

# Index

## A

Abrupt steroid discontinuation 35  
ACA occlusion risk 75  
Acetate 54  
Acetazolamide  
– and pseudotumor cerebri 229  
– challenge test 55  
– dosage for premature infants 100  
– initial dose in premature infants 100  
Achilles tendon reflex 13  
ACoM surgery 354  
AC-PC line 5, 54  
Acromegaly  
– initial tests 211  
– diagnostic tests 210  
ACTH  
– diurnal peak 34  
– secreting tumor 206  
Acute carpal tunnel syndrome causes 128  
Acute hydrocephalus  
– in aneurysm 354  
– in SAH with IVH 355  
– management after SAH 342  
Acute hyponatremia duration 24  
Acute kidney injury in rhabdomyolysis 29  
Acute mountain sickness 246  
Acute paraplegia or quadriplegia 413  
Acute purulent meningitis CSF findings 95  
Acute stroke 54  
Acute subdural hematoma (ASDH) 257  
Acute subdural hemorrhage 54  
Acute transverse myelitis 41  
Acyclovir for herpes simplex encephalitis 89  
Adamantinomatous craniopharyngiomas 202  
Addisonian crisis 35  
– management 35  
ADH  
– powerful physiologic stimulus 34  
– release stimulus 34  
– release triggers 34  
– release stimulus clarification 34  
AdIS vs. AIS differences 320  
Adolescent idiopathic scoliosis (AIS) 320, 326  
Adrenal insufficiency treatment 35  
Adult degenerative spine disease 326  
Adult idiopathic scoliosis 326  
Adult-type diffuse gliomas 149  
Agenesis of corpus callosum 63  
Age-related risk of intracerebral hemorrhage 385  
Aggressive dural arteriovenous fistula hallmark 460  
Agitation and sedation scores in RASS 31  
AICA (Anterior Inferior Cerebellar Artery) 119, 448  
Air 55  
Air embolism diagnostics 426  
AIS characteristics 320  
AIS treatment 320  
Alar ligament 4  
ALARA distance recommendation, for radiation exposure 51

Alcohol consumption and hemorrhage 385  
Alcohol withdrawal seizure 114  
Alcohol withdrawal syndrome 45  
Alcohol withdrawal syndrome 47  
Allograft dural substitutes 420  
Alpha 2 adrenergic receptor agonist 22  
Alpha 2 receptors 21  
Alpha frequency 58  
Alpha sympathomimetic 28  
ALS vs. CSM differentiation 313  
American Society of Anesthesiologists (ASA) grading system 21  
American/English/French Connection classification 334  
Aminoglycosides, in intrathecal treatment 87  
Amoeba causing CNS infection 89  
Amoebic CNS infection 89  
Amphotericin B  
– for cryptococcal infection 89  
– for Naegleria fowleri 90  
Amygdalohippocampectomy 454  
Amyotrophic lateral sclerosis (ALS) 41, 412  
Analgesic overdose and respiratory issues 32  
Analgesics for visceral or deafferentation pain 32  
ANCA-associated vasculitis 46  
Ancillary confirmatory tests 79  
Anderson and D'Alonzo classification 281  
Anderson and Montesano classification 280  
Anencephaly 71  
Aneurysm  
– etiologies 349  
– location and symptoms 350  
– size and management recommendations 358  
Aneurysmal bone cyst 235  
Aneurysmal rupture treatment during coiling 461  
Aneurysmal SAH risk during pregnancy 342  
Aneurysmal subarachnoid hemorrhage 341  
Aneurysmal subarachnoid hemorrhage (aSAH) 25, 341  
Aneurysms 351  
Aneurysms associated with moyamoya disease 377  
Angiocentric glioma 161  
Angiographically occult malformations 365  
Angiographically occult vascular malformations 365  
Angular gyrus 3  
Ankylosing spondylitis 329  
Ankylosing spondylitis diagnosis 329  
Annual hemorrhage rate for Zabramski classification 366  
Anoxemic anoxia 76  
Anoxic encephalopathy 58, 76  
Anterior cerebral artery  
– infarction 10  
– involvement 347  
– segment 8

Anterior cervical fusion graft options 308  
Anterior chiasmal syndrome, causes 140  
Anterior choroidal artery 4, 10  
Anterior column 288  
Anterior corpectomy and cage fixation 326  
Anterior horn cells 126  
Anterior inferior cerebellar artery (AICA) 10  
Anterior interosseous nerve palsy 130  
Anterior limit of spinal canal 51  
Anterior longitudinal ligament hypertrophy 312  
Anterior lumbar interbody fusion (ALIF) 324, 437  
Anterior margin of spinal canal on X-ray 52  
Anterior odontoid fixation 434  
Anterior odontoid screw fixation 435  
Anterior spinal canal contour line 52  
Anterior spinal canal limit mark 51  
Anterior spinal canal margin marker 51  
Anterior spinal cord syndrome 330  
Anterior spinal syndrome 275  
Anterior temporal tip cyst 63  
Anterior transoral odontoidectomy 436  
Antibiotic cover duration after pituitary surgery 218  
Antibiotic prophylaxis for pituitary surgery 217  
Antibiotics, for ALS 41  
Anticholinergic effect 119  
Anticoagulation, for large infarcts 381  
Anticonvulsant barbiturates 21  
Antiepileptic drugs (AED) liver function tests 108  
Antiepileptic drugs (AED) post-surgery 454  
Anti-Parkinson drugs dosage adjustment post-DBS 444  
Antiseizure medication  
– dosage adjustment 110  
– for absence seizure 109  
Antiviral for ALS 41  
Antivirals, for Guillain-Barre syndrome 41  
Anton Babinski syndrome 14  
Apnea test criteria 79  
Apneic breathing 75  
Apolipoprotein E (apoE-4) in TBI prognosis 268  
Arachnid cyst, treatment frequency 409  
Arachnoiditis classification 298  
Arachnoiditis MRI pattern 299  
Arcade of Lazorthes 9  
Arcuate fasciculus 13  
Area postrema 13  
Areflexia in Guillain-Barre syndrome 41  
Arginine vasopressin for diabetes insipidus 26  
Argyll Robertson pupil, causes 141  
Arnold Chiari malformation 71  
Arterial CO<sub>2</sub> tension 22  
Arterial feeders, craniopharyngiomas 202

Arteriovenous malformations (AVMs) 363  
Artery crossing sylvian fissure 428  
Artery of Adamkiewicz 9  
ASA class IV 21  
ASA class V 21  
Ascending paralysis 413  
Ascending pharyngeal artery 8  
Aseptic meningitis etiology 83  
Ashworth score, for spasticity 444  
ASIA Scoring System 273  
ASM for generalized genetic epilepsies 110  
Aspiration 277  
Aspirin dosage limit 31  
Aspirin for CADASIL 46  
Associated cerebrovascular malformations with Osler Weber Rendu syndrome 365  
Asterion 3  
Astrocytes 158  
Astrocytoma IDH mutant 149  
– grade 2 158  
Ataxic breathing 75  
Atherosclerotic changes 349  
Atlantoaxial subluxation 406  
Atlanto-occipital dislocation (AOD) 280  
Atlantooccipital interval (CCI) 280  
Atlantooccipital stability 4  
ATLS protocol 277  
ATRX mutation 158  
Atypical choroid plexus papilloma 173  
Atypical meningioma 191  
Atypical teratoid or rhabdoid tumors CNS location 177  
Audiogram in Meniere's disease 143  
Auditory brainstem responses (ABR) 185  
Augmented hyperventilation 252  
Augmenting cerebral oxygen delivery 345  
Autoimmune disease and PMR 45  
Autonomic hyperreflexia 292–293  
AVM  
– characteristics on angiography 363  
– classification aneurysm types 363  
– risk of first-time hemorrhage 363  
– risk of recurrent intracerebral hemorrhage 363  
AVM aneurysms, classification of 363  
Awake craniotomy 422–423  
Axonotmesis, characteristics in Sunderland system 133

## B

Baclofen pump selection criteria 444  
Bacterial infections of parenchyma/meninges/complex infections 83  
Bacterial meningitis 58  
BAER (Brainstem Auditory Evoked Response) 143  
Balloon-assisted coiling 461  
Ballooning of lateral and frontal ventricles 97  
Bamboo spine appearance 329  
Barthel Index Most Difficult Factor 396  
Basal cisterns

- and 4th ventricle compression 381
  - status and Glasgow outcome 267
  - Basal encephalocele** 63
  - Basal energy expenditure (BEE) in TBI** 267
  - Basal vein of Rosenthal** 11
  - Basic tenets of AVM surgery** 363
  - Basilar apex aneurysm**
    - management 351
  - Basilar artery aneurysms** 354
  - Basilar artery occlusion** 75
  - Basilar invagination**
    - and skull base conditions 52
    - associated conditions 52
    - measurement line 51
  - Basion axial interval (BAI)** 280
  - Basion to dental interval (BDI)** 280
  - Beaten copper cranium in chronic hydrocephalus** 97
  - Beevor's sign test** 273
  - Behcet syndrome** 45
  - Behcet's disease treatment** 46
  - Bell's palsy causes** 143
  - Bell's palsy prognosis** 143
  - Bell's palsy treatment** 143
  - Bence Jones proteins** 41
  - Benedikt's syndrome** 14
  - Benign histology, malignant behavior** 202
  - Benign tumors of the skull** 232
  - Benzodiazepine treatment** 113
  - Benzodiazepines for alcohol withdrawal** 47
  - Beta 2 transferrin test for CSF** 95
  - Beta frequency** 58
  - Beta receptors** 29
  - Beveling in entry and exit wounds** 261
  - Biceps brachii** 126
  - Biconvex arachnoid cyst** 63
  - Biconvex hyperdense area on CT** 257
  - Bifrontal decompressive craniectomy** 257
  - Bilateral arachnoid cysts** 63
  - Bilateral cerebral hemispheres dysfunction** 75
  - Bilateral external ventricular drains** 63
  - Bilateral internuclear ophthalmoplegia, causes** 139
  - Bilateral periodic lateralizing epileptiform discharges (PLEDs)** 58
  - Bilateral selective vestibular neurectomy** 143
  - Bilateral vestibular schwannomas** 153
  - Binocular blindness, differential diagnoses** 410
  - Binocular vision loss, causes** 409
  - Biochemical cure criteria for acromegaly** 218
  - Biochemical cure of acromegaly** 205
  - Biphasic growth pattern in PCA** 163
  - Bipolar progenitor cells in ependymomas** 170
  - Birth injuries** 264
  - Bitemporal hemianopia, craniopharyngioma symptoms** 202
  - Bladder problems in lipomyeloschisis** 68
  - Blood, brain barrier** 13
  - Blood pressure control** 45
    - in aSAH 345
  - Blood supply interruption during pregnancy** 72
  - Blunt cerebrovascular injury signs** 247
  - Bobble-head doll syndrome** 63
  - Bone flap storage temperature for reimplantation** 431
  - Bone fracture** 412
  - Bone grafts** 419
  - Bone metastasis to the skull** 231
  - Bone mineral density**
    - measurement 289
  - Bony compression** 412
  - Boston brace** 324
  - Botulinum toxin for torticollis** 444
  - Botulism, diagnosis, cranial nerve palsies** 409
  - Bow Tie sign** 286
  - Brachial plexus injury** 125, 264
    - neurosurgical intervention 135
  - Brachialgia and cord syndrome** 312
  - Bracing**
    - in scoliosis 319
    - indications in AIS 320
  - BRAF v. V600E mutation** 161, 203
  - Brain abscess** 85
  - Brain death**
    - 58
    - confirmatory tests 79
    - 79
  - Brain death confirmation EEG** 58
  - Brain death in children** 79
  - Brain MRI signal characteristics of ICH** 385
  - Brain oxygen tension monitoring** 250
  - Brain stem** 13
  - Brain stem reflexes, for brain death** 79
  - Brain tumor management** 166
  - Brainstem auditory evoked potential (BAER)** 58
  - Brainstem auditory evoked responses (BAER)** 58
  - Brainstem gliomas** 164
  - Brisk bleeding during C2 pedicle screw placement** 434
  - Broca's area** 3, 13
  - Brodmann's area 39** 13
  - Brodmann's area 40** 13
  - Brodmann's area 41** 3
  - Brodmann's area 42** 3
  - Brodmann's area 43** 3
  - Brodmann's area 44** 3
  - Brodmann's area 45** 3
  - Bromocriptine Therapy** 213
  - Brown sequard syndrome** 275
  - Brun's nystagmus, lesion location** 139
  - Bullet crossing midline prognosis** 261
  - Burr hole evacuation** 63
  - Burst fracture** 288
  - Burst fracture mechanism** 285
  - Burst fracture subtypes** 289
  - Butterfly vertebra appearance on lateral X-ray** 51
- C**
- C2 screws** 436
  - C2 vertebra ossification centers** 51
  - C4,C5 cervical disk herniation** 308
  - C5,C6 cervical disk herniation** 308
  - C6,C7 cervical disk herniation** 308
  - C7,T1 cervical disk herniation** 308
  - Cabergoline Dosage** 214
  - CADASIL treatment** 46
  - Caf au lait spots** 154
  - Calcifications in meningiomas** 187
  - Calcified brain lesions** 166
  - Calcitonin derivatives mechanism in Paget's disease** 330
  - Calcium** 54
  - Calcium re-entry block in malignant hyperthermia** 23
  - Callosotomy disconnection syndrome risk reduction** 432
  - Callosotomy length to prevent disconnection syndrome** 431
  - Caloric requirement post-trauma** 268
  - Calvaria involvement** 254
  - Candida spp. infection treatment** 87
  - Candle guttering** 155
  - Capsaicin patches** 120
  - Carbamazepine**
    - CBC monitoring 108
    - dosage for children 110
  - Carcinomatous meningitis** 83
  - Cardiac output** 28
  - Cardiogenic brain embolism** 381
  - Carotid artery segments** 355
  - Carotid cavernous fistula (CCF) presentation** 364
  - Carotid endarterectomy, for residual stenosis** 375
  - Carotid endarterectomy, indications** 375
  - Carotid stump syndrome** 381
  - Carotid tubercle** 4
  - Carpal tunnel pressure thresholds** 128
  - Carpal tunnel syndrome** 125, 128, 130
    - prevalence 128
    - symptoms 130
  - Cauda equina neuroendocrine tumor** 183
  - Cauda equina syndrome** 301, 303
  - Causalgia** 120
  - Cavernous malformation** 365
  - Cavernous malformation formation** 366
  - Cavernous malformations** 365
  - Cavernous sinus**
    - contents 9
    - invasion, Knosp grading 210
    - non-contents 10
    - surgical entrance 9
  - CDC guidelines for CNS cryptococcal infection** 89
  - Cefepime in intrathecal treatment** 87
  - Cellular astrocytoma** 162
  - Central calcified disk herniation** 306
  - Central cord syndrome** 274, 312
  - Central herniation** 75
  - Central nervous system (CNS) pathologies** 28
  - Central neurocytoma diagnostic criteria** 166
  - Central neurocytoma treatment** 167
  - Central pontine myelinolysis diagnosis** 24
  - Central spinal canal characteristics** 335
  - Central sulcal line** 3
  - Central sulcus location** 5
  - Cephalhematoma** 264
  - Cerebellar hemisphere tumors** 163
  - Cerebellar hemorrhage factors** 385
  - Cerebellar herniation** 76
  - Cerebellar hypoplasia** 71
  - Cerebellar infarct** 381
  - Cerebellar liponeurocytoma prognosis** 167
  - Cerebellar mutism syndrome** 14
  - Cerebellar tonsillar herniation syndrome** 71
  - Cerebellar vermis lesion** 150
  - Cerebral abscess**
    - as late complication 261
    - pathogens 84
  - Cerebral abscess, surgical treatment of** 85
  - Cerebral amyloid angiopathy (CAA)** 385
  - Cerebral aneurysm**
    - in family history 341
    - locations 350
  - Cerebral angiography risks** 460
  - Cerebral arterial dissection** 377–378
  - Cerebral autosomal dominant arteriopathy (CADASIL)** 46
  - Cerebral blood flow** 54
  - Cerebral blood flow** 250, 372
  - Cerebral blood volume** 54
  - Cerebral edema** 13
  - Cerebral edema prevention** 29
  - Cerebral hemispheric lesions** 162
  - Cerebral injuries from bullet fragmentation** 261
  - Cerebral metabolic rate of oxygen (CMRO<sub>2</sub>)** 21
  - Cerebral metastases** 223
  - Cerebral metastasis, diagnosis** 151
  - Cerebral perfusion pressure** 250
  - Cerebral perfusion pressure** 252
  - Cerebral radionuclide angiogram (CRAG)** 79
  - Cerebral salt wasting treatment** 24
  - Cerebrospinal fluid** 95, 250
  - Cerebrovascular event** 113
  - Cervical collar removal criteria** 277
  - Cervical electromyography (EMG)** 58
  - Cervical laminectomy** 71
  - Cervical laminoplasty** 436
  - Cervical lateral mass and facet fractures** 285
  - Cervical myelopathy pathogenesis** 312
  - Cervical or thoracic spinal stenosis** 412
  - Cervical spinal canal stenosis criteria** 52
  - Cervical spine fracture-dislocation diagnosis** 51
  - Cervical spine injury** 51
  - Cervical spondylosis** 312
  - Cervical syringomyelia** 71
  - Cervical X-ray** 292
  - Cervicomедullary gliomas** 164
  - Cervicomедullary junction below foramen magnum** 71
  - Cervicothoracic Orthosis** 275
  - Chaddok maneuver** 13
  - CHADS<sub>2</sub> scoring system** 381
  - Chamberlain's line** 54
  - Chance fracture** 289
  - Chemical hemostasis** 420
  - Chemical meningitis** 84
  - Chemical spasmolysis for vasospasm** 460
  - Chemotherapy**
    - agents and blood-brain barrier 223
    - and CNS seeding 223
    - for glioblastoma multiforme 149
    - for PCA 163
    - options for brain tumors 166
    - response in melanoma 224
  - Cheyne-Stokes breathing** 75
  - Chiari malformation type 1** 71
    - without MMC 97
  - Chiari malformation type 1.5 features** 71

