

REHABILITATION OF THE INJURED COMBATANT, Volumes 1 and 2

A

- AAEM
 - See* American Association of Electrodiagnostic Medicine (AAEM)
- AAROM
 - See* Active assistive range-of-motion (AAROM)
- Abdominal binders
 - elastic, 182, 184
- Abducens nerve, 291–300
 - anatomy and function, 291–293
- Abducens neuropathies, 295–296
 - electrodiagnosis, 299
 - evaluation, 299
 - imaging, 299–300
 - management, 299–300
 - symptoms and signs, 297–299
 - syndromes, 296–297
- Above-elbow (AE) amputations, 43–44
 - long, 44
 - short, 44
 - surgical procedures, 46
- Above-elbow prostheses, 34, 56–59
 - versus* below-elbow prostheses, 56
 - choice of, 69–71
 - elbow joints for, 56–57, 59
 - fitting, 48–50
 - myoelectric, 69
 - and residual limb problems, 61
 - standard components, 57
- Above-knee amputations (AKA), 122–134
 - acute pain management, 125
 - definitions, 122–123
 - energy expenditure for walking, 93
 - functional outcome, 83
 - interdisciplinary team management case study, 835–837
 - joint contracture prevention, 126
 - long-term follow-up, 133–134
 - low, 82
 - mortality rates, 93
 - psychological support, 125, 133–134
 - rehabilitation, 123–127, 143, 147–148
 - reintegration into community, 133
 - selection, 123–124
 - surgical techniques, 122–124
 - unbalanced myodesis in, 140
 - weight bearing, 126
- Above-knee prostheses
 - fitting, 126–127
 - training, 133
- ABPM
 - See* American Board of Physical Medicine (ABPM)
- ABPM&R
 - See* American Board of Physical Medicine and Rehabilitation (ABPM&R)
- Accessory nerve, 335–338
 - anatomy and function, 335–336
- Accessory neuropathies, 336–338
 - electrodiagnosis, 338
 - evaluation, 336–338
 - imaging, 338
 - management, 338
 - prognosis, 338
 - symptoms and signs, 336
- syndromes, 336
- Accidental death
 - incidence, 209–210
- Accommodation reflex
 - innervation, 295
- Ace bandages, 357
- Acetazolamide, 217
- Acetylcholine, 450, 785
- Acetylcholine receptor proliferation
 - following denervation, 435–436
- Acetylcysteine, 759
- Acetylsalicylate
 - contraindications, 357
- Achilles tendinitis, 399–400
- Acid burns, 577–578
- AC joint
 - See* Acromioclavicular (AC) joint
- Acknowledgment, 847
- ACL
 - See* Anterior cruciate ligament (ACL)
- Acoustic nerve, 315–325
 - anatomy and function, 315–317
- Acoustic neuroma, 322
- Acoustic neuropathies, 317–318
 - electrodiagnosis, 322–323
 - evaluation, 319–322
 - management, 323–324
 - prognosis, 323
 - symptoms and signs, 318–319
- Acromioclavicular (AC) joint, 371–372
 - rehabilitation, 372
- ACTH
 - See* Adrenocorticotrophic hormone (ACTH)
- Actin, 783
- Action potentials, 424–425, 785
 - duration, 459
 - loss of ability to provoke, 460
 - measurement, 451
 - propagation, 449
 - See also* Compound motor action potentials (CMAP); Sensory nerve action potential (SNAP)
- Active assistive range-of-motion (AAROM)
 - for burn patients, 603–606
 - definition, 602–603
- Activities of daily living (ADL)
 - assessment instruments, 852–853
 - and bilateral upper extremity amputees, 63–64
 - and burn patients, 596, 601, 607, 618–621, 631, 676–680
 - limitations, 15
 - and lower extremity amputees, 84, 102–104, 106
 - and quadruple amputees, 149
 - and spinal cord injured patients, 179
 - and traumatic brain injuries, 227–228
 - and upper extremity amputees, 50–52, 62–64
 - See also specific activity*
- Acupuncture
 - for phantom limb pain, 147
- Acute abdomen
 - in spinal cord injured patients, 184
- Acute mountain sickness, 820
- Adaptic, 591, 594–595, 600, 616
- Adaptive devices
 - for bathing, 679
 - for burn patients, 618–621, 631, 674–680

- for communication, 620–621, 681–682, 833
- for donning pressure garments, 679–680
- for dressing, 679–680
- for drinking, 619–620
- for driving, 54, 64, 178–179, 682
- for environmental control systems, 621
- for feeding, 619–620, 676–677
- for functional mobility, 682
- for grooming, 620, 677–679
- for hand rehabilitation, 38, 41–42
- for hearing impairments, 324
- for home accessibility, 681
- for housekeeping, 681
- for keyboard usage, 681–682
- for kitchen activities, 681
- for lower extremity amputees, 106
- as orthosis attachments, 707
- for reading, 621
- recreational, 10, 41–42, 52–54, 70–71, 149, 682–683
- for self-feeding, 619–620, 676–677
- for spinal cord injured patients, 178–179
- for toileting, 679
- vocational, 54
- for writing, 621
- See also specific device*
- Adaptive skills
 - assessment, 855
- Adenosine diphosphate (ADP), 786
- Adenosine triphosphatase (ATPase), 783–784
- Adenosine 5'-triphosphate (ATP), 786–787
 - resynthesis, 786–787
- Adie's pupil, 297
- ADL
 - See Activities of daily living (ADL)*
- Adler-Scheie test, 287
- ADP
 - See Adenosine diphosphate (ADP)*
- Adrenocorticotrophic hormone (ACTH), 218
- Adson maneuver, 501
- Advisory Board for Medical Specialties, 5–6, 831
- Advocacy
 - for brain injured patients, 249, 255
- AE amputations
 - See Above elbow (AE) amputations*
- Aerobic capacity
 - and age, 804–805
 - correlation between body fat percentage and, 795
 - and gender, 803–804
 - and immobilization, 764
 - of military populations, 803–806
 - and occupation, 804–805
- Aerobic power, 782, 799–801
 - definition, 799
 - determinants, 800–801
 - measurement, 799–800
- Aerobic system, 787
- Aerobic training, 810–812
 - adaptation to resistance training, 812
 - adaptive response, 809
 - in integrated program, 813–814
 - in weight control programs, 793
- Affective disorders
 - after traumatic brain injury, 223
- Afferent fibers
 - in cranial nerves, 281
- AFO
 - See Ankle/foot orthoses (AFO)*
- African Americans
 - counseling concerns, 849
- Age
 - as risk factor for injury, 816
 - and severity of burn injury, 579
 - and traumatic brain injury management, 218
 - and vocational rehabilitation, 847
 - See also Elderly; Children*
- Ageusia, 311
- Air cushion
 - three-layered, 757
- Air-Flex Foot, 117–119
- Air-fluidized bed, 757
- Air Force
 - body fat standards, 796–798
 - disability systems, 884
 - physical therapy services, 25–26
- Air Force Convalescent Training Program, 831
- Airplane splints, 630, 638
- Air suspension beds, 757
- Airway compromise
 - signs of, 583
- Airway management
 - of burn patients, 583–585, 598–599
- Akathisia
 - after traumatic brain injury, 220
- Alcohol abuse
 - and pharmacologic therapy, 240
 - and traumatic brain injury, 229, 239–241, 246
- Alignment
 - dynamic, 104
 - static, 103–104, 127
- Alkali burns, 577–578
- Allergic contact dermatitis
 - on residual limb, 139
- Allodynia, 482
- Allograft skin
 - See Homograft skin*
- Alternate binaural loudness balance test, 320
- Altitude
 - high terrestrial, 820
- Amantadine hydrochloride, 214–215, 217, 219
- Amaurotic familial idiocy, 287
- Ambulation
 - after spinal cord injury, 175, 177–178, 731
 - after traumatic brain injury, 226
 - by burn patients, 636
 - energy expenditure for, 92–93, 149, 178, 723–724, 731, 733
 - by fracture patients, 733–737
 - impairment, 15
 - by lower extremity amputees, 13, 81, 84, 88, 102, 104, 106, 125–127, 135
 - by multiple amputees, 148–149
 - and musculoskeletal disorders, 358, 384
 - See also Crutch ambulation; Gait pattern; Gait training; Gait velocity*
- American Association of Electrodiagnostic Medicine (AAEM), 11, 448, 513
- American Association of Electrotherapy and Radiology, 830
- American Association of Physical Therapists, 830
- American Board of Medical Specialties, 6
- American Board of Physical Medicine (ABPM), 5–6, 831
- American Board of Physical Medicine and Rehabilitation (ABPM&R), 6, 832
- American Burn Association, 579, 583
- American College of Radiology and Physiotherapy, 4
- American Medical Association, 5–6, 8
 - American Board of Physical Medicine, 5–6, 831
 - Council on Physical Therapy, 22

- impairment rating scale, 285
- Special Exhibit Committee on Physical Medicine, 742
- American Physical Therapy Association, 20
- American Spinal Injury Association (ASIA), 167–169
- Americans with Disabilities Act, 6
- American Women's Physical Therapeutic Association, 21
- Amino acids
 - and traumatic brain injury, 212
- Amino acid supplementation
 - for burn patients, 687
- Amitriptyline, 476, 492, 495
- Amnesia
 - and mild brain injury, 230
 - posttraumatic, 253
- Amphetamine, 219
- Amplification
 - electrodiagnostic, 451–452
- Amplitude, 459
 - motor unit, 457
 - nerve conduction studies, 459, 464
- Amputation
 - Civil War, 34, 71–72, 80, 134
 - emotional aspects, 47, 52
 - Korean War, 134
 - mortality rate, 134
 - multiple, 122, 133, 148–149
 - Persian Gulf War, 12–15, 46–47, 80
 - primary indication for, 45
 - psychological trauma, 10
 - quadruple, 149
 - surgical principles, 45–46
 - Vietnam War, 10, 52, 72, 80, 134, 148, 150
 - vocational outcomes after, 150
 - World War I, 35, 81, 93, 95, 134
 - World War II, 34–35, 46, 71–72, 80, 93–95, 134
 - See also* Lower extremity (LE) amputations; Upper extremity (UE) amputations; *specific type of amputation*
- Amputation centers
 - World War II, 7, 10, 34–35, 52, 80–81, 94, 149
- AMSC
 - See* Army Medical Specialist Corps (AMSC)
- AMSC-CIR
 - See* Chief of Army Medical Specialist Corps Clinical Investigation and Research (AMSC-CIR)
- Anaerobic glycolysis, 787–788
- Anaerobic power, 782, 801–802
 - definition, 801
 - determinants, 802
 - measurement, 801–802
 - population data, 806
- Anaerobic training, 812–813
 - in integrated program, 813–814
 - See also* Resistance training
- Anaerobiosis
 - muscle, 786, 789
- Analgesics
 - for burn patients, 599–600, 621–623, 625–626
 - for musculoskeletal injuries, 357–358, 383
 - for phantom limb pain, 145–146
 - for spinal cord injured patients, 191
 - See also* Pain management; *specific drug*
- Anderson shoulder ring, 713
- Anesthesia
 - for causalgia, 489–490
 - for lumbar pain, 382
 - malpositioning during, 628
 - ocular complications, 296
 - for phantom limb pain, 146, 148
 - for reflex sympathetic dystrophy, 141, 148
 - for residual limb pain, 142, 147
- Anesthesia dolorosa, 308
- Anesthetics
 - for musculoskeletal injuries, 372, 375
 - for phantom limb pain, 146
 - See also specific drug*
- ANG
 - See* Army National Guard (ANG)
- Angiography
 - pulmonary, 760–761
- Aniracetam, 219
- Ankle
 - musculoskeletal disorders, 395–401
 - nerve injuries, 531–545
 - scar compression, 675
- Ankle compression injury
 - chronic or repetitive, 538, 541–542
- Ankle disarticulation
 - See* Syme's amputation
- Ankle-foot orthoses (AFOs), 704, 715–726
 - ankle joints for, 716–717
 - anterior stops, 715–716, 718–720, 723
 - biomechanical function, 716–720
 - for burn patients, 615, 631, 643
 - components, 715–716
 - design and suitability, 720–722
 - evaluation by biomechanical principles, 722–723
 - indications, 716
 - mediolateral stability, 716–717
 - metabolic requirements, 723–724
 - metal, 715–720
 - for peripheral nerve injuries, 495
 - pistoning, 722–723
 - plastic, 720–723
 - posterior stops, 715, 717–718, 722–723
 - with prostheses, 90
 - specialized designs for patient needs, 723–724
 - Teufel, 723–725
 - VAPC shoe clasp, 722–723, 725
- Ankle/foot prostheses, 87, 127
- Ankle fractures
 - stress, 397
- Ankle positioning
 - for burn injuries, 611
- Ankle sprains
 - inversion, 397–399
 - superficial peroneal neuropathy caused by, 541
 - sural entrapment neuropathy caused by, 542
 - tarsal tunnel syndrome caused by, 533
- Ankylosis, 380–381
- Anorexia
 - after traumatic brain injury, 217
 - and immobilization, 752
- Anosmia, 283, 285
- Anosognosia, 211
- Antacids, 754
- Anterior cord syndrome, 170–171
- Anterior cruciate ligament (ACL), 392–393
- Anterior drawer test, 392
- Anterior interosseous nerve, 508
- Anterior interosseous syndrome, 508–509
- Anterior scalene syndrome, 501
- Anterior stops
 - on ankle-foot orthoses, 715–716, 718–720, 723
 - on knee-ankle-foot orthoses, 729
- Anterior tarsal tunnel, 538
- Anterior tarsal tunnel syndrome, 538–540

- Antibiotics
 - for urinary tract infections, 585
 - See also specific drug*
- Anticholinergic drugs
 - for traumatic brain injury, 212, 220
 - See also specific drug*
- Anticholinesterases
 - for traumatic brain injury, 218
- Anticoagulants, 762–764
 - See also specific drug*
- Anticonvulsants
 - for cranial neuropathies, 329, 335
 - for peripheral neuropathy, 477
 - for phantom limb pain, 146
 - for spinal cord injured patients, 191
 - for traumatic brain injury, 216, 221, 240
 - See also specific drug*
- Antidepressants
 - See Tricyclic antidepressants; specific drug*
- Antigravity positioning, 470–471, 604, 606–610, 628, 743, 746
- Antihypertensives
 - contraindications, 220
 - for spinal cord injured patients, 183–184
 - See also specific drug*
- Antiinflammatory medications
 - for musculoskeletal injuries, 355, 357–358, 364, 372–373
 - See also Nonsteroidal antiinflammatory drugs (NSAIDs); specific drug*
- Antiosteoclastic agents
 - for immobilization osteoporosis, 748, 750
- Antipersonnel mines
 - injuries caused by, 82
- Antispasticity agents
 - for traumatic brain injury, 216
 - See also specific drug*
- Anxiety
 - and traumatic brain injury, 251–254
- Anxiolytics
 - and alcohol use, 240
 - for burn patients, 622
 - See also specific drug*
- APDAB
 - See Army Physical Disability Appeals Board (APDAB)*
- Aphonia, 332
- Appetite dysregulation
 - after traumatic brain injury, 217
 - and immobilization, 752
- Appraisal, 847
- Aquaplast, 617
- Archives of Physical Medicine and Rehabilitation, 4
- Arginine supplementation, 687
- Argyll Robertson pupil, 292, 297, 299
- Aris Isotoner, Inc., 665
- Arm amputations
 - See Upper extremity (UE) amputations*
- Armed Forces Military Entrance Processing Stations
 - strength measurement methodology, 806
- Armed Service Amputation Center, 10, 149
- Arm scar compression, 673
- Arm supports
 - mobile, 676–677, 710–712
 - suspension sling, 712–713
- Army
 - aerobic capacity values, 804–806
 - basic recruit training, 814–816
 - body fat standards, 796–797
 - body weight/fat control program, 793
 - body weight limits, 796
 - cardiovascular risk screening program, 818
 - physical disability system, 865–883
 - physical therapy, 16, 20–28
 - rehabilitation teams, 16
- Army-Baylor University Graduate Program in Physical Therapy, 25
- Army Medical Command (MEDCOM), 866
- Army Medical Specialist Corps (AMSC), 23
- Army National Guard (ANG)
 - disability compensation, 882–883
- Army of the Republic of Vietnam (ARVN), 23
- Army Patient Administration Division (OTSG), 27
- Army Physical Disability Agency (USAPDA), 865–867
 - caseload statistics, 879–883
 - history, 865
 - location, 867
 - review by, 876–879
- Army Physical Disability Appeals Board (APDAB), 866
- Army Physical Therapy Registry (Persian Gulf War), 27–28
- Army Regulations 40-48 and 40-68, 24
- Army Reserve (USAR)
 - disability compensation system, 877, 882–883
- Arterial blood pressure
 - See Blood pressure (BP)*
- Arthritis
 - in amputees, 142
- Arthrogenic contractures, 746
- Arthroscopy
 - peroneal neuropathies caused by, 529
- Artificial muscle
 - in hand orthoses, 708–709
- Ashworth scale
 - for grading muscle tone, 172
- ASIA
 - See American Spinal Injury Association (ASIA)*
- Aspartate, 212
- Aspen Workgroup, 235
- Aspiration
 - in spinal cord injured patients, 182
- Assist mode, 599
- Ataxia
 - after traumatic brain injury, 217
- Atelectasis
 - in spinal cord injured patients, 182
- Atlanto-axial instability
 - C-1 to C-2, 174
- Atlanto-occipital dislocations, 173
- ATP
 - See Adenosine 5'-triphosphate (ATP)*
- ATPase
 - See Adenosine triphosphatase (ATPase)*
- Atrophy
 - optic, 287
 - See also Muscle atrophy*
- Atropine, 183
- Attentional process disruption
 - after traumatic brain injury, 220
- Audiogram, 320
- Audiometry
 - pure tone, 319
- Auditory hallucinations, 319
- Auditory palpebral reflex, 313–314
- Auditory screening test, 319
- Auriculotemporal nerve syndrome, 303, 312
- Autonomic dysregulation
 - after traumatic brain injury, 217
- Autonomic hyperreflexia
 - in spinal cord injured patients, 183–184

Autonomic instability
 causalgia-associated, 482
 Avellis's syndrome, 332
 Axial flaps, 691
 Axillary nerve, 496
 injury to, 499–500
 Axillary straps
 for upper extremity prostheses, 57
 Axon, 422–423
 Axonal debris removal
 role of macrophages in, 433
 Axonal degeneration
 See Wallerian degeneration
 Axonal regeneration
 after peripheral nerve injury, 431–432, 434, 436
 after traumatic brain injury, 212
 Axonal shear injuries, 209
 Axonal transport, 425–426
 antegrade, 425
 models, 426
 retrograde, 425–426
 Axon collateral sprouting
 after traumatic brain injury, 212–213
 Axonotmesis, 429

B

Babinski response, 190
 Bacitracin, 582, 591
 Back pain
 immobilization for, 743
 low, 11, 378–389, 857
 Baclofen
 for cranial neuropathies, 308
 for phantom limb pain, 146
 for spinal cord injuries, 191
 for traumatic brain injury, 216, 220
 BAEPs
 See Brainstem auditory evoked potentials (BAEPs)
 Balance
 with knee-ankle-foot orthoses, 730
 Balance board training
 for musculoskeletal injuries, 398
 Balkan Wars, 162
 Ball-bearing mobile arm support, 710–712
 Barbiturates, 216
 Barium swallow, 327–328
 Barthel Index-Granger Adaptation, 852
 Barton, Walter E., 22
 Barton Carey garments, 659, 669
 Baruch, Bernard, 5
 Baruch Committee, 5
 Basic recruit training
 injuries associated with, 814–816
 Bathing
 adaptive aids, 679
 Batteries
 for myoelectric prostheses, 67
 Battle fatigue
 prevention, 623
 Battle stress, 16, 623
 Battle wounds
 emotional reaction to, 846–848
 BE amputations
 See Below elbow (BE) amputations
 Becker-type ankle joint, 716
 Bedrest
 See Immobilization; Immobility complications

Beds
 for spinal cord injured patients, 182, 186
 See also specific type of bed
 Behavioral approaches
 to burn pain, 625
 to phantom limb pain, 147
 Behavioral assessment tools, 223
 Behavioral observations
 for neurobehavioral assessment, 242–243
 Behavioral problems
 after traumatic brain injury, 211–213, 222–223, 238–239
 Behrens, Charles F., 5
 Belgian Army Medical Corps, 81
 Bell clapping
 residual limb pain caused by, 142–143
 Bell's palsy, 311
 Below-elbow (BE) amputations, 43–44
 bilateral, 64
 long, 44, 52
 short, 44, 53
 surgical procedures, 46
 very short, 44, 53
 Below-elbow prostheses, 34, 52–59
 versus above-elbow prostheses, 56
 choice of, 69–71
 elbow joints for, 55
 fitting, 48–50
 long, 44, 52
 myoelectric, 68–69
 and residual limb problems, 61
 short, 44, 53
 standard components, 55
 suspension and control, 54–56
 terminal devices, 44, 53–54
 very short, 44, 53
 wrist units, 53–55
 Below-knee amputations (BKA), 82, 93–122
 classification, 93
 energy expenditure for walking, 93
 functional outcome, 83, 93
 high, 82
 indications, 94
 long, 93
 long-term follow-up, 106
 mortality rates, 93
 postoperative dressings, 96–100
 preoperative evaluation, 100–101
 psychological support, 101
 rehabilitation, 100–106, 143, 147–148
 residual limb lengthening, 96
 short, 93
 standard or medium length, 93
 surgical techniques, 93–96
 ultrashort, 93
 weight bearing, 98–99, 102–103
 Below-knee prostheses, 106–120
 computer aided design/ manufacturing, 120–121
 fitting, 106
 foot, 97–100, 110, 113
 immediate postoperative, 96–98
 selection, 106–107
 shanks, 112–113
 sockets, 106–110, 112
 suspension, 110–112
 Bending moment
 at knee, 717, 723
 Benedikt's syndrome, 296
 Benseraide, 214–215

- Benson's relaxation, 625–626
- Benzodiazepines
 - for burn patients, 622
 - for traumatic brain injury, 216, 220–221, 240
 - See also specific drug*
- Beta-blockers
 - for causalgia, 490
 - for phantom limb pain, 146
 - for traumatic brain injury, 217, 220
 - See also specific drug*
- Betadine
 - See Povidone-iodine*
- Betapile, 668
- Bethanecol, 218
- Bevor's sign, 169
- BIA
 - See Brain Injury Association (BIA)*
- Bicycles
 - stationary, 125, 635, 800–802
- Biker's compression shorts, 657–658, 665
- Billings, Frank, 4
- Bine's test, 320
- Biobrane, 582, 593, 629
- Bio-Concepts, Inc., 665
- Bioconcepts prefabricated glove, 667
- Biofeedback
 - for myoelectric prosthesis training, 69
 - for phantom limb pain, 147
- Biological dressings, 592–593
- Bioplasty mesher, 590
- Biphosphonates, 748, 750
- Bivalved casts, 639, 747
- Bladder calculi
 - in spinal cord injured patients, 194
- Bladder carcinoma
 - in spinal cord injured patients, 194
- Bladder drainage
 - in immobilized patients, 585, 752
 - in spinal cord injured patients, 193–194
- Blink reflex, 302–303
 - electrodiagnostic evaluation, 305
- Blisters
 - on burn wound, 632, 656
 - foot, 818
 - on residual limb, 136
- Blocking, 463
- Blood flow distribution, 791
- Blood loss
 - from debrided wound, 588
- Blood pressure (BP)
 - arterial, 790–791
 - during exercise, 790–791
 - in immobilized patients, 764–765
 - response to maximal exercise, 791
- Bobath shoulder roll, 713
- Body composition
 - definition, 792
 - and physical capacity, 794–796
 - and physical fitness, 792–799
 - reference values, 792
 - standards, 796–797
- Body fat, 792–793
 - android pattern, 793
 - assessment, 793
 - classification, 792
 - essential or obligatory, 792
 - excess, 793, 797
 - gynoid pattern, 793
 - measurement methodology, 797–799
 - military control programs, 793, 796–799
 - reduction, 793
 - regional distribution, 793, 798
 - storage, 792–793
- Body fat percentage
 - correlation between aerobic capacity and, 795
 - and fitness level, 792–799
 - military standards, 796–797
 - reference values, 792
 - values for military populations, 794
- Body-powered prostheses
 - hybrid (myoelectric and body-powered), 56, 59
 - versus* myoelectric prostheses, 68–71
 - for upper extremity amputations, 53, 56, 62
- Body strength
 - See Strength*
- Body temperature
 - regulation, 791
- Body weight
 - See Weight*
- Bolton, Frances P., 22
- Bolton Bill, 22
- Bone changes
 - after burn injuries, 690
 - in resistance training, 810
- Bone homeostasis
 - during immobilization, 747–748
- Bone scans
 - in causalgia, 487–488, 491
 - in musculoskeletal injuries, 381, 385–386
 - in reflex sympathetic dystrophy, 141–142
- Bone spurs
 - in residual limb, 139–140
- Bone stress reactions
 - See Stress fractures*
- Bonnier's syndrome, 303, 326
- Boutonniere deformity, 611, 614, 639
- Bowden control cable, 55, 57–58
- Bowel programs
 - for immobilized patients, 753
 - for spinal cord injured patients, 185
- Boyd hindfoot amputation, 86–87
- Braces
 - for musculoskeletal injuries, 374, 386
- Brachial plexopathies, 496–498
 - anatomic considerations, 496–497
 - in burn patients, 689–690
 - clinical presentation, 498–500
 - electrodiagnosis, 498–500
 - etiology, 497–498
- Brachial plexus, 496–497
- Brachial plexus injuries, 366
- Bracing
 - fracture cast, 735
 - functional electrical stimulation for, 732–733
- Bradyarrhythmia
 - in spinal cord injured patients, 182–183
- Bradycardia, 333
- Brain
 - contusions, 209
 - surface anatomy, 223
- Brain injuries
 - See Traumatic brain injury (TBI)*
- Brain Injury Association (BIA), 227, 230
- Brainstem auditory evoked potentials (BAEPs), 322–323
- Brainstem tumors, 323
- Brake mechanisms

