

Index

Note: *Italic page numbers* indicate figures, **bold page numbers** indicate tables

A

- 10 steps of universal precautions in pain medicine, 413–414
- A β afferent fibers, 26, 26
- A δ afferent fibers, 26, 26
- AAAPT (ACTION American Academy of Pain Medicine Pain taxonomy), 7
- AAIDD *see* American Association on Intellectual and Developmental Disabilities
- AAPT (ACTION American Pain Society Pain Taxonomy), 7–8, **318**
- aberrant behavior, patients on
 - opioids, 192, 312, 402, 403, 412, 413, 414, 415
- ablative procedures *see* neuroablation
- ACC *see* anterior cingulate cortex
- acceptance and commitment therapy (ACT)
 - children, 434, 435
 - cognitive-behavioral therapy relationship, 275, 277, 384
 - fear of movement interventions, 285, 286
 - older adults with pain, 426
 - pediatric patients, 435
 - postsurgical pain, 53, 56, 298
- acceptance of limitations or handicaps, 43
- acceptance of sleep and pain fluctuations, 75
- acetaminophen (paracetamol/APAP)
 - combination therapies, 223, 224, 399, 458, 459
 - first-line for mild to moderate pain, 135, 140, 141
 - non-prescription use for chronic pain, 140
 - older adults, 426
 - opioid use relationship, 458, 459
- acid suppression, non-cardiac chest pain, 360
- ACT *see* Acceptance and Commitment Therapy; acceptance and commitment therapy
- action potentials, 28, 29, 34, 109, 355, 373, 374, 456, 457
- active inflammatory process, rheumatic diseases, 326–327
- activity
 - assessment, 119
 - avoidance, fear of pain/movement, 277, 283, 284–286
 - encouragement by physical therapists, 162–163, 164–165
 - engagement in paced activity, 273–274, 276, 277
 - graded exposure to feared activities, 165, 276, 285
 - pain affecting daily life of older adults, 423–424
 - see also* exercise
 - activity-encouragement
 - fear of movement interventions, 285
 - physical therapists, 162–163
 - activity monitoring/progressive goal setting/graded activity, fear of movement interventions, 285, 286
 - ACTION (Analgesic Clinical Trials Translations, Innovations, Opportunities, and Networks), 7
 - see also* AAAPT; AAPT
 - acupuncture, 73–74, 140, **294**, 296–297, 321, 360, 436
 - acute pain
 - definitions, 3
 - inadequate treatment correlating with persistent postsurgical pain, 4
 - management in patients with opioid tolerance, 456–461
 - physical therapy, 162
 - postsurgical pain transition to chronic, 50–59
 - prevention of perioperative pain to reduce chronic pain, 55
 - adaptive factors, turning down the volume on pain, 273–275
 - addiction, 407–418
 - clinical care of pain patients, 407–412
 - cycle, 410
 - diagnosis, 416
 - neurobiology, 407–410
 - opioids, 141, 402–403
 - physical dependence relationship, 408–409
 - restrictions of legitimate opioid medication for pain, 411
 - role of pain, 411–412
 - Universal Precautions - 10 steps in the management of chronic pain, 413–414
 - see also* pediatric patients; substance use disorders
- addiction specialists, 415–416
- adjustment disorders, 452, 453
- adjuvant therapies
 - antidepressants, 173–180, 330, 359–360
 - cancer patients, 398, 399, 403–404, **404**
 - older adults with pain, 426
 - rheumatic diseases, 330
- adolescents, 432
- antidepressant analgesic, 177–178
- Bath Adolescent Pain Questionnaire, 98
- complex regional pain syndrome, 382, 391
- digital self-management programs, 267–268
- extrapolation of adult pharmacology data, 435
- low back pain, 9–10
- pain assessment, 96, 98
- ADRQL-R *see* Alzheimer Disease-related Quality of Life-Revised
- adults with cognitive challenges
 - dementia, 422, 424–425, 426
 - intellectual and developmental disabilities, 439–449
- adverse events *see* complications; drug interactions; safety issues/side effects
- AEDs (antiepileptic drugs) *see* anticonvulsants
- aerobic exercise, fibromyalgia syndrome therapy, 321
- affective qualities of pain experience, psychological assessment, 116
- afferent mechanisms, orofacial pain, 343–344
- afferent signal blocking, visceral pain interventions, 358–359
- afferent terminals, 26, 27–28, 28, 29–32, 31
- age effects in chronic non-cancer pain, 14
- age related changes in pain sensitivity and nociceptive processing, 422

- agitation assessment, older adults
with dementia, 425
- agreements *see* treatment agreements
- AHI *see* apnea-hypopnea index
- alcohol use
cancer patients, 402–403
cannabinoid interactions, 213
see also substance use disorders
- allodynia
definition, **4**
ion channels, 27, 28, 29, 31
spinal pathways, 33
see also sensitization
- alternative therapies *see* complementary and alternative medicine
- Alzheimer disease, *see also* dementia
in older adults
- Alzheimer Disease-related Quality of Life-Revised (ADRQL-R) measure, 425
- American Academy of Pain Medicine (AAPM), diagnostic criteria and pain taxonomy, 7–8
- American Association on Intellectual and Developmental Disabilities (AAIDD), 440
- American Pain Society, Pain Taxonomy, 7
- Analgesic Clinical Trials Translations, Innovations, Opportunities, and Networks (ACTTION), 7
- anatomic procedures, neurosurgical interventions, 250–251
- anesthesia dolorosa, definition, **4**
- anesthesiology, surgical factors in chronic postsurgical pain, 55
- anesthetic facet, diagnostic injections, 308–309
- angina, Chronic Angina Self-Management Program, 264, 266, 269
- animal-based substances, complementary therapies, 296
- animal models
central sensitization, 33
divergence of neurochemistry with humans, 30, 35
nociceptor RNA expression profiles, 26–27, 35
- ankylosing spondylitis, 106
- annular fissures, chronic low back pain, 310
- anterior cingulate cortex (ACC)
deep brain stimulation, 240, 241
placebo/nocebo studies, 63, 63, 64, 64, 65
- anterior cingulate gyrus, cingulotomy, 257
- anthrax toxins, complementary therapies, 295
- antibody testing, 106
- anticonvulsants (antiepileptics), 181–187, 370, 387
adjuvant treatment, 330
combination therapy, 219, 221, 222, 223, 224–225
complex regional pain syndrome, 387
dosing, 185–186, 458, 459
indications, 183–185
mechanisms of action, 181–183, **182**, 358, 457
for neuropathic pain, 34, 135, 377, 378, 404
rheumatic disease, 330
safety/side effects, **182**, 185–186, 387, 435
- antidepressants
adjuvant treatment, 173–180, 330, 359–360
combined pharmacotherapy, 220–221
headache prevention, 338, 340
nutritional effects, 154
pharmacological mechanisms of pain relief, 174
post-traumatic stress disorder and chronic pain, 452
rheumatic diseases, 330
safety issues, 174, 220–221
topical amitriptyline with ketamine, 202
visceral pain, 360
- antiepileptic drugs (AEDs) *see* anticonvulsants
- anti-inflammatory effects
acupuncture, 73
exercise, 328
immunomodulatory drugs (thalidomide and lenalidomide), 339
lidocaine infusions, 458
nutritional interventions/supplements, **149–150**, 151, **152**, 155, 297, 331
steroid injections, 236
see also nonsteroidal anti-inflammatory drugs
- antioxidant treatments, 360–361, 387, 391
- anti-reward system, drug withdrawal, 408
- anxiety/anxiety disorders, 451–452
catastrophizing as risk factor, 120
definition, 451
emotional factors in chronic pain, 274
neurophysiology, 452
prevalence with pain disorders, 451
psychological assessment, 118
relationship to pain, 451–452
risk factor for chronic low back pain, 311
treatments, 452
- AO (atypical odontalgia) *see* persistent idiopathic dentoalveolar pain
- APAP *see* acetaminophen
- apnea-hypopnea index (AHI), 71, 72, 73, 74
- apps (smartphone applications), 121–122, 266–268, 436
- assessment
clinical assessment of adults, 80–94
universal precautions for opioid prescribing, 413–414
assessment of pain, 93–130
challenges in complementary therapy research, 298
- cognitively intact older adults, 423
- documentation importance, 102
- frequency in pediatric patients, 100, 102
- individuals with intellectual disability, 440, 443
- innovative technology, 121–122
- pediatric patients, 95–104
- self-report measures, 96–99, 100, 117–118
- atypical odontalgia (AO) *see* persistent idiopathic dentoalveolar pain
- autoimmunity
Complex Regional Pain Syndrome, 384, 385
see also irritable bowel syndrome; rheumatoid arthritis
- autonomic nervous system
Complex Regional Pain Syndrome, 384
see also sympathetically maintained pain
- avoidance behaviors
anxiety disorders, 451
Cognitive-Behavioral Therapy, 276, 277
fear of pain/movement, 277, 283, 284–286
pain reinforcement, 273–274
post-traumatic stress disorder, 452
see also fear

B

- back pain
economic impacts, 16–17
epidemiology, 9–10
see also low back pain
- baclofen, intrathecal delivery, 246, 441
- bacteria, complementary therapies, 295
- bacterial infection, direct neural response, 28–29
- BAPQ *see* Bath Adolescent Pain Questionnaire
- baseline behaviors, assessing pain in individuals with intellectual disability, 444
- basic mechanisms of pain, 25–39
- Bath Adolescent Pain Questionnaire (BAPQ), 98
- BDI-II *see* Beck Depression Inventory
- Beck Depression Inventory (BDI-II), 118
- behavioral factors, pain relationship, 273–274
- behavioral mood management interventions, older adults with dementia, 426
- behavioral psychology principles, physical therapy, 165
- behavior-based interventions
nutritional interventions, 151, 153
see also Cognitive-Behavioral Therapy
- behavior observations for pain assessment
individuals with dementia, 424–425

