

GLOSSARY

Note to the Learner: This glossary contains neuronatomical terms, as well as terms commonly used clinically to describe neurological symptoms and physical findings of a neurological examination; few clinical syndromes are included.

Abducens nerve 6th cranial nerve (CN VI); to lateral rectus muscle for abduction of the eye

Accessory nerve 11th cranial nerve (CN XI) — see spinal accessory nerve

Afferent Conduction toward the central nervous system; usually means sensory

Agnosia Loss of ability to recognize the significance of sensory stimuli (tactile, auditory, visual), even though the primary sensory systems are intact

Agonist A muscle that performs a certain movement of the joint; the opposing muscle is called the antagonist

Agraphia Inability to write due to a lesion of higher brain centers, even though muscle strength and coordination are preserved

Akinesia Absence or loss of motor function; lack of spontaneous movement; difficulty in initiating movement (as in Parkinson's disease)

Alexia Loss of ability to grasp the meaning of written words; inability to read due to a central lesion; word blindness

Allocortex The phylogenetically older cerebral cortex, consisting of less than six layers; includes paleocortex (e.g., subicular region = three to five layers) and archicortex (e.g., hippocampus proper and dentate = three layers)

Alpha motor neuron Another name for the anterior (ventral) horn cell, also called the lower motor neuron

Ammon's horn The hippocampus proper, which has an outline in cross-section suggestive of a ram's horn; also called the Cornu Ammonis (CA)

Amygdala Amygdaloid nucleus or body in the temporal lobe of the cerebral hemisphere; a nucleus of the limbic system

Angiogram Display of blood vessels for diagnostic purposes, using, x-rays, MRI or CT, usually by using contrast medium injected into the vascular system

Anopia A defect in the visual field (e.g., hemianopia — loss of one-half of visual field; quadrantanopia — loss of one-quarter of visual field)

Antagonist A muscle that opposes or resists the action of another muscle, which is called the agonist

Antidromic Relating to the propagation of an impulse along an axon in a direction that is the reverse of the normal or usual direction

Aphasia An acquired disruption or disorder of language, specifically a deficit of expression using speech or of comprehending spoken or written language; global aphasia is a severe form affecting all language areas

Apoptosis Programmed cell death, either genetically determined or following an insult or injury to the cell

Apraxia Loss of ability to carry out purposeful or skilled movements despite the preservation of power, sensation, and coordination

Arachnoid The middle meningeal layer, forming the outer boundary of the subarachnoid space

Areflexia Loss of reflex as tested using the myotatic, stretch, deep tendon reflex

Archicerebellum A phylogenetically old part of the cerebellum, functioning in the maintenance of equilibrium; anatomically, the flocculonodular lobe

Archicortex Three-layered cortex included in the limbic system; located mainly in the hippocampus proper and dentate gyrus of the temporal lobe

Area postrema An area involved in vomiting; located in the caudal part of the floor of the fourth ventricle, with no blood-brain-barrier

Ascending tract Central sensory pathway, e.g., from spinal cord to brainstem, cerebellum, or thalamus

Association fibers Fibers connecting parts of the cerebral hemisphere, on the same side

Astereognosis Loss of ability to recognize the nature of objects or to appreciate their shape by touching or feeling them

Astrocyte A type of neuroglial cell with metabolic and structural functions; reacts to injury of the CNS by forming a gliotic "scar"

A synergy Disturbance of the proper sequencing in the contraction of muscles, at the proper moment, and of the