- for knee prostheses, 127–128
 - Bretylum, 490
 - Bromocriptine, 214–215, 219–220, 222
 - Brown, Paul W., 10
 - Brown-Séquard syndrome, 170–171
 - Buf-N-Puff, 633
 - Bulimia
 - after traumatic brain injury, 217
 - Bullet fragment removal
 - from spinal cord injuries, 164–165
 - Bullets
 - spinal cord injuries caused by, 164–165
 - traumatic brain injury caused by, 208–209
 - Bullet shock waves
 - spinal cord injuries caused by, 164
 - Bunnell, Sterling, 9, 35–36, 38
 - Bunnell splints, 709
 - Burn centers, 577, 583–584, 633
 - Burn claw deformity, 614
 - Burn cream, 582
 - Burn grafts
 - See* Skin grafts
 - Burn injuries, 575–702
 - acid, 577–578
 - acute phase, 595–625
 - alkali, 577–578
 - associated illnesses and injuries, 581
 - chemical, 577–578, 583
 - classification, 577–579
 - closed treatment, 600
 - complications, 582
 - depth, 580–581
 - dressings, 582, 587, 592–594, 600, 632
 - electrical, 578–579, 591–592, 595, 691–692
 - emergency care, 583–585
 - first degree, 580
 - flame, 577
 - fourth degree, 581
 - immobilization phase, 595–596, 625–631
 - neurologic complications, 689–690
 - nonhealing wounds, 587
 - open treatment, 600
 - Persian Gulf War, 14–15
 - pigmentation, 605
 - scald, 577
 - second degree, 580–581
 - severity factors, 579–581
 - size, 579–580
 - steam, 577
 - surgical considerations, 582, 628
 - thermal, 577
 - third degree, 581
 - topical treatment, 582
 - treatment, 582–595
 - wound excision, 587–588
 - wound maturation phase, 595–596, 631–684
 - Burn Net, 600
 - Burn pain, 621–622
 - Burn patients
 - adaptive equipment, 618–621, 631, 674–680
 - airway management, 583–585, 598–599
 - contracture prevention, 600, 603–610, 627–628, 636, 643–674
 - edema management, 587, 600, 606, 655–674
 - enteral feeding, 602, 687–688
 - exercises, 596–597, 602–606, 627–628, 635–637, 652–653
 - functional activities, 596, 601, 607, 618–621, 631, 674–680
 - home management, 680–681
 - inpatient care guidelines, 583–584
 - intubation, 584, 598–600
 - management, 595–693
 - nutritional care, 602, 684–689
 - orthotics, 596, 600, 611–618, 629–630, 637–643
 - outpatient care, 583–584, 636
 - pain management, 599–600, 621–623, 625–626
 - phases of care, 595–596
 - positioning, 607–611
 - psychological support, 596, 623–626, 631, 633, 683–684
 - pulmonary edema in, 584–585
 - reconstructive surgery, 690–693
 - rehabilitation goals, 595, 632
 - return to duty, 637, 683–685
 - vascular access, 584–585
 - Burn resuscitation formulas, 586
 - Burn scars
 - assessment, 662–664, 666
 - desensitization, 633–634
 - Burn shock
 - fluid resuscitation for, 585–587
 - Burn splints, 615–616
 - Bursae injuries, 356
 - residual limb pain caused by, 142
 - Bursitis
 - trochanteric, 389
 - in upper extremity amputees, 61
 - Burst fractures, 175
 - Bushnell General Hospital, Utah, 35, 80
 - Buspirone, 215–216
 - Bypass prosthesis, 126
- ## C
- Cable excursion
 - in upper extremity prostheses, 59
 - Cable tensiometer, 802
 - Cacosmia, 283
 - CAD
 - See* Computer aided design (CAD)
 - CAI
 - See* Career Assessment Inventory (CAI) Enhanced Version
 - Calcaneal nerve, 533
 - Calcanectomy
 - partial, 87
 - Calcarine cortex, 286, 289
 - Calcitonin
 - for hypercalcemia, 750
 - for immobilization osteoporosis, 748
 - for phantom limb pain, 146, 148
 - Calcium alginate dressing, 594
 - Calcium channel blockers, 479, 490
 - Calcium gluconate, 578
 - Calcium intake
 - during immobilization, 751
 - Calcium ions, 783–784
 - Calcium supplementation, 748
 - Callosities
 - of residual limb, 137
 - Caloric testing, 321
 - Calorie counts
 - for burn patients, 602, 687–688
 - and immobilization, 752
 - CAM
 - See* Computer aided manufacturing (CAM)
 - Camouflage makeup
 - for burn patients, 673, 690
 - Canada

- amputee vocational outcome study, 159
- Canadian socket design, 132–133
- Canes
 - for above-knee amputees, 126
 - for musculoskeletal injuries, 357
- CANFIT system, 121
- Canty, Thomas J., 10
- Capsaicin, 477–478, 490
- CAPTE
 - See Commission on Accreditation for Physical Therapy Education (CAPTE)
- Carafate
 - See Sucralfate
- Carbamazepine, 477
 - for cranial neuropathies, 308, 335
 - for traumatic brain injury, 216, 220–222
- Carbidopa, 214–215, 219, 222
- Carbohydrate metabolism
 - and burn injuries, 687
- Carbon Copy II, 92, 116, 120
- Carbon Copy III, 116–117, 120
- Carbon dioxide (CO₂)
 - as orthotic power source, 705, 708–709
 - partial pressure (PCO₂), 789, 791
 - production, 788–789
- Carbon fiber
 - shoe shanks/inserts, 90
 - socket reinforcement with, 91–92
- Carbon graphite shoe inserts, 89–90
- Carcinoma
 - bladder, 194
 - colon, 185
- Cardiac enlargement
 - in resistance training, 810
- Cardiac output (C.O.)
 - and blood flow distribution, 791
 - maximum, 801
 - and oxygen consumption, 790
 - response to aerobic training, 809
 - response to maximal exercise, 791
- Cardiac reconditioning, 765
- Cardiopulmonary resuscitation (CPR)
 - after spinal cord injury, 162
- Cardiorespiratory endurance
 - See Aerobic power
- Cardiovascular complications
 - exertion-related, 818
 - of immobilization, 762–765
 - of spinal cord injury, 182–184
- Cardiovascular conditioning
 - and musculoskeletal injuries, 388
- Cardiovascular deconditioning, 764–765
- Cardiovascular function
 - during exercise, 789–792
- Cardiovascular response
 - to aerobic training, 809
 - to resistance training, 809–810
- Cardiovascular risk screening program, 818
- Career Assessment Inventory (CAI) Enhanced Version, 854
- Career Compensation Act, 865, 879
- Career content skills
 - assessment, 855–856
- Career plan guideline, 857
- Career Planning Guide Book, 855
- Caromed Int'l, Inc., 665
- Carotid sinus reflex, 327, 333
- Carpal tunnel, 509–510
- Carpal tunnel release (CTR), 513–514
- Carpal tunnel syndrome (CTS), 437–439, 509–514
 - acute, 510, 513–514
 - anatomic considerations, 509–510
 - chronic, 510
 - classification, 511–512
 - clinical presentation, 511–512
 - electrodiagnosis, 512–513
 - etiology, 510–511
 - treatment, 513–514
- Casts
 - bivalved, 639, 747
 - fiberglass material, 48, 53, 97–100
 - fracture bracing, 735
 - plaster impression for residual limb, 121
 - serial, 747
 - thumb spica, 377
 - See also Orthoses
- CAT/CAM socket
 - See Contoured Adducted Trochanteric/Controlled Alignment Method (CAT/CAM) socket
- Catecholaminergic antagonists, 219–220
- Catecholamines
 - for traumatic brain injury, 212–215, 219
 - See also specific drug
- Catheters
 - See Urinary catheters
- Cauda equina, 168
 - injuries, 191, 193, 732
- Cauda equina syndrome, 170–172
- Causalgia, 481–496
 - cardinal characteristics, 482–483
 - case studies, 491–496
 - clinical considerations, 486
 - clinical staging, 483
 - diagnosis, 486–489, 491
 - incidence, 481–482
 - laboratory findings, 486–488
 - pathophysiology, 483–485
 - Persian Gulf War, 482, 491
 - superficial radial nerve compression-associated, 505
 - treatment, 489–491
 - Vietnam War, 482
- Cavernous sinus
 - anatomy, 295
 - inflammatory disease, 295
 - septic thrombosis, 296
- Cavernous sinus syndrome, 303
- Cavitation, 747
- CDP-choline
 - for traumatic brain injury, 219
- CED
 - See Cognitive enhancing drug (CED)
- Cellulitis
 - in spinal cord injured patients, 187–188
- Central Army Physical Review Council, 865
- Central auditory pathway lesions, 318
- Central cord syndrome, 170–171
- Central nervous system (CNS)
 - burn injury-associated damage, 633–634
 - causalgia-associated changes in, 484
 - effects of alcohol on, 240
 - effects of immobility on, 749
 - neural recovery, 212–213
- Central venous pressure
 - in immobilized patients, 764
- Centripetal wrapping, 471
- Centrophenoxine, 219
- Cerebellar ataxia, 217

- Cerebrospinal fluid markers
 - in traumatic brain injury, 211
- Cerebrovascular blood flow
 - and cognitive function, 219
- Cerium nitrate, 591
- Cervical collars, 361
- Cervical glides
 - dorsal, 362
- Cervical radiculopathy, 363–366
- Cervical soft tissue injuries, 361–363
 - rehabilitation, 361–362
- Cervical spine, 167–168
- Cervical spine injuries, 169, 171, 173–174
 - complications, 181–182, 191, 193
 - interdisciplinary team management case study, 843–844
- Cervical spine orthoses, 174
- Cervical stabilization exercises, 364–365
- Cervical stenosis
 - congenital, 165, 171
- Cervical traction, 364
- Cervicothoracic disorders, 361–367
 - See also specific disorder*
- Cervicothoracic stabilization exercises, 364–365
- Chance fractures, 175
- Charcot's spine, 189
- Check sockets, 52–53, 121, 130
- Chemical burns, 577–578
 - treatment, 583
- Chemosensory testing, 285
- Chest expansion
 - elbow lock operation by, 59–60
- Chest strap
 - for above-elbow prostheses, 58
 - for humeral neck amputation prostheses, 60
- Chief of Army Medical Specialist Corps Clinical Investigation and Research (AMSC-CIR), 27
- Childbirth
 - in spinal cord injured patients, 195
- Children
 - skin graft sites, 595
- Chin control
 - of wheelchair, 177
- Chlorhexidine, 597
- Chlorphenesin, 308
- Choking
 - socket, 143
- Cholelithiasis
 - in spinal cord injured patients, 185
- Choline, 218
- Cholinergic substances
 - for traumatic brain injury, 216, 218–220
 - See also specific drug*
- Chopart's amputations
 - See Tarsotarsal amputations*
- Chorda tympani syndrome, 312
- Chronaxie, 449
- Ciliary muscle
 - innervation, 292–293
- Cimetidine, 754
- Circulation, motion, sensation, and temperature (CMST), 616, 626
- Circulatory complications
 - after amputation, 137–139
 - in immobilized patients, 764–765
- Citalopram, 216
- Civil War
 - amputations, 34, 71–72, 80, 134
 - causalgia, 481
 - cranial neuropathies, 339
 - immobility complications, 742
- CK
 - See Creatine kinase (CK)*
- Claymore mines
 - injuries caused by, 82
- Clear film dressings, 594–595
- Cleveland Clinic, 5
- Clinical symptom complex, 356
- Clinitron bed, 186–187, 628, 631, 757
- Clodronate, 748, 750
- Clonazepam, 220–222, 477
- Clonidine, 219–220, 479, 490
- CMAPs
 - See Compound motor action potentials (CMAPs)*
- CMRR
 - See Common mode rejection ratio (CMRR)*
- CMST
 - See Circulation, motion, sensation, and temperature (CMST)*
- CN
 - See Cranial nerves (CN)*
- CNS
 - See Central nervous system (CNS)*
- C.O.
 - See Cardiac output (C.O.)*
- Coagulation necrosis
 - caused by acid burns, 577–578
- Coban, 471, 613, 658–659
- Cochlear implants, 324
- Cochlear nerve
 - anatomy and function, 315–317
- Cochlear neuropathies, 318–324
 - evaluation, 319–322
 - management, 323–324
- Cocked-hat flap procedure, 37
- Cockup splint, 709–710
- Codeine, 622
- Code of Hammurabi, 864
- Cognitive-behavioral dysfunction, 217–220, 222–223, 230
 - and family outcome, 252–253
 - treatment, 218–219, 228, 237–246
- Cognitive-behavioral profiling
 - after traumatic brain injury, 217
- Cognitive enhancing drug (CED), 218
- Cognitive function
 - drugs that may enhance, 218–220
 - drugs that may interfere with, 219–220
- Cognitive remediation
 - for brain injured patients, 245
- Cohen, Henry, 429
- Colace
 - See Docusate sodium*
- Cold exposure
 - differential sensitivity of nerves to, 445
 - effect on nerve conduction velocity, 445
 - and exercise-related injuries, 819–820
 - nerve damage caused by, 443–446
 - tissue injury from, 123
 - See also Frostbite*
- Cold-induced neuropathies, 443–446
 - clinical considerations, 443–444
 - and duration of exposure, 445
 - electrodiagnosis, 445–446
 - morphologic changes, 445
 - pathophysiology, 444–445
 - prognosis, 444
 - and temperature considerations, 445

- and type of nerve involved, 445
- Collagen
 - and hypertrophic scar formation, 644
- Collagen biosynthesis
 - in denervated muscles, 435, 465
- Collagen production phase, 354–355
- Colle's fracture
 - carpal tunnel syndrome caused by, 510, 513
- Collet-Sicard syndrome, 331–332, 336, 340
- Colon carcinoma
 - in spinal cord injured patients, 185
- Colorectal disease
 - in spinal cord injured patients, 185
- Columns of Denis, 174–175
- Coma
 - definition, 234
- Coma/Near Coma Scale, 224
- Coma Recovery Scale, 224
- Coma stimulation programs, 235–237
- Comatose patient
 - cranial neuropathies in, 280
- Combat boots
 - as risk factor for injury, 817
- Combat stress, 16, 623
- Combat theater
 - physical medicine and rehabilitation in, 8–9
 - physical therapy in, 19–30
 - See also specific theater*
- Commission on Accreditation for Physical Therapy Education (CAPTE), 25
- Common mode rejection ratio (CMRR), 452
- Communication
 - adaptive devices, 620–621, 681–682, 833
 - by intubated patients, 181
- Community mobility
 - and spinal cord injured patients, 178–179
- Community reintegration, 845–861
 - for spinal cord injured patients, 180
 - for traumatic brain injured patients, 224, 227–229
 - See also Return to duty; Vocational rehabilitation*
- Compartment syndromes, 439–440
 - pronator teres syndrome associated with, 506
- Compensation Act, 865, 879
- Compensation systems
 - See Physical disability system*
- Complex regional pain syndrome (CRPS)
 - diagnostic criteria, 486–489
 - See also Causalgia; Reflex sympathetic dystrophy (RSD)*
- Complex repetitive discharges, 455
- Compound motor action potentials (CMAPs)
 - amplitude, 459, 464
 - inability to elicit, 460
 - measurement, 451
 - in ulnar neuropathy, 462, 517
- Compression
 - for edema control, 471
 - for musculoskeletal disorders, 357
- Compression inserts
 - for orthoses, 650, 664–674
- Compression neuropathy, 436–439
 - classification, 429
 - clinical considerations, 437–439
 - and impulse propagation, 450
 - pathophysiology, 436–437
 - See also specific nerve*
- Computed tomography (CT)
 - in cranial neuropathies, 285, 299, 341
 - in femoral neuropathy, 527
 - in musculoskeletal disorders, 381
 - socket design with, 121
 - in spinal cord injury, 163–164, 173, 175
 - in traumatic brain injury, 225, 230
- Computer aided design (CAD)
 - of sockets, 120–121
- Computer aided manufacturing (CAM)
 - of sockets, 120–121
- Computer aided socket design (CASD), 121
- Computers
 - for spinal cord injured patients, 179
- Concentric contractions, 783
- Concentric needle electrodes, 453
 - bipolar, 453
 - coaxial, 453
- Concussive injuries, 227, 230
 - classification, 230
 - incidence, 210
 - symptoms, 227, 230–231
- Conditioning period
 - and muscle injury avoidance, 356
- Condom catheters
 - skin complications, 186–187
- Conduction block, 449–450
 - focal, 430
- Conduction slowing with temporal dispersion
 - electrodiagnostic findings, 461–462
- Conduction velocity
 - See Nerve conduction velocity*
- Cones, 285–286
- Confusion
 - in burn patients, 631
- Connecticut Chemosensory Clinical Research Center, 283–284
- Connective tissue
 - denervation-associated changes, 435, 438–439, 442
 - of nerve, 426–427
 - peripheral neuropathy-associated stretching, 465–467
- Consciousness
 - loss of, 230, 234–235
- Constipation
 - in immobilized patients, 752–753
- Contact dermatitis
 - caused by orthoses, 668–669
 - on residual limb, 138–139
- Continental United States (CONUS) hospitals
 - physical medicine and rehabilitation at, 9
 - See also specific hospital*
- Continuous passive motion (CPM) devices, 605, 616–618, 639–641, 747
- Continuous positive airway pressure (CPAP), 599
- Contoured Adducted Trochanteric/Controlled Alignment Method (CAT/CAM) socket, 129–130
- Contour foam, 670
- Contracture prevention, 8–9, 226, 746–747
 - in burn patients, 600, 603–610, 627–628, 636, 643–674
 - in lower extremity amputees, 81, 84, 88, 94, 101–102, 124–125, 135
 - in spinal cord injured patients, 189
 - in upper extremity amputees, 47
- Contractures
 - arthrogenic, 746
 - formation, 745
 - during immobilization, 745–746
 - myogenic, 435, 465–467, 491, 746
 - soft tissue, 746
 - types, 746
- Control mode, 599
- Control systems

- above-elbow prostheses, 57–58
- below-elbow prostheses, 54–56
- humeral neck amputation prostheses, 60
- myoelectric prostheses, 65–67
- Contusions
 - brain, 209
 - lumbar, 386–389
- CONUS
 - See* Continental United States (CONUS) hospitals
- Conus medullaris, 168
- injuries, 193
- Conus medullaris syndrome, 170, 172
- Convalescent hospitals
 - pre-World War II, 5
- Convalescent leave, 872
- Convergence system, 294
- Coping skills
 - and vocational rehabilitation, 846
- Corpectomy, 192
- Corneal reflex, 302–303
 - electrodiagnostic evaluation, 306–307
- Coronary artery disease
 - in spinal cord injured patients, 184
- Corps of Invalids, 72
- Cortical blindness, 287, 291
- Corticosteroids
 - for causalgia, 490
 - for musculoskeletal injuries, 358, 361, 366–367, 374, 377
 - See also specific drug*
- Corticotropin-releasing hormone, 217
- Cortisone, 542, 544
- Cosmetic covers
 - for above-knee prostheses, 132
 - for foot prostheses, 117, 119
 - for myoelectric prostheses, 68–69, 71
- Cosmetic prostheses
 - hand, 43
- Costoclavicular syndrome, 501
- Cough, 333
 - impaired, 182
- Coulter, John S., 5
- Coumadin, 183
- Council on Medical Education, 5
- Council on Physical Therapy (American Medical Association), 22
- Counseling
 - See* Emotional counseling; Psychological support; Psychotherapy
- Counterforce braces
 - for epicondylitis, 374
- Courage
 - as characteristic of soldier, 846
- CP
 - See* Creatine phosphate (CP)
- CPAP
 - See* Continuous positive airway pressure (CPAP)
- CPM devices
 - See* Continuous passive motion (CPM) devices
- C-polymodal nociceptors (C-PMN), 484–485
- CPR
 - See* Cardiopulmonary resuscitation (CPR)
- Cramp
 - heat, 819
- Cranial nerves (CN), 280
 - anatomy and function, 280–281
 - decompression, 280
 - I. *See* Olfactory nerve
 - II. *See* Optic nerve
 - III. *See* Oculomotor nerve
 - IV. *See* Trochlear nerve
 - V. *See* Trigeminal nerve
 - V₁. *See* Ophthalmic nerve
 - V₂. *See* Maxillary nerve
 - V₃. *See* Mandibular nerve
 - VI. *See* Abducens nerve
 - VII. *See* Facial nerve
 - VIII. *See* Acoustic nerve
 - IX. *See* Glossopharyngeal nerve
 - X. *See* Vagus nerve
 - XI. *See* Accessory nerve
 - XII. *See* Hypoglossal nerve
- Cranial neuropathies, 279–352
 - causes, 280
 - in comatose patient, 280
 - incidence, 280
 - prognosis, 280
 - See also specific cranial nerve*
- Creatine kinase (CK), 579
- Creatine phosphate (CP), 786–787
- Cricopharyngeus sphincter dilation, 329
- Cricothyroid muscle, 333
- Croatia, 28
- Crocodile tears, 312
- Cross-bridges, 783–784
- Crossed adduction maneuver, 371
- CRPS
 - See* Complex regional pain syndrome (CRPS)
- Crush injury
 - carpal tunnel syndrome caused by, 510, 514
- Crutch ambulation
 - for above-knee amputees, 126
 - carpal tunnel syndrome caused by, 510–511
 - by multiple amputees, 148
 - for musculoskeletal injuries, 357
 - patient education, 102–104, 106
 - for spinal cord injured patients, 178
- Crutch palsy, 503–504
- Cryotherapy
 - for musculoskeletal injuries, 357–358, 371–373, 383
- CT
 - See* Computed tomography (CT)
- CTR
 - See* Carpal tunnel release (CTR)
- CTS
 - See* Carpal tunnel syndrome (CTS)
- Cubital tunnel, 514–515
- Cubital tunnel release, 519
- Cubital tunnel syndrome, 514, 516, 519
- Cultural values
 - and counseling approaches, 849
- Cultured autologous keratinocyte grafts, 591–592
- Cutaneous sensation
 - and neurological evaluation of spinal cord injury, 169
- Cuthbertson, D. P., 742
- Cyber dynamometer, 635, 801
- Cyclanedolate, 219
- Cycle ergometry, 800, 802
- Cycling tests
 - for anaerobic power, 801–802
- Cyproheptadine, 217
- Cysts
 - epidermoid, 137
- Cytidine 5'-diphosphocholine
 - See* CDP-choline
- Cytotec
 - See* Misoprostol

D

- Daily living skills
 - See Activities of daily living (ADL)
- Dantrolene sodium, 217
- Deafferentation pain, 475
- Death
 - accidental, 209–210
 - exertion-related, 817
- Debridement
 - burn wounds, 587–589, 597
 - of devitalized tissues, 81, 135
 - enzymatic, 588–589
 - instruments, 587–588
 - for pressure sores, 187
 - See also Excision
- Decompression sickness, 166
- Deconditioning
 - cardiovascular, 764–765
 - prevention, 8–9, 81, 84, 126
- Deep brain stimulation
 - for phantom limb pain, 146
- Deep heating, 467, 746–747
- Deep peroneal nerve, 538
- Deep venous thrombosis (DVT), 183, 762–764
 - differential diagnosis, 763–764
 - prevention, 763–764
 - versus pulmonary embolism, 763
- Degenerative arthritis
 - in amputees, 142
- Degloving injuries, 37
- Dehydration, 819
- Dejerine's anterior bulbar syndrome, 340
- Deltoid aid, 639
- Dematomes
 - for spinal cord injury evaluation, 168
- Dementia
 - immobility-related, 749
- Demerol, 495
- Demyelination
 - See Conduction block
- Dendrites, 422–423
- Denervation
 - end organ changes following, 431–436
 - muscle changes following, 434–436
- Denervation supersensitivity, 435–436, 456
 - after traumatic brain injury, 213
- Dens fractures, 174
- Dental anesthesia
 - ocular complications, 296
- Dentistry
 - and oral contractures, 638
 - role in medical evaluation board, 868
- Department of Defense (DoD)
 - disability directives, 865
- Department of Veterans Affairs
 - See Veterans Administration
- L-deprenyl
 - for traumatic brain injury, 214
- Depression
 - after traumatic brain injury, 242, 245–246, 251–254
 - in spinal cord injured patients, 196
- De Quervain's tenosynovitis, 376–377
- Dermapad, 670
- Dermatitis
 - contact, 138–139, 668–669
 - stasis, 137–138
- Dermis
 - artificial, 592
- Desensitization
 - of burn scar, 633–634
 - hyperesthetic, 472–473, 491–492, 495
- Desipramine, 219, 476
- Detraining, 808–809
- Detrusor-sphincter dyssynergia
 - in spinal cord injured patients, 193–194
- DEXA
 - See Dual photon x-ray absorptiometry (DEXA)
- Dexamethasone, 315, 377
- Dextroamphetamine, 214–215
- Diabetes mellitus
 - in spinal cord injured patients, 185
- Diabetic ischemic neuropathy, 296
- Diarrhea, 333
- Diathermy, 467, 746–747
 - microwave, 746
 - ultrasound, 467, 746–747, 758
- Diazepam, 213
- Didronel, 221
- Dietary considerations
 - See Nutrition
- Dietary fiber
 - for immobilized patients, 753
- Dietitians, 22–23
- Dietrick, J. E., 742
- Differential amplification
 - electrodiagnostic, 451–452
- Digital control systems
 - for myoelectric prostheses, 65
- Digital neuropathies, 543–545
 - anatomic considerations, 543
 - clinical presentation, 544
 - differential diagnosis, 544
 - electrodiagnosis, 544
 - etiology, 543–544
 - treatment, 544–545
- Digits
 - See Fingers
- Dihydroergotamine, 219
- Diltiazem, 479
- DIP disarticulation
 - See Distal interphalangeal (DIP) disarticulation
- Diphosphonate EHDP, 748
- Diplopia, 297
 - management, 299–300
- Disability event
 - adaptive stages to, 847–848
- Disability ratings, 873–875
- Disability Rating Scale, 224
- Disarticulation
 - and residual limb/prosthesis interface, 89
 - See also specific type of disarticulation
- Discography, 381
- Disks
 - herniations, 381
 - internally disrupted, 380
- Disk space
 - narrowing, 380
- Dislocations
 - anterior interosseous syndrome caused by, 508–509
 - brachial plexopathies caused by, 497, 499
 - neuropathies associated with, 440–443
 - pronator teres syndrome caused by, 506–507
- Disodium diphosphonate, 748
- Disodium ethane-1-hydroxy-1,1-diphosphonate, 748
- Distal interphalangeal (DIP) disarticulation, 37

