

Coding for Diseases of the Nervous System and Sense Organs

Chapter Outline

Disorders of the CNS

Inflammatory Disorders

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Objectives

- ▶ Describe the pathology of common disorders of the nervous system and sense organs.
- ▶ Recognize the typical manifestations, complications, and treatments of common disorders of the nervous system and sense organs in terms of their implications for coding.
- ▶ Correctly code disorders and procedures related to the nervous system and sense organs by using the ICD-9-CM and medical records.

Diseases of the nervous system and sense organs are classified in code section 320 to 389 of chapter 6 of the Disease Tabular of ICD-9-CM. This chapter is subdivided into disorders of the central nervous system (CNS), disorders of the peripheral nervous system, and disorders of the sensory organs (eyes and ears). To aid in your understanding, see Figure 12.1, an illustration of the anatomic divisions of the nervous system, and Table 12.1, which lists word parts and meanings of medical terms related to the nervous system and sense organs.

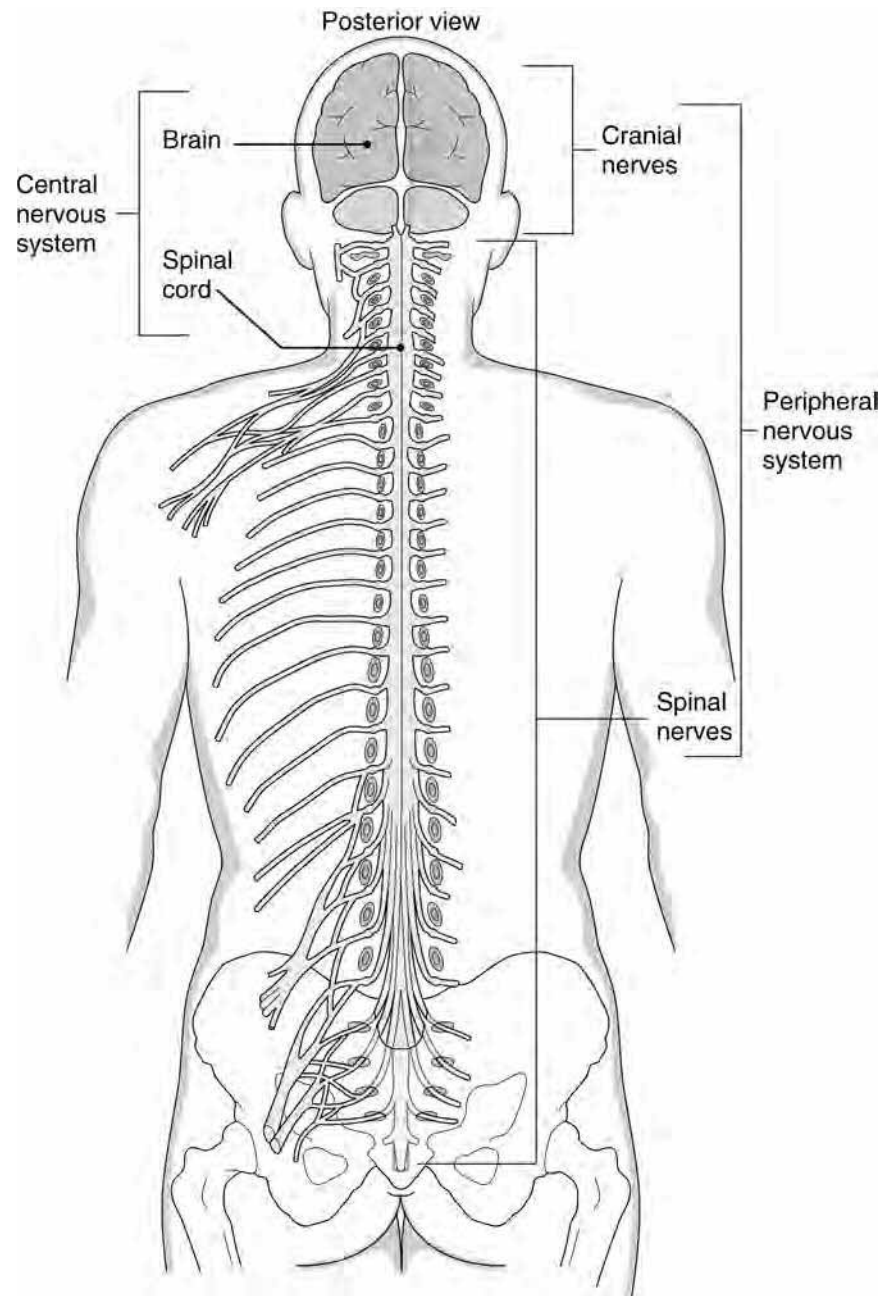


Figure 12.1 Anatomic divisions of the nervous system. (Reprinted with permission from Cohen BJ. *Medical Terminology: An Illustrated Guide*, 4th Ed. Baltimore: Lippincott Williams & Wilkins, 2004.)

Table 12.1 Word Parts and Meanings of the Nervous System and Sense Organs

Word Part	Meaning	Example	Definition of Example
menin/o-	meninges;	meningitis	Inflammation of the meninges
meningi/o-	membranes		
neur/o-	nerves	neuropathy	Disease condition of nerves
-lepsy	seizure	epilepsy	A chronic seizure disorder
-paresis	paralysis	hemiparesis;	Paralyzed on one side (half) of the body
-plegia		hemiplegia	
encephal/o-	brain	encephalitis	Inflammation of the brain
-sclerosis	hardening	multiple sclerosis	Disease that results in hardening (plaquing) of the myelin sheath that covers nerves of the central nervous system
oto-	ear	otosclerosis	Hardening of small bones in the ear, causing conduction deafness
hemi-	half	hemianopsia	Loss of vision in half of the visual field
retin/o-	retina	retinitis	Inflammation of the retina (nerve tissue) of the eye
-opia	vision	myopia; hyperopia	Near-sightedness; far-sightedness
glauco/o-	gray	glaucoma	Clouding or "graying" of the lens of the eye
myring/o-	eardrum	myringotomy;	Incision into the eardrum; surgical repair of
tympan/o-		tympanoplasty	the eardrum
presby/o-	old age	presbyopia	Poor vision attributable to old age
-plasty	surgical repair	neuroplasty	Surgical repair of a nerve
-pathy	disease	encephalopathy;	Disease of the brain; disease of many nerves
		polyneuropathy	

Disorders of the CNS

Category code range 320 to 349 includes diseases of the CNS, which is composed of the brain and spinal cord. Common CNS diseases that can cause hospital admissions include inflammatory disorders, degenerative disorders, and other disorders such as demyelinating and paralytic disorders.

Inflammatory Disorders

Meningitis and encephalitis are common inflammatory disorders of the CNS.

Meningitis

The meninges are three membranes (dura, arachnoid, and pia) that surround and protect the CNS. Meningitis (category code range 320 to 322) is an inflammation of the meninges that can be caused by bacteria (e.g., streptococci and staphylococci), viruses (e.g., Enterovirus and herpes simplex), or fungi (e.g., candidiasis and histoplasmosis). Meningitis can be classified with a single combination code from chapter 1 of the Disease Tabular of the ICD-9-CM codebook, "Infectious and Parasitic Diseases" (category 001 to 139), or with a

single combination code from chapter 6, “Diseases of the Nervous System and Sense Organs” (category 320 to 389). Alternatively, meningitis can be described with dual coding from chapters 1 and 6.

Example *Adenoviral meningitis: 049.1 (single combination code from chapter 1)*
Escherichia coli meningitis: 320.82 (single combination code from chapter 6)
Meningitis attributable to Lyme disease: 088.81 + 320.7 (dual coding from chapters 1 and 6)

Symptoms commonly associated with meningitis are stiff neck, headache, fever, and hypersensitivity to light (photophobia). Antibiotics are used to treat the bacterial forms of meningitis, antifungal drugs are used to treat fungal forms, and viral forms are treated symptomatically. Antibiotics are not effective for treating viral forms of the disease.

To confirm a diagnosis of meningitis, a procedure called a *lumbar puncture*, also called a *spinal tap*, is routinely performed to withdraw cerebrospinal fluid (CSF) for laboratory analysis. CSF is a normally clear liquid that contains water, glucose (sugar), protein, sodium (salt), and chloride and that circulates in the CNS. CSF helps to cushion and protect the brain and spinal cord. A laboratory analysis of CSF can include a culture, cytologic (cell) examination, and cell counts to determine whether any abnormalities are present (e.g., bacterial growth, cancer cells, other abnormal substances, or cell concentrations). A lumbar puncture is often indicated for infants who present to the emergency department crying or lethargic and with a fever, apparent stiff neck, and rigidity. In a lumbar puncture, the physician inserts a needle between two lower lumbar vertebrae just beyond the distant end of the spinal cord to withdraw CSF without incurring damage to the spinal cord itself.

A lumbar puncture is an important test for diagnosing meningitis and other diseases. Normal CSF is clear. If the CSF is turbid (cloudy), it may indicate bacterial growth; if the fluid contains blood, it may indicate a hemorrhagic stroke or brain injury. Cytologic analysis may reveal cancer cells in cases of CNS malignancy.

Example *Meningitis attributable to group B streptococcus, lumbar puncture (spinal tap) with CSF culture positive for group B streptococcus: 320.2; 03.31*
Cryptococcal meningitis, lumbar puncture with CSF culture positive for cryptococci: 117.5 + 321.0; 03.31

Encephalitis

Encephalitis (category code 323) is an inflammation of the brain that is often caused by a virus (e.g., herpes simplex, measles, influenza, or arboviruses carried by mosquitoes and ticks). Other types of encephalitis can result from protozoal diseases (e.g., malaria) or the toxic effects of chemicals or metals (e.g., lead or mercury).

Dual coding is often required. The underlying disease is expressed first, and the manifestation of encephalitis is sequenced as an additional code.

Example *Encephalitis attributable to cat-scratch disease: 078.3 + 323.0*
Encephalitis attributable to infectious mononucleosis: 075 + 323.0
Postinfectious mononucleosis: 136.9 + 323.6

Symptoms of encephalitis can include headache and stiff neck, fever, sensitivity to light, seizures, lethargy, and confusion. Young children and people who are immunocompromised, such as the elderly or those with acquired immunodeficiency syndrome (AIDS), are at a higher risk for contracting encephalitis from an infection. Most people recover within a few weeks, but encephalitis is a serious disease that can, in some cases, be fatal.

