*
DMARDs. *See* disease modifying anti-rheumatic drugs
DMRs. *See* depolarising muscle relaxants
dobutamine, 35, 42, 43, 199
dolutegravir, 328
domperidone, 270, 278
dopamine, 191, 192, 193, 195–196
dopamine antagonists
antiemetic effects of, 267–270
prokinetic effects of, 278
dopaminergic receptors, 193, 196
dopexamine, 199–200
DOP-receptor, 128, 129, 131
dose ratio, 33, 34
dothiepin, 258–259
double burst stimulation (DBS), 171, 172
doxycycline, 316
droperidol, 269–270
drug
binding by, 29–35
cell membrane passage by, 1–4
desensitisation to, 35
factors influencing diffusion of, 5–7
tachyphylaxis to, 35
tolerance to, 35–36
drug absorption. *See* absorption
drug design, 80
drug distribution. *See* distribution
drug excretion. *See* excretion
drug interactions, 37
isobolograms of, 40–41
PGP induction and inhibition, 4, 37–38
pharmaceutical, 37
pharmacodynamic, 39–41
pharmacokinetic, 37–39
drug mechanisms, 23
actions dependent on chemical properties, 23
enzyme inhibition, 23
receptor binding, 24–29
voltage-gated ion channel interactions, 23
drug metabolism. *See* metabolism
drug pharmacokinetics. *See* pharmacokinetic models
drug preparations, 45
enantiopure preparations, 45
mixtures of multiple, 46
racemic mixtures, 45
drug structures, 82
barbiturates, 83, 84
BDZs, 84
catecholamines and derivatives, 82–83
NDMRs, 84–85
opioids, 85–86
dulaglutide, 351
dynorphins, 131

echinocandins, 330
ecothiopate iodide, 186
edoxaban, 341, 342
edrophonium, 23, 184
efavirenz, 328
effect compartment, 59
efficacy, 30–31
elderly, absorption, distribution, metabolism and excretion in, 21–22
emergence phenomena, 105
EMLA. *See* eutectic mixture of local anaesthetic
enalapril, 16, 246–247, 248
enantiomers, 44–45
enantiopure preparations, 45
endorphins, 131
enflurane, 42, 111, 116, 117, 118, 119, 121
enkephalins, 131
enoxaparin, 337
enoximone, 28, 204–205
enteral nutrition, 293
enterohepatic circulation, 20
entonox, 111, 114
environmental impact, 104, 108–109
enzymes
  drug actions on, 23
  induction of, 18, 38–39
  inhibition of, 18, 23, 38–39
ephedrine, 35, 201–202
epidural administration, 13
epoprostenol, 335
eptifibatide, 334
ER. *See* extraction ratio
ergometrine, 362
ertapenem, 312
erythromycin, 317
esmolol, 210, 213, 214, 223–224
esterases, 17
ethanol, 17, 293–294
etomidate, 17, 94–95, 96, 102, 105, 106–107
etoricoxib, 143, 153
eukaryotes, 301, 302
eutectic mixture of local anaesthetic (EMLA), 12, 163–164
excretion, 19
  age effects on, 21–22
  biliary, 19–20
  disease effects on, 20–21
  drug interactions involving, 39
  renal, 19
exenatide, 351
exponential functions, 47–48, 49
extraction ratio (ER), 10–11
extravascular fluid volume, 280

facilitated diffusion, 2–3, 14
famciclovir, 326
famotidine, 277
F_B. *See* bioavailable fraction
felypressin, 13
fentanyl, 6, 12, 39, 78–79, 85–86, 131, 133, 135–136
fetus, drug distribution to, 14–16
fibrinolysis, 331, 332, 342–345
fibrinolytics, 342–343
Fick's law, 5
first-order kinetics, 51, 62, 63
first-pass metabolism, 9–10
flecainide, 227–228
fluconazole, 330
flucytosine, 330
fluid compartments, 280
  interstitial, 280
  intracellular, 280
  intravascular, 280
  movement between, 280–281
  in neonates and infants, 21
  two-compartment model for, 281–282
fluids, 282. *See also* intravenous fluids
flumazenil, 39, 256
fluoroquinolones, 320–321, 323
fluoxetine, 259–260
fondaparinux, 342
formulation, absorption rate and, 9
fosaprepitant, 274
foscarnet sodium, 327
FRC. *See* functional residual capacity
full agonists, 31, 32
fulminant hepatic necrosis, 121
functional residual capacity (FRC), 110
functionalization, 16–17
fungi, 301, 302, 328. *See also* antifungal drugs
furosemide, 297
fusidic acid, 321–322