- Chiari malformation type 1.5 malformation 71  
 Chiari malformation type 2 71  
   – with MMC 97  
 Chiari malformation type 3 71  
 Chiari malformation type 4 71  
 Chiari malformation-associated syringomyelia 336  
 Chiari pseudotumor cerebri syndrome 71  
 Chiasma types, pituitary adenoma 209  
 Chiasmal glioma 163  
 Chiasmapexy for visual deterioration 227  
 Cholesterol crystals, in cyst fluid 202  
 Choline 54  
 Chondrosarcoma 191, 235  
 Chondrosarcoma 231  
 Chordoma subtype 191  
 Chordomas 235  
 Choriocarcinoma  
   – diagnosis 196  
   – features 196  
 Choroid plexus 13  
   – carcinoma metastasis 173  
   – CSF production 95  
   – papilloma 174  
   – papilloma in children 174  
   – papilloma prognosis and treatment 173  
   – papilloma recurrence 173  
 Choroid plexus papilloma 173–174  
 Choroid plexus tumors 173  
 Chromosome 17 153  
 Chronic alcohol abuse symptoms 47  
 Chronic heparin side effect 37  
 Chronic pain in schwannomatosis 155  
 Chronic progressive myelopathy radiation type 457  
 Chronic subdural hematoma (CSDH) 258  
   – with meningitis 85  
 Cigarette smoking 322  
   – and street drugs 385  
 Cingulotomy 451  
 Circular lucency with honeycomb pattern 232  
 Circulating blood volume, in adults 37  
 Classic migraine 41  
 Classic type medulloblastoma 176  
 Clay Shoveler's fracture 284  
 Clay Shoveler's fracture vertebra 285  
 Cleft  
   – communicating with ventricles 71  
   – not communicating with ventricles 71  
 Clinical stability of spine 273  
 Clinical vasospasm 346  
 Clonidine suppression test 228  
 Clonus 126  
 Clopidogrel reversal regimen 37  
 Clopidogrel use indications 461  
 Clot size decrease rate after ICH 386  
 Cluster breathing 75  
 CNS lymphomas 198  
 CNS tumors 223  
 Cobb angle measurement 316  
 Cognard angiographic classification of dural AVFs 364  
 Cognard classification Type 3 dural AVF 364  
 Coiling in aneurysms 341  
 Cold phase in Paget's disease 329  
 Colistimethate sodium in intrathecal treatment 87  
 Collapsed ventricles after VP shunting 101  
 Collar use, in occipital neuralgia 128  
 Collateral blood flow 371  
 Collateral flow in internal cerebral artery occlusion 8  
 Collet-Sicard syndrome 14  
 Coma and coma scales 75  
 Coma operational definition 76  
 Comatose patient examination 77  
 Combined C1 and type III odontoid fracture 282  
 Communitated fracture, from gunshot wound 261  
 Commissural myelotomy 451  
   – laminectomy 451  
   – success rate 452  
 Communicating hydrocephalus in pediatric population 97  
 Complete facial nerve paralysis in Bell's palsy 143  
 Complete removal of contaminated shunt 87  
 Complex regional pain syndrome 119  
 Complex regional pain syndrome type 1 120  
 Complex regional pain syndrome type 2 120  
 Compression fracture 288  
 Computer-assisted cisternal endoscopic approach 181  
 Concussion CT findings 247  
 Concussion diagnosis 246  
 Concussion imaging 246  
 Concussion symptoms 246  
 Conditions associated with basilar invagination 52  
 Conduction aphasia 13  
 Conductive hearing loss 143, 254  
 Condylar line 3  
 Confirmatory test for CSF 95  
 Congenital causes of myelopathy 413  
 Congenital cervical spinal stenosis 312  
 Congenital predisposition 349  
 Congestive heart failure 28  
 Conivaptan in cerebral salt wasting 24  
 Conjoined nerve root 67  
 Conservative management of cervical disk 308  
 Conservative treatment  
   – for CSF fistula 95  
   – for low-back pain 297  
 Constructive interference in steady state (CISS) 55  
 Contrast medium for shunt X-ray 100  
 Contrast medium for X-ray shuntogram 100  
 Contrast reaction prevention medication 52  
 Control of hypertension postoperatively 22  
 Control of intracranial pressure (ICP) 22  
 Convergence nystagmus, diencephalon lesion 139  
 Cordotomy 451  
 Cordotomy fibers 451  
 Corduroy pattern 191  
 Coronal and sagittal malalignments 320  
 Coronal CSO 63  
 Coronal curve types 326  
 Coronal imbalance measurement 326  
 Coronal suture 3  
 Corpus callosotomy indications 454  
 Corpus callosum 158  
 Corpus callosum and cingulate gyrus 432  
 Corpus callosum lesion, differential diagnosis 401  
 Cortical dysplasia 71  
 Corticospinal pathways 75  
 Corticospinal pathways removal 75  
 Corticosteroids  
   – administration 213  
   – in Bell's palsy 143  
 Corticotropin peak cortisol timing 34  
 Cortisol levels, nadir 212  
 Cortisol peak timing 34  
 Cosmetic deformity, in skull fractures 254  
 Costotransversectomy skin incision 305  
 Cosyntropin stimulation test 213  
 Coumadin necrosis cause 37  
 Coup de poignard of Michon 335  
 Coup-contrecoup injury in gunshot wounds 261  
 CP angle lesion incision types 426  
 CPK levels, critical illness polyneuropathy 133  
 Cranial and paraspinal nerve tumors 183  
 Cranial nerve involvement, in Paget's disease 330  
 Cranial nerve involvement, pituitary adenoma 209  
 Cranial nerves 119, 125, 419  
 Cranial vault encephalocele 63  
 Craniectomy boundaries for large tumors 426  
 Craniectomy size for tumors in the posterior fossa 426  
 Craniofacial dysmorphic syndromes 63  
 Craniopharyngioma 202  
   – blood supply 203  
   – cyst wall characteristics 227  
   – gene mutations 203  
   – malignant behavior 202  
 Craniopharyngioma, postoperative radiotherapy 202  
 Cranioplasty  
   – and postoperative headache reduction 422  
   – complications 432  
   – materials 432  
   – timing for noncontaminated situations 431  
 Craniosynostosis (CSO) 63  
 Craniotomy 113  
   – for cyst excision 63  
 Creutzfeldt-Jakob disease 58  
   – characteristics 89  
   – EEG 58  
   – survival 89  
   – treatment 89  
 Cribriform neuroepithelial tumors location 177–178  
 Criteria for diagnosing pretruncal nonaneurysmal SAH 359  
 Critical illness polyneuropathy (CIP), EMG findings 133  
 Crossed cerebellar diaschisis 45  
 Cryoprecipitate transfusion criteria 37  
 Cryptococcal CNS infection features 90  
 Cryptococcus neoformans 83  
 Crystalloids and cerebral edema 29  
 CSF 54  
   – absorption of 95  
   – absorption sites 95  
   – dissemination in PMA 163  
   – fistula associated with pneumococcal meningitis 95  
   – formation rate and volume 95  
   – glucose levels 95  
   – infection post EVD placement 87  
   – lymphocyte count 95  
   – obstruction 71  
   – pleocytosis and pseudotumor cerebri 229  
   – pleocytosis in Guillain-Barre syndrome 41  
   – pressure in pseudotumor cerebri 229  
   – protein and glucose levels 95  
   – Protein Correction for Traumatic Tap 440  
   – proteomics in PCNSL 199  
   – rhinorrhea vaccination 83  
   – seeding in ependymomas 169  
   – tumor markers for choriocarcinomas 196  
 CSF fistula 95  
 CSF fistula and pseudomeningocele 427  
 CSF spread in choroid plexus carcinoma 173  
 CSN administration advantages 452  
 CT  
   – and MRI for thoracic disk herniation 305  
   – angiography for vascular status 261  
   – angiography in stroke 376  
   – angiography of neck vessels 292  
   – brain angiography 72  
   – cisternography for CSF fistula 95  
   – indications in pediatric head injuries 264  
   – myelogram for SIH diagnosis 96  
   – or MRI criteria for pretruncal nonaneurysmal SAH 359  
   – perfusion 54  
   – scan in adult degenerative scoliosis 327  
   – scan information in gunshot injuries 261  
   – vs. MRI Advantages 297  
 CT/MRI in Meniere's disease 143  
 CTNNB1 mutations in craniopharyngiomas 203  
 Cumulative trauma effects 322  
 Cushing's syndrome, diagnostic management 212  
 Cushing Syndrome 207  
 Cushing syndrome tests 210  
 Cushing's disease 289  
 Cushing's disease management 214  
 Cushing's triad 250  
 Cushing's ulcer causes 28  
 Cyclophosphamide for acute transverse myelitis 41  
 Cyst formation, adamantinomatous craniopharyngiomas 202  
 Cystic brainstem hemangioblastoma 191  
 Cystic lesion with contrast enhancing nodule 191  
 Cysticercosis location in brain 90

