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CANINE BRAIN ATLAS GLOSSARY

Thomas F. Fletcher

A

abducent nerve [Levels 8, 9]

The sixth cranial nerve. It exits the medulla oblongata and innervates lateral rectus and retractor bulbi muscles of the eye. *Note: Abducent* is derived from the Latin “to lead away,” referring to the lateral gaze for which the nerve is responsible.

abducent nucleus [Level 9]

The nucleus is composed of somatic efferent neuron cell bodies that innervate two of the seven extrinsic muscles of the carnivore eye. The neurons shift the gaze laterally (lateral rectus m.), and they retract the eyeball in order to protract the third eyelid (retractor bulbi m.). *Note: Abducent* is derived from the Latin “to lead away,” referring to the lateral gaze for which the nerve is responsible.

accessory nerve motor nucleus [Level 12]

This column of somatic efferent cell bodies is located in intermediate gray matter throughout most of the cervical spinal cord. Axons from the nucleus form the spinal root of the accessory nerve (XI) and ultimately innervate neck muscles (trapezius, omotransversarius, cleidocephalicus, and mastoid part of sternocephalicus).

accumbens nucleus [Level 1]

Located at the base of the septum, the nucleus plays a role in pleasure, addiction, and processing reward stimuli. Dopamine and serotonin neurotransmitters are associated with neurons comprising the nucleus. Via a mesolimbic pathway, the nucleus connects with the ventral tegmental area of the midbrain, which contains neurons responsive to opiates, amphetamine, and alcohol. *Note: Accumbens* is derived from the Latin word for “reclining.”

ambiguus nucleus [Level 10]

This collection of somatic efferent neurons sends axons through glossopharyngeal (IX) and vagus (X) cranial nerves to innervate striated muscle of the pharynx, larynx, and esophagus. *Note: Ambiguus* is Latin for “doubtful” (the nucleus appears ambiguous because its cell density is sparse).

amygdala [Levels 2–5]

A collection of nuclei deep to the piriform lobe, the amygdala is involved in processing and remembering emotions, particularly fearful ones and those related to punishment. The amygdala is a basal nucleus of the telencephalon and a major component of the limbic system. It has reciprocal connections with other limbic components. *Note: Amygdala* is from the Greek word for “almond”.

B

basal nuclei (basal ganglia) [Levels 1, 2 captions]

Refers to nuclei located deep within white matter of the telencephalon, as opposed to surface gray matter (cerebral cortex). Basal nuclei include: caudate nucleus, nucleus accumbens, putamen, globus pallidus, amygdala, and claustrum. In addition, the subthalamic nucleus and substantia nigra are commonly referred to as basal nuclei because of their movement-related connections with certain telencephalic nuclei.

brachium of the caudal colliculus [Levels 6, 7]

A band of auditory axons that run from the lateral lemniscus and caudal colliculus to the medial geniculate body. The axons convey conscious hearing from both ears, but predominantly from the contralateral ear. *Note: Brachium* is the Latin word for “arm”; *colliculus* is Latin for “small hill”.

C**caudal cerebellar peduncle** [Levels 9–11]

White matter connecting the cerebellum to the hindbrain and spinal cord. It contains cerebellar afferent input from the dorsal spinocerebellar tract (hindlimb), lateral cuneate nucleus (forelimb), olivary nucleus (climbing fibers), vestibular nuclei, and vestibular nerve. It conveys cerebellar efferents to vestibular nuclei and the reticular formation. *Note: Peduncle* comes from the Latin “pedunculus”, meaning stemlike; like a stalk, the fiber bundle attaches the cerebellum to the brain stem.

caudal colliculus [Level 7]

This functions as an auditory reflex center for head, eye, ear orientation toward a sudden sound. It receives bilateral cochlear input via the lateral lemniscus. *Note: Colliculus* is Latin for “small hill.”

caudal commissure [Level 4]

Nerve fibers that connect right and left pretectal areas in connection with the bilateral pupillary light reflex. *Note: Commissure* is from the Latin word for “junction” (the term is used for fibers that cross the midline).

caudate nucleus [Levels 1–4]

This basal nucleus is named for its long, narrow, arched tail. The caudate nucleus participates in voluntary movement circuits that are active during movement planning. Together the caudate nucleus and the putamen comprise the striate body, which facilitates movement by inhibiting the endopeduncular nucleus, which otherwise suppresses thalamic excitation of the motor area of the cerebral cortex. The striate body can inhibit movement by inhibiting the globus pallidus, which inhibits the endopeduncular nucleus. *Note: Cauda* is the Latin word for “tail.”

central canal [Level 12]

This cavity within the spinal cord is derived from the embryonic neural cavity and lined by ependymal cells.

central tegmental tract [Level 7]

A bundle of axons that carries information from the forebrain to the brain stem reticular formation. Also, it conveys information among nuclei of the reticular formation and from the red nucleus to the olivary nucleus. *Note: Tegmentum*, from the Latin word for “covering,” is applied to mid-regions of the midbrain and pons.

cerebellar cortex [Levels 8–11]

Refers to surface gray matter covering the cerebellum. Two of the three layers comprising the cortex are evident in the Atlas [Levels 10, 11]: a superficial **molecular layer** and a deep **granule cell layer**. The latter appears dark because it is densely populated with pachychromatic small neurons. *Note: Cerebellum* is Latin for “small brain.”

cerebellar hemispheres [Level 8]

Refers to the paired cerebellar regions bilateral to the median vermis. Hemispheric cortex projects to the underlying lateral (dentate) nucleus in order to coordinate movement synergy. *Note: “Cerebellum”* is Latin for “small brain.”

cerebellar nuclei [Level 9]

