

# Index

Note: Page numbers set **bold** or *italic* indicate headings or figures, respectively.

## A

- AAMC, *see* Association of American Medical Colleges (AAMC)
- AANS, *see* American Association of Neurological Surgeons (AANS)
- Abducens nerve 46, 55
- Abductor pollicis brevis 33
- ABNS, *see* American Board of Neurological Surgery (ABNS)
- Abscess, spinal epidural **222, 415**
- Absence epilepsy 444
- AC, *see* Assist control (AC)
- AC/PC line 346, 347, 349, 364
- ACA, *see* Anterior cerebral artery (ACA)
- Accreditation Council for Graduate Medical Education (ACGME) 1, 460
- ACDF, *see* Anterior cervical discectomy and fusion (ACDF)
- Acellular nerve allografts/nerve tubes 379
- Acetazolamide 252
- *See also* Diamox challenge
- ACGME, *see* Accreditation Council for Graduate Medical Education (ACGME)
- AchA, *see* Anterior choroidal artery (AchA)
- Achilles tendon reflex 323
- ACoA, *see* Anterior communicating artery (ACoA)
- ACS, *see* American College of Surgeons (ACS)
- ACTIVE trial 254
- Acuity 29
- Acute inflammatory demyelinating polyneuropathy (AIDP) 438
- Acute ischemic stroke, in neuroradiology 92
- Acute respiratory distress syndrome (ARDS) 150, 151
- Acyclovir 236, 415
- Adamantinomatous craniopharyngiomas 310
- ADC hypodense regions, *see* Apparent diffusion coefficient (ADC) hypodense regions
- Additional reading 473
- general **473**
- memoirs **476**
- operative **474**
- subspecialty **474**
- Adductor brevis 33
- Adductor longus 33
- Adductor magnus 33
- Adductor minimus 33
- ADH, *see* Antidiuretic hormone (ADH)
- Adie's pupil **450**
- Adolescent idiopathic scoliosis (AIS) 220
- *See also* Scoliosis
- ADPKD, *see* Autosomal dominant polycystic kidney disease (ADPKD)
- Adult diffuse gliomas **299, 300**
- AEDs, *see* Antiepileptic drugs (AEDs)
- Afferent pupillary defect **450**
- Afferent pupillary defect (APD) 30
- AG, *see* Angular gyrus (AG)
- Agaphia 28
- AIDP, *see* Acute inflammatory demyelinating polyneuropathy (AIDP)
- Air embolism, patient positioning and **138**
- Airway 150, 164
- AIS, *see* Adolescent idiopathic scoliosis (AIS)
- Alar ligaments **68**
- Albendazole 422
- Alberta Stroke Program Early CT Score (ASPECTS) **249**
- Alertness, evaluation of **322**
- Alexia 28
- Alfentanil 446
- ALIF, *see* Anterior lumbar interbody fusion (ALIF)
- Allodynia 236, 238
- Alpha omega alpha (AOA) 3
- Alprazolam 349
- ALS, *see* Amyotrophic lateral sclerosis (ALS)
- Altered mental status **543**
- Altinok, Aysima 20
- Álvarez-Tostado, María Cristina García-Sancho y 20
- AMA, *see* American Medical Association (AMA)
- Amantadine 344
- Ambient cistern 77, 91
- American Association of Neurological Surgeons (AANS) 10, 464, 478
- American Board of Neurological Surgery (ABNS) 1, 460, 485
- American College of Surgeons (ACS) 462
- American Medical Association (AMA) 462
- American Society of Head and Neck Radiology (ASHNR) 478
- American Society of Spine Radiology (ASSR) 478
- American Spinal Injury Association (ASIA) scale 185
- Amitriptyline 237, 239
- Amniocentesis **326**
- Ampicillin 415
- Amyotrophic lateral sclerosis (ALS) 437, 437
- clinical and diagnosis **437**
- epidemiology **437**
- pathology **437**
- treatment and prognosis **437**
- Anatomical hemispherectomy 358
- Anencephaly **327**
- Anesthesia
- and evoked potential monitoring **447**
- in history of neurosurgery 16
- inhalational agents in **424**
- intravenous agents in 445
- malignant hyperthermia and **448**
- Anesthesia dolorosa 241
- Aneurysm clipping **265**
- Aneurysm formation and molecular pathways **262**
- Aneurysmal subarachnoid hemorrhage **105, 152**
- Aneurysms, cerebral **261**
- aneurysm formation and molecular pathways **262**
- aneurysms, other types of **262**
- definitions **261**
- epidemiology **261, 263**
- initial management **264, 264**
- treatment options **264**

- Aneurysms, intracranial
  - craniotomy for **130**
  - in neuroradiology **92**
- Angiocentric glioma **301**
- Angiolipomas **296**
- Angular gyrus (AG) **50**
- Anisocoria **450**
- Ankle dorsiflexion **33**
- Ankle plantarflexion **42**
- Ankylosing spondylitis (AS) **221**
- Anterior cerebral artery **257**
- Anterior cerebral artery (ACA) **75, 75, 94**
- Anterior cervical **131**
- Anterior cervical discectomy and fusion (ACDF) **131, 132, 133, 136, 207**
- Anterior choroidal artery (AchA) **74, 356**
- Anterior commissure **47, 53**
- Anterior communicating artery (ACoA) **75**
- Anterior cord syndrome **188, 189**
- Anterior inferior cerebellar artery **77, 257**
- Anterior interosseous nerve **375**
- Anterior interosseous syndrome **239**
- Anterior longitudinal ligament **70**
- Anterior lumbar interbody fusion (ALIF) **136**
- Anterior median fissure **58**
- Anterior perforated substance **55, 78**
- Anterior ramus **51**
- Anterior spinal artery **77**
- Anterior temporal lobectomy (ATL) **354–355**
- Anterior versus posterior circulation **275**
- Anterolateral sulcus **58**
- Anterolateral triangle **46**
- Anteromedial triangle **46**
- Anti-NDMA antibody **443**
- Anti-Ri antibody **443**
- Anti-voltage-gated calcium channel antibody **443**
- Anti-Yo antibody **443**
- Antibody disorders **443**
- Anticoagulation therapy **256**
- Antidiuretic hormone (ADH) **153**
- Antiepileptic drugs (AEDs) **351, 448**
- Antiplatelet medication and bleeding **107**
- Antiseptic, in history of neurosurgery **16**
- AOA, see Alpha omega alpha (AOA)
- AOD, see Atlanto-occipital dislocation (AOD)
- APD, see Afferent pupillary defect (APD)
- Aphemia **28**
- Apical ligament **68**
- Apical vertebra **218**
- Apparent diffusion coefficient (ADC) hypodense regions **251**
- Applications for neurosurgery **1**
  - away rotations **5**
  - home neurosurgery program, match without **7**
  - interviewing **7**
  - letters of recommendation **6**
  - match data **1**
  - preference signaling **9**
  - qualifications **2**
  - ranking **8**
  - research **3**
  - research for international medical graduates **4**
  - top neurosurgery program, match into **7**
- Arachnoid cysts **323, 323**
  - diagnosis **323**
  - treatment **324**
- Arcuate fasciculus **28**
- ARDS, see Acute respiratory distress syndrome (ARDS)
- Argyll Robertson pupil **450**
- Arnold-Chiari malformation **324, 326**
- Arousal, level of **40**
- Arterial anatomy **71, 71**
  - anterior cerebral artery (ACA) **75, 75**
  - basilar artery (BA) **76, 77**
  - Circle of Willis **76, 77, 78**
  - common carotid artery (CCA) **72, 72**
  - middle cerebral artery (MCA) **76, 76**
  - posterior cerebral artery (PCA) **76, 77**
  - vertebral artery (VA) **77**
- Arterial dissection, in neuroradiology **92**
- Arteriovenous fistula (AVF), dural **216, 217, 395**
- Arteriovenous malformation (AVM) **267, 271, 272**
  - definition **267, 267**
  - epidemiology **267**
  - estimating risk **268, 268**
  - formation and molecular pathways **268**
  - initial management **268**
  - spinal **216**
  - stereotactic radiosurgery in **391, 394, 394**
  - treatment **268**
- Artery of Percheron **258**
- Articular process **64**
- AS, see Ankylosing spondylitis (AS)
- Ascending ramus **51**
- ASHNR, see American Society of Head and Neck Radiology (ASHNR)
- ASIA scale, see American Spinal Injury Association (ASIA) scale
- ASIA score **185**
- Asl, Zahra Taati **21**
- ASPECTS, see Alberta Stroke Program Early CT Score (ASPECTS)
- ASPECTS score **249**
- Aspergillosis **424**
- Aspergillus fumigatus **424**
- Aspirin **173, 254**
- Assist control (AC) **151**
- Association of American Medical Colleges (AAMC) **9**
- ASSR, see American Society of Spine Radiology (ASSR)
- Asterion **44**
- Astroblastoma **304**
- Astrocytomas **214, 299, 396**
- Asymmetric tonic neck reflex **319**
- Athetosis **35**
- ATL, see Anterior temporal lobectomy (ATL)
- Atlanto-occipital dislocation (AOD) **191**
  - additional measurements **192**
  - Basion–Dens interval (BDI) **192**
  - powers ratio **192**
- Atlantoaxial dislocation **193**
- Atlantooccipital membrane **70**
- Atlas **61**
- Atorvastatin **254**
- Atrophy **32, 36**
- Attention **27**
- Atypical teratoid rhabdoid tumor **308**
- Autosomal dominant polycystic kidney disease (ADPKD) **262**
- AVF, see Arteriovenous fistula (AVF)
- AVM, see Arteriovenous malformation (AVM)
- Awards **480**

- Away rotation 5  
 Axillary nerve 33  
 Axis 63
- B**
- BA, see Basilar artery (BA)  
 Babinski reflex 338  
 Babinski's sign 35  
 Baclofen 234, 242, 351  
 BAF Research Grant, see Brain Aneurysm Foundation (BAF) Research Grant  
 BAI, see Basion-axial interval (BAI)  
 Bailey, Orville 22  
 Ballance, Charles 17  
 Ballismus 35  
 Barbiturates 445  
 Basal ganglia 52, 178, 308, 344, 345, 350, 359, 395, 427  
 Basal skull fractures 175  
 Basal vein of Rosenthal 78  
 Basilar artery 77, 258  
 Basilar artery (BA) 76, 77  
 Basilar sulcus 55  
 Basion-axial interval (BAI) 192  
 Basion-Dens interval (BDI) 192  
 Bastos, Katherine Escoes 20  
 Battle's sign 164  
 BBB, see Blood-brain barrier (BBB)  
 BCVI, see Blunt cerebrovascular injuries (BCVI)  
 BDI, see Basion-Dens interval (BDI)  
 Beck, Diana 20  
 BED, see Biological effective dose (BED)  
 Bedside procedures 101, 495
  - burr hole for chronic subdural hematoma 103
  - external ventricular drain 101
  - intracranial pressure monitor 103
  - lumbar puncture and drain 104
  - postprocedure care and complication management 114
  - procedure 112
  - procedure preparation 106
  - shunt check and adjustment 106
  - shunt tap and externalization 105
 Behçet's disease 441  
 Bell's palsy 455
  - management 455
 Benedict's syndrome 257  
 Benign extraneural lesions, surgical approach for 388  
 Benign fibrous histiocytoma 297  
 Benign mesenchymal tumors 296  
 Benign nerve sheath tumors, surgical approach for 387, 387  
 Benign rolandic epilepsy 443  
 Benign tumors 384  
 Bennett, Hughes 17  
 Benzodiazepines 351-352, 446  
 Berger, Hans 22  
 Bess, Irene Zamalea 20  
 Bhattachan, Maya 20  
 BHC, see Burr hole craniectomy (BHC)  
 Biceps 33  
 Biceps femoris 33  
 Big toe extension 33  
 Big toe flexion 33  
 Biological effective dose (BED) 393  
 Bipolar coagulation, in history of neurosurgery 23  
 Bitemporal hemianopia 29, 42  
 Blink-to-threat 31  
 Blood-brain barrier (BBB) 393, 404  
 Blood-brain barrier (BBB) 437  
 Blunt cerebrovascular injuries (BCVI) 191  
 Board review 485
  - oral board review 486
  - written board review 485
 Bone scan, three-phase 239  
 Bormane, Anna 20  
 Botulinum toxin A 349  
 Bovie electrocoagulator 18, 18  
 Bovie, William T. 21  
 BPIs, see Brachial plexus injuries (BPIs)  
 Brachial plexus injuries (BPIs) 379, 380-382  
 Bradykinesia 343-344  
 Brain abscess 415, 417, 418  
 Brain abscesses 418, 542  
 Brain Aneurysm Foundation (BAF) Research Grant 481  
 Brain surface anatomy 51  
 Brain tumor, see Tumor(s)
  - in neuroradiology 94
 Brain, subcortical structures of 52, 54
  - basal ganglia 52
  - internal capsule 52
  - ventricles of the brain 53, 54
 Brainstem 55
  - examination 40
  - medulla 58, 59-60
  - midbrain 55, 57
  - pons 55
 - rhomboid fossa 58, 60  
 -- superior/pontine triangle 58  
 - surface anatomy 55, 55, 56  
 BRAT trial 266  
 Breathing, in traumatic brain injury assessment 164  
 Bregma 44  
 Broca, Pierre Paul 16  
 Broca's syndrome 28  
 Bronchogenic cysts 311  
 Brown-Séquard syndrome 190, 190  
 Bryusova, Serafima Semyonova 20  
 Bulbocavernosus reflex 39, 39, 40  
 Bulk, in motor examination 32  
 Burr hole craniectomy (BHC) 103, 110  
 Burr hole for chronic subdural hematoma 103, 109, 112, 115
  - symptoms, persistence of 103
 Burst fractures 200, 200  
 Bystander arteries 267
- C**
- C-reactive protein (CRP) 413, 441  
 C1 fractures 193, 193, 194  
 C1 vertebra 67  
 C2 fractures 196, 196  
 C2 vertebra 68  
 C6 vertebra 68  
 C7 vertebra 68  
 CADASIL, see Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL)  
 Canadian CT head rule 165  
 Canady, Alexa 19  
 Cancer pain 244
  - See also Tumor(s)
 Cancer Pain Research Consortium 478  
 Capitation 464  
 Capsaicin 237  
 CAPTIVA trial 257  
 Carbamazepine 234  
 Carbidopa 344  
 Cardiogenic shock 152  
 Carol, Mark 23  
 Carotid angioplasty 256  
 Carotid artery atherosclerosis, management of 254, 255  
 Carotid artery endarterectomy 256  
 Carotid atherosclerosis 254, 256  
 Carotid canal 73  
 Carpal tunnel syndrome 39, 239, 240

