

Index

A

- Acetaminophen, 26–27
- Acute burn management
 - care of, 181–182
 - epidemiology, 179
 - infection, 182
 - inhalational injury, 182
 - reconstruction by anatomical site, 184–186
 - rule of nines, 180–181
 - surgery
 - burn reconstructive ladder, 183
 - escharotomy and fasciotomy, 182
 - excision and grafting, 182–183
 - principles, 182–183
 - tissue expansion, 183–184
 - wound and triage, 179–181
- Adjacent tissue transfer, 183
- Advanced Balancing Combined Digital Extension Flexion Grip (ABCDEFG) Reconstruction, 244
- Advanced Trauma Life Support (ATLS), 221–222
- Air-fluidized (AF) beds, 160
- Allograft, 182–183
- Allotransplantation, hand
 - donor and recipient selection, 278
 - donor limb procurement, 278
 - maintenance immunosuppression, 278–279
 - recipient surgery, 278
- American Association of Hip and Knee Surgeons (AAHKS), 300
- American Burn Association, 179, 180
- American College of Surgeons (ACS), 221
- American Spinal Injury Association (ASIA) score, 98
- Amion, 182
- Amputation vs. limb salvage
 - financial considerations, 231–233
 - litigation and outcomes, 231
 - orthopedic care, 222–226
 - overall outcomes, 230–231
 - pathologic process, 221
 - plastic surgery care, 226–230
 - psychosocial aspects, 230
 - traumatic etiologies, 221–222
 - vascular etiologies, 221
- Amyotrophic lateral sclerosis (ALS), 120, 125
- Anesthesia
 - autonomic dysreflexia (*see* Autonomic dysreflexia (AD))
 - emergence, 23
 - induction, 22–23
 - intraoperative monitoring, 22
 - maintenance, 23
 - peripheral nerve reconstruction, 25–26
 - postoperative considerations
 - acute pain management, 26–28
 - long-term care, 26
 - postanesthesia care, 26
 - preoperative evaluation
 - cardiovascular system, 20–21
 - genitourinary system, 21
 - musculoskeletal system, 21
 - psychological issues, 22
 - respiratory system, 21
 - thermal regulation, 21–22
 - SCL, 19
 - spinal and epidural vs. regional, 24
- Aneurysmal subarachnoid hemorrhage (SAH), 55–56
- Antiseizure medications, 51
- Antiseptic technique, 9
- Arteriovenous malformations (AVM), 56
- Arthritis and avascular necrosis, 299–300
- Arthrofibrosis, 300–302
- Athletic pubalgia
 - clinical presentation and physical examination, 268–269
 - diagnostic imaging, 269
 - MRI grading, 269
 - pathophysiology, 267–268
 - surgical and postoperative management, 269–270
- Atrophic nonunion, 298–299
- Autonomic dysreflexia (AD), 154, 339
 - acute management of, 19–20, 22
 - bladder stones, 342
 - evaluation and management, 341
 - pharmacological treatment, 341
 - post-autonomic dysreflexia management, 341–342
 - prevention, 340
 - symptomatic manifestations, 19
 - treatment, 24–25, 340–341
- Avascular necrosis (AVN), 300

B

- Baclofen, 160, 190–191
- Bi-level positive airway pressure (BiPAP), 121–122
- Biobrane, 182
- Bladder management and surgical considerations
 - Crede/Valsalva voiding, 338
 - indwelling catheterization, 337
 - intermittent catheterization, 336–337
 - reflex voiding, 337–338
- Botulinum toxin, 190
- Bowel obstruction, 147, 148
- Brachial plexopathy, 190
- Brain tumors
 - adult cranial neurosurgery
 - Chiari 1 and 2 malformation, 63–64
 - normal pressure hydrocephalus, 64–65
 - advanced operative technique and treatment options, 57–59
 - postoperative management, 61–63
 - types, 59–61
- Buried bumper syndrome, 150
- Burn wound. *See also* Acute burn management
 - reconstructive ladder, 183
 - surgery
 - burn reconstructive ladder, 183
 - escharotomy and fasciotomy, 182
 - excision and grafting, 182–183
 - principles, 182
 - tissue expansion, 183–184