- individuals with intellectual disability, 444
- infants and young children, 99
- beliefs about pain
 - individuals with intellectual disability, 447
 - negative thoughts, 274
 - psychological assessment, 120–121
 - reassurance/education by physical therapists, 162–163
 - self-efficacy, 275
 - tissue-based damage beliefs
 - reinforced by biophysical and manual therapies, 164
- bias
 - Acceptance and Commitment Therapy studies, 56
 - caregiver assessment of pain, 45, 447
 - placebo studies, 61, 64
 - predicting chronic pain from perioperative pain, 55
 - self reporting, 44, 100, 120
- biofeedback, 296, 435
- biophysical modalities, physical therapy, 163–164
- biopsychosocial history, clinical assessment, 82, **83**
- biopsychosocial models of pain, 13–14, 41, 41, 133–137, 433
- bipolar I or bipolar II disorders, 450
- bisphosphonates, 387, **404**
- bladder pain, 70, 363, **367**, 368
- blocking noxious perioperative impulses to CNS, chronic postsurgical pain prevention, 55
- blood brain barrier, 30
- blood tests, fibromyalgia syndrome diagnosis, 317
- BMS *see* burning mouth syndrome
- bone scans (bone scintigraphy), 107–108, 383
- botulinum toxin, **233**, 295, 322, 338, 339, 377, 387, 441
- BPI *see* Brief Pain Inventory
- brain
 - cerebellar examination, 91
 - cerebral neuroablation/neuromodulation, 255
 - deep brain stimulation, 240–241, 241, 251
 - non-invasive brain stimulation for sleep disorders and pain, 75
 - pain processing and filtering, 257, 272–275, 345, 457
- brainstem
 - central sensitization, 33–34
 - neurosurgical interventions/lesioning, 257
 - orofacial pain mechanisms, 344–345, 344
 - pain signal transmission and modification, 457–458
- Brief Pain Inventory (BPI), 86, 118, 161, 192–193, 423
- Budapest Criteria, Complex Regional Pain Syndrome, 382, **382**
- bupivacaine, 246, 459
- buprenorphine, 189, 191, 195, 329, 412
- burning mouth syndrome (BMS), 350
- C**
 - CAGE questionnaire, alcoholism assessment, 398, 402–403
 - calcitonin gene-related peptide (CGRP)
 - neurogenic inflammation, 29, 338, 384
 - primary afferent fiber expression, 26, 27, 28, 29
 - therapy targets, 34, 184, 246, 295, 338
 - CAM *see* Complementary and Alternative Medicine
 - cancer pain, 396–406
 - adjuvant therapies, 398, 399, 403–404, **404**
 - assessment, 398
 - basic mechanisms, 396–398, **397**
 - cancer-specific therapies, 403
 - cannabinoid medication, 209–210
 - continuity of care and multidisciplinary management, 404
 - management, 398–399
 - opioids, 398–403
 - risk factors, **398**
 - cannabidiol (CBD), 74, 206–209, **208**, 211
 - cannabinoid medication, 207–213, **208**
 - complexity, 207–209
 - drug–drug interactions, 212–213
 - indications, **208**, 209–210
 - patient selection, 210
 - preparation choice, **208**, 210
 - safety and efficacy maximization, 210–211
 - side effects, 211–212, **212**
 - cannabinoid receptors (CBR), 200, 201, 206–207, 330, 356, 458
 - see also* endocannabinoid system
 - cannabis and cannabinoids, 206–217
 - complementary therapies, 294
 - history of use, 206
 - neuropathic pain, 377
 - nutritional effects, 154
 - plant derived cannabinoids, 206, 207, 208
 - regulatory issues, 206, 207
 - rheumatic diseases, 330
 - sleep improvement, 74
 - topical analgesics, 201
 - capsaicinoids, topical analgesia, **199**, 200
 - carbamazepine, **182**, 183, **183**, 184, 377
 - cardiometabolic disease prevention and management, 151–154
 - cardiovascular disease (CVD), nutritional management, 147, 151, 153
 - caregivers (clinicians)
 - interpersonal determinants, 45–46
 - intrapersonal determinants, 45, 46
 - psychosocial perspectives in pain assessment, 45
 - psychosocial perspectives in pain management, 46
 - social communication model of pain, 41–43, 42
 - caregivers (family)
 - assessing pain in individuals with intellectual disability, 99–100, 444, 447
 - assessing pain in pediatric patients, 95–100, **97**
 - education for pain management, 445
 - CAS *see* Color Analog Scale
 - CASMP *see* Chronic Angina Self-Management Program
 - catastrophizing, 282–290
 - assessment, 283–284
 - cognitive-behavioral therapy
 - reducing, 276, 284
 - Complex Regional Pain Syndrome, 386
 - definition of pain catastrophizing, 282
 - mental health relationship, 283, 284
 - outcome relationship, 116, 274, 282–283
 - psychological assessment, 116, 120–121
 - psychopathology relationship, 118, 119
 - substance use, 121
 - treatments, 284
 - causalgia *see* Complex Regional Pain Syndrome type II
 - CBD *see* cannabidiol
 - CBR *see* cannabinoid receptors
 - CBT *see* cognitive-behavioral therapy
 - CCK *see* cholecystokinin
 - CCS (CRPS severity score), 383, 389
 - CDC *see* Centers for Disease Control and Prevention
 - CDH *see* chronic daily headache
 - celecoxib, 203, 224, 459
 - Centers for Disease Control and Prevention (CDC), opioid guidelines and restrictions, 194
 - central nervous system (CNS)
 - central sensitization, 32–34
 - CNS depression risk from opioids
 - plus anticonvulsants, 185, 221, 223, 224–225
 - Complex Regional Pain Syndrome, 385
 - neurosurgical interventions, 254–255, 256–257
 - somatic symptom mediation and chronic overlapping pain conditions, 13
 - see also* brain; brainstem; spinal cord
 - central processing, visceral sensation/pain, 355–356, 359–360
 - Central Sensitivity Syndromes (CSS), epidemiology, 13
 - central sensitization (CS), 13, 32–34, 55, 110, 295, 315, 320, 346–348, 357, 386
 - cerebellar examination, 91
 - cervical range of motion, 88, 91

- CEUS *see* contrast enhanced ultrasound
- C fibers, nociceptor types, 26–27, 26
- CGRP *see* calcitonin gene-related peptide
- chemical dependency *see* addiction; physical dependence and withdrawal
- chemical stimuli, nociceptors, 28
- CHEPs *see* contact-heat evoked potentials
- children, 432–438
 antidepressant analgesic, 177–178
 assessment of pain, 95–104
 biopsychosocial model of pain, 433
 Complex Regional Pain Syndrome, 381–395
 fear of pain assessment scales, 98
 intellectual and developmental disabilities, 99–100, 439–449
 long-term effects of pain in early life, 4
 self-reporting pain rating tools, 96–99, 100
 variation adult pharmacology norms, 435
see also adolescents; pediatric patients
- cholecystokinin (CCK) system, 63, 63, 64–65, 64
- Chronic Angina Self-Management Program (CASMP), 264, 266, 269
- chronic daily headache (CDH), 339
- chronic low back pain, 310–313
see also low back pain
- chronic migraine (CM), 337, 339, **339**
- chronic non-cancer pain (CNCP)
 antidepressant analgesics, 173–180
 associated factors, 13–14
 combined pharmacotherapy, 218–228
 definition, 8
 economic impacts, 15–18
 epidemiology, 6, 8–11
 pharmacotherapy recommendations, **219**
- chronic overlapping pain conditions (functional pain disorders), 13
- chronic pain
 conceptual model, 433
 definitions, 3
 physical therapy focus shift, 162
 Universal Precautions in opioid use, 413–414
- Chronic Pain Assessment Toolbox for Children with Disabilities, **442**, 443
- chronic pain registries, pediatric patients, 100
- Chronic Pain Self-Management Program (CPSMP), 264–269
- chronic pancreatitis, 361
- chronic pelvic pain, 366–372
 definitions, 12, 366
 etiology, 366, **367**
 evaluation, 366, 368
 management, 369–370
see also pelvic pain
- chronic postsurgical pain (CPSP), 50–59
 causation/prevention relationship, 51, 52, 53
 definition, 51
 epidemiology, 51–52, **51**
 multi-modal preventive approaches, 54, 55–58
 patient-related factors, 52
 preoperative pain relationship, 52, 55
 psychosocial factors, 52
 risk factors and causation, 51–55, **51**, 53, 54
 social support and social environmental factors, 52
 surgical factors, 52
 Transitional Pain Service prevention approach, 56–58, 57
- chronic prostatitis, 363
- chronic widespread pain (CWP)
 fibromyalgia syndrome diagnosis, 317
 medications causing, 317
 myofascial pain syndrome progression, 317
see also Central Sensitivity Syndromes; functional pain disorders; "primary" pain category
- cingulotomy, 257
- classical conditioning, placebo/nocebo effect, 61
- classification of pain, 7–8
- clinical hypnosis, 53, 56, **294**
- clinical interviews, psychological assessment, 115, **116**, 117–121
- clinical investigations, 105–112
- clinical trials
 failure to translate animal model
 preclinical studies of analgesics, 35
 use of placebos, 60, 61
- clinicians
 best practice influenced by psychosocial perspectives, 45–46
 patient–provider relationship, 133–135
 reassuring patient of the reality of their experience, 134
- clonidine
 opioid withdrawal treatments, 408
 suppressing REM sleep, 70
 topical analgesia, **199**, 201–202
- C-low threshold mechanoreceptors (C-LTMRs), 26, 26, 27
- cluster headache, 340–341
- CM *see* chronic migraine
- CNCP *see* chronic non-cancer pain
- CNS *see* central nervous system
- codeine, 75, 188, 189, 190, **190**, 400
- cognitive-behavioral therapy (CBT), 272–281
 approaches and techniques, 275–277
 efficacy, 275
- fear of pain/movement, 276, 277, 285, 286
- fibromyalgia syndrome, 321
- older adults with pain, 426
- pain catastrophizing reduction, 276, 284
- pediatric patients, 434–435
- primary care, 142
- rationale, 272–275
- remote online strategies, 122
- treatment goals, 275
- cognitive-emotional brain regions, pain processing, 273
- cognitive engagement, placebo/nocebo effect, 61–62
- cognitive features of pain experience, 116, 274–275
- cognitive impairments
 older adults, 422, 424–425, 426
see also dementia in older adults; intellectual and developmental disabilities; intellectual disability
- cognitive therapy
 pain neuroscience education, 163
see also cognitive-behavioral therapy
- Cohen Mansfield Agitation Inventory, 425
- Color Analog Scale (CAS)
 children's pain assessment, 98
 older adults with dementia, 425
- Columbia Suicide Severity Rating Scale (C-SSRS), 84–85, **85**
- combined pharmacotherapy, 218–228
 analgesic combinations, 218–228
 analgesics with treatment for other symptoms, 220
 clinical implementation, 224–225
 clinical trials, 220–226, 222, **225**
 fibromyalgia, 224, **225**
 minimizing adverse drug effects, 219, 220, 225
 neuropathic pain, 222, 224
 optimizing potential benefits, 220–223, **221**
 rationale, 219–220
 safety issues, 220–221, 225
 simultaneous versus sequential therapy, 225–226
 specific conditions, 223–224
 topical therapies, 202, 203
- COMM *see* Current Opioid Misuse Measure
- Communal Coping Model of pain, 274
- communication, establishing and communicating diagnosis, 133–135
- community-based programs, self-management, 266
- compensation *see* disability compensation and claims
- complementary and alternative medicine (CAM), 136, 291–303
- cancer pain, 404
- challenges integrating with conventional medicine, 298–299

- chronic low back pain, 312
 combined/multimodal, 297
 dietary, 294–296
 glossary, **294**
 pediatric patients, 436
 physical interventions, 296–297
 physical therapy, 165
 primary care, 142–143
 psychological interventions, 296, 297
 research challenges, 298
 rheumatic diseases, 329, 331
 therapeutic output, 297–298, **298**
 US spend, 293
 visceral pain, 360
- Complex Regional Pain Syndrome (CRPS)**, 381–395
 acute phase, 384, 386–387
 autoimmunity, 385
 autonomic nervous system, 384
 behavioral aspects, 386
 bone scintigraphy/bone scans, 108, 383
 central nervous system, 385–386
 children, 390–391
 chronic phase, 385, 387
 diagnosis, 382–383, **382**
 dorsal root ganglion stimulation, 244–245
 electromyography, 383
 epidemiology, 381–382
 functional restoration, 388–389
 genetic associations, 383
 historical understanding, 381
 immune response, 384–385
 management, 389, 386–389
 naltrexone, 191
 neurogenic inflammation, 338
 neuromodulation, 389
 pathophysiology, 384–385
 potential immunomodulatory therapies, 388
 regional anesthetic blocks, 389–390
 risk factors, 383, 385
 severity scores, 382–383, 383
 surgery, 390
 topical NSAIDs, 201
- Complex Regional Pain Syndrome type I (CRPS I)**, definition, 381
- Complex Regional Pain Syndrome type II (CRPS II)**, definition, 381
- complications**
 cancer, **398**
 CNS surgery, 256, 257
 deep brain stimulation, 251
 intrathecal analgesia, 246–247
 opioid therapy, **192**
 spinal cord stimulation, 244
see also safety issues/side effects
- computed tomography (CT) scanning**, 106–107, 308
- conceptual model of chronic pain** *see* biopsychosocial models
- conditioning-based explanation of responses to pain**, 283
- conolidine from *Tabernaemontana divaricata***, complementary therapies, 295
- Constant Unilateral Facial Pain with Additional Attacks (CUFPA)**, 351
- contact-heat evoked potentials (CHEPs)**, 112
- continuity of care**, cancer pain, 404
- contrast enhanced ultrasound (CEUS)**, 108, 109
- coping**, psychological assessment, 116, 120
- coping/confidence**, outcome relationship, 116
- Coping Strategies Questionnaire (CSQ)**, 283–284
- cordotomy**, 254, 256
- Cornell Depression in Dementia Scale**, 425
- correlated risk factors**, 52, 53
- corticosteroids**, rheumatic diseases, 330
- cost effectiveness**
 intrathecal analgesia, 245
 spinal cord stimulation, 244
- CPK** *see* creatine phosphokinase
- CPP** *see* chronic pelvic pain
- CPSMP** *see* Chronic Pain Self-Management Program
- CPSP** *see* chronic postsurgical pain
- cranial nerves**, 89
- C-reactive protein (CRP)**, laboratory investigation, 104–105
- creatine phosphokinase (CPK)**, 106
- CRP** *see* C-reactive protein
- CRPS** *see* Complex Regional Pain Syndrome
- cryoablation**, peripheral nerve intervention, 233–234, **234**
- CS** *see* central sensitization
- CSQ** *see* Coping Strategies Questionnaire
- CSS** *see* Central Sensitivity Syndromes
- C-SSRS** *see* Columbia Suicide Severity Rating Scale
- CT** *see* computed tomography
- CUFPA** *see* Constant Unilateral Facial Pain with Additional Attacks
- Current Opioid Misuse Measure (COMM)**, 121, 194
- CVD** *see* cardiovascular disease
- CWP** *see* chronic widespread pain
- cysts**, 106, **233**, 276
- D**
- Dallas discogram scores**, 235, 236
- deep brain stimulation (DBS)**, 240–241, 241, 251
- definitions of pain**, 3, **4**, 40
- degenerative changes of joints and tendons**, rheumatic pain, 326
- degenerative discs**, chronic low back pain, 310
- delta opioid receptor (DOP)**, 189, **189**, 191
- dementia in older adults**, 422, 424–425, 426
- demographic factors in chronic and recurrent pain**, 14, 311
- dental pain**, 344, 347–348, **349**
 mood disorders, 450
 persistent idiopathic dentoalveolar pain, 350–351
 placebo analgesia, 62
- dependence** *see* addiction; physical dependence and withdrawal; substance use disorders
- depression/depressive disorders**, 450–451
 Acceptance and Commitment Therapy, 56
 catastrophizing association, 120, 283
 depressive disorder types, 450
 importance of MDD in chronic pain, 451
 neurophysiology, 451
 pain outcome relationship, 115
 prevalence with chronic pain, 18, 43, 450
 psychological assessment, **116**, 118
 psychological interventions, 142, 360
 PTSD relationship, 452
 risk factor in chronic pain, 274, 311
 serotonin role, 173
 suicide risk, 84
 treatments, 451
- developmental delay** *see* intellectual and developmental disabilities
- Devil's claw**, complementary therapies, 295
- DHE** *see* dihydroergotamine
- diabetes (type 2)**, nutritional management, 147, 151, 153
- diabetic neuropathies**, 34, 109, 110, **150**, 175, 184, **199**, 200, 223, 373, 376
- diagnosis**
 of addiction, 416
 clear communication, 133–135
 first step of universal precautions in pain medicine, 413
- diagnostic blocks**, 112, 231–232, 233, 308–309
- diagnostic studies**
 assessment based on disease and response, 231, 232
 laboratory investigations, 105–106
 limitations, 105
 medically unexplained pain, 133–135
- diclofenac gel**, **199**, 201
- diet**
 chronic pain relationship, 148, 151–154
 gut microbiome, 148, 153, 329
 plant-based/vegan/gluten-free diets, 148, 151
 rheumatic diseases, 329
 sleep/pain relationship, 72
see also nutrition
- dietary deficiencies and supplements**, 74, 148, **149–150**, 154, 294–296, 331
- digital health interventions**, 122, 266–268, 269, 361–362, 436
see also technology
- dihydroergotamine (DHE)**, 338, 341, 342
- dimethyl sulfoxide (DMSO)**, 387, 391
- direct current non-invasive brain stimulation**, 75