- Cytotoxic agents for Behcet's disease 46  
Cytotoxic edema 13
- D**
- D j vu, memory impairment 150  
Dandy-Walker malformation (DWM) 64  
Dandy-Walker malformation in congenital hydrocephalus 97  
Danger points in frontal craniotomy 428–429  
Dantrolene sodium 23  
Daptomycin in intrathecal treatment 87  
Deafferentation pain 32  
Debridement in gunshot wound surgery 261  
Debridement of skin edges 254  
Decerebrate posturing 241, 250  
Decerebrate rigidity 76  
Decompression of C2 nerve root 129  
Decompressive craniectomy 257, 375  
Decorticate posturing 75–76, 241, 250  
Decrease of callosal angle in iNPH 98  
Dedifferentiated chordoma 192  
Deep brain stimulation conditions 445  
Deep brain stimulation indications 444  
Deep tendon reflex 126  
Deep vein thrombosis 277  
Definitive diagnostic study for cerebral arterial dissection 377  
Definitive treatment of syndrome of trephination 422  
Degenerative disk disease 322  
Degenerative lumbosacral fractional curve 320  
Delayed cerebritis 83  
Delayed deterioration After ICH 385  
Delayed intracranial hemorrhage in traumatic aneurysms 358  
Delayed postoperative deterioration in AVM 363  
Delayed spinal cord injury deterioration 292  
Delayed traumatic intracerebral hemorrhage (DTICH) 257  
Delirium tremens 45  
Delta frequency 58  
Deltoid muscle 126  
Demeclocycline in cerebral salt wasting 24  
Denis three-column model 288  
Dense bone 55  
Dentate interval in adult male 51  
Denver grade 4 injury management 248  
Denver grading scale 247  
Depressed skull fractures 254  
Depression less than 1 cm 254  
Dermatome 13  
Descending paralysis with ophthalmoplegia 412  
Desirable Spinal Needle Size for Diagnostic Purpose 441  
Desmoplastic infantile astrocytoma characteristics 166  
Desmoplastic infantile astrocytoma recurrence 166
- Desmopressin dosage in DDAVP Nasal Spray 25  
Desmopressin in coagulation disorders 38  
Desmopressin use cases 38  
Detection of aneurysms on CT angiography 341  
Detrusor muscle 13  
Detrusor overactivity 14  
Dexamethasone activity 34  
Dexamethasone maintenance dose 149  
Dexamethasone mineralocorticoid activity 34  
Dexmedetomidine  
– in hypertensive patients 32  
– use precautions 32  
Dexmedetomidine (Precedex) 21  
Dextroscoliosis 319  
Diabetes insipidus 75  
– diagnostic criteria 25, 218  
– in neurosarcoïdosis 41  
– management 79  
– treatment options 26  
Diabetes, peripheral neuropathy cause 133  
Diabetic amyotrophy, symptoms and EMG findings 133  
Diabetic amyotrophy, treatment options 134  
Dialysis in rhabdomyolysis 28  
Diastematomyelia in SCM 69  
Dickman classification 280  
Diencephalic breathing pattern 77  
Diencephalic lesion, nystagmus type 139  
Diffuse astrocytoma, MYB or MYBL1-altered 161  
Diffuse axonal injury  
– clinical grade 247  
– grading 246  
– histological grading 248  
– symptoms 38  
Diffuse enhancement, nerve roots, cauda equina 407  
Diffuse gliomas 158  
– in children 164  
– MYB- or MYBL1-altered 161  
Diffuse glioneuronal tumor (DGONC) criteria 167  
Diffuse hemispheric glioma, H3 G34-mutant 161  
Diffuse hypoxic injury to occipital lobes 97  
Diffuse low-grade glioma, MAPK pathway altered 161  
Diffuse meningeal melanocytic neoplasms 195  
Diffuse midline glioma, H3 K27 M altered 161  
Diffuse pediatric type high-grade glioma 162  
Diffusion tensor imaging (DTI) MRI 54  
Diffusion tensor tractography 56  
Diffusion-weighted MRI (DWI) 54  
Diminished achilles reflex 298  
Diplopia, causes 410  
Direct high flow shunts in CCF 364  
Disability in aSAH survivors 341  
Disabling positional vertigo 448  
Disconnection syndrome 455  
Discontinuation of dopamine agonist therapy 214  
Disk herniation 322
- Disk herniation, types 297  
Disk sequestration 298  
Disk space destruction, adjacent vertebral levels 406  
Diskography access points 299  
Diskoligamentous complex scores 284  
Disruption of neuronal signals 28  
Dissection of vertebral artery in young patients 377  
Distal anterior cerebral artery aneurysms 354  
Distal symmetric polyneuropathy in AIDS 134  
Distance for minimizing radiation exposure 51  
Distribution of lumbar lordosis (LL) 317  
Diuretic therapy adjustments 100  
Diuretic therapy in premature infants 100  
Diurnal peak in cortisol levels 34  
Dizziness and vertigo 381  
Dobutamine dosage 28  
Dobutamine effects 29  
Dominant vertebral artery dissection 378  
Dopamine 277  
Dopamine agonist 213  
Dopamine dosage 28  
Dopamine dose 28  
Dorsal rhizotomy 451  
Dorsal rhizotomy candidate criteria 444  
Dorsal root entry lesions 451  
Dorsal root entry zone effectiveness 452  
Downbeat nystagmus 71  
Drop attacks 454  
Drop metastasis 179  
Drug of choice for herpes simplex encephalitis 89  
Drug-induced neuropathy, exceptions 133  
Drugs exacerbating weight gain in pseudotumor cerebri 229  
Dual energy X-ray absorptiometry 289  
Dural arteriovenous fistula (AVF) presentation 364  
Dural laceration repair 254  
Dural lipoma 68  
Dural opening complications 302  
Dural penetration evidence 254  
Dural sinus thrombosis and pseudotumor cerebri 229  
Dural sinus thrombosis (DST) 265  
Dural substitutes 419  
Dural tail sign 164, 187  
DVT prophylaxis 277  
DVT risk estimation 38  
DVT risk factors in severe TBI 267  
DWI MRI 54  
Dynamic Instability Tests 297  
Dysembryoplastic neuroepithelial tumor location 166  
Dysembryoplastic neuroepithelial tumor WHO grade 167  
Dysplastic cerebellar gangliocytoma symptoms 167  
Dysrhythmias 28
- E**
- Early capsule 83
- Early cerebritis 83  
Early finding in spontaneous extradural dissection of vertebral artery 377  
Early signs of infarction 375  
Early signs of malignant hyperthermia 22  
Early Surgery after Aneurysm Rupture 349  
Early tracheostomy benefits in severe head injury 268  
Echinococcus granulosus infection 90  
Echinococcus (hydatid disease) cyst removal technique 90  
EC/IC bypass surgery 3  
Ectodermal origin of anterior pituitary 34  
EDH with meningitis 85  
EEG changes in ischemic brain 372  
EEG differential diagnosis 58  
EEG findings in absence seizures 105  
EEG for hydranencephaly 72  
EEG rhythms 58  
Electrodiagnostics 58  
Electrolyte imbalance 113  
Electrolyte imbalance associated with carbamazepine 108  
Electrolyte imbalance correction 79  
Electromyography in nerve injuries 130  
Elevated alkaline phosphatase 329  
Elevated ICP without hydrocephalus 71  
Elevated prolactin, associated conditions 210  
Eligibility criteria for tissue plasminogen activator 376  
Embryonal carcinoma diagnostic criteria 196  
Embryonal tumor with multilayer rosettes age group 177  
Embryonal tumors 176  
Emergency Management Coma 77  
Emergency radiation dose for spinal cord paralysis 457  
Emergency surgery indications in acute stroke 375  
Emergency ventriculostomy burr hole placement 426  
EMG checklist 59  
EMG, neuralgic amyotrophy timeline 133  
Empty sella syndrome treatment 227  
En bloc resection 192  
Encephalocele 63  
End tidal CO<sub>2</sub> (ETCO<sub>2</sub>) goal in neurological surgery 21  
Endocrinology 34  
Endolymphatic sac tumors 154  
Endolymphatic shunting 143  
Endoscopic cyst fenestration 63  
Endoscopic third ventriculostomy 63  
– complications of 101  
– for tectal glioma 164  
– indications 101  
Endotracheal intubation 241  
Endovascular technique for ICA 292  
Endovascular Techniques 349  
Endovascular treatment options 461  
ENG with bithermal caloric stimulation 143  
Engorged veins in SIH 95  
Enhancing nerve roots, causes 407

- Enlarged head circumference in infants 162  
 Entrapment neuropathies, surgical treatments for 129  
 Entrapment neuropathy causes 128  
 Entrapment neuropathy in systemic diseases 129  
 Entry point for LMS placement by Magerl method 434  
 Entry points and direction of screw placement in pedicles 438  
 Environmental risk factors for meningioma 188  
 Eosinophilia in neurocysticercosis 90  
 Ependymoma  
   - histology 169  
   - radiosensitivity 170  
   - staining characteristics 151  
 Ependymoma enhancement patterns 169  
 Epidermoid  
   - and dermoid tumors 231  
   - cyst in spinal dermal sinus 68  
   - vs. dermoid cysts 227  
 Epidermoid and dermoid tumors 231  
 Epidural abscess diagnosis 87  
 Epidural block 119  
 Epidural hematoma (EDH) 257  
 Epidural mass MRI findings 88  
 Epilepsy risk after first seizure in AVM 363  
 Epilepsy-related brain tumors 161  
 Epileptogenic zone 454  
 Epsilon frequency 58  
 Erb's palsy, brachial plexus injury 135  
 Essential diagnostic criteria of meningeal melanoma 195  
 Esthesioneuroblastoma extension 227  
 E ethosuximide drug of choice 109  
 Etomidate contraindications 22  
 ETV in infants 101  
 ETV indications and complications 101  
 ETV success score for 3-year-old with tectal tumor 101  
 ETV success score for a child with tectal glioma 100  
 ETV success score for a child with tectal tumor 101  
 ETV success score for hydrocephalus 100  
 Excess body weight 322  
 Excision of mural nodule in PCA 163  
 Exclusion criteria for tissue plasminogen activator 461  
 Exiting nerve root 301  
 Exophthalmos, definition 409  
 Exophytic brainstem gliomas 164  
 Expressive aphasia 371  
 Extended approaches for meningioma 189  
 Extensor hallucis longus 126  
 External beam radiotherapy for pituitary adenomas 215  
 External carotid artery branches 8  
 External hydrocephalus treatment 97  
 External ventricular drain (EVD) usage 87  
 Extracellular volume expansion 28  
 Extracerebral lesion diagnosis 85  
 Extradural tumors 235  
 Extramedullary hematopoiesis 412  
 Extravasation diagnosis 292  
 Extraventricular location of choroid plexus papilloma 174  
 Extraventricular neurocytoma locations 167  
 Extreme lateral herniated lumbar disk 303  
**F**  
 Facial artery anastomosis 8  
 Facial diplegia, causes 409  
 Facial nerve injury during surgery 143  
 Facial nerve preservation 185  
 Facial pain syndromes in aneurysm 350  
 Factors affecting aneurysm treatment selection 461  
 Factors affecting ICP 22  
 Factors affecting likelihood of relapse after cessation of ASM 110  
 Factors increasing aneurysm rupture risk 358  
 Factors lowering seizure threshold 105  
 Failed Back Surgery Syndrome 298  
 False cyst in PCA 163  
 False Localizing Sign 76  
 False statement about remifentanil 21  
 Family agreed to withdraw support 80  
 Fasciculations 126  
 Fat graft placement for empty sella syndrome 227  
 Fatty tissue in lipomyeloschisis 68  
 FDA recommendations for drill use during craniotomy 423  
 Features of AVM on MRI 363  
 Features of chronic hydrocephalus 97  
 Febrile seizures 113  
 Femoral neuropathy, common causes 133  
 Fetal circulation in posterior cerebral artery 8  
 Fetal hydantoin syndrome association 109  
 Fetal warfarin syndrome features 38  
 FGFR gene mutations 63  
 Fibromuscular dysplasia (FMD) 45  
 Fibromuscular dysplasia (FMD) angiographic patterns 46  
 Fibrosarcoma 231  
 Fibrous dysplasia 232  
 Fibrous dysplasia characteristics 232  
 Fielding and Hawkins classification 280  
 Filum terminale lipoma treatment 68  
 Filum terminale sectioning 68  
 Flaccid quadriplegia in SIAD treatment 24  
 Flexion Injury with Compression 284  
 Flexion/extension X-rays 277  
 Flexor digitorum profundus 126  
 Fludrocortisone acetate in cerebral salt wasting 24  
 Fluid intake in SIAD based on solute ratio 24  
 Fluid-attenuated inversion recovery (FLAIR) 54  
 Fluorescein 419  
 Fluorescein side effects 419  
 Focal decompression 326  
 Focal neurologic deficit 241  
 Focal onset seizures of temporal origin 454  
 Foix-Alajouanine syndrome 41  
 Follow-up imaging for subependymoma 171  
 Foot drop 125, 412  
 Foramen magnum 71  
 Foramen magnum lesion, long tract signs 401  
 Foramen magnum margin for basilar invagination 51  
 Foramen of Monro 153  
 Foramen of Monro tumors 164  
 Foramen spinosum 4  
 Foraminal herniated disk root involvement 302  
 Forehead motion in Bell's palsy 143  
 Fosphenytoin 113  
 Foster Kennedy syndrome 14, 187  
 Four Rs of radiobiology 458  
 Fourth ventricle length 4  
 Fractionated therapy for spinal tumors 458  
 Fractionation for metastatic spine tumors 457  
 Fracture dislocation 288  
 Fracture-dislocation diagnosis on cervical X-ray 51  
 Fragment migration causing hydrocephalus 261  
 Frankfurt plane 3  
 Frazier point for emergency ventriculostomy 426  
 Fresh frozen plasma indications 38  
 Friisen scale, papilledema grading 140  
 Froin's syndrome 237  
 Froment's sign 130  
 Frontal craniotomy 429  
 Frontal eye field 16  
 Frontal horn length 4  
 Frontal Lobe Infarction and AComA 354  
 Frontal Lobe Lesion 77  
 Frontal lobectomy for Guillain-Barre syndrome 41  
 Frontal sinus involvement 254  
 Fronotoethmoidal encephalocele 63  
 Frontotemporal approach indications 217  
 Full anticoagulation with heparin 38  
 Functional deficit zone 454  
 Functional Independence Measure (FIM) for Minimal Assistance 395  
 Functional Independence Measure for Spinal Cord Injury 396  
 Functional Independence Measure Scoring for 75% Activities 395  
 Functional Independence Score of 7 Meaning 396  
 Functional MRI basis 247  
 Functional MRI types 247  
 Functional neurosurgery applications 445  
 Fungal CNS infections 90  
 Fungal meningitis 83  
 Furosemide for pseudotumor cerebri 229  
 Fusion of cervical vertebrae 68  
**G**  
 Gabapentin 119  
 Gait ataxia in Wernicke's encephalopathy 47  
 Gait difficulty in tethered cord syndrome 67  
 Galassi type 63  
 Gangliocytoma location 166  
 Ganglioglioma features 166  
 Ganglioglioma recurrence treatment 166  
 Gardner's syndrome triad 231  
 Gastric residual volume in enteral feeding 267  
 GCS score 76  
 GCS Score Coma 76  
 Gender and intracerebral hemorrhage 385  
 General neurocritical care 28  
 Genetic influence 322  
 Genetic mutations associated with choroid plexus carcinoma 174  
 Genetic syndromes associated with aSAH 341  
 Genetic testing for pheochromocytoma 228  
 Germ cell tumor markers in CSF 195  
 Germ cell tumors in children and adolescents 195  
 Germ cell tumors sensitivity to radiotherapy 195  
 Germinal Matrix Blood Supply 389  
 Germinoma 179  
 Germinoma characteristics 196  
 Germline SMAECB1 mutation 155  
 Gerstmann's syndrome 14  
 Gertzbein classification of pedicle screw medial breach 437  
 GH regulation 34  
 GH release and suppression 34  
 GH release suppression 34  
 Giant aneurysms 358  
 Giant aneurysms treatment options 358  
 Giant cell arteritis 45  
 Giant cell arteritis association 45  
 Giant cell tumors 235  
 Giant pyramidal cells of Betz 3  
 Glasgow Coma Scale (GCS) 241  
 Glasgow Outcome Scale Extended and Original 396  
 Glasgow Outcome Score Dependence for Institutional Support 395  
 Glasgow Outcome Score for Severe Disability 395  
 Glial fibrillary acidic protein (GFAP) 151  
 Glioma with diffuse growth architecture 161  
 Global alignment 326  
 Glomus tumor extension into petrous apex 228  
 Glossopharyngeal nerve 4  
 Glossopharyngeal neuralgia 448  
 Goal of antiseizure medication 109  
 Goal of surgery for cavernous malformation 366  
 Goals of surgical treatment for hydrocephalus 101  
 Gold standard test for carotid artery stenosis 372  
 Gold standard test for cerebral aneurysms 341  
 Grade 3 tumor characteristics 158  
 Grade IV Bell's palsy symptoms 143  
 Gradenigo's syndrome, symptoms 139  
 Gradient echo MRI 54

Gradient recalled acquisition in a steady state (GRASS) 55  
Gradual onset of anosmia, probable causes 410  
Graduated compression stockings 267  
Granulomatosis with polyangiitis (GPA) 46  
Great cerebral vein of Galen formation 11  
Grisel's syndrome 282  
Gross anatomy, cranial and spine 3  
Gross nodular seeding stage in medulloblastoma 177  
Gross total removal feasibility 169  
Gross total removal prognosticator 169  
Gross total resection (GTR) 159  
Growth hormone release suppression 34  
Growth Hormone Secreting Tumors 213  
Guidelines for hemicraniectomy timing 381  
Guillain-Barre syndrome 41  
Gunshot wound injury indications 292  
Gyrus Rectus Resection and AComA Surgery 354

**H**

H3.3 p.K28 (K27) mutation 161  
Hangman's fracture 281  
Hardy's classification 203  
Hardy's Classification Grade 206  
Hardy's classification, invasive pituitary tumors 203  
Head circumference out of proportion to body size 97  
Head injury and antiseizure medication 114  
Head position for pterional approach 428  
Head rotation for Acom artery aneurysm in pterional craniotomy 428  
Head rotation loss after atlantoaxial fusion 436  
Headache Treatment Post-LP 441  
Hearing loss treatment options 184  
Hearing loss types 143  
Heavy metals 54  
Hemangioblastoma 191  
Hemangioma 191  
Hemangiomas 231  
Hemangiomas of the skull 231  
Hematology 37  
Hematolymphoid tumors involving CNS 198  
Hemicraniectomy 381  
Hemifacial spasm 448  
Hemiplegic migraine 41  
Hemorrhage in spinal cord injury 28  
Hemorrhage occurrence in cavernous malformation 366  
Hemorrhagic transformation types 386  
Hemostasis in gunshot wound surgery 261  
Heparin chronic side effects 37  
Heparin dosage and monitoring 37  
Heparin dosage titration 37  
Heparin full anticoagulation contraindications 38