Important tests to diagnose encephalitis include a spinal tap to obtain CSF or a blood culture that may reveal the virus. Some forms of viral encephalitis respond to antiviral drugs. However, other forms may be treated only symptomatically. Analgesics (e.g., aspirin) can be used to reduce fever, and anti-seizure medications (e.g., phenobarbital or phenytoin) can be used if needed.

Degenerative Diseases

Common degenerative diseases of the CNS include Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis (ALS; also known as Lou Gehrig's disease).

Parkinson's Disease

Parkinson's disease (code 332.0) usually occurs in the elderly and results in progressive degeneration of the nerves in the brain. It can result in hand tremors, a shuffling gait (sometimes referred to as *cogwheel rigidity*), and muscle weakness. Parkinson's disease is caused by a deficiency of dopamine, a chemical (i.e., neurotransmitter) that is required to transmit nerve impulses in the brain. The symptoms of Parkinson's disease can be alleviated with drugs such as levodopa or dopamine agonists (drugs that increase the reception of dopamine in the brain); however, such drugs do not cure the disease. Secondary parkinsonism (code 332.1) is a form of Parkinson's disease that is secondary to another underlying disease (e.g., Huntington's disease or syphilis) or that occurs as an adverse effect of the therapeutic use of a drug (e.g., antipsychotic drugs). In the case of an adverse effect, you should use an additional E code from the Table of Drugs and Chemicals to identify the responsible drug.

Primary parkinsonism: 332.0

Parkinson's disease secondary to haloperidol (Haldol) prescribed for chronic schizophrenia: 332.1 + E939.2 + 295.62

Parkinsonism in Huntington's disease: 333.4

Example

Alzheimer's Disease

Alzheimer's disease (code 331.0) is a progressive, degenerative brain disorder that can occur in elderly people. It is characterized by progressive memory loss, loss of intellectual abilities, confusion and dementia, emotional disturbances such as anxiety and/or depression, and wandering. Alzheimer's disease results in a progressive destruction of brain cells. Certain pathogenic (disease-causing) changes also occur in the brain, such as atrophy (shrinkage of parts of the brain), neural plaques (deposits) and tangles (bundles) that contain a protein (amyloid) that degenerates brain cells, and a loss of substances called *neurotransmitters*. Neurotransmitters are chemicals that help to carry messages

between nerve cells (neurons) in the brain. Alzheimer's patients often lose their sense of person, place, and time, and they often wander away from safety; as such, they are sometimes cared for in locked medical units. There is no known cure for Alzheimer's disease. However, medications are available—tacrine (Cognex), donepezil (Aricept), rivastigmine (Exelon), and galantamine (Reminyl). How these drugs work is not fully understood, but it is believed that they increase the level of a neurotransmitter (acetylcholine) in the brain. These drugs will not cure the disease; however, they may help to slow symptom progression (e.g., memory loss) and control behavioral disturbances.

ICD-9-CM allows an additional code for reporting Alzheimer's dementia (senile) with or without behavioral disturbances. This information is required for health-care providers to assess the patient's individual needs and establish the appropriate plan of care, because Alzheimer's patients with behavioral disturbances may become demanding, disruptive, combative, and overly suspicious of others.

Example *Alzheimer's dementia with behavioral disturbance: 331.0 + 294.11*

Alzheimer's dementia without behavioral disturbance: 331.0 + 294.10

Amyotrophic Lateral Sclerosis

ALS (code 335.20) is a progressive CNS disease of unknown etiology that causes a degeneration of motor nerves from the brain and spinal cord. Motor nerves carry impulses from the CNS to internal organs and muscles. ALS is also known as Lou Gehrig's disease (named after the famous major-league baseball player who died from the disease).

With ALS, progressive skeletal muscle weakness results in paralysis, shortness of breath, difficulty speaking and swallowing, and increasing respiratory depression as the diaphragm (the muscle that aids in respiration) becomes increasingly affected. Eventually, respiratory paralysis occurs. There is no known cure for ALS. Palliative (not curative) treatment is directed at controlling symptoms, providing comfort, and alleviating pain.

Other Disorders of the CNS

Other common disorders of the CNS include multiple sclerosis, hemiplegia, hemiparesis, and epilepsy.

Multiple Sclerosis

Multiple sclerosis (code 340) is suspected to be an autoimmune disorder in which abnormal antibodies attack and destroy normal myelin tissues. Like the covering over an electrical wire, a myelin sheath (white matter) insulates nerves. However, in multiple sclerosis, the myelin sheath is destroyed and replaced by a hard plaque in a process called *demyelination*. Demyelination prevents the proper conduction of nerve impulses in the body, and this can cause muscle weakness, numbness, and paralysis and can result in difficulty walking (i.e., gait disorders). Speech and vision can also be affected. Multiple sclerosis is a chronic disease marked by periods of remission (no symptoms) and relapses (exacerbation of symptoms). Some drugs are available that can shorten exacerbations of the disease (e.g., steroids and interferon- β); however, there is no specific treatment for the disease.

To clarify a common misunderstanding: when a patient is in remission, the patient still has the disease but is not currently experiencing signs or symptoms.



Hemiplegia and Hemiparesis

Both *hemiplegia* and *hemiparesis* (code 342.XX) refer to paralysis of one side of the body. This can result from a cerebrovascular accident (CVA; stroke), traumatic brain injury, or tumor. The fourth-digit subcategory conveys the type of hemiplegia. For example, 342.0X classifies flaccid hemiplegia, which is characterized by the loss of muscle tone (atrophy) and tendon reflexes of the affected (paralyzed) side. Spastic hemiplegia (code 342.1X) is characterized by increased muscle spasms and tendon reflexes of the affected (paralyzed) side. The fifth-digit subclassification conveys whether the side affected is dominant, nondominant, or unspecified.

If an individual who is right-hand dominant experiences a stroke that results in paralysis of the right side of his or her body, the course of rehabilitation is greatly affected. This fact points to the importance of accurately and completely reporting this information through coding.

Acute left-sided CVA with infarct resulting in hemiplegia, right side. Patient is right-hand dominant: 434.91, 342.91

Example

If an individual has a stroke affecting the right side of the brain, a left-sided paralysis may manifest; conversely, if an individual has a stroke affecting the left side of the brain, a right-sided paralysis may occur. Hemiplegia will be contralateral, or opposite, the brain lesion because nerve fibers cross over to the opposite side in the medulla oblongata. The medulla oblongata is part of brain stem and helps to connect the spinal cord to the brain.

Category code 342 is used exclusively to describe hemiplegia or hemiparesis for the current admission or episode of care. It is used as a secondary diagnosis; the underlying reason for the hemiplegia (e.g., CVA with infarction) is sequenced as the principal diagnosis. Once a patient is discharged from acute care to a rehabilitation facility or is readmitted to the hospital, you should code hemiplegia as a “late effect” of cerebrovascular disease (code 438.2X).

Unfortunately, patients who have CVAs may have repeated or new CVAs. Coding hemiplegia (342.9X) or other symptoms as current with the new CVA while coding residual conditions or symptoms associated with old CVAs to late effects (438.XX) enables a coder to report which residual conditions or symptoms are attributed to the new acute CVA versus symptoms that are residual conditions of the old CVAs.

Acute left-sided CVA with infarct and right-sided hemiplegia: 434.91

Patient had a CVA 5 years ago with residual dysphagia: 342.90, 438.82

Example

If a patient experiences a CVA with hemiplegia or other residuals, such as aphasia (i.e., speech impairment), that are transient and that clear before hospital discharge, do not assign a code for the hemiplegia or other residuals because it will not affect the patient’s future course of care. If a patient has a CVA with hemiplegia or other residual conditions that are present at hospital discharge, add these as additional or secondary diagnosis codes, because the hemiplegia or other residuals will require continuing care (i.e., rehabilitation).

Example

Acute CVA with infarction with left-sided hemiplegia, aphasia, and dysphagia (all present on discharge to a rehabilitation facility): 434.91, 342.90, 784.3, 787.2

Acute CVA with infarction with left-sided hemiplegia, aphasia, and dysphagia (hemiplegia and dysphagia cleared before discharge; only aphasia was present at discharge to rehabilitation): 434.91, 784.3

Epilepsy

Epilepsy (345.XX) is a chronic (recurrent) seizure disorder characterized by sudden abnormal electrical activity in the brain that can cause seizures. Epilepsy is classified into two major categories: *generalized* epilepsy, which involves abnormal electrical discharges that affect the entire brain, and *partial* epilepsy, which involves abnormal electrical discharges that affect only a part of the brain. The major categories of generalized or partial epilepsy are further divided into different types of epilepsy: grand mal, petit mal, focal, and temporal lobe.

Grand mal epilepsy (generalized convulsive; code 345.1X) is characterized by a loss of consciousness with convulsive seizures that can include *tonic* stiffening and contractions of muscles and *clonic* jerking and twitching movements of the extremities. *Petit mal epilepsy* (generalized nonconvulsive; code 345.0X) is characterized by a momentary loss of awareness and surroundings, but no loss of consciousness or convulsive seizures. In *focal epilepsy* (partial epilepsy; code 345.5X), one part of the body will jerk and twitch (convulsive seizures), but there is no impairment of consciousness (loss of awareness). In *temporal lobe epilepsy* (partial epilepsy; code 345.4X), there is abnormal brain activity in the temporal lobe of the brain (near the ears) with an impairment of consciousness (loss of awareness).



Never automatically code a diagnosis of seizures or convulsions to epilepsy. Epilepsy or recurrent seizures must be documented by the physician.

Some seizures, such as tonic/clonic (grand mal) seizures, can occur without a diagnosis of epilepsy. A diagnosis of epilepsy can be made only by a physician who has assessed that a pattern of repeated brain seizures is attributed to epilepsy. Convulsions and seizures can often occur as a temporary result of an infection or fever (febrile seizure, 780.31; seizure not otherwise specified, 780.39) and should not be coded to epilepsy. If a physician documents a diagnosis of seizures or convulsions, carefully review the patient's record for a documented history of epilepsy, review the patient's current medications and old medical records, and then query the physician before assigning the code for epilepsy, recurrent seizures, or seizure disorder. As of October 2006, if the diagnosis is "recurrent seizures" or "seizure disorder" (even in the absence of term "epilepsy"), a code from category 345 (epilepsy and recurrent seizures) is assigned. However, if the diagnosis is that of a *single*, isolated seizure or that of convulsions, the code assigned remains 780.39.