disability compensation and claims (workers compensation), 14–15, 16, 18, 308–311, **308**, 313, 382

disability measures, older adults, 423–424

discogenic pain

- interventional treatments for chronic low back pain, **252**, 312
- non-surgical minimally invasive interventions, 235
- pseudo-diagnosis, 309–310

discograms/discography

- Dallas scores, 235, 236
- low back pain, 308, 309

disease-modifying agents (DMARDs), inflammatory arthritis, 327, 330, 332

disk fusion, **309**, 310, 313

DMARDs *see* disease-modifying agents

DMSO *see* dimethyl sulfoxide

documentation, universal precautions in pain medicine, 414

DOLOPLUS-II scale, 424

DOP *see* delta opioid receptor

dopamine, reward system, 409

dorsal horn circuitry, spinal cord, 30, 31, 32

dorsal rhizotomy, 253, 256

dorsal root entry zone (DREZ), lesioning, 254, 256

dorsal root ganglia (DRG)

- ganglionectomy, 253, 256
- molecular identification of sensory neuron subtypes, 27, 30
- primary afferent neurons, 25
- stimulation, 244–245, 390

drug interactions

- cancer patients, 396
- cannabinoids, 212–213
- combined pharmacotherapy, 219, 220–221, 225
- combining drugs with similar adverse effects, 221, 225
- individuals with intellectual disability, 446
- opioids, 190

drug interventions *see* pharmacotherapy

drug testing, 415

dry mouth and eyes (sicca symptoms), 106

dry needling, 165, 322

DSM-5 (DSM-V)

- adjustment disorder, 452, 453
- dependence and tolerance as indicators of abuse, 121
- removal of pain disorder/somatization disorder/undifferentiated somatoform disorder, 453
- somatic symptom disorder, 453

duloxetine

- combination therapy, 223–224, 360
- depression and chronic pain, 451
- dosage, **379**
- fibromyalgia syndrome, 321
- neuropathic pain, 377, **378**, **404**
- rheumatic pain, 330

dysesthesia, **4**, 256, 257, 317, 374

dyspepsia, 178, 212, 317, 360, 361, 362

E

early life pain, long-term effects, 4

economic impacts of chronic pain, 15–18

- back pain, 16–17
- direct costs, 15–16
- headache, 17
- indirect costs, 16
- mental health effects, 17–18
- osteoarthritic, 17
- pelvic pain, 17

economic issues, *see also* cost effectiveness; disability compensation

ECS *see* endocannabinoid system

ECS-CP *see* Edmonton Classification System for Cancer Pain

Edmonton Classification System for Cancer Pain (ECS-CP), 398, 399

Edmonton Symptom Assessment Scale (ESAS), 398, 400

education *see* patient education

elastography measures, ultrasound, 108, 109

electrocardiographic QT prolongation, side effects of combined pharmacotherapy, 174, 221

electromyography (EMG), 109, 110, 375, 383

electronic hand-held devices

- pain self-reporting tools, 100, 101
- see also* smartphone applications

electronic visual analog scales, 98, 117

embodiment, placebo/nocebo effect, 62

EMDR *see* eye movement desensitization and reprocessing

EMG *see* electromyography

emotional distress, psychological assessment, 118–119

emotional factors, pain relationship, 274, 276

endocannabinoid system, 206–207, 213, 356, 409

- see also* cannabinoid receptors

endometriosis, 17, 358, 368, 369

ENFD *see* epidermal nerve fiber density

engagement in paced activity, 273–274, 276, 277

enhanced therapeutic alliance, physical therapy, 160

entrapment neuropathies, 232, 233, 234, 251

epidemiology

- all chronic non-cancer pain, 8–9
- chronic postsurgical pain, 51–52, **51**
- chronic and recurrent pain, 4, 6, 8–11, 14
- definition, 6
- identification of causal risk factors, 51
- musculoskeletal pain, 9–10
- pain classification taxonomies, 7–8
- use of different diagnostic criteria or populations, 382

epidermal nerve fiber density (ENFD) analysis, 110–111, 111

epidural analgesia

- facilitating physical/occupational therapy, 390
- perioperative patients, 457, 458, 459, 460

epidural electrodes, motor cortex/spinal cord stimulation, 252

equianalgesia, 400

erythrocyte sedimentation rate (ESR), 104–105

ESAS *see* Edmonton Symptom Assessment Scale

ESWT *see* extracorporeal shockwave therapy

ethical issues

- placebo/nocebo effects, 60, 64, 65
- undertreatment of pain in older adults/dementia patients, 422

European League Against Rheumatism (EULAR), 315, 321, 322

exercise

- fibromyalgia syndrome, 321
- primary care, **140**, 142
- rationale, 136
- rheumatic diseases, 328
- see also* activity; physical therapy

expectations, placebo/nocebo effect, 61–62, 64

expectations and goals

- patients, 81, 84, 117
- referral sources, 117
- unrealistic expectations, 139
- see also* treatment goals

expert-based classification of pain, 7–8

extracorporeal shockwave therapy (ESWT), 163

eye movement desensitization and reprocessing (EMDR), 452

F

faces pain scales for children, 98

facet joint disease

- diagnostic blocks, 231, 235, 308–309
- single photon emission computed tomography, 107

facet syndrome, pseudo-diagnosis, 309–310

facial pain, *see also* orofacial pain; temporomandibular disorders

facial pain display assessment, nonverbal children and individuals with intellectual disability, 99, 443

Fear-Avoidance Beliefs Questionnaire (FAB-Q), 284

Fear-Avoidance Model of pain, 274, 283

fear of movement, 283, 284–286

fear of pain (kinesiophobia), 119, 283, 284

- anxiety disorder relationship, 451
- assessment, 98, 284–285
- children, 98
- Cognitive-Behavioral Therapy, 276, 277, 286, 452
- fear-avoidance cycle, 452

Fear of Pain Questionnaire III (FPQ-III), 284
 fentanyl, 188, 189, 190, 246, 329, 400, **402**, 411, 459–460
 fibromyalgia (FM)
 anticonvulsant therapy, **183**, 184–185
 antidepressant analgesics, 176, **178**
 combined pharmacotherapy, 224, **225**
 epidemiology, 13
 laboratory investigation, 106
 poor sleep quality, 67
 fibromyalgia survey questionnaire, **319**
 fibromyalgia syndrome (FMS), 315
 course and prognosis, 316
 definition, 316
 diagnosis, 317–318, **318**
 non-pharmacological therapies, 321
 pathophysiology, 320
 pharmacological therapies, 321
 prevalence, 316
 risk factors, 320
 treatments, 320–321, 322
 fish oils in diet, **149**, **150**, **152**, 296, 328
 see also omega-3 fatty acids
 r-FLACC *see* revised Faces, Legs, Activity, Cry, Consolability
 FM *see* fibromyalgia
 FMS *see* fibromyalgia syndrome
 FNE *see* free nerve endings
 focal pain, dorsal root ganglion stimulation, 244–245
 focus groups, self-management programs, 268–269
 food supplements *see* dietary deficiencies and supplements
 Fordyce, W E, 273–274
 FPQ-III *see* Fear of Pain Questionnaire III
 free nerve endings (FNE), connective tissue sensation, 456, 457
 functional capacity, psychological assessment, 119–120
 functional dyspepsia, 178, 317, 360, 361, 362
 functional impact of pain, 86
 functional pain disorders (chronic overlapping pain conditions), 13

G

gabapentinoids (gabapentin and pregabalin), 34, 183–186, 222, 224, 330, 358, 457, 458, 459
 see also anticonvulsants
 gastrointestinal conditions
 chronic pelvic pain, **367**, 368
 dyspepsia, 178, 212, 317, 360, 361, 362
 gastroesophageal acid reflux, 360–361
 irritable bowel syndrome, 357, 357, 358, 361–362, 362, 368, 370
 see also irritable bowel syndrome
 gastrointestinal effects

cannabinoids, 211, **212**, 356
 migraine, 337
 non-steroidal anti-inflammatory drugs, 221
 SNRI antidepressants, 174
 gastrointestinal function
 gut microbiome, 148, **150**, 154, 329, 356, 359, 362
 pelvic pain, **367**, 368
 visceral pain, 359, 360–363
 Gate Control Theory, 242, 272–273
 GDNF *see* glial derived neurotrophic factor
 gene expression, sensitization, 34
 gene therapy, analgesia targets, 35
 genetic associations, Complex Regional Pain Syndrome, 383
 genetic/epigenetic and selective expression factors, chronic low back pain, 311
 genetic profiling, sensory neurons, 26–27
 genital pain, 203, 366, 368, 370
 glial cells
 analgesia targets, 35
 microglia central sensitization, 33
 glial derived neurotrophic factor (GDNF), peripheral sensitization, 32
 gluten-free vegan diet, nutritional interventions, 148, 151
 glyceryl trinitrate (GTN), 202
 GMI *see* Graded Motor Imagery
 goal setting *see* expectations and goals; treatment goals
 graded exposure to feared activities, 165, 276, 285
 graded exposure to pain-related activities, 435
 Graded Motor Imagery (GMI), 165
 graduated treatment approach, fibromyalgia syndrome, 321, 322
 graphic rating scales, 98
 GTN *see* glyceryl trinitrate
 gut microbiome, 148, **150**, 154, 329, 356, 359, 362
 gynecologic conditions
 chronic pelvic pain, **367**, 368, 369
 vulvodynia/vestibulodynia, 203, 368, 370
 see also endometriosis