- proper degree, so that an action is not executed smoothly or accurately
- Ataxia** A loss of coordination of voluntary movements; often associated with cerebellar dysfunction
- Athetosis** Slow writhing movements of the limbs, especially of the hands, not under voluntary control, caused by degenerative changes in the striatum
- Autonomic** Autonomic nervous system; usually taken to mean the efferent or motor innervation of viscera (smooth muscle and glands)
- Autonomic nervous system (ANS)** Visceral innervation; sympathetic and parasympathetic divisions system
- Axon** Efferent process of a neuron, conducting impulses to other neurons or to muscle fibers (striated and smooth) and gland cells
- Babinski response** Babinski reflex is not correct; stroking the outer border of the sole of the foot in an adult normally results in a plantar (downgoing) of the toes; the Babinski response consists of an upgoing of the first toe and a fanning of the other toes, indicating a lesion of the pyramidal (cortico-spinal) tract
- Basal ganglia (nuclei)** CNS nuclei involved in motor control, the caudate, putamen and globus pallidus (the lentiform nucleus); including, functionally, the subthalamus and the substantia nigra
- Basilar artery** The major artery supplying the brainstem and cerebellum, formed by the two vertebral arteries
- Brachium** A large bundle of fibers connecting one part with another (e.g., brachium associated with the inferior and superior colliculi of the midbrain)
- Bradykinesia** Abnormally slow initiation of voluntary movements (usually seen in Parkinson's disease)
- Brainstem** Includes the medulla, pons, and midbrain
- Brodman areas** Numerical subdivisions of the cerebral cortex on the basis of histological differences between different functional areas (e.g. area 4 = motor cortex; area 17 = primary visual area)
- Bulb** Referred at one time to the medulla but in the context of "cortico-bulbar tract" refers to the whole brainstem in which the motor nuclei of cranial nerves and other nuclei are located
- Carotid siphon** Hairpin bend of the internal carotid artery within the skull
- CAT or CT scan** Computerized (Axial) Tomography; a diagnostic imaging technique that uses x-rays and computer reconstruction of the brain
- Cauda equina** "Horse's tail"; the lower lumbar, sacral, and coccygeal spinal nerve roots within the subarachnoid space of the lumbar (CSF) cistern
- Caudal** Toward the tail, or hindmost part of neuraxis
- Caudate nucleus** Part of the neostriatum, consists of a head, body, and tail (which extends into the temporal lobe)
- Central nervous system (CNS)** Brain (cerebral hemispheres), including diencephalon, cerebellum, brainstem, and spinal cord
- Cerebellar peduncles** Inferior, middle, and superior; fiber tracts linking the cerebellum and brainstem
- Cerebellum** The little brain; an older part of the brain with motor functions, dorsal to the brainstem, situated in the posterior cranial fossa
- Cerebral aqueduct (of Sylvius)** Aqueduct of the midbrain; passageway carrying CSF through the midbrain, as part of the ventricular system
- Cerebral peduncle** Descending cortical fibers in the "basal" (ventral) portion of the midbrain, sometimes includes the substantia nigra (located immediately behind)
- Cerebrospinal fluid (CSF)** Fluid in the ventricles, and in the subarachnoid space and cisterns
- Cerebrum** Includes the cerebral hemispheres and diencephalon but not the brainstem and cerebellum
- Cervical** Referring to the neck region; the part of the spinal cord that supplies the structures of the neck; C1–C7 vertebral; C1–C8 spinal segments
- Chorda tympani** Part of the 7th cranial nerve (CN VII) (see facial nerve); carrying taste from anterior two-thirds of tongue and parasympathetic innervation to glands
- Chorea** A motor disorder characterized by abnormal, irregular, spasmodic, jerky, uncontrollable movements of the limbs or facial muscles, thought to be caused by degenerative changes in the basal ganglia
- Choroid** A delicate membrane; choroid plexuses are found in the ventricles of the brain
- Choroid plexus** Vascular structure consisting of pia with blood vessels, with a surface layer of ependymal cells; responsible for the production of CSF
- Cingulum** A bundle of association fibers in the white matter under the cortex of the cingulate gyrus; part of Papez (limbic) circuit
- Circle of Willis** Anastomosis between internal carotid and basilar arteries, located at the base of the brain, surrounding the pituitary gland
- Cistern(a)** Expanded portion of subarachnoid space containing CSF, e.g., cisterna magna (cerebello-medullary cistern), lumbar cistern
- Clastrum** A thin sheet of gray matter, of unknown function, situated between the lentiform nucleus and the insula
- Clonus** Abnormal sustained series of contractions and relaxations following stretch of the muscle; usually elicited in the ankle joint; present following lesions of the descending motor pathways, and associated with spasticity
- Conjugate eye movement** Coordinated movement of both eyes together, so that the image falls on corresponding points of both retinas
- CNS** Abbreviation for central nervous system