GABA. *See* γ-aminobutyric acid
$GABA_A$ receptors, 2, 24, 94–95, 253
$GABA_B$ receptors, 253
gabapentin, 264–265
gallamine, 20
γ-aminobutyric acid (GABA), 253
γ-cyclodextrin, 23
ganciclovir, 327
gastric irritation, NSAID, 144–145
gastric motility, drugs influencing, 278
gastric secretion drugs, 275
  H_2 receptor antagonists, 275–277
  proton pump inhibitors, 277–278
gate theory of pain, 127, 128
gelatins, 286, 287
Gelofusine™, 286, 287
gene transcription, 29
general anaesthetic agents, 93. *See also* inhaled anaesthetic agents; intravenous anaesthetic agents
  anatomical sites of action of, 93
  $GABA_A$ receptor interactions of, 94–95
  glycine receptor interactions of, 95
  MAOI interactions with, 261
  membrane lipid interactions of, 93–94
  molecular theories on, 93–94
  NMDA receptor interactions of, 95, 96
  protein sites of action of, 94, 95
genetic polymorphism, 16–17, 18
gentamicin, 306, 313–315
geometric isomerism, 43
GI tract absorption, 8, 9–10
glibenclamide, 352–353
gliclazide, 352–353
glipizide, 352–353
gliptins, 351–352
globulins, 6–7
glomerulus, filtration at, 19

GLP- 1 agonists, . *See* glucagon-like peptide-1 receptor agonists
glucagon, 205–206
glucagon-like peptide-1 receptor (GLP-1) agonists, 351–352
glucocorticoid receptor (GR), 29
glucocorticoids, 355
  anti-inflammatory effects of, 355, 356
  immunosuppressive effects of, 356
  metabolic effects of, 355
  other effects of, 356–357
  peri-operative supplementation of, 357–358
glucose lowering drugs, 349. *See also* insulin
  alpha glucosidase inhibitors, 349–350
  biguanides, 350–351
  dipeptidylpeptidase-4 inhibitors and GLP-1 agonists, 351–352
  meglitinides, 352
  peri-operative, 353–354
  SGLT-2 inhibitors, 352
  sulfonylureas, 352–353
  thiazolidinediones, 353
glucose solutions, 283, 284–285
glucuronidation, 17
glutamate, 24–25
glyceryl trinitrate (GTN), 11, 37, 235–236
glycine receptor, 95
glycopeptides, 312–313, 323–324
glycoprotein IIb/IIIa-receptor antagonists, 334
glycoproteins, 1, 2
glycopyrrolate, 14
G-protein coupled receptors (GPCRs), 26–29
G-proteins, 26–29
GR. *See* glucocorticoid receptor
Graham's law, 5
gram-positive and gram-negative bacteria, 301–302, 303, 304
GTN. *See* glyceryl trinitrate
guanethidine, 249–250
guanylyl cyclase, 28
gut absorption, 8, 9–10
gylcopyrrolate, 271, 272

H_2 receptor antagonists, 275–277
HAART. *See* highly active antiretroviral therapy
haemostasis, 331. *See also* coagulation; fibrinolysis; platelets
  cell-based model of, 331–332
  classical model of, 331, 332
half-life ($t_{1/2}$), 48, 67
halothane, 111, 116, 117, 118, 119, 120–121
Hartmann's solution, 283, 284
HAS. *See* human albumin solutions
He. *See* helium
Heliox, 125
helium (He), 125
Hemaccel™, 286, 287
Henderson–Hasselbalch equation, 5–6
heparins, 335–336, 337
hepatic impairment, 20–21
hepatic metabolism. *See* metabolism
hepatotoxicity, 121, 145, 148
HES. *See* hydroxyethyl starch
hexobarbitone, 96
highly active antiretroviral therapy (HAART), 327–328
HIV infection, 327–328
Hofmann degradation, 17, 84, 181–182
hormone replacement therapy (HRT), 361
5-HT_3 antagonists, 273
5-HT_3 receptor, 24, 273
human albumin solutions (HAS), 287, 288–289
human insulins, 347–348
hydralazine, 18, 241–242
hydrocortisone, 355–358
hydroxychloroquine, 155
hydroxyethyl starch (HES), 287, 288
hyoscine, 271
hypertension. *See* antihypertensives
hyperthyroidism, 359–360
hypnotics and anxiolytics, 253, 258. *See also* benzodiazepines