Located deep in cerebellar white matter, three bilateral accumulations of neuron cell bodies form: fastigial, interpositus, and lateral (dentate) nuclei, from medial to lateral. Axons from the nuclei constitute cerebellar output to caudal and rostral cerebellar peduncles. *Note: Cerebellum* is Latin for “small brain.”

cerebellar vermis [Level 8]

Refers to the (wormlike) median cerebellar region. It is divisible into 10 lobules. Cortex of the vermis projects to fastigial and interpositus cerebellar nuclei in connection with maintaining balance and appropriate muscle tone. *Note: Vermis*

is the Latin word for “worm.”

cerebellar white matter [Levels 8–10]

Refers to the internal accumulation of myelinated axons that run from cerebellar peduncles to cerebellar cortex and from cerebellar cortex to cerebellar nuclei. *Note:* “*Cerebellum*” is Latin for “small brain”.

cerebral cortex [Levels 7–11]

Surface gray matter covering the telencephalon (cerebral hemispheres). Most of the cerebral cortex is isocortex (neocortex). This has six layers and is involved with detailed sensory perception, cognitive functions including learning and memory, and voluntary movement planning and initiation. Allocortex (fewer layers and older) covers the rhinencephalon (ventral telencephalon). *Note:* *Cortex* comes from the Latin word for “bark” or “rind.”

cerebral white matter [Levels 1, 3, 4, 6, 7]

Refers to the internal accumulation of myelinated fibers that run from the thalamus to the cerebral cortex (corticopedal) and from the cortex to basal nuclei, thalamus, and the brain stem (corticofugal). Also, there are fibers running within a cerebral hemisphere (association fibers) and between right and left hemispheres (commissural fibers). *Note:* *Cerebrum* is the Latin word for “brain.”

choroid plexus [Levels 2, 10, 11]

The source of cerebrospinal fluid within a brain ventricle, it consists of epithelium covering highly vascular villi. *Note:* *Choroid* is derived from the Greek word for “chorion”; *plexus* is from the Latin “to pleat.”

cingulate gyrus [Levels 1–6]

Located medially, dorsal to the corpus callosum, the cingulate gyrus is part of the limbic system and thus plays a role in processing emotions, including learning and memory. It is involved with emotional response to pain and is a key brain structure associated with crying in mammals. It communicates with the thalamus and other areas of neocortex as well as with the rhinencephalon. *Note:* *Cingulate* is derived from the Latin word for “girdle.”

claustrum [Levels 1–4]

A broad, narrow area of gray matter sandwiched between the white matter entities designated external capsule and extreme capsule. The claustrum has broad connections with the cerebral cortex but its function is unclear. *Note:* *Clastrum* is from the Latin word for “barrier.”

cochlear nuclei [Level 9]

Neurons comprising dorsal and ventral cochlear nuclei receive input from the cochlear nerve (VIII). The nuclei are positioned together, but the dorsal nucleus contributes to a surface elevation (acoustic tubercle). Neurons are tonotopically arranged within the nuclei. Axons from the nuclei initiate the auditory pathway within the brain. *Note:* *Cochlear* is from the Latin for “snail shell.”

commissure of the caudal colliculus [Level 7]

The band of fibers that connects right and left caudal colliculi in the tectum (roof) of the midbrain. *Note:* *Commissure* is from the Latin word for “junction”; *colliculus* is Latin for “small hill.”

commissure of the rostral colliculus [Level 6]

The band of fibers that connects right and left rostral colliculi in the tectum (roof) of the midbrain. *Note:* *Commissure* is from the Latin word for “junction”; *colliculus* is Latin for “small hill.”

corpus callosum [Levels 1–5]

The band of commissural fibers that connects neocortex of right and left cerebral hemispheres, effectively making one integrated brain out of the two hemispheres. *Note:* *Corpus* is the Latin word for “body”; *callosum* is Latin for “tough.”

corticospinal fibers [Level 8]

These fibers arise from cell bodies in cerebral cortex (particularly motor and somatosensory neocortex) and they terminate in the spinal cord. The fibers run in pyramids of the medulla oblongata (hence they are contained in the pyramidal tract). The fibers provide voluntary control of distal joints of the limbs, and they regulate traffic in ascending pathways.

crus cerebri [Levels 4–7]

A midbrain bundle of corticospinal fibers coming from internal capsule and going through the ventral pons to the pyramid of the medulla oblongata. The bundle also contains corticobulbar fibers to substantia nigra, pontine nuclei, reticular formation, olivary nucleus, and cranial nerve nuclei. *Note: Crus* is from the Latin word for “leg.”

D

decussation of rostral cerebellar peduncle [Level 7]

Axons, originating from the interpositus nucleus or the lateral (dentate) nucleus of one side of the cerebellum, cross the midline via this decussation in order to synapse, respectively, in the contralateral red nucleus and thalamus. *Note: Decussate* is derived from the Latin word for “X”.

dentate gyrus [Level 5]

The innermost gyrus of the hippocampus. In transverse sections, the gyrus appears to cap the deep edge of the hippocampus proper. In general, the dentate gyrus initially processes hippocampal input and sends its output to the hippocampus proper. The dentate gyrus is one of the few sites where formation of new neurons (neurogenesis) is known to take place. *Note: Dentate* is derived from a Latin word pertaining to “tooth,” due to the shape of the gyrus when sectioned transversely.

dentate nucleus [Level 9]

The dentate (lateral) nucleus of the cerebellum receives inhibitory input from cortical Purkinje cells located in the ipsilateral cerebellar hemisphere. Axons from the nucleus run through the rostral cerebellar peduncle and decussate in the midbrain. They impact the pre-motor cerebral cortex through the thalamus, via either a direct synapse or through a neuron in the red nucleus. *Note: Dentate* is derived from a Latin word pertaining to “tooth,” referring to the shape of the nucleus.

dorsal nucleus of trapezoid body [Level 9]

Via fibers in the trapezoid body (from ventral cochlear nuclei), this nucleus receives input from both ears and is involved in sound localization. It is also a reflex center for middle ear muscles and the source of efferent axons found in the cochlear nerve. *Note: Trapezoid* is derived originally from the Greek word for “table.”

dorsal spinocerebellar tract [Level 12]

This tract is formed by axons from nucleus thoracicus of the spinal cord. The nucleus receives proprioceptive input from the pelvic limb. The tract enters the cerebellum via the caudal cerebellar peduncle. *Note: Spino* is derived from the Latin word for “backbone.”