Heparin reversal agent 37  
Heparin weight-based protocol maintenance dose 460  
Heparin-induced necrosis 37  
Hepatic failure 29  
Hereditary hemorrhagic telangiectasia 366  
Hereditary hemorrhagic telangiectasia associations 366  
Herniated brainstem effects 75  
Herpes simplex 83  
Herpes simplex encephalitis 58  
Herpes simplex encephalitis EEG 58  
Herpes simplex encephalitis predilection 89  
Herpes zoster 119  
Heteropia 71  
High dose steroids for giant cell arteritis 46  
High medulla dysfunction 75  
High Medulla Dysfunction 75  
High prolactin levels, hook effect 209  
High urine output in treatment 45  
Higher sacral slope and spondylolisthesis 317  
High-grade gliomas 158  
Highly radioresistant brain metastases 224  
High-risk aneurysm features 460  
Hippocampal sclerosis and its effects 106  
Hirayama disease 336, 412  
Histaminic migraine 41  
Histologic staging of cerebral abscess 85  
Histological features of myxopapillary ependymomas 171  
Histological phase of cerebral abscess 83  
Histopathologic workup to differentiate B-cell from T-cell PCNSL 199  
Histopathological diagnosis of brain tumors 166  
Histopathological features of choroid plexus carcinoma 173  
Histopathology of brain abscess 83  
History of epilepsy or seizures 58  
Hoffman's sign 13  
Hollow skull phenomenon 79  
Holoprosencephaly 71  
Homonymous superior quadrantanopsia 139  
Homunculus 5  
Hormone Replacement Therapy 213  
Hormone Sensitivity to Compression 206  
Hormone synthesis in hypothalamus 34  
Hormone-producing nuclei location 34  
Horner Syndrome after ACDF 309  
Horner syndrome, components 139  
Hot phase in Paget's disease 329  
Hounsfield units 55  
House and Brackmann facial nerve grading 184  
Hueter-Volkmann principle 319  
Hunt and Hess classification for aSAH 342  
Hunter syndrome 63  
Huntington's disease 41  
Hurler syndrome 63  
Hybrid nerve sheath tumors 183

Hydatid cyst of brain treatment 89  
Hydatid cyst treatment options 89  
Hydranencephaly vs. maximal hydrocephalus 72  
Hydranencephaly vs. severe hydrocephalus 58  
Hydrocephalus 67, 97, 113, 180, 419  
Hydrocephalus ex vacuo 97  
Hydrocephalus in agenesis of corpus callosum 63  
Hydrocephalus in cerebellar infarct 381  
Hydrocephalus in choroid plexus papilloma 174  
Hydrocephalus in tectal glioma 164  
Hydrocephalus incidence in myelomeningocele 68  
Hydrocephalus rate in Dandy-Walker malformation 64  
Hydrocephalus risk factors post-TBI 267  
Hydrocortisone administration pre-surgery 217  
Hydrocortisone tapering post-pituitary surgery 218  
Hyperactive reflexes in CSM 312  
Hyperchloremic acidosis symptoms 26  
Hyperdense artery sign 375  
Hyperglycemia 29  
Hyperostosis frontalis interna associations 232  
Hypertension and aSAH 341  
Hypertension and cerebellar hemorrhage 385  
Hypertension exacerbation 29  
Hypertension management in acute ischemic stroke 375  
Hyperthyroidism, secondary causes 210  
Hypertrophy of facets 322  
Hyperventilation 21  
Hyperventilation in ICP management 251  
Hyperventilation in malignant hyperthermia treatment 23  
Hypointense T2 lesion 187  
Hypolordotic and hypokyphotic spine 317  
Hypomelanocytic macules 153  
Hypometabolism 45  
Hyponatremia correction test 25  
Hyponatremia correction with saline infusion 25  
Hyponatremia risk factors after SAH 345  
Hyponatremia severity classification 24  
Hypophysis 13  
Hypophysitis vs. adenoma, differentiating points 403  
Hypotension 241  
Hypotension in brain death 79  
Hypotension with tachycardia 28  
Hypothalamic hamartoma (HH) 63  
Hypothalamic hormone nuclei 34  
Hypothyroid Surgery 213  
Hypothyroidism and surgery symptoms 35  
Hypothyroidism management 217  
Hypothyroidism surgery symptoms 35  
Hypotonic hyponatremia etiology 24  
Hypoxemia 241  
Hypoxia 113, 241

I peak latency 58  
ICA ligation 292  
ICH Location with Hemisensory Loss 386  
ICH Score Calculation Example 387  
ICH score components 386  
ICH Score Components 386  
ICP monitor complications 250  
ICP monitoring in acute subdural hematoma 259  
ICP monitoring indications 250  
ICU admission 29  
Ideal MAC for inhalational agents 22  
IDH wildtype 161  
IDH1 codon 132 mutation 158  
Idiopathic Bell's palsy 143  
Idiopathic brachial plexitis, improvement timeline 133  
Idiopathic paralysis agitans 41  
Idiopathic seizures 113  
I-III peak latency 58  
Imaging characteristics of choroid plexus papilloma 173  
Imaging characteristics of craniopharyngiomas 202  
Imaging characteristics of hemangiomas 231  
Imaging characteristics of MYCN-amplified ependymomas 170  
Imaging findings in spontaneous intracranial hypotension (SIH) 95  
Immunodeficiency-associated CNS lymphomas survival 199  
Immunoglobulins for Guillain-Barre syndrome 41  
Immunohistochemical stain response, tumors 151  
Implanted electronic devices 58  
Improvement Rate of Acute Cervical Radiculopathy Without Surgery 309  
Incidence of parenchymal cerebral metastases 224  
Incidence of postoperative headache after posterior fossa surgery 422  
Incidence of Rebleed After ICH 386  
Incision placement for temporal tip access 429  
Incomplete eye closure in Bell's palsy 143  
Incomplete Spinal Cord Injury 273  
Incorrect Gertzbein classification of pedicle screw medial breach 438  
Increase in intracranial pressure due to ketamine 22  
Increased cerebral blood volume with remifentanil 21  
Increased end tidal pCO<sub>2</sub> 22  
Increased intracranial pressure (ICP) 229  
Increased mortality rate in children with shunt infection 87  
Increased TSH in SIAD diagnosis 24  
Increasing spasticity in myelomeningocele 67  
Indigo carmine 419  
Infant type hemispheric glioma 162  
Infection during pregnancy 72  
Inferior hypophysial artery occlusion 8  
Inferior mesenteric ganglion 13  
Inferior petrosal sinus sampling, Cushing's disease 211  
Inferior scapular pole 4

Infratentorial Mass 77  
 Infratentorial supracerebellar approach 181  
 Infratentorial tumors in infants 149  
 Infratentorial vs. supratentorial ependymomas outcome 169  
 Infundibular tumors, presenting symptoms 203  
 Inhalational anesthetic agents 22  
 Initial acetazolamide dosage in hydrocephalus 100  
 Initial control of bleeding in gunshot wounds 261  
 Initial dose of levetiracetam in adults 109  
 Initial management concerns after aSAH 345  
 Initial replacement time frame 25  
 Initial screening test for carotid artery stenosis 371  
 Initial symptom of spontaneous internal carotid artery dissection 378  
 iNPH Radscale components 98  
 Inter-collicular level 75  
 Inter-Collicular Transection 75  
 Intercostal block 119  
 Intercristal Line Location 441  
 Interfornical Approach 431  
 Interhemispheric Subdural Hematoma 355  
 Interictal spikes 454  
 Intermediate-acting muscle relaxant 21  
 Intermediolateral gray 13  
 Intermittent CSF leaks 96  
 Internal auditory canal (IAC) diameter 185  
 Internal auditory meatus 5  
 Internal capsule 158  
 Internal carotid artery dissection 377  
 Internal carotid artery segments 8  
 Internal cerebral vein 11  
 Internuclear ophthalmoplegia 75  
 Internuclear Ophthalmoplegia 75  
 Interspinous spacer 324  
 Interstitial brachytherapy clinical improvement rate 457  
 Interthalamic adhesions 158  
 Intervertebral disk involvement in tuberculous vertebral osteomyelitis 88  
 Intra-arterial thrombolysis 381  
 Intracerebral Hematoma in Aneurysm 354  
 Intracranial arachnoid cyst treatment 63  
 Intracranial hematoma management 254  
 Intracranial hematomas 241  
 Intracranial hemorrhage in gunshot wounds 261  
 Intracranial hemorrhage risk with heparin 267  
 Intracranial hypertension 241  
 Intracranial hypotension due to over-shunting 100  
 Intracranial hypotension in neurosarcoïdosis 41  
 Intracranial nerve sheath tumors 183  
 Intracranial pressure 250  
 Intracranial pressure (ICP) effects 28  
 Intracranial tumor location 189  
 Intractable partial epilepsy 161

Intractable temporal lobe epilepsy 105  
 Intradiskal procedure types 303  
 Intradiskal procedures 302  
 Intradural cysts 67  
 Intradural extramedullary tumors 235  
 Intramedullary AVM treatment 334  
 Intramedullary lesions (Spetzler classification) 335  
 Intramedullary spinal cord tumors 235  
 Intramedullary tumor symptoms 235  
 Intranasal DDAVP dosage for diabetes insipidus 218  
 Intraoperative brain swelling 423  
 Intraoperative brain swelling etiologies 422  
 Intraoperative complications in pituitary surgery 217  
 Intraoperative cortical mapping uses 423  
 Intraoperative cyst rupture 83  
 Intraoperative evoked potentials (EPs) monitoring 21  
 Intraoperative fluid management 217  
 Intraoperative monitoring 58  
 Intraoperative Rupture Stages 351  
 Intraparenchymal blood 54  
 Intraparenchymal hemorrhage 54  
 Intraspinal cysts, differential diagnoses 407  
 Intraspinal tumors 235  
 Intrathecal contrast agent approved 51  
 Intrathecal dye 419  
 Intravascular lymphomatosis 198  
 Intravenous dose of tissue plasminogen activator 461  
 Intravenous fluid management for diabetes insipidus 25  
 Intravenous insulin and glucose in hyperthermia 23  
 Intraventricular catheter 250  
 Intraventricular chemotherapy for PCNSL 200  
 Intraventricular Hematoma in Aneurysm 354  
 Intraventricular Hemorrhage 349  
 Intraventricular Hemorrhage Arising from Subependymal Hemorrhage 389  
 Intraventricular lesions, by location 403  
 Intraventricular or intrathecal antibiotics 87  
 Intubation 277  
 Intubation methods for transoral surgery 436  
 Invasive pituitary tumors 203  
 Invasive pituitary tumors classification 203  
 Investigation of choice for CSF fistula 95  
 Ipsilateral facial paralysis 119  
 IPV vaccination 83  
 Iris 153  
 Ischemia 241  
 Ischemic edema 13  
 Ischemic stroke 372  
 Isointense T1 lesion 187  
 IV carbamazepine 448  
 IV diazepam 448  
 IV drug abuse related backache 88  
 IV epival 448

IV levetiracetam 448  
 IV phenobarbital 448

**J**

Jackson's syndrome 15  
 Jefferson fracture 282  
 Jendrassick maneuver 125  
 Joubert's syndrome 64  
 Jugular foramen syndrome 14  
 Jugular foramen tumors 8  
 Jugular venous oxygen saturation 250  
 Juvenile myoclonic epilepsy syndrome 106  
 Juvenile spinal AVM (Type 3) 334  
 Juxtafacet cyst 322  
 Juxtafacet cyst (JFC) locations 336  
 Juxtacular meningioma vs. macroadenoma, differentiating features 401

**K**

Kakosmia and temporal lobe epilepsy 105  
 Kambin's Triangle 297  
 Karnofsky Performance Scale Descriptions 395  
 Karnofsky Performance Score for Assistance Needed 395  
 Karnofsky Performance Score for GBM Grade 4 395  
 Karnofsky Performance Score Identifying Poor Prognosis 395  
 Keen's point 5  
 Kernohan's notch phenomenon 258  
 Kernohan's phenomenon 76  
 Ketamine side effects 22  
 Ketorolac tromethamine overdose 32  
 Ki-67 expression phases 150  
 Ki-67 index 41, 158  
 Ki-67 index and XRT decision 204  
 Ki-67 index, invasive pituitary tumors 204  
 Klippel-Feil syndrome clinical features 68  
 Klippel-Feil syndrome triad 67  
 Klumke's paralysis, brachial plexus injury 135  
 Knee jerk (Westphal's sign) 302  
 Koos grading 183  
 Koos grading system 185  
 Kyphoplasty indications 289  
 Kyphosis 312

**L**

L1 dermatome 13  
 L4 dermatome 13  
 L4, L5 herniated disk root involvement 302  
 L4 radiculopathy 412  
 L5 dermatome 13  
 L5 root 125  
 Labetalol dosage adjustment 28  
 Labetalol in neurosurgery 28  
 Lacerum segment of internal carotid artery 8  
 Lacunar infarct locations 371  
 Lacunar infarct locations (repeated for emphasis) 372  
 Lambdoid CSO 63  
 Lambdoid suture 3

Lamotrigine anticonvulsant effect mechanism 109  
 Landell's classification 282  
 Langerhans cell histiocytosis common location 200  
 Langerhans cell histiocytosis skull lesions 199  
 Large bifrontal skin incision name 429  
 Largest branch of vertebral artery 9  
 Last life-saving measure for brain swelling 422  
 Late capsule 83  
 Late cerebritis 83  
 Late complications of gunshot wounds 293  
 Late complications of traumatic brain injury 268  
 Late post-traumatic epilepsy 113  
 Lateral curvature of the spine (scoliosis) 317  
 Lateral medullary syndrome (Wallenberg's syndrome) 371  
 Lateral recess syndrome 322  
 Lateral spinothalamic tract 4  
 Lateral Ventricle Approaches 431  
 Lead toxicity in gunshot wounds 261  
 Left Pterional Approach Exceptions 355  
 Left-sided approach preference 437  
 Length of survival of cancer patients 223  
 Lenke classification of AIS 320  
 Leptomeningeal cyst (growing skull fracture) 264  
 Leptomeningeal spread 161  
 Lesion localization, personality changes 149  
 Levothyroxine adverse effects 35  
 Levothyroxine component 34  
 Levothyroxine content 34  
 Levothyroxine contents 34  
 Levothyroxine initiation 35  
 Lewy bodies 41  
 Lhermitte-Duclos disease association 166  
 Lhermitte's sign 413  
 Li Fraumeni's syndrome 154  
 Lidocaine overdose reversal 460  
 Lidocaine patch 119  
 Li-Fraumeni syndrome association with brain tumors 166  
 Ligamentum flavum hypertrophy 312  
 Linear skull fractures 113, 254  
 Lipids 54  
 Lipomyelomeningocele 68  
 Lipomyeloschisis surgery 68  
 Lisch nodules 153  
 Lissencephaly 71  
 Lissencephaly as migration abnormality 71  
 Lithium in cerebral salt wasting 24  
 Liver dysfunction 385  
 LL = PI 9 degrees 326  
 Loading dose of phenobarbital in adults 108  
 Loading dose of phenytoin 110  
 Lobar Hemorrhage and Contralateral Hemiparesis 386  
 Lobar hemorrhage etiologies 385  
 Lobar Hemorrhage Etiologies 385  
 Location of choroid plexus papilloma in adults and children 174  
 Location of germ cell tumors in females 196