IA. *See* intrinsic activity
ibuprofen, 143, 150
idarucizumab, 341–342
imidazoles, 330
imipenem, 311
imipramine, 258–259
indirect drug interactions, 39–40
induction
  enzyme, 18, 38–39
  PGP, 4, 37–38
infants. *See* neonates
infection. *See* antimicrobials
inhalation administration, 12, 13
inhaled anaesthetic agents, 13, 107. *See also specific agents*
  distribution of, 14
  environmental impact of, 108–109
  excretion of, 19
  ideal properties of, 107–108
  kinetics of, 109–110, 111, 112, 113
  MAC of, 107
inhibition
  enzyme, 18, 23, 38–39
  PGP, 4, 37–38
inositol triphosphate (IP_3), 28
input, drug, 55
INR. *See* international normalized ratio
inspired concentration, 110
insulin
  deficiency of or resistance to, 346
  drug interactions of, 37
  peri-operative, 353–354
  physiology of, 346–347
  preparations of, 347–348
  safe use of, 348–349
  side effects of, 349
  subcutaneous administration of, 11–12
insulin analogues, 347–348
insulin receptor, 28–29, 346–347
integrase inhibitors, 328
integration (calculus), 51–52
intermediate messengers, 26–29

intermediate-acting insulins, 348
international normalised ratio (INR), 339
interstitial fluid volume, 280
intra-arterial injection, 99–100
intracellular fluid volume, 280
intralipid, 163
intramuscular administration, 11
intrathecal administration, 13
intravascular fluid volume, 280
intravenous administration, 8
intravenous anaesthesia, 68–70. *See also* total intravenous anaesthesia
intravenous anaesthetic agents, 96. *See also* barbiturates; *specific agents*
  distribution of, 14
  ideal properties of, 96–97
intravenous fluids, 282
  bicarbonate solutions, 283, 289–290
  colloids, 286–290
  crystalloid solutions, 283, 282–286
  volume kinetics of, 281–282
intravenous minerals, 290–291
intravenous regional anaesthesia, 163
intrinsic activity (IA), 30–31
inverse agonists, 30–31
iodide, 360
ion channels, 1–2, 3
  of ACh receptors, 168–169, 170
  drug action on, 23, 24–26
  $GABA_A$ receptors, 253
  general anaesthetic agent interactions with, 94, 95
  local anaesthetic interactions with, 156, 157, 158
ion pumps, 3–4
ionization state, 5–6
ionotropic glutamate receptors, 24–25
ionotropic purinergic receptors, 26
IP_3. *See* inositol triphosphate
irreversible antagonists, 34–35
isobolograms, 40–41
isocarboxazid, 260
isoflurane, 42, 95, 108–109, 111, 115–117, 118, 119
isomerism, 42
  in drug preparations, 45–46
  stereoisomerism, 42–45
  structural, 42, 43
  tautomerism, 42
isoniazid, 18
isoprenaline, 42, 198–199
isosorbide dinitrate, 236
isosorbide mononitrate, 236
itraconazole, 330
ivabradine, 231–232

k. *See* rate constant for elimination
K_A. *See* association constant
κ-receptor, 128, 129, 131
K_D. *See* dissociation constant
ketamine, 96, 104
  effects of, 104–105
  epidural administration of, 13
  kinetics of, 102, 106
  mechanism of action of, 34, 95, 96
  presentation and uses of, 104
ketoconazole, 330
ketorolac, 143, 149
kidney. *See also* diuretics
  drug toxicity affecting, 145, 315
  drugs acting on, 295, 296
  excretion by, 19
kidney disease, 20
KOP-receptor, 128, 129, 131

labetalol, 210, 213, 215–216
lactate solutions, 283, 284
Lactated Ringer's, 283, 284
lactic acidosis, 350–351
lamotrigine, 264
levobupivacaine, 164–165
levosimendan, 205
lidocaine. *See also* eutectic mixture of local anaesthetic
  anti-arrhythmic effects of, 225
  effects of, 160, 163, 225
  epidural administration of, 13
  hepatic metabolism of, 10
  kinetics of, 163, 225
  mechanism of action of, 225
  pharmacological properties of, 162
  preparations of, 163
  toxicity of, 12
ligand binding, 29–30
linagliptin, 351–352
lincosamides, 318
linear kinetics, 51, 62, 63
linezolid, 261, 318
lipid solubility
  of anaesthetic agents, 93, 94, 158
  rate of diffusion and, 6
lipodepsipeptides, 319–320
liraglutide, 351
lisinopril, 246–247
lithium carbonate, 262
liver, metabolism by. *See* metabolism
liver disease, 20–21. *See also* hepatotoxicity
lixisenatide, 351
LMWHs. *See* low-molecular-weight heparins
local anaesthetics. *See also* *specific agents*
  effects of, 160
  epidural administration of, 13
  intrathecal administration of, 13
  for intravenous regional anaesthesia, 163
  kinetics of, 160–161, 162
  mechanism of action of, 2, 23, 157, 158
  nerve physiology and, 156, 157
  physiochemical characteristics of, 157–160
  placental crossing by, 15–16
  preparations of, 157
  toxicity of, 161–163, 165
  transdermal administration of, 12
logarithms, 49–50
  addition and subtraction of, 64
  base conversions of, 65–66
  division of, 63–64
  multiplication of, 62–63
  of numbers with exponential terms, 64–65
  relationship between half-life and time constant, 67
  semi-logarithmic plot of concentration against time, 66
long-acting insulins, 348
loop diuretics, 297