The fifth-digit assignment in the epilepsy code describes whether the epilepsy is intractable. Intractable epilepsy means that it is difficult to control by conventional treatments, such with the drugs phenytoin or phenobarbital (anticonvulsant medications). Physicians rarely document intractable epilepsy. Therefore, you should review the medical record for epileptic seizures described as prolonged or refractory to treatment and then query the physician as appropriate.

A patient with a known history of grand mal epilepsy was admitted with uncontrolled seizures that were refractory to outpatient treatment. The physician described the seizures as “intractable”: 345.11

Example

A patient was admitted secondary to a breakthrough seizure. The patient’s medications were adjusted, and the patient did not have any further seizures while in the hospital: 780.39

It is important to remember that physicians are not always aware of the Uniform Hospital Discharge Data Set rules for reporting inpatient diagnoses. According to Uniform Hospital Discharge Data Set rules, if an inpatient diagnosis is documented as possible, probable, suspected, questionable, or rule out, then it would be coded as if the condition were established. However, as an exception to these rules, if epilepsy is documented as possible, probable, suspected, questionable, or rule out, then query the physician for clarification before assigning the code for epilepsy. This is because of the social and work-related consequences that might affect the patient (e.g., patients diagnosed with epilepsy must report their condition to the Department of Motor Vehicles and may be denied a driver’s license). Such care should also be taken for suspected human immunodeficiency virus and cancer diagnoses. For these conditions, do not assign the definitive code unless they are specifically documented or clarified by the physician.



Disorders of the Peripheral Nervous System

Category code range 350 to 359 includes disorders of the peripheral nervous system, which are classified according to the nerves involved. The *cranial nerves* carry nerve impulses to and from the brain, head, and neck. The *spinal nerves* carry impulses to and from the brain, trunk, and extremities.

Also part of the peripheral nervous system, the autonomic nervous system is further subdivided into sympathetic and parasympathetic systems. The sympathetic nervous system stimulates the body in times of crisis by inducing the “fight or flight” response: heart rate, blood pressure, and respiration increase; the body increases the production of epinephrine (adrenaline); pupils widen; and digestion slows (e.g., a sympathetic nervous response may be stimulated in a student getting an unannounced pop quiz in class). After the crisis has passed, the parasympathetic nervous system counters the sympathetic system and returns the person to a more relaxed state (e.g., heart rate, blood pressure, and respiration slow).

Common peripheral nervous system disorders include peripheral nerve lesions, palsies, mononeuropathies and polyneuropathies, inflammatory and toxic neuropathies, and myoneural disorders. Many peripheral nervous system disorders are the manifestation of an underlying disease, which you would code first.

Diabetic polyneuropathy: 250.60 + 357.2

Example

Polyneuropathy in disseminated lupus erythematosus: 710.0 + 357.1

Polyneuropathy in rheumatoid arthritis: 714.0 + 357.1

Acute Infective Polyneuritis (Guillain-Barré Syndrome)

A significant disease in this code range that often causes hospital admission is acute infective polyneuritis. Also known as Guillain-Barré syndrome (code 357.0), acute infective polyneuritis is an autoimmune disorder in which the body's immune system attacks the peripheral nervous system. The etiology of this disorder is unknown; however, it can sometimes follow a viral illness. Guillain-Barré syndrome results in a sudden, acute, and progressive motor nerve (voluntary muscle) paralysis. Symptoms include rapidly progressive weakness and paresthesias (abnormal sensations such as tingling or numbness in the extremities) that begin in the legs and move to the upper body. Ultimately, the individual can experience incapacitating paralysis with subsequent respiratory paralysis and respiratory failure.

Because there is no specific treatment for Guillain-Barré syndrome, the symptoms are treated. The primary focus is to keep patients alive and functioning and to prevent them from succumbing to secondary complications (e.g., pneumonia) until the paralysis resolves. This usually occurs within a few weeks. Patients with Guillain-Barré syndrome often require many inpatient resources because of profound respiratory difficulties that can necessitate placement in the intensive care unit and treatments such as endotracheal intubation with mechanical ventilation and emergent tracheostomy placement.

Developed by the federal government, MS-DRGs use coded data to establish prospective payment rates to hospitals for inpatient services under Medicare (see Appendix 1: MS Diagnosis-Related Groups (DRG) List). The coding of procedures makes the difference in DRG assignment and, therefore, reimbursement (see below diagnosis-related group MS-DRG 094 versus MS-DRG 004 reporting).



Coding Clinic 1991, second quarter, describes more information about Guillain-Barré syndrome with respiratory failure.

Example

MS-DRG 094: Bacterial & tuberculous infections of nervous system w MCC

MDC: 001 Diseases and disorders of the nervous system

CMS wt: 3.1499

A/LOS 12.5

G/LOS 9.7

Principal diagnosis: 357.0 Acute infective polyneuritis (Guillain-Barré syndrome)

Secondary diagnosis: 518.81 Acute respiratory failure

Principal procedure: 96.71 Continuous mechanical ventilation (96 hours)

Other procedure: 96.04 Insert endotracheal tube

Medicare inpatient reimbursement: \$12,599.60

MS-DRG 004: Tracheostomy with mechanical ventilation 96+ hours or PDX except face/mouth/neck without major OR procedure

MDC: Pre-MDC—surgical

CMS wt: 11.4219

A/LOS 29.3

G/LOS 23.8

Principal diagnosis: 357.0 Acute infective polyneuritis (Guillain-Barré syndrome)

Secondary diagnosis: 518.81 Acute respiratory failure

Principal procedure: 31.1 Temporary tracheostomy

Other procedures: 96.71 Continuous mechanical ventilation (96 hours)

96.04 Insert endotracheal tube

Medicare inpatient reimbursement: \$45,687.60

Disorders of the Eye and Adnexa

Category code range 360 to 379 includes disorders of the eye and adnexa (tissues surrounding the eye), including blindness, cataracts, glaucoma, strabismus, macular degeneration, and retinal detachment.

Anatomy and Physiology

Understanding the anatomy (structure) and physiology (function) of the eye can lead to a better understanding of the pathologies (dysfunctions) that affect the eyes and can enable you to code more precisely (Figure 12.2).

The eyes transmit sensory impulses that provide pictures to the brain. Primarily, an eye consists of three layers. The outer layer consists of the following:

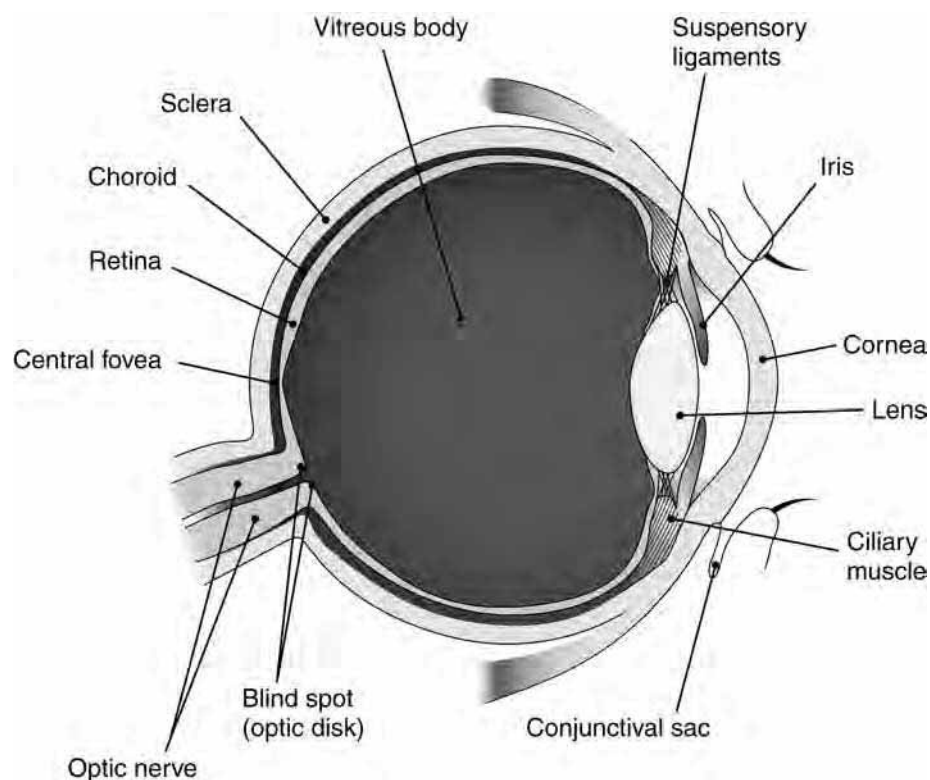


Figure 12.2 The eye. (Reprinted with permission from Cohen BJ and Wood DL. Memmler's *The Human Body in Health and Disease*, 9th Ed. Philadelphia: Lippincott Williams & Wilkins, 2000.)

- ▶ Cornea—an outer clear lens in front of the pupil (dark opening in the eye).
- ▶ Sclera—the white of the eye.
- ▶ Conjunctiva—a clear covering over the front sclera and lining the eyelids.

The middle layer (uveal tract) consists of the following:

- ▶ Choroid—a membrane containing blood vessels that nourish the eye.
- ▶ Ciliary body—muscle tissue that surrounds and applies tension to inner lens of the eye so that the lens can thicken for close vision and thin for distance vision. *Presbyopia* (far-sightedness associated with old age) occurs when the inner lens loses flexibility and can no longer thicken for close vision, resulting in the need for reading glasses (bifocals).
- ▶ Iris—the colored part of the eye surrounding the pupil. The iris contains circular and radial muscles that widen or constrict to control the amount of light entering through the pupil. The iris constricts in bright light as a protective mechanism to prevent damage to the retina (nervous tissue of the eye), and it widens to let in more light in dim lighting.