- Colliculus** A small elevation; superior and inferior colliculi comprising the tectum of the midbrain; also facial colliculus in the floor of the fourth ventricle
- Commissure** A group of nerve fibers in the CNS connecting structures on one side to the other across the midline (e.g., corpus callosum of the cerebral hemispheres; anterior commissure)
- Consensual reflex** Light reflex; refers to the bilateral response of the pupil after shining a light in one eye
- Contralateral** On the opposite side (e.g., contralateral to a lesion)
- Corona radiata** Fibers radiating from the internal capsule to various parts of the cerebral cortex — a term often used by neuroradiologists
- Corpus callosum** The main (largest) neocortical commissure of the cerebral hemispheres
- Corpus striatum** Caudate, putamen, and globus pallidus, nuclei inside cerebral hemisphere, with motor function; the basal ganglia
- Cortex** Layers of gray matter (neurons and neuropil) on the surface of the cerebral hemispheres (mostly six layers) and cerebellum (three layers)
- Cortico-bulbar** Descending fibers connecting motor cortex with motor cranial nerve nuclei and other nuclei of brainstem (including reticular formation)
- Corticofugal fibers** Axons carrying impulses away from the cerebral cortex
- Corticopetal fibers** Axons carrying impulses toward the cerebral cortex
- Cortico-spinal tract** Descending tract, from motor cortex to anterior (ventral) horn cells of the spinal cord (sometimes direct); also called pyramidal tract
- Cranial nerve nuclei** Collections of cells in brainstem giving rise to or receiving fibers from cranial nerves (CN III–XII); may be sensory, motor, or autonomic
- Cranial nerves** Twelve pairs of nerves arising from the brain and innervating structures of the head and neck (CN I is actually a CNS tract)
- CSF** Cerebrospinal fluid, in ventricles and subarachnoid space (and cisterns)
- Cuneatus (cuneate)** Sensory tract (fasciculus cuneatus) of the dorsal column of spinal cord, from the upper limbs and body; cuneate nucleus of medulla
- Decerebrate posturing (rigidity)** Characterized by extension of the upper and lower limbs; lesion at the brainstem level between the vestibular nuclei and the red nucleus
- Decorticate posturing (rigidity)** Characterized by extension of the lower limbs and flexion of the upper; lesion is located above the level of the red nucleus
- Decussation** The point of crossing of CNS tracts, e.g., decussations of the pyramidal (cortico-spinal) tract, medial lemnisci, and superior cerebellar peduncles
- Dementia** Progressive brain disorder that gradually destroys a person's memory, starting with short-term memory, and loss of intellectual ability, such as the ability to learn, reason, make judgments, and communicate, and finally, inability to carry out normal activities of daily living; usually affects people with advancing age
- Dendrite** Receptive process of a neuron; usually several processes emerge from the cell body, each of which branches in a characteristic pattern
- Dendritic spine** Cytoplasmic excrescence of a dendrite and the site of an excitatory synapse
- Dentate** (toothed or notched) Dentate nucleus of the cerebellum (intracerebellar nucleus); dentate gyrus of the hippocampal formation
- Dermatome** A patch of skin innervated by a single spinal cord segment (e.g., T1 supplies the skin of the inner aspect of the upper arm; T10 supplies umbilical region)
- Descending tract** Central motor pathway (e.g., from cortex to brainstem or spinal cord)
- Diencephalon** Consisting of the thalamus, epithalamus (pineal), subthalamus, and hypothalamus
- Diplopia** Double vision; a single object is seen as two objects
- Dominant hemisphere** The hemisphere responsible for language; this is the left hemisphere in about 85 to 90% of people (including left-handed individuals)
- Dorsal column** Fasciculus gracilis and fasciculus cuneatus of the spinal cord, pathways (tracts) for discriminative touch, conscious proprioception and vibration
- Dorsal root** Afferent sensory component of a spinal nerve, located in the subarachnoid (CSF) space
- Dorsal root ganglion (DRG)** A group of peripheral neurons along the dorsal root, whose axons carry afferent information from the periphery; their central process enters the spinal cord
- Dura** Dura mater, the thick external layer of the meninges (brain and spinal cord)
- Dural venous sinuses** Large venous channels for draining blood from the brain; located within dura of the meninges
- Dysarthria** Difficulty with the articulation of words
- Dyskinesia** Purposeless movements of the limbs or trunk, usually due to a lesion of the basal ganglia; also difficulty in performing voluntary movements
- Dysmetria** Disturbance of the ability to control the range of movement in muscular action, causing under- or overshooting of the target (usually associated with cerebellar lesions)
- Dysphagia** Difficulty with swallowing
- Dyspraxia** Impaired ability to perform a voluntary act previously well performed, with intact movement, coordination, and sensation
- Efferent** Away from the central nervous system; usually means motor to muscles
- Emboliform** Emboliform nucleus of the cerebellum, one of the intracerebellar (deep cerebellar) nuclei; with globose nucleus forms the interposed nucleus