lorazepam, 17, 84, 255, 256, 274
losartan, 17, 38–39, 248–249
low-molecular-weight heparins (LMWHs), 337
lung absorption, 12, 13

MAC. *See* minimum alveolar concentration
macrolides, 317, 323–324
magnesium, 290–291
magnesium-containing antacids, 275
malignant hyperthermia (MH), 174–176
mannitol, 299
manual TIVA, 70–71
MAOI. *See* monoamine oxidase inhibitors
Marsh model, 71–76
mathematical concepts, 47
  differentiation, 51
  exponential functions, 47–48, 49
  integration, 51–52
  logarithms, 49–50, 62–67
MBC. *See* minimum bactericidal concentration
mean residence time (MRT), 59–60
medical gases. *See also* inhaled anaesthetic agents
  carbon dioxide, 125–126
  helium, 125
  nitric oxide, 12, 28, 124–125
  oxygen, 123–124
medicinal chemistry, 80
  amino acids, 81
  important drug structures, 82–83, 84–86
  nucleic acids, nucleosides and nucleotides, 81, 82
  sugars, 82
  terminology used in, 86–92
meglitinides, 352
meloxicam, 143, 151
membrane guanylyl cyclase, 28
membrane passage. *See* cell membrane
membrane potential, 156, 157
membrane tyrosine kinase, 28–29
meropenem, 312
metabolism, 16
  age effects on, 21–22
  bioavailability and, 9–10
  disease effects on, 20–21
  drug interactions involving, 38–39
  enzyme inhibition and induction in, 18, 38–39
  extraction ratio and, 10–11
  genetic polymorphism and, 16–17, 18
  of inhaled anaesthetic agents, 110, 111
  local anaesthetics, 161
  phase I, 16–17
  phase II, 17
metabotropic receptors, 26
metaraminol, 202
metformin, 350–351
methadone, 139
methionine, 148
methionine synthetase, 113–114
methohexitone, 96
methotrexate, 154
methoxamine, 42
methoxyflurane, 16, 19
methylation, 17
methyldopa, 250–251
methylprednisolone, 355–358
metiglinide, 352
metirosine, 250
metoclopramide, 37–38, 270, 278
metolazone, 295–297
metoprolol, 210, 213, 214
metronidazole, 305, 322–323
mexiletine, 225–226
MH. *See* malignant hyperthermia
mianserin, 261
MIC. *See* minimum inhibitory concentration
micafungin, 330
Michaelis constant, 10
miconazole, 330
microorganisms. *See* antimicrobials
midazolam, 16, 40, 42, 84, 254, 255
milrinone, 28, 39–40, 205
mineralocorticoid receptor (MR), 29
minerals, 282, 290–291
minimum alveolar concentration (MAC), 107
minimum bactericidal concentration (MBC), 306–307
minimum inhibitory concentration (MIC), 306–307
minoxidil, 242
misoprostil, 279
mivacurium, 43, 84, 180, 182, 183
mixed (α and β) agonists, 201–202
moclobemide, 261
molecular size, diffusion rate and, 5
monoamine oxidase, 14, 17
monoamine oxidase inhibitors (MAOI), 39, 139, 140, 195, 196, 260, 261
monobactams, 312
MOP-receptor, 128, 129, 131
morphine, 6, 42, 85–86, 129, 130, 131–132, 133, 134, 135
moxifloxacin, 320–321
MR. *See* mineralocorticoid receptor
MRT. *See* mean residence time
mucosal protectors, 279
multi-compartment models, 53, 56–59
multi-drug resistant protein transporter, 3–4
muscle relaxants. *See also* non-depolarising muscle relaxants
  ACh physiology and, 168–170
  depolarising, 172–177
  distribution of, 14
  mechanism of action of, 2, 34, 170, 172, 173, 177
  neuromuscular block monitoring for, 170–172
  NMJ physiology and, 168, 169
  reversal agents for, 183–188
μ-receptor, 128, 129, 131