C

- Cavernous malformation (Cavernoma), 56–57
- Cellulitis, 296
- Cerebral ischemia, 51
- Cerebrovascular disease
 - cerebrovascular lesions
 - aneurysmal subarachnoid hemorrhage, 55–56
 - arteriovenous malformation, 56
 - cavernous malformation, 56–57
 - stroke
 - cerebral ischemia, 51
 - evaluation and management, 53–55
 - hemorrhage, 51–52
 - pathophysiology, 52, 54–55
 - symptoms, 52–53
- Cervical spinal injury, 103–106
- Chest wall excursion (CWE), 130, 131
- Chronic pain, 35–47. *See also* Pain
- Clasp knife phenomenon, 83
- Clevidipine, 25
- Coagulation zone, 179
- Colostomy, 146–148
- Compartment syndrome
 - definition, 153
 - symptoms, 153
 - treatment, 153
- Compensatory breathing patterns, 130
- Complex regional pain syndrome (CRPS), 43, 44

- Compression injury, 108
- Compression syndromes, lower extremity
 - femoral and obturator nerve compression, 255–256
 - peroneal nerve compression, 256
 - piriformis syndrome, 255
 - pudendal neuralgia, 253–255
 - tarsal tunnel syndrome, 256–257
- Computed tomography (CT)
 - cerebral abscess, 66, 67
 - pain, 38
 - spine, 102
- Computed tomography angiogram (CTA), 54
- Concussion, 70–71
- Constant low-pressure (CLP) devices, 160
- Continuous positive airway pressure (CPAP), 121–122
- Contracture, 300–302
- Contusion, 71–72
- Corticosteroids, 27
- Cultured epidermal autografts (CEA), 183
- Cytokines, 7

D

- Damage control surgery, 145–146
- Deep venous thrombosis (DVT), 29–31
 - history and physical exam, 349–350
 - risk factors, 349
 - testing, 350
 - treatment, 350
- Deformity/malunion, 299
- Diabetic foot wound, lower extremity
 - clinical evaluation and surgical planning, 260
 - reconstructive options, 260–265
- Diaphragmatic paralysis
 - amyotrophic lateral sclerosis, 120
 - etiology, 118–119
 - evaluation, 120–121
 - idiopathic paralysis, 120
 - incidence, 118
 - neuromuscular pathology, 121
 - signs and symptoms, 120
 - treatment, 121–123
 - viral neuritis, 120
- Diaphragm pacing (DP)
 - clinical trial, 141
 - in spinal cord injury, 142
 - surgical intervention, 140–141
- Distraction, 108
- Dorsal root ganglion (DRG), 45–46
- DVT. *See* Deep venous thrombosis (DVT)

E

- Ectropion, 185
- ECU tenodesis, wrist alignment, 242
- Ehlers-Danlos syndrome, 302
- Elbow extension reconstruction, 238–239

Electrodiagnostic testing, 89–91
 Electromyography (EMG), 89, 90, 197, 198
 Embedded sensory-motor activity for prosthetic limbs, 376
 Enalapril, 25
 Enteral nutrition (EN), 146, 148
 Enteroatmospheric fistula (EAF), 146
 Enterocutaneous (EC) fistula, 146
 Epidural hematomas, 73
 EPL-loop-knot (ELK) procedure, 240
 Escharotomy, 182
 External pulse generator (EPG), 141

F

Failure to wean (FTW), 139
 Fasciotomy, 153, 182
 Fat embolism syndrome (FES), 295
 Fecal incontinence, 160
 Femoral and obturator nerve compression, 255–256
 Fetal pacemaker, 377
 Fistulas, 13
 Flaccid paralysis, 190
 Flaps, 184
 Flexor digitorum brevis muscle flap, 265
 Floating Light-Activated Microelectrical Stimulators (FLAMES), 376
 Fluid resuscitation, 181
 Forearm pronation reconstruction, 239
 Friction, 158

G

Gabapentin, 27–28
 Gait, 132–133
 Garage door analogy, 191–192
 Gastric outlet obstruction, 150
 Gastrostomy, 148, 149, 152
 complications, 150
 Gluteal thigh flap, 166
 Grip function, reconstruction of, 240–241