- Carpal tunnel syndrome (CTS) 371
- Cauda equina syndrome 223, 536
- Caudate nucleus 52–53, 54, 56
- Causalgia, *see* Complex regional pain syndrome (CRPS)
- Cavernomas 216, 269
- Cavernous malformation 395
- Cavernous malformations 269
  - cavernoma formation and molecular pathways 269
  - definition 269
  - epidemiology 269
  - estimating risk 269
  - initial management 269
  - treatment 269
- CBD, *see* Corticobasal degeneration (CBD)
- CBF, *see* Cerebral blood flow (CBF)
- CCA, *see* Common carotid artery (CCA)
- CCMs, *see* Cerebral cavernous malformations (CCMs)
- CDC, *see* Centers for Disease Control and Prevention (CDC)
- Cebocephaly 330
- Cefepime 416, 418
- Ceftazidime 418–419
- Ceftriaxone 415–416
- Centers for Disease Control and Prevention (CDC) 326
- Central cord syndrome 189, 190
- Central nervous system (CNS) 326, 436
- Central sulcus 49, 54
- Cerebellar hemisphere 51
- Cerebellopontine angle (CPA) 125
- Cerebral aneurysms 261
  - aneurysm formation and molecular pathways 262
  - aneurysms, other types of 262
  - definitions 261
  - epidemiology 261, 263
  - initial management 264, 264
  - treatment options 264
- Cerebral arteriography, in history of neurosurgery 22, 23
- Cerebral autoregulation 155
- Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) 442
- Cerebral blood flow (CBF) 154, 250, 444
- Cerebral cavernous malformations (CCMs) 395
  - treatment 207
- Cerebral edema 534
  - diffuse, in neuroradiology 91
- Cerebral localization, in history of neurosurgery 16
- Cerebral metabolic rate of oxygen consumption 444
- Cerebral metabolism and perfusion 154
  - intracranial hypertension, management of 156
  - intracranial pressure monitoring 155
- Cerebral peduncle 55
- Cerebral perfusion pressure (CPP) 155, 166, 250, 444
- Cerebral relaxation 131
- Cerebral salt wasting (CSW) 153–154
- Cerebral spinal fluid (CSF) analysis 413
- Cerebral vascular resistance (CVR) 250
- Cerebral vasospasm, in subarachnoid hemorrhage 260
- Cerebral veins 78
  - deep veins 78
  - superficial veins 78
- Cerebrospinal fluid (CSF) 53, 101, 104, 171, 251, 292, 435
- Cerebrovascular 249, 510
  - cerebral aneurysms 261
  - endovascular techniques 271
  - open vascular techniques 274
  - stroke 249
  - subarachnoid hemorrhage 258
  - vascular malformations 267
- Cerebrum 47
  - subcortical structures of brain 52, 54
  - basal ganglia 52
  - internal capsule 52
  - ventricles of the brain 53, 54
  - surface anatomy 47, 50–51
  - frontal lobe 48
  - medial surface 52, 53
  - occipital lobe 52
  - parietal lobe 50
  - temporal lobe 51
- Certification, professional 460
- Cervical collars 187
- Cervical degenerative disc disease 208
- Cervical disc herniation 206
  - diagnosis 206
  - pathology 206
- treatment 207
- Cervical laminoplasty 134
- Cervical myelopathy 536
- Cervical osteoarthritis 205
  - cervical disc herniation 206
  - degenerative disc disease 205
  - facet joint degeneration 208
  - ligamentous degeneration 209
  - osteophytosis pathology 207
- Cervical spine degenerative disease 205
- Cervical spine fractures 191, 197
- Cervical spine injuries 191
  - atlanto-occipital dislocation (AOD) 191
  - additional measurements 192
  - Basion–Dens interval (BDI) 192
  - powers ratio 192
  - atlantoaxial dislocation 193
  - blunt cerebrovascular injuries (BCVI) 191
  - C1 fractures 193, 194–195
  - C2 fractures 196
  - cervical trauma, additional principles for 199
  - Hangman's fractures 196, 196
  - jumped facets 198, 198
  - occipital condyle fractures 192, 193, 193
  - odontoid (dens) fractures 195, 195
  - subaxial cervical spine injuries 196, 197, 198
- Cervical spine trauma 191
- Cervical spine, rheumatoid arthritis of 221
- Cervical trauma, additional principles for 199
- Cervical vertebrae 65, 67
- Chance fracture 201
- CHANCE trial 256
- Charcot, Jean-Martin 16
- Charlie Kuntz Scholar Award 481
- Chiari I malformations 324
- Chiari II malformation (Arnold–Chiari) 326
- Chiari malformation 324
- Chiari malformations 324
  - diagnosis 324, 325
  - general 324, 325
  - treatment 324
- Children, *see* Pediatric patients
- Chondromas 296
- Chondrosarcomas 294, 397
- Chordoid glioma 303

- of third ventricle 303
- Chordomas 294, 397
- Chorea 35
- Choriocarcinoma 309
- Choroid plexus 53
- Choroidal feeding arteries 267
- Chronic inflammatory demyelinating polyneuropathy, clinical 438
- Chronic inflammatory demyelinating polyneuropathy (CIDP) 430, 438
  - diagnostic features 438
  - treatment 438
- Chronic subdural hematoma, burr hole for 109, 112, 115
- Chronic subdural hematoma (cSDH) 101, 103
- Chronic subdural hematoma, burr hole for 103
  - symptoms, persistence of 103
- CIDP, *see* Chronic inflammatory demyelinating polyneuropathy (CIDP)
- Cingulate gyrus 52
- Cingulotomy 244
- Circle of Willis (COW) 76, 78, 262
- Circulation, in traumatic brain injury assessment 164
- Circumscribed astrocytic gliomas 302
  - astroblastoma 304
  - chordoid glioma 303
  - high-grade astrocytoma with piloid features 303
  - pilocytic astrocytoma 302, 303
  - pleomorphic xanthoastrocytoma 303
  - subependymal giant cell astrocytoma 303
- Cisterns 61, 62, 91
- CIW, *see* Critical illness weakness (CIW)
- CJD, *see* Creutzfeldt-Jakob disease (CJD)
- Classic migraine 434
- Claustrium 52
- Cleft lip, in holoprosencephaly 330
- Clip constructs 281, 281
- Clip materials 281
- Clip types 275
- Clipping versus coiling 266
- Clipping, of aneurysms 265
- Clonazepam 349
- Clopidogrel 254
- Closed neural tube defects 328
  - fatty filum 328
  - lipomyelomeningocele 329, 329
  - spina bifida occulta 329
  - tethered cord syndrome (TCS) 328
- Clozapine 351
- Cluster headache 435
  - basics 435
  - treatment 435
- CMV, *see* Continuous mandatory ventilation (CMV)
- CNS, *see* Central nervous system (CNS), Congress of Neurological Surgeons (CNS), Cranial nerves (CNs)
- Coagulation 157
- Cobb angle 218, 332
- Cobb angles 220
- Cognition, in mental status examination 27
- Cogwheel rigidity 33
- Coiling, endovascular 264, 265
- Collateral branches 77
- Commissural myelotomy 243
- Common carotid artery (CCA) 72, 72
  - external carotid artery 72
  - internal carotid artery 73, 74
- Common migraine 434
- Common Procedural Terminology (CPT) 464
- Communication, in patient-centered care 461
- Complete oculomotor palsy 451
- Complex regional pain syndrome (CRPS) 231
- Complex regional pain syndrome/ causalgia 237, 237, 238
  - diagnosis 239
  - pathophysiology 238
  - signs and symptoms 238
  - treatment 239
- Compression fractures, in spinal trauma 200
  - burst fractures 200, 200
  - fracture dislocations 201
  - seatbelt-type injuries 201
- Computed tomography (CT) 414
  - *See also* Neuroradiology
  - in astroblastoma 304
  - in cervical disc herniation 206
  - in chondrosarcoma 294
  - in facet joint degeneration 208
  - in history of neurosurgery 23
  - in medulloblastoma 306, 307
  - in neuroradiology 84, 85
- in ossification of posterior longitudinal ligament 209
- in osteophytosis 208
- in radiation vasculopathy 404
- in stroke 251
- in traumatic brain injury 165, 165
- Conduction 28
- Conductive and sensorineural hearing loss 455
- Congenital brain disorders 330
  - Dandy-Walker malformation 331
  - holoprosencephaly 330, 330
  - hydranencephaly 330
- Congenital scoliosis 332
- Congress of Neurological Surgeons (CNS) 464, 478
- Consent, informed 462
- Continuous mandatory ventilation (CMV) 151
- Controversial entrapments 373
- Contusion, in traumatic brain injury 167
- Contusions, in traumatic brain injury 170
- Conus medullaris syndrome 199
- Coordination 37
- Cordotomy 242
- Corneal reflex 31
- Corneomandibular reflex 452
- Corning, James L. 21
- Corpus callosotomy 360
- Corpus callosum 52, 53, 55, 96
- Cortical resections 358
- Corticobasal degeneration (CBD) 344, 436
- Corticospinal tract 57, 59
- Council of State Neurosurgical Societies (CSNS) 478
- COVID-19 pandemic 8
- COW, *see* Circle of Willis (COW)
- CPA, *see* Cerebellopontine angle (CPA)
- CPP, *see* Cerebral perfusion pressure (CPP)
- CPT, *see* Common Procedural Terminology (CPT)
- Cranial and paraspinal nerves, tumors of 308
  - germ cell tumors 308
  - germinomas 309
  - nongerminomatous germ cell tumors 309
  - prognosis 310
  - treatment 309
- Cranial approaches 123

- craniotomy for aneurysm 130
  - decompressive hemicraniectomy (DHC) 129, 130
  - endonasal transsphenoidal 128, 129
  - occipital 127
  - orbitozygomatic 125, 126
  - pterional 123, 125
  - retrosigmoid 125
  - temporal 127, 127, 128
  - Cranial nerve (CN) examination 29, 30
    - CN I 29
    - CN V facial sensation 31
    - CN VII 31
    - CN VIII 32
    - CN XI 32
    - CNs II and III 29
    - CNs III, IV, and VI eye movements 31
    - CNs IX, X, and XII 32
  - Cranial nerve evaluation 322, 322
  - Cranial nerve III compression 450
  - Cranial nerves (CNs) 436
    - See also specific nerves
  - Cranial positioning 122
    - frontal 123
    - occipital 123
    - pterional 122, 122
    - retrosigmoid 123
    - temporal 123, 124
    - transsphenoidal 123
  - Craniocervical ligaments 69
  - Craniofacial neuralgias 235
    - greater and lesser occipital neuralgias 235, 236
  - Craniofacial pain syndromes 232
    - complex regional pain syndrome/ causalgia 237, 237, 238
    - glossopharyngeal neuralgia 234
    - greater and lesser occipital neuralgias 235, 236
    - peripheral nerve syndromes 239
    - postherpetic neuralgia 235, 237
    - trigeminal neuralgia 232
  - Craniopharyngioma 310, 311, 312, 331, 332, 402
  - Craniosynostosis 321
  - Craniotomy 103, 126
    - for aneurysm 130
  - Cranium 44
    - skull base 44, 46–47
    - skull vault 44, 45
  - Credentialing, professional 461
  - CREST trial 256
  - Creutzfeldt-Jakob disease (CJD) 434
  - Cribriform plate 50
  - Critical illness weakness (CIW) 158, 158, 159
    - clinical presentation 158
    - prevention and management 159
    - work-up and diagnosis 159
  - CRP, see C-reactive protein (CRP)
  - CRPS, see Complex regional pain syndrome (CRPS)
  - Cruciate ligaments 68
  - Crus cerebri 56
  - Cryptococcosis 414, 421
  - Cryptococcus spp. 421
  - cSDH, see Chronic subdural hematoma (cSDH)
  - CSF, see Cerebrospinal fluid (CSF)
  - CSF analysis, see Cerebral spinal fluid (CSF) analysis
  - CSNS, see Council of State Neurosurgical Societies (CSNS)
  - CSNS Socioeconomic Fellowship 480, 484
  - CSW, see Cerebral salt wasting (CSW)
  - CT, see Computed tomography (CT)
  - CT angiography (CTA) 251
  - CTA, see CT angiography (CTA)
  - CTS, see Carpal tunnel syndrome (CTS)
  - Cubital tunnel syndrome (CuTS) 371
  - Cuneus 50
  - Cushing era 17
  - Cushing, Harvey 17, 17
  - CuTS, see Cubital tunnel syndrome (CuTS)
  - CVR, see Cerebral vascular resistance (CVR)
  - CyberKnife 392
  - Cyclopia 330
  - Cysticercosis 422, 422
  - Cysts and tumor-like lesions 311
- D**
- Dabigatran 174
  - Damadian, Raymond 23
  - Dandy, Walter E. 9, 18, 21, 22, 265
  - Dandy-Walker malformation (DWM) 331
  - Dandy's point 139
  - Dantrolene sodium 448
  - DBS, see Deep brain stimulation (DBS)
  - DC, see Decompressive craniectomy (DC)
  - DCI, see Delayed cerebral ischemia (DCI)
  - Deafferentation 231
  - Deafness, pure word 28
  - Decompressive craniectomy (DC) 172
  - Decompressive hemicraniectomy (DHC) 129, 130
  - Deep brain stimulation (DBS) 139, 241, 344, 349, 351, 360, 399, 436
  - Deep vein thrombosis (DVT) 158, 173
  - Deep veins 78
  - Degenerative cervical myelopathy 205
    - cervical disc herniation 206
    - degenerative disc disease 205
    - facet joint degeneration 208
    - ligamentous degeneration 209
    - osteophytosis pathology 207
  - Degenerative disc disease (DDD) 208
    - of cervical spine 205
  - DEI, see Diversity, equity, and inclusion (DEI)
  - Delayed cerebral ischemia (DCI) 105
  - Deltoid 33
  - Dementia 434
    - basic guidelines for biopsy 434
  - Dementia with Lewy bodies (DLB) 436
  - Denis classification 200–201, 201
  - Dens fracture 195, 195
  - DENVER criteria 191
  - Department of State 5
  - Depressed skull fractures 176
  - Depth electrodes 353
  - Dermatome map 37
  - Desflurane 445
  - Detmold, William 17
  - Developmental anomalies 323
    - arachnoid cysts 323, 323
    - chiari malformations 324
    - congenital brain disorders 330
    - hydrocephalus 334
    - neural tube defects (NTDs) 326
    - sellar lesions 331
    - spinal disorders 332
  - Dexametomidine 446
  - Dextroscapular 332
  - DGME funding, see Direct graduate medical education (DGME) funding