- Distal metatarsal amputations, 85
 - Division of Special Hospitals and Physical Reconstruction, 830–831
 - Dizziness, 319
 - Docusate sodium, 753
 - DoD
 - See* Department of Defense (DoD)
 - Dopamine, 219
 - Dopamine agonists
 - for traumatic brain injury, 213–215, 217, 220–222
 - See also specific drug*
 - Doppler ultrasonography
 - color-flow, 763
 - Dorrance hooks, 53
 - Dorsal cord stimulation
 - for phantom limb pain, 146–148
 - Dorsal root entry zone (DREZ) lesioning, 146, 148, 192
 - Dorsal root ganglia, 167–168
 - Dorsal scapular nerve, 496
 - Dorsiflexion assist orthosis
 - spring wire, 715
 - Dorsiflexion (anterior) stops
 - on ankle-foot orthoses, 715–716, 718–720, 723
 - on knee-ankle-foot orthoses, 729
 - Double-stopped ankle joint, 716
 - Dow Corning prosthetic foam, 670
 - Dow Corning silicone gel sheeting, 669–670
 - Downey Hand Center, 472–473
 - Doxepin, 476–477, 492
 - Dressing
 - adaptive aids, 679–680
 - See also* Activities of daily living (ADL)
 - Dressings
 - biological, 592–593
 - for burn wounds, 582, 587, 592–594, 600, 632
 - calcium alginate, 594
 - clear film, 594–595
 - hydrocolloid, 594
 - local compression, 357
 - for lower extremity amputations, 84, 87–88, 94, 96–100, 102–106, 124–125
 - postgraft changing, 626–627
 - for pressure sores, 187
 - rigid, 87–88, 96, 99
 - for skin grafts, 591–594, 626–627, 629
 - soft, 96, 125
 - synthetic, 593–594
 - for upper extremity amputations, 48–50
 - See also* Immediate postoperative rigid dressing (IPORD); *specific type of dressing*
 - DREZ lesioning
 - See* Dorsal root entry zone (DREZ) lesioning
 - Drinking
 - adaptive devices, 619–620
 - Driving
 - adaptive aids, 54, 64, 178–179, 682
 - and brain injured patients, 227
 - Dual-control cable
 - for upper extremity prostheses, 57–60
 - Dual photon x-ray absorptiometry (DEXA), 799
 - Duane's retraction syndrome, 296
 - Duoderm, 594, 656, 662, 673
 - Durnin-Womersley equations, 797–798
 - DVT
 - See* Deep venous thrombosis (DVT)
 - Dycem, 620
 - Dynamic constant resistance
 - See* Isotonic exercises
 - Dynamic response feet, 92, 115–120, 127
 - Dynamic splinting, 747
 - Dynamic strength
 - measurement, 802
 - Dynamometer, 802
 - Cybex, 635, 801
 - isokinetic, 802–803
 - Dysarthria, 312, 340–341
 - Dysautonomia
 - central, 211
 - Dysesthetic pain, 475
 - Dysgeusia, 311
 - Dyskinesias
 - after traumatic brain injury, 221
 - Dysosmia, 283, 285
 - Dysphagia, 332, 334–335
 - after traumatic brain injury, 222
 - Dysphonia, 332
 - Dysreflexia
 - autonomic, 183–184
 - Dystonia
 - after traumatic brain injury, 220
 - Dysvascular amputees
 - bilateral, 149
 - residual limb pain, 139
- ## E
- Ear
 - anatomy, 315–317
 - burn injury positioning concerns, 608
 - prosthetic, 655
 - Early recovery management programs (ERMPs)
 - for brain injured patients, 226, 236
 - Eccentric contractions, 783, 813
 - Ectopic bone
 - in residual limb, 139–140
 - ECU
 - See* Environmental control unit (ECU)
 - Edema
 - after peripheral neuropathy, 470–471, 491–492, 496
 - in burn patients, 587, 600, 606, 655–674
 - physiology, 470
 - prevention, 88, 104–106, 124–125
 - pulmonary, 584–585, 820
 - stump, 134, 138
 - Edema-sleeves, 658
 - Edinger-Westphal nucleus, 286, 291–292
 - Education
 - See* Patient education; Family education
 - Educational experiences
 - and vocational assessment, 851
 - EEG
 - See* Electroencephalography (EEG)
 - Efferent fibers
 - in cranial nerves, 281
 - Elastic abdominal binders
 - for spinal cord injured patient, 182, 184
 - Elastic bands
 - for below-elbow prostheses, 55
 - Elastic digi-sleeves, 658
 - Elastic hoods, 650
 - Elastic sport garments, 665
 - Elastic stockinettes
 - for amputations, 48–50, 94, 97, 125
 - Elastic stretch, 465
 - Elastic tubular supports, 658–660
 - Elastic wrapping

- for burn patients, 601, 606, 610–611, 613, 615, 630, 645, 656, 658–660
- for lower extremity amputations, 87–88, 94, 96–98, 103–105, 124–125
- for upper extremity amputations, 48–50
- Elastin, 355
- Elastogel, 667, 669–670
- Elastomers
 - in orthotic inserts and overlays, 670
- Elastomer silicone shoe inserts, 642–643
- Elbow
 - contracture prevention, 47
 - cubital tunnel at, 514–516, 519
 - immobilization orthoses, 630
 - positioning for burn injuries, 610
 - scar compression, 672–673
 - ulnar nerve injury at, 514–519
- Elbow disarticulation, 44
 - prostheses, 44
 - surgical procedures, 46
- Elbow disorders, 372–376
 - rehabilitation, 376
- Elbow flexion test, 515
- Elbow-locking cable
 - for upper extremity prostheses, 57–60
- Elbow orthoses, 639
 - functional, 713
 - static, 713
 - support of, 713–715
- Elderly
 - skin graft sites, 595
- Electrical arc, 578
- Electrical burns, 578–579
 - combined with thermal injuries, 578–579
 - treatment, 591–592, 595, 691–692
- Electrical motor
 - as orthotic power source, 705, 708–709
- Electrical muscle stimulation
 - for peripheral nerve injuries, 481
- Electrical stimulation
 - for cranial neuropathies, 315
 - for edema control, 470–471
 - for musculoskeletal injuries, 358–359, 374, 383
 - for peripheral nerve injuries, 479–481
 - for spinal cord injured patients, 192
 - See also* Transcutaneous electrical nerve stimulation (TENS)
- Electrical stimulators
 - implantable functional, 179
- Electrocochleography, 322
- Electrodes
 - electrodiagnostic, 453
 - electroencephalographi, 284–285
 - electromyographic, 453–454
 - ground, 453
 - myoelectric, 65, 67
 - needle, 453
 - surface, 453, 456–457
 - transcutaneous electrical nerve stimulation, 480
- Electrodiagnosis, 11–12
 - of accessory neuropathies, 338
 - of acoustic neuropathies, 322–323
 - amplification, 451–452
 - of anterior interosseous syndrome, 509
 - of anterior tarsal tunnel syndrome, 539
 - of brachial plexopathies, 498–500
 - of carpal tunnel syndrome, 512–513
 - classes of disorders detectable by, 448
 - of cold-induced nerve injuries, 445–446
 - in compartmental syndromes, 440
 - and determination of injury severity, 459–462
 - of digital neuropathies, 544
 - electrodes, 453
 - of facial neuropathies, 314–315
 - of femoral neuropathy, 526–527
 - filters, 452–453
 - of foot and ankle nerve injuries, 531
 - general principles, 448
 - of glossopharyngeal neuropathies, 328
 - history, 420
 - of hypoglossal neuropathies, 340–341
 - instrumentation, 450–453
 - of ischemic nerve injuries, 440
 - limitations, 464–465
 - localization with, 461–463
 - of lumbosacral plexopathy, 523–524
 - of oculomotor neuropathies, 299
 - of olfactory neuropathies, 284–285
 - of peripheral nerve injuries, 448–465
 - of peroneal neuropathy, 529–530
 - of posterior interosseous nerve entrapment, 505
 - of pronator teres syndrome, 508
 - of radial neuropathy, 503
 - recovery monitoring with, 460, 463–464, 468
 - of residual limb pain, 142
 - of sciatic neuropathy, 525–526
 - of superficial peroneal neuropathy, 541
 - of supracondylar process syndrome, 506
 - of sural entrapment neuropathy, 543
 - of tarsal tunnel syndrome, 535
 - of thoracic outlet syndrome, 501–502
 - timing of, 460–461
 - of trigeminal neuropathies, 305
 - of ulnar neuropathy, 514, 517–519, 521–522
 - utility of, 459–465
 - of vagus neuropathies, 333–334
 - See also specific instrument*
- Electroencephalography (EEG)
 - in olfactory nerve injuries, 284–285
- Electrogustometry, 314
- Electrolyte homeostasis, 750
- Electromechanical digitization
 - for socket design, 121, 130
- Electromyography (EMG), 453–458
 - in anterior interosseous syndrome, 509
 - in brachial plexopathies, 499
 - in carpal tunnel syndrome, 512–513
 - and determination of injury severity, 459–462
 - electrodes, 453–454
 - in femoral neuropathy, 527
 - filter settings, 452
 - in foot and ankle nerve injuries, 531
 - in hypoglossal neuropathies, 340–341
 - insertional activity, 454
 - instrumentation, 450–453
 - of laryngeal nerves, 330, 333–334
 - limitations, 464–465
 - in lumbosacral plexopathy, 523
 - at maximal contraction, 458
 - at minimal contraction, 456
 - motor unit electrical morphology, 456–457
 - motor unit recruitment, 457–458
 - in peroneal neuropathy, 530
 - in posterior interosseous nerve entrapment, 505
 - in pronator teres syndrome, 508
 - recovery monitoring, 463–464

- at rest, 454–456
 - in sciatic neuropathy, 525
 - in supracondylar process syndrome, 506
 - in ulnar neuropathy, 519
 - See also* Nerve conduction studies (NCS)
- Electronystagmography (ENG), 322
- Electrophysiologic assessment
 - of spinal cord injury, 173
 - of traumatic brain injury, 211
- Electroretinography (ERG), 290
- Electrotherapy, 830
- Elevation
 - See* Antigravity positioning
- El Salvador, 28
- Elset wrap, 658–659
- Emergency medical care
 - burn injuries, 583–585
 - spinal cord injury, 162
 - traumatic brain injury, 225
- EMG
 - See* Electromyography (EMG)
- Emotional counseling
 - for brain injured patients, 227–228
 - for burn patients, 596, 623–626, 631, 633, 683–684
 - cultural concerns, 849
 - group, 849
 - for hearing-impaired patients, 325
 - for immobilized patients, 750
 - in interdisciplinary team management, 832
 - for lower extremity amputees, 84, 88, 101, 125, 133–134
 - resistance to, 850
 - for spinal cord injured patients, 180, 195–196
 - for upper extremity amputees, 47, 52
 - in vocational rehabilitation, 848–850
 - See also* Psychological support; Psychotherapy
- Emotional needs
 - following injury, 847
- Emotional reaction
 - to war-related injuries, 846–848
- Emotional sequelae
 - of traumatic brain injury, 238–239, 243–246, 253
- Endocrine adaptation
 - in resistance training, 810
- Endocrinologic complications
 - of immobility, 750–751
 - of spinal cord injury, 185
- Endoneurium, 427
 - transection, 430–431
- End organ changes
 - following denervation, 431–436
- Endurance
 - See* Aerobic power; Anaerobic power
- Energy expenditure for walking
 - with ankle-foot orthoses, 723–724
 - at different levels of lower extremity amputations, 92–93
 - with functional electrical stimulation, 733
 - of hemiplegic ambulation, 723
 - with knee-ankle-foot orthoses, 729
 - measurement, 723
 - by multiple amputees, 149
 - of normal ambulation, 724
 - of paraplegic ambulation, 731
 - with reciprocating gait orthoses, 732
 - by spinal cord injured patients, 178
 - of wheelchair locomotion, 731
- Energy needs
 - of burn patients, 684–686
- Energy transfer
 - in exercise, 787–788
- Energy transformation
 - within muscle, 786
- ENG
 - See* Electronystagmography (ENG)
- Enteral feeding
 - of burn patients, 602, 687–688
- Entrapment syndromes
 - of foot and ankle, 531–545
 - lower extremity, 522–531
 - upper extremity, 496–522
 - See also* Compression neuropathy; *specific nerve*
- Environmental control systems
 - adaptive devices, 621
- Environmental control unit (ECU)
 - for spinal cord injured patients, 177, 179
- Environmental stimulation
 - and comatose patient, 236
- Enzymatic debridement, 588–589
- Ephedrine sulfate, 184
- Epicondylar muscles
 - stretching, 373
- Epicondylitis, 355, 372
 - differential diagnosis, 372
 - lateral, 372–374
 - medial, 372–374
 - rehabilitation, 373–374
- Epidermoid cysts
 - on residual limb, 137
- Epidural anesthesia
 - for lumbar pain, 382
 - for residual limb pain, 142, 147
- Epilepsy
 - posttraumatic, 221
- Epineurium, 427
 - transection, 431
- Épluchage, 597
- Equinus deformities, 83
- ERG
 - See* Electroretinography (ERG)
- Ergometry
 - cycle, 800, 802
- Ergot alkaloids
 - for traumatic brain injury, 215, 219
 - See also specific drug*
- ERMPs
 - See* Early recovery management programs (ERMPs)
- ERTL procedure
 - for lower extremity amputation, 95–96
- Esophageal dysfunction, 333
- Esophageal manometry, 334
- Ethacrynic acid, 750
- Ethical issues
 - with traumatic brain injury, 235
- Ethnic groups
 - counseling concerns, 849
- Etidronate disodium, 221, 748, 750
- Etiacetam, 219
- Evoked potentials
 - gustatory, 314
 - olfactory, 284
 - trigeminal, 307–308
 - visual, 290–291
- Excision, 587–588, 597
 - to fascia, 588
 - instruments, 587–588
 - tangential, 587–588
- Exercise(s)

acute responses to, 791
 for burn patients, 596–597, 602–606, 627–628, 635–637, 652–653
 cardiovascular function during, 789–792
 energy generating systems for, 782
 energy transfer in, 787–788
 for immobility complications, 744, 765
 for lower extremity amputees, 88, 102–103, 123, 125
 medical problems associated with, 814–820
 mental concentration during, 635
 for musculoskeletal injuries, 355, 358, 383–385, 387–389
 for peripheral neuropathy, 469–470, 492, 495–496
 physiological principles, 787–792
 pulmonary function during, 788–789, 801
 for spinal cord injury, 167
See also Physical capacity for exercise; Physical training;
 specific type of exercise
 Exercise intolerance
 in immobilized patients, 765
 Exertional rhabdomyolysis, 818
 Exidine
 See Chlorhexidine
 Exophthalmus, 297
 Exoskeleton prostheses, 132
 Expectancy
 principle of, 623
 Explosions
 burns caused by, 581
 Extension exercises
 for musculoskeletal injuries, 383
 Extensor spasms
 in spinal cord injured patients, 190–191
 Exteroceptive sensations
 phantom limb, 143
 Eye closure
 reflex, 313–314
 Eyelid muscles
 innervation, 294
 Eye movement
 clinical evaluation, 299
 muscular control, 293–294
 supranuclear control system, 294
 Ezeform, 617

F

Facial dyskinesia, 312
 Facial exercise program
 for burn patients, 653
 Facial movement
 innervation, 310–311
 testing, 312–313
 Facial myokymia, 314–315
 Facial nerve, 308–315
 anatomy and function, 308–311
 Facial neuropathies, 311–315
 electrodiagnosis, 314–315
 evaluation, 312–314
 management, 315
 prognosis, 315
 symptoms and signs, 312
 syndromes, 311–312
 Facial orthoses
 compression inserts, 650
 fitting, 652–655
 immobilization, 630
 transparent, 638, 650–655
 wearing instructions, 651–652, 655

Facial pain, 304, 308
 Facial paralysis, 311–312
 Facial scars
 camouflage makeup, 673, 690
 management, 638
 plastic surgery strategies, 692–693
 FAD
 See Flavin adenine dinucleotide (FAD)
 See McMaster Family Assessment Devise (FAD)
 Fading
 of phantom limb sensation, 143
 Falklands War, 443
 Family
 role in interdisciplinary team, 833
 Family Adaptability and Cohesion Scales, 254
 Family assessment
 in vocational rehabilitation, 853–854
 Family education
 after brain injuries, 227–228, 231, 245, 254
 after burn injury, 601–602, 624
 after spinal cord injury, 180
 Family Environment Scale, 254
 Family Needs Questionnaire (FNQ), 254
 Family outcome
 after traumatic brain injury, 250–255
 Famotidine, 754
 Fascia
 excision to, 588
 graft adherence on, 588
 Fascicular composition
 of peripheral nerves, 426–427, 435, 438–439, 442
 Fasciculation potentials, 455
 Fasciitis, 355
 plantar, 400–401
 Fast twitch (type 2) fibers, 784, 802, 809
 Fat
 See Body fat
 Fat-free mass, 792
 correlation between body strength and, 795–796
 Fatigue
 muscle, 786
 Fat intake
 and burn injuries, 687
 FDA
 See Food and Drug Administration (FDA)
 Fecal impaction
 in immobilized patients, 753
 in spinal cord injured patients, 185
 Feeding
 adaptive devices, 619–620, 676–677
 Felbamate, 222
 Femoral neck stress fractures, 397
 Femoral nerve, 526
 Femoral neuropathy, 526–527
 anatomic considerations, 526
 clinical presentation, 527
 electrodiagnosis, 526–527
 etiology, 526–527
 treatment, 527
 Fenfluramine, 217
 Fentanyl (Fentaugh), 622
 Fertility
 in spinal cord injured patients, 194–195
 FES
 See Functional electrical stimulation (FES)
 Fiberglass cast material, 48, 53, 97–100
 Fiberglass orthoses, 617
 Fibrillation potentials, 454, 494

- quantification, 455
- Fibrillations, 454
- Fibroblasts
 - and hypertrophic scar formation, 644
- Fibula
 - excess length, 140
 - hypermobile, 140
 - stress fractures, 397
- Fifth ray amputations, 86
- Figure-8 clavicle strap, 638–639
- Figure-8 elastic bandage wraps, 656
- Figure-8 harness, 55–58
- Figure-8 wrapping technique, 88, 104–105, 125
- Filters
 - electrodiagnostic, 452–453
- Finances
 - and brain injured patients, 229
 - and spinal cord injured patients, 180
- Finger extension attachments
 - for hand orthoses, 705–706
- Finger prostheses, 39
 - extension, 39
 - fabrication, 39
 - See also* Thumb prostheses
- Fingers
 - lengthening procedures, 36
 - pollicization, 36–37
 - scar compression, 671
 - single amputation, 37
 - See also* Digital neuropathies
- Finger splint, 615
- Finger wraps, 613
- Finkelstein's test, 376
- Finnish War, 15
- First Conference of the International Federation of Automatic Control, 65
- Fish-mouth flaps
 - for transfemoral amputation, 124
- Fitness
 - See* Aerobic power; Physical fitness
- Fitzsimons Army Hospital, Colorado, 10, 52, 80, 148–149
- Fixation
 - for limb length preservation, 95
- Fixed ankle orthoses, 734–735
- Flame burns, 577
- Flavin adenine dinucleotide (FAD), 786
- Flex Foot, 116–117, 120
 - variants, 117–119
- Flexibility
 - decreased, 358–359
 - as risk factor for injury, 817
- Flexibility exercises
 - for musculoskeletal injuries, 356, 359, 367–369, 386–387, 395
- Flexicare bed, 757
- Flexion exercises
 - for hamstring strain, 391–392
- Flexor hinge hand orthoses, 707–709
 - external power-driven, 708–709
 - passive prehension, 709
 - shoulder harness-driven, 708
 - wrist extensor-driven, 707–708
- Flexor pollicis longus tendon rupture/entrapment, 508–509
- Flexor spasms
 - in spinal cord injured patients, 190
- Flex Sprint, 117–118
- Flex Syme's foot, 91, 117–118
- Flex Vertical Shock Pylon, 117, 119
- Flex Walk, 117–118
- Fluid intake
 - during immobilization, 751
- Fluid resuscitation
 - average requirements, 585
 - for burn shock, 585–587
 - typical programs, 586
- Flunarizine, 222
- Fluoride, 748
- Fluoroscopy
 - swallowing study, 327–328
- Fluoxetine, 215–217, 220, 476
- Fluvoxamine, 216
- Flynn phenomenon, 299
- FNQ
 - See* Family Needs Questionnaire (FNQ)
- Foam finger pressure wraps, 615
- Foam rubber
 - in finger prostheses, 39
 - for residual limb padding, 61
- Follicular hyperkeratosis
 - of residual limb, 137
- Food and Drug Administration (FDA)
 - drug approval, 214
- Foot
 - arch height, 817
 - musculoskeletal disorders, 395–401
 - nerve injuries, 531–545
 - positioning for burn injuries, 611
 - scar compression, 676
- Foot amputations
 - See* Partial foot amputations
- Foot blisters, 818
- Foot fractures
 - stress, 397
- Foot orthoses
 - for burn injuries, 631, 641–643
 - for superficial peroneal neuropathy, 542
- Foot prostheses, 89–92
 - in above-knee prostheses, 127
 - in below-knee prostheses, 97–100, 110, 113
 - dynamic response, 92, 115–120, 127
 - multiaxis, 114–115, 120
 - multiflex, 114–115
 - selection, 120
 - single-axis, 113–114
 - See also specific type of prosthesis*
- Footwear
 - as risk factor for injury, 817
- Forced vital capacities (FVCs), 181
- Forearm
 - scar compression, 673
 - strengthening exercises, 376
- Forearm orthosis
 - with friction joints, 712
- Forefoot amputation, 82
- Forequarter amputations, 43–45
 - prostheses, 59–60, 67
- Fort Sam Houston, Texas, 25
- Foster Kennedy syndrome, 287
- Foster turning frame, 186
- Fothergill's disease
 - See* Tic douloureux
- Four bar hydraulic knee joint, 128
- Fovea centralis, 286
- Foville's syndrome, 296, 311
- Fracture cast bracing, 735
- Fracture-dislocations

neuropathies associated with, 440–443
 spinal, 175

Fractures
 brachial plexopathies caused by, 497, 499
 carpal tunnel syndrome caused by, 510, 513
 cranial neuropathies caused by, 280
 early ambulation after, 733–737
 interdisciplinary team management case study, 833–835
 lumbosacral plexopathy caused by, 523–524
 neuropathies associated with, 440–443
 posterior interosseous nerve entrapment caused by, 504
 pronator teres syndrome caused by, 506
 radial neuropathy caused by, 503
 sciatic neuropathy caused by, 525
 spinal, 173–175
 in spinal cord injured patients, 189
 stress, 396–397, 816–818
 ulnar neuropathy caused by, 516
See also specific type of fracture

Frankel grading
 of incomplete spinal cord injury, 169–170

Frastec, 594

Free flaps, 591–592, 691–692

Free radicals
 and traumatic brain injury, 212

Freezing injury
 caused by volatile liquids, 577
See also Cold exposure; Frostbite

Fresnel lenses, 299

Frey's syndrome, 303

Friction feeder, 712

Friction joints
 for above-elbow prostheses, 57

Friedreich's ataxia, 217

Frostbite, 123, 595–596, 637, 819–820
See also Cold exposure

Functional activities
 assistive devices, 682
 for burn patients, 596, 601, 607, 618–621, 631, 674–680
See also Activities of daily living (ADL)

Functional adaptation complex, 356

Functional assessment
 in traumatic brain injury, 224
 in vocational rehabilitation, 852–853, 855

Functional Assessment Inventory, 852–853

Functional Assessment Measure, 224

Functional biomechanical deficit, 356

Functional capacity
 effect of immobilization on, 743

Functional electrical stimulation (FES), 606–607, 683, 709
 for bracing, 732–733
 energy expenditure for walking with, 733
 for immobility complications, 743–745
 of peroneal nerve, 725–726

Functional Inventory Measure, 224

Functional orthoses
 shoulder/elbow, 713

Functional outcome
 after spinal cord injury, 170–173, 175–176
 after traumatic brain injury, 211–212

Functional substitution
 after traumatic brain injury, 212

Fundoscopy, 288

Furacin, 582

Furosemide, 750

FVCs
See Forced vital capacities (FVCs)

G

GABAergic agents
 for traumatic brain injury, 213, 216, 219–220, 222

Gabapentin, 477, 490

Gag reflex, 327, 332

Gait pattern
 with knee-ankle-foot orthoses, 729–731
 with metal ankle-foot orthoses, 718–720
 with plastic ankle-foot orthoses, 722–723
 with reciprocating gait orthoses, 732
 swing-through, 178

Gait training
 for lower extremity amputees, 84, 88–89, 98, 102, 104, 106, 126, 133
 for multiple amputees, 149

Gait velocity
 at different levels of lower extremity amputation, 92–93
 with functional neuromuscular stimulation, 733
 in hemiplegic ambulation, 724
 in normal ambulation, 724
 in paraplegic ambulation, 731
 in wheelchair locomotion, 731

Gamma-vinyl GABA
 for traumatic brain injury, 217

Ganglionic blockade
 for causalgia, 489

Gangliosides
 for cranial neuropathies, 291
 for spinal cord injury, 167

Gangrene
 after cold-exposure injury, 123

Gastric fluids
 hypersecretion, 333

Gastric ulcers
 in immobilized patients, 753–755

Gastritis
 stress, 184–185

Gastrocnemius-soleus muscles
 stretching, 398–399

Gastrointestinal complications
 of immobilization, 752–755
 of spinal cord injury, 184–185

Gaze stabilization, 324

GCS
See Glasgow Coma Scale (GCS)

Gender
 and lifting strength, 806
 and physical capacity for exercise, 803–804
 as risk factor for injury, 816
See also Women; Men

General Functioning Scale, 254

Geniculocalcarine tract, 286

Genitourinary complications
 of spinal cord injury, 162, 181, 193–194
See also specific complication

Genuentric knee orthoses, 736

Genu recurvatum, 736

Glasgow Assessment Scale, 224

Glasgow Coma Scale (GCS), 211

Glasgow-Liege Scale, 211

Glasgow Outcome Scale (GOS), 224, 237

Glenohumeral joint injuries, 370–371

Glossopharyngeal breathing (GPB), 182

Glossopharyngeal nerve, 325–329
 anatomy and function, 325–326

Glossopharyngeal neuralgia, 326, 328–329

- Glossopharyngeal neuropathies, 326–329
 electrodiagnosis, 328
 evaluation, 327–328
 imaging, 328
 management, 328–329
 prognosis, 328
 symptoms and signs, 327
 syndromes, 326–327
- Gloves
 external vascular support, 659, 667
 Isotoner, 616, 618, 658–659, 667
- Glucocorticoids
 for musculoskeletal injuries, 357–358, 364
- Glucose intolerance
 immobilization-induced, 750–751
- Glutamate, 212
- Glutamine supplementation, 687
- Glycerin suppositories, 753
- Glycolysis
 anaerobic, 787–788
- Goal setting
 and vocational rehabilitation, 847
- Goldthwait, Joel, 830
- Gordon Occupational Checklist, 854
- GOS
See Glasgow Outcome Scale (GOS)
- Gottfried Medical, Inc., 665
- GPB
See Glossopharyngeal breathing (GPB)
- Gradenigo's syndrome, 296, 303
- Gradient pressure, 471, 645, 667
See also Vascular support garments; *specific type of garment*
- Graefe disease, 296
- Granger, Frank B., 4
- Graph-lite prosthetic foot, 115
- Grasp
 orthotic substitution for, 704–705
- Gray, Barbara, 23
- Gray matter, 165–166
 damage, 165
- Greissinger foot prosthesis, 114, 120
- Grenada, 23
- Grieving process
 in lower extremity amputees, 84
- Grooming
 adaptive devices, 620, 677–679
- Ground electrodes, 453
- Growth cone, 432, 434
- Guanethidine infusion, 490
- Gunshot wounds
 burns secondary to, 581
 cranial neuropathies caused by, 280, 287, 295–296, 326, 339
 spinal cord injuries caused by, 164–165
 traumatic brain injury caused by, 208–209
See also Penetrating nerve injuries
- Gustatory evoked potentials, 314
- Gustatory hyperhidrosis syndrome, 312
- Gustatory sensation, 310–311
- Gustatory sweating, 333
- Gustometry, 312
- Guttmann, L., 9
- Guyon's canal, 514, 519–520
 compression injury at, 520–521
 lesions within, 522
- H**
- Hairs
 coiled, 137
- Haldol, 220
- Hallucinations
 auditory, 319
 in burn patients, 631
 olfactory, 283
- Hallux valgus deformity, 85
- Halo skeletal traction, 630
- Halstead-Reitan Neuropsychological Battery, 195, 237
- Hamilton Rating Scale for Depression, 223
- Hamstring injuries, 390–392
- Hand
 external vascular support, 658–659
 positioning for burn injuries, 610
 scar compression, 672
- Hand amputations, 36–43
 central, 40, 43
 classification, 40
 occupational therapy, 41
 rehabilitation, 37–38, 41–42
- Hand centers
 at military hospitals, 9
 World War II, 35, 38
- Hand continuous passive motion machine, 616–618, 640–641
- Hand contractures
 reduction, 709
- Hand controls
 for driving, 54, 64, 178–179
- Hand deformities
 caused by burns, 614, 639
- Hand function
 with myoelectric prostheses, 69
- Hand injuries, 376–378
 World War II, 35
- Hand orthoses, 38, 704–709
 adaptive aid attachments, 707
 attachment principles, 704–705
 basic opponens, 705–706
 for burn injuries, 611, 630–631, 639–641
 flexor hinge, 707–709
 grasp assist, 704–705
 long opponens, 706–707
 power sources, 705, 708–709
 with radial extension, 704–705
 reach assist, 704–706, 710–713
 for specific functions, 705–707
 for ulnar neuropathy, 522
- Hand prehension patterns, 705
- Hand prostheses, 36, 38–43
 cosmetic, 43
- Hand reconstruction, 36–37
 after burn injuries, 692–693
 World War II, 35
- Hand splint
 short opponens, 705
- Hand terminal devices, 53, 70
- Hangman's fracture, 174
- Harness designs
 for upper extremity prostheses, 55–56
- Harris hemisling, 713
- Hassles Scale, 253
- HDL
See High density lipoprotein (HDL)
- Head injuries
 and alcohol use, 239–241
 associated with spinal cord injuries, 195
versus brain injuries, 208, 231