H

Hand opening reconstruction, 241–242
 Hand, transplantation and rehabilitation
 allotransplantation
 donor and recipient selection, 278
 donor limb procurement, 278
 maintenance immunosuppression, 278–279
 recipient surgery, 278
 rehabilitation
 cortical plasticity and neurointegration, 281
 functional assessment, 279–280
 outcomes, 281
 rejection assessment, 280–281
 Hannover Fracture Scale-98 (HFS-98), 220
 Hematoma, 150
 Hemorrhagic stroke, 51–52

Hernia, 12–13
 Heterotopic ossification, 300
 Hydralazine, 25
 Hyperemia zone, 180
 Hypertrophic nonunion, 298–299
 Hypovolemic shock, 221

I

Ileostomy, 146–148
 Inflammation, 7–8
 Inguinal neuralgia
 clinical presentation, 271
 diagnosis, 271–273
 management, 273
 pathophysiology, 270–271
 Inguinal pathology
 athletic pubalgia
 clinical presentation and physical examination, 268–269
 diagnostic imaging, 269
 MRI grading, 269
 pathophysiology, 267–268
 surgical and postoperative management, 269–270
 inguinal neuralgia
 clinical presentation, 271
 diagnosis, 271–273
 management, 273
 pathophysiology, 270–271
 Inhalational injury, 182
 International Association for the Study of Pain (IASP), 35
 International classification of surgery
 surgical algorithms, 239
 tetraplegic upper extremity, 237
 Interphalangeal (IP) joint hyperflexion, 240
 Interventional pain management, 42–43
 epidural steroid injections, 43
 intrathecal therapy, 46–47
 kyphoplasty, 44–45
 local anesthetics, epidural infusions of, 43
 minimally invasive lumbar decompression, 45
 neuromodulation, 45
 novel targets and frequencies, 45–46
 spinal cord stimulation, 45
 sympathetic ganglion blocks, 43–44
 vertebroplasty, 44–45
 Intraaxial tumors, 59
 Intracerebral hemorrhage (ICH), 53
 Intraoperative electromyography, 91
 Intrathecal therapy, 46–47
 Intrinsic, reconstruction, 241
 Involutum, 296
 Ischemic stroke. *See* Stroke
 Ischial ulcers reconstruction, 165–168

J

Jejunostomy, 148, 149, 152

K

Key pinch reconstruction, 241
 Kyphoplasty, 44–45

L

Labetalol, 25
 Limb length discrepancy (LLD), 225
 Limb Salvage Index (LSI), 220
 Long-distance brain-brain
 communication, 377
 Low air loss (LAL) beds, 160
 Lower extremity
 amputation vs. limb salvage
 financial considerations, 231
 litigation and outcomes, 231
 orthopedic care, 222–226
 overall outcomes, 230–231
 pathologic process, 221
 plastic surgery care, 226–230
 psychosocial aspects, 230
 traumatic etiologies, 221–222
 vascular etiologies, 221
 anatomy, 252–253
 approach to, 251
 compartments of, 252
 compression syndromes
 femoral and obturator nerve
 compression, 255–256
 peroneal nerve compression, 256
 piriformis syndrome, 255
 pudendal neuralgia, 253–255
 tarsal tunnel syndrome, 256–257
 cross section, middle of leg, 261
 diabetic foot wound, coverage of
 clinical evaluation and surgical
 planning, 260
 reconstructive options, 260–265
 flexor digitorum brevis
 muscle flap, 265
 innervation, 252–253
 neuropathy
 basic science, 259–260
 diagnosis, 257
 medical therapy, 257–258
 surgical therapy, 258–259
 Lower motor neurons (LMN), 189, 190
 lesions, 81
 Lumbar perforator flaps, 165
 Lumbar plexus, 270
 Lymphedema
 epidemiology and etiologies, 350–351
 pathophysiology, 351
 treatment, 351–354

M

Magnetic resonance imaging (MRI)
 cerebral abscess, 66, 67

 cervical spine, 102
 pain, 38
 thoracic and lumbar spine, 103
 Mangled Extremity Severity Score (MESS), 220
 Manual muscle testing (MMT), 196
 Marjolin's ulcer, 13, 186
 Mechanical ventilation (MV), 139
 Minimally invasive lumbar decompression, 45
 Motor system
 lower vs. upper, 81–83
 pathways, 81, 82
 Multicompartment trauma, 74
 Muscle reinnervation, transfers for
 shoulder disarticulation level, 199–200
 transhumeral level, 199