- DHC, see Decompressive hemicraniectomy (DHC)
- DI, see Diabetes insipidus (DI)
- Diabetes insipidus (DI) 152
- Diabetic neuropathy 241
- Diagnosis-related groups (DRGs) 462–463
- Diamox challenge 252
- DIC, see Disseminated intravascular coagulation (DIC)
- Diffuse cerebral edema, in neuroradiology 91
- Diffuse intrinsic pontine glioma (DiPG) 302
- Diffusion-weighted imaging (DWI) sequence hyperintensity 251
- DiPG, see Diffuse intrinsic pontine glioma (DiPG)
- Direct drug administration into the CNS 242
- intraspinal narcotics 242
- Direct graduate medical education (DGME) funding 460
- Disability insurance 465
- Disability, in traumatic brain injury assessment 164
- Disc herniations, cervical 206
- Disseminated intravascular coagulation (DIC) 157, 424
- Distributive shock 153
- Dix–Hallpike maneuver 453
- Dizziness 453
- DLB, see Dementia with Lewy bodies (DLB)
- Dolbeau, Henri 21
- Donaghy, R. M. P. 23
- Dopaminergic neurons 344, 435
- Dorsal root entry zone (DREZ) lesions 242
- Dorsal root ganglion stimulation 240
- Drain, lumbar 130
- DREZ lesions, see Dorsal root entry zone (DREZ) lesions
- DRGs, see Diagnosis-related groups (DRGs)
- Drift 34
- Drug/antibiotic delivery 102
- Dual antiplatelet therapy 256
- Duane's syndrome 452
- Dumb-bell tumors 384
- Durable power of attorney 465
- Dural arteriovenous fistula 216, 217, 395
- Dural arteriovenous malformation 271, 272
- Dural sinuses 78, 79
- Durante, Francesco 17
- DVT, see Deep vein thrombosis (DVT)
- DWI sequence hyperintensity, see Diffusion-weighted imaging (DWI) sequence hyperintensity
- DWM, see Dandy–Walker malformation (DWM)
- Dysarthria 32
- Dysdiadochokinesis 38
- Dyskinesias 344
- Dysmetria 38
- Dystonia 35, 350
- diagnosis 350
  - pathophysiology 350
  - treatment 351, 352
- DYT1 350–351

## E

- Eagle's syndrome 234
- EBRT, see External beam radiation therapy (EBRT)
- EBV, see Epstein–Barr virus (EBV)
- EC-IC, see External carotid–internal carotid (EC-IC)
- ECA, see External carotid artery (ECA)
- ECoG, see Electrocorticography (ECoG)
- EDHs, see Epidural hemorrhages (EDHs)
- EDX studies, see Electrophysiologic (EDX) studies
- EEG, see Electroencephalogram (EEG)
- Ehlers–Danlos syndromes 220, 262
- Elbow extension 33
- Elbow flexion 33
- Electrical stimulation 240
- deep brain stimulation 241
  - dorsal root ganglion stimulation 240
  - peripheral nerve stimulation 240
  - spinal cord stimulation 240, 241
  - transcranial magnetic stimulation 241
- Electrocorticography (ECoG) 354
- Electrodes
- depth 353, 354
  - foramen ovale 353
  - strip 360
  - subdural grid 353, 354
- Electrodiagnostic testing 447
- Electroencephalogram (EEG) 22, 154, 352, 447
- Electrolytes 153
- Electromyography (EMG) 132, 369, 447
- Electrophysiologic (EDX) studies 369
- Elevated ICP 103
- Embryonal carcinoma 309
- Embryonal/PNETs 306
- atypical teratoid rhabdoid tumor 308
  - medulloblastoma 306, 307
  - molecular biology 306
  - treatment 308
- EMG, see Electromyography (EMG)
- Encephalocele 327
- Encephaloduroarteriosyn-angiosis 270
- Endodermal sinus tumor 309
- See also Yolk sac tumor
- Endonasal transsphenoidal approach 128, 129
- Endoscopic endonasal approach 283
- Endoscopic third ventriculostomy (ETV) 330
- Endovascular coiling 265
- Endovascular techniques 271
- access 273
  - closure devices 274
  - general considerations 273
  - historical perspective 271
  - safety 272
  - contrast load 273
  - planning the study 273
  - radiation safety 272
- Engel Outcome Classification 354
- Enoxaparin 158, 255
- Enterobacteriaceae 413
- Entrapments 370
- carpal tunnel syndrome (CTS) 371
  - controversial entrapments 373
  - cubital tunnel syndrome (CuTS) 371
  - lateral femoral cutaneous nerve entrapment 373
  - Morton's neuroma 373
  - peroneal nerve entrapment 372
  - tarsal tunnel syndrome 373
- Ependymal tumors 304, 305
- Ependymomas 214, 305, 401, 401
- Ephaptic transmission 233, 238
- Epidural hematoma, in neuroradiology 88, 89
- Epidural hemorrhages (EDHs) 168, 168, 534
- Epidural spinal abscess 222
- Epilepsy 351, 400

- absence 444
- benign rolandic 443
- foramen ovale electrodes in 353
- in angiocentric glioma 301
- in traumatic brain injury 173
- juvenile myoclonic 443
- presurgical investigations 352
- invasive 353, 354
- noninvasive 352
- strip electrodes in 360
- Epilepsy surgery
  - anterior temporal lobectomy in 354, 357
  - corpus callosotomy in 360, 361
  - deep brain stimulation in 344
  - depth electrodes in 353, 354
  - Engel Outcome Classification in 354–355
  - extratemporal lobe 358, 358, 359–362
  - hemispherectomy in 358
  - multiple subpial transection in 358
  - presurgical investigations in 352
  - temporal lobe 354, 355, 355
  - vagus nerve stimulation in 358, 362
- Epilepsy syndromes 443, 443, 444
- Epileptogenic zone (EZ) 351
- Epstein-Barr virus (EBV) 292
- Erb's palsy 381
- Erythrocyte sedimentation rate (ESR) 441
- Escherichia coli 222
- Esmolol 446
- ESR, *see* Erythrocyte sedimentation rate (ESR)
- Essential hyperhidrosis 242
- Essential tremor (ET) 348, 436
  - diagnosis 348
  - pathophysiology 348
  - treatment 349
- ET, *see* Essential tremor (ET)
- Ethambutol 423
- Ethmocephaly 330
- Ethmoid bone 50
- Etomidate (Amidate) 445–446
- ETV, *see* Endoscopic third ventriculostomy (ETV)
- EVD, *see* External ventricular drain (EVD)
- Ewing's sarcoma 298
- Exposure, in traumatic brain injury assessment 164
- Extensor carpi radialis brevis 33
  - Extensor carpi radialis longus 33
  - Extensor digitorum 33
  - Extensor hallucis longus 33
  - External beam radiation therapy (EBRT) 391
  - External carotid artery (ECA) 72
  - External carotid–internal carotid (EC-IC) 265
  - External radiation therapy (XRT) 401
  - External ventricular drain (EVD) 101, 101, 108, 109–110, 112, 113, 114, 115, 130, 171, 534
    - complication management 115
    - drug/antibiotic delivery 102
    - hydrocephalus 101, 102
    - intracranial pressure, increased 101
    - maintenance 114
    - traumatic brain injury 101, 102
  - Extra-axial masses, in neuroradiology 94
  - Extramedullary tumors 214
  - Extraocular muscles 451
    - CN III (oculomotor) palsy 451
    - CN IV (trochlear) palsy 451
    - CN VI (abducens) palsy 451
    - Gradenigo's syndrome 452
    - internuclear ophthalmoplegia 451
    - orbital pseudotumor 451
    - Raeder's syndrome 452
    - Tolosa–Hunt syndrome 452
  - Extratemporal lobe epilepsy 358, 358, 359–362
  - Extremity drift 34
  - Eye opening 28
  - EZ, *see* Epileptogenic zone (EZ)
- F**
  - FABER test, *see* Flexion, ABduction, and External Rotation (FABER) test
  - Facet fracture-dislocation 197
  - Facet joint degeneration 208
    - diagnosis 208
    - pathology 208
    - treatment 209
  - Facet/articular process 64
  - Facets, jumped 198, 198
  - Facial colliculus 60
  - Facial droop 31
  - Facial nerve 55–56, 59
  - Facial nerve palsy 454
    - bell's palsy 455
    - management 455
    - etiology 454
    - herpes zoster oticus 455
    - surgical treatment 455
    - localization 454
  - Facial strength 31
  - FADIR test, *see* Flexion, ADduction, and Internal Rotation (FADIR) test
  - Falx cerebri 47, 89
  - Famciclovir 236
  - Far-lateral approach 282
  - Fasciculations 32
  - Fatal familial insomnia 434
  - Fatty filum 328
  - FBN-1 262
  - Fee for service 463
  - Fellowships 7, 10, 480
  - Femoral nerve 33
  - Fenestration, in arachnoid cyst 324
  - Feng, Ling 20
  - Fentanyl 446
  - Ferrier, David 16
  - Fetal MRI 326
  - Fibrin foam, in history of neurosurgery 22
  - Fibromuscular dysplasia (FMD) 263, 442, 442
    - diagnosis 442, 442
    - etiology and aneurysms 442
    - presentation 442
    - treatment 442
  - Fibrosarcoma 298
  - Fibularis peroneus brevis 33
  - Fibularis peroneus longus 33
  - Finger abduction 33
  - Finger extension 33
  - Finger flexion 33
  - Finger tapping 37
  - Finger-to-nose test 38
  - Fisher scale 258, 259, 259
  - FLAIR, *see* Fluid-attenuated inversion recovery (FLAIR)
  - Flexion, ABduction, and External Rotation (FABER) test 38, 39
  - Flexion, ADduction, and Internal Rotation (FADIR) test 38, 39
  - Flexor carpi radialis 33
  - Flexor carpi ulnaris 33
  - Flexor digitorum profundus 33
  - Flexor digitorum superficialis 33
  - Flexor hallucis longus 33
  - Flexor pollicis brevis 33
  - Flocculus 51
  - Flow diverters, *see* Pipeline embolization devices (PEDs)
    - in aneurysm 266

- Fluid and electrolytes 153  
 – hypernatremia 154  
 – hyponatremia 153  
 Fluid-attenuated inversion recovery (FLAIR) 437  
 FMD, *see* Fibromuscular dysplasia (FMD)  
 Focused ultrasound (FUS) 347, 349  
 Foix–Chavany–Marie syndrome 257  
 Folic acid 326  
 Foot eversion 33  
 Foramen lacerum 73  
 Foramen magnum 44  
 Foramen ovale 73  
 Foramen ovale electrodes 353  
 Foramen rotundum 46  
 Foramen spinosum 46  
 Foster–Kennedy syndrome 448  
 FOUR score 27  
 Fracture dislocations 201  
 Frazier, Charles 18  
 Frazier's point 139  
 Friedlander, Robert M 9  
 Fritsch, Gustav 16  
 Frontal approach 123  
 Frontal bone 44, 45  
 Frontal lobe 48, 91  
 – central sulcus 49  
 – inferior surface 50  
 – lateral sulcus (sylvian fissure) 49  
 – secondary sulci 49  
 Frontal operculum 51  
 Frontal pole 50–51  
 Fronto-occipital head circumference 320  
 Functional disorders 399  
 – epilepsy 400  
 – movement disorders 399  
 – ocular disorders 400  
 – psychiatric disorders 399  
 Functional hemispherectomy 358  
 Functional procedures 139  
 – deep brain stimulation (DBS) 139  
 Funduscopic examination 30  
 FUS, *see* Focused ultrasound (FUS)
- G**
- G4 Alliance 24  
 GA, *see* General anesthesia (GA)  
 Gabapentin 237, 349  
 Gag reflex 32  
 Gait 37  
 – shuffling 343
- Galbraith Award 482  
 Gamma knife radiosurgery 392, 392  
 Gamma Knife radiosurgery (GKRS) 391, 395, 397–398  
 – *See also* Stereotactic radiosurgery (SRS)  
 GAPSBlF, *see* Global Alliance for the Prevention of Spina Bifida-F (GAPSBlF)  
 Gas exchange 150  
 Gastrocnemius 33  
 Gate control theory 230  
 GBM, *see* Glioblastoma multiforme (GBM)  
 GBS, *see* Guillain-Barre syndrome (GBS)  
 GCA, *see* Giant cell arteritis (GCA)  
 GCS, *see* Glasgow Coma Scale (GCS)  
 GCTs, *see* Germ cell tumors (GCTs)  
 GDCs, *see* Guglielmi Detachable Coils (GDCs)  
 Gelfoam, in history of neurosurgery 22  
 General anesthesia (GA) 400  
 Geniculate neuralgia 235  
 Gentamycin 454  
 Genu 52  
 Germ cell tumors (GCTs) 308  
 Germinomas 309  
 Gerstmann–Sträussler–Scheinker disease 434  
 Gerstmann's syndrome 257  
 Giant cell arteritis (GCA) 441  
 – clinical 441  
 – epidemiology 441  
 – evaluation and biopsy 441  
 – treatment 441  
 Gigli, Leonardo 21  
 GKRS, *see* Gamma Knife radiosurgery (GKRS)  
 Glasgow Coma Scale (GCS) 28, 162  
 Glasscock's triangle 46  
 Glioblastoma multiforme (GBM) 94, 96, 299, 300  
 Glioma 401  
 – angiocentric 301  
 – chordoid, of third ventricle 303  
 – diffuse intrinsic pontine 302  
 – high-grade 396  
 – pediatric brainstem 302  
 – stereotactic radiosurgery in 396  
 Global Alliance for the Prevention of Spina Bifida-F (GAPSBlF) 24  
 Global neurosurgery 23  
 Globus pallidus 52, 54
- Globus pallidus internal segment (GPI) 139, 436  
 Glomus tumors 397  
 Glossopharyngeal neuralgia 234, 322  
 – diagnosis 235  
 – pathophysiology 234  
 – signs/symptoms 235  
 – treatment 235  
 Gluteus maximus 33  
 Gluteus medius 33  
 Gluteus minimus 33  
 GME, *see* Graduate medical education (GME)  
 Godlee, Rickman 17  
 GON, *see* Greater occipital nerve (GON)  
 Gowers, William 16–17  
 GPI, *see* Globus pallidus internal segment (GPI)  
 Gradenigo's syndrome 452  
 Graduate medical education (GME) 460  
 Grady, M. Sean 13  
 Grants and awards 480  
 – general 480  
 – subspecialties 480  
 Great cerebral vein 78  
 Greater occipital nerve (GON) 235, 236  
 Growing skull fracture (GSF) 335, 336  
 – diagnosis 335  
 – treatment 335  
 GSF, *see* Growing skull fracture (GSF)  
 GSWs, *see* Gunshot wounds (GSWs)  
 Guglielmi Detachable Coils (GDCs) 265  
 Guglielmi, Guido 265  
 Guillain-Barre syndrome (GBS) 438  
 – clinical 438  
 – diagnostic features 438  
 – treatment 438  
 Guleke, Nikolai 22  
 Gunshot wounds (GSWs), to head 177
- H**
- H-index 3, 482  
 Habenular trigone 56  
 Haemophilus influenzae 414  
 Halo vest 188  
 Hangman's fractures 196, 196  
 Harrington rods 18, 19

