

## Disclaimer

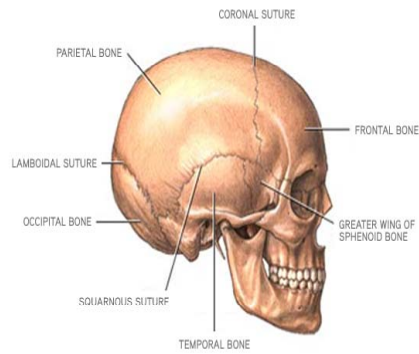
The information in this presentation was current at the time the presentation was compiled and does not include specific payer policies or contract language. Always consult CPT®, CMS, and your payers for specific guidance in reporting services. The views expressed in this presentation are simply my interpretations of information I have read, compiled and studied. Much of the information is directly from the AMA, AAPC, CMS literature, specialty societies and other reputable sources.

## Objectives

- ▶ Review the Anatomy of the Brain and supporting structures
- ▶ Understand the various methods of approach and the tools used to get there
- ▶ Interpret specific procedures and the CPT® codes which represent them
- ▶ Discuss diagnoses as each relates to the interventional or therapeutic treatment described by assorted CPT® codes

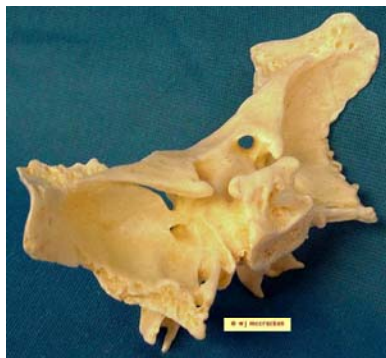
## Part and Pieces

# Skull Anatomy

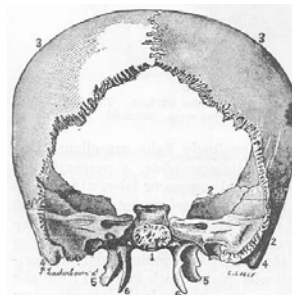


- 8 Skull bones
  - Support
  - Enclose
  - Protect
  - Attachment points
- 14 Facial Bones
  - Framework
  - Support

## Sphenoid Bone



- Anterior base of cranium
  - Central body
  - Sella turcica
- 2 Pair wings



## Ethmoid bone

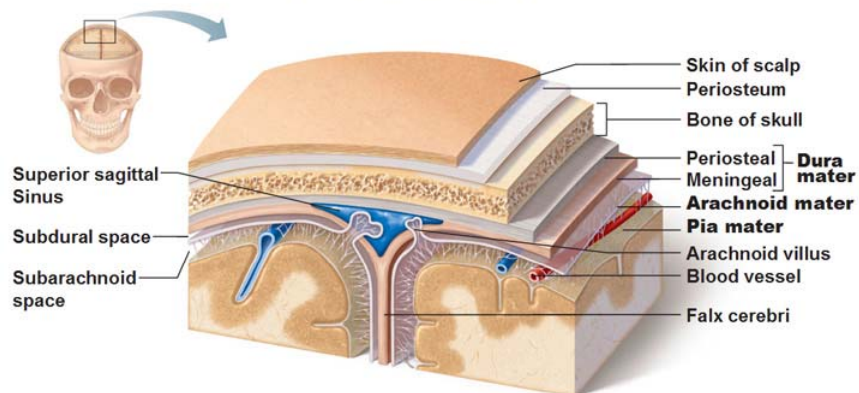
Forms a portion of the anterior cranial floor