The inner layer consists of the following:

- ▶ Retina—the nervous tissue of the eye, consisting of nerve cells called *rods* and *cones*. Rods aid in peripheral vision and seeing in the dark; cones assist in central vision and seeing color. The retina includes an area called the *macula* that contains the fovea centralis (i.e., central macula). When light rays coming into the eye are focused on this area, it produces the sharpest vision.
- ▶ Optic nerve—a cranial nerve that communicates with the optic disc to send impulses to the brain for visual interpretation. Optic nerve fibers leading to the brain cross over in an area called the *optic chiasm* that allows each eye to communicate with both sides of the brain, thus producing three-dimensional vision (height, width, and depth). Without three-dimensional vision, the world would look flat.

The outer cornea, inner lens, aqueous humor (fluid behind the cornea), and vitreous humor (fluid behind the inner lens) combine to direct and bend light (refraction) to focus on the fovea centralis for the sharpest vision. In *myopia* (near-sightedness), the eye shape is too long, and the rays being refracted do not reach the fovea. In *hyperopia* (far-sightedness), the eye shape is too short, and the rays being refracted overshoot the fovea (Figure 12.3). These refraction errors can be corrected with glasses (biconcave for near-sightedness and biconvex for far-sightedness), contact lenses, and refractive operations, such as laser-assisted stromal in situ keratomileusis (LASIK), or radial keratotomy, that reshape the cornea.

The *Snellen chart* is an important visual acuity test. Standing at a distance of 20 feet away, a patient will read large black letters on the top of a white chart that gradually decrease in size toward the bottom. If you have 20/20 vision, this means that at 20 feet away from the chart, you can see every letter clearly. OD (oculus dexter) is an abbreviation for the right eye, OS (oculus sinister) is an abbreviation for the left eye, and OU (oculus uterque) is an abbreviation for both eyes. If a person has 20/20 OD and 20/800 OS vision, that would indicate that vision is normal in one eye but profoundly impaired in the other eye. (A person with 20/20 vision standing 800 feet away can see what the person with 20/800 vision sees at 20 feet away.)

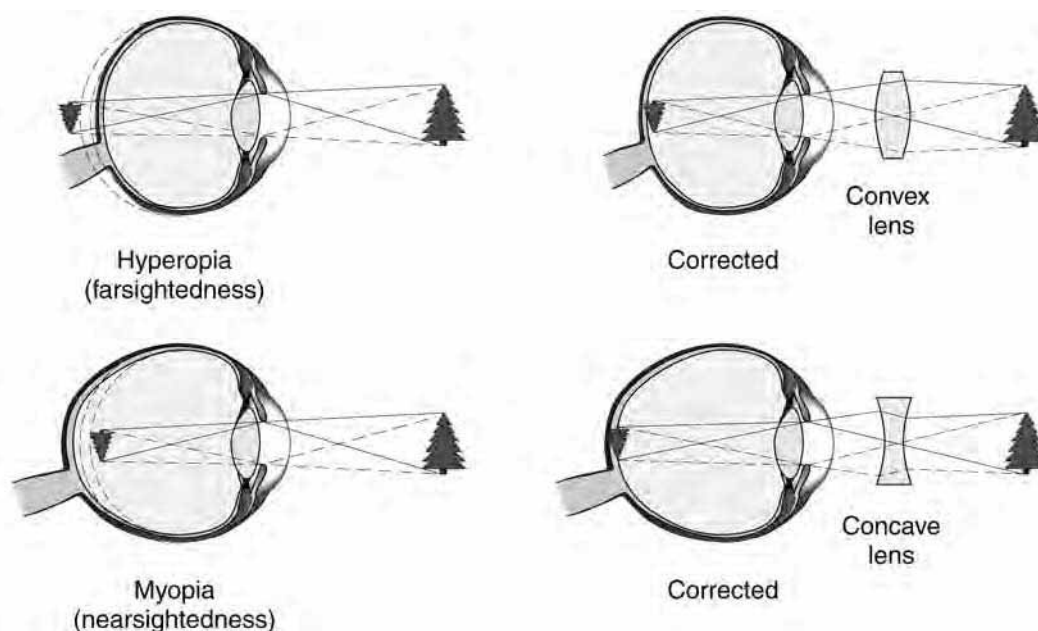


Figure 12.3 Errors of refraction. (Reprinted with permission from Cohen BJ and Wood DL. Memmler's The Human Body in Health and Disease, 9th Ed. Philadelphia: Lippincott Williams & Wilkins, 2000.)

Blindness

Blindness and low vision not otherwise specified are coded to category 369 of ICD-9-CM. Under category 369, the ICD-9-CM codebook includes a table to describe the level of visual impairment based on the recommendations of the World Health Organization. A person with 20/20 OD and 20/800 OS vision would be coded to 369.69 (one eye, profound impairment; other eye, normal vision).

Often, physicians document the diagnosis of blindness inadequately, and the condition is coded to blindness without further specificity (code 369.00). However, ICD-9-CM provides more detailed coding of visual impairment, which may, in turn, refine the assignment of future MS-DRGs. Good documentation facilitates more precise coding and provides a more accurate description of the patient's visual impairment.



Blindness is not often listed as the principal diagnosis or the reason for inpatient admission. However, blindness is sometimes reported as a secondary diagnosis that affects the patient's episode of care because of the need for increased patient assistance. Although it is generally accepted that blindness is a reportable condition that affects patient care, the Centers for Medicare and Medicaid Services do not recognize blindness as a comorbid condition that significantly affects the health-care services provided such that it would increase the reimbursement to the provider. A lack of documentation and inadequate specificity in the reporting of blindness provide insufficient data for the government to determine its true effect on patient care, health-care resource use, and provider reimbursement.

- Example** *Profound legal blindness in both eyes: 369.08*
Nearly total blindness in the right eye with normal vision in the left eye: 369.66
Total blindness, both eyes: 369.01

Cataracts

Cataracts (category code 366) result in a cloudiness of the inner lens of the eye that leads to a loss of vision. Some cataracts are associated with age (senile), others may be congenital (present at birth), secondary to trauma, or related to the long-term affects of diabetes.



You should never assume a senile cataract if the patient is elderly or a diabetic cataract if the patient has diabetes. Only a physician can document the exact nature of a cataract.

Cataracts are routinely removed by operation on an outpatient basis. An intracapsular cataract extraction (13.1X) involves the removal of the entire inner lens. In an extracapsular cataract extraction (13.2-5X), the lens is removed, leaving the posterior (back) portion of the lens capsule in place (Figure 12.4). Whichever technique is used, these cataract-extraction procedures are routinely accompanied by the insertion of an intraocular lens implant, which requires an additional procedure code (13.71).

Glaucoma

Glaucoma (category code 365) is “a disease of the eye characterized by increased intraocular pressure, excavation, and atrophy of the optic nerve that

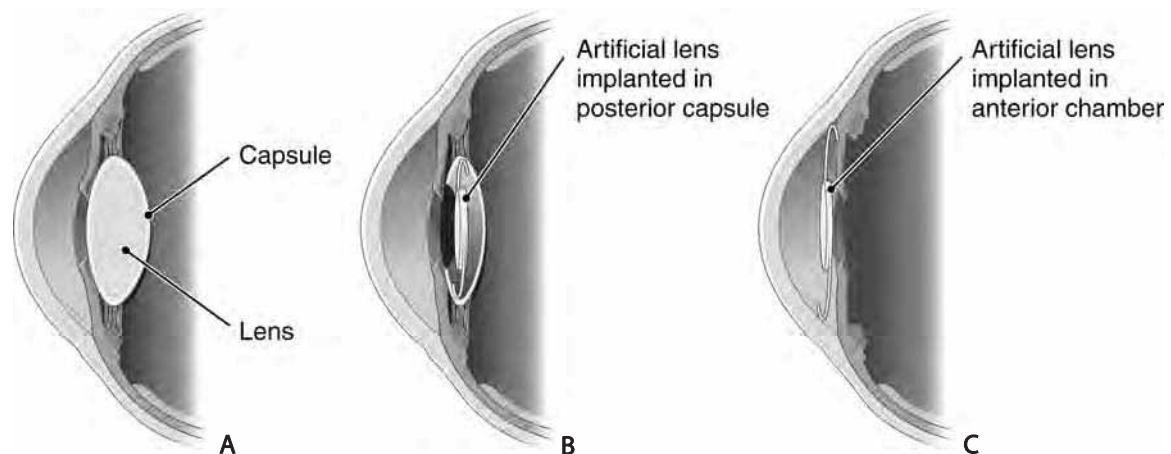


Figure 12.4 Cataract extraction surgeries. **A.** Cross-section of normal eye anatomy. **B.** Extracapsular lens extraction involves removing the lens but leaving the posterior capsule intact to receive a synthetic intraocular lens. **C.** Intracapsular lens extraction involves removing the lens and lens capsule and implanting a synthetic intraocular lens in the anterior chamber. (Reprinted with permission from Cohen BJ. *Medical Terminology: An Illustrated Guide*, 4th Ed. Baltimore: Lippincott Williams & Wilkins, 2004.)

produces defects in the field of vision”¹. Glaucoma can be specified as acute, chronic, angle-closure, open-angle, or other ways. You can think of glaucoma as hypertension of the eye caused by the buildup of aqueous humor in the anterior (front) chamber of the eye that cannot drain properly. Tonometry, a common test to diagnose glaucoma, measures intraocular pressure. Glaucoma is often refractory to treatment. However, eyedrops (e.g., pilocarpine) can sometimes be used effectively to decrease intraocular pressure, and surgical procedures including trabeculectomy, trabeculotomy, or iridectomy with scleral fistulization may offer some relief. These surgical procedures use a laser to create a hole in the iris or sclera to facilitate intraocular circulation.

Strabismus

Strabismus is the inability of the eyes to remain balanced or parallel when looking in the same direction (e.g., cross-eyed). Different forms of strabismus include exotropia (378.1X), in which one eye is deviated outward, and esotropia (378.0X), in which one eye is deviated inward. Some forms of strabismus can result in visual impairments such as diplopia (double vision). Often corrective surgery is performed on the extraocular muscles (the muscles surrounding the eye). Such operations may involve recession procedures that lengthen the extraocular eye muscles (15.11 and 15.3) or resection procedures that shorten the extraocular muscles to bring the eyes into proper balance (15.13 and 15.3).