E

endopeduncular nucleus [Level 2]

This basal nucleus may be regarded as the internal component of the globus pallidus (pallidum). It contains spontaneously active inhibitory neurons and its role in voluntary movement circuits is to suppress thalamic neurons that activate the motor cortex. *Note: Endo* is from the Greek “within”; *peduncular* is derived from Latin “stemlike.”

external capsule [Level 1]

A thin white matter sheet that separates putamen and globus pallidus from claustrum. *Note: The white matter appears to encapsulate the gray basal nuclei.*

extreme capsule [Level 1]

A layer of white matter positioned along the lateral margin of the claustrum, separating it from the cerebral cortex.

Among the three white matter “capsules” it occupies the extreme lateral position. *Note:* The white matter appears to encapsulate the gray basal nuclei.

F

facial motor nucleus [Level 10]

This nucleus is composed of somatic efferent neuron cell bodies that innervate muscles of facial expression via the facial nerve. *Note:* *Nucleus* is from the Latin word for “kernel.”

facial nerve [Level 9]

Cranial nerve VII. It innervates muscles of facial expression (somatic efferent fibers); nasal and lacrimal glands and mandibular and sublingual salivary glands (visceral efferent fibers); taste buds from the rostral two-thirds of the tongue (special visceral afferent); and sensation from the concave surface of the pinna of the ear (general somatic afferent). *Note:* *Nerve* is derived from the Greek word for sinew, “neuron.”

facial nerve fibers and genu [Level 9]

Axons from the facial motor nucleus have an indirect course within the brain stem. From the nucleus, they run dorsally and rostrally, form a bend (genu) dorsal to the abducent nucleus, and then run ventrally and laterally to exit the brain stem. *Note:* *Genu*, the Latin word for “knee,” is applied to bend made by the fibers.

fasciculus cuneatus [Level 12]

This white matter bundle within the dorsal funiculus of the spinal cord conveys proprioception and discriminative touch from the thoracic limb to the medial cuneate nucleus (conscious pathway) and to the lateral cuneate nucleus (for relay to the cerebellum). The fasciculus is formed by cranial branches of primary afferent neurons. *Note:* *Fasciculus* is from the Latin word for “small bundle”; *cuneatus* is from the Latin word for “wedge.”

fasciculus gracilis [Level 12]

A white matter bundle within the dorsal funiculus of the spinal cord that conveys discriminative touch from the pelvic limb to the gracilis nucleus as part of a conscious pathway. The fasciculus is formed by cranial branches of primary afferent neurons. *Note:* *Fasciculus* is from the Latin word for “small bundle”; *gracilis* comes from the Latin word for “slender.”

fastigial nucleus [Level 9]

This cerebellar nucleus receives inhibitory input from cortical Purkinje cells of the vermis. It sends axons through the caudal cerebellar peduncle to the reticular formation and vestibular nuclei to regulate muscle tone and maintain balance. *Note:* *Fastigial* comes from a Latin word referring to “gable peak” (roof of the IV ventricle).

fimbria [Levels 3–5]

Refers to the white matter layer formed by axons from the hippocampus extending laterally to join the fornix. *Note:* *Fimbria* is from the Latin word for “fringe.”

flocculus [Level 9]

Refers to a ventrolateral lobule of a cerebellar hemisphere. Together with the nodulus of the vermis, the two flocculi form the flocculonodular lobe of the cerebellum, which is closely associated with vestibular function. *Note:* *Flocculus* is Latin for “small tuft.”

fornix [Levels 2–4]

A white matter bundle composed of axons that come from the hippocampus (via the fimbria) and go to the septum or rostral thalamus or mamillary bodies. The fornix can be divided into regions [L2]: **crus**—lateral to the hippocampus; **body**—where right and left crura appear to join at the midline; and **column**—the bundle that runs to the mamillary body. *Note:* *Fornix* is the Latin word for “arch” or “vaulted.”

fourth ventricle [Levels 8, 10, 11]

This hindbrain cavity is derived from the embryonic neural cavity. It is lined by ependyma, filled with

cerebrospinal fluid, and covered by a thin roof that bilaterally gives rise to choroid plexuses. Rostrally, the ventricle communicates with the mesencephalic aqueduct. Caudally, the ventricle communicates with the central canal of the spinal cord. Bilaterally, the ventricle is open to the subarachnoid space via a lateral recess and aperture. *Note: Ventricle* is from the Latin for “small belly.”

fourth ventricle lateral recess [Level 10]

Bilateral extensions of the fourth ventricle leading to lateral apertures, by which cerebrospinal fluid exits the ventricular system in order to surround the brain and spinal cord.

frontal lobe [Level 1 captions]

Refers to the rostral end of a cerebral hemisphere. The pre-motor area of the cerebral cortex (for planning and learning voluntary movement) is located in the frontal lobe. The frontal pole (prefrontal cortex) is associated with cognitive capacity, including the ability to plan and execute directed activities, choose better actions, and suppress impulsive and unacceptable behavior. In dogs, frontal lobe deficits are manifested by learning disability and incoherent, fleeting attention spans directed at any and every stimulus encountered.