- hCG, *see* Human chorionic gonadotropin (hCG)
- Head injury, *see* Traumatic brain injury (TBI)
- Head rotation 38
- Head shape, evaluation of 321, 321
- Head size 320
- Headache 434
  - cluster headache 435
  - basics 435
  - treatment 435
  - headaches requiring investigation 434
  - migraine 434
  - classic migraine 434
  - common migraine 434
  - post-puncture headache 435
  - basics 435
  - features 435
  - neuroimaging 435
  - pathophysiology 435
  - treatment 435
- Health care proxy 465
- Hearing function 32
- Hearing loss 453
- Heary, Robert F. 12
- Hemangioblastoma 298
- Hemangioblastomas 398
- Hemangiopericytomas (HPC) 297
- Hematology and coagulation 157
  - disseminated intravascular coagulation (DIC) 157
  - venous thromboembolism 158
- Hemimegalencephaly 358
- Hemispherectomy 358
- Hemolytic uremic syndrome 236
- Hemorrhagic stroke 254
  - *See also* Stroke
- Heparin 252
- Herniated disc 209
- Herpes zoster 236
- Herpes zoster oticus 455
  - surgical treatment 455
- Heterodegenerative dystonias 350
- High-grade astrocytoma with piloid features 303
- Hip abduction 33
- Hip adduction 33
- Hip extension 33
- Hip flexion 33
- Hippus 452
- Hirsch, Oscar 18
- History, of neurological surgery 15
  - ancient neurosurgery in 16
  - anesthesia in 16
  - cerebral localization in 16
  - classical neurosurgery in 16
  - Cushing era in 17
  - global neurosurgery 23
  - lineage of instrumentation in 21
  - Paleolithic neurosurgery in 15
  - pre-Cushing era in 15, 15
  - pre-Cushing generation in 16
  - spinal neurosurgery 18
  - women in neurosurgery 19
- Hitzig, Eduard 16
- HIV, *see* Human immunodeficiency virus (HIV)
- Hoffman's sign 36, 36
- Holmes-Adie syndrome 450
- Holmgren, Gunnar 21
- Holoprosencephaly 330, 330
- Home neurosurgery program, match without 7
- Horner's syndrome 450
- Horsley, Victor 17, 21
- Hounsfield, Godfrey 23
- Human chorionic gonadotropin (hCG) 309
- Human immunodeficiency virus (HIV) 413
- Huntington's disease 350, 468
- Hunt-Hess grading scale 258, 259
- Hutchinson's sign 457
- Hydranencephaly 330
- Hydrocephalus 101, 102, 103–104, 309, 334
  - diagnosis 334
  - etiology 334
  - in intraventricular hemorrhage 170
  - in meningitis 93
  - in parenchymal hemorrhage 90
  - in subarachnoid hemorrhage 91, 260
  - in ventriculoperitoneal shunt 138
  - treatment 334
- Hydrocephalus/shunt malfunction 538
  - disposition 539
  - in the room 539
  - prior to seeing the patient 538
- Hyperalgesia 236
- Hyperdynamic therapy 261
- Hyperhidrosis, essential 242
- Hypernatremia 154
- Hyperreflexia 36
- Hyperthermia, malignant 448, 457
- Hypertonia 33
- Hypoglossal nerve 30, 55–56, 58, 59
- Hypoglossal trigone 58
- Hyponatremia 153
- Hyporeflexia 36
- Hypothalamus 65
- Hypovolemic shock 152

- Informed consent 462
- Infratrochlear triangle 45
- Infundibular recess 53
- Infundibulum 55–56
- Ingraham, Franc 22
- Inion 44
- Injuries 376, 377, 378, 379
- brachial plexus surgery 379, 380–382
  - outcomes 383
- INO, *see* Internuclear ophthalmoplegia (INO)
- Instrumentation 21
- Insurance payments 463
- Intensive care unit, neurological examination in 40
- brainstem examination 40
  - level of arousal 40
  - sedation 40
- Intercostal neuralgia 236
- Interdisciplinary care 434, 528, 543
- altered mental status 543
  - neuroanesthesia 444
  - neurology 434
  - neuroophthalmology 448
  - neurology 453
  - stroke-like symptoms 543
- Interest group 3
- Interhemispheric fissure (IHF) 47, 90, 91
- Internal capsule 52
- Internal carotid artery (ICA) 73, 74, 257
- Internal cerebral vein 78
- Internal elastic lamina (IEL) 262
- International medical graduates (IMGs) 3
- research for 4
- International Society for Pediatric Neurosurgery 478
- International Student Surgical Network (InciSioN) 24
- International Study of Unruptured Intracranial Aneurysms (ISUIA) 264, 266
- Internuclear ophthalmoplegia (INO) 31, 451
- Interspinous ligament 71
- Interthalamic adhesion 53
- Interventricular foramen 53
- Intervertebral foramen 64, 66
- Interview 1, 4, 7
- Intra-axial masses, in neuroradiology 94
- Intracerebral hemorrhage (ICH) score 250, 250, 534
- Intracranial ablative procedures 243
- cingulotomy 244
  - stereotactic mesencephalotomy 243
- Intracranial aneurysm (IA) 266
- in neuroradiology 92
- Intracranial atherosclerotic disease 256
- anticoagulation therapy 256
  - dual antiplatelet therapy 256
  - statin therapy 257
  - stenting 257
- Intracranial hemorrhage (ICH) 115
- Intracranial hypertension, management of 156
- Intracranial infection, in neuroradiology 93
- Intracranial pressure (ICP) 129, 155, 171, 414, 444, 447
- and cerebral perfusion pressure management 172
  - increased 101
  - indications for 171
  - stroke and 250
  - techniques 171
- Intracranial pressure monitor (ICPM) 101, 103, 108, 112, 115, 155
- elevated ICP 103
  - hydrocephalus 103
  - traumatic brain injury 103
- Intradural tumors 214
- extramedullary tumors 214
  - intramedullary tumors 214
- Intramedullary tumors 214
- Intranuclear ophthalmoplegia 457
- Intraparenchymal hemorrhages (IPHs) 170, 254
- acute treatment 254, 255
- Intraparietal sulcus 50
- Intraspinal narcotics 242
- Intrathecal drug delivery 104
- Intrathecal steroids 237
- Intraventricular hemorrhages (IVH) 170
- Intubation, paralytics for 446
- Involuntary motor movements 35, 35
- IPG, *see* Implantable pulse generator (IPG)
- IPHs, *see* Intraparenchymal hemorrhages (IPHs)
- IPL, *see* Inferior parietal lobule (IPL)
- ISAT trial 266
- Ischemic stroke 251
- *See also* Stroke
  - after transient ischemic attack (TIA) 249
  - in neuroradiology 92, 93–97
- Ischemic stroke therapeutic management 252
- acute treatment 252
  - secondary prevention 253
  - subacute treatment 253
- Isoflurane 445
- Isoniazid 423
- ISS, *see* Inferior sagittal sinus (ISS)
- ISUIA, *see* International Study of Unruptured Intracranial Aneurysms (ISUIA)
- ITG, *see* Inferior temporal gyrus (ITG)
- IVH, *see* Intraventricular hemorrhages (IVH)

## J

- J1 visa 5
- Jackson, Hughlings 16
- Jacobson, Julius 23
- Jakoby, Ruth Kerr 19
- JC virus 426
- Jefferson fracture 194, 194
- JME, *see* Juvenile myoclonic epilepsy (JME)
- Job satisfaction 466
- Journalistic and Academic Neurosurgical Excellence (J.A.N.E.) Award 481
- Journals 482
- Jugular foramen 78
- Jumped facets 198, 198
- Juvenile idiopathic scoliosis 220
- Juvenile myoclonic epilepsy (JME) 443
- Juvenile pilocytic astrocytoma 303

## K

- Kanaka, T. S. 20
- Kaplan-Meier curves 403
- Kaposi's sarcoma 298
- Karanja, Susan 21
- Karekezi, Claire 21
- Kato, Yoko 20
- Kawase's triangle 46
- Kcentra 255
- Keen, William W. 17

Keen's point 139  
 Kennedy's disease 438  
 Ketamine 445, 447  
 Khataybeh, Redab Al 21  
 Kinetic tremor 348, 352  
 Klinefelter, Dorothy 19  
 Knee extension 33  
 Kocher, Emil T. 18  
 Kocher's point 47, 112, 138–139  
 Krause, Fedor 21  
 Kuru, Theodore 434  
 Kurze, Theodore 23  
 Kyphosis 219

**L**

L-Dopa 344  
 Lalam, Faiza 21  
 Lamina affixa 56  
 Lamina terminalis 53  
 Laminae 64  
 Laminectomy 135, 136, 210, 324  
 Laminoplasty 210–211, 223  
 Laminotomy 135, 136  
 Lang, Fritz 18  
 Language 27  
 Laser interstitial thermal therapy (LITT) 357  
 Lateral femoral cutaneous nerve entrapment 373  
 Lateral geniculate body 56  
 Lateral lumbar interbody fusion (LLIF) 136–137  
 Lateral sulcus 49  
 LDs, see Lumbar drains (LDs)  
 Lead-pipe rigidity 33  
 Leadership 484  
 Leadership positions 484  
 Leiomyomas 297  
 Leksell, Lars 22  
 Lennox–Gastaut syndrome 443  
 Lentiform nucleus 52  
 Leptomenigeal cyst 335, 336  
 Lesch-Nyhan syndrome 350  
 Lesser occipital nerve (LON) 235, 236  
 Letters of recommendation 4, 6, 7  
 Level localization 132  
 Level of consciousness 27  
 Levodopa 344  
 Lewy bodies 344, 434  
 Lhermitte's sign 39  
 Licensing 460  
 Lidocaine 446  
 Lidocaine skin patch 237

Life insurance 465  
 Ligamentous degeneration 209  
 – diagnosis 209, 210  
 – pathology 209  
 – treatment 210  
 Ligaments of occipitoatlantoaxial junction 68, 69  
 – alar ligaments 68  
 – apical ligament 68  
 – atlantooccipital membrane 70  
 – tectorial membrane 69  
 – transverse and cruciate ligaments 68  
 Ligamentum flavum 71  
 Light touch sense 36  
 Light-near dissociation 450  
 LINACs, see Linear accelerators (LINACs)  
 Linear accelerators (LINACs) 392  
 Lipomas 297  
 Lipomyelomeningocele 329, 329  
 Lister, Joseph 16  
 Listeria monocytogenes 415, 424  
 Listeriosis 424  
 LITT, see Laser interstitial thermal therapy (LITT)  
 Living will 465  
 – and testament 465  
 LLIF, see Lateral lumbar interbody fusion (LLIF)  
 LMN, see Lower motor neuron (LMN)  
 Localization, sensory 36  
 Locked-in syndrome 258  
 LON, see Lesser occipital nerve (LON)  
 Long thoracic nerve 375  
 Longitudinal fissure of cerebrum 47  
 Lorazepam 446  
 Lordosis 220  
 Low molecular weight heparin 255  
 Lower motor neuron (LMN) 36  
 LP, see Lumbar puncture (LP)  
 LSO, see Lumbosacral orthoses (LSO)  
 Lumbar back pain (LBP) 212  
 – treatment 213, 213  
 Lumbar drains (LDs) 101, 130  
 Lumbar interbody fusion 135, 137  
 Lumbar puncture (LP) 413  
 Lumbar puncture and drain 104, 111, 113, 114, 115  
 – aneurysmal subarachnoid hemorrhage 105  
 – cerebrospinal fluid (CSF) leak 104  
 – hydrocephalus 104  
 – intrathecal drug delivery 104

– spinal cord perfusion pressure, improvement of 105  
 Lumbar vertebrae 68  
 Lumbosacral orthoses (LSO) 188  
 Lunsford, L. Dade 10, 23  
 Luque rod system 18  
 Luque, Eduardo 18  
 Lutz, Wendell 23  
 Lyme 414  
 Lymphoma, primary central nervous system 430  
 Lymphomas and hematopoietic tumors 292, 293  
 – diagnosis 292  
 – outcome 293  
 – treatment 293

**M**

Macewen, William 17–18  
 MacRae, Elizabeth 19  
 Macrostimulation 347  
 Maffucci's syndrome 296  
 Magnetic resonance (MR) 206  
 Magnetic resonance imaging (MRI), see Neuroradiology  
 – fetal, in neural tube defects 326  
 – in angiocentric glioma 301  
 – in cervical disc herniation 206  
 – in Chiari malformation 324  
 – in craniopharyngioma 311  
 – in ependymoma 305  
 – in glioblastoma 299  
 – in history of neurosurgery 23  
 – in medulloblastoma 306  
 – in neuroradiology 86, 86, 87  
 – in posterior reversible encephalopathy syndrome 440  
 – in Pott's disease 223  
 – in sarcoidosis 439  
 – in stroke 251  
 – in subependymoma 304  
 – in traumatic brain injury 166  
 – sequences 88  
 Magnetoencephalography (MEG) 352  
 Malignant hyperthermia 448  
 – presentation 448  
 – prevention 448  
 – treatment 448  
 Malignant mesenchymal tumors 298  
 Malignant peripheral nerve sheath tumors (MPNSTs) 384  
 – surgical approach for 388  
 Malignant tumors 384

- Malis, Leonard 23
- Management of Myelomeningocele Study (MOMS) 328
- MAP, *see* Mean arterial pressure (MAP)
- Marcus Gunn pupil 450
- Marfan's syndrome 262
- Marshall Grade 165
- Martuza, Bob 468
- Mastication, muscles of 31
- Match 1, 7
- Maternal serum alpha-fetoprotein (MSAFP) test 326
- Maternal serum alpha-fetoprotein test 326
- Maxillary artery 73
- Mayfield three-point fixation 122–123
- MCA, *see* Middle cerebral artery (MCA)
- Mean arterial pressure (MAP) 134, 155, 444
- Mechanical thrombectomy, in stroke 253
- Meckel's cave 234
- Medial frontal gyrus 53
- Medial geniculate body 56–57
- Medial longitudinal fasciculus (MLF) 31, 451
- Medial surface 52, 53
- Medial thalamus 230
- Median nerve 33, 36
- Medicaid 463
- Medical economics 462
- advocacy, professionalism, and philanthropy 464
  - components 463
  - insurance payments 463
  - mechanisms of payments 463
  - Medicaid 463
  - Medicare 462
- Medical therapy 266
- Medicare 460, 462
- Medulla 55, 58, 59–60, 97
- Medulla oblongata 51, 56
- Medullary triangle 58
- Medulloblastoma 306, 307, 401
- MEG, *see* Magnetoencephalography (MEG)
- Melanocytic lesions 298
- Melanocytomas 298
- Melanomas 298
- Memoirs 476
- Memory, in mental status examination 27
- Ménière's disease 453, 453
- clinical 453
  - diagnostic studies 454
  - differential 454
  - epidemiology 454
  - treatment 454
  - nonsurgical 454
  - surgical 454
- Meningeal melanomatosis 298
- Meningeal tumors 294
- benign mesenchymal tumors 296
  - malignant mesenchymal tumors 298
  - meningiomas 294, 296, 297
- Meningioma 95, 396
- Meningiomas 294, 296, 297, 401
- Meningitis 93, 414, 416
- *See also* Meningococcal disease
- Meningocele 327
- Meningococcal disease 424
- Meningococci 413
- Meningohypophyseal trunk 73
- Mental status examination (MSE) 27, 27, 28
- Mentors 3, 6–7, 464, 486
- Meperidine (Demerol) 446
- MEPs, *see* Motor evoked potentials (MEPs)
- Mesencephalon 56
- Mesencephalothalamic syndrome 258
- Mesenchymal tumors 294, 295
- chondrosarcomas 294
  - chordomas 294
  - hemangioblastoma 298
  - melanocytic lesions 298
  - meningeal tumors 294
- Mesial temporal lobe epilepsy (MTLE) 354
- Message to Garcia 6
- Metastases 395
- Meyer's loop 353, 356
- MFG, *see* Middle frontal gyrus (MFG)
- Microvascular decompression (MVD), in trigeminal neuralgia 233
- Midazolam 446
- Midbrain 55, 57, 85
- Middle cerebral artery (MCA) 49, 76, 76, 90, 93, 130, 257, 356
- Middle frontal gyrus (MFG) 49
- Middle frontal sulcus 51
- Middle meningeal artery 73
- Middle temporal gyrus (MTG) 51, 355
- Migraine 434
- classic migraine 434
  - common migraine 434
- Mixed germ cell tumor 309
- MLF, *see* Medial longitudinal fasciculus (MLF)
- Modified Fisher scale 259, 260
- Modified Rankin Scale (mRS) 249
- MOGAD, *see* Myelin oligodendrocyte glycoprotein antibody disease (MOGAD)
- Molecular biology 306
- MOMS, *see* Management of Myelomeningocele Study (MOMS)
- Moniz, A. Egas 22, 23
- Monro-Kellie hypothesis 155
- Moore, Anne 20
- Moro reflex 338
- Morphine 244, 446
- Morton, William T. G. 16
- Morton's neuroma 373
- Motor evaluation, in infants 319, 323
- Motor evoked potentials (MEPs) 132
- Motor examination 32
- bulk 32
  - involuntary 35, 35
  - strength 33, 33, 34
  - tone 32
- Motor neuron diseases 437
- amyotrophic lateral sclerosis 437
  - clinical and diagnosis 437
  - epidemiology 437
  - pathology 437
  - treatment and prognosis 437
- spinal bulbar muscular atrophy 438
  - spinal muscular atrophy (SMA) 438
- Motor response 28
- Movement disorders 343, 399
- *See also* Dystonia; Essential tremor (ET); Parkinson's disease (PD)
  - dystonia 350
  - epilepsy 351
  - essential tremor (ET) 348
  - Parkinson's disease (PD) 343
- Movement Disorders and Epilepsy 520
- Moyamoya disease 270
- definition 270
  - epidemiology 270
  - initial management 270
  - treatment 270
- Moyamoya molecular pathways 270