Macular Degeneration

Age-related macular degeneration (code 362.5X) results in degeneration of the macular area of the retina and leads to a loss of central vision (i.e., cannot see straight ahead). It is a leading cause of blindness for elderly people in the United States. Peripheral vision is usually maintained. There are two forms of the disease: the wet form, which results from leaky blood vessels beneath the retina, is not as common as the dry (atrophic) form, which results from retinal thinning and degeneration. Generally, there are few treatments available for the dry form; however, a new procedure (code 13.91) involves implanting a miniature telescopic lens prosthesis for patients with moderate to profound visual impairment due to end-stage age-related macular degeneration (AMD). This allows the patients to maintain peripheral vision in the untreated affected (untreated) eye and to gain central vision in the treated eye. For the wet form, laser photocoagulation can sometimes be used to destroy the damaged blood vessels, but this only manages or slows the progression of the disease. A newer procedure, photodynamic therapy, with a photosensitive drug called verteporfin (Visudyne), can selectively destroy leaking vessels in the retina with the use of a laser. There is no cure for macular degeneration.

Retinal Detachment

Retinal detachment (361.0X, 361.9) results in a retinal tear. This condition can be preceded by numerous *floaters* (floating dark spots), the perception of flashes of light, and a blind spot in the field of vision. Surgery is required to restore vision. A scleral buckling procedure with a silicone implant is used to suture the separated sections of retinal tissue back together (code 14.41).

Disorders of the Ear

Category code range 380 to 389 includes disorders of the ear and mastoid process that include various outer, middle, and inner ear disorders and deafness attributable to conductive, neural, and mixed hearing dysfunction.

Anatomy and Physiology

The primary function of the ears is to transmit sensory impulses to the brain that enable one to perceive sounds. The ear has three sections (Figure 12.5):

- ▶ The outer section consists of the auricle or pinna (external flap of the ear) and the external auditory canal. A membrane called the eardrum (tympanic membrane) separates the outer ear from the middle ear. It vibrates to conduct sound to the middle ear.

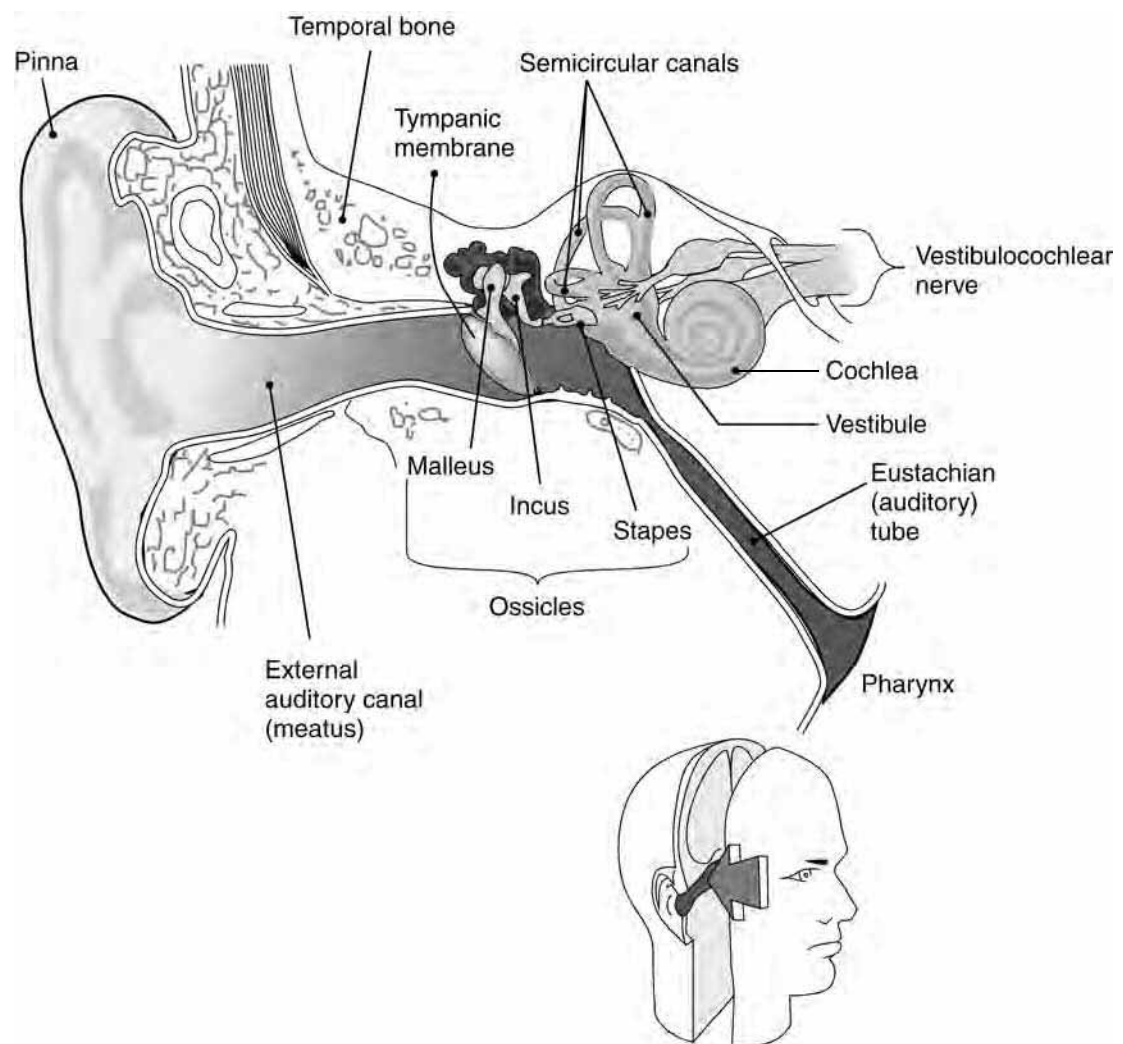


Figure 12.5 The ear, showing the outer, middle, and inner subdivisions. (Reprinted with permission from Cohen BJ and Wood DL. Memmler's The Human Body in Health and Disease, 9th Ed. Philadelphia: Lippincott Williams & Wilkins, 2000.)

- ▶ The middle section consists of three small bones (ossicles) called the malleus, the incus, and the stapes. The ossicles transfer sound through vibrations to the oval window, which separates the middle ear from the inner ear.
- ▶ The inner section is a mazelike structure called the labyrinth, which contains the snail-shaped cochlea, the organ of Corti, vestibular and semicircular canals, auditory fluids (perilymph and endolymph), and small hairs (cilia). In the inner ear, the auditory fluids and specialized tiny hairs carry vibrations to the auditory nerves, which, in turn, transmit nerve impulses to the brain, where sound is perceived. In addition, the fluids and tiny hairs of the semicircular canals give one a sense of balance or spatial sense in response to body movement. This is why when a child rapidly spins in circles, he or she feels dizzy: the inner-ear apparatus sends mixed spatial messages to the brain. Classic symptoms associated with labyrinthitis or inner ear inflammation or infection include vertigo (dizziness) with accompanying nausea.

Sound is received by the external ear (auricle) and travels through the external auditory canal, where it vibrates against the eardrum. The vibration of the eardrum is relayed to the ossicles (malleus, incus, and stapes) of the middle ear, which, in turn, transmit the vibration to the oval window leading to the inner ear. The vibrations of the oval window then travel through the fluids and tiny hairs of the cochlea until they are picked up by the receptors of the auditory nerves, which send the sound impulses to the brain for auditory interpretation.

External Ear Conditions

A condition often associated with the external ear is impacted cerumen (ear-wax) (380.4), which can be removed through irrigation of the ear (96.52). Although impacted cerumen would not be a cause for hospital admission, it is frequently a secondary diagnosis that requires attention during the current episode of patient care.

Middle Ear Conditions

Conditions associated with the middle ear include otosclerosis and otitis media. *Otosclerosis* (387.X) is a hardening of bone tissue around the oval window. Conduction deafness occurs, because the ossicles in the middle ear cannot pass along vibrations through the oval window to the acoustic nerves of the inner ear. Stapedectomy with a prosthetic incus replacement (19.11) can be performed to restore hearing. *Otitis media* is an inflammation of the middle ear. It can be described as acute or chronic and as suppurative (infectious with pus formation) or serous (noninfectious with clear fluid).

Unique to the middle ear is the eustachian, or pharyngoeustachian, tube, an opening that allows the middle ear to communicate with the pharynx (throat). This is an important protective mechanism that prevents the eardrum from being perforated (ruptured). For example, when you ascend quickly in an airplane, where the atmosphere is thin and the external air pressure is low, the air pressure in the middle ear remains high and the eardrum bulges outward. The eustachian (pharyngoeustachian) tube responds by opening to allow the pressure of the middle and external ear to equalize, to prevent perforation of the eardrum.

Children often experience recurrent or chronic middle ear inflammations or infections called *chronic otitis media* that are attributable to dysfunction of the eustachian tube, which provides drainage from the middle ear to the pharynx. A tympanotomy or myringotomy (incision into the eardrum) with intubation (pharyngoeustachian tube insertion: 20.01) can be performed to keep the eustachian tube open for drainage.

Inner Ear Conditions

Conditions associated with the inner ear include labyrinthitis and Ménière's disease. Labyrinthitis (otitis interna; code 386.3X) is an inflammation of the inner-ear labyrinth. The fifth digit describes the type or form of labyrinthitis (serous or diffuse, circumscribed or focal, suppurative or purulent, toxic or attributable to chemicals, and viral).

Ménière's disease (code 386.0X) is a disorder of the inner ear labyrinth that results from an excess accumulation of fluid pressure (endolymph) in the cochlea and semicircular canals. Symptoms include vertigo (dizziness), tinnitus (ringing in the ears), headache, and nausea and vomiting.

Conductive deafness (code 389.0X) usually results from a transmission disorder of the ossicles of the middle ear, tympanic membrane, or oval window. Sensorineural deafness (code 389.1X) occurs when there is a dysfunction involving the cochlea or acoustic nerves of the inner ear. Mixed hearing loss involves both conductive and sensorineural hearing loss (code 389.2X).



The type of deafness indicated (i.e., conductive, sensorineural, or mixed conductive and sensorineural) is key to understanding and assigning the correct procedure codes for the various hearing devices available.