- Crista Galli
- Cribriform plate

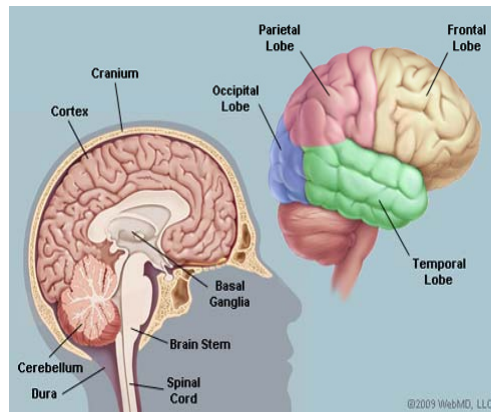


## Skull Anatomy

### The Dura Mater

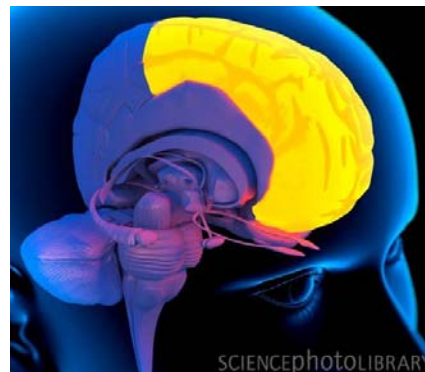


# Brain Anatomy



## Frontal Lobe

- Reasoning
- Motor Skills
  - Motor cortex
- Higher level cognition
- Expressive language

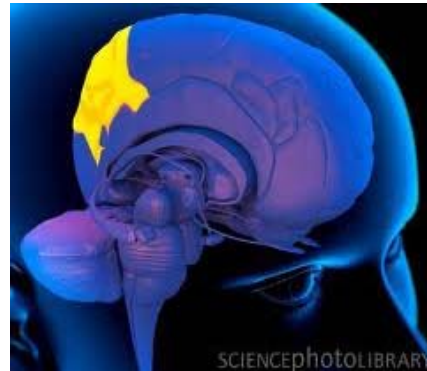


Damage may lead to changes in:

- Socialization
- Attention
- Sexual habits
- Increased risk-taking

## Parietal Lobe

- Processing tactile sensory information
  - Pressure
  - Touch
  - Pain
- Somatosensory cortex
  - Processes body's senses



Damage to this lobe may

- Verbal memory issues
- Impair control of eye gaze
- Problems with language

## Temporal Lobe

- Primary auditory cortex
  - Interpret sound
  - Interpret language
- Hippocampus
  - Formation of memories

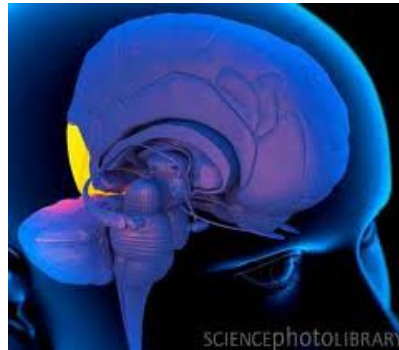


Damage may lead to problems with:

- Memory
- Speech perception
- Language skills

## Occipital Lobe

- Interpreting visual stimuli and information
  - Primary Visual Cortex
  - Secondary Visual Cortex
  - Tertiary Visual Cortex



- Damage may lead to:
- Recognizing objects
  - Identifying colors
  - Recognizing words

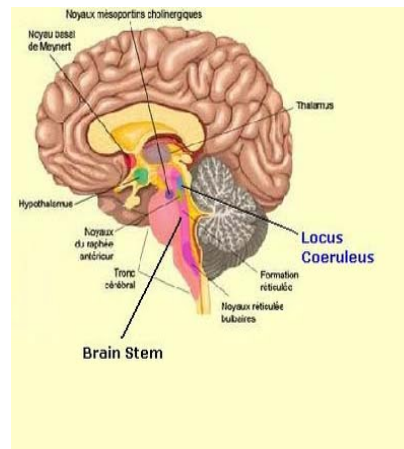
## Brainstem & Cerebellum

### Brainstem – Nerve pathways

- Medulla Oblongata
  - Cardiac
  - Respiratory
  - Vasomotor
- Midbrain
  - Auditory reflex centers
  - Visual reflex centers
- Pons
  - Respiratory center