- Entorhinal** Associated with olfaction (smell); the entorhinal area is the anterior part of the parahippocampal gyrus, adjacent to the uncus
- Ependyma** Epithelium lining of ventricles of the brain and central canal of spinal cord; specialized tight junctions at the site of the choroid plexus
- Extrapyramidal system** An older clinically used term, usually intended to include the basal ganglia portion of the motor systems and not the pyramidal (cortico-spinal) motor system
- Facial nerve** 7th cranial nerve (CN VII); motor to muscles of facial expression; carries taste from anterior two-thirds of tongue; also parasympathetic to two salivary glands, lacrimal and nasal glands (see also chorda tympani)
- Falx** Dural partition in the midline of the cranial cavity; the large falx cerebri between the cerebral hemispheres, and the small falx cerebelli
- Fascicle** A small bundle of nerve fibers
- Fasciculus** A large tract or bundle of nerve fibers
- Fasciculus cuneatus** Part of dorsal column of spinal cord; ascending tract for discriminative touch, conscious proprioception and vibration from upper body and upper limb
- Fasciculus gracilis** Part of dorsal column of spinal cord; ascending tract for discriminative touch, conscious proprioception and vibration from lower body and lower limb
- Fastigial nucleus** One of the deep cerebellar (intracerebellar) nuclei
- Fiber** Synonymous with an axon (either peripheral or central)
- Flaccid paralysis** Muscle paralysis with hypotonia due to a lower motor neuron lesion
- Flocculus** Lateral part of flocculonodular lobe of cerebellum (vestibulocerebellum)
- Folium** (plural folia) A flat leaf-like fold of the cerebellar cortex
- Foramen** An opening, aperture, between spaces containing CSF (e.g., Monro, between lateral ventricles and third ventricle; Magendie, between fourth ventricle and cisterna magna; Luschka, lateral foramen of fourth ventricle)
- Forebrain** Anterior division of embryonic brain; cerebrum and diencephalon
- Fornix** The efferent (noncortical) tract of the hippocampal formation, arching over the thalamus and terminating in the mammillary nucleus of the hypothalamus and in the septal region
- Fourth (4th) ventricle** Cavity between brainstem and cerebellum, containing CSF
- Funiculus** A large aggregation of white matter in the spinal cord, may contain several tracts
- Ganglion** (plural ganglia) A collection of nerve cells in the PNS — dorsal root ganglion (DRG) and sympathetic ganglion; also inappropriately used for certain regions of gray matter in the brain (i.e., basal ganglia)
- Geniculate bodies** Specific relay nuclei of thalamus — medial (auditory) and lateral (visual)
- Genu** Knee or bend; middle portion of internal capsule; genu of facial nerve
- Glial cell** Also called neuroglial cell; supporting cells in the central nervous system — astrocyte, oligodendrocyte, and ependymal — also microglia
- Globus pallidus** Efferent part of basal ganglia; part of the lentiform nucleus with the putamen; located medially
- Glossopharyngeal nerve** 9th cranial nerve (CN IX); motor to muscles of swallowing and carries taste from posterior one-third of tongue; nerve for the gag reflex
- Gracilis (gracile)** Sensory tract (fasciculus gracilis) of the dorsal column of spinal cord; nucleus gracilis of medulla
- Gray matter** Nervous tissue, mainly nerve cell bodies and adjacent neuropil; looks “grayish” after fixation in formalin
- Gyrus** (plural gyri) A convolution or fold of the cerebral hemisphere; includes cortex and white matter
- Habenula** A nucleus of the limbic system, adjacent to the posterior end of the roof of the 3rd ventricle (part of the epithalamus)
- Hemiballismus** Violent jerking or flinging movements of one limb, not under voluntary control, due to a lesion of subthalamic nucleus
- Hemiparesis** Muscular weakness affecting one side of the body
- Hemiplegia** Paralysis of one side of the body
- Herniation** Bulging or expansion of the tissue beyond its normal boundary
- Heteronymous hemianopia** Loss of different halves of the visual field of both eyes, as defined by projection to the visual cortex of both sides; bitemporal for the temporal halves and binasal for the nasal halves
- Hindbrain** Posterior division of the embryonic brain; includes pons, medulla, and cerebellum (located in the posterior cranial fossa)
- Hippocampus or hippocampus “proper”** Part of limbic system; a cortical area “buried” within the medial temporal lobe, consisting of phylogenetically old (three-layered) cortex; protrudes into floor of inferior horn of lateral ventricle
- Homonymous hemianopia** Loss of the same visual field in both eyes (i.e., left or right) as defined by the projection to the visual cortex on one side — involving the nasal half of the visual field in one eye and the temporal half in the other eye; also quadrantanopia
- Horner’s syndrome** Miosis (constriction of the pupil), anhidrosis (dry skin with no sweat), and ptosis (drooping of the upper eyelid) due to a lesion of the sympathetic pathway to the head