- MPNSTs, see Malignant peripheral nerve sheath tumors (MPNSTs)
- MR, see Magnetic resonance (MR)
- MRI, see Magnetic resonance imaging (MRI)
- mRS, see Modified Rankin Scale (mRS)
- MS, see Multiple sclerosis (MS)
- MSA, see Multiple system atrophy (MSA)
- MSAFP test, see Maternal serum alpha-fetoprotein (MSAFP) test
- MSE, see Mental status examination (MSE)
- MTG, see Middle temporal gyrus (MTG)
- MTLE, see Mesial temporal lobe epilepsy (MTLE)
- Mullan's triangle 46
- Muller's muscle 450
- Multiple sclerosis (MS) 233, 426, 436
  - basics 436
  - clinical 436
  - diagnostic criteria 436
  - epidemiology 436
- Multiple subpial transection 358
- Multiple system atrophy (MSA) 436
- Muscles of mastication 31
- Musculocutaneous nerve 33
- MVD, see Microvascular decompression (MVD)
- Mycobacterium tuberculosis 414
- Mycotic aneurysms 264
- Myelin oligodendrocyte glycoprotein antibody disease (MOGAD) 436
- Myelitis 438
  - clinical presentation 439
  - etiology 438
  - treatment 439
  - workup 439
- Myelography, in history of neurosurgery 22
- Myelomeningocele/meningocele 327, 328
- Myoclonus 35
- Myxopapillary ependymoma 305
- Myxopapillary ependymomas 214
- Nasolabial fold flattening 31
- National conferences 477
  - general 477
  - subspecialties 478
- National Institutes of Health (NIH) 4-5
- National Resident Matching Program (NRMP) 1
- NCC, see Neurocysticercosis (NCC)
- NCSs, see Nerve conduction studies (NCSs)
- Neisseria gonorrhoeae 430
- Neisseria meningitidis 414
- Neolithic era 15
- Neolithic skulls 15
- Nerve biopsy 386, 386
- Nerve conduction studies (NCSs) 369, 447
- Nerve grafting 377
- Nerve sheath tumors 214
- Nerve to iliopsoas 33
- Nerve transfer 378
- Neural tube defects (NTDs) 326
  - closed neural tube defects 328
  - fetal MRI 326
  - open neural tube defects 327
  - prenatal diagnostics 326
  - prevention 326
- Neuroanatomy 44, 488
  - brainstem 55
  - cerebrum 47
  - cisterns 61, 62
  - skull, bones of 44, 44, 45
  - spinal cord 61
  - vascular anatomy 71
  - vertebral column 63
- Neuroanesthesia 444
  - clinical neurophysiology 447
  - drugs inhalational agents 445
  - malignant hyperthermia 448
  - modifiable parameters 444
- Neurocritical care 150, 499, 533
  - cerebral edema 534
  - cerebral metabolism and perfusion 154
  - critical illness weakness 158
  - fluid and electrolytes 153
  - hematology and coagulation 157
  - respiratory physiology 150
  - shock 152
  - status epilepticus 533
- Neurocysticercosis (NCC) 422
- Neuroepithelial brain tumors 299
  - adult diffuse gliomas 299, 300
  - circumscribed astrocytic gliomas 302
  - ependymal tumors 304, 305
  - neuronal and glioneuronal tumors 304
  - pediatric-type high-grade diffuse gliomas 301, 302
  - pediatric-type low-grade diffuse gliomas 301
- Neurofibromas 214
- Neurological examination 27, 487
  - cranial nerves (CNs) 29, 30
  - gait and coordination 37
    - coordination 37
    - gait 37
  - in intensive care unit 40
    - arousal, level of 40
    - brainstem examination 40
    - sedation 40
  - in traumatic brain injury 164
  - mental status 27, 27, 28
    - motor examination 32
    - bulk 32
    - involuntary 35, 35
    - strength 33, 33, 34
    - tone 32
  - reflex examination 35
    - Babinski's sign 35
    - Hoffman's sign 36, 36
    - reflex grading 35, 35
    - sensory examination 36
    - light touch 36
    - pain and temperature 36
    - proprioception 36
    - sensory localization 36, 37
    - vibration 36
    - special tests 38
      - bulbocavernosus 39, 40
      - FABER/FADIR tests 38, 39
      - Lhermitte's sign 39
      - Phalen's maneuver 39
      - Spurling test 38, 39
      - straight leg raise 38, 38
      - Tinel's sign 39
- Neurological infectious diseases 413, 542
  - aspergillosis 424
  - brain abscess 415, 417, 418
  - brain abscesses 418, 542
  - cryptococcosis 414, 421
  - cysticercosis 422, 422
  - listeriosis 424
  - meningitis 414, 416
  - meningococcal disease 424

**N**

- Narcotics 445
  - intraspinal 242
- Nasion 44
- Nasociliary nerve 457

- microbiological diagnosis 413, 413, 414
- neurosyphilis 414, 425
- nocardiosis 423
- shunt infections 414, 420, 421
- skull and vertebral osteomyelitis 419, 419
- spinal epidural abscess (SEA) 417, 419, 422
- toxoplasmosis 421, 422
- tuberculosis 414, 423
- viral encephalitis 414, 422, 425
- Neurology 434
  - altered mental status 543
  - CADASIL 442
  - chronic inflammatory demyelinating polyneuropathy 438
  - dementia 434
  - epilepsy syndromes 443, 443, 444
  - essential tremor 436
  - fibromuscular dysplasia 442
  - Guillain-Barre syndrome (GBS) 438
  - headache 434
  - motor neuron diseases 437
  - multiple sclerosis (MS) 436
  - myelitis 438
  - neuronal antibody disorders 443
  - neurosarcoidosis 439
  - parkinsonism 435
  - Parsonage Turner syndrome 444
  - posterior reversible encephalopathy syndrome 440, 440
  - stroke-like symptoms 543
  - vasculitis 440
- Neurolysis 378
- Neuromas 231
- Neuromonitoring 171
  - intracranial pressure (ICP) 171
  - intracranial pressure (ICP) monitoring
  - indications for 171
  - techniques 171
- Neuromyelitis optica spectrum disorders (NMOSDs) 436
- Neuronal and glioneuronal tumors 304
- Neuronal antibody disorders 443
- Neuroophthalmology 448
  - corneomandibular reflex 452
  - Duane's syndrome 452
  - extraocular muscles: introduction 451
  - hippus 452
  - nystagmus 448
  - ocular bobbing 452
  - opsoclonus 453
  - oscillopsia 453
  - papilledema 448
  - pupillary diameter 450
  - visual fields 448
- Neuropathic pain 231, 231, 383
  - medical treatment of 231
- Neuroradiology 84, 492, 533
  - See also Computed tomography (CT); Magnetic resonance imaging (MRI); X-rays
  - aneurysms in 92
  - arterial dissection in 92
  - brain tumor in 94
  - cerebral edema in 91
  - computed tomography in 84, 85
  - epidural hematoma in 88, 89
  - intracranial infection in 93
  - ischemic stroke in 92, 93-97
  - magnetic resonance imaging (MRI) 86, 86, 87
  - parenchymal hemorrhage in 90
  - subarachnoid hemorrhage in 90, 93
  - subdural hematoma in 89, 91
- Neurosarcoidosis 439
  - biopsy 440
  - clinical findings 439
  - imaging 439
  - laboratory 439
  - pathology 439
  - treatment 440
- Neurosurgery, functional 520
- Neurosurgical oncology 292, 514, 538
  - See also Tumor(s)
  - cysts and tumor-like lesions 311
  - embryonal/PNETs 306
  - lymphomas and hematopoietic tumors 292, 293
  - mesenchymal tumors 294, 295
  - neuroepithelial brain tumors 299
  - pineal region tumors 305
  - sellar tumors 310
  - tumors of cranial and paraspinous nerves 308
- Neurosyphilis 414, 425
- Neurotology 453
  - conductive and sensorineural hearing loss 455
  - facial nerve palsy 454
  - Ménière's disease 453
  - vertigo 453
- Neutral vertebra 218
- New Orleans criteria 165
- Newborn and infant 319, 319
- NGGCTs, see Nongerminomatous germ cell tumors (NGGCTs)
- NIH, see National Institutes of Health (NIH)
- Nimodipine 261, 349
- Nitrous oxide 445
- NMOSDs, see Neuromyelitis optica spectrum disorders (NMOSDs)
- Nocardia 423
- Nocardiosis 423
- Nociception
  - defined 228
  - peripheral nerves and 228
- Nociceptive pain 230
- Non-pupil-sparing oculomotor palsy 451
- Noncommunicating hydrocephalus 101
- Nongerminomatous germ cell tumors (NGGCTs) 309
  - choriocarcinoma 309
  - embryonal carcinoma 309
  - mixed germ cell tumor 309
  - teratoma 309
  - yolk sac tumor 309
- Nonprojectile penetrating injuries 178
- Nonsynthetic agents 446
- Nonvestibular schwannomas 398
- Noonan's syndrome 297
- Nortriptyline 237
- NOTCH3 gene 442
- NREF Medical Student Summer Research Fellowship 480
- NRMP, see National Resident Matching Program (NRMP)
- NTDs, see Neural tube defects (NTDs)
- Nylén, Carl 21
- Nystagmus 31-32, 448

## O

- Obex 56
- Oblique lateral interbody fusion (OLIF) 136
- Obsessive-compulsive disorder (OCD) 399
- Obstructive shock 153
- Occipital approach 123, 127
- Occipital bone 44, 45

- Occipital condyle fractures 192, 193, 193
  - Occipital lobe 52, 95
  - Occipital neuralgias, greater and lesser 235, 236
  - Occipital pole 50–51
  - Occipitoatlantoaxial junction 68
  - Occipitotemporal gyrus 53, 355
  - OCD, see Obsessive-compulsive disorder (OCD)
  - Ocular bobbing 452
  - Ocular disorders, stereotactic radiosurgery in 400
  - Oculomotor nerve 45, 53, 55, 55, 57
  - Oculomotor palsy 451
  - Odontoid (dens) fractures 195, 195
  - Olfactory bulb 51, 53, 55
  - Olfactory sulcus 50
  - Olfactory tract 48, 51, 55
  - Olfactory trigone 55
  - OLIF, see Oblique lateral interbody fusion (OLIF)
  - Olive 51, 55–56
  - Ollier's disease 296
  - On/off fluctuations 344
  - Oncology, see Tumor(s)
    - neurosurgical 514
  - Ondine's curse 242
  - Open neural tube defects 327
    - anencephaly 327
    - encephalocele 327
    - myelomeningocele/meningocele 327, 328
  - Open vascular techniques 274
    - anatomic considerations and planning 275
    - anterior versus posterior circulation 275
    - bypass generations 283, 283
    - clip constructs 281, 281
    - clip materials 281
    - clip types 275
    - combined approaches 281
    - endoscopic endonasal approach 283
    - far-lateral approach 282
    - historical perspective 274
    - orbitozygomatic approach 282
    - pterional approach 282
    - subarachnoid cisterns 275, 276
    - subtemporal approach 283
  - Operating room (OR) 122, 497
    - cerebral relaxation 131
    - cranial approaches 123
    - cranial positioning 122
      - etiquette 122
      - functional 139
      - pediatric 138
      - positioning-related complications 137
      - spinal approaches 132
      - spinal positioning 131
  - Opioids 237
  - Opisthion 44
  - OPLL, see Ossification of the posterior longitudinal ligament (OPLL)
  - Opponens pollicis 33
  - Opsoclonus 453
  - Optic chiasm 53, 55, 449
  - Optic nerve 48, 403, 448
  - Optic radiation 449
  - Optic tract 55–56
  - OR, see Operating room (OR)
  - Oral board review 486
  - Orbital gyri 50, 51
  - Orbital pseudotumor 451
  - Orbitozygomatic approach 125, 126, 282
  - Orientation 27
  - Oscillopsia 453
  - Osler–Weber–Rendu syndrome 263
  - Ossification of the posterior longitudinal ligament (OPLL) 132, 209
  - Osteoarthritis
    - cervical 205
    - in facet joint degeneration 208
  - Osteochondromas 297
  - Osteomas 297
  - Osteomyelitis
    - of skull 419
    - vertebral body 222
  - Osteophytosis 207
    - diagnosis 208
    - treatment 208
  - Oxcarbazepine 234, 237
- P**
- Paget's disease 294
  - Pain 228, 230, 230, 509, 537
    - cancer pain 244
    - commissural myelotomy 243
    - conferences 477
    - craniofacial pain syndromes 232, 232
    - direct drug administration into the CNS 242
    - electrical stimulation 240
    - gate control theory 230
      - intracranial ablative procedures 243
      - neuropathic 231, 231
      - nociceptive 230
      - procedures for 240
      - cancer pain 244
      - commissural myelotomy 243
      - direct drug administration into the CNS 242
      - electrical stimulation 240
      - intracranial ablative procedures 243
      - spinal ablative procedures 242, 243
      - spinal ablative procedures 242, 243
      - stereotactic radiosurgery for 399
      - trigeminal neuralgia 537
  - Pain pathway anatomy 228
    - peripheral nerves 228
    - spinal cord 228, 228, 229
    - thalamic and cortical 230
  - Pain sense 36
  - Painful diabetic neuropathy (PDN) 231
  - Palatal movement 32
  - Paleolithic neurosurgery 15
  - Pallidotomy 347
  - PAN, see Polyarteritis nodosa (PAN)
  - Pan-plexus injury 382
  - Papillary craniopharyngiomas 311
  - Papilledema 448
  - Paracentral lobule 52, 54
  - Parahippocampal gyrus (PHG) 51, 356
  - Paralytics, for intubation 446
  - Parenchymal hemorrhage, in neuroradiology 90
  - Parietal bone 44
  - Parietal lobe 50
    - intraparietal sulcus 50
    - postcentral sulcus 50
  - Parietoccipital sulcus 54
  - Parinaud's syndrome 258
  - Parkinsonism 435
    - classic Parkinson's disease 435
    - Parkinson's disease plus 436
    - surgical treatment 436
  - Parkinson's disease (PD) 343
    - basal ganglia in 343
    - deep brain stimulation in 343
    - diagnosis 343, 343
    - medical therapy for 344
    - pallidotomy in 347
    - pathophysiology 344, 345