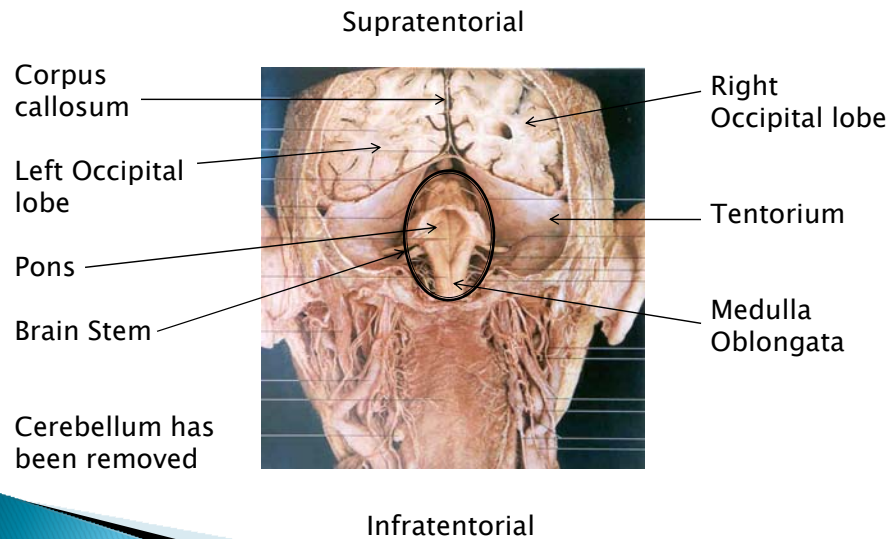
### Cerebellum

- Fine movement coordination
- Balance and Equilibrium
- Muscle Tone





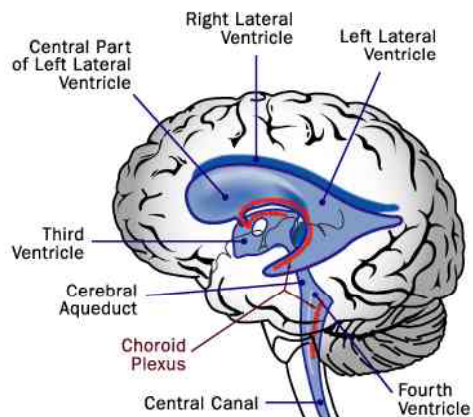
## Tentorium



## Ventricle System

4 Ventricles  
Aqueduct of Sylvius  
Cerebral Aqueduct  
Central Canal

Protects the Brain  
Transports Cerebrospinal Fluid





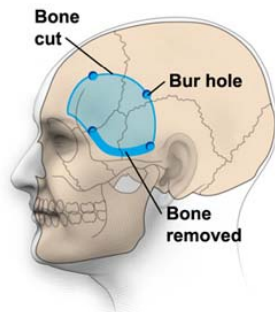
# Approach Method & Anatomic Site

## Open Approach

- Twist Drills
- Burr Hole(s)
  - Punctures
  - Injections
  - Aspirations
  - Drainage
  - Biopsies
  - Implantations/Insertions
  - Exploration
- Trephine
  - Biopsies
  - Exploration



## Craniectomy vs. Craniotomy



- Craniectomy – bone flap removed w/o return to original site

- Craniotomy – bone flap is removed with return to original site
  - Immediate
  - Delayed

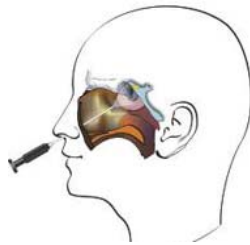
- Decompression
- Excision
- Insertions

- Resections
- Repairs
- Implantations

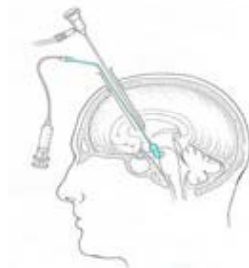
## Neuroendoscopy



# Neuroendoscopy



Transnasal



Transcranial

Approach is dependant upon site of lesion and critical structures

## Approach – Anatomic

### ► Skull

- Frontal
- Parietal
- Temporal
- Occipital
- Ethmoid
- Transcochlear
- Transcondylar
- Transpetrosal