N

Nasal burns, 185
 National Pressure Ulcer Advisory Panel
 (NPUAP), 158, 161
 Neck burns, 185
 Nerve action potentials (NAPs), 92
 Nerve conduction velocity (NCV) tests, 38
 Nerve injuries and repairs
 intraoperative electromyography, 91
 nerve action potentials, 92
 preoperative electrodiagnostic testing, 89–91
 stimulus-triggered EMG, 93
 Nerve Injury, Ischemia, Soft-Tissue Injury,
 Shock, and Age of Patient Score
 (NISSSA), 220
 Nervous System 2.0, 374–377
 Neural enhancement divide (NED), 373–374
 Neurogenic bladder
 anatomy and physiology
 lower urinary tract, 332
 neuroanatomy, 332–333
 pontine micturition center, 333
 sacral micturition centers, 333
 suprapontine (higher) centers, 333
 upper urinary tract, 331–332
 voiding centers, 333
 autonomic dysreflexia, 339
 bladder stones, 342
 evaluation and management, 341
 pharmacological treatment, 341
 post-autonomic dysreflexia management,
 341–342
 prevention, 340
 treatment, 340–341
 bladder management and surgical considerations,
 types of
 Crede/Valsalva voiding, 338
 indwelling catheterization, 337
 intermittent catheterization, 336–337
 reflex voiding, 337–338
 preoperative urologic evaluation, 335–336
 spinal cord injury on voiding

- sacral lesions, 335
 - suprapontine lesions (higher centers), 334
 - suprasacral spinal cord lesions, 334–335
- urinary tract infections, 338–339
- Neurologic injury. *See* Motor system
- Neurolysis/neuromy, 86–87
- Neuromodulation, 45
- Neuropathy
 - lower extremity
 - basic science, 259–260
 - diagnosis, 257
 - medical therapy, 257–258
 - surgical therapy, 258–259
- Neurosurgical infections
 - cerebral abscess, 66–67
 - fungal infection, 68
 - parasitic infections, 67–68
 - postoperative infection, 70
 - shunt infection, 69
 - spinal epidural abscess, 68–69
 - subdural empyema, 67
 - viral encephalitis, 68
- Neurotization, 195
- Nifedipine, 25
- Nipple areola complex (NAC), 185
- Nitroprusside, 25
- Nonsteroidal anti-inflammatory drugs (NSAIDs), 27
- Nonunion/fixation failure, 298–299
- Normal pressure hydrocephalus (NPH), 64–65

- O**
- Oligotrophic nonunion, 299
- Optogenetic technology, 200
- Orthopedic considerations
 - complications and treatments
 - acute and chronic soft tissue, 296–298
 - acute blood loss and vascular injury, 294
 - acute infection and chronic osteomyelitis, 296
 - arthritis and avascular necrosis, 299–300
 - contracture and arthrofibrosis, 300–302
 - deformity/malunion, 299
 - fat embolism syndrome, 295
 - heterotopic ossification, 300
 - instability, 302–303
 - neurologic injury, 295–296
 - nonunion/fixation failure, 298–299
 - venous thromboembolic disease, 295
 - wound complications, 296–298
 - principles, 293–294
- Osteomyelitis, 162