H

HADS *see* Hospital Anxiety and Depression Scale
 headaches, 336–342
 antidepressant analgesics, 176–177, **178**
 cannabinoids, 210
 economic impacts, 17
 epidemiology, 10–11
 evaluation and diagnostic testing, 336–337
 orofacial pain resembling presentations of primary headaches, 351–352

tension-type, 11, 177, **178**, **339**, 340
 see also migraine
 healthful living review, 135
Helicobacter pylori, 361, 362
 helplessness, self-perception as unable to cope with pain, 282
 herbal medicine, complementary therapies, 294–295, 331
 herniated discs, 108, 250, 310
 Holland Bloorview's Chronic Pain Assessment Toolbox for Children with Disabilities, 443
 Hospital Anxiety and Depression Scale (HADS), 118
 hydromorphone, 189, 190, **190**, 246, 329, **402**, 459–460
 hyperalgesia
 definition, **4**
 nocebo effects, 61, 64–65
 opioids inducing, 189, 387
 pressure pain detection threshold measures, 162
 see also sensitization
 hyperpathia, **4**, 110, 391
 hypervigilance, 70, 232, 275, 357, 453
 hypnosis, complementary therapies, 53, 56, **294**, 296

I

IA *see* inflammatory arthritis
 IASP *see* International Association for the Study of Pain
 IBS *see* irritable bowel syndrome
 ICD *see* International Classification of Diseases
 ICER *see* incremental cost-effectiveness ratio
 ICF *see* International Classification of Functioning, Disability and Health
 ICOP *see* International Classification of Orofacial Pain
 ID *see* intellectual disability
 IDD *see* intellectual and developmental disabilities; intrathecal drug therapy
 IDDS *see* intrathecal drug delivery systems
 IDET *see* intradiscal electrothermal therapy
 idiopathic orofacial pain, 350–351
 illegal drug trade, 411
 illusions and sensory distortions, physical therapy, 165
 imaging, 106–109
 magnetic resonance imaging, 107, 108, 235, 235, 310–311, 336
 positron emission tomography, 63, 108, 308
 immune responses
 Complex Regional Pain Syndrome, 384–385
 infection, 29
 opioids receptor effects, **189**
 see also autoimmunity; inflammation

- immunological diseases, 327
 - immunomodulatory therapies,
 - Complex Regional Pain Syndrome, 388
 - impaired kidney function *see* renal impairment
 - implantable devices, neuromodulation therapy, 240–249
 - implantable pulse generators (IPGs)
 - deep brain stimulation, 241
 - spinal cord stimulation, 241–242, 242, 244
 - implantable pumps *see* intrathecal drug delivery systems
 - inappropriate drug prescribing, 411, 416
 - incidence, definition, 6
 - incremental cost-effectiveness ratio (ICER), 244
 - ‘inert’ treatments, placebos, 60, 61
 - infants and neonates
 - long-term effects of early life pain, 4
 - pain assessment, 99
 - inflammation
 - chemical mediators, 32, 456–457
 - Complex Regional Pain Syndrome, 384
 - neurogenic, 28, 29
 - peripheral sensitization, 32
 - rheumatic pain mechanisms, 326–327
 - inflammatory arthritis (IA), 325
 - classification, **327**
 - combined pharmacotherapy, 223
 - disease-modifying agents, 327, 330, 332
 - pathogenic mechanisms, 326
 - treatments, 223, 328–331
 - see also* rheumatoid arthritis
 - Inflammatory bowel disease, 362–363
 - inflammatory markers, laboratory investigation, 104–105
 - informed consent, pain medication, 414
 - inhibitory control, loss in central sensitization, 33
 - injections
 - diagnostic, 233, 233, 234, 235, 308–309
 - low back pain, 308–309, 312
 - percutaneous interventions, 232, **233**, 234, 235–236, **236**, 237, 312
 - rheumatic diseases, 331
 - insomnia
 - pain relationship, 70–71
 - see also* sleep disorders
 - integrated stress response (ISR),
 - analgesia targets, 34–35
 - integrative health care
 - conventional and complementary approaches, 293, 295, 297–298
 - models, 41
 - see also* interdisciplinary approach
 - intellectual and developmental disabilities (IDD), 99–100, 439–449
 - intellectual disability (ID), 99–100, 439–449
 - definition, 440
 - drug interactions, 446
 - non-pharmacotherapy approaches, 446
 - pain assessment, 99–100, 441–443, **442**
 - pain epidemiology, 440–441
 - pain management, 443, **444**, 445–447
 - pain risk factors, 441
 - pain sources, 441, 443–444, 445
 - pharmacotherapy, 445–446
 - therapeutic failure, 446, **446**
 - intensity of pain, self-report measures, 117–118
 - intensive interdisciplinary pain treatment programs, pediatric patients, 436
 - interdisciplinary approach
 - cognitive-behavioral therapy delivery, 275
 - Complex Regional Pain Syndrome, 388
 - dementia patients, 425–426
 - integrative care models, 41
 - neuropathic pain, 376, 379–380
 - opioid misuse, 403
 - orofacial pain, 346
 - pediatric patients, 434, 435–436
 - International Association for the Study of Pain (IASP)
 - Classification of Chronic Pain, 7, 8, 13
 - criteria for Complex Regional Pain Syndrome, **282**, 381, 382
 - definitions, 3, **4**, 13, 40, 439
 - Neuropathic Pain Special Interest Group, 175, 376–377, **378**
 - International Classification of Diseases (ICD-11), 51, 373
 - International Classification of Functioning, Disability and Health (ICF), 160, 433
 - International Classification of Orofacial Pain (ICOP), 346, 347, 349, 350, 351, 352
 - Internet-based programs, 122, 266, 267, 362, 436
 - see also* digital health interventions; technology
 - interoceptive signals, visceral pain, 355
 - interruption of analgesia
 - nocebo effects from expectation, 65
 - see also* tapering
 - interstitial cystitis or bladder pain syndrome, 368, 370
 - interventional diagnostic procedures (diagnostic blocks/neural blockade), 112, 231–232, 233, 308–309
 - interventional therapies, 312
 - Complex Regional Pain Syndrome, 389, 388–390
 - non-surgical minimally invasive interventions, 231–239
 - rheumatic diseases, 331
 - intracranial neurosurgical interventions, 255, 257
 - intradiscal electrothermal therapy (IDET), 312
 - intraoperative factors, chronic postsurgical pain association, 52, 54
 - intrathecal drug delivery systems (IDDS), 245–247
 - intrathecal drug therapy (IDD), 245–247, 252, 254, 390, 441
 - invasive procedures
 - rheumatic diseases, 331
 - see also* interventional therapies; surgical interventions
 - ion channels
 - inhibition by analgesics, 34
 - neurophysiology of pain, 27–29, 456
 - IPGs *see* implantable pulse generators
 - irritability of unknown origin (IUO), 444, 445
 - irritable bowel syndrome (IBS)
 - chronic pelvic pain, 368, 370
 - manifestations, 361
 - treatments, 358, 361, 362, 370
 - visceral sensitization, 357, 357
 - ISR *see* integrated stress response
 - IUO *see* irritability of unknown origin
- K**
- kappa opioid receptor (KOP), 189, **189**, 191
 - ketamine
 - cancer pain, 401, 404
 - depression plus pain treatment, 451
 - mode of action, 34, 202
 - perioperative use, 458, 459
 - polypharmacy, 220
 - topical applications, 202, 203, 391
 - kinesiphobia *see* fear of pain
 - knee injections, 236, **236**, 237
 - KOP *see* kappa opioid receptor
 - kratom (*Mitragyna speciosa*) leaves,
 - complementary therapies, 295
- L**
- laboratory investigations, 105–106, 308
 - lacosamide, **182**, 183–185
 - lamotrigine, **182**, 183–185
 - laser evoked potentials (LEPs), 111–112
 - LBP *see* low back pain
 - lenalidomide, 388
 - LEPs *see* laser evoked potentials
 - levetiracetam, **182**, 183–184
 - lidocaine
 - instillation into urinary bladder or rectum for visceral pain, 358
 - nerve blocking, 34
 - postoperative analgesia in opioid tolerant patients, 458, 459, 460
 - topical preparations, 141, 199, **199**, 203, **379**
 - lifestyle measures
 - rheumatic diseases, 328–329
 - see also* diet; exercise
 - LILT *see* low-intensity laser light therapy
 - listening, beginning of pain management process, 133

- local anesthetics
 dental injection, 348
 diagnostic/therapeutic blocks, 34, 112, 231–235, 246, 253, 351, 358, 370
 intrathecal delivery, 246
 neurophysiology, 457
 perioperative, 458, 459, 460
 perioperative analgesia in opioid tolerant patients, 457, 459, 460
 topical analgesia, 199–200, **199**, 202–203
- localization of pain, poorly localized orofacial pain, 345
- locating source of pain, diagnostic blocks, 231–232
- low back pain (LBP), 307–314
 alternative therapies, 312
 anatomic evaluation, 308
 antidepressant analgesics, 177, **178**, 312
 chronic, 310–313
 clinical evaluation, 307–309
 combined pharmacotherapy, 224
 demographic risk factors, 311
 diagnostic blocks, 231
 diagnostic evaluation, 307–309
 disk/spinal fusion, **309**, 310, 313
 economic impacts, 16–17
 epidemiology, 9–10
 extent of problem in US, 307
 natural history, 310
 opioid use, 307, 312
 persistent, 308, **309**
 pharmacotherapy, 312
 primary radicular symptoms, 307, 308
 progression to chronic state, 310–311
 psychological risk factors, 311
 psychosocial and neurophysiological barriers to recovery, 308, **308**
 reporting after motor vehicle accidents, 310
 ruling out serious illness, 307–308, **308**
 spinal interventions, 234–235
 surgical interventions, 312–313
 treatments for chronic condition with only common degenerative changes, 311–313
 trivial findings and “pseudo-diagnoses”, 309–310
 work related factors, 311
- low-intensity laser light therapy (LILT), 163
- low threshold mechanoreceptors (LTMRs), 26
- lumbar facets *see* facet joint disease; facet syndrome
- lumbosacral spine, Schober's test for range of motion, 87, 90
- M**
- McGill Pain Questionnaire (MPQ), 86, 118, 241, 423
- magnetic non-invasive brain stimulation, 75
- magnetic resonance imaging (MRI), 107, 108, 235, 235, 310–311, 336
- magnetic resonance neurography (MRN), 107
- magnification, exaggerating threat of pain, 282
- major depressive disorder (MDD), 173, 450–451
- ‘malingering’, 232
- malnutrition, 155
- manual therapies, 143, 164, 165, **294**, 295, 297, 331
- MAPA receptors, conduction of nociceptive signals, 29
- MAP-kinase interacting serine/threonine kinases (MNK), 34–35
- marine-based substances, complementary therapies, 295
- massage, **294**, 295, 297, 331, 426
- MBHI *see* Millon Behavior Health Inventory
- MCS *see* motor cortex stimulation
- MDD *see* major depressive disorder
- mechanical stimuli, nociceptors, 27
- MED *see* morphine equivalent dose
- MEDD *see* morphine equivalent daily dose
- medically unexplained pain, 133–135
- medication consumption, behavioral pain reinforcement, 273
- medication overuse headache, 339–340, **340**
- medication reviews, universal precautions in pain medicine, 414
- meditative movements, complementary therapies, 297
- Mediterranean diet, nutritional interventions, 151
- melatonin supplements, sleep improvement, 74
- memory-like processes, pain relationship, 55
- mental health *see individual disorders*; psychiatric illness
- meralgia paresthetica, 234, 234
- mesencephalotomy (trigeminal tractotomy), 251, 254, 257
- methadone, 189, 190–191, 195, 221, 396, 400, 401, **402**, 408, 418n
- microbial-derived substances, complementary therapies, 295
- microglia, central sensitization, 33
- microvascular decompression (MVD), 251, 341, 377
- microvascular imaging, 108–109
- midbrain, pain signal modification, 458
- midline myelotomy, 256
- migraine, 337–338
 anticonvulsant therapy, **183**, 184
 antidepressant analgesics, 176–177, **178**
 epidemiology, 10–11
 features/diagnosis, 337–338, **337**
 orofacial migraine, 352
 pathophysiology, 338
 pharmacotherapy, 176–177, **178**, **183**, 184, 338
 preventive treatment, **183**, 338–339
- Millon Behavior Health Inventory (MBHI), 118, 119
- mindfulness-based therapy
 approaches, 56, 142, 275, 277, **294**, 296, 426, 434, 435
see also Acceptance and Commitment Therapy
- minimally invasive interventions *see* non-surgical minimally invasive interventions
- Minnesota Multiphasic Personality Inventory (MMPI-2), 118–119
- mirror box therapy, 165
- mitragynine and 7-hydroxymitragynine, complementary therapies, 295
- MMPI-2 *see* Minnesota Multiphasic Personality Inventory
- MNK *see* MAP-kinase interacting serine/threonine kinases
- mobile technology *see* smartphone applications
- modeling, network of biological/psychological/social determinants of pain, 41–43
- molecular mechanisms of visceral sensation, 355–356
- monitoring, universal precautions in pain medicine, 414–415
- mood disorders, 450–451
see also anxiety; depression; irritability
- mood and personality, psychological assessment, **116**, 118–119
- MOP *see* mu opioid receptor
- morphine
 cancer pain, 401, **402**
 combined therapies, 220, 221, 223
 full agonist, 189
 intra-articular injection for temporomandibular pain, 347
 intrathecal delivery, 246, 390
 metabolism, 190
 primary/secondary care, 141
 topical formulations, 201, 202
- morphine equivalent daily dose (MEDD), 398, 401, 402, **402**
- morphine equivalent dose (MED)
 calculation, 189–191, **190**
 opioid guidelines, 56, **140**, 141, 194
 opioid tolerant patients, 458–460
- mortality, pain effects, 4
- motion sensors, activity level and sleep assessment, 119–120
- motor cortex stimulation (MCS), 252
- motor examination, neurological assessment, 91
- motor vehicle accidents MVA's, low back pain reporting, 310
- movement-based therapies, 160
see also physical therapy
- MPI *see* Multidimensional Pain Inventory
- MPQ *see* McGill Pain Questionnaire
- MPS *see* myofascial pain syndrome
- MRI *see* magnetic resonance imaging
- MRN *see* magnetic resonance neurography
- MSK *see* musculoskeletal pain and conditions
- mucosal tissue, topical analgesics, 202–203