- treatment 344, 346, 347, 347
- Parkinson's triangle 45
- Parsonage Turner syndrome 444
- Pass/fail (P/F) grading system 1, 3
- Patient care 461
  - communication 461
  - informed consent 462
  - patient safety 461
- Patient safety 461
- Pay for performance 463
- PCA, see Posterior cerebral artery (PCA)
- PCC, see Prothrombin complex concentrate (PCC)
- PCDF, see Posterior cervical decompression and fusion (PCDF)
- PCL, see Primary central nervous system lymphoma (PCL)
- Pcomm, see Posterior communicating artery (Pcomm)
- PD, see Parkinson's disease (PD)
- PDN, see Painful diabetic neuropathy (PDN)
- PE, see Pulmonary embolism (PE)
- Pediatric head trauma 539
  - disposition 540
  - in the room 540
  - prior to seeing the patient 539
- Pediatric indications 400
- Pediatric neurosurgeon 138
  - ventriculoperitoneal shunt 138, 139
- Pediatric neurosurgery 319, 516, 538
  - developmental anomalies 323
  - examination 319
  - hydrocephalus/shunt malfunction 538
  - pediatric head trauma 539
  - pediatric trauma 335
  - pediatric tumors 335
- Pediatric patients
  - alertness evaluation in 322
  - anencephaly in 327
  - ceftriaxone in 415
  - Chiari malformations in 324
  - cranial nerve evaluation in 322, 322
  - craniopharyngiomas in 331
  - Dandy-Walker malformation in 331
  - examination of 319
  - fatty filum in 328
  - growing skull fracture in 335, 336
  - head shape evaluation in 321, 321
  - head size in 320
  - holoprosencephaly in 330, 330
  - hydrocephalus in 334
  - lipomyelomeningocele in 329, 329
  - meningocele in 327, 328
  - motor evaluation in 319, 323
  - neural tube defects in 327
  - Rathke's cleft cyst in 331
  - sensory evaluation in 323
  - spina bifida occulta in 329
  - tethered cord syndrome in 328
  - trauma in 335
- Pediatric skull fractures 176
- Pediatric trauma 335
  - growing skull fracture 335, 336
  - spinal trauma 336
- Pediatric tumors 335, 401
  - craniopharyngioma 402
  - ependymoma 401
  - glioma 401
  - medulloblastoma 401
  - meningiomas 401
  - pineal tumors 402
  - pituitary adenoma 401
  - vestibular schwannomas 401
- Pediatric-type high-grade diffuse gliomas 301, 302
- Pediatric-type low-grade diffuse gliomas 301
- Pedicle screw plate fixation system 19
- Pedicles 64
- PEDs, see Pipeline embolization devices (PEDs)
- PEEP, see Positive end-expiratory pressure (PEEP)
- Pelvic incidence (PI) 219
- Pelvic tilt (PT) 219
- Penetrating trauma 177
  - gunshot wounds (GSWs) 177
  - nonprojectile penetrating injuries 178
  - shotgun wounds 178
- Penumbra 251
- Perceptual disturbance 27
- Percutaneous trigeminal rhizotomy 234
- Perforating artery 267
- Perioperative peripheral nerve injuries (PPNIs) 137
- Peripheral nerve disorders, contemporary approach to patients with 369, 370
- Peripheral nerve injury, positioning and 137
- Peripheral nerve stimulation (PNS) 240
- Peripheral nerve surgery 369, 522
  - entrapments 370
  - carpal tunnel syndrome (CTS) 371
  - controversial entrapments 373
  - cubital tunnel syndrome (CuTS) 371
  - lateral femoral cutaneous nerve entrapment 373
  - Morton's neuroma 373
  - peroneal nerve entrapment 372
  - tarsal tunnel syndrome 373
  - inflammation 374
  - injuries 376, 377, 378, 379
  - brachial plexus surgery 379, 380-382
  - outcomes 383
  - neuropathic pain 383
  - perspectives on 540
  - tumors 383
  - benign extraneural lesions, surgical approach for 388
  - benign nerve sheath tumors, surgical approach for 387, 387
  - benign tumors 384
  - imaging 386
  - malignant peripheral nerve sheath tumors (MPNSTs), surgical approach for 388
  - malignant tumors 384
  - nerve biopsy 386, 386
  - syndromes 384, 384, 385
  - tumor biopsy 386
- Peripheral nerve syndromes 239
  - diagnosis and treatment 239
  - pathophysiology 239
  - syndromes 239
- Peripheral nerves, in nociception 228
- Peripheral nervous system (PNS) 436
- Permissive hypertension, in stroke 253
- Peroneal nerve 36
- Peroneal nerve entrapment 372
- Personal finance 465, 466
- PET, see Positron emission tomography (PET)

- PFD, *see* Posterior fossa decompression (PFD)
- PFS, *see* Progression-free survival (PFS)
- Phalen's maneuver **39**
- Pharmacologic pupil **450**
- Phenytoin **173, 234**
- PHG, *see* Parahippocampal gyrus (PHG)
- Philtrum-premaxilla anlage, in holoprosencephaly **330**
- PHN, *see* Postherpetic neuralgia (PHN)
- Phosphenes **347**
- Physical examination details **164**
- PI, *see* Pelvic incidence (PI)
- PICA, *see* Posterior inferior cerebellar artery (PICA)
- Pilocytic astrocytoma **302, 303**
- Pineal body **53, 56**
- Pineal parenchymal tumor (PPT) **305**
- Pineal region tumors **305, 402**
- Pineal tumors **402**
- Pineoblastoma **305**
- Pinprick **31, 323**
- Pipeline embolization devices (PEDs) **266**
- Pituicytomas **310**
- Pituitary adenoma **397, 401**
- Pituitary gland **53**
- Pituitary tumors **310**
- Plain film radiographs **206**
- PLC, *see* Posterior ligamentous complex (PLC)
- Pleomorphic xanthoastrocytoma **303**
- PLIF, *see* Posterior lumbar interbody fusion (PLIF)
- PLL, *see* Posterior longitudinal ligament (PLL)
- PNET, *see* Primitive neuroectodermal tumor (PNET)
- Pneumococci **413**
- Pneumoencephalography **22**
- Pneumoventriculography **22**
- PNS, *see* Peripheral nerve stimulation (PNS), Peripheral nervous system (PNS)
- Polyarteritis nodosa (PAN) **441**
- Pons **51, 53, 55, 85, 96**
- Pontine triangle **58, 58**
- Positioning-related complications **137**
- air embolism **138**
  - peripheral nerve injuries **137**
  - visual loss **138**
- Positive end-expiratory pressure (PEEP) **151**
- Positron emission tomography (PET) **352**
- Post-puncture headache **435**
- basics **435**
  - features **435**
  - neuroimaging **435**
  - pathophysiology **435**
  - treatment **435**
- Postcentral gyrus **50**
- Postcentral sulcus **50**
- Postdoctoral research fellow **5**
- Posterior cerebral artery (PCA) **76, 77, 77, 257, 356**
- Posterior cervical **131**
- Posterior cervical approach **131**
- Posterior cervical decompression and fusion (PCDF) **134**
- Posterior communicating artery (Pcomm) **73, 131, 312**
- Posterior cord syndrome **189**
- Posterior fossa decompression (PFD) **324**
- Posterior inferior cerebellar artery (PICA) **77, 258**
- Posterior interosseous nerve **375**
- Posterior interosseous syndrome **240**
- Posterior ligamentous complex (PLC) **197**
- Posterior longitudinal ligament (PLL) **70, 191, 209**
- Posterior lumbar interbody fusion (PLIF) **136**
- Posterior ramus **51**
- Posterior reversible encephalopathy syndrome (PRES) **440, 440, 440**
- clinical features **440**
  - imaging **440**
  - treatment **440**
- Posterior thoracolumbar approach **132**
- Posterolateral triangle **46**
- Posteromedial triangle **46**
- Postherpetic neuralgia (PHN) **235, 237, 237**
- diagnosis **236**
  - pathophysiology **235**
  - signs/symptoms **236**
  - treatment **236**
- Postoperative visual loss **138**
- Postprocedure care **114**
- Postprocedure care and complication management
- burr hole for chronic subdural hematoma **115**
  - external ventricular drain **114**
  - intracranial pressure monitor **115**
  - lumbar puncture and drain **115**
  - shunt tap and externalization **116**
- Posttraumatic seizures (PTSS) **173**
- Postural tremor **348**
- Pott's disease **223, 423**
- Power of attorney **465**
- Powers ratio **192**
- PPNIs, *see* Perioperative peripheral nerve injuries (PPNIs)
- PPT, *see* Pineal parenchymal tumor (PPT)
- Praziquantel **422**
- Pre-Cushing era **15**
- ancient **16**
  - classical **16**
  - Paleolithic **15**
- Pre-Cushing Generation **1**
- Precentral gyrus **50, 50**
- Precentral sulcus **50, 50**
- Precuneus **50, 53**
- Pregabalin **237**
- Prenatal diagnostics **326**
- amniocentesis **326**
  - maternal serum alpha-fetoprotein (MSAFP) test **326**
  - ultrasound **326**
- Prenatal ultrasound **326**
- Preoccipital notch **51**
- PRES, *see* Posterior reversible encephalopathy syndrome (PRES)
- Pressure support ventilation (PSV) **151**
- Prevention **326**
- Primary benign brain tumors **396**
- chordoma and chondrosarcoma **397**
  - glomus tumors **397**
  - hemangioblastomas **398**
  - meningioma **396**
  - nonvestibular schwannomas **398**
  - pituitary adenoma **397**
  - vestibular schwannomas (VS) **397**
- Primary central nervous system lymphoma (PCL) **293**
- Primary central nervous system vasculitis **442**
- Primary malignant brain tumors **396**
- Primary Raynaud's disease **242**
- Primidone **349**

- Primitive neuroectodermal tumor (PNET) 298
- Prior anticoagulation agents, reversal of 173, 174
- Progression-free survival (PFS) 398
- Progressive supranuclear palsy (PSP) 344, 436
- Pronator drift 34
- Prophylactic anticoagulation 173
- Propofol 445–446
- Propranolol 349
- Proprioception 36
- Protamine 255
- Proteus syndrome 296
- Prothrombin complex concentrate (PCC) 173
- Proton beam SRS 393
- Pseudomonas aeruginosa 222
- PSP, see Progressive supranuclear palsy (PSP)
- PSV, see Pressure support ventilation (PSV)
- Psychiatric disorders 399
- PT, see Pelvic tilt (PT)
- Pterion 44
- Pterional approach 122, 122–123, 125, 282
- Ptoxis 31
- PTs, see Posttraumatic seizures (PTs)
- Pu, Peiyu 20
- Publications 3–4, 482
- Pulmonary embolism (PE) 158
- Pulvinar 56
- Pupil-sparing oculomotor palsy 451
- Pupillary diameter 450
- Adie's pupil 450
  - afferent pupillary defect 450
  - anisocoria 450
  - cranial nerve III compression 450
  - Horner's syndrome 450
  - light-near dissociation and Argyll Robertson pupil 450
  - pupilloconstrictor and tract 450
  - pupillodilator and tract 450
- Pupillary light reflex 30
- Pupilloconstrictor 450
- Pupillodilator 450
- Pure agraphia 28
- Pure alexia 28
- Pure word deafness 28
- Putamen 52
- Pyramid 55, 55–56, 58
- Pyrazinamide 423
- Q**
- QOL, see Quality of life (QOL)
- Quadrantanopia 29, 257, 353, 449
- Quadriceps 33
- Quadrigeminal cistern 82
- Quality of life (QOL) 349
- R**
- Radial nerve 33, 42
- Radiation background 391
- Radiation vasculopathy 404
- Radiation-induced tumors 405
- Radiofrequency (RF) ablation 347
- Radiosurgery, see Gamma Knife radiosurgery (GKRS); Proton beam SRS; Stereotactic radiosurgery (SRS)
- Radiotherapy, in history of neurosurgery 23
- Raeder's syndrome 452
- Ranawat classification 208
- Rankin scale 249
- Ranking 1, 8
- Rapid alternating movements 38
- Rapid sequence intubation (RSI) 446
- Rasmussen's encephalitis 360
- Rathke's cleft cyst (RCC) 311, 331
- Raynaud's disease 242
- RCC, see Rathke's cleft cyst (RCC)
- Red reflex 30
- Reflex examination 35
- Babinski's sign 35
  - Hoffman's sign 36, 36
  - reflex grading 35, 35
- Reflex(es)
- Achilles tendon 323
  - asymmetric tonic neck 319
  - Babinski 319
  - bulbocavernosus 39
  - corneal 31
  - corneomandibular 452
  - gag 32
  - in pediatric patients 319
  - Moro 319
  - palmar grasp 319
  - parachute 319
  - plantar 319
  - plantar grasp 319
  - pupillary light 30
  - red 30
  - rooting 319
  - startle 319
  - vestibulo-ocular 31
- Relative value unit (RVU) 463
- Relaxation, cerebral 131
- Remifentanyl 446
- Research 3, 4
- for international medical graduates 4
- Residency 460
- Residency director 1, 5
- Residency Review Committee (RRC) 460
- Resident training, funding for 460
- Respiratory failure 150
- Respiratory physiology 150
- acute respiratory distress syndrome (ARDS) 151
  - ventilator basics 151
- Respiratory rate (RR) 151
- Responsive Neurostimulation (RNS) 360
- Resting tremor 343, 348
- Resuscitation 164
- Retirement 465
- Retrosigmoid approach 123, 125
- Rexed laminae 64
- Rexed's lamina 228
- RF ablation, see Radiofrequency (RF) ablation
- Rhabdomyomas 296
- Rheumatoid arthritis of cervical spine 221
- Rheumatoid arthritis, of cervical spine 221
- Rhinal fissure 53
- Rhomboid fossa 55, 58, 60
- superior/pontine triangle 58
- Rifampin 423
- Rigidity 33, 343
- Riluzole 437, 456
- Rinne test 32
- Rivaroxaban 174
- RNS, see Responsive Neurostimulation (RNS)
- Rocuronium 446
- Romberg test 36
- Ronquillo, Victoria 20
- Röntgen, Wilhelm 21
- Root entry zone 233–234
- Ropinirole 344
- Rostrum 53, 75
- Roy-Camille, Raymond 18
- RR, see Respiratory rate (RR)
- RRC, see Residency Review Committee (RRC)
- RSI, see Rapid sequence intubation (RSI)