- Location of hormone-producing nuclei 34  
 Locked Facet Signs 284  
 LOH chromosome 22 153  
 Longitudinal fracture in head injury 254  
 Long-term omeprazole use 29  
 Loss of consciousness 241  
 Loss of parasympathetic output 75  
 Loss of sympathetic input 75  
 Low density lesion 158  
 Low levels of antiepileptic drugs 113  
 Low molecular weight heparin (LMWH) 267  
 Low posterior hairline in Klippel-Feil syndrome 67  
 Lower medulla dysfunction 75  
 Lower Medulla Dysfunction 75  
 Lower motor neuron lesion 125  
 Low-grade tumors, sellar region 202  
 Low-lying conus 67  
 Lumbar catheter CSF drainage 441  
 Lumbar lordosis correction 326  
 Lumbar lordosis (LL) and pelvic incidence (PI) harmony 317  
 Lumbar lordosis normal value 316  
 Lumbar puncture 441  
 Lumbar puncture complications 75  
 Lumbar puncture contraindications 440  
 Lumbar puncture findings in subarachnoid hemorrhage 341  
 Lumbar spinal lordosis 316  
 Lumbar spinal stenosis 322  
 Lumbar spine lordosis compared to thoracic spine 317  
 Lumbosacral nerve root type 3 anomaly 67  
 Lumbosacral plexus neuropathy, diagnosis 134  
 Lundberg A waves 250  
 Lung cancer as paraneoplastic syndrome cause 46  
 Luxol fast blue stain 150  
 Lymphoma in spinal compartments 235
- M**
- Macronia risk factors 72  
 Macular sparing, lesion locations 140  
 Maintaining euolemia 345  
 Major curve in scoliosis 319  
 Major dural sinus fractures 254  
 Major indications for surgery in empty sella syndrome 227  
 Malignancy of the skull 401  
 Malignant cerebral edema 251  
 Malignant hyperthermia 22  
 Malignant hyperthermia treatment 23  
 Malignant melanocytic nerve sheath tumors 183  
 Malignant middle cerebral artery infarction 381  
 Malignant peripheral nerve sheath tumors (MPNST) 183  
 Malignant tumors and ICH 385  
 Malignant Tumors Involving ICH 385  
 Malignant tumors of the skull 231  
 Mammosomatotroph pitNET 149  
 Mannitol therapy 252  
 Mannitol therapy 241  
 Mannitol therapy in hypotonic hyponatremia 24  
 MAPK pathway 161  
 Marble bone disease, alternate name 410  
 Marcus Gunn pupil, condition 141  
 Marfan's syndrome, vertebral hyperostosis 407  
 Marie-Fox syndrome 372  
 Markers for germ cell tumors 195  
 Markwalder neurologic grading scale for CSDH 258  
 Martin Gruber anastomosis 125  
 Mass effect in arachnoid cyst 63  
 Maternal cocaine abuse 72  
 Maternal cold exposure 72  
 Maternal drug exposure 72  
 Mature teratoma 195–196  
 Maximal annual dose limit for radiation 51  
 Maximum alveolar concentration (MAC) of anesthetic agents 22  
 Maximum current for cortical stimulation during awake craniotomy 422  
 Maximum daily dose – of aspirin 31, 461 – of levetiracetam for adults 109  
 Maximum dantrolene dose for spasticity 444  
 Maximum effect dose of topiramate for seizures 109  
 Maximum neostigmine dosage for reversal 32  
 Maximum recommended dose of valproic acid 108  
 Maximum safe recommended dose of levetiracetam per day 110  
 Mayfield head holder 420  
 McAfee classification 288  
 McDonald criteria 41  
 McGregor's baseline 54  
 McRae's line 54  
 McRae's line and basilar invagination 51  
 McRae's line and odontoid tip measurement 52  
 McRae's line for basilar invagination 51  
 McRae's line relationship with odontoid tip 52  
 MDR TB treatment duration 84  
 Mean transit time 54  
 Measures to decrease intraoperative brain swelling 423  
 Mechanical hemostasis 420  
 Medial angle for lumbar pedicle screw at L1 437  
 Medial angle of pedicle screws in lumbar spine 438  
 Medial lenticulostriate artery 10  
 Medial longitudinal fasciculus 75  
 Medial Longitudinal Fasciculus Lesion 75  
 Medial side infarction of frontal lobe 10  
 Medial Thalamic Hemorrhage 77  
 Median nerve 125  
 Median nerve anatomy 129  
 Median survival after radiotherapy in PCNSL 199  
 Medical Management of Acromegaly 214  
 Medical management of cerebral abscess 85  
 Medical management options for carotid artery stenosis 371  
 Medical team and asystole 80  
 Medically refractory posttraumatic cerebral edema 257  
 Medication for prevention of contrast reaction 52  
 Medullary lesion 75  
 Medullary Lesion 75  
 Medullary reticular formation 75  
 Medullary Reticular Formation Disinhibition 75  
 Medulloblastoma around the foramen of Luschka 176  
 Medulloblastoma associated with Gorlin syndrome 177  
 Medulloblastoma molecular genetics cluster 177  
 Medulloblastoma obstructive hydrocephalus 177  
 Medulloblastoma posterior fossa location 176  
 Medulloblastoma treatment 176  
 Medulloblastoma vs. ependymoma, differentiating features 401  
 Medulloblastoma with extensive nodularity histology 176  
 Medulloblastoma with extensive nodularity prognosis 176  
 MEK inhibitors 154  
 Melanocytic tumors and CNS germ cell tumors 195  
 Meniere's disease 143  
 Meniere's disease treatment 143  
 Meningeal melanocytoma 195  
 Meningeal melanoma 195  
 Meningeal melanomatosis 195  
 Meningioma 179, 187  
 Meningioma, EMA staining 151  
 Meningioma tumor marker 150  
 Meningioma-like features 191  
 Meningomas (intracranial) 187  
 Meningomas of CPA, clinical presentation 402  
 Meningitis after neurosurgical procedure 84  
 Meningitis CSF findings 95  
 Meningitis due to CSF fistula 95  
 Meningohypophyseal trunk 10  
 Meningothelial cells 188  
 Meralgia paresthetica vs. femoral neuropathy 129  
 Merland's subclassification of Type 4 AV fistulas 334  
 Mesenchymal, nonmeningothelial tumors 191  
 Mesial temporal lobe epilepsy 105  
 Mesial temporal lobe epilepsy with MRI findings 105  
 Mesial temporal sclerosis vs. herpes encephalitis, diagnosis 402  
 Metabolic causes of seizures 113  
 Metabolic considerations in EMG 59  
 Metabolic expenditure in comatose patients 268  
 Metal in head or neck 58  
 Metastasis to the CNS 223  
 Metastatic involvement, spine fractures, MRI 406  
 Metastatic melanoma 223  
 Metastatic small-cell tumors, neuroendocrine stains 150  
 Metastatic workup in brain metastasis patients 224  
 Metastatic workup, intracranial lesions 401  
 Methazolamide and pseudotumor cerebri 229  
 Methohexitol as an exception 21  
 Methotrexate overdosage management 198  
 Methylation profile in neurocytomas 166  
 Methylprednisolone 277  
 Metopic CSO 63  
 Meyerding grade 324  
 MGMT promoter methylation 159  
 MIB-1 index 158  
 Mib-1 41  
 Microadenomas 205  
 Microcephaly 71  
 Microcephaly causes 72  
 Microfibrillar collagen 419  
 Microsurgical Clipping 349  
 Microvascular decompression (MVD) 448  
 Midbrain lesion 75  
 Midbrain Lesion 75  
 Midbrain Pretectal Lesions 77  
 Middle cerebral artery segments 8  
 Middle column 288  
 Middle ear perfusion with gentamicin 143  
 Middle meningeal artery 4  
 Midline Shift 77  
 Midline shift definition 267  
 Midline shift in MCA infarction 381  
 Midline thoracic spine lesions 306  
 Midthoracic spine, anterior access to 437  
 Migraine equivalent 41  
 Migraine with neurologic symptoms 41  
 Mineralocorticoid activity of dexamethasone 34  
 Minor spinal injuries 288  
 Miosis, Horner syndrome 139  
 MISME syndrome 154  
 MMR vaccination 83  
 Modic classification 322  
 Modic Type I 298  
 Modified Dandy's criteria 229  
 Modified Engel and ILAE classification 455  
 Modified Engel classification 454  
 Modified Jackson classification for glomus tumor 228  
 Modified Japanese Orthopedic Association Scale 312  
 Modified Kadish grade 227  
 Modified Rankin Scale Descriptions 396  
 Modified Rankin Score for Assistance in Daily Needs 395  
 Modified Vellere grading system for hydrocephalus 83  
 Molecular genetic studies for ependymomas 170  
 Monitoring arrhythmias after aSAH 345  
 Monitoring head growth for hydrocephalus 97  
 Monomorphic cells 161  
 Monoradiculopathy 58  
 Monro-Kellie doctrine 250  
 Morbid obesity and spine surgery 326

- Mortality causes,  
  craniopharyngioma 202
- Mortality rate in aSAH 341
- Mortality risk for delayed treatment of acute bacterial meningitis 440
- Motor Examination Findings 76
- Motor findings in CSM 312
- Motor neuron disease 58
- Motor strip location 3
- Mottling of density on CT in extradural hematoma 258
- Movement disorder persistent in sleep 445
- Moyamoya disease 378
- Moyamoya disease angiographic stages 378
- Moyamoya disease radiologic signs 379
- MR perfusion 159
- MRC scale 125
- MRI characteristics of cerebral abscess 85
- MRI features of choroid plexus carcinoma 173
- MRI findings in Wernicke's encephalopathy 47
- MRI in lumbar spine diagnosis 322
- MRI Indications for Lumbosacral Spine 297
- MRI Phase of ICH Hyperintense on T1 388
- MRI radiologic sign for cavernoma 366
- MRI signal characteristics of ICH 385
- MRI spine 125
- MRI timing 277
- MRI timing post-craniotomy 151
- MRI with diffusion-weighted imaging (DWI) 376
- Multilevel T2 hyperintensity in CSM 313
- Multinodular and vacuolating neuronal tumor location 167
- Multiple ASMs on seizure control 110
- Multiple sclerosis 41  
  – internuclear ophthalmoplegia 139
- Multiple synostoses 63
- Muscle recovery timeline 125
- Muscle relaxant options for intubation 32
- Muscle relaxants for head injury intubation 32
- Muscle strength grading 125
- MYCN-amplified spinal ependymoma recurrence rate 170
- Mycotic aneurysms pathogens 358
- Myelographic Classification of Arachnoiditis 299
- Myelomeningocele 67
- Myelopathy, acquired causes of 413
- Myocardial ischemia 29
- Myoclonic status epilepticus 113
- Myoglobin release 29
- Myxopapillary ependymoma prognosis 170
- Myxopapillary ependymoma variant 171
- Myxopapillary ependymomas 235
- N**
- N9-N18 peak latency 58
- N-acetyl aspartate 54
- Naegleria fowleri treatment 90
- Naloxone reversal 45
- Narcotics in neurosurgery 22
- Nasal glioma vs. encephalocele, differentiating features 402
- Neck injury zones 292
- Neck injury zones exceptions 292
- Needle aspiration of arachnoid cyst 63
- Neisseria meningitidis 83
- Neonatal brain tumors 149
- Neoplastic ganglion and glial cells 166
- Neostigmine for muscle blockade reversal 32
- Neostigmine maximum dosage 32
- Neovascularity in abscess 83
- Nephrotoxic agents 29
- Nerve conduction studies in CTS 130
- Nerve root en passant 301
- Nerve root tension signs 301
- Nerves not to anesthetize during awake craniotomy 422
- Neural foramina 278
- Neural injury in myelomeningocele 67
- Neuralgic amyotrophy, EMG changes timeline 133
- Neurectomies 120
- Neuroanesthesia 21
- Neurocysticercosis ring enhancing lesions 90
- Neurocysticercosis treatment 90
- Neuroendoscopic ventriculocystostomy 63
- Neurofibroma 183
- Neurofibromatosis II 188
- Neurofibromatosis, spinal lesions 407
- Neurofibromatosis type 1 63
- Neurofibromatosis type 1 (NF1) 183
- Neurofibromatosis type 2 63
- Neurofibromatosis type 2 (NF2) 154
- Neurogenic claudication 322
- Neurogenic pulmonary edema management 346
- Neurogenic shock drug avoidance 28
- Neurogenic shock mechanisms 28
- Neurogenic stress cardiomyopathy management 346
- Neurohypophysis function, screening tests 212
- Neurologic Status Scores 284
- Neurological examination 277
- Neurological surgery and ETCO<sub>2</sub> 21
- Neurology for neurosurgeons 41
- Neuromonitoring during thoracic spine surgery 305
- Neurophysiology and regional brain syndromes 13
- Neurosarcoidosis 41
- Neurosurgical patients DVT risk 38
- Neurovascular disorders and neurotoxicology 45
- NF1 153
- NF1 diagnostic criteria 154
- NF2 153
- NG tube feeding and medication absorption 269
- NIH stroke scale components 375
- Nitrous oxide and pneumocephalus 21
- Nitrous oxide (N<sub>2</sub>O) in cranial surgery 22
- Nociceptive pain stimulation 452
- Nodular enhancing lesions, spinal canal, differential diagnoses 407
- Nodular enhancing lesions, spine, differential diagnoses 406
- Nonaccidental injuries (child abuse) 264
- Nonambulatory comatose patient management 26
- Nonbacterial infections 89
- Noncontrast CT scan 54
- Nonentrapment peripheral neuropathies, etiologies 134
- Nonepileptic seizures 113
- Nonfunctioning Pituitary Adenomas 213
- Nonfunctioning pituitary macroadenomas 213
- Nonfunctioning Pituitary Tumors 206
- Noninvasive seizure evaluation 454
- Non-neoplastic skull lesions 231
- Non-neoplastic thalamic lesions, pediatric and adult 402
- Nonoperative management of TICH 257
- Non-posteriorlateral approach for thoracic spine surgery 306
- Nonpulsatile exophthalmos, causes 410
- Nonspecific Low-Back Pain Bed Rest Duration 299
- Nonsurgical management of skull fractures 254
- Non-traumatic CSF fistula causes 95
- Normal anterior dentate interval measurement 51
- Normal cerebral blood flow 371
- Normal cerebral metabolic rate of oxygen 371
- Normal CSF glucose and protein levels 95
- Normal Opening Pressure during LP 441
- Normal pelvic tilt value 317
- Normal pressure hydrocephalus 98
- Normal pressure hydrocephalus (NPH) presentation 98
- Normal saline 29
- Normal saline in cerebral salt wasting 24
- NRC dose limits for radiation 51
- NSAIDs  
  – and renal toxicity 31  
  – gastrointestinal side effects 31  
  – impact on gastrointestinal health 31
- Nuclear pleomorphism and mitotic activity 227
- Nucleus locus coeruleus 13
- Null Cell Tumor 205
- Number of melanoma mets for surgical removal 224
- Nurick grade of disability 329
- Nutritional protein requirement in head trauma 268
- Nutritional replacement in head injury 267
- Nystagmus types, structural lesions 139
- O**
- Obesity 72
- Occipital condyle fractures 280
- Occipital encephalocele 63
- Occipital nerve entrapment 128
- Occipital neuralgia 129
- Occipitoatlantal injuries 280
- Occipitocervical fusion 435
- Occipitofrontal circumference measurement 72
- Occipitomastoid suture 3
- Oclusion of posterior cerebral arteries 97
- Occult brain injury risk 264
- Ocular lesions in Behcet's syndrome 45
- Ocular lymphoma radiotherapy dose 199
- Oculocephalic reflex 75–76
- Oculocephalic reflex contraindications 76
- Oculomotor 3rd Nerve Palsy 349
- Odontoid Epiphysiolyis 274
- Odontoid fractures 281
- Olfactory groove meningioma 16, 187
- Oligoclonal bands 41
- Oligodendrogioma 158
- Oligodendrogioma-like components 161
- Oliguric renal failure 28
- Olivopontocerebellar degeneration 41
- Omeprazole side effects 29
- Open carotid repair 292
- Ophthalmic artery aneurysm 355
- Ophthalmic artery branches 8
- Opioid withdrawal symptoms management 45
- Opioid withdrawal treatment 45
- Opponens pollicis 126
- Optic gliomas in NF1 163
- Optic nerve compression, early signs 210
- Optic nerve sheath fenestration 229
- Optic nerve sheath hydrops, MRI findings 140
- Optic pathway glioma 154
- Optic pathway glioma in children 163
- Optimizing cerebral blood flow 345
- Oral Anticoagulant Use After ICH 389
- Oral nimodipine administration 345
- Orbital lesion in pediatric patients 403
- Orbitomeatal line 54
- Organ donation 79
- Organ donation requirements 80
- Organ preservation physiologic aberrations 79
- Orthopedic consultation for kyphosis 68
- Osler Weber Rendu syndrome (hereditary hemorrhagic telangiectasia) 365
- Osler Weber Rendu syndrome imaging characteristics 365
- Osmotic demyelination syndrome diagnosis 26
- Ossified posterior longitudinal ligament (OPLL) 329
- Osteoblastic metastasis 235
- Osteoblastic metastasis, vertebrae 407
- Osteoblastoma 235
- Osteochondroma 235
- Osteoclast activity in Paget's disease 329
- Osteoconductive properties 419
- Osteogenesis 420
- Osteogenic sarcoma 231
- Osteoid osteoma 235
- Osteoinduction 420
- Osteolytic metastasis 235
- Osteomas in Gardner's syndrome 231
- Osteophytic spur 312