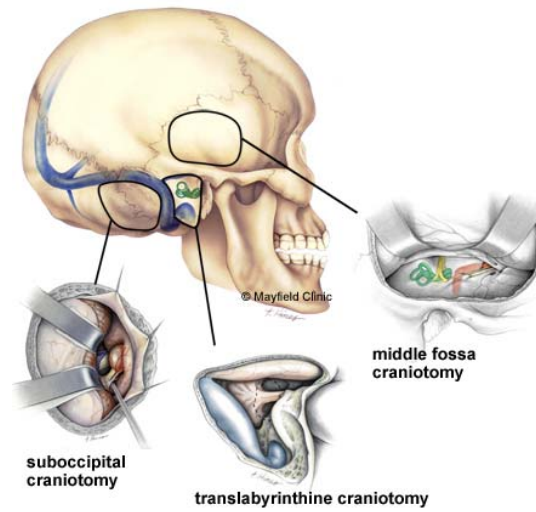
### ► Skull base

- Anterior Fossa
- Central Fossa
- Posterior Fossa
- Orbitocranial zygomatic
- Craniofacial
- Infratemporal

### ► Site

- Extradural
- Subdural
- Supratentorial
- Infratentorial
- Intracerebral
- Intracerebellar
- Ventricular
- Subpial
- Transoral
- Transnasal
- Intracranial
- Extracranial

## Approach – Anatomic



## Conditions & Procedures

## Evacuations – Hematomas

### **Twist Drill**

**61108** ... for evacuation and/or drainage of subdural hematoma

### **Burr Hole**

**61154** ...evacuation and/or drainage of hematoma, extradural or subdural

**61156**...with aspiration of hematoma or cyst, intracerebral

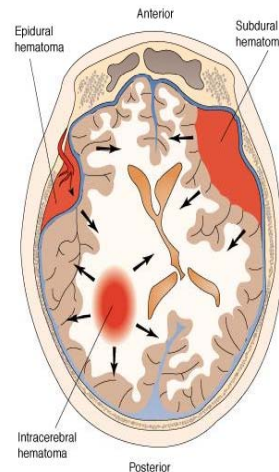
### **Craniectomy /Craniotomy**

**61312**...for evacuation of hematoma, supratentorial: extradural or subdural

**61313** intracerebral

**61314**...for evacuation of hematoma, infratentorial; extradural or subdural

**61315** intracerebral



## Intracranial Hemorrhage

ICD-9-CM		ICD-10-CM	
432.0	Extradural hemorrhage	I62.00	Nontraumatic subdural hemorrhage, unspecified
		I62.01	Nontraumatic acute subdural hemorrhage
		I62.02	Nontraumatic subacute subdural hemorrhage
		I62.03	Nontraumatic chronic subdural hemorrhage
432.1	Subdural hemorrhage	I62.1	Nontraumatic extradural hemorrhage
432.9	Unspecified intracranial hemorrhage	I62.9	Nontraumatic intracranial hemorrhage, unspecified

## Intracranial Hemorrhage

431	Intracerebral hemorrhage	I61.0	Nontraumatic Intracerebral hemorrhage in hemisphere, subcortical
		I61.1	Nontraumatic Intracerebral hemorrhage in hemisphere, cortical
		I61.2	Nontraumatic Intracerebral hemorrhage in hemisphere, unspecified
		I61.3	Nontraumatic Intracerebral hemorrhage in brainstem
		I61.4	Nontraumatic Intracerebral hemorrhage in cerebellum
		I61.5	Nontraumatic Intracerebral hemorrhage, intraventricular
		I61.6	Nontraumatic Intracerebral hemorrhage , multiple localized
		I61.8	Other nontraumatic Intracerebral hemorrhage
		I61.9	Nontraumatic Intracerebral hemorrhage, unspecified