Rueda, Barbara Nettel 20  
 RVU, *see* Relative value unit (RVU)  
 Radiosurgery, in history of  
     neurosurgery 23

**S**

Sacral fractures 201, 201, 202  
 Sacral slope 219  
 Saemisch, Edwin 21  
 Safety, patient 461  
 Sagittal balance 219  
 Sagittal craniosynostosis 321, 321  
 Sagittal vertical axis (SVA) 220  
 SAH, *see* Subarachnoid hemorrhage  
     (SAH)  
 SANS Written Board Module 485  
 Santana, Diana 20  
 Sarcoidosis 439  
 Satellites 34  
 Saturday night palsy 42  
 Schiller–Duval bodies 309  
 Schloffer, Hermann 17–18  
 Schwannomas 214, 308, 398  
 Sciatic nerve 33  
 Scoliosis 220, 332, 332, 333  
 SCPP, *see* Spinal cord perfusion  
     pressure (SCPP)  
 SCS, *see* Spinal cord stimulation (SCS)  
 SDHs, *see* Subdural hemorrhages  
     (SDHs)  
 SEA, *see* Spinal epidural abscess (SEA)  
 Seatbelt-type injuries 199, 201  
 Secondary sulci 49  
 Sedation 40  
 Seizure prophylaxis 173  
 Seizure semiology 352  
 Select peer-reviewed journals 482  
     – journals 482  
     – subspecialty 483  
 Selegiline 344  
 Sella and parasellar anatomical  
     landmarks 44, 48  
 Sellar lesions 331  
     – craniopharyngioma 331, 332  
     – Rathke's cleft cyst 331  
 Sellar tumors 310  
     – craniopharyngioma 310, 312  
     – pituitary tumors 310  
 Semiology, seizure 352  
 Semmelweis, Ignaz 16  
 Sensory evaluation, in infants 323  
 Sensory examination 36  
     – light touch 36  
     – pain and temperature 36

– proprioception 36  
 – sensory localization 36, 37  
 – vibration 36  
 Sensory localization 36, 37  
 SEPS, *see* Subdural evacuating port  
     system (SEPS)  
 Septum pellucidum 53, 78  
 Severe traumatic brain injury 534  
 Sevoflurane 445  
 SFG, *see* Superior frontal gyrus (SFG)  
 SFTs/HPCs, *see* Solitary fibrous  
     tumors and  
         hemangiopericytomas (SFTs/  
         HPCs)  
 SHH-activated group, *see* Sonic  
     hedgehog (SHH)-activated group  
 Shitsama, Sylvia 21  
 Shock 152  
     – cardiogenic 152  
     – different forms of 153, 153  
     – distributive 153  
     – hypovolemic 152  
     – obstructive 153  
 Shock and secondary injury, in spinal  
     trauma 187  
 Shotgun wounds 178  
 Shoulder abduction 33  
 Shoulder–hand syndrome 242  
 Shuffling gait 343  
 Shulman Award 480  
 Shunt check 106  
 Shunt infections 414, 420, 421  
 Shunt tap and externalization 105,  
     111, 114, 116  
     – infection/abdominal  
         complication 105  
     – shunt infection 105  
     – Shunt Obstruction 106  
 SIADH, *see* Syndrome of  
     inappropriate antidiuretic  
     hormone secretion (SIADH)  
 Sicard, Jean-Athanase 21  
 Sigmoid sinus 47, 49, 78  
 Simpson Grading Scale 296–297  
 Simpson, James Y. 16  
 SINS, *see* Spinal Instability Neoplastic  
     Score (SINS)  
 Skull and vertebral  
     osteomyelitis 419, 419  
 Skull base 44, 46–47  
     – sella and parasellar anatomical  
         landmarks 44, 48  
     – skull base triangles 45, 48  
 Skull fractures 175, 175  
     – basal 175  
     – depressed 176  
     – in pediatric patients 176, 335  
 Skull vault 44, 45  
 Skull, bones of 44, 44, 45  
     – clinical applications 47, 49  
     – cranium 44  
 SLICS score, *see* Subaxial Cervical  
     Spine Injury Classification System  
     (SLICS) score  
 Slit-lamp examination 450  
 SMA, *see* Spinal muscular atrophy  
     (SMA)  
 SMG, *see* Supramarginal gyrus (SMG)  
 SN, *see* Substantia nigra (SN)  
 SNS, *see* Society of Neurological  
     Surgeons (SNS)  
 Society of Neurological Surgeons  
     (SNS) 5  
 Socioeconomics in  
     neurosurgery 460  
     – job satisfaction 466  
     – medical economics 462  
     – patient care 461  
     – personal finance 465, 466  
     – training 460  
 Solidarity Bridge 24  
 Solitary fibrous tumors and  
     hemangiopericytomas (SFTs/  
     HPCs) 297  
 Somatic pain 239  
 Somatosensory evoked potentials  
     (SSEPs) 132  
 SOMI brace 187  
     – *See also* Sterno-occipital-  
         mandibular immobilization  
         device (SOMI brace)  
 Sonic hedgehog (SHH)-activated  
     group 306  
 SPARCL trial 257  
 Spasticity 33  
 Spetzler–Martin grade 268  
 Sphenoid bone 45  
 Spiegel, Ernest 22  
 Spina bifida occulta 329  
 Spinal ablative procedures 242, 243  
     – cordotomy 242  
     – dorsal root entry zone (DREZ)  
         lesions 242  
     – sympathectomy 242  
 Spinal approaches 132  
     – anterior cervical discectomy and  
         fusion 132, 133, 136  
     – cervical laminoplasty 134  
     – laminectomy/laminotomy 135,  
         136

- level localization 132
- lumbar interbody fusion 135, 137
- posterior cervical decompression and fusion (PCDF) 134
- Spinal bulbar muscular atrophy 438
- Spinal column model 190
- Spinal cord 61, 228, 228, 229
  - fixation of 61
  - internal configuration of 61, 63, 64, 65
  - pain and 228
  - surface anatomy 61
- Spinal cord perfusion pressure (SCPP) 105
  - improvement of 105
- Spinal cord stimulation (SCS) 240, 241
- Spinal cord syndromes 188
  - anterior cord syndrome 188, 189
  - Brown-Séquard syndrome 190, 190
  - central cord syndrome 189, 190
  - posterior cord syndrome 189
- Spinal deformity 217, 218–220
  - kyphosis 219
  - lordosis 220
  - scoliosis 220
- Spinal disorders 332
  - scoliosis 332, 332, 333
- Spinal epidural abscess (SEA) 222, 417, 419, 422, 537
- Spinal fixation 18
- Spinal infections 222
  - epidural spinal abscess 222
  - Pott's disease 223
  - vertebral body osteomyelitis (VBO) 222
- Spinal Instability Neoplastic Score (SINS) 215
- Spinal metastatic disease 537
- Spinal muscular atrophy (SMA) 438
- Spinal neoplasms 213
  - intradural tumors 214
  - extramedullary tumors 214
  - intramedullary tumors 214
  - vertebral body metastases 214
- Spinal neurosurgery 18
- Spinal positioning 131
  - anterior cervical 131
  - posterior cervical 131
  - posterior thoracolumbar 132
- Spinal syndromes 224
  - tethered cord syndrome 224
- Spinal trauma 185, 535
  - cervical collars 187
  - cervical spine injuries 191
  - cervical spine trauma 191
  - compression fractures 200
  - disposition 535
  - examination in 185, 185
  - imaging in 186, 186, 188
  - immobilization devices 187, 188
  - in pediatric patients 336
  - in the room 535
  - intubation in 186
  - prior to seeing the patient 535
  - sacral fractures 201, 201, 202
  - shock and secondary injury 187
  - steroids 187
  - thoracic injuries 199
  - thoracolumbar and lumbar spine injuries 190, 199, 200
- Spinal vascular disorders 216
  - cavernomas 216
  - vascular malformations 216, 217
- Spine 205, 506, 536
  - cauda equina syndrome 223, 536
  - cervical myelopathy 536
  - cervical spine degenerative disease 205
  - common ligaments of 70, 70
  - anterior longitudinal ligament 70
  - interspinous ligament 71
  - ligamentum flavum 71
  - posterior longitudinal ligament 70
  - supraspinous ligament 71
  - degenerative cervical myelopathy 205
  - inflammatory spondyloarthropathies 221
  - lumbar back pain (LBP) 212
  - spinal deformity 217, 218–220
  - spinal epidural abscess 537
  - spinal infections 222
  - spinal metastatic disease 537
  - spinal neoplasms 213
  - spinal vascular disorders 216
  - tethered cord syndrome 224
  - thoracic spine degenerative disease 211, 212
  - trauma 504
- Spinopelvic parameters 219, 219
- Spinothalamic tract 229, 242
- Spinous process 64
- SPL, see Superior parietal lobule (SPL)
- Splenium 53
- Spurling test 38, 39
- SRS, see Stereotactic radiosurgery (SRS)
- SSEPs, see Somatosensory evoked potentials (SSEPs)
- SSS, see Superior sagittal sinus (SSS)
- STA, see Superficial temporal artery (STA)
- Stable vertebra 218
- Staphylococci 413
- Staphylococcus aureus 222, 417
- Staphylococcus epidermidis 222, 419
- Statin therapy 257
- Statins 261
- Status epilepticus 533
- Status trigeminus 233
- Steffee, Arthur D. 18, 20
- Stellate reticulum 310
- Stenting 257
- Stereotactic frame 344, 349
- Stereotactic laser ablation 357
- Stereotactic mesencephalotomy 243
- Stereotactic needle biopsy 292
- Stereotactic radiosurgery (SRS) 268, 391–392, 523
  - adverse reactions 393
  - clinical outcomes 404
  - cranial nerve deficits 405
  - cyst formation 404
  - dosing and tolerance 393
  - edema 404
  - functional disorders 399
  - epilepsy 400
  - movement disorders 399
  - ocular disorders 400
  - psychiatric disorders 399
  - future directions 405
  - Gamma Knife in 22
  - gamma knife radiosurgery 392, 392
  - in trigeminal neuralgia 234
  - indications 393
  - linear accelerators (LINACs) 392
  - morbidity 404
  - mortality 404
  - pain 399
  - trigeminal neuralgia (TN) 399
  - pediatric indications 400
  - pediatric tumors 401
  - craniopharyngioma 402
  - ependymoma 401
  - glioma 401
  - medulloblastoma 401
  - meningiomas 401
  - pineal tumors 402
  - pituitary adenoma 401
  - vestibular schwannomas (VS) 401

- primary benign brain tumors 396
- chordoma and chondrosarcoma 397
- glomus tumors 397
- hemangioblastomas 398
- meningioma 396
- nonvestibular schwannomas 398
- pituitary adenoma 397
- vestibular schwannomas (VS) 397
- primary malignant brain tumors 396
- procedural considerations 403
- proton beam 296
- proton beam SRS 393
- radiation background 391
- radiation vasculopathy 404
- radiation-induced tumors 405
- reading resources 475
- treatment procedure 402
- perioperative care 402
- planning 402
- preoperative imaging 402
- preoperative SRS frame placement 403, 403
- vascular indications 394
- arteriovenous malformation 394, 394
- cavernous malformation 395
- dural arteriovenous fistula 395
- metastases 395
- Sterno-occipital-mandibular immobilization device (SOMI brace) 187
- Sternocleidomastoid 30, 32, 133, 133
- Steroids
  - in postherpetic neuralgia 237
  - in spinal trauma 187
  - in transverse myelitis 439
- STG, *see* Superior temporal gyrus (STG)
- STN, *see* Subthalamic nucleus (STN)
- Straight leg raise 38, 38
- Straight sinus 78
- Strength, in motor examination 33, 33, 34
- Streptococcus pneumoniae 414
- Stroke 249
  - *See also* Transient ischemic attack (TIA)
  - anterior cerebral artery 257
  - anterior inferior cerebellar artery 257
  - basilar artery 258
  - carotid artery atherosclerosis, management of 254, 255
  - definitions 249
  - epidemiology 249
  - initial management 251
  - internal carotid artery 257
  - intracranial atherosclerotic disease 256
  - intraparenchymal hemorrhage management 254
  - ischemic, in neuroradiology 92, 93–97
  - ischemic stroke therapeutic management 252
  - middle cerebral artery 257
  - posterior cerebral artery 257
  - posterior inferior cerebellar artery 258
  - risk and prognosis 249
  - superior cerebellar artery 257
  - thalamic strokes 258
  - vertebral artery 258
  - vertebrobasilar insufficiency 258
- Stroke evolution and molecular pathways 250
  - biochemical and hemodynamic requirements of brain tissue 250
  - cellular level, events at 251
- Stroke syndromes 257
  - anterior cerebral artery 257
  - anterior inferior cerebellar artery 257
  - basilar artery 258
  - internal carotid artery 257
  - middle cerebral artery 257
  - posterior cerebral artery 257
  - posterior inferior cerebellar artery 258
  - superior cerebellar artery 257
  - thalamic strokes 258
  - vertebral artery 258
  - vertebrobasilar insufficiency 258
- Stroke-like symptoms 543
- Sturge-Weber syndrome 358
- Suarez, Ernesto 23
- Subarachnoid cisterns 275, 276
- Subarachnoid hemorrhage (SAH) 258
  - cardiogenic shock in 152
  - cerebral autoregulation in 155
  - epidemiology 258
  - estimating risk and prognosis 258
  - hyponatremia in 153
  - in neuroradiology 90, 93
  - in traumatic brain injury 169
  - initial management 260
  - secondary prevention 260
- Subaxial cervical spine injuries 196, 197, 198
- Subaxial Cervical Spine Injury Classification System (SLICS) score 197
- Subcentral gyrus 49
- Subcortical structures of brain 52, 54
  - basal ganglia 52
  - internal capsule 52
  - ventricles of the brain 53, 54
- Subdural evacuating port system (SEPS) 103, 111
- Subdural grids and strips of electrodes 353
- Subdural hematoma, in neuroradiology 89, 91
- Subdural hemorrhages (SDHs) 169, 535
- Subependymal giant cell astrocytoma 303
- Subependymoma 304
- Subinternship 5–7
- Subspecialties 474, 478, 480, 483
- Substantia gelatinosa 228
- Substantia nigra (SN) 57, 344
- Subtemporal approach 283
- Subthalamic nucleus (STN) 139, 344, 436
- Succinylcholine 446
- Sufentanil 446
- Sulfadiazine 421
- Sumatriptan 445
- Superficial temporal artery (STA) 123
- Superficial veins 78
- Superior cerebellar artery 257
- Superior cerebellar peduncle 56
- Superior frontal gyrus (SFG) 49, 50–51
- Superior frontal sulcus 49, 50–51
- Superior orbital fissure 46
- Superior parietal lobule (SPL) 50, 50
- Superior sagittal sinus (SSS) 78
- Superior temporal gyrus (STG) 51, 51, 355–356
- Superior temporal sulcus 50, 51
- Superior/pontine triangle 58
- Supramarginal gyrus (SMG) 50
- Suprapineal recess 53
- Suprascapular nerve 375
- Supraspinous ligament 71
- Supratrochlear neuralgia 235
- Supratrochlear triangle 45
- Surface anatomy 47, 50–51
  - frontal lobe 48