N_2O. *See* nitrous oxide
nabilone, 274
Na^+/K^+ ATPase, 3, 4, 156
nalbuphine, 141, 142
naloxone, 39, 85–86, 131, 138, 141
naproxen, 143
natural logarithms, 49–50
naturally occurring catecholamines, 191–196

nausea and vomiting. *See* antiemetics
NDMRs. *See* non-depolarising muscle relaxants
nebulised drugs, 12, 13
neomycin, 313–315
neonates, 15–16, 21
  distribution in, 21
  fluid compartments in, 21
  metabolism and excretion in, 21
neostigmine, 39–40, 184, 185–186
nephrotoxicity, 145, 315
nerve physiology, 156, 157
neuraminidase inhibitors, 327
neuraxial anaesthesia, 342
neurokinin 1 (NK_1) receptor antagonists, 274
neuromuscular block. *See* muscle relaxants
neuromuscular block monitoring, 170
  DBS, 171, 172
  post-tetanic potentiation and count, 171
  single twitch stimulation, 170, 171
  tetanic stimulation, 170
  TOF, 171–172
neuromuscular junction (NMJ)
  ACh receptors in, 168–169, 170
  muscle relaxant interactions with, 170, 172, 173, 177
  physiology of, 168, 169
  spare receptors in, 35
neurotransmitters, 2–3
nevirapine, 328
newborn. *See* neonates
nicorandil, 237–238
nicotinic ACh receptors, 24, 168–169, 170, 172, 173, 177
nifedipine, 11, 239, 240
nimodipine, 241
nitrates
  GTN, 11, 37, 235–236
  isosorbide dinitrate and isosorbide mononitrate, 236
  mechanism of action of, 124–125
  for sodium nitroprusside toxicity, 234–235
  tolerance to, 35–36
  transdermal administration of, 12
nitric oxide (NO), 12, 28, 124–125
nitric oxide synthase (NOS), 124
nitroimidazoles, 322–323
nitrous oxide (N_2O), 107, 111. *See also* entonox
  concentration effect and, 112, 113
  diffusion hypoxia with, 113
  effects of, 111–112
  environmental impact of, 108–109
  manufacture of, 111
  mechanism of action of, 95, 96
  metabolism of, 111
  physiochemical properties of, 116
  second gas effect and, 113
  storage of, 111
  TIVA with, 70
  toxicity of, 113–114
nizatidine, 277
NK_1 receptor antagonists. *See* neurokinin 1 receptor antagonists
N-methyl D-aspartate (NMDA) receptor, 2, 24–25, 95, 96
NMJ. *See* neuromuscular junction
N-monomethyl-L-arginine (L-NMMA), 124–125
NNRTI. *See* non-nucleoside reverse transcriptase inhibitors
NO. *See* nitric oxide
NOACs. *See* non-vitamin K oral anticoagulants
nociceptors, 127, 128
non-anaesthetic medical gases. *See* medical gases
non-compartmental models, 59–60
non-competitive antagonists, 33, 34
non-depolarising muscle relaxants (NDMRs), 177. *See also specific drugs*
  distribution of, 14
  drug interactions of, 39–40, 179, 296
  mechanism of action of, 2, 34, 177
  onset of action of, 5
  placental crossing by, 15–16
  structures of, 84–85, 178
non-linear kinetics, 62, 63
non-nucleoside reverse transcriptase inhibitors (NNRTIs), 328
non-steroidal anti-inflammatory drugs (NSAIDs), 141, 142. *See also* cyclo-oxygenase inhibitors
  drug interactions of, 145, 247, 296
  kinetics of, 143
  mechanism of action of, 141–144
  side effects of, 143, 144–145
non-synthetic metabolism, 16–17
non-vitamin K oral anticoagulants (NOACs)
  direct factor Xa inhibitors, 340–341
  direct thrombin inhibitors, 339–340, 341
  monitoring and overdose of, 341–342
  neuraxial anaesthesia and, 342
NOP-receptor, 128, 129, 131
noradrenaline, 35, 191, 192, 193, 194–195, 249–250
Normosol^{TM}, 284
nortriptyline, 258–259
NOS. *See* nitric oxide synthase
NRTI. *See* nucleoside reverse transcriptase inhibitors
NSAIDs. *See* non-steroidal anti-inflammatory drugs
nuclear receptors, 29
nucleic acids, 81, 82
  antibiotics agents targeting, 304–305, 320–323
nucleoside reverse transcriptase inhibitors (NRTIs), 328
nucleosides, 81, 82
nucleotides, 81, 82
nutrition, 292–294
nystatin, 329