## Intracranial Hemorrhage

430	Subarachnoid hemorrhage	I60.0– I60.00 – I60.02	Nontraumatic subarachnoid hemorrhage from carotid siphon and bifurcation (5 <sup>th</sup> character identifies laterality)
		I60.1– I60.10 – I60.12	Nontraumatic subarachnoid hemorrhage from middle cerebral artery (5th character identifies laterality)
		I60.2– I60.20 – I60.22	Nontraumatic subarachnoid hemorrhage from anterior communicating artery (5th character identifies laterality)
		I60.3– I60.30 – I60.32	Nontraumatic subarachnoid hemorrhage from posterior communicating artery (5th character identifies laterality)
		I60.4	Nontraumatic subarachnoid hemorrhage from basilar artery
		I60.5– I60.50 – I60.52	Nontraumatic subarachnoid hemorrhage from vertebral artery (5th character identifies laterality)
		I60.6	Nontraumatic subarachnoid hemorrhage from other intracranial artery
		I60.7	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
		I60.8	Other nontraumatic subarachnoid
		I60.9	Nontraumatic subarachnoid hemorrhage, unspecified

## Ventricular Punctures

### Temporary placement

#### Burr Hole

**61020** Ventricular puncture through *previous* burr hole, fontanelle, suture, or implanted ventricular catheter/reservoir; without injection

**61026** with injection of medication or other substance for diagnosis or treatment

**61120** Burr hole for ventricular puncture (including inj. of gas, contrast media, dye or radioactive material)

**61210** ...for implanting ventricular catheter, reservoir, EEG electrode(s), pressure recording device, or other cerebral monitoring device (separate procedure)

#### Twist Drill

**61105**...for subdural or ventricular puncture

**61107**...for subdural, intracerebral, or ventricular puncture; for implanting ventricular catheter, pressure recording device, or other intracerebral monitoring device

## Ventricular Shunts

### Placement

**62220** Creation of shunt; ventriculo-atrial, -jugular, -auricular

**62223** ventriculo-peritoneal, -pleural, other terminus

### Replacement

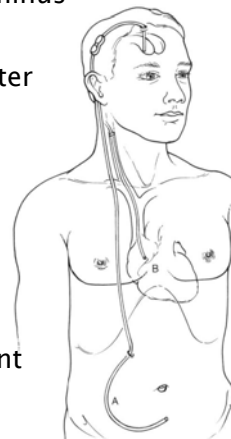
**62225** Replacement or irrigation, ventricular catheter

**62230** Replacement or revision of cerebrospinal fluid shunt, obstructed valve, or distal catheter in shunt system

### Removal

**62256** Removal of complete cerebrospinal fluid shunt system; without replacement

**62258** with replacement by similar or other shunt at same operation





## Ventricular Shunts

### Other Shunt Related Services

- +62160 Neuroendoscopy, intracranial, for placement of intracranial catheter and attachment to shunt system or external drainage
- 62252 Reprogramming of programmable cerebrospinal shunt
- 61070 Puncture of shunt tubing or reservoir for aspiration or injection procedure
- 75809 Shuntogram for investigation of previously placed indwelling nonvascular shunt (eg, LeVeen shunt, ventriculoperitoneal shunt, indwelling infusion pump), radiological supervision and interpretation

## Hydrocephalus

ICD-9-CM		ICD-10-CM	
331.3	Communicating hydrocephalus	G91.0	Communicating hydrocephalus
331.4	Obstructive hydrocephalus	G91.1	Obstructive hydrocephalus
331.5	Idiopathic normal pressure hydrocephalus	G91.2	Idiopathic normal pressure hydrocephalus
		G91.3	Post-traumatic hydrocephalus
		G91.4	Hydrocephalus in diseases classified elsewhere
		G91.8	Other hydrocephalus
		G91.9	Hydrocephalus, unspecified
742.3	Congenital hydrocephalus	Q03.0	Malformations of aqueduct of Sylvius
		Q03.1	Atresia of foramina of Magendie and Luschka
		Q03.8	Other congenital hydrocephalus
		Q03.9	Congenital hydrocephalus, unspecified

## Electrocorticography – Mapping



**61531** – Subdural implantation of strip electrodes through 1 or more burr hole(s) for long-term seizure monitoring

**61533** – Craniotomy with elevation of bone flap, for subdural implantation of an electrode array; for long-term seizure monitoring

**61534** – ; For excision of epileptogenic focus without electrocorticography during surgery

**61535** – ; for removal of epidural or subdural electrode array, without excision of cerebral tissue (separate procedure)