- P**
- Pain
 - definition, 35
 - diagnostic workup, 36–38
 - interventional management, 42–43
 - epidural steroid injections, 43
 - intrathecal therapy, 46–47
 - kyphoplasty, 44–45
 - local anesthetics, epidural infusions of, 43
 - minimally invasive lumbar decompression, 45
 - neuromodulation, 45
 - novel targets and frequencies, 45–46
 - spinal cord stimulation, 45
 - sympathetic ganglion blocks, 43–44
 - vertebroplasty, 44–45
- physical therapy, 133
- physicians, 35, 36
- severity scales, 37
- treatment
 - cognitive and behavioral approaches, 42
 - medication management, 39–42
 - physical medicine modalities, 42
 - psychological approaches, 42
- types, 39
- Parastomal hernias, 147
- Parenteral nutrition (PN), 146
- Percutaneous endoscopic gastrostomy (PEG), 148
- Perforator flaps, 163
- Peripheral arterial disease (PAD)
 - epidemiology, 347
 - history and physical exam, 347–348
 - noninvasive testing, 348–349
 - treatment, 349
- Peripheral nerve regeneration
 - autologous repairs and timing, 371–372
 - nerve guidance conduits and neurotrophic devices, 372–373
- Peripheral neurectomy, 191
- Peripheral parenteral nutrition (PPN), 6
- Peroneal nerve compression, 256
- Phantom limb pain, 229
- Phrenic nerve reconstruction, 118
 - outcomes, 123
 - surgical treatment, 123
 - treatment algorithm, 123–124
- Physical therapy (PT)
 - preoperative assessment, 129–130
 - continence, 133
 - endurance, 131
 - pain, 133
 - postural alignment, 131–132
 - postural stability, 132–133
 - respiration, 130–131
 - rehabilitation
 - reassessment, 133–134
 - treatment, 134–136
- Piriformis syndrome, 255
- Plastic surgery care, 226–230
- Power grip reconstruction, 241
- Predictive Salvage Index (PSI), 220
- Pregabalin, 27–28
- Pressure sores. *See* Pressure ulcers

- Pressure ulcers
 diagnosis
 classification, 161
 osteomyelitis, 162
 patient evaluation, 161–162
 economic burden, 158
 epidemiology, 157
 incontinence, 160
 nutrition, 161
 outcomes and complications, 171–173
 pathophysiology
 anatomic distribution, 158
 friction, 158
 malnutrition, 159
 moisture, 159
 neurological injury, 159
 pressure, 158
 shear, 158
 postoperative management, 165, 171
 pressure relief, 160–161
 prevention, 159
 reconstruction
 by anatomic region, 163–165
 concepts, 162–163
 skin care, 159
 spasticity, 160
 surgical management, 162
 terminology, 157
 Prolonged mechanical ventilation (PMV), 139
 Prophylactic bone resection, 165
 Pudendal neuralgia, 253–255
 Pulmonary function tests (PFT), 130
- R**
- Radionucleotide bone scanning, 38
 Radiosurgery, 58
 Reconstruction
 of burns
 breast, 185
 face, 184–185
 long-term complications, 186
 lower extremity, 185–186
 perineum, 185
 scalp, 184
 upper extremity, 185
 of pressure ulcers
 ischial ulcers, 165
 midline defects, 165
 prophylactic bone resection, 165
 sacral wound, 163
 trochanteric ulcers, 165
 Reflex sympathetic dystrophy (RSD), 43, 44
 Rehabilitative surgery, 3–4
 Respiratory paralysis
 anatomy, 115
 anatomy and physiology, 116–117
 central pathways, 116–117
 diaphragm, 118
 muscles of respiration, 117–118
 phrenic nerve, 118
 surgical intervention, 115–116
- Reversible cerebral vasoconstrictive syndrome (RCVS), 53
 Rhizotomy, 191
 Rotation/translation injury, 108
 Rule of nines, 180–181. *See also* Acute burn
- S**
- Sacral wound reconstruction, 163
 Salvage vs. amputation
 financial considerations, 231–233
 litigation and outcomes, 231
 orthopedic care, 222–226
 overall outcomes, 230–231
 pathologic process, 221
 plastic surgery care, 226–230
 psychosocial aspects, 230
 traumatic etiologies, 221–222
 vascular etiologies, 221
 Seldinger technique, 149, 154
 Seroma, 150, 298
 Shear stress, 158
 Skin care, 159
 Skin grafts, 183, 227
 Skull-base surgery, 60
 Sleep, 130
 Spare parts, 192–193
 Spasticity, 160, 243–244
 clinical features, 83
 treatment, 83
 chemodenervation, 84
 intrathecal baclofen, 85
 oral medications, 84, 85
 physical therapy, 83–84
 surgery, 85–87
 Spastic paralysis, 189–190
 Spinal cord injury (SCI), 19, 139
 patient's with
 acute abdomen in, 154–155
 compartment syndrome, 153
 damage control surgery, 145–146
 enteroatmospheric fistula, 146
 enterocutaneous fistula, 146
 ileostomy and colostomy, 146–148
 nutrition, 148–150
 surgical drains, 152
 tracheostomy, 153–154
 wound complications, 150–152
 on voiding
 sacral lesions, 335
 suprapontine lesions (higher centers), 334
 suprasacral spinal cord lesions, 334–335
 Spinal cord regeneration, 361
 early studies, 361
 glial scar, 363–364
 importance of rehabilitation, 369–370
 peripheral nerve effects on, 368–369
 proteoglycans, 364–365
 Spinal cord stimulation, 45
 Spinal epidural abscess, 68–69
 Spinal trauma
 anatomy, 95–96