O_2. *See* oxygen
obidoxine, 187

oestrogen, 360–361
omeprazole, 23, 38–39, 277–278
ondansetron, 273
one-compartment model, 48, 51, 52–55, 56
opioid partial agonists, 141, 142
opioid receptors, 128–129, 131
opioids, 128. *See also specific drugs*
  drug interactions of, 39
  epidural administration of, 13
  equivalent doses of, 134
  liver disease and, 21
  mechanism of action of, 26–28
  receptor classification for, 128–129
  receptor interactions of, 131
  structures of, 85–86
  tolerance to, 35–36
optical stereoisomers, 44–45
oral administration, 8–11
oral contraceptives, 360–361
organic chemistry, 80. *See also* medicinal chemistry
organophosphorous compounds, 186–187
oseltamivir, 327
osmolality, 285
osmotic diuretics, 299
ototoxicity, 315
output, drug, 55
oxazolidinones, 318
oxprenolol, 213
oxybarbiturates, 83, 97, 98
oxycodone, 134, 138
oxygen (O_2), 123–124. *See also* entonox
oxytocic drugs, 361–362
oxytocin, 361–362

Pabrinex, 293–294
pain, 127, 128. *See also* analgesics
pancuronium, 19, 84–85, 180–181, 182
paracetamol, 143, 146, 147–148
paraldehyde, 37
parasympathetic nervous system (PNS), 189, 190, 191
parecoxib, 16, 143, 153
parenteral nutrition (PN), 292
paroxetine, 259–260
partial agonists, 30–31, 32
passive diffusion
  at distal tubules, 19
  drug passage across cell membrane by, 1–2, 3
  factors influencing rate of, 5–7
patient factors, absorption rate and, 9
PDE inhibitors. *See* phosphodiesterase inhibitors
penicillins, 14, 40, 304, 307, 308–310, 312
pentameric family of receptors, 24
pentazocine, 141, 142
peroxisome proliferator-activated receptor, 29
perphenazine, 269
pethidine, 15, 39, 133, 138–139
p-glycoprotein (PGP), 3–4, 37–38
pharmaceutical drug interactions, 37
pharmaceutical preparation, absorption rate and, 9
pharmacodynamic drug interactions, 39–41
pharmacokinetic drug interactions, 37–39
pharmacokinetic models, 52
  applications of, 68–79
  compartmental models, 47, 48, 51, 52–55, 56–59
  mathematical concepts for, 47–52, 62–67
  measurement of parameters in, 60–62
  non-compartmental models, 59–60
  non-linear kinetics, 62, 63
  volume kinetics, 281–282
phase I metabolism, 16–17
phase II metabolism, 17
phencyclidine, 96
phenelzine, 260
phenobarbital, 264
phenothiazines, 267–269
phenoxybenzamine, 34–35, 208–209
phenoxymethylpenicillin, 304, 309–310
phentolamine, 207–208
phenylbutazone, 38, 149–150
phenylephrine, 39, 196–198
phenytoin, 10–11, 37–38, 62, 224, 231, 262–263
phosphodiesterase (PDE) inhibitors
  mechanism of action of, 28
  non-selective, 202–204
  selective, 204–205
phospholipase C, 26–28
phospholipid bilayer, 1, 2
phosphorus, 291
physicochemical interactions, absorption rate and, 9
physicochemical properties, drug actions dependent on, 23
physostigmine, 184, 185, 186
pindolol, 210, 213
pinocytosis, 4
pioglitazone, 29, 353
piperacillin, 304, 309–310
pK_a, 1, 5–6
placenta, drug transfer across, 14–16
plasma, drugs confined to, 13
Plasma-lyte™, 283, 284
platelet phosphodiesterase inhibitors, 332–333
platelets, 145, 331, 332. *See also* antiplatelet drugs
PN. *See* parenteral nutrition
PNS. *See* parasympathetic nervous system
polyenes, 329–330
polymyxins, 319
post-operative nausea and vomiting (PONV), 266, 267. *See also* antiemetics
post-tetanic potentiation and count, 171
potassium channel activators, 237–238
potassium sparing diuretics, 298
potentiation, 40
Poynting effect, 114
pralidoxime, 187
prasugrel, 333
prazosin, 209
prednisolone, 42, 355–358
pregabalin, 265
pregnancy, drugs during, 15
prilocaine, 162, 163, 165–166. *See also* eutectic mixture of local anaesthetic
primary active transport, 3–4