G

gigantocellular reticular nucleus [Level 10]

Composed of scattered large neurons, this nucleus gives rise to the medullary reticulospinal tract, which excites limb flexor muscles. The neurons are activated by corticobulbar fibers from the cerebral motor cortex. *Note: The term, reticular* is from the Latin “reticulum,” meaning “small net.”

globus pallidus (pallidum) [Levels 1, 2]

This basal nucleus is involved in voluntary movement circuits. The globus pallidus, which contains spontaneously active inhibitory neurons, sends inhibitory output to the endopeduncular nucleus and receives inhibitory input from the caudate nucleus and putamen (striate body). As a result the globus pallidus functions to facilitate desired movement (by disinhibition). *Note: Globus pallidus* comes from Latin, it means “pale globe.”

gracilis nucleus [Level 12]

A relay nucleus in the discriminative touch conscious pathway from the pelvic limb. The nucleus receives cranial branches of primary afferent neurons that innervate, more or less, the caudal half of the body. Axons from the nucleus ascend in the contralateral medial lemniscus to the lateral portion of the ventral caudal nucleus of the thalamus. *Note: Gracilis* comes from the Latin word for “slender.”

gyrus [Level 1]

Refers to an elevated ridge at the surface of the cerebrum or cerebellum. The elevation consists of gray matter cortex and underlying white matter. *Note: Gyrus* comes from the Greek term for “ring”.

H

habenula [Level 3]

Refers to habenular nuclei, located lateral to the pineal body in the epithalamus of the diencephalon. The nuclei receive input from the septal region, rostral thalamus and hypothalamus, and spinal cord. Output is sent to the midbrain, including the interpeduncular nucleus and dopaminergic substantia nigra. Via inhibition of dopamine release, the habenula is involved in freezing movement, such as exhibited by prey animals in response perceived threats. *Note: Habenula* comes from Latin; it means “small rein.”

hippocampal commissure [Level 5]

Composed of nerve fibers crossing the midline between the right hippocampus and the left hippocampus. *Note: Commissure* is from the Latin word for “junction” (the term is used for fibers that cross the midline).

hippocampus [Levels 3–6]

Located medial to the lateral ventricle, the hippocampus is the oldest cerebral cortex. It is a component of the limbic system and it is essential for forming new memories, including spatial memory (how you got to your current location and how to return). Neurons of the hippocampus give rise to the fimbria and fornix. The hippocampus undergoes selective neuron loss as dogs age. *Note:* Named for its appearance in cross section, the term *hippocampus* is derived from the Greek words for “sea horse.”

hypoglossal nerve and nerve fibers [Level 11]

These nerve fibers arise in the hypoglossal nucleus and run to the tongue to innervate intrinsic and extrinsic tongue muscles. *Note: Hypoglossal* is from the Greek terms “under” and “tongue,” referring to the course the nerve takes in innervating the tongue.

hypoglossal (motor) nucleus [Level 11]

The nucleus is composed of somatic efferent neurons that, via the hypoglossal nerve, innervate intrinsic and extrinsic muscles of the tongue. In conjunction with the first cervical spinal nerve (ansa cervicalis), the nucleus also innervates sternohyoid and sternothyroid muscles. *Note: Hypoglossal* is from the Greek terms “under” and “tongue,” referring to the course the nerve takes in innervating the tongue.

hypophysis [Level 3]

The hypophysis (pituitary gland) is attached via an infundibulum to the ventral surface of the tuber cinereum region of the hypothalamus. The hypophysis is absent in this brain atlas (it was lost during brain removal). *Note: Hypophysis* comes from the Greek “under growth.”

hypothalamus [Levels 2–4]

Located ventrally and medially in the diencephalon, the hypothalamus is divisible into a number of regions, areas, and nuclei. Functionally, the hypothalamus is involved in expressing visceral and emotional behavior, controlling autonomic nuclei, and, via the pituitary gland, directing endocrine homeostasis. *Note: Hypothalamus* means “under” the “thalamus,” from the Greek.

I

indusium griseum [Level 5]

This thin strip of gray matter, located dorsally on the corpus callosum, tucked ventral to the cingulate gyrus, is only remarkable for its anatomical oddity. Phylogenetically associated with the hippocampus, the indusium griseum is a caudal continuation of the slender supracallosal gyrus. *Note:* From Latin, *Indusium* = “tunic” and *griseum* = “gray”.

infundibulum [Level 3]

The infundibulum is a stalk that attaches the hypophysis (pituitary gland) to the ventral surface of the hypothalamus. It conveys axons and vessels from the hypothalamus to the hypophysis. The infundibulum is absent in this brain atlas; it was lost during brain removal. *Note: Infundibulum*, derived from Latin, means “funnel.”

internal capsule [Levels 1–4]

This white matter “capsule” is the largest and most medial of the three so called capsules. It separates putamen and globus pallidus from the caudate nucleus; further caudally, it separates thalamus from globus pallidus. The internal capsule consists of corticopedal axons that arise in the thalamus and corticofugal axons that terminate in basal nuclei, thalamus, brain stem, or spinal cord. *Note:* The white matter was regarded as encapsulating gray matter by early anatomists.

interpeduncular nucleus [Levels 6, 7]

The nucleus receives input from habenular nuclei and sends output to tegmental nuclei and midbrain raphe nuclei. Tegmental nuclei are concerned with visceral control and the raphe nuclei send serotonergic projections to the forebrain, affecting mood and sleep status. The interpeduncular nucleus is named for its midline position between right and left cer-

erebral peduncles (the latter term is seldom used). *Note: Inter-* is Latin for “between,” and *peduncular* comes from the Latin “pedunculus,” meaning stemlike.

interpositus nucleus [Level 9]

This cerebellar nucleus sends axons into the rostral cerebellar peduncle. The axons decussate and terminate in the contralateral red nucleus in order to regulate the force and timing of activity of limb proximal musculature. *Note: Inter-* is Latin for “between,” and *posit* is Latin for “placed.”

interthalamic adhesion [Levels 2–4]

Refers to the midline site where the right thalamus contacts the left thalamus, obliterating the center of the third ventricle. It is not a site of significant right-left communication. *Note: Thalamus* comes from the Greek word “thalamos,” which refers to part of the brain.