- cranial neuropathies caused by, 280, 286, 295, 303, 311, 317, 326, 331, 336, 339
- incidence, 210
- olfactory dysfunction caused by, 282–283
- vertigo after, 319
- vocational rehabilitation, 856
- See also* Traumatic brain injury (TBI)
- Head orthoses
 - for burn patients, 638
 - See also* Facial orthoses
- Head scars
 - management, 645–655
- Head tilt test, 299
- Healing
 - delayed, 135
- Hearing aids, 324
- Hearing impairments, 312, 318–319
 - adaptive devices, 324
 - causes, 318–319
 - incidence, 318
 - management, 323–325
 - prevention, 325
- Hearing loss
 - conductive, 318, 323–324
 - sensorineural, 318, 324
- Hearing scotomas, 319–320
- Hearing threshold level (HTL), 318
- Heart rate (HR), 790
 - exercise training based on, 790
 - in immobilized patients, 764
 - maximum, 790
 - neural control, 790
 - response to maximal exercise, 791
- Heat cramp, 819
- Heat exhaustion, 819
- Heating modalities
 - used with stretching, 467, 746–747
- Heat injuries
 - See* Thermal injuries; Burn injuries
- Heat rash, 819
- Heat stress, 818–819
- Heat stroke, 819
- Heel cutoff
 - reduction of knee bending moment by, 717
- Heel pain, 536–537
- Heelstrike phase
 - with metal ankle-foot orthoses, 717–720
 - with plastic ankle-foot orthoses, 722–723
- Hematoma formation
 - after amputation, 134
- Hemiinattention
 - after traumatic brain injury, 220
- Hemipelvectomy, 124
 - functional outcome, 83
- Hemiplegic ambulation
 - energy requirements, 723–724
- Hemispata neglect
 - after traumatic brain injury, 220
- Hemodynamic changes
 - after amputation, 137–139
 - in immobilized patients, 764–765
- Hemorrhages
 - punctate, 209
- Hemostasis
 - in debrided wound, 588
- Henneman's size principle, 457
- Heparin, 183, 763–764
- Hering-Brewer reflex, 331
- Herpes zoster, 296
- Hertzman, Carl, 8
- Heterograft
 - porcine skin, 593
- Heterotopic ossification (HO), 188
 - neurogenic, 221
- Hibiclens
 - See* Chlorhexidine
- High-altitude pulmonary edema, 820
- High density lipoprotein (HDL), 182
- Highet's grading system, 474–475
- High-threshold mechanoreceptors (HTM), 484
- Hill-Burton Act Amendments, 6
- Hindfoot amputations
 - surgical technique, 86–87
 - See also* Tarsotarsal amputations
- Hines Veteran Administration Hospital, Chicago, 162
- Hinges
 - for above-elbow prostheses, 56–57
 - for below-elbow prostheses, 53, 55
 - step-up, 44, 53
- Hip
 - positioning for burn injuries, 610, 631
 - scar compression, 675
- Hip contractures
 - prevention, 101–102, 135
 - in spinal cord injured patients, 189
- Hip disarticulation, 124
 - functional outcome, 83
 - socket design, 132–133
 - surgical technique, 124
- Hip disorders, 389–392
 - See also specific disorder*
- Hip stabilization orthoses, 704
- Hip subluxation
 - in spinal cord injured patients, 190
- Hirschberg reflex, 299
- Hispanics
 - counseling concerns, 849
- Histamine₂-receptor antagonists, 754
- HIV
 - See* Human immunodeficiency virus (HIV)
- HO
 - See* Heterotopic ossification (HO)
- Hoffman-Tinel sign, 430
- Hollister Odor Absorbent dressing, 668
- Holmes-Adie syndrome, 287, 297
- Homan's sign, 763
- Home accessibility aids, 681
- Home-based services
 - for brain injured patients, 228
- Home management
 - of burn patient, 680–681
- Homograft skin, 593
- Hook terminal devices, 53, 70
- Horizontal segment
 - of facial nerve, 309
- Horner's syndrome, 303, 340
- Hospital
 - vocational assessment in, 850–857
 - vocational rehabilitation in, 846–857
- Hospital discharge
 - vocational rehabilitation after, 858–859
- Housekeeping
 - adaptive aids, 681
- Housing
 - for brain injured patients, 227, 229
 - for spinal cord injured patients, 180, 196

HR
 See Heart rate (HR)

HTL
 See Hearing threshold level (HTL)

HTM
 See High-threshold mechanoreceptors (HTM)

Hubbard tank, 597

Hughlings-Jackson syndrome, 332

Human immunodeficiency virus (HIV)
 disability cases, 881

Humeral neck amputations, 44–45
 prostheses, 59–60

Humeral rotation devices, 56–57

Hydergine, 219

Hydration status assessment, 751

Hydrocephalus
 communicating, 211

Hydrocolloid dressings, 594

Hydrofluoric acid, 578

Hydrogen-ion homeostasis, 788

Hydronephrosis
 in spinal cord injured patients, 193–194

Hydrostatic weighing, 797–799

5-Hydroxytryptophan, 217

Hygiene
 residual limb, 84, 107–108, 134, 136

Hypafix, 668

Hyperacusis, 312

Hyperalgesia, 482

Hypercalcemia
 immobilization-induced, 750
 in spinal cord injured patients, 185
 treatment, 750

Hypercalcuria, 751

Hyperemia
 nerve damage caused by, 443–444
 reactive, 137

Hyperesthesia, 472

Hyperesthetic desensitization, 472–473, 491–492, 495

Hypermetabolic-catabolic response, 684

Hypermobile segments
 lumbar, 380, 383

Hyperosmia, 283

Hyperpathia, 482

Hyperpigmentation
 of burn wounds, 605, 633
 of residual limb, 136

Hyperplasia
 verruccose, 138

Hyperpyrexia
 after traumatic brain injury, 217

Hyperreflexia
 autonomic, 183–184

Hypersensitivity
 denervation, 435–436, 456

Hypertension
 in spinal cord injured patients, 183–184

Hypertonicity
 definition, 208
 in spinal cord injured patients, 190–191
 See also Spasticity

Hypertrophic scars, 643–645, 655–674

Hyperventilation
 reflex, 789

Hypnosis
 for burn pain management, 622–623
 for phantom limb pain, 147

Hypnotics

 for phantom limb pain, 146

Hypogeusia, 311

Hypoglossal nerve, 338–342
 anatomy and function, 338–339
 stimulation, 340–341

Hypoglossal neuropathies, 339–340
 electrodiagnosis, 340–341
 imaging, 341
 management, 341–342
 prognosis, 341
 symptoms and signs, 340
 syndromes, 340

Hyposmia, 283

Hypotension
 orthostatic, 175, 177, 184

Hypothermia, 819
 and traumatic brain injury, 213

Hypoxic brain injury, 211, 234–235

I

IASP
 See International Association for the Study of Pain (IASP)

IC
 See Intermittent catheterization (IC)

Ice
 See Cryotherapy

Icelandic-New York (ISNY) socket, 130

Ileus
 in spinal cord injured patients, 184

Iliotibial band (ITB) syndrome, 389–390

Ilizarov technique
 of stump lengthening, 96

Imaging studies
 in accessory neuropathies, 338
 in glossopharyngeal neuropathies, 328
 in hypoglossal neuropathies, 341
 in musculoskeletal injuries, 381–382
 in oculomotor neuropathies, 299–300
 in olfactory neuropathies, 285
 in spinal cord injury, 163–164, 173, 175, 192
 in traumatic brain injury, 211, 225, 230–231
 See also specific type of study

Imipramine, 476

Immediacy
 principle of, 623

Immediate postoperative prosthesis (IPOP)
 advantages and disadvantages, 98
 construction, 96–98
 for lower extremity amputations, 88, 96–98, 100, 124, 126
 for upper extremity amputations, 48
 and wound breakdown, 99–100

Immediate postoperative rigid dressing (IPORD)
 advantages and disadvantages, 99
 for lower extremity amputations, 87–88, 96, 99, 103–106, 124–126
 weight bearing, 99–100, 102
 and wound breakdown, 99–100, 135

Immersion foot, 443–446

Immobility complications, 741–777
 cardiovascular, 762–765
 endocrine, 750–751
 functional electrical stimulation for, 743–745
 gastrointestinal, 752–755
 historical background, 742
 integumentary, 755–758
 management, 743–765
 metabolic, 750–751

- monetary impact, 742
- musculoskeletal, 356, 359, 743–765
- neurologic, 748–750
- pathophysiology, 743
- Persian Gulf War, 742, 745, 756
- prevention, 8–9, 84, 101, 226
- respiratory, 758–762
- urinary tract, 751–753
- Vietnam War, 742
- See also* Pressure sores; Contractures
- Immobilization
 - for back injuries, 383
 - complications caused by, 102, 135, 175
 - contractures during, 745–746
 - for musculoskeletal injuries, 358–359, 371–372, 378, 385
 - postgraft, 627, 629
 - therapeutic use, 743
 - types, 743
- Immobilization orthoses
 - postgraft, 629–631
- Immobilization osteoporosis, 747–748, 750
- Immobilization phase
 - of wound care, 595–596, 625–631
- Impingement syndrome
 - in spinal cord injured patients, 189
- Inactivity
 - See* Immobilization
- Incentive spirometry, 759–760
- Incontinence
 - in spinal cord injured patients, 193
- Independent living
 - for brain injured patients, 227, 229
 - for spinal cord injured patients, 180, 196
- Indomethacin, 354
- Induction Medical Form, 869–871
- Infantry
 - musculoskeletal injuries rate, 815–816
- Infection
 - after amputation, 134
- Inferior vena cava filters, 183
- Inflamed joints
 - immobilization of, 743
- Inflammatory reaction, 354, 357
- Inhalation analgesics
 - for burn patients, 622
- Inhalation injury, 584–585, 598–599, 620
- Innervation
 - muscular, 784–785
 - vascular, 428
- Innervation ratio, 448–449
- Inserts
 - for orthoses, 650, 664–674
- Inspiration
 - factors affecting, 181–182
- Insulin, 185
- Integumentary system
 - See* Skin
- Intensity
 - of training, 807, 810, 812–813
- Interdigital neuromas, 544–545
- Interdigital web spacers, 615–616, 640, 642
- Interdisciplinary team, 7, 829–844
 - Army, 16
 - case studies, 833–844
 - in combat theater, 8–9
 - composition of, 831–833
 - concept of, 6–7
 - historical perspective, 830–831
 - for lower extremity amputation, 81, 85, 89, 92, 101, 127, 133, 147–148
 - for spinal cord injury, 175, 180, 195
 - for traumatic brain injury, 208, 225–229, 255
 - for upper extremity amputation, 47
 - World War II, 9–10
- Interdisciplinary team conference, 830
- Interest assessment
 - in vocational rehabilitation, 854–855
- Interest Check List, 854
- Interference pattern, 458
- Intermittent catheterization (IC)
 - in spinal cord injured patients, 193
- Intermittent mandatory ventilation mode, 599
- International Association for the Study of Pain (IASP), 481
- Interphalangeal (IP) joint
 - amputation at, 37
 - extension attachments, 706
- Interphalangeal (IP) joint stabilizers, 709
- Inter-potential interval (IPI), 463
- Interview
 - for neurobehavioral assessment, 242–243
 - for vocational assessment, 853
- Intracompartmental pressure, 440
- Intrafascicular derangement, 430
- Intrinsic bar
 - long opponens splint with, 706–707
- Intubation
 - of burn patients, 584, 598–600
- Inversion sprains
 - ankle, 397–399
- Investigation report
 - line of duty (LOD), 868–869, 877
- IOMED, 66
- Ion channels
 - cell membrane, 423–424
- Iowa City Buckner Microstomia Prevention Appliance (MPA), 615–616
- IPI
 - See* Inter-potential interval (IPI)
- IPOP
 - See* Immediate postoperative prosthesis (IPOP)
- IPORD
 - See* Immediate postoperative rigid dressing (IPORD)
- Iraq
 - See* Persian Gulf War
- Ischemia
 - residual limb pain caused by, 139
- Ischemic brain injury, 211, 234–235
- Ischemic cord injury, 166
- Ischemic neuropathy, 439–440
- Ischial containment sockets, 129–130
- Ischial weight-bearing orthoses, 734–735
- Ishihara's chart, 288
- ISNY socket
 - See* Icelandic-New York (ISNY) socket
- Isokinetic dynamometer, 802–803
- Isokinetic exercises, 813
 - for musculoskeletal injuries, 360
 - for peripheral neuropathy, 470
- Isokinetic fatigue test, 801
- Isometric contractions, 783
- Isometric exercises, 813
 - for immobility complications, 743
 - for musculoskeletal injuries, 360, 362, 369, 371–374, 377
 - for peripheral neuropathy, 469
- Isotoner gloves, 616, 618, 658–659, 666–667
- Isotonic compression gloves, 471

Isotonic exercises, 813
 for musculoskeletal injuries, 360, 362, 393
 for peripheral neuropathy, 469
 Israeli Defense Force
 combat injuries, 13–16, 72, 150, 162
 exertion-related deaths, 817
 stress fractures, 817
 Isshiki thyroplasty, 335
 ITB syndrome
 See Iliotibial band (ITB) syndrome
 Itching
 after burn injury, 633

J

Jackson's syndrome, 340
 Jacob's ladder effect, 578
 Jaeger cards, 288
 Jay cushion, 196
 Jay Medical Ltd., 196
 Jefferson fracture
 C-1, 173–174
 Jeltrate, 654
 Jitter, 463
 Job coach
 for brain injured patients, 248–250
 Job search assistance, 858
 Job site training/enabling
 for brain injured patients, 249
 Jobst custom stockings, 660
 Jobst Institute, Inc., 665
 Jobst Interim glove, 659
 Jobst Intermittent Compression Pump, 606–607, 682
 Jogger's foot, 534, 537
 Joint capsule tightness
 in spinal cord injured patients, 189
 Joint contractures
 prevention, 88, 101–102, 125–126, 135
 in spinal cord injured patients, 189
 Joint immobilizers
 prefabricated, 358
 Joint mobility, 387
 passive resistance, 172
 See also Range-of-motion exercises
 Joints
 burn injury-induced changes, 690
 inflamed, 743
 preservation, 83
 See also specific joint
 Jones, Sir Robert, 20
 Joule's law, 579
 Joystick control
 of wheelchair, 177
 Jugular foramen syndrome, 326, 332

K

KAFOs
 See Knee-ankle-foot orthoses (KAFOs)
 Kainate, 212
 Kanamycin, 591
 Kaneda instrumentation, 175
 Keloid, 644
 Kerlix, 600, 613, 630, 645
 Ketorolac, 495
 Kevlar shank-ankle-foot unit, 116
 Kevlar socks
 for foot prostheses, 116
 Keyboard usage

 adaptive aids, 681–682
 Kinaire bed, 604, 608, 628
 Kinaire foot cushion, 611
 Kinesiotherapist, 831
 Kinesthetic sensations
 phantom limb, 143
 Kinetic Concepts, 182, 186
 Kinetic sensations
 phantom limb, 143
 Kinnairbed, 186
 Kirk, Norman T., 38
 Kirkaldy-Willis' degenerative cascade, 379
 Kitchen activities
 adaptive aids, 681
 Klenzak-type ankle joint, 716–717
 Kling, 600, 630
 Klüber-Bucy syndrome, 222
 Knee
 bending moment at, 717, 723
 fixed/locked, 734–735
 joint salvage, 93, 123
 positioning for burn injuries, 610–611
 scar compression, 675
 valgus deformity, 736–737
 varus deformity, 736–737
 Knee alignment
 orthoses for, 736–737
 Knee-ankle-foot orthoses (KAFOs), 178, 726–733
 anterior stops, 729
 bilateral, 178, 731–732
 components, 726–729
 knee stabilization force, 726–727
 metabolic requirements, 729
 pelvic bands, 730–731
 reciprocating gait, 732
 Scott-Craig, 729, 732
 shear forces, 727–729
 standing balance, 730
 types, 726–727
 Knee cage designs, 736
 Knee continuous passive motion machine, 618
 Knee contractures
 prevention, 135
 in spinal cord injured patients, 189
 Knee disarticulation, 82, 122–124
 advantages, 122
 functional outcome, 83
 indications, 124
 prostheses, 83, 123
 surgical technique, 124
 Knee dislocations
 stretch neuropathies associated with, 440–441
 Knee disorders, 392–395
 ligament, 355, 392–395
 See also specific disorder
 Knee lock
 manual, 128
 Knee orthoses
 genucentric, 736
 Knee prostheses, 127–133
 biomechanically stable, 128
 brake mechanisms, 127–128
 classification, 128
 disarticulation, 83
 fabrication, 129–131
 polycentric (four-bar), 128
 single axis, 128
 sockets, 129–131

stability of, 127–128
suspension, 131
Knee shear
with knee-ankle-foot orthoses, 727–729
Knee stability
with ankle-foot orthoses, 720, 723
with knee-ankle-foot orthoses, 726–727
Knuckle-bender orthosis, 709
Korean War
amputations, 134
physical therapy, 22–23
Krukenberg procedure, 64
Krusen, Frank H., 5, 8
Kuehlthau, Brunetta A., 22
Kushion flex, 670
Kuwait
See Persian Gulf War

L

Labyrinthine segment
of facial nerve, 309
Lachman test, 392
Lacrilube, 315
Lacrimation
dysfunction, 312
Lactate threshold, 789
Lactic acid accumulation, 787, 789
Lamb's wool, 668
Lamotrigine, 222
Language disorders
after traumatic brain injury, 222
Larrey, Barron, 443
Laryngeal nerves
evaluation, 333–334
muscles supplied by, 331
paralysis, 331–332
stimulation, 330
Laryngoplasty, 335
Laryngoscopy, 333
Laser beam scanning
for socket design, 121
Latency, 459
residual, 512
Lateral geniculate body, 286, 289
Lateral plantar nerve, 532–533
branch-I entrapment, 536–537
Lateral rotational treatment
for pulmonary complications, 759
Lawson General Hospital, Georgia, 35, 80
L-dopa
See Levodopa
Leak speech, 181
LE amputations
See Lower extremity (LE) amputations
Leave
convalescent, 872
Lebanese Civil War, 14–15, 482, 490
Lecithin, 218
Leeds anxiety and depression scales, 251, 253
Legal issues
with traumatic brain injury, 235
Legal representation
during physical disability review process, 875
Leg amputations
See Lower extremity (LE) amputations
Leg disorders
musculoskeletal, 395–401

See also specific disorder
Lehmann, Justus F., 6
Levator palpebrae muscle
innervation, 292–293
Levodopa, 214–215, 219, 222
Lichenification
of residual limb skin, 136–137
Lidocaine, 361, 372, 382, 513
Lifting strength
gender differences, 806
measurement, 806
Ligament injuries, 355, 392–394
spinal, 173–174
See also specific injury
Ligament of Struthers, 506
Ligaments
function, 355
resistance training-induced changes, 810
Limb length preservation, 83, 95–96
Limb salvage
versus lower extremity amputations, 81–83, 122–123
Line of duty (LOD)
disability payments, 865
investigation report, 868–869, 877
Liners
for prosthetic sockets, 107–108, 140–141
Lingual nerve
compromise, 304
Lipid, 792
Lipid intake
and burn injuries, 687
Lisfranc's amputations
See Tarsometatarsal amputations
Lisuride, 214–215
Lithiasis, 751
Lithium carbonate, 240
LLB
See Long leg braces (LLB)
LMB finger pressure wraps, 612–613, 615, 658
Load cells, 802
Local anesthetic blocks
for phantom limb pain, 146
Local flaps, 691
Locked ankle orthoses, 734–735
Lockjaw, 304
LOD
See Line of duty (LOD)
Longitudinal arch, 537
medial plantar nerve entrapment at, 537–538
Long leg braces (LLB), 733
Long's Line, 129
Long-term care facilities
for brain injured patients, 226–227
Long thoracic nerve, 496
injury to, 498
Lorazepam, 220
Low-air-loss bed, 186, 757
Low back pain, 11, 378–389, 857
Lower extremity (LE) amputations, 79–159
causes, 34
complications, 134–148
early, 122–123
and energy expenditure for walking, 92–93
indications, 122
level selection, 83, 135
versus limb salvage, 81–83, 122–123
multiple, 148–149
nerve recovery in, 82

patient education, 84, 101–102
 rehabilitation, 81–85, 93, 101, 106
 sensory feedback, 85, 93
 surgical procedures, 83–84
 World War II, 34–35
See also Above-knee amputations (AKA); Below-knee amputations (BKA); *specific type of amputation*
 Lower extremity nerve injuries, 522–531
See also specific injury
 Lower extremity orthoses, 704, 715–737
See also specific type of orthosis
 Lower extremity prostheses
 long-term maintenance, 92, 106, 133–134
 postoperative fitting, 85
 psychological support, 84
 residual limb interface, 89, 96–97, 104, 107, 129, 131, 136–137, 142–143
 temporary, 84, 88, 96–100
See also specific type of prosthesis
 Lower extremity scar compression, 675–676
 Lower respiratory tract infection
 in immobilized patients, 759
 Low load
 definition, 603
 Low threshold mechanoreceptors (LTM), 484
 Lumbar plexus, 522–523
 Lumbar radiculopathy, 379–381
 Lumbar spine
 contusions, 386–389
 Kirkaldy-Willis' degenerative cascade, 379
 muscle strain, 386–389
 pars interarticularis injury, 385–386
 posterior element pain, 384
 Lumbar spine disorders, 378–389
 classification, 378–382
 diagnosis, 378–382
 imaging, 381–382
 rehabilitation, 382–385
 Lumbar sympathetic blockage
 for causalgia, 489–490
 Lumbosacral plexopathy, 522–524
 anatomic considerations, 522–523
 clinical presentation, 523
 electrodiagnosis, 523–524
 etiology, 523
 Lumbosacral spine, 167–168
 injury, 169
 Lumbrical bar hand orthosis
 for ulnar neuropathy, 522
 Lund and Browder chart, 580
 Luria-Nebraska Neuropsychological Battery, 195

M

Maceration
 of residual limb skin, 136
 Macfarlane microstomia correction device, 638
 Macrophages
 role after denervation, 433
 Madigan Army Medical Center, Washington, 10–11
 Mafenide acetate, 582
 Magnesium depletion
 immobilization-induced, 750
 Magnetic resonance imaging (MRI)
 in cranial neuropathies, 285, 299, 341
 in musculoskeletal injuries, 381
 neuroma location with, 140
 socket design with, 121, 130
 in spinal cord injury, 163–164, 173, 192
 in traumatic brain injury, 225, 230
 Makeup
 for burn patients, 673, 690
 Mallet finger, 614
 Mandibular nerve, 300
 Mangled Extremity Syndrome Index (MESI), 82, 122–123
 Mannitol, 585
 Marcus-Gunn pupil, 290
 Mare Island Naval Hospital, California, 10, 52, 149
 Marine Corps
 body fat standards, 796–798
 Marital instability
 and brain injuries, 253–254
 and spinal cord injured patients, 196
 Martin-Gruber anastomosis, 517–518
 Massage
 desensitization with, 634
 external, 471
 for phantom limb pain, 147–148
 Massage and Therapeutic Exercise (McMillan), 21
 Masseter inhibitory reflex
 electrodiagnostic evaluation, 305
 Masseter reflex, 302
 electrodiagnostic evaluation, 305
 Master knot of Henry
 See Longitudinal arch
 Mastication muscles
 paralysis, 304–305
 Mastoid segment
 of facial nerve, 309
 Maturation phase, 355
 Maxillary nerve, 300
 Maximum physiologic potential, 743
 Maximum voluntary isometric contraction (MVC), 744
 Mayo Clinic, 5, 9
 McCance, R. A., 742
 McCloskey General Hospital, 35, 80
 McGuire General Hospital, Virginia, 80
 MCL
 See Medial collateral ligament (MCL)
 McMaster Family Assessment Devise (FAD), 252, 254
 McMillan, Mary, 20–22, 830
 MCP joint
 See Metacarpophalangeal (MCP) joint
 MCVOST
 See Medical College of Virginia Olfactory Screening Test (MCVOST)
 Meatal segment
 of facial nerve, 309
 MEB
 See Medical Evaluation Board (MEB)
 Mechanical ventilation
 in burn patients, 599
 MEDCOM
 See Army Medical Command (MEDCOM)
 Medial antebrachial cutaneous nerve injury, 498–499
 Medial capsuloligamentous injuries, 374–376
 Medial collateral ligament (MCL), 393–394
 Medial cutaneous nerve, 496
 Medial plantar nerve, 532–533, 543
 entrapment at longitudinal arch, 537–538
 Medial tibial stress syndrome, 395–396
 Median nerve, 496, 506–507, 509–510
 Median neuropathy, 505–514
 case scenario, 491–493
 compression sites, 505–506
 orthotics, 640–641