- Osteoporosis 289, 322  
Osteosarcoma 191  
Oswestry Disability Index for Bed-Bound Patients 298  
Otolithic crisis of Tumarkin 143  
Overshunting of VP shunt 101  
Oxcarbazepine side effect monitoring 108  
Oxygenation 277
- P**
- P comm aneurysm, third nerve palsy 139  
P100 absolute latency 58  
Pachy-meningeal enhancement 95  
Paget's disease, destructive spine lesions 406  
Paget's disease symptoms 329  
Pain in entrapment neuropathy 128  
Pain in tethered cord syndrome 69  
Pain management with antidepressants 32  
Pain procedures 451  
Painful diabetic neuropathy 119  
Pallidal stimulation effectiveness in dystonia 444  
Pallidotomy effectiveness in tremors 445  
Palpable skull fracture 264  
Pan-cerebellar degeneration 46  
Pan-cerebellar degeneration primary cancers 46  
Papillary craniopharyngioma 202
  - diagnostic criteria 203
  - location 202Papillary tumor of pineal region 180  
Papilledema
  - development timeline 140
  - fundoscopy findings 139
  - in pseudotumor cerebri 71
  - in pseudotumor cerebri 229
  - modified Frisen grade 139Paramedian herniated lumbar disk 301  
Paramedian suboccipital craniectomy 426  
Paraparesis 419  
Parasitic CNS infection 89  
Parasitic infections of CNS 90  
Parasympathetic Output Loss 75  
Parasympathetic stimulation 13  
Parenteral loading dose of phenytoin for adults 108  
Parietomastoid suture 3  
Parinaud's syndrome 14  
Park Bench position setup details 426  
Park Bench position thorax elevation 426  
Parkinson-dementia complex of Guam 41  
Parkinson's disease surgery 446  
Parkinson's disease surgical treatment indications 445  
Parsonage Turner syndrome, diagnostic clues 134  
Particle generation PET scan source 457  
Past surgical skull defects 58  
Pathologic differences between primary and secondary CNS lymphomas 199
- Pathologic fracture, spine etiologies 406  
Patient positions and instruments in EMG 59  
Patients with liver disease 22  
PCA contrast-enhancing mural nodule 163  
PCA (Posterior Cerebral Artery) 119  
PCA with cystic component 163  
PCNSL investigations and findings 198  
Peak cortisol production timing 34  
PECARN algorithm for pediatric CT scan 265  
Pediatric brain tumors 202  
Pediatric brain tumors 150  
Pediatric skull fractures 254  
Pediatric spine injuries 274  
Pedicle breach rates in freehand technique 437  
Pedicle subtraction 326  
Peduncular segment P1 9  
Pedunculated hamartoma 63  
Pelvic incidence 316  
Pelvic tilt 326  
Pelvic tilt angle 316  
Penetrating brain injury 113  
Penetrating neck injury complications 292  
Penicillin for Creutzfeldt-Jakob disease 89  
Percutaneous Ventricular Tap Needle Size 440  
Perfusion-weighted MRI (PWI) 54  
Periaqueductal gliosis in hydrocephalus 97  
Periarteritis nodosa (PAN) 45  
Perimedullary AVM (Type 4) 334  
Perimetry for vision assessment 229  
Perineuroma 183  
Perioperative neuropathy, commonly affected nerves 134  
Peripheral nerve regeneration rate 133  
Peripheral nervous system 125  
Peripheral neuropathic pain 119  
Peripheral neuropathy, cause 133  
Peripheral neuropathy, drugs causing 134  
Periventricular calcifications 41  
Periventricular solid enhancing lesion, most common type 403  
Permanent VP shunt placement after posterior fossa resection 177  
Peroneal nerve injury 125  
Persistent anterior circulation 10  
Persistent fetal anastomosis 9  
Persistent hyperkalemia 28  
Persistent metabolic alkalosis 28  
Persistent symptoms after minor head trauma 268  
Petroclival meningiomas blood supply 8  
PHACES syndrome, findings 401  
Phalen's test 130  
PHASES aneurysm rupture risk score components 358  
PHASES score component excluding 358  
Phenobarbital 113  
Phenylephrine use 28  
Phenytoin 113  
Phenytoin dose adjustment in renal failure 108
- Phenytoin intravenous infusion side effects 110  
Pheochromocytoma investigations 228  
pHGG RTK1, pHGG RTK2, pHGG MYCN 162  
Physical Examination Tests for Cervical Disk Herniation 309  
Physical findings in scoliosis 319  
Physiologic ADH stimulus 34  
Physiologic Corticosteroid Replacement Dose 214  
Physiologic Replacement Dose 213  
Physiologic stimulus for ADH 34  
PICA 448  
PICA Aneurysms 355  
PICA (Posterior Inferior Cerebellar Artery) 119  
PICA segments to preserve 10  
Pilocytic astrocytoma 161  
Pilocytic astrocytoma (PCA) 163  
Pilomyxoid astrocytoma (PMA) 163  
Pin Point Pupils 75  
Pin-based head fixation 420  
Pineal cyst 179  
Pineal cyst size 180  
Pineal cysts 227  
Pineal region tumors 179  
Pineal tumors and pineal region lesions 179  
Pineoblastoma 179  
Pineocytoma 180  
Ping pong fracture 264  
Pinpoint pupils 75  
Pinpoint Pupils and Ventilation 75  
Piriformis syndrome 412  
PitNET Syndromes 205  
Pitnet/adenomas clinical consideration 205  
Pitnet/adenomas general management 213  
Pitnet/adenomas surgical management 217  
Pituicytoma 202  
Pituitary adenoma, diagnostic criteria 203  
Pituitary adenoma effects on sella turcica 52  
Pituitary adenoma, endocrine hyperfunctioning 209  
Pituitary Adenoma Removal 205  
Pituitary adenoma, visual field deficits 209  
Pituitary adenoma/PitNET diagnostic criteria 203  
Pituitary Apoplexy 205  
Pituitary carcinoma management 203  
Pituitary hormone synthesis locations 34  
Pituitary protocol MRI 55  
Pituitary pseudotumor, causes 401  
Pituitary Tumor Incidence 206  
Pituitary tumor metastasis 203  
Pituitary Tumors 205  
Pituitary tumors evaluation 209  
Pituitary tumors, GH secretion 149  
Plagiocephaly 63  
Plain radiology and contrast agents 51  
Plantar reflex 13  
Plasma exchange for acute transverse myelitis 41  
Platelet count for stereotactic brain biopsy 444  
Platelet storage duration 37
- Platelet transfusion indications 38  
Platelet transfusion indications exceptions 38  
Pleomorphic xanthoastrocytoma 164  
Plexopathy 58  
Pneumocephalus 54  
Pneumococcal meningitis in CSF fistula 95  
Pneumococcal polysaccharide vaccine (PPSV23) 83  
Pneumococcal vaccination 83  
Pneumococcal vaccination recommendations 83  
Pneumorrhachis surgical indications 330  
Polka-dot sign 191  
Polymorphous low-grade neuroepithelial tumor 161  
Polymyalgia rheumatica (PMR) 45  
Polymyalgia rheumatica (PMR) diagnosis 46  
Pons dysfunction 75  
Pons Dysfunction 75  
Pontine Lesion 77  
Pontine lesions 161  
Pontine reticular formation 75  
Pontine Reticular Formation Disinhibition 75  
Poor prognosticators of medulloblastoma 176  
Porencephaly 71  
Porus acusticus 4  
Position of head for pterional craniotomy 428  
Positional plagiocephaly 63  
Positive inotropic effect of dopamine 28  
Post herpetic neuralgia 119  
Postconcussive syndrome 246  
Postcordotomy complications 451  
Posterior approach indications in cervical spine surgery 313  
Posterior cerebral artery segment 8  
Posterior Cervical Decompression 309  
Posterior column 288  
Posterior communicating arteries evaluation 460  
Posterior cord injury vs. radial nerve injury 129  
Posterior decompression 334  
Posterior fossa ependymoma characteristics 169  
Posterior fossa ependymoma prognosis 169  
Posterior fossa group B ependymoma invasion 170  
Posterior Fossa Mass 77  
Posterior hard palate line measurement 51  
Posterior hard palate to foramen magnum margin 51  
Posterior inferior cerebellar artery (PICA) 10  
Posterior Keyhole Laminotomy Indications 309  
Posterior lumbar disk herniation 302  
Posterior pituitary hormone synthesis 34  
Posterior plagiocephaly 63  
Posterior reversible encephalopathy syndrome (PRES) 45  
Posterior reversible encephalopathy syndrome (PRES) associated conditions 46

- Posterior Spinal Syndrome 275  
 Posterolateral approach for thoracic spine surgery 305  
 Post-Lumbar Puncture Headache Factors 440  
 Postneurulation defects 71  
 Postoperative 5-year survival rate 181  
 Postoperative care for PLIF or TLIF or ALIF 438  
 Postoperative complications of carotid endarterectomy 375  
 Postoperative complications of pituitary surgery 217  
 Postoperative diskitis 87  
 Postoperative hemorrhage risk and types of hematomas 423  
 Postoperative management for seizure surgery 455  
 Postoperative medications after craniotomy for brain tumor 423  
 Postoperative MRI for vestibular schwannoma 185  
 Postoperative paralysis cause 38  
 Postoperative radiotherapy for PCA 163  
 Postoperative radiotherapy role 169  
 Postoperative steroid dosage 35  
 Postoperative steroid dose 35  
 Postoperative TIA and seizures 375  
 Postoperative ventriculo-subdural collection 174  
 Post-pituitary surgery diabetes insipidus diagnosis 26  
 Post-surgery MRI follow-up 454  
 Post-traumatic conductive hearing loss 246  
 Post-traumatic leptomeningeal cyst 264  
 Post-traumatic meningitis vaccination 83  
 Post-traumatic seizures 114  
 Pott's disease 88  
 Power's ratio 280  
 Practice guidelines for asymptomatic carotid stenosis 372  
 Precautions with Precedex (Dexmedetomidine) 32  
 Precentral gyrus 3  
 Precocious puberty and HH 63  
 Predictors of poor outcome in metastatic melanoma 223  
 Predilection of herpes simplex encephalitis 89  
 Prednisolone in Bell's palsy 143  
 Preferred Approach for 3rd Ventricle Tumors with Hydrocephalus 431  
 Preferred Surgical Approach for Large ACoA Aneurysm 355  
 Pregeniculate vs. postgeniculate blindness 97  
 Prenatal folic acid deficiency 72  
 Preoperative angiography indications 261  
 Preoperative embolization 191  
 Preoperative requirements for transoral odontoidectomy 434  
 Preoperative tumor size 158  
 Presentation in early childhood 162  
 Pre-surgical management of myelomeningocele 68  
 Pre-surgical management steps for myelomeningocele 68  
 Pre-terminal breathing patterns 75  
 Pre-terminal Breathing Patterns 75  
 Previous stroke risk factor 385  
 Primary approved intrathecal contrast agent 51  
 Primary bone tumor of the calvaria 232  
 Primary brain injury 241  
 Primary CNS melanocytic tumors vs. melanotic nerve sheath tumors 196  
 Primary CNS tumor with extraneural spread 224  
 Primary craniospinal anomalies 71  
 Primary diffuse large B-cell lymphoma of CNS 198  
 Primary injury from gunshot wound of head 261  
 Primary intra-axial brain tumors 158  
 Primary intracranial anomalies 63  
 Primary malignant tumor of clivus 232  
 Primary motor cortex 3  
 Primary ossification centers in axis 51  
 Primary ossification centers in C2 at birth 51  
 Primary otalgia 119  
 Primary spinal developmental anomalies 67  
 Procainamide and diuretics 23  
 Procarbazine, CCNU, and vincristine therapy 151  
 Procedure for collapsed ventricles post-VP shunt 101  
 Prognosis of choroid plexus carcinoma 173  
 Prognostic factors in gliomas 158  
 Progressive upward deviation in hydrocephalus 97  
 Prolactin levels, pituitary tumor 209  
 Prolactin levels, pregnancy 210  
 Prolactin Secretion 206  
 Prolactinomas 205, 213  
 Prominent arteries in petroclival meningioma 10  
 Pronator teres syndrome vs. carpal tunnel syndrome 128  
 Prophylactic antiepileptic drugs 113  
 Prophylactic antiseizure medication (ASM) 151  
 Prophylactic antiseizure medications 345  
 Prophylactic antiseizure medications (ASMs) 242  
 Propofol characteristics 22  
 Propofol dosage for sedation 31  
 Propofol infusion reactions 31  
 Propofol infusion syndrome 31  
 Propofol infusion syndrome symptoms 31  
 Propofol maximum dose 31  
 Propofol neuroprotectant 31  
 Propofol neuroprotective effects 31  
 Propofol overdose effects 31  
 Propofol sedation properties 32  
 Protein percentage in daily caloric intake 267  
 Proteins 150, 41  
 Proton beam therapy 192  
 Psammoma bodies 41, 186  
 Pseudoaneurysm Denver grade 248  
 Pseudohydrocephalus conditions 97  
 Pseudoprogression 159  
 Pseudospread of Atlas 274  
 Pseudotumor cerebri, intracranial mass in 229  
 Pseudotumor cerebri syndrome 229  
 Psychogenic seizures 113  
 PT less than 20 degrees 326  
 Pterion 5  
 Pterional craniotomy 428  
 Pterional craniotomy 354  
 Pterional craniotomy for anterior circulation aneurysms 428  
 Pulmonary edema 28  
 Pulmonary embolism diagnosis test 37  
 Pulsatile tinnitus, diagnostic investigations 409  
 Pupil examination in coma 77  
 Pupil sparing ptosis, etiologies 410  
 Pupillary dilation 241  
 Pupillary light reflex, neural pathways 141  
 Pupillodilator muscle, sympathetic fibers 141  
 Pupil-sparing oculomotor palsy, causes 139  
 Pure motor hemiparesis lacune 372  
 Pure motor hemiplegia 412  
 Putaminal hemorrhage source 386
- Q**
- Quadriplegia 419  
 Quantitative glucose test for CSF 95
- R**
- Radial nerve 125  
 Radial nerve injury 125  
 Radiation dose to fetus 55  
 Radiation exposure distance recommendation 51  
 Radiation myopathy 458  
 Radiation necrosis 458  
 Radicular pain and tumor biopsy 306  
 Radicular pain in schwannomas 236  
 Radiculopathy 297  
 Radiculopathy Evaluation 308  
 Radiculopathy in neurosarcoïdosis 41  
 Radiculopathy Mimicking Carpal Tunnel Syndrome 309  
 Radiofrequency lesioning temperature 445  
 Radiofrequency rhizotomy 448  
 Radiographic imaging 278  
 Radiologic criteria for hydrocephalus diagnosis 97  
 Radiosensitive CNS tumors 457–458  
 Radiotherapy
  - dose for spinal drop mets 170
  - dose to tumor bed 170
  - for acute transverse myelitis 41
  - for ALS 41
  - for brain tumors 166
  - in posterior fossa ependymoma 169
  - indications 189
 Raised intracranial pressure (ICP) 164  
 Raised opening pressure 41  
 Ramsay Hunt syndrome 119  
 Ranawat classification in rheumatoid arthritis 329  
 Ranchos Los Amigos Cognitive Scale Levels 396  
 Ranchos Los Amigos Cognitive Score for Automatic-Appropriate 395  
 Ranchos Los Amigos Cognitive Score for Familiar Environment 395
- Ranchos Los Amigos Scale for Head Injury 395  
 Range of motion reduction after occipitocervical fusion 434  
 RASS agitation and sedation scores 31  
 Rathke's cleft cyst recurrence factors 227  
 Rathke's pouch 202  
 Rathke's pouch, craniopharyngiomas 202  
 Reactive osteoblastic activity 329  
 Reasons for a vascular lesion being angiographically cryptic 366  
 Rebleed incidence post-ICH 386  
 Rebleeding after SAH 346  
 Rebleeding risk in aSAH 341  
 Reconstruction of the skull 254  
 Recreational lawn darts injuries 264  
 Recurrent artery of Heubner origin 10  
 Recurrent brain metastases in SCLC 224  
 Recurrent Disk Herniation Treatment 299  
 Recurrent subdural hygroma 259  
 Reducing cerebral oxygen delivery 345  
 Reduction of NSAIDs gastrointestinal side effects 31  
 Reflexes absent 125  
 Reflex-mediated syncope, vasovagal, Valsalva 409  
 Refractory intracranial hypertension 257  
 Rehabilitation time post-commissural resection 455  
 Reid's baseline 3  
 Re-implantation Timing After Stroke 432  
 Relapsing ocular lesions 45  
 Relapsing oral ulcers 45  
 Remifentanil effects 21  
 Remifentanil for sedation 32  
 Removal of foreign body in nonmissile injuries 261  
 Removal of posterior rib and transverse process 305  
 Renal cell carcinoma in VHL 155  
 Renal damage 29  
 Renal failure and hyponatremia 24  
 Renal failure dose adjustment 28  
 Renal profile monitoring in ICU after aneurysm clipping 347  
 Repeat angiography recommendations for unknown etiology SAH 359  
 Repeat angiography timing after initial negative 359  
 Rescue drug for methotrexate chemotherapy in PCNSL 200  
 Residual Motor or Sensory Function 273  
 Residual tumor volume 158  
 Respiratory depression from analgesic overdose 32  
 Retroclival hematoma 265  
 Retrolabyrinthine approach for SVN 144  
 Retrobulbar part 4  
 Retroperitoneal hematoma, femoral neuropathy cause 133  
 Retropharyngeal space 277  
 Retrosigmoid approach 185  
 Return-to-play progression scale 247  
 Revascularization for moyamoya disease 379