- Hydrocephalus** Enlargement of the ventricles, usually due to excessive accumulation of cerebrospinal fluid within the ventricles (e.g., obstruction)
- Hypoglossal nerve** 12th cranial nerve (CN XII); motor to muscles of the tongue
- Hypo/hyper reflexia** Decrease (hypo) or increase (hyper) of the stretch (deep tendon) reflex
- Hypo/hyper tonia** Decrease or increase of the tone of muscles, manifested by decreased or increased resistance to passive movements
- Hypokinesia** Markedly diminished movements (spontaneous)
- Hypothalamus** A region of the diencephalon that serves as the main controlling center of the autonomic nervous system and is involved in several limbic circuits; also regulates the pituitary gland
- Infarction** Local death of an area of tissue due to loss of its blood supply
- Infundibulum (funnel)** Infundibular stem of the posterior pituitary (neurohypophysis)
- Innervation** Nerve supply, sensory and/or motor
- Insula (island)** Cerebral cortical area not visible from outside view and situated at the bottom of the lateral fissure (also called the island of Reil)
- Internal capsule** White matter between lentiform nucleus and head of caudate nucleus, and thalamus; consists of anterior limb, genu and posterior limb
- Ipsilateral** On the same side of the body (e.g., ipsilateral to a lesion)
- Ischemia** A condition in which an area is not receiving an adequate blood supply
- Ischemic penumbra** A region adjacent to or surrounding an area of infarcted brain tissue that is not receiving sufficient blood; the neurons may still be viable
- Kinesthesia** The conscious sense of position and movement
- Lacune** A pathological small “hole” remaining after an infarct in the internal capsule; also irregularly-shaped venous “lakes” or channels draining into the superior sagittal sinus
- Lateral ventricle** CSF cavity in each cerebral hemisphere; consists of anterior horn, body, atrium (or trigone), posterior horn, and inferior (temporal) horn
- Lemniscus** A specific pathway in CNS (medial lemniscus for discriminative touch, conscious proprioception, and vibration; lateral lemniscus for audition)
- Lentiform** Lens-shaped; lentiform nucleus, a part of the corpus striatum; also called lenticular nucleus; composed of putamen (laterally) and globus pallidus
- Leptomeninges** Arachnoid and pia mater, part of meninges
- Lesion** Any injury or damage to tissue (e.g., vascular, traumatic)
- Limbic system** Part of brain associated with emotional behavior
- Locus ceruleus** A small nucleus located in the uppermost pons on each side of the fourth ventricle; contains melanin-like pigment, visible as a dark-bluish area in freshly sectioned brain
- Lower motor neuron** Anterior horn cell of spinal cord and its axon; also the cells in the motor cranial nerve nuclei of the brainstem; called the alpha motor neuron; its loss leads to atrophy of the muscle and weakness, with hypotonia and hyporeflexia; also fasciculations are to be noted
- Mammillary** Mammillary bodies; nuclei of the hypothalamus that are seen as small swellings on the ventral surface of diencephalon (also spelled mamillary)
- Massa intermedia** A bridge of gray matter connecting the thalami of the two sides across third ventricle; present in 70% of human brains (also called the inter-thalamic adhesion)
- Medial lemniscus** Brainstem portion of sensory pathway for discriminative touch, conscious proprioception and vibration, formed after synapse (relay) in nucleus gracilis and nucleus cuneatus
- Medial longitudinal fasciculus (MLF)** A tract throughout the brainstem and upper cervical spinal cord that interconnects visual and vestibular input with other nuclei controlling movements of the eyes and the head and neck
- Medulla** Caudal portion of the brainstem; may also refer to the spinal cord as in a lesion within (intramedullary) or outside (extramedullary) the cord
- Meninges** Covering layers of the central nervous system (dura, arachnoid, and pia)
- Mesencephalon** The midbrain (upper part of the brainstem)
- Microglia** The “scavenger” cells of the CNS, i.e., macrophages; considered by some as one of the neuroglia
- Midbrain** Part of the brainstem; also known as mesencephalon (the middle division of the embryonic brain)
- Motor** Associated with movement or response
- Motor unit** A lower motor neuron, its axon, and the muscle fibers that it innervates
- MRI/NMR** Magnetic Resonance Imaging (nuclear magnetic resonance), a diagnostic imaging technique that uses an extremely strong magnet, not x-rays
- Muscle spindle** Specialized receptor within voluntary muscles that detects muscle length; necessary for the stretch/myotatic reflex (DTR); contains muscle fibers within itself capable of adjusting the sensitivity of the receptor
- Myelin** Proteolipid layers surrounding nerve fibers, formed in segments, which is important for rapid (saltatory) nerve conduction
- Myelin sheath** Covering of nerve fiber, formed and maintained by oligodendrocyte in CNS and Schwann cell in PNS; interrupted by nodes of Ranvier