- Medical College of Virginia Olfactory Screening Test (MCVOST), 284
- Medical diagnoses
 - and disability compensation evaluation, 872
- Medical Evaluation Board (MEB), 865–868
 - establishment, 868
 - membership, 868
 - Narrative Summary (NARSUM), 868–872
 - versus Physical Evaluation Board (PEB), 872
- Medical Force 2000 (MF2K), 28–29
- Medical history of patient
 - in disability compensation evaluation, 868–869
- Medical treatment facilities (MTFs)
 - brain injury rehabilitation centers, 225–226
 - physical medicine and rehabilitation at, 9–16
 - spinal cord injury treatment at, 163
 - See also specific center
- Medicare/Medicaid, 6
- Medications
 - See Pharmacologic therapy; specific medication
- Medroxyprogesterone acetate, 222
- Medulla, 790–791
- Megacolon
 - in spinal cord injured patients, 185
- Melanocyte stimulating hormone (MSH), 218
- Mellaril, 220
- Membrane instability
 - denervation, 435–436
- Membrane potential, 423–425, 449
 - alteration following denervation, 436
- Memory function
 - and neurotransmitter systems, 218
 - and traumatic brain injury, 218, 230
- Men
 - military body fat standards, 796, 798
 - percent body fat values, 794
 - physical capacity for exercise, 803–804
 - reference body composition values, 792
- Menace reflex, 313
- Mendez, Cristobal, 742
- Mental concentration
 - during exercise periods, 635
- Mental status alterations, 230
- Meperidine, 495
- Mephanesin, 308
- Merthiolate, 632, 656
- Mesencephalon, 291–292
- Meshed skin grafts, 589–591, 644
- MESI
 - See Mangled Extremity Syndrome Index (MESI)
- Metabolic requirements
 - of burn patients, 684–686
 - See also Energy expenditure for walking
- Metabolism
 - effect of immobility on, 742, 750–752
- Metacarpals
 - phalangization, 36
- Metacarpophalangeal (MCP) joint
 - amputation at, 37, 42
 - extension attachments, 705–706
- Metal orthoses
 - ankle-foot, 715–720
- Metamucil
 - See Psyllium hydrophilic mucilloid fiber
- Methadone, 495, 600, 622
- N-methyl D-aspartate, 212
- Methyldopa, 220
- Methylphenidate hydrochloride, 214–215, 219
- Methylprednisolone, 163, 167, 513
- Metropolitan Life Insurance tables, 793, 797
- Mexiletine, 146, 148, 477–478
- MF2K
 - See Medical Force 2000 (MF2K)
- Microfoam tape, 670
- Microstomia correction devices, 638
- Microstomia Prevention Appliance (MPA), 615–616
- Microwave diathermy, 746
- Midazolam, 622
- Midfoot amputations, 85
 - prosthetic fitting and training, 90
 - surgical technique, 86
 - See also Tarsometatarsal amputations; Transmetatarsal amputations
- Military history of patient
 - in disability compensation evaluation, 868–869
- Military Medical Retention Board (MMRB), 867
- Military Occupational Specialty–Military Medical Retention Board (MOS/MMRB), 867
- Military pensions
 - See Physical disability system
- Military performance
 - physical fitness and training for, 781–827
- Military populations
 - body fat percentage values/standards, 794
 - physical capacity for exercise, 803–806
- Military services
 - body fat measurement methodology, 797–799
 - body fat standards, 796–797
 - physical disability system, 863–885
 - weight control programs, 793, 796–797
- Millard-Gubler syndrome, 296, 311
- Mind-body connection, 846
- Mineral requirements
 - of burn patients, 687
- Mini compartment syndrome, 540
- Minnesota Multiphasic Personality Inventory (MMPI-2), 195, 239, 241, 244–245, 857
- Minority groups
 - counseling concerns, 849
- Miosis
 - in darkness, 299
- Misdirection syndrome, 299
- Misoprostol, 754–755
- Missile wounds
 - brachial plexopathies caused by, 497
 - spinal cord injuries caused by, 164
 - traumatic brain injury caused by, 208–209
- Mithramycin, 750
- MMPI-2
 - See Minnesota Multiphasic Personality Inventory (MMPI-2)
- MMRB
 - See Military Medical Retention Board (MMRB)
- MMTN
 - See Myelinated mechanothermal nociceptors (MMTN)
- Mobility training
 - for lower extremity amputees, 84, 102
- Mobilization
 - after spinal cord injury, 175
 - See also Ambulation
- Möbius' syndrome, 296, 311
- Modular Flex Foot, 117–118
- Moleskin, 668
- Monopolar needle electrodes, 453
- Morphine, 217, 600
- Morphine sulfate, 495

- Morton's toe neuroma, 543
- MOS/MMRB
 See Military Occupational Specialty-Military Medical Retention Board (MOS/MMRB)
- Motion Control, Inc., 66
- Motivation
 to recover, 846–847
- Motoneurons, 449–450, 784–785
- Motoneuron weakness
 after spinal cord injury, 167
- Motor cortex, 790
- Motor fitness, 782
- Motor function
 after peripheral neuropathy, 464–465
 and ulnar neuropathy, 516
- Motor unit, 448–449, 784–785
 activity duration, 456
 electrical morphology, 456–457
 recording phases, 456–457
 recruitment, 457–458, 785
 size, 448–449
- Motor unit potential
 amplitude, 457
 polyphasic, 456–457, 463–464
- Mouth
 positioning for burn injury, 609
- Mouth stretch
 for facial contractures, 652
- Mouth-stretching devices, 652–653, 655
- Movement disorders
 after traumatic brain injury, 220–221
- MP
 See Myoelectric prostheses
- MPA
 See Microstomia Prevention Appliance (MPA)
- MRI
 See Magnetic resonance imaging (MRI)
- M.S. Contin, 622
- MSH
 See Melanocyte stimulating hormone (MSH)
- MTFs
 See Medical treatment facilities (MTFs)
- Mucomist
 See Acetylcysteine
- Muenster socket, 53
- Multiaxis foot prostheses, 114–115, 120
- Multidisciplinary approach
 See Interdisciplinary team
- Multiflex ankle/foot, 114, 120
- Multiple sclerosis, 296, 322
- Multireceptive neurons, 484
- Muscle
 denervation-induced changes in, 434–436
- Muscle(s)
 antagonist, 782
 artificial, 708–709
 contractility, 783–784
 energy stores, 787
 energy transformation within, 786
 fiber types, 784
 force development, 785
 immobility-induced ultrastructural changes in, 744–745
 innervation, 784–785
 oxidative capacity, 801
 and physical fitness, 792–799
 structure and function, 782–786
- Muscle atrophy
 after denervation, 435
 in burn patients, 606
 due to immobilization, 744–745
- Muscle fatigue, 786
- Muscle fibers
 classification, 784
 contractile tension loss in, 786
 fast twitch (type 2), 784, 802, 809
 slow twitch (type 1), 784
 structure, 783
 type distribution, 784
- Muscle hypertrophy, 809
- Muscle mass
 and body weight, 793
 correlation between body strength and, 795–796, 803
 increase in, 793–794
 loss in, 794
- Muscle sites
 for myoelectric prostheses, 69
- Muscle soreness
 avoidance, 603
- Muscle strain
 lumbar, 386–389
- Muscle strength
 See Strength
- Muscle tone
 grading, 172, 208
- Muscular contraction
 concentric, 783
 eccentric, 783
 isometric, 783
 mechanism, 783–784
 neural control, 784–786
 static, 783
 types, 782–783
- Muscular endurance
 See Anaerobic power
- Musculocutaneous flaps, 691–692
- Musculocutaneous nerve injury, 499
- Musculoskeletal disorders, 353–356
 components, 356–357
 diagnosis, 356–357
 exercise-associated, 814–817
 forward care, 8, 11–13, 24
 healing, 355–356, 358–360
 local effect minimization, 357–358
 mechanisms, 354–355
 pathophysiology, 354–356
 Persian Gulf War, 11–13
 physical therapy for, 20, 24
 rehabilitation, 8, 11–13, 29, 356–401
 return to duty, 360
 in spinal cord injured patients, 188–189
 symptoms and signs, 355–356
 World War I, 354
 See also specific disorder
- Musculoskeletal system
 effect of immobility on, 743–748
- Mustard, 578
- MVC
 See Maximum voluntary isometric contraction (MVC)
- Myasthenia gravis, 296
- Myelin, 422–423
- Myelinated mechanothermal nociceptors (MMTN), 484
- Myelin debris removal
 role of macrophages in, 433
- Myelin sheath
 denervation-induced changes in, 433
- Myelin thickness

- and conduction velocity, 449
- Myelograms, 381
- Myocardial infarction
 - silent, 184
- Myoclonus
 - after traumatic brain injury, 220–221
- Myocutaneous flaps
 - for pressure sores, 187
- Myodesis, 95, 124
 - definition, 122
 - versus* myoplasty, 122
 - unbalanced, 140
- Myoelectric electrodes, 65, 67
- Myoelectric prostheses
 - above-elbow, 56
 - advantages and disadvantages, 69, 71
 - below-elbow, 53
 - bilateral, 62
 - components, 67–68
 - control systems, 65–67
 - versus* conventional prostheses, 68–71
 - cosmetic covers for, 68–69, 71
 - evaluation of candidates, 68
 - history, 65
 - humeral neck, 59
 - hybrid (myoelectric and body-powered), 62
 - rehabilitation issues, 68–69
 - sensory feedback with, 67, 69
 - for upper extremity amputations, 44–46, 65–69
 - Utah brand, 67–68
- Myoelectric testing device, 69
- Myofibrils, 783–784
- Myofibroblasts
 - and hypertrophic scar formation, 644
- Myofilaments
 - denervation-induced loss, 434–435
- Myogenic contractures, 746
 - in denervated muscles, 435, 465–467, 491
- Myokymic discharges, 455
- Myoplasty, 95
 - definition, 122
 - versus* myodesis, 122
- Myosin, 783–784
- Myositis ossificans
 - See* Heterotopic ossification (HO)
- Myotendinous contracture
 - in spinal cord injured patients, 189
- Myotomal levels
 - for neurological evaluation of spinal cord injury, 169

N

- NAD⁺
 - See* Nicotinamide adenine-dinucleotide (NAD⁺)
- Naftidrofuryl, 219
- Naloxone, 216
- Naltrexone, 216–217
- Naprosyn, 492, 495
- Narcotics
 - for musculoskeletal injuries, 364
 - for phantom limb pain, 146, 148
 - for spinal cord injured patients, 191–192
- Narrative Summary (NARSUM)
 - Medical Evaluation Board (MEB), 868–872
- National Center for Medical Rehabilitation Research, 6
- National Head Injury Foundation (NHIF), 227
- National Institutes of Health, 6
 - obesity definition, 793, 797
- Navy
 - body fat standards, 796–798
 - disability system, 883–884
 - obesity definition, 793, 797
 - physical therapy services, 25–26
- Neck
 - contracture prevention, 630, 638, 649–652
 - passive stretches for, 362
 - positioning for burn injuries, 609
 - scar management, 645–655
 - strengthening, 362
- Neck and tongue syndrome, 303
- Neck injuries, 361–363
 - cranial neuropathies caused by, 280, 336
 - See also specific injury*
- Neck orthoses, 630, 638, 650–652
- Necrosis
 - after amputation, 135
- Necrotic muscle
 - left in wound, 81
- Needle electrodes, 453
 - concentric, 453
 - monopolar, 453
 - single fiber, 453
- Negative feedback loop
 - in musculoskeletal injuries, 357
- Neoprene, 670
- Nerve blocks
 - for lumbar pain, 382
 - for residual limb pain, 147
- Nerve conduction block
 - electrodiagnostic findings, 460–461
- Nerve conduction studies (NCS), 458–459
 - in accessory neuropathies, 338
 - action potential duration, 459
 - amplitude, 459
 - in anterior interosseous syndrome, 509
 - in brachial plexopathies, 498–500
 - in carpal tunnel syndrome, 512–513
 - in compartmental syndromes, 440
 - conduction velocity, 459
 - and determination of injury severity, 459–462
 - electrodes, 453
 - in facial neuropathies, 314–315
 - in femoral neuropathy, 526–527
 - filter settings, 452
 - in foot and ankle nerve injuries, 531
 - in hypoglossal neuropathies, 340–341
 - instrumentation, 450–453
 - latency, 459
 - limitations, 464–465
 - localization with, 462
 - in lumbosacral plexopathy, 524
 - in peroneal neuropathy, 529–530
 - in posterior interosseous nerve entrapment, 505
 - in pronator teres syndrome, 508
 - in radial neuropathy, 503
 - recovery monitoring, 463–464
 - in sciatic neuropathy, 525–526
 - in superficial radial nerve compression, 505
 - in sural entrapment neuropathy, 543
 - in tarsal tunnel syndrome, 535
 - timing of, 460–461
 - in ulnar neuropathy, 514, 517–522
 - in vagus neuropathies, 333–334
- Nerve conduction velocity calculation, 459
 - effects of temperature on, 445
 - and myelin thickness, 449

- Nerve entrapment
 - peripheral, 192–193
- Nerve excitability studies
 - in facial neuropathies, 314
- Nerve fibers
 - myelinated, 422–423
 - unmyelinated, 422–423
- Nerve impulse propagation, 424–425, 449–450, 785
- Nerve root stimulation
 - for thoracic outlet syndrome, 502
- Nerve tissue pressure thresholds, 438
- Nerve trunk pain, 475
- Nerve trunk transection, 431
- Neural adaptation
 - in resistance training, 810
- Neural connection alterations, 212
- Neuralgia
 - atypical, 280
 - trigeminal, 280
- Neural membrane stabilizers
 - for peripheral nerve injuries, 477–478, 490
- Neural recovery mechanisms, 212–213, 431–432
- Neural reserve
 - and brain injury prognosis, 210
- Neuroanatomy, 422–423, 426–427
- Neurobehavioral assessment, 231, 237
 - protocol, 242–244
 - test interpretation and reporting, 244–245
 - test selection and administration, 243–244
 - theoretical rationale, 241–242
- Neurobehavioral programs
 - for brain injured patients, 228
- Neurobehavioral Rating Scale, 223
- Neurogenic heterotopic ossification
 - after traumatic brain injury, 221
- Neurogenic spinal arthropathy
 - See* Charcot's spine
- Neuroimaging
 - in traumatic brain injury, 211, 225, 230–231
- Neuroleptics
 - for phantom limb pain, 146
 - for traumatic brain injury, 217, 220, 240
- Neurological complications
 - of burn injury, 689–690
 - of immobility, 748–750
 - of spinal cord injury, 189–193
- Neurological evaluation, 167–173, 195
 - myotomal levels, 169
 - segmental reflexes, 171–172
 - sensory levels, 169
- Neurologic states
 - low level, 234–235
- Neuromas
 - acoustic, 322
 - in lower extremity amputees, 122, 140
 - and phantom limb pain, 144, 146–147
 - in upper extremity amputees, 61
- Neuromatrix theory
 - of phantom limb pain, 126, 145
- Neuromedical issues
 - with traumatic brain injury, 217, 222–224
- Neuromedical workup
 - standard, 227
- Neuromuscular junction, 425, 450, 784–786
 - failure, 460
- Neuromusculoskeletal conditions
 - physical therapy for, 20, 24–26
 - See also* Musculoskeletal disorders; *specific disorder*
- Neuron, 422–423
 - motor, 449–450, 784–785
 - multireceptive, 484
 - vascular supply, 427–428
- Neuronal reorganization, 212
- Neuronal signaling, 423–425
- Neuronal sparing, 212–213
- Neuropathic pain
 - classification, 475
 - management, 475–479
- Neuropathy
 - diabetic ischemic, 296
 - evaluation, 82
 - Persian Gulf War, 11–14, 38, 80
 - See also* Cranial neuropathies; Peripheral nerve injuries; Spinal cord injury (SCI); *specific injury*
- Neurophysiology, 212–213, 423–426, 448–450
 - of peripheral nerves, 448–450
- Neuropraxia, 429
- Neuropsychological tests
 - interpretation and reporting, 244–245
 - selection and administration, 243–244
 - See also specific test*
- Neuropsychopharmacology, 214–222
- Neurosignature, 145
- Neurotmesis, 429
- Neurotoxic cascade
 - after traumatic brain injury, 212–213
- Neurotransmitters, 425, 450, 785
 - and traumatic brain injury, 212–213, 218
- NHIF
 - See* National Head Injury Foundation (NHIF)
- Nicardipine, 479
- Nicotinamide adenine-dinucleotide (NAD⁺), 786
- Nifedipine, 183–184, 479
- 97th General Hospital, Germany, 11
- Nitrofurantoin, 752
- Nitrogen balance equations, 688, 750
- Nitropaste, 183
- Nizatidine, 754
- NMS conditions
 - See* Neuromusculoskeletal conditions
- Nodes of Ranvier, 423
- Nonphysician healthcare providers, 24–26
 - See also specific type of provider*
- Nonsteroidal antiinflammatory drugs (NSAIDs)
 - adverse effects, 193
 - for musculoskeletal injuries, 354, 357, 367, 383
 - for peripheral nerve injuries, 478–479, 490
 - for phantom limb pain, 145, 148
 - for traumatic brain injury, 221
 - See also specific drug*
- Nootropics
 - for traumatic brain injury, 219
 - See also specific drug*
- Noradrenergic treatment
 - for traumatic brain injury, 213, 220
- Norepinephrine, 212, 219, 476
- Normal shape, normal alignment (NSNA) socket, 129, 139
- Northwestern University, 5, 9
- Nortriptyline, 219, 476
- Nose
 - positioning for burn injury, 609
 - prosthetic, 655
- Nose orthosis, 655
- NSAIDs
 - See* Nonsteroidal antiinflammatory drugs (NSAIDs)
- N-ter-face, 591, 594

Numb cheek syndrome, 303–304
 Numb chin syndrome, 304
 Nurses
 role in interdisciplinary team, 832–833
 World War II, 22
 Nursing
 during acute phase of burn injury, 596–607
 during immobilization phase of burn injury, 625–627
 during wound maturation phase of burn injury, 632–635
 Nutrition
 and amputation complications, 135
 and burn patients, 602, 684–689
 and cranial neuropathies, 285, 296
 and immobilization, 752, 754
 and pressure sores, 187
 Nutritional assessment
 of burn patients, 684–687
 of immobilized patient, 752
 Nutritional monitoring
 of burn patients, 688–689
 Nutrition care planning
 for burn patients, 687–688
 Nystagmus, 319, 321

O

Oakland Naval Hospital, 149
 Ober's test, 390
 Obesity, 793
 Navy definition, 793, 797
 OBLA
 See Onset of blood lactate accumulation (OBLA)
 Obstipation
 in spinal cord injured patients, 185
 Oculocardiac reflex, 333
 Occupation
 and aerobic fitness, 804
 and disability compensation evaluation, 869–872
 and lower back pain, 378–389
 physical training specific to, 808, 814
 Occupational therapists
 Korean War, 23
 role in interdisciplinary team, 7, 831–832
 Occupational therapy
 for above-knee amputees, 133
 in Army, 16
 for functional impairments, 15
 history, 830–831
 importance of, 8–9
 for lower extremity amputations, 84, 102
 for mild traumatic brain injury, 231
 for multiple amputees, 149
 for nerve injuries, 12
 for spinal cord injured patients, 179–180
 for upper extremity amputations, 38, 41–42, 52
 See also Vocational rehabilitation
 Occupational Therapy Association, 831
 Ocular muscles
 innervation, 293–294
 Ocular neuromyotonia, 297
 Oculomotor nerve, 291–300
 anatomy and function, 291–295
 muscles innervated by, 293–294
 Oculomotor neuropathies, 295–300
 electrodiagnosis, 299
 imaging, 299–300
 management, 299–300
 symptoms and signs, 297–299
 syndromes, 296–297
 valuation, 299
 Odontoid fracture
 C-2, 174
 Odor
 from vascular support garments, 656
 See also Smell
 Odor identification test, 283
 OEA
 See Operations, Evaluations, and Analysis Officer (OEA)
 Office of The Surgeon General (OTSG), 20, 22–23, 80
 Army Patient Administration Division, 27
 Reconditioning Division, 22
 OH
 See Orthostatic hypotension (OH)
 Ohm's Law, 451
 Olfactometer, 284
 Olfactory evaluation, 283–285
 Olfactory evoked potentials, 284
 Olfactory hallucination, 283
 Olfactory nerve, 282–285
 anatomy and function, 282–283
 Olfactory neuropathies, 282–285
 electrodiagnosis, 284–285
 evaluation, 283–284
 imaging, 285
 incidence, 282
 management, 285
 prognosis, 285
 symptoms and signs, 283
 Olfactory recognition
 diminished, 283
 Olfactory threshold tests, 284
 Omeprazole, 754
 Omniderm, 594
 One repetition maximal lift, 806
 One repetition maximum (1RM), 802, 812
 Onion skin pattern of Dejerine, 169
 Onset of blood lactate accumulation (OBLA), 789
 Open axillary abduction splint
 See Airplane splints
 Open circular amputation, 45–46, 83, 134
 advantages, 94
 disadvantages, 95
 surgical technique, 94
 Open flap technique
 for limb revision, 95
 Operation Job Match, 855
 Operations, Evaluations, and Analysis Officer (OEA), 877
 Ophthalmic nerve, 300
 Ophthalmoplegia, 295–296
 Opioid antagonists
 for traumatic brain injury, 216–217, 222
 Opioids
 and traumatic brain injury, 218
 Opponens hand splints, 705–707
 Opsite, 593–594
 Optic atrophy, 287
 Optic chiasm, 288
 Optic nerve, 285–291
 anatomy and function, 285–286
 Optic neuropathies, 286–290
 evaluation, 288–290
 incidence, 286–287
 management, 291
 prognosis, 291
 symptoms and signs, 287–289
 syndromes, 287

- Optic radiations, 286, 289
 - Optic tract, 286, 289
 - Optokinetic reflex, 294
 - Oral contractures
 - management, 638
 - Oral phase
 - of swallowing, 327
 - "O" ring
 - in upper extremity prostheses, 55, 58
 - Orthopedic felt, 668
 - Orthopedic mechanics
 - See* Prosthetists
 - Orthopedics
 - in combat theater, 8
 - history, 830–831
 - Persian Gulf War, 27
 - role, 15
 - Vietnam War, 24
 - Orthopedic trauma
 - immobilization for, 743
 - Orthoplast, 617
 - Orthoses, 703–740
 - algorithm for use of, 612
 - for burn patients, 596, 600, 611–618, 629–630, 637–643
 - commonly used materials, 617
 - compression inserts, 650, 664–674
 - contact dermatitis caused by, 668–669
 - lower extremity, 704, 715–737
 - for nerve injuries, 12–13
 - overlays, 664–674
 - for peripheral nerve injuries, 471–472, 492, 495
 - postgraft immobilization, 629–631
 - for shin splints, 396
 - for skeletal insufficiency, 733–737
 - upper extremity, 704–715
 - See also specific type of orthosis*
 - Orthostasis
 - immobility-related, 748–749, 765
 - Orthostatic hypotension (OH)
 - in spinal cord injured patients, 175, 177, 184
 - Orthotists, 832
 - Osteomyelitis, 134
 - in spinal cord injured patients, 187–188
 - Osteomyoplasty, 95–96
 - Osteoperiosteal bone flaps, 95–96
 - Osteoporosis
 - immobilization, 747–748, 750
 - in spinal cord injured patients, 189
 - Otoform K, 667, 670
 - Otoscopic examination, 321
 - Ototoxic drugs, 323
 - OTSG
 - See* Office of The Surgeon General (OTSG)
 - Otto Bock 1D10 Dynamic Foot, 120
 - Otto Bock hands, 69–70
 - Outpatient care
 - for burns, 583–584, 636
 - transition from inpatient care to, 858–859
 - for traumatic brain injury, 227–228
 - Overhead walkers, 604–605
 - Overlays
 - for orthoses, 664–674
 - Overload, 472, 807
 - musculoskeletal, 357, 359–360
 - physiological response of bone to, 817
 - progression, 807
 - Overstretching
 - complications, 466
 - Overt Aggression Scale, 223
 - Overtraining, 809
 - Overweight, 793
 - definition, 793, 797
 - Overwork injury
 - clarification, 467–468
 - foot and ankle, 531–532
 - Overwork weakness
 - definition, 467
 - Oxcarbazepine, 222
 - Oxford technique, 469
 - Oxidative capacity
 - of muscle, 801
 - Oxidative phosphorylation, 786–787
 - Oxotremorine, 218
 - Oxycodone, 622
 - Oxygen (O₂)
 - partial pressure (PO₂), 789, 791
 - utilization, 788
 - Oxygen consumption (VO₂), 787, 789
 - and cardiac output, 790
 - See also* Volume of maximum oxygen consumption (VO₂max)
 - Oxygen content
 - arterial, 801
 - Oxygen transport system
 - factors that limit, 792, 800–801
 - Oyster shell orthoses, 655
- P**
- Paced Auditory Serial Addition Test, 243
 - PAFOs
 - See* Plastic ankle-foot orthoses (PAFOs)
 - Pain
 - acute, 621
 - back, 11, 378–389, 743, 857
 - burn, 621–622
 - causalgia-associated, 482
 - chronic, 621
 - deafferentation, 475
 - dysesthetic, 475
 - facial, 304, 308
 - heel, 536–537
 - nerve trunk, 475
 - neuropathic, 475
 - patellofemoral, 394–395
 - posterior element, 384–385
 - at residual limb/prosthesis interface, 142–143
 - retroauricular, 312
 - in spinal cord injured patients, 191–192
 - throat, 332–333
 - See also* Phantom limb pain; Residual limb pain
 - Pain clinics
 - for phantom limb pain, 147–148
 - Pain management
 - for burn patients, 599–600, 621–623, 625–626
 - for causalgia, 489–492, 495
 - for lower extremity amputation, 88, 125, 134, 147
 - for musculoskeletal disorders, 357–358
 - for peripheral nerve injuries, 474–479
 - for spinal cord injured patients, 191–192
 - See also specific type of drug or treatment*
 - Pain syndromes
 - sympathetically maintained, 428, 481
 - Palatal arch
 - evaluation, 327
 - Palatal reflex, 327