- Revascularization procedures for moyamoya disease 379  
 Reversal of aspirin 460  
 Reversal of heparin 461  
 Reversal of tissue plasminogen activator 461  
 Rexed lamina 4  
 Rexed lamina IX 13  
 Rhabdomyolysis management 29  
 Rhabdomyolysis treatment 28  
 Rib removal for T4,T5 disk access 305  
 Rib removal for T6 access in costotransversectomy 306  
 Richmond agitation, sedation scale 31  
 Richmond scale score for calm patient 31  
 Right superior quadrantanopsia 149  
 Right-sided thoracotomy 437  
 Riley-Day syndrome 41  
 Ring enhancing lesions in neurocysticercosis 90  
 Ring-enhancing lesions 403  
 Ringer lactate 29  
 Risser staging 319  
 Risser system grading 320  
 Rivaroxaban monitoring 37  
 Rivaroxaban routine monitoring 37  
 Rocuronium 21  
 Rocuronium for intubation 32  
 Rosenthal fibers 163  
 Rosette forming glioneuronal tumor 166  
 Rotatory atlantoaxial subluxation 280  
 Roussouly classification of lumbar lordosis 317  
 Rubrospinal tract 4  
 Rule of Spence for transverse atlantal ligament disruption 52  
 Rupture of Anterior Communicating Artery Aneurysm 354
- S**
- S1 dermatome 13  
 S2 dermatome 13  
 Saccular Aneurysms 349  
 Sacral agenesis, Type 2 406  
 Sacral agenesis, types 407  
 Sacral ala 420  
 Sacral fractures 289  
 Sacral neoplasm 406–407  
 Sacral plexus lesions 412  
 Sacral slope 316  
 Sacral sparing 273  
 Sacroiliitis hip motion test 302  
 Sacrum in surgical fusion 320  
 Safe management options for SAH during pregnancy 343  
 Safe resection distance from temporal tip in dominant hemisphere 428  
 Sagging brain in SIH 95  
 Sagittal CSO 63  
 Sagittal modifiers 326  
 Sagittal vertical axis 316  
 Salt restriction in Meniere's disease 143  
 SCA 448  
 Scalp hematoma 264  
 Scheuermann's kyphosis 329  
 Schizencephaly 71  
 Schmidt's syndrome 15  
 Schober test 330  
 Schwab grade 3 surgical osteotomy 326  
 Schwannoma classification 235  
 Schwannomas 155, 183  
 Schwannomatosis diagnostic criteria 153  
 Sciatica 412  
 SCM type 1 67  
 Scoliosis 319  
 Scoliosis definition 316  
 Scoliosis in myelomeningocele patients 67  
 Screening for Acromegaly 206  
 Screening Protocol for APKD 350  
 Screws used for atlanto-occipital transarticular fusion 434  
 Seat belt fracture 288  
 Second impact syndrome 246  
 Second indicated drug if carbamazepine therapy is ineffective 110  
 Secondary adrenal insufficiency therapy 35  
 Secondary Amenorrhea 206  
 Secondary brain injury 241  
 Secondary empty sella syndrome causes 228  
 Secondary injury in gunshot wounds of head 261  
 Secondary pseudotumor cerebri 229  
 Sedation score 31  
 Sedatives and paralytics 241  
 Sedatives, paralytics, and analgesics 31  
 See-saw nystagmus 139  
 See-saw nystagmus, diencephalon lesion 139  
 Segments of middle cerebral artery 10  
 Segments of vertebral artery 10  
 Seizure history 158  
 Seizure in young child 161  
 Seizure management 113  
 Seizure risk in AVMs 363  
 Seizure surgery risks 455  
 Seizure surgery techniques 454  
 Seizure with shock-like jerks and generalized EEG discharges 105  
 Seizures in pediatric patients 166  
 Selective amygdalohippocampectomy approaches 455  
 Selective vestibular neurectomy approaches 144  
 Sella turcica changes due to pituitary adenoma 52  
 Sellar region tumors 202  
 Sensation in LEs with Cervical Injury 273  
 Sensorineural hearing loss 143  
 Sensory disturbance in CSM 312  
 Sensory nerve action potential (SNAP) 58  
 Separation of lateral ventricles 63  
 Sequence of anesthesia in awake craniotomy 424  
 Serial LP drainage for Guillain-Barre syndrome 41  
 Serum sodium level in SIAD vs. CSW 24  
 Serviceable hearing preservation 185  
 Sessile hamartoma 63  
 Setting sun sign associated condition 100  
 Severe hyponatremia sodium level 24  
 Severe hyponatremia symptoms 26  
 Severe malnutrition 72  
 Severe vasospasm Lindegaard ratio 347  
 Shaken baby syndrome 264  
 Shaken baby syndrome findings 265  
 Sheehan's necrosis 8  
 SHH activated, TP53 mutant medulloblastoma 176  
 SHH activated, TP53 wild type medulloblastoma 176  
 Shingling of laminae 312  
 Shock 277  
 Short half-life of propofol 22  
 Short tau inversion recovery (STIR) 55  
 Shortened neck in Klippel-Feil syndrome 68  
 Short-term symptoms of intracranial hypotension 100  
 Shunt function and repair indications 98  
 Shunt infection 87  
 Shunt insertion in MMC patients 87  
 Shunt malfunction 100–101  
 Shunt malfunction 100  
 Shunt placement criteria for hydrocephalus 267  
 Shunt valve pressure dots 100  
 Shunt valve pressure indication 100  
 Shunting of arachnoid cyst 63  
 Shy-Drager syndrome 41  
 SIAD and brain tumors 25  
 SIAD and CNS infection 25  
 SIAD and head trauma 25  
 SIAD and subarachnoid hemorrhage 25  
 SIAD diagnostic criteria 24  
 SIAD treatment correction limit 24  
 SIADH causes 25  
 SIADH diagnosis 25  
 SIADH ICU admission 26  
 SIADH treatment options 26  
 SIADH vs. CSW differentiation 24  
 Side effects of long-term steroids 35  
 Side effects of prolonged steroid use 35  
 Side effects of spinal radiation 458  
 Side effects of Thiopental 31  
 Simmond's Cachexia 207  
 Simpson grading system 188  
 Sindou grading system 187  
 Sitting position advantages for posterior fossa craniotomies 426  
 Skin incision for small craniectomy in temporal region 428  
 Skull block injection regions during awake craniotomy 422  
 Skull fracture surgery 254  
 Skull infection with edema and swelling 87  
 Skull, spine, and postsurgical infections 87  
 SLIC Classification 284  
 SLIC Score Calculation 285  
 Small artery injury phase 458  
 Small cell lung cancer management 223  
 Smallest screw diameter for smaller pedicles 437  
 Sodium homeostasis and osmolality 24  
 Soft tissue injury in gunshot wounds 261  
 Soft tissue injury signs 278  
 Solitary fibrous tumor 192  
 Solitary intraparenchymal lesion, differential diagnosis, adult posterior fossa 401  
 Solitary lesion in posterior fossa 223  
 Solute ratio in SIAD 24  
 Somatic tissue line differentiation in teratomas 195  
 Somatosensory evoked potential (SSEP) 58  
 Somatostatin Analog Therapy 213  
 Source of cerebral metastases in adults 224  
 Source of Hypercortisolism 206  
 Sources of cerebral metastasis in pediatric patients 223  
 Space-occupying lesions (SOL) 166  
 Spear Tackler's Spine 274  
 Special seizure consideration 113  
 Spence's rule for TAL disruption 52  
 Spetzler Martin AVM grading system 363  
 Sphenoid wing meningiomas 187  
 Spinal arachnoid cysts 68  
 Spinal canal anterior margin on X-ray 52  
 Spinal chordoma 191  
 Spinal cord discharges post-brain death 79  
 Spinal cord injury 277  
 Spinal cord injury and autonomic hyperreflexia 293  
 Spinal cord reflexes 273  
 Spinal cord stimulation 120, 451  
 Spinal cord stimulation 452  
 Spinal curvature between L1 and L5 316  
 Spinal dermal sinus characteristics 68  
 Spinal ependymoma imaging characteristics 169  
 Spinal ependymoma location and characteristics 169  
 Spinal epidural mass 412  
 Spinal glomus AVM (Type 2) 334  
 Spinal Infection 297  
 Spinal intradural meningeal cysts (Type III) 335  
 Spinal neuroenteric cyst 67  
 Spinal region most affected by myelomeningocele 67  
 Spinal Shock 273  
 Spinal shock from penetrating injury 292  
 Spine immobilization 277  
 Spiral groove 125  
 Split cord malformation 69  
 Split cord malformation (SCM) types 69  
 Spondylolisthesis 322  
 Spondyloptosis 324  
 Spontaneous CSF fistula sites 95  
 Spontaneous CSF leaks causes 96  
 Spontaneous extrusion of thrombus 375  
 Spontaneous ICA dissections 378  
 Spontaneous ICH in Young Adults 389  
 Spontaneous intracerebral hemorrhage risk factors 385  
 Spontaneous Intracerebral Hemorrhage Risk Factors 385  
 Spontaneous intracranial dissection sites 377  
 Spontaneous posterior fossa fistula sites 95