Conductive hearing loss is treated with external (battery-powered) hearing aids (95.49), implantation of an electromagnetic bone-conduction device (20.95), or a stapedectomy with prosthetic incus replacement (19.11) for otosclerosis. Sensorineural hearing loss can be treated with a cochlear implant device (single or multiple channels with electrodes) that stimulates the auditory nerve (20.9X).

Summary

This chapter has reviewed the pathology of common disorders of the nervous system and sensory organs. The discussion has been subdivided into the following topical areas: disorders of the CNS, disorders of the peripheral nervous system, and disorders of the sensory organs. The chapter has focused on recognizing manifestations of these disorders and on the complications one might encounter and the treatments commonly used. This has been presented along with an in-depth review of the implications for coding. Proper coding with the ICD-9-CM and medical records has been emphasized throughout the chapter. Chapter 13 addresses the subject of diseases of the circulatory system, blood, and blood-forming organs.

References

¹Stedman's Medical Dictionary, 27th Ed. Baltimore: Williams & Wilkins, 2000.

Testing Your Comprehension

1. What are the causes of meningitis?
2. What procedure is performed to confirm a diagnosis of meningitis?
3. What is a common diagnosis for an inflammation of the brain?
4. What tests are performed to confirm a diagnosis of encephalitis?
5. What drug may be used to relieve the symptoms of Parkinson's disease?
6. Alzheimer's patients lose three senses. Please identify them.
7. What are the symptoms associated with multiple sclerosis?
8. Coding hemiplegia or other symptoms as current with a new CVA while coding residual conditions or symptoms associated with old CVAs to late effects enables the coder to accomplish what objective?
9. A sudden loss of consciousness associated with a fall, stiffening of muscles, and clonic movements may characterize what ailment?
10. What does the fifth digit in the epilepsy code describe?
11. What does the outer layer of the eye consist of?
12. What does the middle layer of the eye consist of?
13. What does the inner layer of the eye consist of?
14. Lack of documentation and inadequate specificity in reporting blindness creates what problems?
15. Glaucoma produces defects in the field of vision. How is this condition manifested?
16. What is the cause of glaucoma?
17. What is strabismus?
18. What does macular degeneration lead to?
19. What are the components of the outer section of the ear?
20. What are the parts of the middle ear?
21. What are the parts of the inner ear?
22. What is otosclerosis?
23. What is labyrinthitis?

Chapter Review Exercises

Coding Practice I

Directions

By using your ICD-9-CM codebook, code the following diagnoses and procedures:

	Diagnosis/Procedures	Code
1	Monocular esotropia, nonaccommodative, OD. Recession of medial rectus muscle, OD.	
2	Conductive and sensorineural deafness. Multiple-channel cochlear implantation.	
3	Senile dementia with Alzheimer's disease with disturbance of behavior.	
4	Recurrent seizure disorder, controlled with phenobarbital.	
5	Keratoconjunctivitis with corneal ulcer.	
6	Retinal detachment with giant tear. Retinal repair with cryotherapy. Scleral buckle.	
7	Leg pain, secondary phantom-limb syndrome. Status post right below-the-knee amputation.	
8	Grand mal epilepsy.	
9	Normal pressure hydrocephalus with dementia and behavior disorder.	
10	Restless-leg syndrome.	
11	Spinal cord infarction.	
12	Dizziness secondary to Ménière's disease.	
13	Brain abscess.	

	Diagnosis/Procedures	Code
14	Senile cataract. Extracapsular cataract extraction with intraocular lens insertion.	
15	Acute glaucoma.	
16	Spinal headache. Fever. Status post recent spinal tap.	
17	Carpal tunnel syndrome. Carpal tunnel release.	
18	Chronic otitis media. Tube (myringotomy) insertion.	
19	Multiple sclerosis exacerbation.	
20	Classic intractable migraine.	
21	Severe head and jaw pain secondary to trigeminal neuralgia.	
22	Staphylococcal meningitis. Spinal tap.	

Medical Record Case Studies

Coding Practice II

Instructions

1. Carefully review the medical reports provided for each case study.
2. Research any abbreviations and terms that are unfamiliar or unclear.
3. Identify as many diagnoses and procedures as possible.
4. Because only part of the patient's total record is available, determine what additional documentation you might need.
5. If appropriate, identify any questions you might ask the physician to code this case correctly and completely.
6. Complete the appropriate blanks below for each case study.

Chapter 12 Case Studies

Case Study 12.1

Patient: **Jane Doe**

Patient documentation: **Review Medical Reports 12.1 and 12.2**

Principal diagnosis: _____

Secondary or other diagnoses: _____

Principal procedure: _____

Other procedures: _____

Additional documentation needed: _____

Questions for the physician: _____

Medical Report 12.1

XYZ Community Hospital
DISCHARGE SUMMARY

PATIENT: JANE DOE
MED REC NO.:
DATE OF ADMISSION:
DATE OF DISCHARGE:
ATTENDING PHYSICIAN: SMITH, M.D.

REASON FOR ADMISSION: This 51-year-old white woman with a history of multiple sclerosis passed out while sitting and taking a shower at home. The patient was taken to the emergency room where she was found to have a blood pressure of 108/80 lying and 80/50 sitting. She was admitted to PCU (progressive care unit) for full evaluation of this syncopal-type episode.

HOSPITAL COURSE: On admission the potassium was found to be 3.2 and this was corrected with IV (intravenous) potassium replacement. Neurologic consultation was obtained and EEG (electroencephalogram) performed. This was found to be within normal limits. The patient continued to complain of some right upper extremity weakness and numbness. The remainder of her physical examination was unchanged from what had been her previous examination. The neurology evaluation by Dr. Nerve confirmed the already known diagnosis of multiple sclerosis and felt that this may be an exacerbation of the same. An MRI (magnetic resonance imaging) of the brain and the C-spine was obtained which did show mild cervical cord degeneration. The patient's condition remained approximately the same. She continued to have lightheaded spells when changing position from lying to sitting. A cardiology consultation was obtained to rule out the possibility of any significant pathologic problem. Dr. Heart's evaluation felt that this was most probably due to autonomic dysfunction in the large extremity secondary to multiple sclerosis. Several recommendations were made to try and correct the situation and these were implemented. The episodes seemed to somewhat improve but continued to happen. Routine chest x-ray revealed a retrocardiac mass. This was evaluated with CT (computerized tomography) scan and the possibility of a tumor could not be excluded. Subsequently, Dr. Lung performed a bronchoscopy and there was no mass or endobronchial lesions seen. The patient remained on a steady course with no other significant problems. As there was nothing further that we could offer and as the patient was stable, she was discharged.

FINAL DIAGNOSIS:

1. Hypokalemia.
2. Exacerbation of multiple sclerosis.
3. Urinary tract infection.
4. Orthostatic hypotension due to autonomic dysfunction of multiple sclerosis.
5. Syncope due to hypotension.
6. Solitary coin lesion of the lung.

DISCHARGE MEDICATIONS: Florinef 0.1 mg q.d. Will continue Prednisone 20 mg b.i.d. Thigh-high TED hose. Ativan 1 mg q.h.s. Fioricet 1 q.6.h. p.r.n. pain. Darvocet-N 100 1 q.6.h. p.r.n. pain.

Continued

Medical Report 12.1 continued

The patient is instructed to change positions from lying to sitting very slowly. She was informed that these episodes, in all likelihood, will continue. Her urinary tract infection had been adequately treated throughout her hospital stay with Floxin 200 mg b.i.d. Due to her inability to get around she was sent home with the Foley catheter in place. Arrangements were made for visiting home nurse and physical therapy if possible. The patient will follow-up in my office in approximately one week or sooner if there is a problem.

DD:

DT:

JOHN SMITH, MD

NOTES

Medical Report 12.2

XYZ Community Hospital
HISTORY AND PHYSICAL

PATIENT: JANE DOE
MED REC NO.:
DATE OF ADMISSION:
ATTENDING PHYSICIAN: SMITH, M.D.

CHIEF COMPLAINT: Complaint of fainting.

HISTORY OF PRESENT ILLNESS: This is a 51-year-old Caucasian female, who fainted at her home today as she was sitting, taking a shower. Paramedics were called and the patient revived by the time they arrived but they did go ahead and give her some glucose solution. At the emergency room, she was found to be orthostatically hypotensive with a blood pressure of 108/80 lying and 80/50 sitting. The patient is an excellent historian and has had MS (multiple sclerosis) since 1980s. She has had occasional relapses that have usually responded to Cortisone; most recently severe was in 1990s. She developed progressive weakness over the past 6 months and took a 3-week Cortisone regimen near Thanksgiving of this year, discontinuing the medication a week ago. She again resumed, a few days ago, due to progressive weakness. She is wheelchair bound but normally can do most of her household activities such as fixing meals for the family, tending to her bodily needs, and transferring quite well. She has not walked in quite some time.

She has been under the care of Dr. Muscle, physical medicine specialist, and Dr. Nerve, neurologist. She is bothered by chronic back pain for which she was thoroughly evaluated at the Clinic earlier this year with conclusion being some type of "central pain disorder." She is bothered by headaches for which she takes Fioricet and is unable to sleep at night for which she has been taking Ativan. The Cortisone makes her feel quite nervous which also seems helped by Ativan. She has had depression over the past year with feeling blue much of the time and has tried various types of antidepressant drugs without much improvement. She has had an unexplained loss of appetite the past 6 months with associated 10 lb. weight loss.

PAST MEDICAL HISTORY: Denies diabetes, hypertension or heart disease. She has had a hysterectomy, lumbar spinal fusion and debridement and closure of a sacral ulcer.

ALLERGIES: SULFA, CODEINE, URECHOLINE.

SOCIAL HISTORY: She is married, does not smoke or use alcohol. Drinks 5-6 glasses of tea daily.

FAMILY HISTORY: Unremarkable.

REVIEW OF SYSTEMS: General: Progressive weakness, feels cold much of the time recently. Weight loss. HEENT: Legally blind in the right eye, occasional loss of vision in the left when she has relapses of MS. Cardiorespiratory: Denies chest pain, shortness of breath or cough. GI: Loss of appetite. Forces herself to eat. Denies abdominal pain, constipation or diarrhea. GU: Incontinence with Foley catheter indwelling at this time. Musculoskeletal: As in history of present illness. Neuro: Frequent headaches, feels depressed and blue much of the time. Unable to move her legs. Occasional numbness and tingling in the right upper extremity which is patchy and diffuse.