multidimensional nature of pain, 3
 Multidimensional Pain Inventory (MPI), 119
 multidimensional pain tools, children, 98–99
 multidisciplinary care
 cancer patients, 397, 404
 communication, 102
 complementary and integrative health approaches, 298
 importance, 41, 135
 non-drug interventions in primary care, 141
 opioid tapering, 194
 mu-opioid receptor agonists, reducing and discontinuing, 412
 mu-opioid receptor (MOP), 189, **189**, 190–191
 muscle relaxants, chronic low back pain, 312
 muscular deconditioning, resting, 273
 musculoskeletal (MSK) pain and conditions
 cannabinoid medication, 209
 chronic pelvic pain, **367**, 368, 369
 conditions, 315–324
 epidemiology, 9–10
 non-surgical minimally invasive interventions, **233**, 235–236
 patient assessment, 86–88
 physical therapy/occupational therapy in children, 435
 see also fibromyalgia syndrome; myofascial pain syndrome
 MVD *see* microvascular decompression
 myelography and post-myelogram CT scanning, 107
 myelotomy, 254, 256
 myofascial pain syndrome (MPS), 315
 course and prognosis, 316–317
 definition, 316
 diagnosis, 318–320
 pathophysiology, 320
 prevalence, 316
 treatments, 321–322
 myofascial pelvic pain, 369

N

naloxone, 62–63, 189, 191, 192, 195, 402, 409
 naltrexone, 189, 191
 narrative in pain, the patient's story, 82, 133
 NCCP *see* non-cardiac chest pain
 NCCPC-R *see* Non-Communicating Children's Pain Checklist–Revised
 NCS *see* nerve conduction studies
 needs assessment, self-management programs, 268–269
 negative and positive sensory phenomena, coexisting in neuropathic pain, 374
 negative thoughts, 274
 neonates
 opioid withdrawal syndrome, 195
 pain assessment, 99, 101
 nerve ablation *see* neuroablation

nerve blocks
 Complex Regional Pain Syndrome, 388–390
 diagnostic blocks, 112, 231–232, 233, 308–309
 local anesthetics, 34, 112, 231–235, 246, 253, 351, 358, 370
 perioperative, 458
 rheumatic diseases, 331
 visceral pain interventions, 358–359
 nerve conduction studies (NCS), electromyography, 109, 110, 375
 nerve entrapment *see* entrapment neuropathies
 nerve management interventions, 232–235, **233**
 nerve trauma, 373
 NeuPSIG *see* Neuropathic Pain Special Interest Group
 neural blockade *see* nerve blocks
 neural networks, pain processing in the brain, 273
 neural responses to tissue injury, chronic pain mechanisms, 3–4
 neuroablation, 232, 233–234, **234**, 235, 236, 252–253, **252**, **253**, 254–255, 331
 cerebral, 255
 midline myelotomy, 256
 peripheral nerve intervention, 233–234, **234**
 neurogenic inflammation, 28, 29
 Complex Regional Pain Syndrome, 384
 headaches, 338
 substance P and calcitonin gene-related peptide release, 29, 338, 384
 see also calcitonin gene-related peptide; substance P
 neurological compression syndromes, 308
 neurological examination, patient assessment, 89, 91, 93
 neurological pain signature (NPS), placebo analgesia, 63–64
 Neuromatrix model, 272
 neuromodulation therapy, 240–249, 251–252, 254, 255
 cerebral, 255
 Complex Regional Pain Syndrome, 390
 deep brain stimulation, 240–241, 241, 251
 definition, 240
 dorsal root ganglion stimulation, 244–245
 intrathecal drug therapy, 245–247, 252, 254, 390, 441
 motor cortex stimulation, 252
 peripheral nerve stimulation, 245
 spinal cord stimulation, 241–244, 242, **243**, 252
 neuropathic pain, 373–380
 anticonvulsant therapy, 183–184, **183**
 antidepressant analgesics, 175, **178**
 basic mechanisms, 373
 brainstem role in central sensitization, 33–34

cannabinoid medication, 209
 clinical evaluation, 108, 109, 110–112, 112, 375
 clinical picture, 374–375
 combined pharmacotherapy, 222, 224
 communicating diagnosis, 134
 definition, **4**
 diabetic neuropathies, 34, 109, 110, **150**, 175, 184, **199**, 200, 223, 373, 376
 diagnosis, 375–376
 epidemiology, 11, 373
 ICD-11 classification, 373
 management, 376–377, **378**, **379**
 pharmacotherapy, 140, 141, 175, **178**, 183–184, **183**, 222, 224, 376–377, **378**, **379**
 primary care, 140, 141
 spinal cord stimulation, 242
 see also small fiber neuropathy
 Neuropathic Pain Special Interest Group (NeuPSIG of IASP), 175, 376–377, **378**
 neurophysiological barriers to recovery, low back pain, 308, **308**
 neurophysiological investigations, 109–112
 neurophysiology, 25–39
 addiction, 407–410
 anxiety disorders and chronic pain, 452
 depression and chronic pain, 451
 nociceptor types, 26–27, 26
 organization of the “pain system”, 29–32, 31
 pain and analgesia, 456–458
 post-traumatic stress disorder and chronic pain, 453
 stimulus detection, 27–29, 28
 targets for analgesia, 34–35
 neurosurgical interventions, 250–259
 nicotinamide riboside (NR), complementary therapies, 296
 nitrates, topical analgesia, **199**, 202, 446
 NMDA (N-methyl-D-aspartic acid) receptors
 action, 29, 33, 34, 346, 357, 457
 blocking/agonists, 34, **149**, 190, 202, 351, 387, 400, 404, 457
 NMOU *see* non-medical opioid use
 nocebos, 60–66
 definitions, 60
 ethical issues, 64
 neurobiology of nocebo hyperalgesia, 64–65
 placebo relationship, 60, 61
 proposed mechanisms, 61–62
 nociception orphanin FQ peptide receptor (NOP), 189, **189**
 nociceptive neurons, structure and function, 456–457
 nociceptive pain
 neuropathic pain comparison, 373
 pharmacotherapy in primary care, 140, 141
 nociceptive processing
 age related changes, 422

- augmentation in chronic overlapping pain conditions, 13
 - modulatory influences, 345–346
 - orofacial region, 343–346
 - nociceptors
 - ascending pathways, 30
 - central projections, 30
 - definition, **4**
 - long term changes caused by chronic pain, 4
 - organization of the “pain system”, 29–32, 31
 - RNA expression profiles, 26–27, 26
 - signal conduction, 29
 - stimulus detection, 27–29, 28
 - subtypes, 26–27, 26
 - nociplastic pain
 - cannabinoid medication, 209
 - rheumatic diseases, 326
 - non-benzodiazepine muscle relaxants, chronic low back pain, 312
 - non-cardiac chest pain (NCCP), 360–361, 361
 - Non-Communicating Children’s Pain Checklist–Revised (NCCPC-R), 100, 443
 - non-invasive brain stimulation, sleep disorders and pain, 75
 - non-medical opioid use (NMOU), 402–403
 - see also* addiction; substance use disorders
 - non-prescription analgesics, use in chronic pain management, 140
 - non-steroidal anti-inflammatory drugs (NSAIDs)
 - chronic low back pain, 312
 - nutritional effects, 154
 - primary care, 140, 141
 - rheumatic diseases, 329
 - side effects of combination with antidepressants, 221
 - topical analgesia, **199**, 201
 - non-surgical minimally invasive interventions, 231–239
 - chronic low back pain, 312
 - see also* interventional therapies
 - nonverbal facial pain displays, 98, 443
 - NOP *see* nociception orphanin FQ peptide receptor
 - NPRS *see* Numeric Pain Rating Scale
 - NPS *see* neurological pain signature
 - NR *see* nicotinamide riboside
 - NRS *see* numerical rating scales
 - NSAIDs *see* non-steroidal anti-inflammatory drugs
 - nuclear imaging, 107–108
 - numerical rating scales (NRS)
 - adult pain intensity measures, 117
 - children, 96–97
 - older adults with dementia, 425
 - Numeric Pain Rating Scale (NPRS), 161
 - nutrition
 - dietary deficiencies and supplements, 74, 148, **149–150**, 294–296
 - omega-3 fatty acids, 148, **149**, **152**, 296, 297, 331
 - pain medication interactions, 154
 - stimulating poor eating habits/nutritional intake, 154–155
 - nutritional assessments, 154, 155
 - nutritional interventions, 147–159
 - cardiometabolic disease prevention and management, 151–154
 - dietary patterns, 148, 151–154, **153**
 - foods to choose/reduce, **152**
 - irritable bowel syndrome, 361
 - sleep improvement, 74
 - supplements, 74, 148, **149–150**, 294–296, 331
 - visceral pain, 359, 360, 362
- O**
- OA *see* osteoarthritis
 - obesity, 71, 151, 311
 - objective withdrawal stage, drug dependence, 409, 411–412
 - observations
 - individuals with intellectual disability, 444
 - older adults with dementia, 425
 - patient assessment, 86
 - pediatric patients, 96, 99–100
 - obstructive sleep apnea (OSA), 71, 72, 73, 74, 75
 - OCC *see* Opioid Compliance Checklist
 - occupational factors, chronic and recurrent pain, 14
 - occupational role disability, chronic non-cancer pain relationship, 14–15
 - occupational therapy (OT), 331, 388, 390, 391, 435
 - see also* physical therapy
 - OIN *see* Opioid-induced neurotoxicities
 - OK Health Checklist, individuals with intellectual disability, 443
 - older adults, 421–431
 - age related changes in pain sensitivity and nociceptive processing, 422
 - clinical pain assessment in cognitively intact patients, 422–424
 - cognitive impairments/dementia, 422, 424–425, 426
 - epidemiology of pain, 421
 - non-pharmacological pain management, 425–426, **428**
 - pharmacotherapy for pain, 426, **427**
 - undermanagement and undertreatment of pain, 421–422
 - omega-3 fatty acids, 148, **149**, **152**, 296, 297, 331
 - online (Internet-based) therapy, 122, 266, 267, 362, 436
 - opioid agonist therapy, opioid use disorder, 194, 195
 - opioid antagonists (μ -antagonists), 191, 401, 408, 409
 - Opioid Compliance Checklist (OCC), 121
 - opioid crisis/epidemic, 188, 401–402, 411
 - Opioid-induced neurotoxicities (OIN), 401
 - opioid-receptor-like receptor 1 (ORL-1) *see* nociception orphanin FQ peptide receptor
 - opioid receptors, 188–189, **189**, 191, 458
 - Opioid Risk Tool (ORT), 121
 - opioids, 188–197
 - addiction, 407–418
 - cancer pain, 398–403
 - CNS depression risks, 185, 221, 223
 - combined pharmacotherapy, 220, 221, 223–224
 - guidelines and restrictions, 56, **140**, 141, 194, 398–399, 411
 - intrathecal delivery, 246, 252
 - legitimate versus appropriate factors in prescribing, 413
 - low back pain, 307, 312
 - mechanism of action, 399–400
 - misuse assessment, 193–194, 402–403
 - negative long-term effects, 273
 - neuropathic pain, 377
 - nutritional effects, 154
 - palliative care patients, 413
 - patient monitoring and management, 192–194, 193
 - patient selection and risk stratification, 191–192, 193
 - pharmacokinetics, 190
 - pharmacology, 188–191
 - physical dependence and withdrawal, 408–410
 - postsurgical tapering and weaning, 56–58, 57
 - primary care use, 141
 - recommendations for use in chronic pain, 218–219
 - regulatory restrictions, 411
 - relative potency, 189, 190, **190**
 - rheumatic diseases, 329–330
 - risk assessment and management, 401–402
 - rotation of drugs, 194, 401
 - safety and side effects, 189–190, 191, **192**, 400–401
 - societal harm, 188
 - substance use disorder, 121, 194, 195, 402–403, 410–412
 - tapering and discontinuation, 56–58, 57, 194–195, 408, 411, 412
 - tolerance, 121, 193, 401, 402, 408, 412, 456, 458, 459
 - topical analgesics, 200–201, 202
 - Transitional Pain Service, 56–58, 57, 58
 - universal precautions steps, 413–415
 - use during pregnancy, 195
 - visceral pain, 359–360
 - opioid tolerant patients
 - definitions, 458
 - perioperative pain management, 456–461
 - organization of the “pain system”, 29–32, 31
 - organization-specific pain assessment guidelines, pediatric patients, 100, 101