- Palate
 - defective elevation, 332
 - examination, 333
- Palmar stimulation
 - for carpal tunnel syndrome, 512
- Palm orthosis, 640–641, 667
- Pamidronate, 750
- Panama, 23
- Papaverine hydrochloride, 219
- Papilledema, 287
- Parallel bars
 - and amputees, 103–104, 148
 - and spinal cord injuries, 177–178
- Paralytic ileus
 - in burn patient, 602
- Paraosteoarthropathy
 - See* Heterotopic ossification (HO)
- Paraplegia
 - See* Spinal cord injury (SCI)
- Paraplegic ambulation, 177–178, 731
 - energy expenditure, 731
- Parathyroid hormone levels
 - in immobilized patients, 750
- Paratrigeminal syndrome, 303
- Parenteral nutrition support
 - for burn patients, 688
- Parinaud's syndrome, 297
- Parkinsonism
 - after traumatic brain injury, 220, 222
- Parkland shoe, 615
- Parosmia, 283
- Paroxetine, 215–216, 220
- Pars interarticularis injury, 385–386
- Pars stress reaction, 385
- Partial anterior interosseous syndrome, 509
- Partial calcanectomy, 87
- Partial foot amputations, 85–93
 - joint contractures, 88
 - long-term follow-up, 92
 - prosthetic fitting and training, 89–92
 - rehabilitation, 87–89
 - surgical technique, 85–87
 - See also specific type of amputation*
- Partial pressure of carbon dioxide (PCO₂), 789
 - response to maximal exercise, 791
- Partial pressure of oxygen (PO₂), 789
 - response to maximal exercise, 791
- Partner-resisted exercises, 812
- PA Section
 - See* Physician Assistant (PA) Section
- Passive prehension orthoses, 709
- Passive range-of-motion (PROM)
 - for burn patients, 605–606, 616–618
 - contraindications, 603
 - definition, 602
- Passpointing, 321
- Patch test
 - for allergic contact dermatitis, 139
- Patellar tendon bearing, total contact socket (PTB-TCS), 107, 139
 - hard, 108
 - soft, 107
 - supracondylar, 108–109
- Patellar tendon-bearing orthosis, 735–736
- Patellar tendon-bearing prosthesis
 - alignment check using, 103–104
- Patellofemoral pain syndrome, 394–395
- Patient
 - role in interdisciplinary team, 833
- Patient age
 - See* Age; Children; Elderly
- Patient controlled analgesia (PCA), 88, 125
- Patient education
 - after burn injury, 601–602
 - after spinal cord injury, 175–180, 186–187
 - after traumatic brain injury, 231, 245
 - in hand rehabilitation, 38
 - and hearing impairments, 323–325
 - for lower extremity amputees, 84, 101–102, 133, 138
 - for musculoskeletal injuries, 382–383
 - for upper extremity amputees, 52, 65, 68–69
- Patient Evaluation Conference System, 224
- Patient history
 - in disability compensation evaluation, 868–869
- Patten bottom
 - orthoses with, 734–735
- Pattern recognition system
 - using phantom limb sensation, 66
- Pavlov ratio, 165
- PCA
 - See* Patient controlled analgesia (PCA)
- PDB
 - See* Physical Disability Branch (PDB)
- PEB
 - See* Physical Evaluation Board (PEB)
- PEBLO
 - See* Physical Evaluation Board Liaison Officer (PEBLO)
- Pectoralis minor syndrome, 501
- PEEP
 - See* Positive end-expiratory pressure (PEEP)
- Pelvic bands
 - with knee-ankle-foot orthoses, 730–731
- Pelvic fractures
 - lumbosacral plexopathy caused by, 523–524
- Pelvic tilts, 384
- Pemoline, 214–215
- Penetrating nerve injuries, 446–448
 - case studies, 491–496
 - classification, 429
 - clinical considerations, 447–448
 - pathophysiology, 446–447
 - prognosis, 447–448
- Pensions
 - See* Physical disability system
- Pentazocine, 503
- Pentoxifylline, 219
- Peptic ulcer disease, 753–755
- Percy Jones General Hospital, Michigan, 35, 80
- Pergolide, 214–215
- Perineurium, 427
 - and traction-related neuropathies, 442
 - transection, 430–431
- Peripheral nerve injuries, 419–574
 - in burn patients, 689–690
 - classification, 429–431
 - cold-induced, 443–446
 - compression, 436–439
 - electrical muscle stimulation, 481
 - electrical stimulation intervention, 479–481
 - electrodiagnosis, 448–465
 - end organ changes following, 431–436
 - epidemiology, 420–422
 - foot and ankle, 531–545
 - hyperesthetic desensitization therapy, 472–473
 - ischemic, 439–440
 - localization, 461–463

- lower extremity, 522–531
 - mechanisms, 436–448
 - orthotic management, 471–472, 492, 495
 - pain management, 474–479
 - penetrating, 446–448, 491–493
 - Persian Gulf War, 11–14, 420, 422, 446, 525
 - pharmacological intervention, 475–479
 - prognosis, 459–462
 - range-of-motion maintenance, 465–467
 - rehabilitative management, 465–481
 - reinnervation following, 431–432, 434, 436, 460, 463
 - secondary injury prevention, 435, 465
 - sensory reeducation, 473–474
 - severity determination, 459–462
 - in spinal cord injured patients, 192–193
 - strength maintenance and improvement, 467–470
 - stretch, 440–443
 - surgical repair postponement, 465
 - upper extremity, 496–522
 - Vietnam War, 447, 497
 - during World Wars, 420–422, 447
 - See also* Causalgia; *specific injury*
- Peripheral nerves
 - anatomy, 422–423, 426–427
 - axonal transport, 425–426
 - causalgia-associated changes in, 484
 - degeneration, 431–434
 - effect of immobility on, 749
 - fascicular composition, 426–427, 435, 438–439, 442
 - impulse propagation, 423–425
 - neuroanatomy, 422–423
 - physiology, 423–426, 448–450
 - regeneration, 431–432, 434, 436, 460, 463
 - vascular system, 427–428
- Peroneal nerve, 527–528
 - deep, 538
 - functional electrical stimulation, 725–726
 - superficial, 540
- Peroneal neuropathy, 527–531
 - anatomic considerations, 527–528
 - in burn patients, 689
 - case scenario, 493–496
 - clinical presentation, 529
 - dislocation-associated, 440–441
 - electrodiagnosis, 529–530
 - etiology, 528–529
 - fracture-associated, 441–442
 - superficial, 540–542
 - treatment, 530–531
- PERSCOM
 - See* Total Army Personnel Command (PERSCOM)
- Pershing, John J., 11
- Persian Gulf War, 23
 - amputations, 12–15, 46–47, 80
 - Army Physical Therapy Registry, 27–28
 - brain injuries, 15
 - burn injuries, 14–15
 - causalgia, 482, 491
 - disability case statistics, 879–880, 883
 - functional impairments, 15
 - hand rehabilitation, 38
 - immobility complications, 742, 745, 756
 - musculoskeletal injuries, 11–13
 - nerve injuries, 11–14, 38, 80, 420, 422, 446, 525
 - physical therapy, 25–28
 - rehabilitation services, 10–16
 - rehabilitation teams, 7
 - wrist-hand orthoses use, 709
- Personality
 - after traumatic brain injury, 217, 223, 238–239
 - premorbid, 195–196
- Personnel Management Officers (PMOs), 865, 877
- PFTs
 - See* Pulmonary function tests (PFTs)
- Phalangization, 36–37
- Phalen's test, 511
- Phantom limb
 - pattern recognition system using, 66
- Phantom limb pain, 14, 143–147, 475
 - definition, 143
 - differential diagnosis, 148
 - duration and frequency, 144
 - incidence, 143–144
 - in lower extremity amputees, 88
 - pathophysiology, 126, 144–145
 - prevention, 147
 - treatment, 145–148
 - in upper extremity amputees, 61
 - See also* Residual limb pain
- Phantom limb sensation
 - after lower extremity amputation, 126, 143
 - classification, 143
 - definition, 143
 - explanation, 126, 143
 - fading, 143
 - management, 126, 143
 - telescoping, 88, 143
- Pharmacologic therapy
 - and alcohol use, 240
 - auditory complications, 323
 - for burn patients, 599–600
 - debilitating side effects, 851
 - for immobilization osteoporosis, 748
 - ocular complications, 296
 - for peripheral nerve injuries, 475–479
 - for phantom limb pain, 126, 145–146, 148
 - for traumatic brain injury, 214–222, 232–233
 - See also specific drug or drug class*
- Pharyngeal phase
 - of swallowing, 328
- Pharyngeal reflex, 327
- Phenobarbital, 221
- Phenoxybenzamine, 490
- Phenytoin, 477, 490
 - for cranial neuropathies, 308
 - for traumatic brain injury, 216, 221
- Phosphagen system, 787–788
- Phosphorylation
 - oxidative, 786–787
- Photographs
 - in burn wound management, 599, 655
- Photoreceptors, 285–286
- Phthalazinol, 217
- Physiatrist
 - definition, 4, 6, 229, 832
 - duties beyond physical rehabilitation, 8
 - role in interdisciplinary team, 832
 - role in surgical decision process, 83, 96
 - role in traumatic brain injury care, 226, 229
- Physiatry
 - history, 4–6, 831
 - See also* Interdisciplinary team
- Physical activity
 - as risk factor for injury, 817
- Physical capacity for exercise, 799–803
 - aerobic, 803–806

- and age, 804–805
- and body composition, 794–796
- and gender, 803–804
- of military populations, 803–806
- and occupation, 804
- Physical Disability Branch (PDB), 865, 873
- Physical disability systems, 863–885
 - Air Force, 884
 - Army, 865–883
 - history, 864–865
 - Navy, 883–884
 - statistics, 879–883
 - triserice comparison statistics, 883
- Physical Evaluation Board (PEB), 71, 150, 250, 865–866, 872–873
 - caseload statistics, 879–883
 - formal hearing process, 874–876
 - location, 867
 - versus Medical Evaluation Board (MEB), 872
 - Navy, 883
 - and preexisting conditions, 876
 - presumptions applied to, 876–877
 - process, 873–877
 - USAPDA review, 876–879
- Physical Evaluation Board Liaison Officer (PEBLO), 868, 872–874
- Physical examination
 - for disability compensation evaluation, 869
- Physical fitness, 781–827
 - and body composition, 792–799
 - definition, 782
 - and disability compensation evaluation, 873
 - and musculoskeletal disorders, 360
 - as risk factor for injury, 817
 - See also Physical capacity for exercise
- Physical fitness standards
 - and age, 804–805
 - DoD directive, 782, 796–799
 - and gender, 803–804
 - and training programs, 811
- Physical medicine and rehabilitation (PMR)
 - in combat theater, 8–9
 - at medical centers, 9–16
 - overview, 4, 6–8, 229
- Physical profile
 - in physical disability system, 867–868
- Physical therapists
 - Army, 7, 20, 24–25, 28–29
 - in civilian practice, 25
 - deployed to third world countries, 28
 - and early ambulation, 84
 - education, 25
 - role in interdisciplinary team, 831–832
 - shortage, 28
 - Vietnam War, 23–24
- Physical therapy
 - for above-knee amputees, 133
 - Army, 16, 20–28
 - in evolving doctrine, 28–29
 - history, 830–831
 - for lower extremity amputees, 103–104, 106
 - for mild traumatic brain injury, 231
 - for multiple amputees, 149
 - Persian Gulf War, 25–28
 - for spinal cord injured patients, 175
 - Vietnam War, 23–24
 - in wartime environment, 19–30
- Physical therapy technicians, 830
- Physical tolerance
 - and vocational assessment, 851
- Physical training, 782, 807–811
 - adaptive response to, 807, 809–810
 - cardiovascular disease associated with, 818
 - definition, 807
 - duration, 807, 810, 812–813
 - frequency, 807, 810–813
 - heart rate-based, 790
 - intensity, 807, 810, 812–813
 - job-specific, 808, 814
 - length, 810–811
 - medical problems associated with, 814–820
 - mode, 810–811, 813
 - musculoskeletal injuries associated with, 814–817
 - principles, 807–809
 - specificity, 808
 - and weight control programs, 793–794
 - See also Exercise; specific type of exercise
- Physical training programs, 811–814
 - components, 810–811
 - initiation, 811
 - integrated, 813–814
 - objectives, 811
 - as risk factor for injury, 816–817
- Physician Assistant (PA) Section, 23
- Physicians
 - role in Army physical disability system, 867–868
 - role in interdisciplinary team, 831
- Physiotherapy aides
 - World War I, 21
- Physostigmine, 218
- Pigskin, 582
- Pin fixation
 - for limb length preservation, 95
- PIP joint
 - See Proximal interphalangeal (PIP) joint
- Piracetam, 219, 221
- Piriformis syndrome, 525
- Pirogoff hindfoot amputation, 86–87
- Pistoning
 - of ankle-foot orthoses, 722–723
- Plantar digital nerve, 543
- Plantar fasciitis, 400–401
- Plantar flexion (posterior) stops
 - on ankle-foot orthoses, 715, 717–718, 722–723
- Plantar nerve
 - lateral, 532–533, 536–537
 - medial, 532–533, 537–538, 543
- Plastazote, 670
- Plaster of Paris
 - in immediate postoperative prostheses, 97–100
 - socket design with, 121, 130
- Plaster orthoses, 617
- Plastic ankle-foot orthoses (PAFOs), 720–723
- Plastic deformation
 - factors influencing, 465–466
- Plastic materials
 - in sockets, 130
- Plastic stretch, 465
- Plastic surgery
 - for burn injuries, 690–693
- Plug fit socket, 129
- Plumb line
 - alignment check using, 103–104
- PMOs
 - See Personnel management officers (PMOs)
- PMR

- See Physical medicine and rehabilitation (PMR)
- Pneumatic compression
 - intermittent, 471
 - for lower extremity amputations, 87, 124, 127
- Pneumonia
 - in spinal cord injured patients, 182
- PNF
 - See Proprioceptive neuromuscular facilitation (PNF)
- Polio epidemics, 6
- Pollicization
 - of remaining fingers, 36–37
- Polycushion, 668–670
- Polyflex, 617
- Polyform, 617
- Polymyxin, 591
- Polyurethane membranes, 593–594
- Polyurethane pads
 - in immediate postoperative prostheses, 96–97
- Porcine skin heterograft, 593
- Positioning
 - during acute phase of burn care, 607–611
 - antigravity, 604, 607–610, 628, 743, 746
 - during immobilization phase of burn care, 628–629
 - for pressure sore prevention, 757
 - during wound maturation phase of burn care, 637
- Positive end-expiratory pressure (PEEP), 599
- Positive sharp waves, 454–456, 494
 - quantification, 455
- Postconcussive symptoms, 230–231
 - pharmacologic therapy, 232–233
- Postconcussive syndromes
 - neurodiagnostic evaluation, 232
- Posterior cord syndrome, 170
- Posterior element pain
 - acute, 384–385
- Posterior flap method
 - of lower extremity amputation, 95
- Posterior interosseous nerve, 503–504
- Posterior interosseous nerve entrapment, 503–505
- Posterior stops
 - on ankle-foot orthoses, 715, 717–718, 722–723
- Posterior tibial nerve, 532
 - See also Tarsal tunnel syndrome
- Postpolio syndrome, 467
- Posttraumatic amnesia (PTA)
 - and family outcome, 253
- Posttraumatic stress disorder (PTSD)
 - in burn patients, 631, 683–684
 - and vocational rehabilitation, 858
- Posture
 - and musculoskeletal injuries, 362–364
- Posturography, 321
- Postvoid residual volume
 - determination, 752
- Potassium depletion
 - immobilization-induced, 750
- Potential reserve, 743
- Povidone-iodine, 582, 597
- Power sources
 - for hand orthoses, 705, 708–709
- Powers ratio, 173
- Power tests
 - anaerobic, 801–802
- Pramiracetam, 219
- Prazosin, 220
- Prednisone, 357, 490
- Preexisting conditions
 - and disability compensation review, 876
- Pregnancy
 - in spinal cord injured patients, 195
- Prentke Romich Light Talker, 620–621
- Prentke Romich Touch Talker, 620–621
- Presbycusis, 319
- Pressure intolerant areas
 - in sockets, 107
- Pressure relieving devices, 757
- Pressure sores, 162, 181, 186, 190, 755–758
 - causes, 186, 755
 - classification, 187, 757–758
 - distribution, 755–756
 - identification of patients at risk for, 756–757
 - incidence, 187, 756
 - prevention, 186, 756–757
 - treatment, 187, 758
- Pressure tolerant areas
 - in sockets, 107
- Pressure wrap
 - bulky, 629–630
- Prilosec
 - See Omeprazole
- Primary irritant dermatitis
 - on residual limb, 139
- Primidone, 221
- Progression
 - overload, 807
- Projectile-related injuries
 - See Bullets; Penetrating nerve injuries; Shell fragment wounds
- Prolonged stretch
 - for burn patients, 603, 636
 - definition, 603
 - with diathermy, 746
- PROM
 - See Passive range-of-motion (PROM)
- Pronator teres muscle, 506–507
- Pronator teres syndrome, 506–508
- Prone positioning
 - anticontracture, 608, 746
- Proportional control systems
 - for myoelectric prostheses, 65–67
- Propranolol, 217, 220, 490
- Proprioception changes
 - burn injury-associated, 633
- Proprioceptive neuromuscular facilitation (PNF), 359
- Proprioceptive training
 - for musculoskeletal injuries, 393, 398
- Prostheses
 - bypass, 126
 - and early ambulation, 13
 - exoskeleton, 132
 - fabrication, 80
 - facial, 655
 - for multiple amputees, 148–149
 - shower, 133
 - stubbie, 133, 148–149
 - temporary, 12–14, 84, 88
 - World War II technology, 35
 - See also Myoelectric prostheses; specific type of prosthesis
- Prosthetic foam, 670
- Prosthetic sockets
 - See Sockets
- Prosthetists, 80, 133, 832
- Protein
 - and burn injuries, 687–688
 - status evaluation, 689
 - synthesis, 750

- Prothrombin time (PT), 763
 - Proximal interphalangeal (PIP) joint
 - amputation at, 37
 - Proximity
 - principle of, 623
 - Pruritus
 - after burn injury, 633
 - Pseudo-anterior interosseous syndrome, 508
 - Pseudo-Graefe's sign, 299
 - Pseudo-Graefe's syndrome, 297
 - Pseudo-obstruction
 - in spinal cord injured patients, 185
 - Psychiatrists
 - role on medical evaluation board, 868
 - Psychological disturbances
 - with amputation, 10
 - immobility-related, 749
 - treatment, 16
 - Psychological shock, 624
 - Psychological support
 - after brain injury, 227–228
 - for burn patients, 596, 623–626, 631, 633, 683–684
 - for immobilized patients, 750
 - in interdisciplinary team management, 832
 - for lower extremity amputees, 84, 88, 101, 125, 133–134
 - for multiple amputees, 149
 - for phantom limb pain, 147–148
 - and physical recovery, 846
 - for spinal cord injured patients, 180, 195–196
 - for upper extremity amputees, 47, 52
 - See also* Emotional counseling; Psychotherapy
 - Psychologists
 - role in interdisciplinary team, 832
 - Psychosocial outcome
 - determinants of, 846–847
 - of traumatic brain injury, 238–241
 - Psychostimulants
 - for traumatic brain injury, 214–215, 219
 - See also specific drug*
 - Psychotherapy
 - for brain injured patients, 245–246
 - for burn pain management, 623
 - for phantom limb pain, 147–148
 - Psyllium hydrophilic mucilloid fiber, 753
 - PT
 - See* Prothrombin time (PT)
 - PTA
 - See* Posttraumatic amnesia (PTA)
 - PTB-TCS
 - See* Patellar tendon bearing, total contact socket (PTB-TCS)
 - Pterygoid reflex
 - electrodiagnostic evaluation, 305–306
 - Ptoxis, 297, 299
 - PTs
 - See* Physical therapists
 - PTSD
 - See* Posttraumatic stress disorder (PTSD)
 - Pubis stress fractures, 397
 - Public Health Service
 - physical therapy services, 25
 - Public Law No. 101-336
 - See* Americans with Disabilities Act
 - Pulmonary angiography, 760–761
 - Pulmonary complications
 - of immobilization, 758–762
 - of spinal cord injury, 181–182
 - See also specific complication*
 - Pulmonary compromise
 - after spinal cord injury, 181
 - signs of, 583
 - Pulmonary edema
 - in burn patients, 584–585
 - high-altitude, 820
 - Pulmonary embolism, 183, 760–762
 - versus* deep venous thrombosis, 763
 - diagnosis, 760–762
 - prevention, 762
 - treatment, 762
 - Pulmonary function
 - during exercise, 788–789, 801
 - Pulmonary function tests (PFTs), 758–759
 - Pulmonary management
 - of burn patients, 584–585, 598–599
 - of immobilized patients, 758–762
 - Punctate hemorrhages, 209
 - Pupil
 - muscles regulating, 294
 - myotonic, 297
 - Pupillary light reflex, 288–290, 296
 - innervation, 294
 - Pushoff
 - with metal ankle-foot orthoses, 718–720
 - with plastic ankle-foot orthoses, 722–723
 - Pylon
 - in immediate postoperative prostheses, 98–100, 135
 - Pyridoxine, 513
- ## Q
- Quadrilateral sockets, 129
 - Quadriplegia
 - See* Spinal cord injury (SCI)
 - Quadruple amputation, 149
 - Quality of life
 - for spinal cord injured patients, 195
 - for traumatic brain injured patients, 224
 - Quisqualate, 212
- ## R
- Racial groups
 - counseling concerns, 849
 - Radial amputations
 - definition, 40
 - prostheses, 39–42
 - Radial nerve, 496, 502
 - Radial neuropathy, 438–439, 502–505
 - anatomic considerations, 502–503
 - case scenario, 491–493
 - clinical presentation, 503
 - compression, 505
 - electrodiagnosis, 503
 - etiology, 503
 - fracture-associated, 440–441
 - orthotics, 640–641, 705–706
 - in spinal cord injured patients, 192
 - treatment, 503–504
 - Radiculopathy
 - cervical, 363–366
 - lumbar, 379–381
 - Radiography
 - in musculoskeletal injuries, 381, 385–386
 - in residual limb problems, 140–143
 - in spinal cord injury, 163, 188
 - in tarsal tunnel syndrome, 535
 - Raeder's syndrome, 303
 - Ramsay-Hunt syndrome, 311–312

- Rancho Los Amigos Scale, 224
- Range of motion
 - definition, 602–603
 - and hand rehabilitation, 38
 - and peripheral nerve injuries, 465–467
- Range-of-motion exercises
 - for accessory neuropathies, 338
 - for brain injured patients, 226
 - for burn patients, 596–597, 602–606, 628
 - early initiation, 9
 - for edema control, 470
 - for immobility complications, 746
 - for lower extremity amputees, 84, 101–103, 135
 - for musculoskeletal injuries, 359, 362, 372, 376–378
 - for peroneal neuropathy, 531
 - for phantom limb pain, 147–148
 - for spinal cord injured patients, 189
 - for upper extremity amputees, 47
- Ranitidine, 754
- Rash
 - heat, 819
- Ratchet splint, 709
- Rating by analogy, 873–874
- Ray amputations
 - prosthetic fitting and training, 89
 - surgical technique, 86
- Raynaud's phenomenon, 444
- Ray resection
 - for finger amputations, 37–38
- Reach
 - orthotic substitution for, 704–706, 710–713
- Reachers, 179, 679
- Reading
 - adaptive devices, 621
- Reamputation (revision), 83, 134, 148
 - surgical technique, 94–95
- Reappraisal, 847
- Reciprocating gait orthoses (RGOs), 732
- Reconstruction aides
 - World War I, 20–21
- Reconstructive surgery
 - for burn patients, 690–693
- Recovery principle
 - in training, 807
- Recreational adaptive aids, 10, 41–42, 52–54, 70–71, 149, 682–683
- Recreational therapists
 - role in interdisciplinary team, 832
- Recreational therapy
 - for above-knee amputees, 133
 - for brain injured patients, 227
 - for burn patients, 636–637, 682–683
 - definition, 832
 - for spinal cord injured patients, 179–180, 195
 - See also Exercise; Sports; specific activity*
- Rectus muscles
 - innervation, 292–293
- Redundancy
 - after traumatic brain injury, 212
- Reed College, Oregon, 20
- Referral questions
 - for neurobehavioral assessment, 242–243
- Reflex arc, 785
- Reflex detrusor contractions
 - in spinal cord injured patients, 193
- Reflexes
 - facial nerve, 312–314
 - glossopharyngeal nerve, 327
 - hyperactive, 190–191
 - laryngeal nerves, 333
 - segmental, 171–172
 - trigeminal nerve, 302–307
 - vagus nerve, 331
 - See also specific reflex*
- Reflex hyperventilation, 789
- Reflex sympathetic dystrophy (RSD), 141–142, 148, 749
- Regional blockade
 - for causalgia, 489–490
- Rehabilitation nurse
 - role in interdisciplinary team, 832–833
- Rehabilitation services
 - Persian Gulf War, 7, 10–16
 - Vietnam War, 7–10
- Rehabilitation team
 - See Interdisciplinary team*
- Reichert's syndrome, 326–327
- Reinnervation
 - after peripheral nerve injury, 431–432, 434, 436
 - after traumatic brain injury, 212
 - electrodiagnostic monitoring, 460, 463–464, 468
 - and functional recovery, 464–465
- Reiter, Reinhold, 65
- Relaxation techniques
 - for burn pain management, 600, 623, 625–626
 - for phantom limb pain, 147
- Remodeling phase, 355
- Remotivation, 847
- Renal calculi
 - in spinal cord injured patients, 194
- Renal failure
 - in spinal cord injured patients, 193
- Reparative phase, 354–355
- Reserpine, 490
- Residual limb
 - definition, 43
 - edema, 134, 138
 - electrical stimulation, 67
 - and energy expenditure for walking, 93
 - hygiene concerns, 84, 107–108, 134, 136
 - interface with lower extremity prostheses, 89, 96–97, 104, 107, 129, 131, 136–137, 142–143
 - lengthening, 96
 - in lower extremity amputees, 134, 136
 - in multiple amputees, 148–149
 - plaster cast impression, 121
 - topographic measurement, 121
 - in upper extremity amputees, 61
 - very short below elbow, 44, 53
 - vibration/percussion, 147
 - weight bearing, 91–92, 98–99, 102–103
- Residual limb pain
 - causes, 139–143
 - differential diagnosis, 142, 148
 - postoperative management, 88, 125, 134, 147
 - referring, 142, 148
 - See also Phantom limb pain*
- Residual limb pain syndrome, 14
- Residual limb wrapping
 - See Stump wrapping*
- Resin
 - in above-knee prostheses, 130
 - in foot prostheses, 90
- Resistance
 - negative, 813
 - variable, 813
- Resistance detraining, 808

Resistance training, 810–813
 adaptation of aerobic training modes to, 812
 adaptive response to, 809–810
 cardiovascular response to, 809–810
 equipment, 812
 for lower extremity amputees, 103
 for muscle mass buildup, 793–794
 for musculoskeletal injuries, 359–360
 for peripheral neuropathy, 467
 specificity, 808
 in weight control programs, 793
See also Isotonic exercises; Strength training

Respirators
 for burn patients, 599

Respiratory failure
 after spinal cord injury, 181
 signs of, 583

Respiratory management
 of burn patients, 584–585, 598–599
 of immobilized patients, 758–762

Respiratory quotient (RQ), 686

Respiratory tract infection
 in immobilized patients, 759

Reston foam, 668

Restructuring, 847

Retina, 286, 288

Retired List
 history, 864–865
 Temporary Disability (TDRL), 865, 873–874, 876, 883

Retirement
See Physical disability system

Retroauricular pain, 312

Return to duty
 of amputees, 150
 of brain injured patients, 246–250
 of burn patients, 637, 683–685
 importance, 16
 of lower extremity amputees, 106
 of multiple amputees, 149
 and musculoskeletal disorders, 360
 transition to, 858–859
 of upper extremity amputees, 70–73
 during Vietnam War, 9, 23–24, 72, 150
See also Vocational assessment; Vocational rehabilitation

Revision
See Reamputation (revision)

RGOs
See Reciprocating gait orthoses (RGOs)

Rhabdomyolysis
 exertional, 818
 in spinal cord injured patients, 193

Rheobase, 449

Rheumatologic disorders
 in amputees, 142

Rhodopsin, 285–286

Rigidity, 208

Ring fracture
 C-1, 173–174
 C-2, 174

Rinne's test, 320–321

Ritalin, 219

1RM
See One repetition maximum (1RM)

Rocker bottom
 orthoses with, 734–735

Rocker soles
 in shoes, 90, 114

Rods, 285–286

Roentgenography
 in anterior tarsal tunnel syndrome, 539
 in causalgia, 486–487
 in pulmonary embolism, 760–761