- Spontaneous resolution of external hydrocephalus 97  
 Spontaneous Thrombosis of Aneurysm 350  
 SRS dose for hearing preservation 457  
 SRS dose for metastatic brain lesion 457  
 SRS dose for secretory pituitary tumors 457  
 SRS-Schwab classification 326  
 Staging studies for primary lung cancer 223  
 Stagnara wake up test 59  
 Standard whole-brain radiation dose for PCNSL 199  
 Staphylococcus aureus in epidural abscess 88  
 Staphylococcus epidermidis 87  
 STAT6 nuclear expression 191  
 Status epilepticus 113  
 Status trigeminus 448  
 Stellate microglia 41  
 Stenosis of cervical spinal canal 52  
 Steps in transsphenoidal surgery 217  
 Steps to reduce tension pneumocephalus 22  
 Stereotactic biopsy 179  
 Stereotactic mesencephalotomy 451  
 Stereotactic radiosurgery 155, 458  
 Stereotactic radiosurgery complications 445  
 Stereotactic radiosurgery for HH 63  
 Stereotactic radiosurgery (SRS) 448  
 Stereotactic surgery indications 445  
 Sterilization procedure for Creutzfeldt-Jakob disease 90  
 Steroid dose following surgery 35  
 Steroid side effects 35  
 Steroid stress dose postoperative 35  
 Steroid treatment 45  
 Steroid treatment timing in Bell's palsy 143  
 Steroid use side effects 35  
 Steroid withdrawal 35  
 Steroid withdrawal symptoms 35  
 Steroids and pseudotumor cerebri 229  
 Steroids for Behcet's disease 46  
 Steroids for Guillain-Barre syndrome 41  
 Stewart classification for ulnar nerve injury 130  
 Stimuli for ADH release 34  
 Striate body (basal ganglia) hemorrhage 385  
 String of pearls appearance 45  
 Stroke 371  
 Stroke density changes on imaging 375  
 Stroke in young adults 371  
 Structures to preserve with occipital condyle screws 435  
 Study of choice for cavernous malformation 365  
 Stupp regimen 159  
 Sturge-Weber syndrome 156  
 Subacute progressive ascending myelopathy (SPAM) 293  
 Subacute sclerosing panencephalitis EEG 58  
 Subarachnoid hemorrhage 54, 342  
 Subarachnoid seeding 158  
 Subclavian artery branches 9  
 Subdural Collection Drainage Taps 440  
 Subdural empyema 85  
 Subdural hematoma in infants 258  
 Subependymal giant cell astrocytoma 164  
 Subependymal giant cell astrocytoma (SEGA) 153  
 Subependymomas location 170  
 Subfalcine herniation 75  
 Subfalcine Herniation 75  
 Subgaleal hematoma 264  
 Subluxation 312  
 Suboccipital craniectomies 427  
 Suboccipital craniectomy 71, 381  
 Suboccipital craniectomy with dural patch grafting 71  
 Suboccipital pseudomeningocele 427  
 Subperiosteal hematoma treatment 264  
 Substantia gelatinosa 4  
 Subtemporal vs. Pterional Approach for Basilar Tip Aneurysms 354  
 Success of cordotomy 451  
 Succinylcholine action duration 31  
 Succinylcholine duration of action 31  
 Succinylcholine onset and duration 31  
 Succinylcholine spontaneous recovery 31  
 Succinylcholine-induced hyperthermia 23  
 Sudden-onset blindness 41  
 Suffix NOS (not otherwise specified) 149  
 Suitable sedative for percutaneous rhizotomy 32  
 Sunderland system, incorrect statement 134  
 Sunderland system, neurotmesis classification 133  
 Superficial wound infection rate 302  
 Superior cerebellar artery (SCA) 10  
 Superior cerebral artery 119  
 Superior longitudinal fasciculus 54  
 Superior orbital fissure syndrome, nerve involvement 139  
 Superior temporal line 3  
 Supracallosal segment 8  
 Suprasellar arachnoid cyst treatment 63  
 Supraspinal lesion 14  
 Supratentorial ependymoma location 169  
 Supratentorial ependymomas 169  
 Supratentorial Herniation 77  
 Supratentorial location of PCNSL 199  
 Supratentorial tumors in children 149  
 Sural Nerve Biopsy Differentiation 440  
 Surface and cavity cooling in treatment 23  
 Surgery for acute transverse myelitis 41  
 Surgery for ALS 41  
 Surgery vs. radiation treatment for AVM 363  
 Surgical approach  
 – for distal AComA aneurysms 354  
 – for posteriorly located tumor 305  
 Surgical approaches  
 – for AComA aneurysm 354  
 – for pituitary adenomas 217  
 – for thoracic disks 305  
 Surgical closure of myelomeningocele 67  
 Surgical excision grading 189  
 Surgical exploration for neck injuries 292  
 Surgical fusion goals in scoliosis 320  
 Surgical goals for hydrocephalus management 101  
 Surgical gold standard for aneurysm 349  
 Surgical intervention for carotid occlusion 381  
 Surgical management of cavernous malformations 366  
 Surgical management (SLIC Score) 284–285  
 Surgical mortality 179  
 Surgical options for c1,c2 fusion 436  
 Surgical options for CSDH 258  
 Surgical removal in rhabdomyolysis 29  
 Surgical resection for spinal arachnoid cyst 68  
 Surgical timing  
 – for cauda equina syndrome 301  
 – in pituitary apoplexy 206  
 Suture line characteristics 254  
 Sylvian fissure danger point in temporal craniotomy 428  
 Sylvian fissure line 3  
 Symmetric jerking 105  
 Sympathetic block 119  
 Sympathetic cell bodies 13  
 Sympathetic dystrophy 120  
 Sympathetic innervation, pupillodilator pathway 141  
 Sympathetic Input Loss 75  
 Symptomatic filum terminale lipoma 68  
 Symptomatic vasospasm with Fisher grade 2 346  
 Synaptophysin expression in tumors 166  
 Syncope 409–410  
 Syringohydromyelia 71  
 Syringomyelia diagnosis 334  
 Syringomyelia secondary to tuberculous meningitis 336  
 Syrinx formation causes 334  
 Syrinx in myelomeningocele patients 67  
 Syrinx treatment options 335  
 System for upper respiratory tract carcinomas 227  
 Systemic diseases and neuropathy 128  
 Systemic necrotizing vasculitis treatment 45
- T**
- T1 low signal in vertebral bodies 88  
 T1WI 54  
 T1WI and T2WI MRI in brain tumors 166  
 T1WI MRI 55  
 T2 increased intensity in vertebral bodies 88  
 T2WI MRI 55  
 T2WI signal abnormality 158  
 Tapering antiseizure medication 113  
 Tapia syndrome 15  
 TB meningitis 83  
 TCMEP contraindications 58  
 Teardrop Fracture Characteristics 284  
 Teardrop Fracture Mechanism 285  
 Technetium 99m-HDP 54  
 Tectal beaking 71  
 Tectal glioma 164  
 Tectorial membrane 4  
 Telovelar vs. transvermian approach to the 4th ventricle 427  
 Temporal artery biopsy, for diagnosis 45  
 Temporal craniotomy 429  
 Temporal headache 46  
 Temporal horn approach 431  
 Temporal lobe  
 – edema in herpes simplex encephalitis 89  
 – involvement in herpes simplex encephalitis 89  
 – lesions 166  
 – resection effects 454  
 – tumor commonality 166  
 Temporary clips in aneurysm surgery 350  
 Tension pneumocephalus 21  
 Tentorial herniation stages 75  
 Teriparatide for osteoporotic bone 327  
 Terson syndrome in subarachnoid hemorrhage 342  
 Testing C4 muscles 58  
 Testing C5 muscles 58  
 Testing C6 muscles 58  
 Testing C7 muscles 58  
 Testing C8 muscles 58  
 Testosterone Replacement 213  
 Tetanus toxoid 83  
 Tethered cord symptoms 67  
 Tethered cord syndrome presentation 69  
 Thalamostriate vein 11  
 Thalassemia major treatment options 39  
 Thallium, drug-induced neuropathy exception 133  
 Therapeutic level of valproic acid 108  
 Theta frequency 58  
 Thiamine deficiency 45  
 Thiamine for Wernicke's encephalopathy 47  
 Thiopental dose-related respiratory depression 31  
 Thioipental myocardial depression 31  
 Third nerve palsy, aneurysm causes 139  
 Third ventricle approach and hydrocephalus 227  
 Third ventricle floor opening locations 440  
 Third ventricle length 3  
 Thoracic disk herniation 305  
 Thoracic disk herniations 306  
 Thoracic kyphosis normal value 316  
 Thoracic screw length 438  
 Thoracic screw placement 438  
 Thoracolumbar spine fractures 288  
 Thorax Elevation for Transcallosal Approach 431  
 Three dots on shunt valve X-ray representation 100  
 Thrombus management 375  
 Thyroid hormone content in levothyroxine 34  
 Thyroid hormone replacement duration 218  
 Thyroid Replacement 213  
 Tic convulsif 120, 448  
 TICH 257

Time limit for surgical closure 67  
 Time to peak 54  
 Time window for tissue plasminogen activator 375  
 Tissue plasminogen activator 376  
 Tissue plasminogen activator (alteplase) 375  
 Titanium Alloy Spine Fusion Cable  
     Tension 441  
 TLICS score 288  
 TLSO bracing 320  
 Tonsillar Herniation 75  
 Topiramate for pseudotumor cerebri 229  
 Total internal carotid artery occlusion 381  
 Total intravenous anesthesia 21  
 Total speech arrest stimulation area in nondominant hemisphere 422  
 Toxoplasma gondii in AIDS 83  
 TP53 mutation 154, 158  
 Traction 278  
 Traction endpoints 285  
 Tramadol overdose effects 32  
 Transarterial embolization for carotid cavernous fistula 460  
 Transcallosal approach 181  
 Transcallosal approach indications 432  
 Transcallosal craniotomy parameters 431  
 Transient ischemic attack (TIA) 371, 409  
 Transient neurologic deficit, causes 410  
 Transoral approach mouth opening requirement 434  
 Transplant team participation 80  
 Transsphenoidal surgery preparation 217  
 Transtentorial herniation 257  
 Transthoracic approach advantages 305  
 Transthoracic approach for thoracic disk disease 305  
 Transverse atlantal ligament (TAL) 6, 52, 406  
 Transverse lesion syndrome 312  
 Transverse myelitis 58  
 Trauma anticoagulation contraindications 247  
 Traumatic aneurysm locations 262  
 Traumatic aneurysms 358  
 Traumatic brain injury 252  
 Traumatic herniated lumbar disk 58  
 Traumatic risk factors for BCVI 248  
 Traumatic subarachnoid hemorrhage 243  
 Traversing nerve root 301  
 Traynelis classification 280  
 TRH stimulation test, cortisol levels 209  
 Triad of symptoms (multiple cranial nerve palsies, long tract signs, ataxia) 161  
 Triangular space of Parkinson 9  
 Triceps involvement in radial nerve injury 129  
 Tricyclic antidepressants 119  
 Tricyclic antidepressants, for pain 32  
 Trigeminal neuralgia 119  
 Trigeminal neuralgia management 120  
 Trigeminal neuralgia (TGN) 448

- immediate pain relief procedures 446  
 Trigone of Lateral Ventricle Approaches 431  
 Triple H therapy/hyperdynamic augmentation 347  
 True statements about spinal X-rays 52  
 Tuber cinereum 13  
 Tuberculum sellae meningioma 187  
 Tuberous sclerosis 155  
 Tuberous sclerosis association 164  
 Tuberous sclerosis complex (TSC) 153  
 Tumor headache etiology 150  
 Tumor markers 180  
 Tumor passing from posterior fossa to middle fossa, differential diagnosis 401  
 Tumor recurrence, craniopharyngioma 202  
 Tumor-related seizures 113  
 Tumors, cysts, and tumor-like lesions 227  
 Tumors of the sellar region 202  
 TURP syndrome and hyponatremia 24  
 Two hemicords in SCM type 1 67  
 Type 1 Dural AVM 334  
 Tyrosine kinase abnormality 162

**U**

Ulnar nerve entrapment sites 130  
 Ulnar nerve injury classification 128  
 Ultrasound for spinal dermal sinus 68  
 UMN vs. LMN paralysis 126  
 Uncal herniation 75  
 Uncinate fasciculus 158  
 Uniform entry point for freehand pedicle screw placement 438  
 Unilateral facial nerve palsy 41  
 Unilateral functional weakness test 302  
 Unilateral pain 451  
 Unilateral papilledema, causes 140  
 Unilateral proptosis, most common cause 409  
 Unopposed sympathetic input 75  
 Unruptured aneurysms 358  
 Unruptured aneurysms risk factors 358  
 Upward bowing of corpus callosum in chronic hydrocephalus 97  
 Upward gaze palsy in neurology 100  
 Upward gaze palsy or setting sun sign 100  
 Urinary hydroxyproline 329  
 Urinary retention 301  
 Urinary sodium level in SIAD vs. CSW 24  
 Urinary specific gravity in diabetes insipidus 218  
 Urinary urgency in CSM 312  
 Use of paralytics in anesthesia 22  
 Use of postoperative X-rays after fixation and fusion 438  
 Use of valproic acid 72  
 Usual target dosage of gabapentin 109

**V**

V peak latency 58  
 V1 prevertebral segment 9

V3 neuralgia 448  
 VA Catheter Tip Placement in Children 440  
 VA ligation prerequisites 292  
 Valproic acid 113  
 Vancomycin dosing 83  
 Vancomycin in intrathecal treatment 87  
 Variably cellular tumor 191  
 Varicella zoster 83  
 Vascular anatomy 8  
 Vascular event 113  
 Vasogenic edema 13  
 Vasopressin receptor antagonists in cerebral salt wasting 24  
 Vasospasm 241  
 VDRL test in Meniere's disease 143  
 Vein of Galen 179  
 Vein of Trolard 9  
 Venous capacitance vessels 28  
 Venous Infarction in Interhemispheric Approach 432  
 Ventilator-dependent patient 80  
 Ventral cerebellar tonsil herniation 71  
 Ventricular catheter insertion trajectory from Kocher's point 440  
 Ventricular catheter length from Frazier Burr Hole 440  
 Ventriculomegaly in pseudotumor cerebri 229  
 Ventriculoperitoneal shunt 63  
 Ventriculoperitoneal shunt repair and removal 98  
 Ventriculostomy exacerbation 77  
 Ventriculostomy indications 386  
 Vertebra plana, criteria 406  
 Vertebral artery segments 9  
 Vertebral body and intervertebral disk involvement 88  
 Vertebral body involvement in Pott's disease 88  
 Vertebral hemangioma 235  
 Vertebral hyperostosis, causes 407  
 Vertebral osteomyelitis with edema 87  
 Vertebral Paget disease 412  
 Vertebrobasilar system 8  
 Vertical pars fracture 282  
 Vessel groove characteristics 254  
 Vestibular schwannoma 58, 183  
 Vestibular suppressants (Valium, meclizine) 143  
 Vestibulospinal tract 75  
 Vestibulospinal Tract Disinhibition 75  
 Villaret's syndrome 15  
 Viral meningitis 83  
 Virginia Radiosurgery AVM Scale 457  
 Virus associated with PCNSL in AIDS 199  
 Visual field defects, diagnostic methods 140  
 Visual field defects, pituitary adenoma 209  
 Visual loss in pseudotumor cerebri 229  
 Volume status in SIAD vs. CSW 24  
 Volumetric CT scanners 54  
 von Hippel-Lindau syndrome 63, 191  
 von Recklinghausen's disease 153  
 VP shunt and medium pressure valve 98  
 VP shunt risks in posterior fossa tumors 150

**W**

Wackenheim's clivus-canal line 54  
 Wallerian degeneration, Sunderland classification 133  
 Warfarin fetal syndrome characteristics 38  
 Water deprivation test in diabetes insipidus 25  
 Waterhouse-Friderichsen syndrome 83  
 Watershed infarct 371, 381  
 Watersoluble contrast CT cisternogram (WS-CTC) 63  
 WBC count 1000 41  
 WBC Count Correction in Traumatic Tap 441  
 Weber syndrome 14  
 Weight loss, diabetic amyotrophy 133  
 Well-balanced spine 317  
 Wernicke's area 3, 13  
 Wernicke's area (speech and language) 5  
 Wernicke's encephalopathy 45, 47  
 West syndrome 106  
 WFNS grading for aSAH 342  
 WFS prions 83  
 Whiplash Grading 273  
 Whiplash-Associated Disorder (WAD) 273  
 White and Panjabi Stability Model 284  
 White and Panjabi Stability Score (1 Point) 285  
 White matter tract 158  
 WHO  
     - classification of CNS tumors, 2021 149  
     - grade 2 meningiomas 188  
     - grade prognostication 169  
     - grading 180  
     - performance score grades 395  
 Whole brain ischemic symptoms 381  
 Whole hemispheric stroke 381  
 Wide base gait  
     - definition 409  
     - differential diagnoses 410  
 Wide-based gait in normal pressure hydrocephalus 98  
 Wilson's classification for pituitary tumors 203  
 Woven bone expansion 329  
 Wrist drop 125

**X**

Xanthomatous cells in astrocytoma 164

**Y**

YAP1 fusion ependymoma location 169  
 Y-shaped durotomy, in suboccipital craniectomies 427

**Z**

Zabramski classification of cavernous malformations 365  
 ZFTA fusion ependymoma location 169