**61536** – ; for excision of cerebral epileptogenic focus, with electrocorticography during surgery (includes removal of array)

## Electrocorticography



**61538**– Craniotomy with elevation of bone flap; for lobectomy, temporal lobe, with electrocorticography during surgery

**61539** – ; for lobectomy, other than temporal lobe, partial or total, with electrocorticography during surgery

**61567** – ; for multiple subpial transections, with electrocorticography during surgery

## Epilepsy

ICD-9-CM		ICD-10-CM	
345.00	Generalized nonconvulsive epilepsy, without mention of intractable epilepsy		N/A
345.01	Generalized nonconvulsive epilepsy, with intractable epilepsy		N/A
345.10	Generalized convulsive epilepsy, without mention of intractable epilepsy		N/A
345.11	Generalized convulsive epilepsy, with intractable epilepsy		N/A
345.2	Petit mal status	G40.301	Generalized idiopathic epilepsy and epileptic syndromes, <i>not intractable</i> , with status epilepticus
345.3	Grand mal status	G40.311	Generalized idiopathic epilepsy and epileptic syndromes, <i>intractable</i> , with status epilepticus

## Epilepsy

ICD-9-CM		ICD-10-CM	
345.40	Localization-related epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy	G40.201	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, <i>with status epilepticus</i>
		G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, <i>without status epilepticus</i>
345.41	Localization-related epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy	G40.211	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, <i>with status epilepticus</i>
		G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, <i>without status epilepticus</i>

## Epilepsy

345.50	Localization-related epilepsy and epileptic syndromes with simple partial seizures, no mention of intractable epilepsy	G40.101	Localization-related symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, <i>with status epilepticus</i>
		G40.109	Localization-related symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, <i>without status epilepticus</i>
345.51	Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy	G40.111	Localization-related symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, <i>with status epilepticus</i>
		G40.119	Localization-related symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, <i>without status epilepticus</i>

## Epilepsy

345.60	Infantile spasms, without mention of intractable epilepsy	G40.401	Other generalized epilepsy and epileptic syndromes, not intractable, <i>with status epilepticus</i>
		G40.409	Other generalized epilepsy and epileptic syndromes, not intractable, <i>without status epilepticus</i>
345.61	Infantile spasms, with intractable epilepsy	G40.411	Other generalized epilepsy and epileptic syndromes, intractable, <i>with status epilepticus</i>
		G40.419	Other generalized epilepsy and epileptic syndromes, intractable, <i>without status epilepticus</i>
345.70	Epilepsia partialis continua, without mention of intractable epilepsy	G40.501	Special epileptic syndromes, not intractable, <i>with status epilepticus</i>
		G40.509	Special epileptic syndromes, not intractable, <i>without status epilepticus</i>
345.71	Epilepsia partialis continua, with intractable epilepsy	G40.511	Special epileptic syndromes, intractable, <i>with status epilepticus</i>
		G40.519	Special epileptic syndromes, intractable, <i>without status epilepticus</i>

# Epilepsy

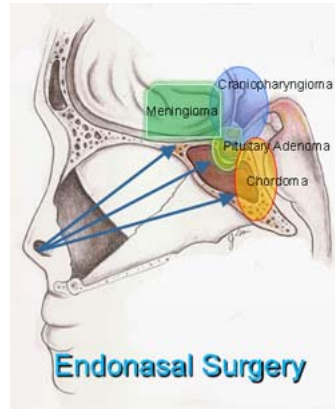
ICD-9-CM		ICD-10-CM	
345.80	Other forms of epilepsy and recurrent seizures, without mention of intractable epilepsy	G40.801	Other epilepsy, not intractable, <i>without status epilepticus</i>
		G40.809	Other epilepsy, not intractable, <i>without status epilepticus</i>
		G40.89	Other seizures
345.81	Other forms of epilepsy and recurrent seizures, with intractable epilepsy	G40.811	Other epilepsy, intractable, <i>with status epilepticus</i>
		G40.819	Other epilepsy, intractable, <i>without status epilepticus</i>
345.90	Epilepsy, unspecified, without mention of intractable epilepsy	G40.901	Epilepsy, unspecified, not intractable, <i>with status epilepticus</i>
		G40.909	Epilepsy, unspecified, not intractable, <i>without status epilepticus</i>
345.91	Epilepsy, unspecified, with intractable epilepsy	G40.911	Epilepsy, unspecified, intractable, <i>with status epilepticus</i>
		G40.919	Epilepsy, unspecified, intractable, <i>without status epilepticus</i>