PRIS. *See* propofol infusion syndrome
probenecid, 40, 305
procainamide, 228–229
prochlorperazine, 268–269
prodrug, 16
progesterone, 360–361
prokaryotes, 301, 302
prokinetics, 278
prolonged block, suxamethonium, 176–177
propafenone, 230
propofol, 96
  clearance of, 61
  CSHT for, 78–79
  drug interactions of, 40
  effects of, 100–101, 105
  environmental impact of, 104
  hepatic metabolism of, 10
  kinetics of, 101, 102
  manual infusion of, 70–71
  mechanism of action of, 94–95
  nausea and vomiting after, 266
  presentation of, 100
  TCI of, 68, 71–76
  TIVA using, 68–70, 76–77
  toxicity of, 103–104
  uses of, 100
  Vd of, 60
propofol infusion syndrome (PRIS), 103–104
propranolol, 210, 213, 214–215, 360
propylthiouracil, 360
prostacyclin, 141–144, 335
prostaglandin, 141–144
prostaglandin analogues, 279
protamine, 337
protease inhibitors, 328
protein binding
  extraction ratio and, 10–11
  local anaesthetics, 158, 161
  rate of diffusion and, 6–7
protein synthesis, antibiotics agents inhibiting, 304–305, 318
protein-binding interactions, 38
prothrombin time (PT), 339
proton pump inhibitors, 277–278
protozoa, 301, 302
proximal tubules, secretion at, 19
PT. *See* prothrombin time
PX1 and PX2 receptors, 26
pyridostigmine, 184, 185, 186

quinidine, 224

racemic mixtures, 45
raltegravir, 328
ramipril, 23, 39–40, 246–247, 248
ranitidine, 38–39, 276–277
rate constant for elimination (k), 48, 52–55, 56–59
rate of elimination, 52–55
receptors. *See also specific receptors*
  dynamics of ligand binding to, 29–30
  mechanisms of action of, 24–29
  types of drug binding to, 30–35
rectal administration, 11
refeeding syndrome, 292–293
remifentanil, 137
  clearance of, 61
  CSHT for, 78, 79
  drug interactions of, 40
  effects of, 137
  in elderly, 21–22
  kinetics of, 133, 137–138
  metabolism of, 17
  presentation and uses of, 137
  TIVA using, 68, 70, 76–77
renal disease, 20
renal excretion, 19
renal function
  drugs acting on, 295, 296
  toxicity affecting, 145, 315
renin–angiotensin–aldosterone system, 245–249
repaglinide, 352
resistance, antibiotic, 323–324
resting membrane potential, 156
reversible antagonists, 33, 34
Reye's syndrome, 147
rifabutin, 322
rifampicin, 4, 37–39, 322, 323
rifamycins, 322
rifaximin, 322
Ringer's acetate, 284
Ringer's lactate, 283, 284
ritodrine, 201
ritonavir, 328
rivaroxaban, 340, 341, 342
rocuronium, 23, 34, 84–85, 180, 182, 187–188
rofecoxib, 151
ropivacaine, 160, 162, 165
rt-PA. *See* alteplase
ryanodine receptors, 175–176

salbutamol, 200–201
salmeterol, 201
saturation kinetics, 62, 63
Schnider model, 71–76
SCN. *See* thiocyanate
second gas effect, 113
secondary active transport, 3–4
sedatives. *See* hypnotics and anxiolytics
seizure. *See* anticonvulsants
selective serotonin reuptake inhibitors (SSRIs), 2–3, 39, 140, 203, 259–260
serotonergic syndrome, 260
sertraline, 259–260
sevoflurane, 111, 116, 117, 118, 119, 120
SGLT-, 2 inhibitors. *See* sodium glucose co-transporter 2 inhibitors
short-acting insulins, 348
sildenafil, 243
single twitch stimulation, 170, 171
sitagliptin, 351–352
skin absorption, 12
SLC proteins. *See* solute carrier proteins
SNP. *See* sodium nitroprusside
SNS. *See* sympathetic nervous system
sodalime, 126
sodium bicarbonate, 283, 13, 37, 39, 275, 289–290
sodium calcium edetate, 38
sodium channels, 156, 157, 158
sodium chloride solutions, 283, 282, 284–286
sodium citrate, 275
sodium glucose co-transporter 2 (SGLT-2) inhibitors, 352
sodium nitroprusside (SNP), 23, 124–125, 233–235
sodium thiosulfate, 234–235
sodium valproate, 263–264