- ORL-1 (opioid-receptor-like receptor)
 1) *see* nociception orphanin FQ peptide receptor
 orofacial pain, 343–354
 brainstem mechanisms, 344–345, 344
 clinical aspects, 346–352
 modulatory influences, 345–346
 nociceptive processes, 343–346
 primary afferent mechanisms, 343–344
 resembling presentations of primary headaches, 351–352
 thalamocortical mechanisms, 345
 ORT *see* Opioid Risk Tool
 OSA *see* obstructive sleep apnea
 osteoarthritis (OA), 325
 antidepressant analgesics, 177, **178**
 classification, **327**
 combined pharmacotherapy, 223–224
 economic impacts, 17
 epidemiology, 10
 non-surgical minimally invasive interventions, 235–236
 pathogenic mechanisms, 326
 prevalence, 325
 topical treatments, 329
 treatments, 328–331
 oxcarbazepine, **182**, 183–185
 oxycodone, 188, 189, **190**, 329, **402**, 459
- P**
 PACSLAC/PACSLAC-II *see* Pain Assessment Checklist for Seniors with Limited Ability to Communicate scales
 PACU *see* post-anesthesia care unit
 Paediatric Pain Profile *see* Pediatric Pain Profile
 pain acceptance, 275
 see also Acceptance and Commitment Therapy
 PAINAD *see* Pain in advanced Dementia Scale
 Pain in advanced Dementia Scale (PAINAD), 424
 Pain and Anxiety Symptom Scale (PASS), 284
 pain assessment, psychosocial perspectives in clinicians' practice, 45–46
 Pain Assessment Checklist for Seniors with Limited Ability to Communicate scales (PACSLAC/PACSLAC-II), 424, 425
 pain behavior, psychological assessment, 116–117
 pain catastrophizing
 definition, 282
 see also catastrophizing
 Pain Catastrophizing Scale (PCS), 120–121, 284
 pain diaries, 100, 117
 Pain Disability Index (PDI), 119
 pain experience
 psychosocial factors in best practice, 43–44
 see also personal experience of pain
 pain expression, psychosocial factors in best practice, 44–45
 painful diabetic neuropathy (PDN), 183, 184, **199**, 200, 223, 373
 pain intensity ratings, children, 96–98
 pain intensity scales, 86
 pain management programs (PMPs), primary care, 142, 143
 Pain Medication Questionnaire (PMQ), 121, 193
 pain 'memory', 55
 pain neuroscience education (PNE), 163
 pain prediction, 52, 55, 285–286
 pain quality assessment, 86
 Pain-QuILT™, mobile pain self-reporting tool
 pain recognition and assessment, individuals with intellectual disabilities, 439, 440, 441–443, **442**
 pain-related evoked potentials (PREPs), 112
 pain specialists/secondary pain care services, 141, 143, **143**, 415
 pain surveys, prevalence rate estimation, 6
 pain taxonomies, 7–8
 palliative care patients, opioids, 413
 palpation, patient assessment, 88, 319
 pancreatitis, 361–
 paracetamol *see* acetaminophen
 parents of pediatric patients, 9, 95, 96, 99–100, 435, 437
 paresthesia
 definition, **4**
 myofascial pain syndrome, 318
 with neuropathic pain, 374
 peripheral nerve stimulation, 245
 small fiber neuropathy, 110
 spinal cord stimulation, 242
 paroxysmal hemicrania, 340
 PASS *see* Pain and Anxiety Symptom Scale
 patient controlled analgesia (PCA), 459
 patient controlled epidural analgesia (PCEA), 459, 460
 patient education
 by physical therapists, 162–163
 fear of movement intervention, 285
 fibromyalgia syndrome, 320–321
 individuals with intellectual disability, 444–445
 rheumatic diseases, 329
 see also cognitive-behavioral therapy
 patient empowerment, physical therapy, 160
 Patient Health Questionnaire-9 (PHQ-9), 118
 patient history
 clinical assessment of adults, 82, **83**, 84–85
 pediatric patients, 96, **97**
 psychological assessment, 116–117
 patient-provider relationship, 133–135
 patient-reported outcome (PRO), 161
 Patient-Reported Outcomes Measurement Information System (PROMIS), 98–99, 117, 118
 patient selection, opioid medication, 415
 patients' values and preferences, nutritional interventions, 155
 PCA *see* patient controlled analgesia
 PCEA *see* patient controlled epidural analgesia
 PCS *see* Pain Catastrophizing Scale
 PDI *see* Pain Disability Index
 pediatric chronic pain registries, 100
 Pediatric Pain Profile (PPP), 100, **442**, 443
 pediatric patients, 432–438
 antidepressant analgesic, 177–178
 assessment of pain, 95–104
 clinical evaluation, 433–434
 clinical practice, 433–437
 cognitive behavioral therapy, 434–435
 complementary and alternative medicine (CAM), 436
 digital self-management programs, 267–268
 etiology and significance of recurrent and chronic pain, 432
 interdisciplinary approach, 434, 435–436
 organization-specific pain assessment guidelines, 100, 101
 pharmacotherapy, 435–436
 physical therapy/occupational therapy, 435
 psychological therapies, 434–435
 remote/digital interventions, 436
 treatment algorithm, 436, 437
 treatment approaches for recurrent and chronic pain, 434
 pelvic pain, 366–372
 chronic, 363–
 economic impacts, 17
 epidemiology, 11–12
 see also chronic pelvic pain
 peppermint oil, complementary therapies, 295
 peptidergic/non-peptidergic nociceptors, 26–27, 26, 30, 35
 percutaneous interventions *see* injections;
 non-surgical minimally invasive interventions
 performative efficacy, placebo/nocebo effect, 62
 periodic limb movement (PLM), sleep disorders and pain, 67, 68, 71–72, 75, 76
 perioperative analgesia
 neurophysiological targets, 457–458
 patients with opioid tolerance, 456–461
 practical management, 458–460
 perioperative pain, chronic postsurgical pain association, 54, 55
 peripheral nerve compression syndromes, neurosurgical interventions, 251

- peripheral nerve stimulation (PNS), 245
see also transcutaneous electronic nerve stimulation
- peripheral nerve ultrasonography, 107
- peripheral nervous system
 dorsal rhizotomy and dorsal root ganglionectomy, 253, 256
 neurectomy, 253, 256
 neurosurgical interventions, 253–256
 non-surgical minimally invasive interventions, 233–234
 sympathectomy, 256
- peripheral sensitization, 32
- peripheral terminals, nociceptors, 27–28, 28
- persistent depressive disorder, 450
- persistent idiopathic dentoalveolar pain (PIDAP), 350–351
- Persistent idiopathic facial pain (PIFP), 350–351
- persistent nociceptor stimulation, central sensitization, 32–33
- persistent postsurgical pain
 correlation with inadequate treatment of acute pain, 4
 transition to chronic, 50–59
- personal experience of pain, 13, 40, 44–45
- personal history, psychological assessment, 117
- personality and mood, psychological assessment, 118–119
- personal social vocational history of patients, 85
- person-centered/patient-centered care, nutritional interventions, 147, 155
- PET *see* positron emission tomography
- pharmacodynamic drug interactions
 cannabinoids, 212–213
 opioids, 190
- pharmacokinetic effects, cannabinoid–drug interactions, 213
- pharmacotherapy, 171–228
 individuals with intellectual disability, 445–446
 older adults with pain, 426, **427**
 overview, 135–136
 pediatric patients, 435–436
 post-traumatic stress disorder and chronic pain, 452
 primary care, 139–141
 regular reviews, 141
 trial and reassessment, 139–140
see also individual conditions and agents
- PHN *see* post-herpetic neuralgia
- phones *see* smartphone applications
- PHQ-9 *see* Patient Health Questionnaire-9
- physical activity *see* activity; exercise
- physical dependence and withdrawal, 408–410, 411, 412
see also addiction; substance use disorders
- physical examination, clinical assessment, 82, **83–84**, 86–91, **93**
- physical interventions, complementary therapies, 296–297
- physically drug dependent patients, clinical care, 410–412, 458–460
- physical performance tests, physical therapy initial assessment, 161
- physical therapy (PT), 160–169
 assessment, 161–162
 behavioral psychology principles, 165
 biophysical modalities, 163–164
 causing pain in children with cerebral palsy, 441
 fibromyalgia syndrome, 321
 manual therapies, 164
 new/alternative interventions, 165–166
 pediatric patients, 390, 435
 physical activity encouragement and programs, 162–163, 164–165
 primary care, 142
 rheumatic diseases, 331
 sleep improvement, 73
 treatment approaches, 162–166
- physiological responses to pain, assessment of pediatric patients, 99
- physiotherapy *see* physical therapy
- PIDAP *see* persistent idiopathic dentoalveolar pain
- Pieces of Hurt Tool (Poker Chip Tool), children's pain assessment, 98
- PIFP *see* persistent idiopathic dentoalveolar pain
- pink noise, sleep disorders and pain, 75
- “placebo-like” effects, expectations of benefit without placebo administration, 64
- placebos, 60–66
 complementary therapies, 296
 definitions, 60
 ethical issues, 60, 65
 history, 60
 neurobiology of placebo analgesia, 62–64, 63
 nocebo relationship, 60, 61
 placebo effect versus placebo response, 61
 proposed mechanisms, 61–62
 use in clinical trials, 60, 61
- plant-based diets, nutritional interventions, 148, 151
- plant-derived substances, complementary therapies, 294–295, 331
- PLM *see* periodic limb movement
- PMPs *see* pain management programs
- PMQ *see* Pain Medication Questionnaire
- PNE *see* pain neuroscience education
- PNS *see* peripheral nerve stimulation
- Poker Chip Tool (Pieces of Hurt Tool), children's pain assessment, 98
- polysomnography (PSG), 68, 71, 72
- positive affect/emotion, buffering effects on pain, 274
- positron emission tomography (PET), 63, 108, 308
- post-anesthesia care unit (PACU), 459
- post-herpetic neuralgia (PHN), 3, 34, 175, 183, 184, 199, **253**, 348, 375
- postoperative neuralgia, 373
- postsurgical pain, transition from acute to chronic, 50–59
- post-traumatic stress disorder (PTSD), 452–453
 cannabinoid medication, 210
 neurophysiology, 453
 prevalence with chronic pain, 452
 screening, 85
 treatments, 453
- post-traumatic trigeminal neuropathic pain (PTNP), 348, 349
- posture, patient assessment, 86, 87
- Power Doppler, microvascular imaging, 108–109
- PPDT *see* pressure pain detection threshold
- PPP *see* Pediatric Pain Profile
- P-Q-R-S-T, exploring the nature of pain symptoms, 444, **444**
- practical considerations, chronic pain
 restraining diet quality, 154–155
- prediction of harm/pain, fear fueled overprediction, 285–286
- prediction of outcomes
 diagnostic blocks, 231
 identification of causal mechanisms, 51
 postsurgical pain becoming chronic, 52, 53, 55
- pregabalin, 34, **182**, 183–186, 223, 330
- pregnancy
 cannabis/cannabinoid use, 210
 opioid use, 195
- preoccupation and anticipation stage, drug dependence, 409
- preoperative pain, chronic postsurgical pain relationship, 52, 55
- preoperative/postoperative factors, chronic postsurgical pain association, 54
- PREPs *see* pain-related evoked potentials
- pressure pain detection threshold (PPDT), physical therapy initial assessment, 162
- prevalence, definition, 6
- preventive approaches
 chronic postsurgical pain, 52, 54, 55–58
 headache/migraine, **183**, 338–339, 340
 pain in individuals with intellectual disability, 444–445
- primary afferent neurons, 25–32, 26, 28, 31
- primary care
 managing chronic pain, 138–146
 non-drug interventions, 141–143
 pharmacotherapy, 139–141
 treatment goals, 139
- “primary” pain category
 epidemiology, 12–13
 IASP classification, 7, 13
- PRO *see* patient-reported outcome
- probiotics, complementary therapies, 295