Roger's sign, 304

ROHO bed, 611, 757

Rolyan Silicone Elastomer, 667

Romania, 28

Romberg test, 321

Room temperature
 for burn patients, 599–600

Roosevelt, Franklin D., 5, 21

Rotating beds
 for spinal cord injured patients, 182, 186

Rotator cuff injuries, 367–370
 in spinal cord injured patients, 189

Rotobed, 631

Roto-Rest Traumabed, 182, 186

RQ
See Respiratory quotient (RQ)

RSD
See Reflex sympathetic dystrophy (RSD)

Rucksack palsy, 497–498

Rule of 9s, 580

Rule of the Palm, 579–580

Rusk, Howard A., 5, 831

Russia, 28

S

Sabolich foot, 120

Saccadic deficits, 299

Saccadic system, 294

SACH foot
See Solid-ankle cushion heel (SACH) foot

Sacral plexus, 522–523

Saddle harness
 for above-elbow prostheses, 57–58

SAFE (stationary attachment, flexible endoskeleton) prosthetic foot, 92, 114–115, 120

Sagittal flap method
 of lower extremity amputation, 95, 124

Saliva
 hypersecretion, 333
 pooling, 312

Salivary flow meter, 312

Salivation
 loss, 312
 measurement, 328

Salmon calcitonin, 748

Saltatory conduction, 449

Salt depletion, 819

Sanderson, Marquerite, 20–21

Saphenous nerve, 526

Sarcomeres, 783

Saturday night palsy, 192, 503

Saudi Arabia
See Persian Gulf War

Scald burns, 577

Scalp donor
 use and healing, 594

Scapular retractors/stabilizers, 368
 strengthening exercises, 363

Scar(s)
 in burn patients, 643–674
 hypertrophic, 643–645, 655–674
 location on residual limb, 136
 skin grafts, 644

- Scar compression, 655–674
 - ankle, 675
 - arm, 673
 - elbow, 672–673
 - fingers, 671
 - foot, 676
 - hand, 672
 - hip, 675
 - knee, 675
 - lower extremity, 675–676
 - shoulder, 673
 - thumb, 671–672
 - trunk, 674
 - upper extremity, 671–673
 - wrist, 672
- Scarpa's triangle, 129, 139
- Schirmer lacrimation test, 312
- Schmidt's syndrome, 332
- Schwann cells, 422–423
 - denervation-related changes in, 433
 - and reinnervation, 434
- SCI
 - See* Spinal cord injury (SCI)
- Sciatic nerve, 524, 528
- Sciatic neuropathy, 438, 524–526
 - anatomic considerations, 524–525
 - clinical presentation, 525
 - electrodiagnosis, 525–526
 - etiology, 525
 - Persian Gulf War, 525
- SCL-90
 - See* Symptom Checklist-90 (SCL-90)
- Scoop type prostheses, 42–43
- Scott-Craig orthoses, 729, 732
- Seat-belt type injuries
 - spinal, 175
- Seattle Ankle, 116
- Seattle Foot, 115–116, 120
- Seattle Lightfoot, 92, 115–116, 120
- Seattle orthosis, 721
- Second General Hospital, Germany, 11
- Sedation
 - of burn patients, 622, 626
 - for phantom limb pain, 146
- Seddon's classification
 - of peripheral nerve injuries, 429
- Segmental dysfunction
 - lumbar, 379
- Segmental hypermobility
 - lumbar, 380, 383
- Seizures
 - posttraumatic, 221–222
- Seizure threshold
 - effects of alcohol on, 240
- Selective serotonin reuptake inhibitors (SSRIs)
 - for traumatic brain injury, 216
- Self-care
 - See* Activities of daily living (ADL); *specific activity*
- Self-Directed Search, 854
- Self-feeding
 - adaptive devices, 619–620, 676–677
- Self-management skills
 - assessment, 855
- Sensory abnormalities
 - causalgia-associated, 482
- Sensory aphasia, 320
- Sensory deprivation
 - in immobilized patients, 748–750
- Sensory feedback
 - in lower extremity amputees, 85, 93
 - with myoelectric prostheses, 67, 69
- Sensory fibers
 - special, 280–281
- Sensory levels
 - for neurological evaluation of spinal cord injury, 169
- Sensory nerve action potential (SNAP)
 - amplitude, 459, 464
 - in brachial plexopathies, 500
 - in carpal tunnel syndrome, 512
 - in compression injuries, 437
 - inability to elicit, 460
 - measurement, 451
 - in thoracic outlet syndrome, 501–502
 - in ulnar neuropathy, 518
- Sensory recovery
 - after peripheral neuropathy, 464–465
 - classification, 474–475
- Sensory reeducation, 473–474, 492
 - discriminative, 474
 - protective, 474
- Sensory stimulation
 - and burn patients, 631
 - and comatose patient, 236
 - and immobilized patients, 749–750
- Sensory Stimulation Assessment Measure, 224
- Separated without benefits (SWOB), 876
- Separated with severance pay (SWSP), 876
- Serial casting, 747
- Series elastic component, 785
- Serotonergic drugs
 - for traumatic brain injury, 215–217, 221
 - See also specific drug*
- Serotonin, 476
- Sertraline, 215–217, 220
- Servo Pro system, 66–67
- Sexual counseling
 - after brain injury, 254
 - after burn injury, 635
- Sexual function
 - in burn patients, 634–635
 - in spinal cord injured patients, 194–195
 - in traumatic brain injured patients, 222
- Shanks
 - for below-knee prostheses, 112–113
 - endoskeletal, 113
 - exoskeletal, 113
 - thermoplastic, 109–110
- Shear forces
 - with knee-ankle-foot orthoses, 727–729
- Sheepskin, 668
- Sheet grafts, 589, 644
- Shell fragment wounds
 - brachial plexopathies caused by, 497
 - burns secondary to, 581
- Shin splints, 395–396
- Shock
 - burn, 585–587
 - psychological, 624
 - spinal, 172
- Shoes
 - for ankle-foot orthoses, 718
 - for burn patients, 615–616, 641–643
 - inserts, 89–90
 - as risk factor for injury, 817
 - rocker soles, 90, 114
 - toe fillers, 89

- Shoulder
 - contracture prevention, 47
 - instability, 370–372
 - positioning for burn injuries, 609–610
 - scar compression, 673
- Shoulder bypass suspension hoops, 714–715
- Shoulder cap design, 714
- Shoulder continuous passive motion machine, 618
- Shoulder disarticulation, 43–45
 - prostheses, 45, 59, 67
 - surgical procedures, 46
- Shoulder dislocation
 - stretch neuropathies associated with, 440–441
 - treatment, 370–371
- Shoulder disorders, 367–372
 - in spinal injured patients, 189
 - See also specific disorder*
- Shoulder flexion assists, 714–715
- Shoulder harness-driven flexor hinge orthoses, 708
- Shoulder orthoses, 630, 638–639
 - functional, 713
 - static, 713
 - support of, 713–715
- Shoulder stabilizers
 - orthotic, 713
- Shoulder suspension
 - for above-knee prostheses, 131
- Shower prostheses, 133
- Shower trolley method
 - of wound cleansing, 598–599
- Shrinker socks, 104–105
- Sickness Impact Profile, 253
- Side-lying positioning
 - anticontracture, 608, 746
- SIDS
 - See Sudden infant death syndrome (SIDS)*
- SII
 - See Strong Interest Inventory (SII)*
- Silastic, 670
- Silesian belt, 131, 133
- Silicone
 - in above-knee prostheses, 132
 - in foot prostheses, 90
 - in orthotic inserts and overlays, 670
 - suction sockets, 112, 131
- Silicone finger trough, 615
- Silver nitrate, 582
- Silver sulfadiazine, 582
- Singer procedure
 - for lower extremity amputation, 96
- Single-axis foot prosthesis, 113–114
- Single-axis knee prostheses, 128
- Single-control system
 - for below-elbow prostheses, 55
- Single photon emission computed tomography (SPECT)
 - in musculoskeletal injuries, 381, 386
 - in traumatic brain injury, 225, 231
- Sinus arrest
 - in spinal cord injured patients, 182–183
- Sitting
 - anticontracture position, 610
 - by spinal cord injured patients, 175–177
- Situational assessment
 - in vocational rehabilitation, 856
- Sjögren's syndrome, 303
- Skeletal insufficiency
 - orthoses for, 733–737
 - See also Dislocations; Fractures; specific injury*
- Skeletal muscle
 - See Muscle(s)*
- Skew flap method
 - of lower extremity amputation, 95
- Skiing program
 - for amputees, 10, 149
- Skin
 - artificial, 592
 - human cadaver, 593
- Skin care
 - during acute phase of burn injury, 596–607
 - during immobilization phase of burn injury, 625–627
 - for lower extremity amputations, 85
 - during wound maturation phase of burn injury, 632–635
 - See also Skin traction management*
- Skin care pads, 667, 669–670
- Skin complications
 - in brain injured patients, 226
 - causalgia-associated, 482–483
 - in immobilized patients, 755–758
 - in lower extremity amputees, 134, 136–137
 - in spinal cord injured patients, 162, 181, 186–188, 755–758
 - in upper extremity amputees, 61
 - See also Pressure sores; specific complication*
- Skin desensitization program
 - for lower extremity amputations, 88, 125, 141, 148
 - for spinal cord injured patients, 191
- Skin flaps, 96, 122, 691–693
- Skin fold procedure
 - for body fat measurement, 797–798
- Skin grafts, 589–592
 - adherence, 588, 590
 - for burn wounds, 587
 - cultured epidermal cells, 591–592
 - donor sites, 589, 594–595, 644
 - dressings, 591–594, 629
 - flaps, 96, 122, 691–693
 - insensate, 85
 - instruments, 587
 - meshed, 589–591, 644
 - movement, 590
 - orthoses, 629–630
 - postgraft dressing changes, 626–627
 - postoperative immobilization, 627, 629
 - for pressure sores, 187, 758
 - for reconstruction, 691–693
 - scarring, 644
 - sheet, 589, 644
 - split-thickness, 96, 122, 589
 - surgical staples for, 590
 - vascular support, 646–649, 655–674
 - wound management, 590–591
- Skin necrosis
 - after amputation, 135
- Skin reactions
 - allergic, 138–139
- Skin tension
 - in residual limb, 136
- Skin traction management
 - errors, 94
 - for lower extremity amputations, 83, 94, 100, 124–125
 - for upper extremity amputations, 45
- Sleep apnea
 - obstructive, 182
- Sleeve suspension
 - for below-knee prostheses, 111
- Sling suspensions
 - for arm support, 712–713

- shoulder, 713
- Slow twitch (type 1) fibers, 784
- Smell
 - altered sense of, 283–285
 - loss of, 282–285
 - testing, 283–285
 - See also* Odor
- Smith and Nephew prosthetic foam material, 667
- Smoke inhalation injury, 584–585, 598–599, 620
- Smooth pursuit system, 294
- SNAP
 - See* Sensory nerve action potential (SNAP)
- Snellen charts, 288
- Social isolation
 - of brain injured patients, 238–239
- Social workers
 - role in interdisciplinary team, 833
- Society for Physical Therapy Physicians, 5
- Sock(s)
 - for foot prostheses, 116
 - for immediate postoperative dressing/prostheses, 97–100, 104–106
 - for suction suspension systems, 112, 131
- Sockets
 - for above-elbow prostheses, 56–57
 - for above-knee prostheses, 129–131
 - for below-elbow prostheses, 52–53
 - for below-knee prostheses, 106–110, 112
 - carbon fiber reinforcement of, 91–92
 - computer aided design/manufacturing, 120–121, 130
 - construction, 109–110
 - fabrication, 120–121, 130
 - for forequarter amputation prostheses, 59
 - hip disarticulation, 132–133
 - for humeral neck amputation prostheses, 59
 - for knee prostheses, 129–131
 - liners, 107–108, 140–141
 - loose, 142
 - myoelectric electrodes embedded in, 67
 - for partial foot prostheses, 89–91
 - pressure areas, 107
 - and residual limb problems, 61, 107
 - Syme's, 91–92
 - transfemoral, 124
 - transpelvic amputation, 132–133
 - See also specific type of socket*
- Sof-Care alternating pressure mattress, 757
- Sof-Kling, 610, 658
- Soft tissue
 - contractures, 746
 - handling during surgical amputation, 122
 - musculoskeletal, 354
 - retraction, 94
- Soft tissue injuries
 - cervical, 361–363
 - rehabilitation, 8–9
- Sole inserts, 642–643
- Sole plate
 - for ankle-foot orthoses, 718
 - rigid, 90
- Solid-ankle cushion heel (SACH) foot, 92, 96, 98, 100, 113, 120, 127
- Soma, 422–423
- Somatosensory evoked potentials
 - filter settings, 452
- Sorbisan, 594
- Sound pressure, 319
- Spasticity
 - in brain injured patients, 226
 - definition, 208
 - in spinal cord injured patients, 167, 172, 178, 190–191
- SPECT
 - See* Single photon emission computed tomography (SPECT)
- Speech and language therapists
 - role in interdisciplinary team, 833
- Speech discrimination test, 320
- Speech disorders
 - after traumatic brain injury, 222
- Speech reading, 324
- Speech therapy
 - for hypoglossal neuropathies, 341–342
 - for mild traumatic brain injury, 231
- Spenco second skin, 670–673
- Spenco skin care pad, 667, 669
- Sphincter pupillae muscle
 - innervation, 294
- Spinal cord changes
 - and phantom limb pain, 126, 144–145
- Spinal cord compression
 - identification, 163
- Spinal cord injury (SCI), 14, 161–205
 - bilateral knee-foot-ankle orthoses for, 731–732
 - causes, 162, 166–167
 - classification, 165, 169
 - complete, 169, 176–178
 - complication management, 181–196
 - complication prevention, 165, 181–196
 - emergency treatment, 162
 - endocrinologic complications, 185
 - first and second echelon MTF treatment, 162–163
 - gastrointestinal complications, 184–185
 - genitourinary complications, 162, 181, 193–194
 - head injuries associated with, 195
 - imaging studies in, 163–164
 - incidence, 162
 - incomplete, 169–170, 178
 - interdisciplinary team management case study, 841–843
 - ligamentous, 173–174
 - long-term follow-up, 180–196
 - mortality and morbidity, 162, 181
 - musculoskeletal complications, 188–189
 - neurological complications, 189–193
 - neurological evaluation, 167–173
 - neurosurgical treatment, 163–165
 - nonpenetrating, 165
 - orthoses, 703–740
 - pathophysiology, 165–167
 - patient education, 175–180, 186–187
 - penetrating, 165
 - prognosis, 170–171
 - psychological complications, 195–196
 - pulmonary complications, 181–182
 - recovery, 167, 175–179, 195
 - recreational rehabilitation, 179–180, 195
 - rehabilitation, 9, 175–180
 - skin complications, 162, 181, 186–188, 755–758
 - third echelon MTF treatment, 163
 - treatment by level of injury, 173–175
 - Vietnam War, 162
 - vocational rehabilitation, 179–180, 195, 856
 - walking after, 177–178, 731
 - wheelchair use after, 175–177
 - World War I, 162
 - World War II, 162
 - zone of injury recovery, 167, 172–173

- Spinal Cord Injury Model Systems Program, 162
- Spinal cord injury units, 162
 - organization, 196
- Spinal manipulative therapy, 362
- Spinal nerve root entrapment, 381
- Spinal nerves, 168
- Spinal shock, 172
- Spinal trigeminal tract, 169
- Spine
 - evaluation, 173–175
 - instability, 163, 189
 - management, 173–175
 - stability, 163–164, 387–389
 - See also specific part of spine*
- Spine alignment
 - restoration and maintenance, 163
- Spine deformities
 - in spinal cord injured patients, 189
- Spine injuries
 - See Spinal cord injury (SCI)*
- Spine rehabilitation program, 382–385
- Spine stabilization exercises, 387–389
- Spiral groove area
 - injuries and compression in, 502–503
- Spirometry
 - incentive, 759–760
- Splinting, 747
 - dynamic, 747
- Splints, 358, 378
 - airplane, 630, 638
 - Bunnell, 709
 - burn, 615–616
 - cockup, 709–710
 - finger, 615
 - hand, 705–707
 - ratchet, 709
 - shin, 395–396
- Split socket
 - for below-elbow prostheses, 53
- Split-thickness skin grafts (STSGs), 589, 691–693
- Split Toe Flex Foot, 117–118
- Spondylolisthesis, 385
- Spondylolysis, 385–386
- Spondylosis, 381
- Spontaneous activity, 454–456, 494
- Sport garments
 - elastic, 665
- Sports
 - brachial plexopathies associated with, 497–499
 - foot and ankle nerve injuries caused by, 531–532, 538, 540, 543–544
 - peroneal neuropathies associated with, 529
 - See also Exercise; specific sport*
- Sprains
 - cervical, 361
 - See also Ankle sprains*
- Spring balances, 802
- Springlite Chopart prosthesis, 90
- Springlite Company, 90
- Springlite II, 119–120
- Springlite Syme's prosthetic foot, 92
- Springlite toe fillers, 89
- Sprint runs
 - maximal, 801
- Spurling's maneuver, 364
- SSRIs
 - See Selective serotonin reuptake inhibitors (SSRIs)*
- Standing balance
 - with knee-ankle-foot orthoses, 730
- Standing table exercise, 603–604
- Stapedial reflex, 312
 - testing, 320
- Stasis dermatitis
 - after amputation, 137–138
- Static orthosis
 - for shoulder/elbow support, 713
- Static strength
 - measurement, 802
- Static stretch, 359
- Stationary attachment, flexible endoskeleton (SAFE) prosthetic foot, 92, 114–115
- Stationary bicycles, 125, 635, 800–802
- Steam burns, 577
- STEN (STored ENergy) Foot, 120
- Step length
 - with ankle-foot orthoses, 720
- Step-up hinges, 44, 53
- Sternocleidomastoid muscle
 - and accessory neuropathies, 336–338
- Steroids
 - for carpal tunnel syndrome, 513
 - for cranial neuropathies, 280, 291, 315
 - for digital neuropathies, 544
 - for superficial peroneal neuropathy, 541–542
 - See also specific drug*
- Stimulants
 - for spinal cord injury, 167
 - for traumatic brain injury, 214–215, 219
 - See also specific drug*
- Stingers
 - See Brachial plexus injuries*
- Stool softeners
 - for immobilized patients, 753
- Strain
 - cervical, 361, 843–844
 - in concussive brain injuries, 230
- Strength, 782, 802–803
 - correlation between muscle mass and, 795–796, 803
 - definition, 802
 - determinants, 803
 - dynamic, 802
 - gender differences, 806
 - immobility-associated loss, 743–744
 - measurement, 802–803, 806
 - population data, 806
 - static, 802
- Strength detraining, 808
- Strength-duration relationship
 - in motor neurons, 449–450
- Strength training, 813
 - basic requirements, 468
 - for burn patients, 635–636
 - in integrated program, 813–814
 - for musculoskeletal injuries, 359–360, 363, 367, 369–372, 375–377
 - for peripheral nerve injuries, 467–470
- Stress
 - battle, 16, 623
 - control principles, 623
 - heat, 818–819
- Stress fractures, 396–397, 816–818
- Stress gastritis
 - in spinal cord injured patients, 184–185
- Stress ulcers, 753–755
- Stretch
 - elastic, 465

- plastic, 465
- prolonged, 603, 636, 746
- terminal, 604
- Stretching exercises
 - for burn patients, 628, 636, 652
 - heating modalities used with, 467, 746–747
 - for musculoskeletal injuries, 371, 373, 390–391, 398–399
 - for peripheral neuropathies, 465–467
- Stretch neuropathies, 440–443
 - brachial plexus, 498–499
 - clinical considerations, 440–441
 - pathophysiology, 441–442
 - peroneal nerve, 528
 - prognosis, 442–443
- Strickland, Benjamin A., Jr., 5, 9
- Stroke volume (SV), 790–791, 801, 809
- Strong-Campbell Interest Inventory, 195
- Strong Interest Inventory (SII), 854
- Structured Clinical Interview, 223
- Stryker turning frame, 186
- STSG
 - See* Split thickness skin graft (STSGs)
- Stubbie prostheses, 133, 148–149
- Stump edema syndrome, 134, 138
- Stump wrapping
 - complications, 125
 - for lower extremity amputations, 87–88, 94, 96–98, 103–105, 125
 - for upper extremity amputations, 48–50
- Stuttering
 - after traumatic brain injury, 222
- Subclavius nerve, 496
- Substance abuse
 - and pharmacologic therapy, 240
 - and traumatic brain injury, 229, 239–241, 246
- Substance P inhibitors
 - for peripheral nerve injuries, 478
- Succinylcholine
 - contraindications, 183
- Sucralfate, 754
- Suction sockets
 - for above-elbow prostheses, 56
 - for above-knee prostheses, 131
 - silicone, 112
- Suction transtibial prostheses, 111
- Sudden infant death syndrome (SIDS), 323
- Suicide
 - by spinal cord injured patients, 196
- Sulfamethoxazole, 752
- Sulfamyalon
 - See* Mafenide acetate
- Summation, 785
- Sunburn, 580–581
- Sunderland's classification
 - of peripheral nerve injuries, 429–431
- Sun exposure
 - and burn patients, 633, 636
- Superficial peroneal nerve, 540
- Superficial peroneal neuropathy, 540–542
- Superficial radial nerve compression, 505
- Superior mesenteric artery syndrome, 755
- Superior oblique muscle
 - innervation, 292–293
- Superior orbital fissure syndrome, 303
- Supersensitivity
 - denervation, 435–436, 456
- Supine positioning
 - anticontracture, 608
- Supported employment model
 - for brain injured patients, 247–250
- Support groups
 - for above-knee amputees, 134
 - family, 255
 - for hearing impaired patients, 325
 - for multiple amputees, 149
- Support Systems International, Inc., 186–187
- Supracondylar cuff suspension
 - of below-knee prostheses, 110
- Supracondylar process syndrome, 506
- Suprapatellar-supracondylar patellar tendon bearing socket, 109
- Suprascapular nerve, 496
 - injury to, 498–499
- Sural entrapment neuropathy, 542–543
- Sural nerve, 542
- Surface electrodes, 453, 456–457
- Surgical complications
 - of lower extremity amputations, 134–148
- Surgical procedures
 - for above-knee amputations, 122–123
 - for amputations, 45–46
 - for anterior interosseous syndrome, 509
 - for below-knee amputations, 93–96
 - for brachial plexopathies, 497
 - brachial plexopathies caused by, 499
 - for burn wounds, 587–595, 628
 - for carpal tunnel syndrome, 513–514
 - for cranial neuropathies, 308, 335
 - cranial neuropathies caused by, 280, 303, 332, 336
 - delayed, 83, 465
 - for digital neuropathies, 544–545
 - for lower extremity amputations, 83–84
 - neuromonitoring during, 280
 - for peripheral neuropathies, 465
 - peroneal neuropathies caused by, 529
 - for phantom limb pain, 146–148
 - for posterior interosseous nerve entrapment, 505
 - for pressure sores, 187, 758
 - safety factors, 628
 - for spinal cord injury, 163–165
 - for superficial peroneal neuropathy, 542
 - for tarsal tunnel syndrome, 536
 - for thoracic outlet syndrome, 502
 - for ulnar neuropathy, 519
 - for upper extremity amputations, 45–46
 - See also specific procedure or injury*
- Surgical staples
 - for skin grafting, 590
- Surgical team
 - multispecialty, 83
- Suspension
 - above-elbow prostheses, 57–58
 - above-knee prostheses, 131
 - below-elbow prostheses, 54–56
 - below-knee prostheses, 110–112
 - humeral neck amputation prostheses, 60
 - immediate postoperative prostheses, 97–100
 - suction, 112, 131
 - supracondylar, 108
- Suspension beds
 - air, 757
- Suspension belts
 - for above-knee prostheses, 131
 - for below-knee prostheses, 97–100, 110–111
 - total elastic, 131
 - transtibial prostheses, 131

Suspension hoops
 shoulder bypass, 714–715
 Suspension sling arm support, 712–713
 SV
 See Stroke volume (SV)
 Swallowing, 326–328
 dysfunction, 327–328, 332, 334–335
 Swallowing reflex, 327
 Swan-Ganz line, 584–585
 Swan neck deformity, 639
 Swimming
 by burn patients, 636
 Swing-through gait, 178
 with knee-ankle-foot orthoses, 729–731
 SWOB
 See Separated without benefits (SWOB)
 SWSP
 See Separated with severance pay (SWSP)
 Syme's amputations, 82
 complications, 87
 functional outcome, 83
 joint contractures, 88
 long-term follow-up, 92
 prosthetic fitting and training, 87, 89–92
 rehabilitation, 87–89
 surgical technique, 87
 weight bearing, 91–92
 Syme's sockets, 91–92
 Sympathectomy
 for causalgia, 490
 Sympathetically maintained pain syndromes, 428, 481
 Sympathetic blockade
 for causalgia, 489–490
 for reflex sympathetic dystrophy, 141, 148
 Sympathetic nervous system
 causalgia-associated changes in, 484–485
 Symptom Checklist-90 (SCL-90), 253
 Synaptic function
 modification, 212
 Synaptogenesis
 reactive, 167, 212–213
 Syndrome of Kiloh and Nevin
 See Anterior interosseous syndrome
 Synkinesis, 315
 Synthetic dressings
 for skin grafts, 593–594
 Syringomyelia
 posttraumatic, 192
 Syrinx
 acute posttraumatic, 173

T

Tachycardia, 333
 Tacrine
 See Tetrahydro-9-aminoacridine (THA)
 Tangential excision
 burn wound, 587–588
 Tapia's syndrome, 340
 Tardy ulnar palsy, 514, 516
 Tarsal tunnel, 532–533
 anterior, 538
 Tarsal tunnel syndrome, 531–536
 anatomic considerations, 532–533
 anterior, 538–540
 clinical presentation, 534–535
 differential diagnosis, 535
 electrodiagnosis, 535
 etiology, 533–534
 treatment, 535–536
 Tarsometatarsal amputations, 85
 disadvantages, 83
 prosthetic fitting and training, 90
 surgical technique, 86
 Tarsotarsal amputations, 85
 disadvantages, 83
 surgical technique, 86–87
 Taste buds, 310–311
 Taste sensation, 310–311
 loss, 312
 Taylor, N. L., 742
 Tay-Sachs disease, 287
 TBI
 See Traumatic brain injury (TBI)
 TBSA
 See Total body surface area (TBSA)
 TCL
 See Tibial collateral ligament (TCL)
 TC-3 socket, 131–132
 TDRL
 See Temporary Disability Retired List (TDRL)
 TDs
 See Terminal devices (TDs)
 Tearing
 excessive, 312
 Tears
 artificial, 315
 Technetium 99m bone scintigraphy
 in causalgia, 487–488, 491
 Tegaderm, 593–594, 670
 Tegapore, 591, 594
 Telephone adaptations, 620
 Telescoping
 of phantom limb sensation, 88, 143
 Temazepam, 220
 Temperature
 high ambient, 818–819
 wet-bulb globe, 819
 See also Body temperature; Cold exposure; Heating modalities
 Temporary Disability Retired List (TDRL), 865, 873–874, 876, 883
 Tendinitis, 355
 Achilles, 399–400
 rehabilitation, 355
 rotator cuff, 369
 in upper extremity amputees, 61
 Tendinosis, 355
 Tendons
 function, 354
 healing phases, 354–355
 injuries, 354–355
 resistance training-induced changes in, 810
 Tendon transfers, 179
 Tenodesis grip, 179
 Tenosynovitis
 De Quervain's, 376–377
 Ten repetition maximum (TRM), 469
 TENS
 See Transcutaneous electrical nerve stimulation (TENS)
 Tensiometer
 cable, 802
 Terminal devices (TDs)
 below-elbow prostheses, 44, 53–56
 body-powered, 53, 56
 hand, 53