solute carrier (SLC) proteins, 2–3
sotalol, 210, 213, 215, 230–231
spare receptors, 35
spironolactone, 298
SSRIs. *See* selective serotonin reuptake inhibitors
Starling equation, 280–281
steady state, drug input and output at, 55
stereoisomerism, 42–45
steroids. *See also* glucocorticoids
  antiemetic effects of, 274
  epidural administration of, 13
  inhalation administration of, 12
  mechanism of action of, 29
stilboestrol, 15
streptokinase, 342–343
streptomycin, 313–315
structural isomerism, 42, 43
structure–activity relationships, 80
subcutaneous administration, 11–12
sublingual administration, 11
sucralfate, 279
sugammadex, 23, 187–188
sugars, 82
sulfadiazine, 321
sulfamethoxazole, 321
sulfasalazine, 155
sulfation, 17
sulfonylureas, 352–353
sulphonamides, 321
summation, 40–41
supraventricular tachyarrhythmia (SVT), 219–224, 226–231
suxamethonium, 15–16, 17, 18, 38, 170, 172, 173–177
SVT. *See* supraventricular tachyarrhythmia
sympathetic nervous system (SNS), 189–191
sympathomimetics, 191
  MAOI interactions with, 261
  naturally occurring catecholamines, 191–196
  other inotropic agents, 202–206
  physiology, 189–191
  synthetic agents, 196–202
symport, 3, 4
synergism, 40–41
synthetic metabolism, 17

$t_{1/2}$. *See* half-life
T_3. *See* triiodothyronine
T_4. *See* thyroxine
tachyarrhythmias, 217–218
  SVT, 219–224, 226–231
  VT, 225–231
tachyphylaxis, 35
tapentadol, 140
target-controlled infusions (TCIs), 68
  in clinical practice, 76–77
  pharmacokinetic models for, 71–76
  safety of, 77–78
Targinact, 138
tautomerism, 42
τ. *See* time constant
tazobactam, 310
TCAs. *See* tricyclic antidepressants
TCI. *See* target-controlled infusions
tedizolid, 318
teicoplanin, 307, 312–313
temazepam, 84, 255
tenoxicam, 143, 150
teratogenicity, 15
terbutaline, 201
terminal elimination half-life, 58–59
tetanic stimulation, 170
tetracyclines, 307, 316, 323–324
theophylline, 28
thiamine, 293–294
thiazide diuretics, 295–297
thiazolidinediones, 353
thiobarbiturates, 83, 97, 98
thiocyanate (SCN), 233–235
thiopental, 15, 42, 62, 95, 96, 97, 98–100, 102, 105
three-compartment model, 53, 58–59
thromboxane, 141–144
thyroid disease, 358–360
thyroid hormone replacement, 358–359
thyroid hormones, 29
thyroxine (T_4), 358–359
ticagrelor, 334
time constant (τ), 48, 55, 56, 58, 67
timolol, 210, 213
tinidazole, 322–323
tinzaparin, 337
tirofiban, 334
tissue-type plasminogen activator, 343
TIVA. *See* total intravenous anaesthesia
tobramycin, 313–315
tocilizumab, 155
TOF. *See* train-of-four
tolbutamide, 352–353
tolerance, 35–36
tonicity, 285
total intravenous anaesthesia (TIVA), 70
  in clinical practice, 76–77
  CSHT, 78–79
  ideal drugs for, 68–70
  manual models, 70–71
  safety of, 77–78
  TCI models, 71–76
train-of-four (TOF), 171–172
tramadol, 134, 139–140
tranexamic acid, 343–344
transdermal administration, 12
transport proteins, 2–3
tranylcypromine, 260
triamcinolone, 355–358
triazoles, 330
tricyclic antidepressants (TCAs), 140, 258, 259
triiodothyronine (T_3), 206, 358–359
trimethoprim, 321
tubocurarine, 84
two-compartment model, 53, 56–58
  for intravenous fluids, 281–282
tyrosine, 82
tyrosine kinase, 28–29

unfractionated heparin, 335–336
urokinase, 343

valaciclovir, 326
valdecoxib, 153
valganciclovir, 327
vancomycin, 307, 312–313, 323–324
vasodilators, 233. *See also specific drugs*
Vaughan–Williams classification, 219

Vd. *See* volume of distribution
vecuronium, 34, 38–39, 60, 84–85, 177, 178, 179–180, 182, 187–188
venlafaxine, 259–260
ventricular tachyarrhythmia (VT), 225–231
verapamil, 4, 37–38, 222–223, 238–239, 240
vigabatrin, 265
viruses, 301, 302, 324, 325. *See also* antiviral drugs
vitamin B_1, 293–294
vitamin B_{12}, 113–114
vitamin K, 338, 339
volatile anaesthetic agents. *See* inhaled anaesthetic agents
voltage-gated ion channels, 23
volume kinetics, intravenous fluids, 281–282
volume of distribution (Vd), 52–55, 56–61
vomiting, 266, 267. *See also* antiemetics
VT. *See* ventricular tachyarrhythmia
warfarin, 38, 338–339, 342

xenon (Xe), 95, 96, 107, 116, 122, 123

yohimbe, 209–210

zaleplon, 258
zanamivir, 327
zero-order kinetics, 51, 62, 63
zidovudine, 328
zolpidem, 258
zopiclone, 258