- Procedure Specific Postoperative Pain Management (PROSPECT), 458
 prognostication *see* prediction of outcomes
 progressive goal setting *see* activity monitoring/progressive goal setting/graded activity
 pro-inflammatory markers, diet relationship, 147–148
 projected pain, 374, 374
 PROMIS *see* Patient-Reported Outcomes Measurement Information System
 PROSPECT *see* Procedure Specific Postoperative Pain Management
 prostatitis, chronic, 363–364
 PRP *see* transient receptor potential channels
 pseudoaddiction, opioid dose too low to control pain, 403
 PSG *see* polysomnography
 psychiatric comorbidities, poor response to pain treatment, 115
 psychiatric illness, 450–455
 changes in DSM-5, 453
 see also individual disorders
 psychoeducation, Cognitive-Behavioral Therapy, 272–273, 276
 psychological approaches, 261–290
 chronic postsurgical pain reduction, 56
 complementary therapies, 296, 297
 non-drug interventions in primary care, 142
 overview, 136
 pediatric patients, 434–435
 self-management programs, 263–271
 see also Acceptance and Commitment Therapy; cognitive behavioral therapy; hypnosis; mindfulness
 psychological assessments, 115–130
 addictive disorder risk, 413–414
 clinical interviews, 115, **116**, 117–121
 determining treatment options, 115, 118, 120–121, 123
 future directions, 122–123
 innovative technologies, 121–122
 psychometric measures, **116**, 117–121
 substance use disorder assessment, 121
 psychological history of patients, 84–85
 psychologically-oriented tools, physical therapy initial assessment, 161
 psychological risk factors, chronic low back pain, 311
 psychological therapies
 chronic pelvic pain, 370
 fibromyalgia syndrome, 321
 visceral pain, 360
 psychometric measures, psychological assessments, **116**, 117–121
 psychometric tools, clinical pain assessment in cognitively intact older adults, 423
 psychopathology *see* individual disorders; psychiatric illness
 psychophysiological and social explanations of functional symptoms, medically unexplained pain, 133–134, 450
 psychosocial factors
 barriers to recovery from low back pain, 308, **308**
 cancer pain, 397
 chronic postsurgical pain association, 52
 Complex Regional Pain Syndrome, 386
 see also placebos
 psychosocial interventions
 older adults with pain, 425–426
 rheumatic diseases, 331–332
 psychosocial perspectives, 40–49
 best practice, 43–46
 caregivers, 41–43, 42, 45–46
 pain experience, 43–44
 pain expression, 44–45
 pain management, 46
 person in pain, 43–45
 study of pain clinic patients, 42–43
 psychosocial problems, older adults, 423
 psychosocial stressors, psychological assessment, 117
 psychotherapeutic treatments
 anxiety disorders and chronic pain, 452
 depression and chronic pain, 451
 modifying sleep habits, 72–73
 post-traumatic stress disorder and chronic pain, 453
 PTNP *see* post-traumatic trigeminal neuropathic pain
 PTSD *see* post-traumatic stress disorder
- Q**
 QST *see* quantitative sensory testing
 QTc prolongation, opioids, 401
 QT prolongation, side effects of combined pharmacotherapy, 221
 quality adjusted life years, cost effectiveness of treatments, 244
 quality of life, pain effects, 4
 quantification of pain intensity, pediatric patients, 96
 quantitative sensory testing (QST), 109–110, 111, **111**, 162
- R**
 RA *see* rheumatoid arthritis
 radicular pain, 250, 307, 308, 312, 376, 377
 radiculopathy, 373
 radiofrequency ablation (RFA), 234, 234, 235, 236, 312, 331
 range of motion (ROM), patient assessment, 87–88, 88–90, 91
 reactive arthritis, 106
 real-time data collection methods, children's pain self reporting, 100
 reassurance
 clinicians validating the reality of patient's experience, 134
 fear of movement interventions, 285
 physical therapists, 162–163
 recurrent pain
 associated factors, 13–14
 economic impacts, 15–18
 epidemiology, 6, 8–11
 referral of pain from one area to another, 345
 referral to pain management specialists, 141, 143, **143**, 415
 reflexes, patient assessment, 91
 Reflex Sympathetic Dystrophy (RSD) *see* Complex Regional Pain Syndrome type I
 regional anesthetic blocks *see* nerve blocks
 region-specific self-report tools, physical therapy initial assessment, 161
 rehabilitation, physical therapy, 160–169
 reinforcement of pain, behavioral factors, 273
 remote delivery of treatments
 online cognitive-behavioral therapy strategies, 122
 pediatric patients, 436
 see also digital health interventions
 renal impairment
 risk of morphine metabolite buildup, 190
 risk of serotonin syndrome, 189–190
 resilience, buffering effects on pain, 274
 resiniferatoxin (RTX), complementary therapies, 294–295
 resting, pain reinforcement and muscular deconditioning, 273
 restless leg syndrome (RLS), 71–72, 75
 see also periodic limb movement
 revised Faces, Legs, Activity, Cry, Consolability (r-FLACC), pediatric pain assessment, 100, 443
 reward system, drug dependence, 409
 RFA *see* radiofrequency ablation
 r-FLACC *see* revised Faces, Legs, Activity, Cry, Consolability
 rheumatic diseases, 325–335
 active inflammatory process, 326–327
 adjuvant drugs, 330
 anatomic considerations, 326
 antidepressants, 330
 barriers/obstacles optimum to pain management, 332, **332**
 basic pain mechanisms, 326
 cannabinoids, 330
 choosing the right analgesic, 330–331
 chronic process, 327
 classification, **327**
 clinical practice, 327–328
 corticosteroids, 330
 diet, 329
 epidemiology, 10
 exercise, 328
 invasive procedures, 331
 laboratory investigation, 106

- NSAIDs, 329, 331
 opioids, 329–330
 pharmacotherapy, 329–331
 psycho-social interventions, 331–332
 stepwise treatment approach, 332
 topical treatments, 329
 treatment and pain management, 328–332
- rheumatoid arthritis (RA), 325
- riboflavin (vitamin B₂), complementary therapies, 296
- risk assessment
 opioid prescribing, 402
 universal precautions in pain medicine, 413–415
- risk factors
 associated with chronic and recurrent pain, 13–14
 causal versus correlated, 52, 53
 chronic postsurgical pain, 51–55, **51**, 53, 54
 definition, 51
- RLS *see* restless leg syndrome
- RNA expression profiles, nociceptor types, 26–27, 26
- ROM *see* range of motion
- rostral ventromedial medulla (RVM), 30, 32, 33–34
- RSD (Reflex Sympathetic Dystrophy) *see* Complex Regional Pain Syndrome type I
- RTX *see* resiniferatoxin
- rumination, 120, 282, 283
- RVM *see* rostral ventromedial medulla
- S**
- sacroiliac joint blockades, 308–309
- safety issues/side effects
 analgesic combinations, 220–221, 225
 anticonvulsants, **182**, 185–186, 387, 434
 antidepressants, 174, 220–221, 404
 combining drugs with similar adverse effects, 221, 225
 medically induced pain mistaken for fibromyalgia syndrome, 317
 minimized by combined pharmacotherapy, 219, 220, 221
 opioids, 189–190, 191, **192**, 400–401
 serotonin–norepinephrine reuptake inhibitors, 174–175, 220–221
 topical analgesics versus transdermal drug delivery, 198
 tramadol, 189–190, 220, 329
see also complications
- Schober's test for range of motion of the lumbosacral spine, 87, 90
- SCL-90-R *see* Symptom Checklist 90
- Scottish Intercollegiate Guideline Network (SIGN), 139, **140**, 141
- Screener and Opioid Assessment for Patients with Pain (SOAPP), 193, 403
- Screener and Opioid Assessment for Patients with Pain–Revised (SOAPP-R), 121
- SCS *see* spinal cord stimulation
- SDB *see* sleep disorders breathing
- “secondary gain” factors, disability compensation, 14–15
- secondary pain care services (pain specialists/specialist pain clinics), 141, 143, **143**, 415
- selective serotonin reuptake inhibitors (SSRIs)
 chronic pain treatment, 173, 174, 360, 362, 388, **404**, 451
 nutritional effects, 154
 PTSD, 451
 safety profiles, 154, 174–175, 220–221
- self-efficacy, bolstering pain management, 275, 276
- self-hypnosis, 276, **294**, 296
- self-management, 263–271
 activity/sleep tracking, 119, 165
 adolescent programs, 267–268
 approaches to pain management, 135
 cognitive-behavioral tools, 276
 community-based programs, 266
 digital programs, 266–268
 effectiveness of education programs, 266–268
 focus groups, 268–269
 needs assessment, 268–269
 pediatric patients, 267–268
 physical therapy, 160
 primary care, 142
 rheumatic diseases, 328–329
 Stanford University Patient Education Research Center model, 264–269
 symptom monitoring/tracking, 266, 268
 tool box, 265
- self-management books, older adults with pain, 426
- self-perception, unable to cope with pain, 282
- self-reporting
 activity levels and disability in older adults, 424
 mood and personality assessment, 118–119
 pain assessment in adults with dementia, 425
 pain assessment in cognitively intact older adults, 423
 pain assessment in individuals with intellectual disability, 440, 443
 pain assessment measures, 117–118
 pain assessment in pediatric patients, 96–99, 100
 physical therapy initial assessment, 161
 poor sleep, 68, 68, 70
 psychological assessments, 115, **116**, 117–121
- semi-structured clinical interviews, psychological assessments, 115, **116**, 117–121
- sensitivity to pain, age related changes, 422
- sensitization
 analgesia targets, 34–35
 central, 32–34
 peripheral, 32
- persistent pain, 32–34
 visceral pain, 357, 357
see also allodynia; hyperalgesia
- sensory examination, neurological assessment, 91, 93
- sensory neurons
 characteristics of primary afferent fibers, 25–27, 26
 visceral sensation, 356
- sensory perception, *see also* quantitative sensory testing
- sensory phenomena, negative and positive coexisting in neuropathic pain, 374
- SEPs *see* somatosensory evoked potential studies
- serotonin, 28, 32, 356, 359, 407, 457
- serotonin–norepinephrine reuptake inhibitors (SNRIs)
 chronic pain treatment, 173–174, **179**, 321, 330, 376, 377, **379**, **404**
 depression and chronic pain, 451
 post-traumatic stress disorder and chronic pain, 452
 safety profiles, 174–175, 220–221
see also duloxetine
- serotonin syndrome, 174, 190, 220–221
- severe neurological impairments (SNI), 441, 443
- SF-36 *see* Short-Form Health Survey
- SFN *see* small fiber neuropathy
- shearwave elastography, 109
- Short-Form Health Survey (SF-36), 119
- short-lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT syndrome), 340
- shortwave diathermy (SWD), 163
- sicca symptoms (dry mouth and eyes), 106
- side effects *see* complications; safety issues/side effects
- SIGN *see* Scottish Intercollegiate Guideline Network
- single photon emission computed tomography (SPECT), 108
- Sjögren's syndrome, 106, 110
- skin temperature/color, Complex Regional Pain Syndrome, 381, **382**
- sleep, 67–79
 advice to improve, 72–76, 73, 76
 assessment, 68–69, 119
 pain interactions, 68–69
 pain processing during sleep, 69–70
 prevalence of poor sleep quality, 67, 70–71
 self-reports of poor sleep, 68, 68, 70
- sleep disorders
 interventions, 72–75, 76
 pain relationship, 68
 in patients with pain, 70–72
 screening tools, 68
 sleep apnea, 67, 68, 68, 71–75, **192**, 256, 402
- sleep disorders breathing (SDB), 71
- sleep environment, 72, 73
- sleep hygiene, 72, 73