J K L

lateral cuneate nucleus [Level 11]

Via fasciculus cuneatus, this nucleus receives cranial branches of proprioceptive primary afferent neurons from the thoracic limb. Axons from the nucleus run through the caudal cerebellar peduncle to the cerebellum. *Note: Cuneate* is derived from the Latin word for “wedge.”

lateral funiculus [Level 12]

This is one of three major regions of spinal white matter. The lateral funiculus is bounded dorsally by the dorsolateral sulcus and ventrally by exiting ventral root fibers. The dorsal half of the lateral funiculus contains the principal voluntary movement tracts (rubrospinal and lateral corticospinal). *Note: Funiculus* is Latin for “small rope,”

lateral geniculate nucleus (body) [Level 5]

This is a thalamic relay nucleus in the conscious visual pathway. The nucleus receives retinal input from the optic tract and sends axons through the internal capsule (optic radiation) to the primary visual cortex in the occipital lobe. The nucleus itself is capable of crude visual consciousness. *Note: Geniculate* is Latin for “small knee,” referring to the surface bulge produced by the nucleus.

lateral lemniscus [Level 7]

This white matter tract is formed by trapezoid body axons ascending through the pons to the midbrain. The axons terminate in the caudal colliculus, or they continue in the brachium of the caudal colliculus. Axons comprising the lemniscus originate bilaterally from cochlear nuclei, although content from the contralateral ear is predominant. *Note: Lemniscus* is derived from the Greek word for “fillet.”

lateral reticular nucleus [Level 11]

Located lateral to the olivary nucleus, the lateral reticular nucleus (also called nucleus of the lateral funiculus) receives input from the rubrospinal tract and from the spinal cord. It sends output ipsilaterally to the cerebellum. Thus the nucleus appears to pre-process cerebellar input. *Note: The term reticular* is from the Latin “reticulum,” meaning “small net.”

lateral rhinal sulcus [Level 6]

Located laterally on each cerebral hemisphere, the sulcus separates the rhinencephalon (ventrally) from the neocortex (dorsally). The long sulcus is divided into rostral and caudal segments. *Note: Rhinal* is from the Greek word for “nose”; *sulcus* comes from the Latin word for “furrow.”

lateral ventricle [Levels 1–6]

The cavity within each cerebral hemisphere. Derived from the embryonic neural cavity, each lateral ventricle is lined by ependyma and filled with cerebrospinal fluid produced locally by a choroid plexus within the ventricle. Each lateral ventricle communicates with the third ventricle via an interventricular foramen. *Note: Ventricle* is from the Latin for “small belly.”

lingula lobule of vermis [Level 8]

This is the most rostral of the 10 lobules comprising the cerebellar vermis. *Note: Lingula* is Latin for “little tongue.”

M

mamillary (mammillary) body [Level 4]

The mamillary body (nuclei) is a significant component of the limbic system. The nuclei are involved in working memory (their damage results in "diencephalic amnesia"). The mamillary body receives input from the hippocampus and amygdala via the fornix. Axons from mamillary nuclei go to rostral thalamic nuclei and the midbrain tegmentum. *Note: Mamillary* is derived from the Latin word for “small breast.”

mamillotegmental tract [Level 5]

Conveys output from the mamillary body to the midbrain tegmentum.

mamillothalamic tract [Levels 2–4]

Conveys output from the mamillary body to rostral thalamic nuclei.

medial cuneate nucleus [Level 12]

A relay nucleus in the kinesthesia and discriminative touch conscious pathway. The nucleus receives cranial branches of primary afferent neurons that innervate the thoracic limb. Axons from the nucleus ascend in the contralateral medial lemniscus to the thalamus (ventral caudal nucleus). *Note: Cuneate* is derived from the Latin word for “wedge.”

medial geniculate nucleus (body) [Level 5]

This is a relay nucleus in the conscious auditory pathway, receiving input from the brachium of the caudal colliculus. Axons from the nucleus run through the internal capsule to the primary auditory cortex. By itself, the nucleus is capable of imprecise sound consciousness. *Note: Geniculate* is Latin for “small knee,” referring to the surface bulge produced by the nucleus.

medial lemniscus [Levels 5–11]

Formed by axons from the contralateral gracilis nucleus and medial cuneate nucleus, the tract conveys conscious discriminative touch and kinesthesia to the lateral part of the ventral caudal nucleus of the thalamus. *Note: Lemniscus* is derived from the Greek for “fillet.”

medial longitudinal fasciculus [Levels 7, 8]

This tract connects nuclei of extrinsic eye muscles and conveys output from vestibular nuclei for reflex control of eye muscles. The fasciculus extends caudally into the cervical spinal cord for vestibular reflex control of neck muscles. *Note: Fasciculus* is Latin for “small bundle.”

mesencephalic aqueduct [Levels 5–7]

A canal within the midbrain that connects between the third ventricle rostrally with the fourth ventricle caudally. It is not a ventricle since it lacks a choroid plexus. *Note: Cephalic* is derived from the Greek for “head.”

mesencephalic nucleus of V [Level 6]

This trigeminal nucleus is composed of cell bodies of primary afferent neurons that convey proprioceptive information from the jaw. The neurons send axons to the motor nucleus of the trigeminal nerve. *Note: Trigeminal* is derived from the Latin “tri-” for three and “geminus” for twin.

middle cerebellar peduncle [Level 8]

The peduncle consists entirely of afferent fibers from pontine nuclei. Information from the cerebral cortex is conveyed to the cerebellum via pontine nuclei. *Note: Peduncle* comes from the Latin “pedunculus,” meaning stemlike.