# Epilepsy

ICD-9-CM		ICD-10-CM	
	N/A	G40.309	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus
		G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable, without status epilepticus
	N/A	G40.001	Localization-related idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, with status epilepticus
	N/A	G40.009	Localization-related idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, without status epilepticus
	N/A	G40.011	Localization-related idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
	N/A	G40.019	Localization-related idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, without status epilepticus

## Neuroendoscopy via Nose

- Less invasive
  - Removal of tumors of
    - Anterior skull base
    - Anterior Brainstem
  - Few codes described as transnasal
- 61548** Hypophysectomy or excision of pituitary tumor, transnasal or transseptal approach, nonstereotactic
- 62165** Neuroendoscopy, intracranial; with excision of pituitary tumor, transnasal or transphenoidal approach

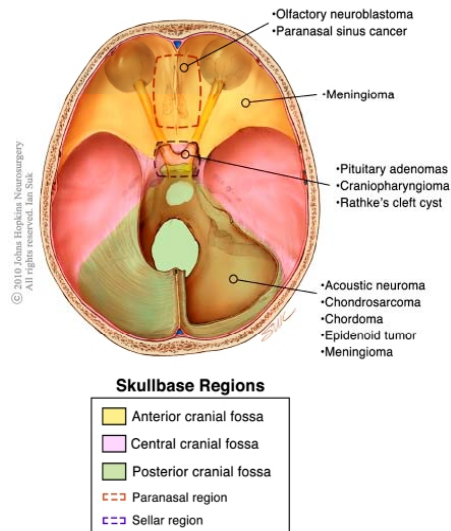


## Neuroendoscopy

- 62161** Neuroendoscopy, intracranial; with dissection of adhesions, fenestration of septum pellucidum or intraventricular cysts (including placement, replacement, or removal of ventricular catheter)
- 62162** with fenestration or excision of colloid cyst, including placement or external ventricular catheter for drainage
- 62163** with retrieval of foreign body
- 62164** with excision of brain tumor, including placement of external ventricular catheter for drainage

# Skull Base Procedures

- ▶ 2 or 3 codes
  - Approach
  - Definitive
  - Repair reconstruction
- ▶ Conditions



## Approach

### Anterior Cranial Fossa

Craniofacial approach to anterior cranial fossa;

- 61580** extradural, including lateral rhinotomy, ethmoidectomy, sphenoidectomy, *without* maxillectomy or orbital exenteration
- 61581** extradural, including lateral rhinotomy, orbital exenteration, ethmoidectomy, sphenoidectomy and/or maxillectomy



## Approach

### Anterior Cranial Fossa

Craniofacial approach to anterior cranial fossa;

**61582** extradural, including unilateral or bifrontal *craniotomy*, elevation of frontal lobe(s), osteotomy of base of anterior cranial fossa

**61584** intradural, including unilateral or bifrontal *craniotomy*, elevation or resection of frontal lobe, osteotomy of base of anterior cranial fossa

## Approach

### Anterior Cranial Fossa

**61584** Orbitocranial approach to anterior cranial fossa, extradural, including supraorbital ridge osteotomy and elevation of frontal and/or temporal lobe(s); without orbital exenteration

**61585** with orbital exenteration

**61585** Bicoronal, transzygomatic and/or LeFort I osteotomy approach to anterior cranial fossa with or without internal fixation, without bone graft