- Myelopathy** Generic term for disease affecting the spinal cord
- Myopathy** Generic term for muscle disease
- Myotatic reflex** Stretch reflex, also called deep tendon reflex (DTR); elicited by stretching the muscle; causes a reflex contraction of the same muscle; monosynaptic (also spelled myotactic reflex)
- Myotome** Muscle groups innervated by a single spinal cord segment; in fact, usually two adjacent segments are involved (e.g., biceps, C5 and C6)
- Neocerebellum** Phylogenetically newest part of the cerebellum, present in mammals and especially well developed in humans; involved in coordinating precise voluntary movements and also in motor planning
- Neocortex** Phylogenetically newest part of the cerebral cortex, consisting of six layers (and sublayers) characteristic of mammals and constituting most of the cerebral cortex in humans
- Neostriatum** The phylogenetically newer part of the basal ganglia consisting of the caudate nucleus and putamen; also called the striatum
- Nerve fiber** Axonal cell process, plus myelin sheath, if present
- Neuralgia** Pain — severe, shooting, “electrical,” along the distribution of a peripheral nerve (spinal or cranial)
- Neuraxis** The straight longitudinal axis of the embryonic or primitive neural tube, bent in later evolution and development
- Neuroglia** Accessory or interstitial cells of the central nervous system; includes astrocytes, oligodendrocytes, ependymal cells, and microglial cells
- Neuron** The basic structural unit of the nervous system, consisting of the nerve cell body and its processes — dendrites and axon
- Neuropathy** Disorder of one or more peripheral nerves
- Neuropil** An area between nerve cells consisting of a complex arrangement of nerve cell processes, including axon terminals, dendrites, and synapses
- Nociception** Refers to an injurious stimulus causing a neuronal response; may or may not be associated with the sensation of pain
- Node of Ranvier** Gap in myelin sheath between two successive internodes; necessary for saltatory (rapid) conduction
- Nucleus** (plural nuclei) An aggregation of neurons within the CNS; in histology, the nucleus of a cell
- Nystagmus** An involuntary oscillation of the eye(s), slow in one direction and rapid in the other; named for the direction of the quick movement
- Oculomotor nerve** 3rd cranial nerve (CN III); motor to most muscles of the eye
- Olfactory nerve** 1st cranial nerve (CN I); special sense of smell
- Oligodendrocyte** A neuroglial cell, forms and maintains the myelin sheath in the CNS; each cell is responsible for several internodes on different axons
- Optic chiasm(a)** Partial crossing of optic nerves — nasal half of retina representing the temporal visual fields — after which the optic tracts are formed
- Optic disc** Area of the retina where the optic nerve exits; also the site for the central retinal artery and vein; devoid of receptors, hence the blind spot
- Optic nerve** 2nd cranial nerve (CN II); special sense of vision; actually a tract of the CNS, from the ganglion cells of the retina until the optic chiasm
- Paleocortex** Phylogenetically older cerebral cortex consisting of three to five layers
- Papilledema** Edema of the optic disc, visualized with an ophthalmoscope (also called a choked disc); usually a sign of abnormal increased intracranial pressure
- Paralysis** Complete loss of muscular action
- Paraplegia** Paralysis of both legs and lower part of trunk
- Paresis** Muscle weakness or partial paralysis
- Paresthesia** Spontaneous abnormal sensation (e.g., tingling; pins and needles)
- Pathway** A chain of functionally related neurons (nuclei) and their axons, making a connection between one region of CNS and another; a tract (e.g., visual pathway, dorsal column-medial lemniscus sensory pathway)
- Peduncle** A thick stalk or stem; a bundle of nerve fibers (cerebral peduncle of the midbrain; also three cerebellar peduncles — superior, middle, and inferior)
- Perikaryon** The cytoplasm surrounding the nucleus of a cell; sometimes refers to the cell body of a neuron
- Peripheral nervous system (PNS)** Nerve roots, peripheral nerves and ganglia outside the CNS (motor, sensory, and autonomic)
- PET** Positron Emission Tomography; a technique used to visualize areas of the living brain that become “activated” under certain task conditions; uses very short-acting biologically active radioactive compounds
- Pia (mater)** The thin innermost layer of the meninges, attached to the surface of the brain and spinal cord; forms the inner boundary of the subarachnoid space
- Plexus** An interweaving arrangement of vessels or nerves
- Pons** (bridge) The middle section of the brainstem that lies between the medulla and the midbrain; appears to constitute a bridge between the two hemispheres of the cerebellum
- Projection fibers** Bidirectional fibers connecting the cerebral cortex with structures below, including basal ganglia, thalamus, brainstem, and spinal cord
- Proprioception** The sense of body position (conscious or unconscious)
- Proprioceptor** One of the specialized sensory endings in muscles, tendons, and joints; provides information concerning movement and position of body parts (proprioception)