N

nodulus [Level 9]

This is the most caudal of the 10 lobules composing the cerebellar vermis. Together with bilateral flocculi, the nodulus forms the flocculonodular lobe, which is closely associated with vestibular function. *Note: Nodulus* is Latin for “small knot.”

nucleus proprius [Level 12]

The term refers to the collection of neuron cell bodies that occupy the bulk of the dorsal horn of the spinal cord. The cell bodies belong to interneurons and ascending pathway projection neurons. *Note: Proprius* is a Latin word meaning “belonging to.”

nucleus of the spinal tract of V [Levels 9–12]

This trigeminal nucleus runs the length of the medulla oblongata, overlapping with the substantia gelatinosa in the spinal cord. The nucleus is composed of cell bodies of interneurons and ascending pathway projection neurons activated by pain and temperature axons comprising the spinal tract of the trigeminal nerve. *Note: Trigeminal* is derived from the Latin “tri-” for three and *geminus* for “twin.”

O**oculomotor nucleus** [Level 6]

The nucleus is composed of somatic efferent neuron cell bodies that innervate four of the seven extrinsic muscles of the carnivore eye. The neurons shift the gaze dorsally, medially, and ventrally, and they rotate the eyeball (ventral eye region toward the nose). *Note: Oculus* is the Latin word for “eye.”

olfactory stria [Level 1]

An olfactory stria (tract) conveys axons from the olfactory bulb to another location within the rhinencephalon. Three tracts are recognized: the **lateral olfactory stria** is the conscious olfactory pathway to the piriform lobe; the **medial olfactory stria** conveys olfactory information to the septum; (not shown, an intermediate olfactory stria communicates with the contralateral olfactory bulb via the rostral commissure). *Note: Stria* is the Latin word for “furrow”; *olfactory* comes from the Latin “to smell.”

olivary nucleus [Level 11]

The nucleus is remarkable for its distinctive appearance in transverse section and as the source of the climbing fibers found on Purkinje cells of the cerebellar cortex. Since the nucleus receives motor directive input from both cerebral cortex and red nucleus as well as proprioceptive input from the spinal cord, it serves as an integrative center for preprocessing input to the cerebellum. *Note: Oliva* is the Latin word for “olive.”

optic chiasm (chiasma) [Level 2]

Axons of the optic nerve travel through the optic chiasm to reach the optic tract. In the dog, about 75% of optic nerve fibers decussate in the chiasm to reach the contralateral optic tract (cat: 63%; horse: 90%). *Note: Chiasma* is the Greek word for “cross-shape.”

optic nerve [Level 1]

The collection of axons that originate from ganglion cells of the retina and go to the optic chiasm. The “nerve” is actually a CNS tract enclosed in meninges (both the retina and optic nerve are embryological outgrowths of the diencephalon). *Note: Optic* comes originally from the Greek “optos,” meaning seen.

optic tract [Levels 3–5]

The tract is composed of axons from retinal ganglion cells. The axons come from both eyes, more so from the contralateral eye. The axons travel through both optic nerves and the optic chiasm to reach the optic tract. The tract begins at the optic chiasm and conveys axons (contralateral visual field per eye) to the lateral geniculate nucleus (conscious vision) and, via the brachium of the rostral colliculus, to visual reflex sites (rostral colliculus and pretectum). *Note: Optic* comes originally from the Greek “optos,” meaning seen.

P

parasympathetic nucleus of vagus [Level 11]

Contains visceral efferent preganglionic neurons that send axons into the vagus nerve to innervate terminal ganglia in thoracic and abdominal viscera. *Note: Vagus* is the Latin word for “wandering.”

parasympathetic oculomotor nucleus [Level 4]

Contains visceral efferent preganglionic neurons that, via postganglionic neurons in the ciliary ganglion, innervate intrinsic muscles of the iris (pupil constriction) and ciliary body (accommodation to near vision). *Note: Edinger-Westphal nucleus* is an older term for this nucleus.

parvocellular reticular nucleus [Level 10]

The term parvocellular refers to small neurons. This reticular nucleus receives spinal tract input and contains interneurons that project to other reticular nuclei. Along with other reticular nuclei, the nucleus is involved with visceral regulation and has a role in the expiration phase of breathing. *Note: Parvus* is a Latin word meaning “small.”

periaqueductal gray matter (PAG) [Levels 6, 7]

This term refers to the gray matter surrounding the mesencephalic aqueduct (central gray substance). It is the origin of an intrinsic analgesia system that indirectly releases serotonin and noradrenaline into the dorsal horn of the spinal cord to block transmission of ascending pathways. Neurons in the PAG are responsive to endorphins and opiates.

pineal gland (body) [Level 4]