- medial surface 52, 53
  - occipital lobe 52
  - parietal lobe 50
  - temporal lobe 51
  - Surgical indications 169–170
  - SVA, *see* Sagittal vertical axis (SVA)
  - Sylvian fissure 49, 91
  - Sympathectomy 242
  - Sympathetic block 239, 242
  - Syncytiotrophoblastic giant cells 309
  - Syndrome of inappropriate
    - antidiuretic hormone secretion (SIADH) 153–154
  - Synthetic narcotics 446
  - Syphilis 414, 438
- ## T
- Tandem gait 37, 427
  - Tarsal tunnel syndrome 373
  - TBI, *see* Traumatic brain injury (TBI)
  - TCAs, *see* Tricyclic antidepressants (TCAs)
  - TCS, *see* Tethered cord syndrome (TCS)
  - Teardrop fracture 197
  - Tectorial membrane 69
  - TEG, *see* Thromboelastography (TEG)
  - Tela choroidea 53, 60
  - Temperature sense 36
  - Temporal approach 123, 124, 127, 127, 128
  - Temporal arteritis, *see* Giant cell arteritis (GCA)
  - Temporal bone 44, 73
  - Temporal lobe 51, 53
  - Temporal lobe epilepsy 354, 355, 355
  - Tenia choroidea 56
  - Tentorial incisura 356
  - Teratoid rhabdoid tumor, atypical 308
  - Teratoma 309
  - Tethered cord syndrome 224, 328
  - Tethered cord syndrome (TCS) 328
  - Thalamic strokes 258
  - Thalamotomy 349
  - Thalamus 53
  - Theophilus, Sharon Casilda 20
  - Theophylline 349
  - Thermography 239
  - Thoracic injuries 199
  - Thoracic spine degenerative disease 211, 212
  - Thoracic vertebrae 68
  - Thoracolumbar and lumbar spine injuries 190, 199, 200
  - Thoracolumbar injury 199
  - Thoracolumbar Injury Classification and Severity Score (TLICS) 199
  - Three-phase bone scan 239
  - Thrombocytopenia 255
  - Thromboelastography (TEG) 157
  - Thrombotic thrombocytopenic purpura/hemolytic uremic syndrome 236
  - Thumb opposition 33
  - TIA, *see* Transient ischemic attack (TIA)
  - Tibial nerve 36
  - Tibialis anterior 33
  - Tic douloureux 232
    - *See also* Trigeminal neuralgia (TN)
  - Tics 35
  - Tidal volume 151
  - Timmons, Shelly D. 12
  - Tinel's sign 39
  - Tissue plasminogen activator (tPA) 249
  - TLIC score 200
  - TLICS, *see* Thoracolumbar Injury Classification and Severity Score (TLICS)
  - TLIF, *see* Transforaminal lumbar interbody fusion (TLIF)
  - TMS, *see* Transcranial magnetic stimulation (TMS)
  - TN, *see* Trigeminal neuralgia (TN)
  - Toddlers and older children, examination of 323
  - Tolosa–Hunt syndrome 452
  - Tone, in motor examination 32
  - Tongue deviation 32
  - Tongue movement 32
  - Top neurosurgery program, match into 7
  - TorsinA 350
  - Toxoplasmosis 421, 422
  - tPA, *see* Tissue plasminogen activator (tPA)
  - Tract of Lissauer 228
  - Training 460
    - certification 460
    - credentialing 461
    - licensing 460
    - residency 460
    - resident training, funding for 460
  - Transcortical mixed 28
  - Transcortical motor 28
  - Transcortical sensory 28
  - Transcranial magnetic stimulation (TMS) 241
  - Transforaminal lumbar interbody fusion (TLIF) 135
  - Transient ischemic attack (TIA), *see* Stroke
    - ischemic stroke after 249
  - Transit arteries 267
  - Transspheoidal approach 123
  - Transverse and cruciate ligaments 68
  - Transverse cerebral fissure 53
  - Transverse ligament 67–68
  - Transverse myelitis 438
  - Transverse occipital sulcus 50–51
  - Transverse process 64
  - Transverse sinuses 78
  - Trapezius 30, 32
  - Trauma, *see* Spinal trauma; Traumatic brain injury (TBI)
  - Traumatic brain injury (TBI) 101, 102, 103, 162, 447, 501, 534
    - associated injuries: skull fractures 175, 175
    - definitions and physiology 166
    - epidural hemorrhages 534
    - history and physical examination 48, 162, 162, 163
    - hyponatremia in 153
    - imaging indications 164
    - imaging modalities 165
    - intracerebral hemorrhages 534
    - management 172
    - neuromonitoring 171
    - penetrating trauma 177
    - severe 534
    - subdural hemorrhages 535
    - traumatic intracranial hemorrhages 167, 167, 168
  - Traumatic intracranial hemorrhages 167, 167, 168
    - contusions 170
    - epidural hemorrhages (EDHs) 168
    - intraparenchymal hemorrhages (IPHs) 170
    - intraventricular hemorrhages (IVH) 170
    - subarachnoid hemorrhage 169
    - subdural hemorrhages (SDHs) 169
    - surgical indications 169–170
  - Traumatic subarachnoid hemorrhage (tSAH) 168
  - Tremor 35

- essential 348, 352, 436
- kinetic 348, 352
- postural 348
- resting 348
- Treponema pallidum 425
- Triceps 33
- Triceps reflex 42
- Tricyclic antidepressants (TCAs) 237
- Trigeminal nerve 29, 55, 55–56
- Trigeminal neuralgia (TN) 232, 399, 537
  - diagnosis 233
  - pathophysiology 233, 233
  - signs/symptoms 233
  - treatment 234
- Trihexyphenidyl 351
- Triphasic response 154
- Trochlear nerve 30, 46, 55, 55–56, 451
- tSAH, see Traumatic subarachnoid hemorrhage (tSAH)
- Tuberculosis 223, 414, 423
- Tuberculum cuneatum 56
- Tuberculum gracile 56
- Tumor(s) 383
  - angiocentric glioma 301
  - angioliopomas 296
  - astroblastoma 304
  - astrocytomas 214, 299, 396
  - atypical teratoid rhabdoid 308
  - benign extraneural lesions, surgical approach for 388
  - benign mesenchymal 296
  - benign nerve sheath tumors, surgical approach for 387, 387
  - benign tumors 384
  - biopsy 386
  - chondromas 296
  - chondrosarcoma 294, 397
  - chordoid glioma of third ventricle 303
  - chordomas 294, 397
  - choriocarcinoma 309
  - craniopharyngiomas 311, 331, 402
  - embryonal 306
  - ependymomas 214, 305, 401
  - Ewing's sarcoma 298
  - extra-axial, in neuroradiology 94–95
  - fibrosarcomas 298
  - germ cell 309
  - germinomas 309
  - glomus 397
  - hemangioblastoma 298, 398

- hemangiopericytoma 297
- imaging 386
- intra-axial, in neuroradiology 94, 96
- lipomas 297
- malignant peripheral nerve sheath tumors (MPNSTs), surgical approach for 388
- malignant tumors 384
- medulloblastoma 306, 307, 401
- melanocytic 298
- meningeal 294
- meningioma 294, 296, 297, 396, 401
- mesenchymal, see Mesenchymal tumors
- nerve biopsy 386, 386
- neuroepithelial brain 299
- pediatric 299
- ocular 400
- of cranial and parasagittal nerves 308
- osteochondromas 297
- osteomas 297
- papillary, of pineal region 311
- pilocytic astrocytoma 302, 303
- pineal parenchymal 305
- pineal region 305, 402
- pineoblastoma 305
- pituitary 310, 401
- primary central nervous system lymphoma 293
- primitive neuroectodermal 298
- radiation-induced 398
- rhabdomyomas 296
- schwannomas 214, 398
- sellar 310
- solitary fibrous 297
- spinal 213
- subependymoma 304
- syndromes 384, 384, 385
- teratoma 309
- tumor biopsy 386
- yolk sac 309
- Tuning fork 36
- Typically affected nerves 375

**U**

- UFH, see Unfractionated heparin (UFH)
- Ulnar 240
- Ulnar nerve 33, 36
- Ultrasound, neural tube defects in 326

- UMN, see Upper motor neuron (UMN)
- Unfractionated heparin 255
- Unfractionated heparin (UFH) 158
- United States Medical Licensing Examination (USMLE) 1–2, 460
- Upper motor neuron (UMN) 36
- Urgency 531
- USMLE, see United States Medical Licensing Examination (USMLE)
- Uveal melanoma 400
- Uvula deviation 32

**V**

- VA, see Vertebral artery (VA)
- Vagal trigone 58
- Vagus nerve 55–56, 361
- Vagus nerve stimulation (VNS) 361
- Valacyclovir 236
- Valproic acid 173
- Vancomycin 415, 418
- Variant Creutzfeldt-Jakob disease (vCJD) 434
- Varicella zoster virus (VZV) 235
- Vascular anatomy 71
  - arterial anatomy 71, 71
  - venous anatomy 76, 78, 79
- Vascular indications 394
  - arteriovenous malformation 394, 394
  - cavernous malformation 395
  - dural arteriovenous fistula 395
  - metastases 395
- Vascular malformations 216, 217, 267
  - See also Arteriovenous malformation (AVM); Cavernomas; Moyamoya disease
  - arteriovenous malformations 267
  - cavernous malformations 269
  - dural AVMs 271, 272
  - moyamoya disease 270
  - vein of Galen malformation 271
  - venous angiomas 271
- Vasculitis 440
  - Behçet's disease 441
  - giant cell arteritis (GCA) 441
  - clinical 441
  - epidemiology 441
  - evaluation and biopsy 441
  - treatment 441
  - polyarteritis nodosa 441
  - primary CNS vasculitis 442
  - Wegener's granulomatosis 441

- Vasospasm prevention 260
- VBO, *see* Vertebral body osteomyelitis (VBO)
- VCC, *see* Ventriculocystocisternotomy (VCC)
- vCJD, *see* Variant Creutzfeldt-Jakob disease (vCJD)
- Vein of Galen malformation 271
- Vein of Labbé 78
- Vein of Trolard 78
- Venous anatomy 76, 78, 79
  - cerebral veins 78
  - dural sinuses 78
- Venous angiomas 271
- Venous thromboembolism 158
- Venous thromboembolism (VTE) 107, 173
- Ventilator 151
- Ventral white commissure 228
- Ventralis intermedialis nucleus of thalamus (VIM) 139, 348–349, 352, 436
- Ventricles of brain 53, 54
- Ventriculocystocisternotomy (VCC) 324
- Ventriculoperitoneal shunt (VPS) 138, 139
- Ventricular thalamus 230
- Ventrolateral sulcus 55–56
- Verapamil 435
- Verbal articulation 32
- Verbal response 28
- Vertebrae
  - cervical 65, 67
  - intervertebral foramen 64, 66
  - lumbar 68
  - standard constitution of 63, 66
  - thoracic 68
- Vertebral artery (VA) 77, 258
  - collateral branches 77
- Vertebral body 63
- Vertebral body metastases 214
- Vertebral body osteomyelitis (VBO) 222
- Vertebral column 63
  - occipitatlantoaxial junction, ligaments of 68, 69
  - spine, common ligaments of 70, 70
  - vertebrae 63, 66
- Vertebral fractures
  - C1 193, 193, 194
  - C2 196, 196
- Vertebrobasilar insufficiency 258
- Vertigo 453
  - differential diagnosis 453, 453
  - vestibular neurectomy 453
  - surgical approaches 453
  - surgical considerations 453
- Vestibular function 32
- Vestibular neurectomy 453
- Vestibular schwannomas (VS) 397, 401
- Vestibular trigone 58
- Vestibulo-ocular reflex (VOR) 31
- Vestibulocochlear nerve 55–56, 59, 393
- VHL disease, *see* Von Hippel–Lindau (VHL) disease
- Vibration sense 36
- VIM, *see* Ventralis intermedialis nucleus of thalamus (VIM)
- Viral encephalitis 414, 422, 425
- Visa 4–5
- Visual acuity 29
- Visual fields 29, 448
  - deficits 448, 449
- Visual loss, postoperative 138
- Vitamin B12 deficiency 427
- VNS, *see* Vagus nerve stimulation (VNS)
- Von Helmholtz, Hermann 21
- Von Hippel–Lindau (VHL) disease 398
- VOR, *see* Vestibulo-ocular reflex (VOR)
- VPS, *see* Ventriculoperitoneal shunt (VPS)
- VS, *see* Vestibular schwannomas (VS)
- VTE, *see* Venous thromboembolism (VTE)
- VZV, *see* Varicella zoster virus (VZV)
- W**
- Wada test 353
- Wallenberg's syndrome 258
- Warfarin 173–174, 256
- Warten-berg reflex, *see* Corneomandibular reflex
- Washington Committee Fellowship 484
- WASID trial 256
- WBRT, *see* Whole-brain radiotherapy (WBRT)
- Weber test 32
- Weber's syndrome 257–258
- Wedge fracture 197
- Wegener's granulomatosis 441
- Wernicke, Carl 16
- Wernicke's area 50
- Wernicke's syndrome 28
- West syndrome 443
- WFNS scale, *see* World Federation of Neurological Societies (WFNS) scale
- Whiplash 197
- Whole-brain radiotherapy (WBRT) 395
- Wilson's disease 350
- Winaktu, Jeanne PMR 20
- Winston, Ken 23
- WNT-activated medulloblastoma 306
- Women in neurosurgery 19
- Work relative value unit (wRVU) 463
- World Federation of Neurological Societies (WFNS) scale 259, 260
- Wrist extension 33
- Wrist flexion 33
- Written board review 485
- wRVU, *see* Work relative value unit (wRVU)
- Wycis, Henry 22
- X**
- X-ray myelography 22
- X-rays
  - in ankylosing spondylitis 221
  - in linear accelerators 392
  - in spinal deformity 218
  - in traumatic brain injury 166
- XRT, *see* External radiation therapy (XRT)
- Y**
- Yasargil, M. Gazi 23
- Yolk sac tumor 309
- Z**
- Zanon, Nelci 20
- Ziconotide 242
- Zonisamide 237
- Zoster sine herpette 236
- Zwagerman, Nathan 11
- Zygoma, in craniotomy 124, 126