- Prosody** Vocal tone, inflection, and melody accompanying speech
- Ptosis** Drooping of the upper eyelid
- Pulvinar** The posterior nucleus of the thalamus; functionally, involved with vision
- Putamen** The larger (lateral) part of the lentiform nucleus, with the globus pallidus; part of the neostriatum with the caudate nucleus
- Pyramidal system** Named because the cortico-spinal tracts occupy pyramid-shaped areas on the ventral aspect of the medulla; may include cortico-bulbar fibers; the term pyramidal tract refers specifically to the cortico-spinal tract
- Quadrigeminal** Referring to the four colliculi of the mid-brain; also called the tectum
- Quadriplegia** Paralysis affecting the four limbs (also called tetraplegia)
- Radicular** Refers to a nerve root (motor or sensory)
- Ramus** (plural rami) The division of the mixed spinal nerve (containing sensory, motor, and autonomic fibers) into anterior and posterior
- Raphe** An anatomical structure in the midline; in the brainstem, several nuclei of the reticular formation are in the midline of the medulla, pons, and midbrain (these nuclei use serotonin as the neurotransmitter)
- Red nucleus** Nucleus in the midbrain (reddish color in a fresh specimen)
- Reflex** Involuntary movement of a fixed nature in response to a stimulus
- Reflex arc** Consisting of an afferent fiber, a central connection, a motor neuron, and its efferent axon leading to a muscle movement
- Reticular** Pertaining to or resembling a net — reticular formation of brainstem
- Reticular formation** Diffuse nervous tissue, nuclei and connections, in brainstem; quite old phylogenetically
- Rhinencephalon** In humans, refers to structures related to the olfactory system
- Rigidity** Abnormal muscle stiffness (increased tone) with increased resistance to passive movement of both agonists and antagonists (e.g., flexors and extensors), usually seen in Parkinson's disease; velocity independent
- Root** The peripheral nerves — sensory (afferent, dorsal) and motor (efferent, ventral) — as they emerge from the spinal cord and are found in the subarachnoid space
- Rostral** Toward the nose, or the most anterior end of the neuraxis
- Rubro** Red; pertaining to the red nucleus, as in rubro-spinal tract and cortico-rubral fibers
- Saccadic** To jerk; extremely quick movements, normally of both eyes together (conjugate movement), in changing the direction of gaze
- Schwann cell** Neuroglial cell of the PNS responsible for formation and maintenance of myelin; there is one Schwann cell for each internode of myelin
- Secretomotor** Parasympathetic motor nerve supply to a gland
- Sensory** Afferent; to do with receiving information, from the skin, the muscles, the external environment, or from internal organs
- Septum pellucidum** A double membrane of connective tissue separating the anterior horns of the lateral ventricles, situated in the median plane
- Septal region** An area below the anterior end of the corpus callosum on the medial aspect of the frontal lobe that includes cortex and the septal nuclei
- Somatic** Used in neurology to denote the body, exclusive of the viscera (as in somatic afferent neurons from the skin and body wall); the word soma is also used to refer to the cell body of a neuron
- Somatic senses** Touch (discriminative and crude), pain, temperature, proprioception, and the “sense of vibration”
- Somatotopic** The orderly representation of the body parts in CNS pathways, nuclei, thalamus, and cortex; topographical representation
- Somesthetic** Consciousness of having a body; somesthetic senses are the general senses of touch, pain, temperature, position, movement, and “vibration”
- Spasticity** Velocity-dependent increased tone and increased resistance to passive stretch of the antigravity muscles; in humans, flexors of the upper limb and extensors of the lower limb; usually accompanied by hyper-reflexia
- Special senses** Sight (vision), hearing (audition), balance (vestibular), taste (gustatory), and smell (olfactory)
- Spinal accessory nerve** 11th cranial nerve (CN XI); refers usually to the part of the nerve that originates in the upper spinal cord (C1–5) and innervates the muscles of the neck, the sternomastoid and trapezius muscles
- Spinal shock** Complete “shut down” of all spinal cord activity (in humans) following an acute complete lesion of the cord (e.g., severed cord after a diving or motor vehicle accident); usually up to two to three weeks in duration
- Spino-cerebellar tracts** Ascending tracts of the spinal cord, anterior and posterior, for “unconscious” proprioception to the cerebellum
- Spino-thalamic tracts** Ascending tracts of the spinal cord for pain and temperature (lateral) and nondiscriminative or light touch and pressure (anterior)
- Split brain** A brain in which the corpus callosum has been severed in the midline, usually as a therapeutic measure for intractable epilepsy
- Stereognosis** The recognition of an object using the tactile senses and also central processing, involving association areas especially in the parietal lobe
- Strabismus** A squint; lack of conjugate fixation of the eyes; may be constant or variable
- Stria** A slender strand of fibers (e.g., stria terminalis from amygdala)

Striatum The phylogenetically more recent part of the basal ganglia (neostriatum) consisting of the caudate nucleus and the putamen (lateral portion of the lentiform nucleus)

Stroke A sudden severe attack of the CNS; usually refers to a sudden focal loss of neurologic function due to death of neural tissue; mostly due to a vascular lesion, either infarct (embolus, occlusion) or hemorrhage

Subarachnoid space Space between arachnoid and pia mater, containing CSF (cerebrospinal fluid)

Subcortical Not in the cerebral cortex, i.e., at a functionally or evolutionary “lower” level in the CNS; usually refers to the white matter of the cerebral hemispheres, and also may include the basal ganglia

Subicular region Part of hippocampal formation; transitional cortex (three to five layers) between that of the hippocampus proper and the parahippocampal gyrus