The pineal endocrine gland contains pinealocytes that secrete melatonin in response to light/dark cycles (light stimulates and dark inhibits production). Melatonin promotes sleep. Also the gland is involved in sexual development, seasonal breeding, and hibernation. Light affects the pineal gland via a pathway that includes: light sensitive ganglion cells in the retina, optic tract axons to hypothalamic nuclei, sympathetic preganglionic neurons in the spinal cord, and postganglionic neurons in the cranial cervical ganglion. *Note: Pineal* comes from the Latin word for “pine cone.”

piriform lobe [Levels 2–6]

The piriform lobe is located within the rhinencephalon and associated with conscious olfaction. It receives olfactory input from the olfactory bulb via the lateral olfactory stria. The lobe consists of a rostral flat part and a caudal swollen part. The amygdala and the ventral tip of the hippocampus are deep to the caudal part. *Note: Piriform* is from Latin “pear-shaped.”

pons [Level 8 caption]

The term *pons* refers to the brain stem component of the metencephalon (cerebellum being the other metencephalon component). The ventral region of the pons appears anatomically distinct and features transverse pontine fibers, whose surface appearance gives the region its name. *Note: Pons* is the Latin word for “bridge.”

pontine nuclei [Level 8]

Located within the ventral pons, the dispersed pontine nuclei relay information from the cerebral cortex motor area to the cerebellum. The nuclei receive their input from collateral branches of axons traveling through the pons from the crus cerebri. Axons from pontine nuclei decussate and, as transverse pontine fibers, they proceed to form the middle cerebellar peduncle. *Note: Pontine* is derived from the Latin word for “bridge.”

pontine sensory nucleus of V [Level 8]

This trigeminal nucleus consists of cell bodies of interneurons and ascending pathway projection neurons that are activated by tactile and proprioceptive input from the face. The nucleus gives rise to conscious pathways for facial discriminative touch and also jaw kinesthesia. *Note: Trigeminal* is derived from the Latin “tri-” for three and *geminus* for “twin”.

pretectal area (pretectum) [Level 5]

Situated rostral to the tectum of the midbrain, the pretectum is concerned with the pupillary light reflex. Input is from the optic tract (via the brachium of the rostral colliculus). Output from pretectal nuclei goes to the parasympathetic oculomotor nucleus. Right and left sides are connected via the caudal commissure. (The pretectum is also involved with REM sleep activity.) *Note: Tectum* comes from the Latin word for “roof.”

putamen [Levels 1, 2]

The putamen and the caudate nucleus are basal nuclei that comprise the striate body. The putamen participates in voluntary movement circuits that are active during movement execution (following movement planning). The striate body suppresses movement by inhibiting the endopeduncular nucleus, which prevents thalamic excitation of the motor area of the cerebral cortex. The striate body facilitates movement by inhibiting the globus pallidus, which inhibits the endopeduncular nucleus. *Note: Putamen* is the Latin word for “remaining after pruning.”

pyramid [Level 11]

Refers to white matter, located ventromedially in the medulla oblongata, which is more or less pyramid-shaped in transverse section. The pyramids contain corticospinal and corticobulbar fibers that collectively constitute the pyramidal tract (named for its location in the pyramid). *Note: Pyramid* is derived from Greek.

pyramidal decussation [Level 12]

At the junction of the brain and spinal cord, most of the corticospinal fibers in the pyramidal tract cross to the contralateral side (decussate) and then descend in the dorsal half of the lateral funiculus as the lateral corticospinal tract. A minority of fibers (ventral corticospinal tract) continue to descend in the ventral funiculus; they cross before terminating in the spinal cord. *Note: Decussation* is derived from the Latin word for “X.”

pyramidal tract [Levels 9, 10]

This tract contains axons from cell bodies located in the cerebral cortex. The axons traverse: internal capsule, crus cerebri, pons, and, in the medulla oblongata, they run in the pyramid (which give the tract its name). The axons terminate in cranial nerve nuclei (corticobulbar fibers) or in the spinal cord (corticospinal fibers). Via the tract, the motor area of cerebral cortex (upper motor neurons) has direct input to interneurons and efferent neurons (lower motor neurons). The pyramidal tract controls voluntary movement of mainly distal muscles of a limb. The tract also contains axons from somatosensory cortex. These axons regulate sensory pathway activity by influencing excitation of second-order projection neurons. *Note: Pyramid* is derived from Greek.

Q R

raphe magnus nucleus [Level 10]

This reticular nucleus is one of several serotonergic nuclei situated along the seam separating right and left halves of the brain stem reticular formation. Axons from raphe magnus nucleus descend into the spinal cord and release serotonin in order to inhibit synaptic transmission in ascending pain pathways. *Note: Raphe* means “seam”, from the Greek.

red nucleus [Level 6]

From rostral to caudal, the red nucleus contains small, medium, and large neurons. Large neurons give rise to rubrospinal tract axons that constitute the principal tract for voluntary control of limb proximal musculature. Axons of medium size neurons terminate in the cervical spinal cord to control head movement. The small neurons project to the thalamus and to the olivary nucleus. The red nucleus receives input from the cerebral motor cortex and from cerebellar nuclei (interpositus to large neurons and dentate to small neurons). *Note: Iron* content in the neurons of this nucleus gives it a red appearance, particularly in primates.

reticular formation [Levels 8, 10]

Anatomically, the term refers to the network of intermixed gray and white matter that forms a background for prominent nuclei and white matter in the brain stem. Functionally, various nuclei of the reticular formation have important roles, including alerting the cerebral cortex to maintain wakefulness; regulating visceral functions (micturition, heart rate, respiration, etc.); and producing movement via medullary and pontine reticulospinal tracts. The latter is spontaneous active and generates muscle tone in limb extensor muscles. *Note: The term reticular* is from the Latin “reticulum,” meaning “small net.”

rostral cerebellar peduncle [Level 8]