- sleep medications, 73, 74
 slow wave sleep (SWS), pink noise to improve sleep, 75
 small-fiber neuropathy (SFN), 109, 110–111, **111**, 184, 320, 375, 384
 smartphone applications (apps), 100, **101**, 121–122, 266–268, 436
 SMI *see* superb microvascular imaging
 SMP *see* sympathetically maintained pain
 snail venoms, complementary therapies, 295
 SNI *see* severe neurological impairments
 SNRIs *see* serotonin–norepinephrine reuptake inhibitors
 SOAPP *see* Screener and Opioid Assessment for Patients with Pain
 SOAPP-R *see* Screener and Opioid Assessment for Patients with Pain–Revised
 social communication model of pain, 41–43, **42**, 43–46
 social environment as a source of stress reactivity, 44
 social factors, pain relationship, 274
 social risk factors, psychological assessments, 115, 117
 social support and social environmental factors, chronic postsurgical pain association, 52
 socioeconomic status, chronic non-cancer pain relationship, 14
 soft tissue rheumatism, **327**
 somatic symptom disorder (SSD), 453
 somatization, 52, 55, 232, 450, 452
 somatosensory evoked potentials (SEPs), 111–112
 somatosensory pathways, orofacial region, **344**
 somatosensory qualities of pain experience, psychological assessment, 116
 somatosensory system, *see also* neuropathic pain
 specialist pain clinics/secondary pain care services, 141, 143, **143**, 415
 SPECT *see* single photon emission computed tomography
 spinal cord
 ascending nociceptive pathways, 30
 central sensitization/plasticity, 32–33
 cordotomy, **254**, 256
 descending pain modulation, 30, 32
 dorsal horn circuitry, 30, **31**, 32
 dorsal root entry zone lesioning, 256
 myelotomy, 256
 neurosurgical interventions, **254**, 256
 organization of the “pain system”, 30, **31**, 32
 spinal cord stimulation (SCS), 241–244, **242**, **243**, 252, **254**, 390
 spinal disorders, anatomical neurosurgical interventions, 250
 spinal manipulation, complementary therapies, **294**, 295, 297
 spinal nerves, non-surgical minimally invasive interventions, 234–235
 spinothalamic tract, cordotomy, 256
 spondyloarthritis, 106
 SSD *see* somatic symptom disorder
 SSRIs *see* selective serotonin reuptake inhibitors
 Stanford University Patient Education Research Center model of self-management, 264–269
 structural changes, chronic low back pain, 310
 subjective withdrawal stage, drug dependence, 409, 411
 subjectivity of pain, problems for research, 6–7
 substance P
 botulinum toxin blocking, 295
 neurogenic inflammation, 29, 338, 384
 ziconotide blocking, 246
 substance use disorders (SUDs)
 assessment, 85, 121
 cancer patients, 402–403
 clinical care of patients, 410–412
 diagnosing addiction, 415–416
 history in assessing opioid risk, 402
 naltrexone, 191
 neurobiology of addictions, 407–410
 opioids, 121, 402–403
 sufentanil, 246, 459, 460
 suicide/suicidal ideation
 major depressive disorder, 451
 patient assessment, 84–85, **85**
 role of pain, 4, 18
 SUNCT syndrome *see* short-lasting unilateral neuralgiform headache with conjunctival injection and tearing
 superb microvascular imaging (SMI), 108, 109
 surgical factors, chronic postsurgical pain association, 52
 surgical interventions
 Complex Regional Pain Syndrome, 390
 endometriosis, 369
 low back pain, 312–313
 osteoarthritis, 331
 trigeminal neuralgia, 251, 341, 342
 survivors of trauma, assessment, 85
 SWD *see* shortwave diathermy
 SWS *see* slow wave sleep
 sympathectomy, 256
 sympathetically maintained pain (SMP), 382, 384, 386, 387, 389, 391
 Symptom Checklist 90 (SCL-90-R), 118, 119
 symptom monitoring/tracking, self-management, 266, 268
 synthetic cannabinoids, 207, **208**, 209
 synthetic opioids, 188
- T**
 T2DM *see* type 2 diabetes
 TAC *see* trigeminal autonomic cephalgias
 Tampa Scale for Kinesiophobia (TSK), 284–285
 tapentadol, 190, **190**, 220
 tapering
 drugs of dependency, 194–195, 408, 411, 412
 postsurgical opioid use, 56–58, 57
 TCAs *see* tricyclic antidepressants
 technology
 electronic hand-held devices, 100, **101**
 imaging methods, 106–109
 Internet-based programs, 122, 266, 267, 362, 436
 online cognitive-behavioral therapy strategies, 122
 pain assessment, 121–122
 pediatric patients, 267–268, 436
 physical therapy, 165, 166
 smartphone applications, 121–122, 266–268, 436
 virtual and augmented reality, 166
 wearable digital devices, 119, 165
 teeth *see* dental pain
 telerehabilitation, physical therapy, 166
 teletherapy, 122
 temporal criterion of precedence, risk factors, 51, 52
 temporomandibular disorders (TMDs), 12, 346–347
 temporomandibular joint (TMJ), 343, 346–347
 tendon pain
 diagnostics, 88, 91, 106, 108
 therapeutic interventions, 232, **233**
 TENS *see* transcutaneous electronic nerve stimulation
 tension-type headache (TTH), **339**, 340
 antidepressant analgesics, 177, **178**
 epidemiology, 11
 testing for drugs, universal precautions in pain medicine, 414–415
 tetrahydrocannabinol (THC), 74, 206–209, **208**, 210–211, **212**
 thalamocortical mechanisms, orofacial pain, 345
 thalamotomy, neurosurgical intervention, 257
 thalamus, pain processing, 257, 273, 344, 345, 457
 thalidomide, 388
 THC *see* tetrahydrocannabinol
 therapeutic alliance, physical therapy, 160
 therapeutic interventions/blocks *see* non-surgical minimally invasive interventions
 therapeutic targets, nociceptive transmission, 457
 therapeutic ultrasound, 163
 thermoreceptors, 27
 time management, opioid prescriptions, 416
 tissue injury, chemical mediator release, 32, 456–457
 TMDs *see* temporomandibular disorders
 TMJ *see* temporomandibular joint

- TN *see* trigeminal neuralgia
 tolerance of drugs, 121, 193, 401, 402, 408, 412, 456, 458, 459–461
 tool kits, Cognitive-Behavioral Therapy, 276
 tooth extraction/root canal treatment, 348
 tooth pain/toothache *see* dental pain
 topical medication, 198–205, 329
 activating inhibitory systems, 200–201
 benefits and shortcomings, 198, **199**
 blocking sensory input, 199–200
 capsaicinoids, **199**, 200
 clonidine, **199**, 201–202
 Complex Regional Pain Syndrome, 386, 391
 local anesthetics, 199–200, **199**, 202–203
 mechanism of action/indications, **199**
 NSAIDs, **199**, 201
 opioids, 200–201
 rheumatic diseases, 329
 use of creams in physical therapy, 163
 topiramate, **182**, 183–186
 “total pain” concept, cancer pain, 396–397
 TPS *see* Transitional Pain Service
 tramadol
 combination therapy, 223, 224
 pharmacology, 190
 recommendations for use, 218, **219**, **378**, **379**
 safety and side effects, 189–190, 220, 329
 transcutaneous electronic nerve stimulation (TENS), 142, 160, 163
 transdermal drug deliver
 buprenorphine, 190, 329
 fentanyl, 190, 400, 459
 topical analgesics comparison, 198
 transduction of mechanical stimuli, 27
 transduction of pain signals, 29, 358, 456, 458
 transient receptor potential (TRP)
 family of ion channels
 inflammation, 32, 34
 nociceptor function, 26, 27, 28, 28, 32, 456–457
 Transitional Pain Service (TPS), 56–58, 57
 trauma-focused cognitive therapy, 452
 trauma and stressor-related disorders, 452–453
 treatment agreements, pain medication, 414
 treatment algorithms, pediatric patients, 436, 437
 treatment goals
 agreeing in primary care, 139
 cognitive-behavioral therapy, 275
 fibromyalgia syndrome, 321
 progressive goal setting in fear of movement interventions, 285, 286
 see also expectations and goals
 treatment options
 overview, 135–136
 psychological assessment role, 115, 118, 120–121, 123
 tricyclic antidepressants (TCAs), 173
 cancer pain, 404, **404**
 chronic low back pain, 177, 312
 combination therapies, 224
 complex regional pain syndrome, 387–388
 electrocardiographic QT prolongation risk, 174, 221
 irritable bowel syndrome, 361
 migraine, 176
 mode of action, 34
 neuropathic pain, 175, 183, **219**, 370, 377, **378**, **379**
 orofacial pain, 351
 pharmacological mechanisms of pain relief, 174
 post-traumatic stress disorder and chronic pain, 452
 PTSD, 435
 recommendations for use, 178, 178, 379
 safety profiles, 174, 220–221, 404
 trigeminal autonomic cephalgias (TAC), 340–341, 351
 trigeminal neuralgia (TN)
 anticonvulsants, 183, **183**
 characterization and treatment, 342, 377
 neurosurgical interventions, 251, 254, 257
 post-traumatic trigeminal neuropathic pain differential diagnosis, 348
 trigeminal neuropathic pain, *see also* post-traumatic trigeminal neuropathic pain
 trigeminal nuceotomy-tractotomy, 254
 trigeminal tractotomy, 251, 257
 trigger points (TrPs), myofascial pain, 88, 315, 316, 319, 320, 322, 368, 370
 triptans, migraine treatment, 338
 TRP *see* transient receptor potential
 TRPV1 antagonists, analgesia targets, 34
 TSK *see* Tampa Scale for Kinesiophobia
 TTH *see* tension-type headache
 type 2 diabetes (T2DM), nutritional management, 147, 151, 153
- U**
 ultrasound
 investigations, 108–109
 physical therapy, 163
 unilateral neuralgiform headache, 340
 Universal Precautions - 10 steps in the management of chronic pain, 413–415
 urogenital pain, 366–372
 genital pain, 203, 366, 368, 370
 urologic conditions, **367**, 368, 370
- V**
 validating patients’ pain experience, 134, 162, 371, 433, 434
 valproate, **182**, 183–186
 VAS *see* visual analog scales
 vasculitides, 106
 vegan diet, nutritional interventions, 148, 151
 venlafaxine, 173, 175, 176, 377, **378**, **404**
 verbal rating scales (VRS)
 adult pain intensity measures, 117
 children, 96–97
 older adults with dementia, 425
 vestibulodynia, 203, 368, 370
 virtual and augmented reality technologies, 166
 visceral contractions, interventions, 359
 visceral pain, 134, 355–364
 alternative and complementary therapies, 360
 antidepressants, 359
 basic mechanisms, 355
 centrally acting analgesics, 359–360
 central processing, 356
 evidence-based treatment strategies, 358–360
 interventions targeting central processing, 359–360
 interventions targeting luminal contents, 359
 interventions targeting peripheral pathways, 358–359
 interventions targeting visceral contractions, 359
 managing common syndromes, 360–363
 molecular mechanisms, 355–356
 myelotomy, 256
 psychologically based interventions, 360
 sensitization, 357, 357
 structural elements, 356
 visual analog scales (VAS)
 adult pain intensity measures, 117
 children, 98
 older adults with dementia, 425
 vitamin B group, **150**, 296, 350
 vitamin C, 154, 387
 vitamin D, 74, 106, **150**, 154
 VRS *see* verbal rating scales
 vulvodynia, 203, 368, 370
- W**
 Wallerian degeneration of the axon, cryoablation, 233
 wearable digital devices, activity/sleep tracking, 119, 165
 weight management
 not effective approach to cardio-metabolic disease management, 151, 153
 see also obesity
 wellbeing, biopsychosocial model of health and illness, 41, 41
 West Haven-Yale Multidimensional Pain Inventory (WHYMPI), 119
 whiplash injuries, disability compensation, 14–15
 white willow bark, complementary therapies, 295
 WHO *see* World Health Organization

Index

WHYMPI *see* West Haven-Yale
Multidimensional Pain Inventory
withdrawal *see* physical dependence
and withdrawal
women, chronic pelvic pain,
366–372
workers compensation *see* disability
compensation and claims

World Health Organization (WHO)
headache epidemiology, 10
International Classification of
Functioning, Disability and
Health, 160, 433
occupational role disability study, 14
opioid guidelines for cancer,
398–399

X

X-ray imaging studies, 106

Z

ziconotide, intrathecal analgesia, 34,
246, 295, 390