- cervical injuries, 103–106
 - classification, 108–109
 - epidemiology, 96–97
 - initial care, 98
 - neurologic injury, 99–100
 - outcomes, 106–107, 109
 - physical examination, 98–99
 - postoperative care, 107
 - radiographic evaluation
 - computed tomography, 102
 - C-spine clearance, 103
 - magnetic resonance imaging, 102–103
 - plain films, 100–102
 - thoracic and lumbar, 107–108
 - Stasis zone, 180
 - Stereotactic radiosurgery, 58
 - Stimulus-triggered EMG, 93
 - Stroke
 - cerebral ischemia, 51
 - evaluation and management, 53–55
 - hemorrhage, 51–52
 - long-term management, 54
 - pathophysiology, 52, 54–55
 - symptoms, 52–53
 - Subarachnoid hemorrhage, 72–73
 - Subaxial injury classification (SLIC) system, 105, 106
 - Subdural empyema, 67
 - Subdural hematomas, 73–74
 - Superhuman strength, 376
 - Superior gluteal cleft wound, 163
 - Surgical debridement, 162
 - Surgical drains, 152
 - Surgical planning exam
 - donors assessment
 - muscles, 196
 - nerves, 195–196
 - function assessment, 193–194
 - pain assessment, 194–195
 - preoperative evaluation, 199
 - process, 198
 - targeted muscle reinnervation, 198–199
 - timing, 197–198
 - transfers for muscle reinnervation, 199–200
 - Surgical principles
 - antiseptic technique, 9
 - feeding tubes, 6, 7
 - fistulas, 13
 - hernia, 12–13
 - infections, 10–12
 - inflammation and injury, 7–8
 - Marjolin's ulcer, 13
 - metabolism and nutrition, 5–7
 - sutures
 - complications, 10
 - drains, 10, 12
 - techniques, 10, 11
 - types, 9–10
 - wound healing
 - epithelialization, 9
 - maturation and remodeling, 8–9
 - neutrophils, 8
 - proliferative phase, 8
 - steroids, 9
 - Surgical site infection (SSI), 151
 - Syndactyly, 185
- T**
- Targeted muscle reinnervation (TMR), 198–199, 283–285
 - Tarsal tunnel syndrome, 256–257
 - TBI. *See* Traumatic brain injury (TBI)
 - Tensor fasciae latae (TFL), 163, 165, 171
 - Tetraplegic upper extremity
 - British Research Council system, 236
 - clinical results
 - nerve transfers, 248
 - neuroprosthetic devices, 248
 - tendon transfers, 246–248
 - complications, 246, 247
 - epidemiology, 235
 - etiology, 235–236
 - International classification of surgery, 237
 - postoperative protocol
 - transferred tendons, immediate activation, 245–246
 - surgical techniques
 - ECU tenodesis, wrist alignment, 242
 - elbow extension reconstruction, 238–239
 - forearm pronation reconstruction, 239
 - grip function, reconstruction of, 240–241
 - hand opening reconstruction, 241–242
 - intrinsic, reconstruction, 241
 - nerve transfer, 239, 244–245
 - spasticity, 243–244
 - tendon transfer, 239
 - thumb, positioning and stabilization, 240
 - wrist extension reconstruction, 240
 - symptoms and physical findings
 - joint range of motion, 236
 - muscle testing, 236
 - pain, 237
 - sensibility testing, 236
 - swelling, 237
 - therapeutic options
 - goals of surgery, 238
 - indications, 237
 - nonoperative treatment, 237
 - preoperative requirements, 237
 - surgical treatment, 237–238
 - time management, 237–238
 - upper extremity
 - functional surgery, 236
 - surgery, 236
 - TFL. *See* Tensor fasciae latae (TFL)
 - Thoracic and lumbar spinal injury, 107–108
 - Thoracolumbar Injury Classification and Severity Score (TLICS), 107, 108
 - Thrombophylaxis, 29–30
 - Thumb, positioning and stabilization, 240
 - Tinel's signs, 198, 199
 - Tissue expansion, 183–184
 - Total body surface area (TBSA), 179, 180
 - Total parenteral nutrition (TPN), 6