## Approach Middle Cranial Fossa

- 61590 Infratemporal pre-auricular approach to middle cranial fossa (*parapharyngeal space, infratemporal and midline skull base, nasopharynx*), with or without disarticulation of the mandible, including parotidectomy, craniotomy, decompression and/or mobilization of the facial nerve and/or petrous carotid artery
- 61591 Infratemporal post-auricular approach to middle cranial fossa (*internal auditory meatus, petrous apex, tentorium, cavernous sinus, parasellar area, infratemporal fossa*) including mastoidectomy, resection of sigmoid sinus, with or without decompression and/or mobilization of contents of auditory canal or petrous carotid artery

## Approach Middle Cranial Fossa

- 61592 Orbitocranial zygomatic approach to middle cranial fossa (*cavernous sinus and carotid artery, clivus, basilar artery or petrous apex*) including osteotomy of zygoma, craniotomy, extra- or intradural elevation of temporal lobe

## Approach

### Posterior Cranial Fossa

- 61595** Transtemporal approach to posterior cranial fossa, jugular foramen or midline skull base, including mastoidectomy, decompression of sigmoid sinus and/or facial nerve, with or without mobilization
- 61596** Transcochlear approach to posterior cranial fossa, jugular foramen or midline skull base, including labyrinthectomy, decompression, with or without mobilization of facial nerve and/or petrous carotid artery

## Approach

### Posterior Cranial Fossa

- 61597** Transcondylar (far lateral) approach to posterior cranial fossa, jugular foramen or midline skull base, including occipital condylectomy, mastoidectomy, resection of C1–C3 vertebral body(s), decompression of vertebral artery, with or without mobilization
- 61598** Transpetrosal approach to posterior cranial fossa, clivus or foramen magnum, including ligation of superior petrosal sinus and/or sigmoid sinus

## Definitive Procedure Anterior Cranial Fossa

- 61600 Resection or excision of neoplastic, vascular or infectious lesion of base of anterior cranial fossa; extradural
- 61601 intradural, including dural repair, with or without graft

## Definitive Procedure Middle Cranial Fossa

- 61605 Resection or excision of neoplastic, vascular or infectious lesion of infratemporal fossa, parapharyngeal space, petrous apex; extradural
- 61606 intradural, including dural repair, with or without graft

## Definitive Procedure Middle Cranial Fossa

- 61607** Resection or excision of neoplastic, vascular or infectious lesion of parasellar area, cavernous sinus, clivus or midline skull base; extradural
- 61608** intradural, including dural repair, with or without graft

## Definitive Procedure Middle Cranial Fossa

Add-on procedures:

- +61609** Transection or ligation, carotid artery in *cavernous sinus*; without repair
- +61610** with repair by anastomosis or graft
- +61611** Transection or ligation, carotid artery in *petrous canal*; without repair
- +61612** with repair by anastomosis or graft

## Definitive Procedure Middle Cranial Fossa

**61613** Obliteration of carotid aneurysm, arteriovenous malformation, or carotid-cavernous fistula by dissection within cavernous sinus

## Definitive Procedure Posterior Cranial Fossa

**61615** Resection or excision of neoplastic, vascular or infectious lesion of base of posterior cranial fossa, jugular foramen, foramen magnum, or C1-C3 vertebral bodies; extradural

**61616** intradural, including dural repair, with or without graft

## Repair and/or Reconstruction of Surgical Defects of Skull Base

- 61618** Secondary repair of dura for cerebrospinal fluid leak, anterior, middle or posterior cranial fossa following surgery of the skull base; by free tissue graft (eg. Pericranium, fascia, tensor fascia lata, adipose tissue, homologous or synthetic grafts)
- 61619** by local or regionalized vascularized pedicle flap or myocutaneous flap (including galea, temporalis, frontalis or occipitalis muscle)





## Resources

2012 CPT® Professional  
Edition  
2012 ICD-9-CM  
2012 ICD-10-CM  
2012 Coders Desk  
Reference for Procedures  
2011 Coders Desk  
Reference for Diagnosis

### Images

TorricellaPeligna.com  
Tallahassee Community  
College  
Anatowiki.wetpaint.com  
Mayfield Clinic  
John Hopkins Neurosurgery  
Antranik.org  
Science photo.com  
Webmd.com  
Drugster.info  
Futurepredictions.com  
Ecc-book.com