PHYSICAL EXAM: Reveals a Caucasian female, age 51, well-developed, well-nourished.

BP: 110/80.

Continued

Medical Report 12.2 continued

PULSE: 72.

RESPIRATIONS: 16.

TEMP: 98.

HEENT: Eyes reveal mildly asymmetric right pupil, mid-sized, reacts poorly to light with absence of consensual reflex in left eye. Left pupil reacts briskly to light and a consensual reflex is present in the right eye. Ears clear. Mouth and throat: Permanent teeth. Tongue midline with pharynx clear. Mild dryness.

NECK: Is supple. Carotid pulsations are brisk without bruits. No adenopathy or thyroid enlargement.

LUNGS: Equal breath sounds.

HEART: Regular rhythm without murmur or gallop.

BREASTS: Not done.

BACK: Some prominence of the dorsal spine due to muscle atrophy. In the lumbar region, a well-healed lumbar surgical scar.

ABDOMEN: Soft, nontender, no organomegaly. A well-healed surgical lower abdominal midline scar. Femoral pulses are 1+ and symmetrical.

EXTREMITIES: Reveal atrophy of the musculature of the thighs and calves with mild flexion contractures at the knee. Pedal pulses are a trace bilaterally. There is no edema.

NEURO: The patient is alert, coherent with mildly depressed affect. She is oriented x 3. She holds her arms, upper extremities well. Unable to move the lower extremities at all.

SKIN: Is warm and dry and pale.

LAB: Serum potassium of 3.2. Electrocardiogram shows sinus rhythm, multiple atrial premature complexes.

IMPRESSION:

1. Syncopal episode.
2. Multiple sclerosis.
3. Hypokalemia.

PLAN: Admission to the progressive care unit for intravenous fluids, adequately rehydrate, correct the potassium deficiency, further evaluate the cause of her syndrome.

DD:

DT:

SMITH, M.D.

Medical Report 12.3**XYZ Regional Hospital**

PATIENT NAME: SMITH, Frank
MEDICAL RECORD NUMBER:
ACCOUNT NUMBER:
ADMISSION DATE:
DISCHARGE DATE:
CLINICAL RESUME

FINAL DIAGNOSIS:

1. Intracranial hemorrhage.
2. Diabetes.

ATTENDING PHYSICIAN: Dr. Jones

RESIDENT PHYSICIAN: Dr. Smith

CONSULTANTS: Dr. Nerve of neurosurgery

ADMITTING DIAGNOSIS:

1. Intracranial hemorrhage
2. Diabetes

INITIAL FINDINGS: This is an 82-year-old white male with multiple past medical history who presents from XYZ Hospital with intracranial hemorrhage. According to Dr. Nerve, there are no surgical options for this patient. According to family, patient got up today from a chair and fell hitting his head against the floor. The patient was conscious after the fall but was weak on the right side. Mental functioning as per family has decreased progressively since then. Normally patient is active, oriented x2, ambulatory with cane and has only mild signs of dementia. Review of systems as per family: Patient denies fever and chills, chest pain, shortness of breath, nausea, vomiting, abdominal pain, or change in bowel movements. Patient does complain of chronic weakness. While at XYZ Hospital, the patient was given 1 unit of FFP and 10 mg of vitamin K.

PAST MEDICAL HISTORY:

1. Atrial fibrillation, on (long-term) Coumadin.
2. Alzheimer's dementia, mild symptoms only as per family.
3. Hypertension.
4. GERD.
5. CVA.
6. Diabetes, diet controlled.

PAST SURGICAL HISTORY:

Medical Report 12.4**XYX Memorial Hospital**
DISCHARGE SUMMARY

PATIENT NAME: JOHNSON, ANN
DATE OF ADMISSION:
DATE OF DISCHARGE:
ATTENDING PHYSICIAN: SMITH, M.D.

DISCHARGE DIAGNOSIS:

1. Acute renal failure, etiology uncertain.
2. History of paroxysmal atrial fibrillation, controlled on meds.
3. Grand mal epilepsy, on Dilantin and Phenobarbital.

This is a 51-year-old female admitted through the Emergency Room because of 48 hours of abdominal pain with low-grade fever, nausea and vomiting. She was admitted for further observation. On examination her chest was clear to auscultation and percussion. Cardiac examination showed regular sinus rhythm. The abdomen was benign. There was some decrease in bowel sounds. No organomegaly, no masses, no tenderness noted although earlier in the Emergency Room apparently there was some discomfort in the left lower quadrant. She was admitted with the diagnosis of gastroenteritis; however, this was ruled out.

I was asked to see the patient in consultation. It was apparent that she had an episode of acute renal failure seemingly related to her congenital solitary kidney. She had mild cardiomegaly. She underwent acute hemodialyses in the Intensive Care Unit. These were uncomplicated. Electrocardiogram demonstrated sinus bradycardia, question of an old anteroseptal defect and nonspecific S-T-T wave changes. Electrocardiogram was essentially negative for significant lesions. There was a minimal sized pericardial effusion. No evidence of a thrombus and there was evidence of the old mitral valve prolapse. Laboratory data was remarkable for the following findings. The electrolytes demonstrated hyponatremia consistent with her acute renal failure. Her urinary electrolytes demonstrated a serum sodium of 35 and subsequently rose to 111 at the time of her maximum defect. Initially her urinalysis demonstrated +4 protein. There was still +4 protein 6 days later and there were 10-20 white cells, reached its peak at 53. The patient was undergoing dialysis through this period of time. Her creatinine similarly had risen to a peak of 8.1. However, the patient subsequently had a spontaneous increase in infiltration rate. By the time of discharge she was vastly improved with a spontaneously decreasing creatinine of 4.4. The cardiac profile suggested an elevated CPK with positive LDH isoenzymes consistent with renal ischemia, perhaps infarction. The patient's course continued to be benign and she was released to be followed up in the office. All other studies were negative. Urine for myoglobin was negative but this was done approximately five days after admission. The patient was sent home on controlled salt diet with follow up in one week to see me.

DD:
DT:

SMITH, M.D.

Medical Report 12.5**XYZ Memorial Hospital**
HISTORY AND PHYSICAL

PATIENT: JOHNSON, ANN

DATE OF ADMISSION:

ATTENDING PHYSICIAN: SMITH, M.D.

CHIEF COMPLAINT: Abdominal pain.

PRESENT ILLNESS: The patient is a 51-year-old white female being admitted from the emergency room to the floor for observation. She presented to the emergency room earlier this afternoon with a 24-hour history of generalized abdominal pain associated with multiple episodes of nausea and vomiting. She has noted in the last 6–12 hours a localization of the pain more in the left lower quadrant of the abdomen.

The patient was visiting the area and saw a physician there who recommended hospitalization. She came back here for evaluation. The patient has had no fever or chills. She has had no diarrhea or rectal bleeding. She has not consumed alcohol recently, has not been taking Aspirin products. She has had no gastrointestinal tract history.

The patient has had a history of grand mal epilepsy since the 1980s with her last seizure occurring in 1990s. She takes Dilantin 200 mg daily and Phenobarbital 30 mg daily. Additionally, the patient has a history of mitral valvular prolapse with paroxysmal atrial fibrillation, and takes Lanoxin .25 mg daily and Inderal long acting 80 mg per day.

PAST HISTORY: Current medications; see above. Allergies; none claimed. Infections/disease; none. Previous hospitalizations; paroxysmal atrial flutter, seizure work-up in the early 1980s. The patient was hospitalized twice for childbirth, and was hospitalized many years ago for a tonsillectomy.

SOCIAL HISTORY: The patient is married with two children. She is a former smoker, but not recently. She does not drink alcohol.

FAMILY HISTORY: Notable for cardiovascular disease.

REVIEW OF SYSTEMS:

GENERAL: Stable weight, no chills, fevers or night sweats.

SKIN: Negative.

HEENT: Presbyopic with glasses, otherwise benign.

RESPIRATORY: No pulmonary disease.

CARDIOVASCULAR: No chest pain or dyspnea, but periodic palpitations have been present. The patient was recently seen in the office the past week with a brief episode of paroxysmal atrial fibrillation.

GASTROINTESTINAL: See above.

Continued

Medical Report 12.5 continued

GENITOURINARY: Solitary congenital kidney per history.

MUSCULOSKELETAL: No amputation or arthritis.

CNS: Negative.

PHYSICAL EXAMINATION:

VITALS: Temperature 96.9, heart rate 58, blood pressure 100/60, respiratory rate 16.

GENERAL: The patient is a pleasant white female who is weak, but in no acute distress.

SKIN: Dry with diminished turgor across all four extremities.

HEAD: Normocephalic without signs or trauma.

EYES: Reveal symmetrical eye movements with reactive pupils. Fundi are benign.

ENT: Unremarkable.

NECK: Carotids are symmetrical, there are no bruits. There is no jugular venous distention.

CHEST: Clear to percussion and auscultation.

CARDIAC: Rhythm is regular. I can hear a mid-systolic click with an apical systolic murmur. There is no rub or gallop rhythm.

ABDOMEN: Notable for diminished bowel sounds. There is no hepatosplenomegaly, no mass and no tenderness; however, in the Emergency Room earlier left lower quadrant tenderness was noted.

RECTAL: The ampulla is empty, but there is some stool on the glove that is occult negative.

PELVIC: Not performed.

EXTREMITIES: Free of cyanosis, clubbing or edema.

IMPRESSION: Probable gastroenteritis with dehydration.

PLAN: Admit for observation and symptom relief, as well as hydration.

DD:

DT:

SMITH, M.D.

Medical Report 12.6**ABC Medical Center**
HISTORY AND PHYSICAL EXAMINATION

PATIENT NAME: HANSON, SARAH

ROOM#:

MED REC NO.:

ADMIT DATE:

ATTENDING PHYSICIAN: SMITH, M.D.