Substantia gelatinosa A nucleus of the gray matter of the dorsal (sensory) horn of the spinal cord composed of small neurons; receives pain and temperature afferents

Substantia nigra A flattened nucleus in the midbrain with motor functions — consisting of two parts: the pars compacta with melanin pigment in the neurons (the dopamine neurons, which degenerate in Parkinson’s disease), and the pars reticulata, which is an output nucleus of the basal ganglia

Subthalamus Region of the diencephalon beneath the thalamus, containing fiber tracts and the subthalamic nucleus; part of the functional basal ganglia

Sulcus (plural sulci) Groove between adjacent gyri of the cerebral cortex; a deep sulcus may be called a fissure

Synapse Area of structural and functional specialization between neurons where transmission occurs (excitatory, inhibitory, or modulation), using neurotransmitter substances (e.g., glutamate, GABA); similarly at the neuromuscular junction (using acetylcholine)

Syringomyelia A pathological condition characterized by expansion of the central canal of the spinal cord with destruction of nervous tissue around the cavity

Tectum The “roof” of the midbrain (behind the aqueduct) consisting of the paired superior and inferior colliculi; also called the quadrigeminal plate

Tegmentum The “core area” of the brainstem, between the ventricle (or aqueduct) and the cortico-spinal tract; contains the reticular formation, cranial nerve and other nuclei, and various tracts

Telencephalon Rostral part of embryonic forebrain; primarily cerebral hemispheres of the adult brain

Tentorium The tentorium cerebelli is a sheet of dura between the occipital lobes of the cerebral hemispheres and the cerebellum; its hiatus or notch is the opening for the brainstem — at the level of the midbrain

Thalamus A major portion of the diencephalon with sensory, motor, and integrative functions; consists of several nuclei with connections to areas of the cerebral cortex

Third (3rd) ventricle Midline ventricle at the level of the diencephalon (between the thalamus of each side), containing CSF

Tic Brief, repeated, stereotyped, semipurposeful muscle contraction; not under voluntary control, although may be suppressed for a limited time

Tinnitus Persistent ringing or buzzing sound in one or both ears

Tomography Radiological images, done sectionally, including CT and MRI

Tone Referring to muscle, its firmness, and elasticity — normal, hyper, hypo — elicited by passive movement and also assessed by palpation

Tract A bundle of nerve fibers within the CNS, with a common origin and termination, (e.g., optic tract, cortico-spinal tract)

Transient ischemic attack (TIA) A nonpermanent focal deficit, caused by a vascular event; by definition, usually reversible within a few hours, with a maximum of 24 hours

Trapezoid body Transverse crossing fibers of the auditory pathway situated in the ventral portion of the tegmentum of the lower pons

Tremor Oscillating, “rhythmic” movements of the hands, limbs, head, or voice; intention (kinetic) tremor of the limb commonly seen with cerebellar lesions; tremor at rest commonly associated with Parkinson’s disease

Trigeminal nerve 5th cranial nerve (CN V); major sensory nerve of the head (face, eye, tongue, nose, sinuses); also supplies muscles of mastication

Trochlear nerve 4th cranial nerve (CN IV); motor to the superior oblique eye muscle

Two-point discrimination Recognition of the simultaneous application of two points close together on the skin; distance varies with the area of the body (compare finger tip to back)

Uncus An area of cortex — the medial protrusion of the rostral (anterior) part of the parahippocampal gyrus of the temporal lobe; the amygdala is situated deep to this area; important clinically as in uncal herniation

Upper motor neuron Neuron located in the motor cortex or other motor areas of the cerebral cortex or in the brainstem — giving rise to a descending tract to lower motor neurons in the brainstem (for cranial nerves) or spinal cord (for body and limbs)

Upper motor neuron lesion A lesion of the brain (cortex, white matter of hemisphere), brainstem, or spinal cord interrupting descending motor influences to the lower motor neurons of the brainstem or spinal cord, characterized by weakness, spasticity, and hyperreflexia, and often clonus; usually accompanied by a Babinski response

Vagus 10th cranial nerve (CN X); supplies motor fibers to the larynx; the major parasympathetic nerve to organs of the thorax and abdomen

Velum A membranous structure; the superior medullary velum forms the roof of the fourth ventricle

Ventricles Cerebrospinal (CSF) fluid-filled cavities inside the brain

Vermis Unpaired midline portion of the cerebellum, between the hemispheres

Vertigo Abnormal sense of spinning, whirling, or motion, either of the self or of one's environment

Vestibulocochlear 8th cranial nerve (CN VIII); special senses of hearing and balance (acoustic nerve is not really correct)

White matter Nervous tissue of CNS made up of nerve fibers (axons), some of which are myelinated; appears "whitish" after fixation in formalin