- Tracheostomy, 153–154
 advantages, 154
 complications, 154
- Transient ischemic attacks (TIAs), 52
- Traumatic brain injury (TBI)
 complications, 74–76
 concussion, 70–71
 contusion, 71–72
 epidural hematomas, 73
 multicompartiment trauma, 74
 subarachnoid hemorrhage, 72–73
 subdural hematomas, 73–74
- Trochanteric ulcers reconstruction, 165
- U**
- University of Michigan, 200
- Unlimited computing power through visual system
 digital overlays, 376
- Upper extremity
 neuromuscular disorders
 cerebral palsy, 319–320
 digital fusion, 317–319
 digital reanimation, 316–317
 DIP fusion, 322
 elbow fusion, 314
 elbow reanimation, 312–313
 heterotopic ossification, 320–321
 HO, 323
 lateral scapular winging, 323
 medial scapular winging and tendon transfer, 324
 musculocutaneous nerve transfer, 326
 orthopedic principles, 307–309
 PIP fusion, 321–322
 scapulothoracic and glenohumeral fusions,
 311–312
 shoulder reanimation, 309–311
 spinal accessory, suprascapular nerve transfer, 325
 Steindler flexorplasty, 325–326
 wrist fusion, 315–316, 326
 wrist reanimation, 314–315
 transplantation and rehabilitation (*see* Hand,
 transplantation and rehabilitation)
- Upper extremity paralysis
 electromyography and imaging, 197
 future directions, 200–202
 reanimation
 flaccid paralysis, 190
 garage door analogy, 191–192
 lower motor neurons, 189
 spare parts, 192–193
 spastic paralysis, 189–190
 treatment, 190–191
 upper motor neurons, 189
 surgical planning
 donors assessment, 195–197
 function assessment, 193–194
 pain assessment, 194–195
 preoperative evaluation, 199
 process, 198
 targeted muscle reinnervation, 198–199
 timing, 197–198
 transfers for muscle reinnervation, 199–200
- Upper limb function restoration, reinnervation strategies
 clinical applications, 288–289
 integration with bioprostheses, 285–286
 surgical considerations, 286–287
 targeted muscle reinnervation, 283–285
 targeted sensory reinnervation, 287–288
- Upper motor neurons (UMN), 189
 lesions, 81–83
- Urinary tract infections, 338–339
- V**
- Vacuum-assisted dressing, 151
- Vascular considerations
 deep venous thrombosis
 history and physical exam, 349–350
 risk factors, 349
 testing, 350
 treatment, 350
 lymphedema
 epidemiology and etiologies, 350–351
 pathophysiology, 351
 treatment, 351–354
 peripheral arterial disease
 epidemiology, 347
 history and physical exam, 347–348
 noninvasive testing, 348–349
 treatment, 349
- Venous thromboembolic (VTE), 29–31
- Venous thromboembolic disease (VTED), 295
- Ventilator dependency, 125–126
- Vertebroplasty, 44–45
- Video-assisted thoracic surgical (VATS), 122
- Viral encephalitis, 68
- W**
- Whole-brain radiation therapy (WBRT), 59
- Work-related injuries (WRIs), 232
- World Health Organization (WHO), 39
- Wound
 complications, 298
 dehiscence, 150–151
 healing
 epithelialization, 9
 four phases, 8
 maturation and remodeling, 8–9
 neutrophils, 8
 proliferative phase, 8
 steroids, 9
- Wrist extension reconstruction, 240
- X**
- Xenograft, 182
- Z**
- Z-plasty, 183, 228