CHIEF COMPLAINT: Weakness, ataxia, confusion.**HISTORY OF PRESENT ILLNESS:** This 86-year-old female with weakness, difficulty walking or standing, and pain in her right foot and leg that has been progressive for the last several weeks. Also, she has been having increasing confusion, especially over the last 3–4 days. No other modifying factors or associated signs or symptoms.**PAST MEDICAL HISTORY:** Remarkable for CHF, hypertension, type 2 diabetes mellitus, CAD, back pain with radiculopathy, severe PVD, chronic renal failure, hyperlipidemia, hypokalemia, allergic rhinitis, diabetic retinopathy, OA. Surgeries: CABG, cholecystectomy, C-section, right arm and shoulder surgery, tumor removed from her neck in 1990, also had bilateral cataract surgery.**ALLERGIES:** Penicillin and questionable pain medication.**CURRENT MEDICATIONS:** Humulin 70/30, 55 units subcu q. a.m. and 25 units subcu q.p.m., tramadol 50 mg one to two q.6.h. p.r.n. pain, hydroxyzine 25 mg t.i.d. p.r.n., Neurontin 400 mg, two t.i.d., enteric coated aspirin 325 mg q.d., Lasix 40 mg q.d., Lanoxin .125 mg q.d., liquid antacid 2–4 teaspoons a.c. and q.h.s. p.r.n., Pletal 100 mg p.o. b.i.d. a.c., Lipitor 10 mg q. h.s., Coreg 3.125 mg b.i.d., lorazepam .5 mg b.i.d. p.r.n., Advil 200 mg one to two q.6.h. p.r.n.**FAMILY HISTORY:** Remarkable for ulcers and cancer.**PSYCHOSOCIAL HISTORY:** She resides with her family. They have electric heat, city water. No pets, no smokers. Patient denies nicotine, alcohol or drug use. She taught Sunday school for many years. No difficulty reading or writing.**REVIEW OF SYSTEMS:****EYES:** Bilateral cataract surgery. Wears reading glasses.**EARS, NOSE, MOUTH AND THROAT:** Edentulous with dentures.**CARDIOVASCULAR:** CAD, status post CABG.**RESPIRATORY:** No complaints of shortness of breath, dyspnea on exertion, cough, sputum production, hemoptysis or orthopnea.**GASTROINTESTINAL:** No complaints of dysphagia, abdominal pain, diarrhea, constipation, nausea, vomiting or hematemesis, melena, hematochezia, hemorrhoids or fecal incontinence.**GENITOURINARY:** No complaints of burning, urinary frequency, urgency, vaginal discharge, irregular menses, dyspareunia, hematuria, nocturia, hesitancy or oliguria.**MUSCULOSKELETAL:** History of generalized pain and joint stiffness with OA with difficulty standing.**Continued**

Medical Report 12.6 continued

INTEGUMENTARY: No complaints of itching, rashes, flaking or history of skin CA.

NEUROLOGICAL: Profound weakness with difficulty walking and ataxia.

PSYCHIATRIC: History of anxiety with confusion.

ENDOCRINE: Type 2 diabetes mellitus, insulin requiring.

HEMATOLOGICAL/LYMPHATIC: No history of anemia, blood disorders, free bleeding or easy bruising.

ALLERGY/IMMUNOLOGICAL: Penicillin and questionable pain pills.

PHYSICAL EXAM: Admission vital signs are as follows: Temp. 98.4, pulse 80, BP 142/86.

GENERAL APPEARANCE: This is a well developed elderly female in no acute distress.

HEENT: Head is normal cephalic and atraumatic. Eyes PERRLA. Extraocular movements intact. Tympanic membranes patent. Posterior pharynx and oral mucosa moist and clear.

NECK: Supple without masses or lymphadenopathy. No jugular vein distension.

RESPIRATORY: Respiratory effort is even and non-labored with all fields clear to auscultation.

CARDIAC: Regular rate and rhythm without murmur, rub, or gallop.

ABDOMEN: Soft and nontender. No masses or hepatosplenomegaly.

GENITOURINARY: Deferred.

MUSCULOSKELETAL/EXTREMITIES: Tenderness in the heel of the foot. Diminished pulses bilaterally.

NEUROLOGICAL: The patient does walk with an ataxic gait. She is also confused. Otherwise, no gross neurosensory deficits.

ASSESSMENT:

1. Confusion, probable OBS of Alzheimer's type.
2. Dyspnea/bronchitis.
3. PVD.
4. Compensated CHF.
5. CAD, status post CABG.
6. Chronic renal failure.
7. Hypertension.
8. Type 2 diabetes mellitus, insulin requiring.
9. Diabetic retinopathy.
10. Osteoarthritis.

PLAN: We will admit, continue medications, do CT, carotids, RPR, sed rate, B-12, thyroids, x-ray right foot, we will monitor closely, Accucheck and await studies.

DD:

DT:

Smith, M.D.

Case Study 12.5

Patient: **Betty Jones**

Patient documentation: **Review Medical Reports 12.7 and 12.8**

Principal diagnosis: _____

Secondary or other diagnoses: _____

Principal procedure: _____

Other procedures: _____

Additional documentation needed: _____

Questions for the physician: _____

Medical Report 12.7

XYZ Hospital
DISCHARGE SUMMARY

PATIENT: JONES, BETTY
ADMISSION DATE:

DISCHARGE DATE:
ATTENDING PHYSICIAN: SMITH, M.D.

DISCHARGE DIAGNOSES:

1. MIGRAINE VARIANT
2. LEFT HEMIPLEGIA
3. VISION LOSS
4. DIABETES
5. OSTEOPOROSIS

HPI/HOSPITAL COURSE: Ms. Jones is a 53-year-old female with past medical history of atypical migraines who was admitted to XYZ Hospital after she presented with one-sided weakness.

Ms. Jones has had problems with vision loss in the past. This usually involves the left eye. It is then followed by return of her vision and with unilateral throbbing headache. This is often associated with nausea. The day of admission, she had some weakness in the left side of her body. She had difficulty walking. She also had some problems with her equilibrium and felt somewhat dizzy.

Workup in the Emergency Room including CAT scan of the brain that was unremarkable. She was followed with serial neural checks during her hospitalization. Her symptoms improved. However, slight hemiplegia on the day of discharge. She still had persistent occasional dizziness but overall was doing better. She had no problems with vision loss.

Carotid ultrasound and echocardiogram were obtained. These were without significant abnormalities. MRI of the brain was obtained and this was pending on the day of discharge.

She did well during her hospitalization. CBC and profile were unremarkable.

LABORATORY DATA: Please refer to chart.

DISCHARGE INSTRUCTIONS: DIET: Low fat. Low salt. No alcohol. No nicotine. No stimulants. No chocolate.

MEDICATIONS ON DISCHARGE:

Depakote 250 mg p.o. b.i.d.

Aspirin 1 p.o. q.d.

Antivert 25 mg p.o. q.6.h. p.r.n., for dizziness.

FOLLOW-UP:

1. She is to follow-up with her primary care physician. She is to call or return if she has any worsening of her symptoms or neurological deficit.
2. She was started back on Depakote 250 mg p.o. b.i.d. as this seemed to help her previously with decreased problems with migraine headache.
3. She was counseled extensively regarding lifestyle and dietary intervention. She is to avoid caffeine, stress, keep regular hours, incorporate exercise, and avoid any precipitants such as MSG, chocolates, cheeses, etc.
4. She should consider additional neurological follow-up. Consideration could be given to obtaining an angiogram.
5. Risks and side-effects of Depakote were reviewed with the patient.

DD:

DT:

Smith, M.D.

Medical Report 12.8**XYZ Hospital****PATIENT ASSESSMENT/ EMERGENCY ROOM ADMISSION**

PATIENT: JONES, BETTY
 ADMISSION DATE:
 PHYSICIAN: SMITH, M.D.

DEPARTMENT OF EMERGENCY MEDICINE:

REASON FOR HOSPITALIZATION: This 53-year-old female brought to the ER via ambulance with a chief complaint of left facial droop, weakness left side (both arm and leg) along with headache and sore throat. Patient described “aura” onset the other day with onset of headache that remains on top of her head and left side. Patient also claims pain behind left eye. She has an unsteady gait. She describes dizziness, with whirling movement of the walls and room.

Pain? Pain scale (1-10) #8

Mode of Arrival: Stretcher

Loss of consciousness: No

Complete GCS, if applicable.

Eye Opening 1-4 4; Motor function 1-6 5; Verbal response 1-5 4; TOTAL (3-15): 13

Corrective Lenses/Contacts? N

Psychosocial: Patient requests or needs: N Spiritual Assistance/Pastoral Care: N

Family Support present: N Live Alone: Y Homeless: No

Does patient exhibit any S/S of abuse? N

Patient comfortable in present environment? Y

Patient feels safe to go home? Y

Patient afraid of being hurt? N

Patient has been hit or injured by someone? N

PAST MEDICAL HISTORY

Past medical history? Y

Afib:

Angina:

Arthritis:

Asthma: Y

Cancer: Y

CAD:

CHF:

Colitis:

COPD:

CVA/TIA:

Dementia:

Diverticulitis:

Continued

Medical Report 12.8 continued

Diverticulosis:
Drug/alcohol:
FTT:
GERD:
Gout:
Hepatitis:
Hyperthyroid:
Hypothyroid
Hiatal Hernia:
HTN:
IDDM:
Kidney stones:
Lupus:
Major Fracture:
Mental illness:
MI:
Migraine: Y
NIDDM: Y
Osteoporosis: Y
Pacemaker:
Phlebitis:
Pneumonia:
PVD:
Renal Failure:
Rheumatism:
Seizure:
TB:
Ulcers:
UTI:
Comment/Other PMH:

PAST SURGICAL HISTORY? Y

Appendectomy:
Bowel: Y
Cancer:
CABG:
Cataracts:
Cholecystectomy:
Colostomy/ileostomy:
C-section:
Cysto:
EGD:
Hernia:
Hysterectomy: Y
Mastectomy:

Continued

Medical Report 12.8 continued

Orthopedic:
Tonsillectomy:
Transplant:
Tubal Ligation:
TURP:
Valve replaced:
Other:

MEDICATION?

Xanax
Nose Spray
For Osteoporosis

ALLERGIES?

Codeine
Sulfa

VITAL SIGNS:

Temp: 97.5
Pulse: 68
Resp: 18
BP: 150/90
Pulse Ox: 97 RA
Weight: 160
LMP: Hyster
G: P: AB: L:
Height: Ft: 5 In: 5

VACCINATION HISTORY:

Date of Pneumococcal Vaccination:
Date of last Influenza Vaccination:
Immunizations Up To Date?
Last Tetanus: Unknown

Priority Code: URGENT

RN Review: Smith, RN