- hook, 53
- myoelectric, 53, 56, 59
- recreational, 53–54
- selection of, 70–71
- vocational, 54
- World War II-era, 35
- See also* Control systems
- Terminal stretching, 604
- TES belt
 - See* Total elastic suspension (TES) belt
- Tetanus, 785
- Tetrahydro-9-aminoacridine (THA), 216, 218–219
- Teufel orthosis, 723–725
- THA
 - See* Tetrahydro-9-aminoacridine (THA)
- Theraband, 369–370, 374
- Thermal injuries, 577
 - combined with electrical burns, 578–579
- Thermography
 - in causalgia, 488
- Thermoplastic materials
 - in above-knee prostheses, 130–131, 133
 - in below-knee prostheses, 109–110
 - in finger prostheses, 39
- Thigh corsets
 - with side joints, 110–111
- Thiohexene, 220
- Thomas M. England General Hospital, New Jersey, 80
- Thoracic outlet syndrome (TOS), 192, 366–367, 500–502
 - classification, 500
 - clinical presentation, 501
 - differential diagnosis, 366
 - electrodiagnosis, 501–502
 - etiology, 500–501
 - rehabilitation, 367
 - treatment, 502
- Thoracic spine injuries, 169
 - complications, 182, 193
- Thoracolumbar fractures, 174–175
- Thoracolumbosacral orthosis (TLSO), 175
- Thorax vascular support garment, 661
- Three-jaw chuck grasp, 40–41
- Three-state control systems
 - for myoelectric prostheses, 66
- Throat pain, 332–333
- Thromboembolism, 762–764
- Thrombolytic therapy, 762, 764
- Through-knee amputations, 122–134
 - prostheses, 132
- Thumb
 - amputation levels, 37
 - preservation, 36–37
 - reconstruction, 36–37, 39
 - scar compression, 671–672
 - ulnar collateral ligament injury, 377–378
- Thumb prostheses, 39–41
- Thumb spica cast, 377
- Thyroarytenoid muscle, 333
- Thyroid ophthalmopathy, 296
- Thyrotropin-releasing hormone, 217
- Tibial beveling
 - inadequate, 140
- Tibial collateral ligament (TCL), 393–394
- Tibial fractures
 - stress, 397
 - type IIIC, 82–83
- Tibial nerve, 532
- Tibial neuropathy
 - and ankle-foot orthoses use, 718–720
 - case scenario, 493–496
 - See also* Tarsal tunnel syndrome
- Tic douloureux, 280, 303, 308
 - of glossopharyngeal nerve, 326, 328–329
- Tics
 - after traumatic brain injury, 220
- Tilt-in-space recline wheelchair, 177
- Tilt table, 175, 603–604, 765
- Tincture of benzoin, 656–657
- Tinel's sign, 140
 - in anterior tarsal tunnel syndrome, 539
 - in carpal tunnel syndrome, 511
 - in superficial peroneal neuropathy, 541
 - in tarsal tunnel syndrome, 534
 - in ulnar neuropathy, 515
- Tinnitus, 318, 323
- Tissue complex injury, 356
- Tissue overload complex, 356–357
- Tissue proliferation
 - on residual limb, 136–137
- TKA line
 - See* Trochanter, knee, ankle (TKA) line
- TLSO
 - See* Thoracolumbosacral orthosis (TLSO)
- Toe amputations, 85
 - prosthetic fitting and training, 89
 - surgical technique, 85
- Toe drag
 - with plastic ankle-foot orthoses, 723
- Toe fillers
 - for shoes, 89
- Toe flexion orthosis, 643
- Toe transfer
 - for thumb amputation, 37
- Toileting
 - adaptive aids, 679
 - See also* Activities of daily living (ADL)
- Tokyo Metropolitan Rehabilitation Center socket, 131–132
- Tolosa-Hunt syndrome, 295
- Tongue
 - disorders, 340
 - evaluation, 340–341
 - exercises, 341–342
 - numbness, 304
 - sensory innervation, 310
- TOS
 - See* Thoracic outlet syndrome (TOS)
- Total Army Personnel Command (PERSCOM), 866–867
- Total body surface area (TBSA), 579–580
 - estimation, 580
- Total elastic suspension (TES) belt, 131
- Total peripheral resistance (TPR), 790–791
- Tourniquet injuries, 690
- Tracheostomy
 - after spinal cord injury, 181
 - in burn patients, 599–600
- Traction
 - for back pain, 384–385
 - halo skeletal, 630
 - neuropathies associated with, 440–443, 498
- Traction frame
 - for upper extremity amputations, 45–46
- Transcarpal amputations, 44
- Transcutaneous electrical nerve stimulation (TENS)
 - acupuncture-like, 480
 - for burn pain management, 623
 - complications, 480–481

- conventional, 480
- for musculoskeletal disorders, 358
- for peripheral nerve injuries, 479–481, 490
- for phantom limb pain, 142, 147–148
- for residual limb pain, 142
- for spinal cord injured patients, 191
- technique, 480
- Transfemoral amputations, 122, 124
 - bilateral, 122, 133, 148–149
 - indications, 123
 - surgical technique, 124
- Transfemoral sockets, 124, 129–131
- Transferable skills assessment
 - in vocational rehabilitation, 855–856
- Transfer training
 - for amputees, 102–104, 106
 - for spinal cord injured patients, 175, 189
- Transmetacarpal amputations, 44
- Transmetatarsal amputations
 - disadvantages, 86
 - functional outcome, 83
 - prosthetic fitting and training, 89–90
 - surgical technique, 86
- Transpelvic amputations
 - socket design, 132–133
- Transphalangeal amputations, 44
- Transportation
 - skin traction systems for, 45–46, 83, 124
- Transtibial amputations, 95
 - complications, 101
 - indications, 123
 - rehabilitation, 102, 106
- Transtibial prostheses
 - suction, 111, 131
 - suspension belts, 131
- Transverse amputations
 - prostheses, 39
- Trapezius muscle
 - and accessory neuropathies, 337–338
- Traumacal, 602
- Traumatic brain injury (TBI), 207–277
 - and alcohol use, 229, 239–241, 246
 - appetite dysregulation after, 217
 - ataxia after, 217
 - autonomic dysregulation after, 217
 - behavioral dysfunction after, 212–213, 217–219, 222–223, 228, 245–246
 - case management, 228–229
 - classification, 208–209, 230
 - closed or nonpenetrating, 208–209
 - cognitive dysfunction after, 217–219, 222–223, 228, 237–238, 245–246
 - community based rehabilitation, 228–229
 - definition, 230
 - diagnosis, 230–231, 234
 - early recovery management programs, 226–227
 - emergency medical treatment, 225
 - epidemiology, 209–210
 - etiology, 208–210
 - family education, 227, 255
 - family outcome, 227–228, 231, 245, 250–255
 - functional outcome, 211–213, 224
 - versus* head injuries, 208, 231
 - home based rehabilitation, 228
 - incidence, 229
 - interdisciplinary team management case study, 837–841
 - low level neurologic states, 234–235
 - management, 226, 228, 230–234
 - mild, 229–234, 250
 - military rehabilitation, 229–237
 - model systems continuum of care, 225–229
 - morbidity, 226, 234, 240
 - movement disorders after, 220–221
 - neural recovery mechanisms, 212–213
 - neurobehavioral assessment, 231, 237, 241–245
 - neurobehavioral outcome, 237–246
 - neurobehavioral programs, 228
 - neurogenic heterotopic ossification after, 221
 - neuromedical issues, 217, 222–224
 - nomenclature, 208–209
 - ocular complications, 295, 299
 - open or penetrating, 208–210
 - orthoses, 704–740
 - outpatient clinical services, 227–228
 - outpatient rehabilitation team, 227
 - Persian Gulf War, 15
 - pharmacologic treatment, 214–222, 232–233
 - prevention, 255
 - prognostication issues, 210–212
 - psychosocial outcome, 238–241
 - rehabilitation, 226–227
 - rehabilitation team, 225–229
 - seizures after, 221–222
 - sexual dysfunction after, 222
 - social concerns, 235
 - speech and language disorders after, 222
 - surgical treatment, 225–226
 - vocational rehabilitation, 228, 243, 246–250, 856
- Trazodone hydrochloride, 215–216, 220–221, 476–477
- Treadmills
 - motor-driven, 800
- Tremors
 - after traumatic brain injury, 220
- Trenchfoot, 443–446
- Triamcinolone, 358
- Triasmus, 304
- Triceps pad, 55
- Tricyclic antidepressants
 - dosage, 476
 - for peripheral neuropathy, 475–477, 491–492
 - for phantom limb pain, 146, 148
 - for reflex sympathetic dystrophy, 141–142
 - side effects, 476
 - for spinal cord injury, 191
 - for traumatic brain injury, 214–215, 220, 222, 240
 - See also specific drug*
- Trigeminal evoked potentials, 307–308
- Trigeminal nerve, 300–308
 - anatomy and function, 300–303
 - reflexes involving, 302–303, 305–307
- Trigeminal neuralgia
 - See* Tic douloureux
- Trigeminal neuropathies, 303–304
 - electrodiagnosis, 305
 - evaluation, 304–305
 - management, 308
 - symptoms and signs, 304
 - syndromes, 303–304
- Trigeminal sensory neuropathy, 303
- Triggering, 463
- Trigger point injections, 382
- Trimethoprim, 752
- TRM
 - See* Ten repetition maximum (TRM)
- Trochanter, knee, ankle (TKA) line, 127–128
- Trochanteric bursitis, 389

Trochlear nerve, 291–300
 anatomy and function, 291–292
 Trochlear neuropathies, 295–300
 electrodiagnosis, 299
 evaluation, 299
 imaging, 299–300
 management, 299–300
 symptoms and signs, 297–299
 syndromes, 296–297
 Tropomyosin, 783
 Troponin, 783
 Truman, Harry S, 22
 Trunk
 scar compression, 674
 L-tryptophan, 216–217, 221
 Tube feeding
 of burn patients, 602
 Tubigrip external vascular supports, 657–660, 667
 Tubiton Oedema sleeves, 613, 658–659
 Tumors
 brainstem, 323
 cranial neuropathies secondary to, 280, 296, 317–318
 Turkey, 28
 Twitch, 785
 Two-state control systems
 for myoelectric prostheses, 65–66
 Tympanometry, 320

U

UCL-BC
See University College of London Bioengineering Center (UCL-BC)
 UDS
See Utah Dynamic Socket (UDS)
 UE amputation
See Upper extremity (UE) amputations
 Ulcerations
 of residual limb, 136
 Ulcers
 in spinal cord injured patients, 184–185
 stress, 753–755
See also Pressure sores
 Ulnar amputations
 definition, 40
 prostheses, 42–43
 Ulnar collateral ligament injury, 377–378
 Ulnar nerve, 514, 519–520
 Ulnar neuropathy, 438, 514–522
 anatomic considerations, 514–515, 519–520
 in burn patients, 689
 case scenario, 491–493
 clinical presentation, 515–516, 520–521
 differential diagnosis, 517, 521
 at elbow, 514–519
 electrodiagnosis, 514, 517–519, 521–522
 etiology, 516, 521
 treatment, 519, 522
 at wrist, 519–522
 Ultrasound
 Doppler color-flow, 763
 in musculoskeletal injuries, 374, 377
 socket design with, 121, 130
 Ultrasound diathermy, 467, 746–747, 758
 Underwater weighing, 797–799
 Unit assignment
 and aerobic fitness, 804
 and disability compensation evaluation, 869–872

and vocational rehabilitation, 847
 Unit dB, 320
 United Kingdom
 military pension laws, 864
 Royal Air Force, 7, 16, 71, 150
 spinal cord injury units, 162
 United Nations (UN), 25
 Universal Below-the-Knee Bicycle Attachment, 125
 University College of London Bioengineering Center (UCL-BC), 121
 Unna dressings, 615, 632, 645, 656, 658–659
 Upper extremity
 anticontracture positioning, 746
 scar compression, 671–673
 Upper extremity (UE) amputations, 33–77
 activities of daily living, 50–52, 62–64
 bilateral, 61–65
 myoelectric prosthesis use, 68–69
 nerve recovery in, 82
 nomenclature and functional levels, 43–45
 psychological support, 47, 52
 rehabilitation, 46–52
 skin traction systems, 45
 surgery principles, 45–46
 vocational rehabilitation, 38, 41–42, 47, 52, 54, 71–73
 World War II, 34–35
See also Above-elbow (AE) amputations; Below-elbow (BE) amputations; *specific type of amputation*
 Upper extremity nerve injuries, 496–522
See also specific injury
 Upper extremity orthoses, 704–715
See also specific type of orthosis
 Upper extremity prostheses
 choice of, 69–71
 hybrid (myoelectric and body-powered), 56, 59
 post-Civil War era, 34
 postoperative fitting, 48–49
 and residual limb problems, 61
 training of amputee, 52, 65, 68–69
See also specific type of prosthesis
 Urinary catheters
 in burn patients, 585
 condom, 186–187
 in immobilized patients, 585
 in spinal cord injured patients, 193
 Urinary incontinence
 in spinal cord injured patients, 193
 Urinary retention
 in immobilized patients, 585, 752
 in spinal cord injured patients, 193–194
 Urinary system
 effect of immobility on, 751–753
 Urinary tract infections (UTIs)
 in immobilized patients, 751–752
 in spinal cord injured patients, 162, 181, 194–195
 Ur-Nammu, 864
 USAPDA
See Army Physical Disability Agency (USAPDA)
 USAR
See Army Reserve (USAR)
 Utah Dynamic Socket (UDS), 56
 Utah myoelectric prosthesis, 67–68

V

Vagus nerve, 329–335
 anatomy and function, 329–331
 muscles innervated by, 331

- paralysis, 331
- Vagus neuropathies, 331–335
 - electrodiagnosis, 333–334
 - evaluation, 333
 - management, 334–335
 - prognosis, 334
 - symptoms and signs, 332–333
 - syndromes, 332
- VA hospital system
 - See Veterans Affairs (VA) hospital system
- Valgus, 716–717
 - knee deformity, 736–737
- Valium, 216, 220
- Valleix phenomenon, 534
- Valproic acid, 216, 220–221, 477
- Valsalva's maneuver, 192–193
- Vancouver General Hospital burn scar assessment, 662–664
- VAPC shoe clasp orthosis, 722–723, 725
- Vari-Flex Foot, 117–119
- Varus, 716
 - knee deformity, 736–737
- Vascular access
 - in burn patients, 584–585
- Vascular innervation
 - of peripheral nerves, 428
- Vascular reconstruction, 82
- Vascular studies
 - for amputation complications, 135, 139
- Vascular support
 - after burn injury, 635, 645–649, 655–674
 - for edema control, 471
 - upper extremity, 671–673
- Vascular support garments, 655–674
 - adaptive aids for donning, 679–680
 - custom-measured, 659–660, 665
 - design, 661
 - fitting, 661–662
 - prefabricated, 665
 - sources, 664–665
 - use guidelines, 662
 - See also specific type of garment
- Vascular system
 - of peripheral nerves, 427–428
 - spinal cord injury-associated disruption, 166
- Vasoconstriction, 791
- Vasodilation, 791
- Vasopressin, 218
- VASRD
 - See Veterans Administration Schedule for Rating Disabilities (VASRD)
- Vegetative state
 - definition, 234
 - permanent, 234–235, 237
 - persistent, 234–235
 - prognosis, 211
 - social concerns, 234–235
 - stimulation programs, 235–237
- Velcro closures
 - for above-knee prostheses, 131–132
 - for below-knee prostheses, 110
 - for bilateral upper extremity amputees, 64
 - for hand prostheses, 39–43
- Velfoam, 667–668
- Venography
 - contrast, 762–763
- Venous insufficiency
 - after amputation, 137–138
- Venous stasis
 - and elastic wrap support, 601
- Venous thrombosis
 - See Deep venous thrombosis (DVT)
- Ventilators, 181
- Ventilatory equivalent, 789
- Ventilatory regulation
 - during exercise, 788–789, 801
- Verapamil, 479
- Vernet's syndrome, 326, 336
- Verrucose hyperplasia
 - of residual limb, 134, 138
- Versed
 - See Midazolam
- Vertebral bodies, 167–168
- Vertigo, 319, 324
 - positional, 324
- Vesicoureteral reflux
 - in spinal cord injured patients, 193–194
- Vestibular nerve
 - anatomy and function, 317
 - dysfunction, 319, 323–324
 - evaluation, 321–322
- Vestibular system, 294, 317
- Vestibulocochlear nerve, 316
- Vestibuloocular reflex, 292
 - innervation, 295
- Veterans Administration
 - and physical disability system, 864–865, 873
 - vocational rehabilitation program, 858–859
- Veterans Administration Schedule for Rating Disabilities (VASRD), 868, 872–873
 - rating codes, 874–875, 881
- Veterans Affairs (VA) hospital system, 7–8, 34, 81
 - brain injury treatment centers, 225–226
 - spinal cord injury centers, 14, 196
- Veterans Affairs Medical Center
 - upper extremity amputee care, 50, 52
 - vocational counselor, 47
- Veterans Benefit Counselor, 859
- Veterans Health Service
 - kinesiotherapy, 831
- Veterans Reserve Corps, 72
- Vibration
 - desensitization with, 633–634
- Vicarious functioning
 - after traumatic brain injury, 212
- Vietnam Head Injury Study, 27, 210
- Vietnam War
 - amputations, 10, 52, 72, 80, 134, 148, 150
 - causalgia, 482
 - immobility complications, 742
 - peripheral nerve injuries, 447, 497
 - physical therapy, 23–24
 - rehabilitation services, 7–10
 - return to duty during, 9, 23–24, 150
 - spinal cord injuries, 162
 - vocational rehabilitation case study, 847–848
- Vigabatrin, 222
- Villaret's syndrome, 340
- Vincamine, 219
- Virchow-Robin spaces, 192
- Visual acuity
 - alteration, 287–289, 300
- Visual evoked potentials, 290–291
- Visual field defects, 287–289
- Visual field testing, 288
- Visual pathways, 287
 - symptoms and signs, 288–289

- Visual perception, 294, 300
 - Vitamins
 - for burn patients, 687
 - VO₂
 - See* Oxygen consumption (VO₂)
 - Vocal cord paralysis, 332
 - Vocational assessment, 850–857
 - for brain injured patients, 248–250
 - and educational experiences, 851
 - family, 853–854
 - functional, 852–853
 - interest, 854–855
 - interview, 853
 - measurement tool validity/reliability, 851–852
 - and medication effects, 851
 - and nature of disability, 851
 - and physical tolerance, 851
 - situational, 856
 - transferable skills, 855–856
 - Vocational Interest, Experience, and Skill Assessment, 854
 - Vocational outcomes
 - of amputees, 150
 - of brain injured patients, 234, 246–250
 - of spinal cord injured patients, 196
 - See also* Return to duty
 - Vocational rehabilitation, 845–861
 - for amputees, 150
 - for brain injured patients, 228, 243, 246–250, 856
 - case studies, 847–848, 850
 - coordination of necessary services for, 859
 - in-hospital phase, 846–857
 - for lower extremity amputees, 84, 93, 101, 106
 - posthospital phase, 858–859
 - resistance to, 850
 - short-term counseling in, 848–850
 - for spinal cord injured patients, 179–180, 195, 856
 - for upper extremity amputees, 38, 41–42, 47, 52, 54, 71–73
 - Veterans Affairs program, 858–859
 - Vietnam War case study, 847–848
 - See also* Occupational therapy
 - Vocational Rehabilitation Act Amendments, 6
 - Vocational rehabilitation counselors
 - role in interdisciplinary team, 833
 - Vogel, Emma, 21–23
 - Voicaid, 620–621
 - Voice impairments, 332
 - Volar wrist flexion control orthosis, 709–710
 - Volume of maximum oxygen consumption (VO₂max)
 - and cardiac output, 790
 - definition, 790
 - in immobilized patients, 765
 - measurement, 799–800
 - and muscle fatigue, 786
 - and oxygen transport variables, 792, 801
 - response to aerobic training, 809
 - values for elite athletes, 799
 - See also* Aerobic capacity
 - VO₂max
 - See* Volume of maximum oxygen consumption (VO₂max)
 - “V” straps
 - for above-elbow prostheses, 57–58
- W**
- Waist belt suspension
 - for above-knee prostheses, 131
 - for below-knee prostheses, 97–100, 110–111
 - Walkers
 - for above-knee amputees, 127
 - for musculoskeletal injuries, 357
 - overhead, 604–605
 - Walking
 - See* Ambulation; Gait pattern
 - Wallerian degeneration, 431–434
 - electrodiagnostic findings, 460
 - initiation, 432–433
 - Walter Reed Army Medical Center, 7, 10, 21, 28, 34–35, 80
 - Warm-up period
 - and muscle injury avoidance, 356
 - War-related injuries
 - emotional reaction to, 846–848
 - Water beds, 637
 - Watershed infarctions, 211
 - WDR neurons
 - See* Wide dynamic range (WDR) neurons
 - Weber’s syndrome, 296
 - Weber’s test, 320
 - Webril, 615, 630, 667
 - Wechsler Adult Intelligence Scale, 195
 - Wechsler Memory Scale-Local Memory subtest, 243
 - Weighing
 - hydrostatic (underwater), 797–799
 - Weight
 - of burn patient, 602, 688
 - and immobilization, 752
 - measurement, 793, 797–799
 - military control programs, 793
 - and muscle mass, 793
 - use for resistance training, 812
 - Weight bearing
 - after above-knee amputations, 126
 - after below-knee amputations, 98–99, 102–103
 - after Syme’s amputations, 91–92
 - and musculoskeletal injuries, 357
 - in spinal cord injured patients, 189
 - Weight-bearing orthoses
 - ischial, 734–735
 - Weight control programs
 - military services, 793, 795–797
 - physical training in, 793–794
 - Weights
 - for training, 812
 - Wernicke’s syndrome, 296
 - Western Neurosensory Stimulation Profile, 224
 - Wet-bulb globe temperature (WBGT), 819
 - Wheatstone bridge circuit
 - wire strain gauge with, 802
 - Wheelchair, 682
 - controls, 177
 - manual, 177
 - power, 177
 - pressure sores caused by, 196
 - reclining, 175, 177
 - selection, 177
 - Wheelchair cushions, 611
 - Wheelchair locomotion
 - energy expenditure for, 731
 - Wheelchair skills
 - patient education, 102–103, 175–177
 - WHFO
 - See* Wrist, hand, finger orthosis (WHFO)
 - Whiplash, 171, 208, 230
 - White matter, 165–166
 - damage, 165–166
 - White phosphorus
 - burns caused by, 577–578

- Widdowson, E. M., 742
 - Wide dynamic range (WDR) neurons, 484
 - Wide Range Achievement Test, 195
 - Wilbur, Ray Lyman, 5
 - Williams flexion exercises, 383–384, 391
 - Wire strain gauge
 - with Wheatstone bridge circuit, 802
 - Women
 - Korean War service, 23
 - military body fat standards, 796, 798
 - percent body fat values, 794
 - physical capacity for exercise, 803–804
 - reference body composition values, 792
 - World War II service, 22
 - Women's Medical Specialist Corps (WMSMC), 23
 - See also* Army Medical Specialist Corps (AMSC)
 - Word deafness, 320
 - Word discrimination test, 320
 - Work hardening, 858
 - Work hardening programs, 637
 - World War I
 - amputations, 35, 81, 93, 95, 134
 - cranial neuropathies, 332, 339
 - disability retirement laws, 864
 - musculoskeletal injuries, 11, 354
 - peripheral nerve injuries, 420–421, 447
 - physical reconstruction services, 4–5, 7–8
 - physical therapy, 20–28, 830
 - spinal cord injuries, 162
 - trenchfoot, 443–446
 - World War II
 - amputation centers, 7, 34–35, 52, 80–81, 149
 - amputations, 34–35, 46, 71–72, 80, 93–95, 134
 - causalgia, 481–482
 - disability retirement laws, 864
 - hand injuries, 35, 38
 - immersion foot, 443–446
 - immobility complications, 742
 - musculoskeletal injuries, 11
 - peripheral nerve injuries, 420–422, 447
 - physical therapy, 21–22, 831
 - rehabilitation services, 5–10
 - spinal cord injuries, 162
 - stress fractures, 817
 - Worth Four Dot flashlight, 299
 - Wound breakdown
 - and immediate postoperative prostheses, 99, 102
 - Wound care
 - burns, 596–607
 - skin grafts, 590–591
 - Wound cleansing
 - burns, 597–598, 627
 - Wound closure
 - burns, 587
 - Wound contamination
 - in lower extremity amputee, 81–83, 94–95, 134
 - in upper extremity amputee, 46
 - Wound debridement
 - See* Debridement; Excision
 - Wound dehiscence
 - after amputation, 135
 - Wound healing
 - delayed, 102
 - phases, 595–596
 - Wound maturation phase, 595–596, 631–684
 - Wound protection
 - for lower extremity amputations, 87
 - for upper extremity amputations, 48–50
 - Wright Linear Pump, 606–607, 665, 682
 - Wrist
 - contracture reduction, 709, 746
 - positioning for burn injuries, 610
 - scar compression, 672
 - strengthening exercises, 374
 - ulnar neuropathy at, 519–522
 - Wrist, hand, finger orthosis (WHFO), 611–613, 630–631
 - Wrist disarticulation, 44
 - prostheses, 44, 52
 - and residual limb problems, 61
 - surgical procedures, 46
 - Wrist disorders, 376–378
 - See also* Carpal tunnel syndrome (CTS); *specific disorder*
 - Wrist extension assist, 710
 - Wrist extensor-driven flexor hinge orthosis, 707–709
 - Wrist-flexion units, 54
 - Wrist-hand orthosis, 492, 746
 - for carpal tunnel syndrome, 513
 - for posterior interosseous nerve entrapment, 505
 - for radial neuropathy, 504
 - Wrist orthoses, 709–710
 - extension assist, 710
 - volar flexion control, 709–710
 - Wrist units, 53–55, 57
 - quick change, 54
 - thin friction, 54
 - variable-friction, 54
 - Writing
 - adaptive devices, 621
- X**
- Xeroform, 616, 638, 650
- Y**
- Yohimbine, 222
 - Yom Kippur War, 15
 - “Y” strap
 - for below-elbow prostheses, 55
- Z**
- Zeiter, Walter J., 5
 - Zero-shear recline wheelchair, 177
 - Zimmer mesher, 590
 - Zinc oxide, 656
 - Zone of injury recovery, 167, 172–173
 - Zone of partial preservation, 169
 - Z-plasty, 691
 - “Z” strap attachment
 - for above-elbow prostheses, 58–59