This peduncle is composed predominantly of efferent fibers from interpositus and dentate cerebellar nuclei. The axons go to the red nucleus and thalamus and are the means by which the cerebellum regulates ongoing movement. *Note: Peduncle* comes from the Latin “pedunculus,” meaning stemlike.

rostral colliculus [Level 6]

This is a control center for eye movement and a visual reflex center (for head, ear, eye orientation toward sudden light). Bilateral retinal input arrives via the optic tract and brachium of the rostral colliculus, terminating superficially in the colliculus. The deepest neurons of the colliculus receive auditory and spinal input. Intermediate neurons give rise to tectobulbar and tectospinal tracts that produce orientation reflexes for both vision and sound (caudal colliculus). Note: *Colliculus* is Latin for “small hill.”

rostral commissure [Level 1]

Nerve fibers that connect right and left sides of the rhinencephalon. The rostral limb of the commissure links bilateral olfactory bulbs via intermediate olfactory striae. The amygdala is linked bilaterally via the caudal limb of the commissure. Note: *Commissure* is from the Latin word for “junction” (the term is used for fibers that cross the midline).

rostral ventromedial medulla [Level 10]

This region of the medulla oblongata is involved in pain modulation, among other roles. Part of the brain’s intrinsic analgesia circuit, it receives input from the periaqueductal gray and sends axons into the spinal cord to inhibit second-order projection neurons of pain pathways. The region is known to contain opioid-sensitive neurons. Note: *Rostral* is derived from the Latin word for “beak”; *medulla* is from the Latin word for “marrow.”

rubrospinal tract [Level 8]

Originating from neurons of the red nucleus, the rubrospinal tract immediately decussates and then descends through the brain stem and through the dorsal half of the lateral funiculus of the spinal cord. Axons from medium size neurons terminate in the cervical spinal cord and produce head movement. Axons from large neurons constitute the principal tract for quadruped gait and voluntary movement involving limb proximal musculature. Note: *Rubro* is derived from the Latin word for “red.”

rubrospinal tract decussation [Level 6]

The rubrospinal tract immediately decussates before descending through the brain stem and spinal cord. Note: *Decussation* is derived from the Latin word for “X.”

S

septum [Level 1]

The septum (septal area; septal nuclei) forms the medial wall of the rostral end of the lateral ventricle (ventral to the thin septum pellucidum). A major component of the limbic system, the septum is a known reward center. It receives input from the medial olfactory stria and has reciprocal connections with the hippocampus, amygdala, hypothalamus, habenula, and the cingulate gyrus. Note: *Septum* is derived from the Latin for “enclose.”

septum pellucidum [Level 1]

This thin layer is part of the medial wall of the lateral ventricle. It is more or less evident between the septum and corpus callosum. Note: *Pellucidum* is derived from the Latin word for “shine through.”

solitary tract [Level 11]

This tract is composed of axons from primary general visceral afferent neurons innervating the pharynx, middle ear, and larynx (glossopharyngeal and vagus nerves). Rostrally, the tract also contains taste fibers, i.e., special visceral afferent fibers from facial, glossopharyngeal, and vagus nerves. Axons of the tract terminate in the adjacent nucleus of the solitary tract. Note: The tract is named for its solitary profile, surrounded by gray matter in transverse section.

spinal root of nerve XI [Level 11]

The root is composed of somatic efferent axons from the motor nucleus of the accessory nerve. The spinal root is formed by nerve fibers that emerge periodically from the mid-lateral surface of the cervical spinal cord. After joining the bulbar root of the accessory nerve (temporarily), the spinal root fibers continue in the accessory nerve to innervate neck muscles (trapezius, omotransversarius, cleidocephalicus components, and the mastoid part of sternocephalicus).

spinal tract of V [Levels 9–12]

The spinal tract of the trigeminal nerve is composed of facial pain and temperature axons. The axons are from the primary general somatic afferent component of the trigeminal nerve. *Note: Trigeminal* is derived from the Latin “tri-” for three and *geminus* for “twin”.

spinothalamic tract [Levels 4–8, 10, 11]

The spinothalamic tract is composed of second-order axons of a three-neuron pathway conveying conscious pain and temperature sensation. The axons arise from second-order projection neurons located in the dorsal horn of the spinal cord (marginal nucleus and nucleus proprius). The axons decussate in the spinal cord and ascend, in the lateral funiculus and through the brain stem, to terminate in the lateral portion of the ventral caudal nucleus of the thalamus.

stria habenularis [Level 2]

Conveys axons from the septal region, rostral thalamus, and rostral hypothalamus to habenular nuclei. *Note: Stria* is the Latin word for “furrow”; *habenula* is Latin for “small rein”; *—aris* is Latin for “of the.”

substantia nigra [Levels 5, 6]

This gray matter has compact and reticulated divisions, each with a different role. In general, the substantia nigra interacts with the basal nuclei circuits concerned with movement. In particular, the dorsal compact region send dopamine projections to the caudate nucleus and putamen to neuromodulate basal nuclei circuits. The net effect is movement facilitation. Parkinson’s disease results from the loss of dopamine neurons in the substantia nigra. Ventrally, the reticulated substantia nigra contains spontaneously active inhibitory neurons controlled by basal nuclei. The axons project to the tectum to control eye movement (saccades). *Note: Nigra* is the Latin word for “black.” In primates, the compact neurons are pigmented.

subthalamus [Level 3]

Located ventral to the thalamus and lateral to the hypothalamus, the subthalamus consists of several nuclei and fiber zones. Functionally, the subthalamus participates in basal nuclei circuits concerned with movement. In response to cortical input, the subthalamus suppresses unwanted movements by exciting the inhibitory neurons of endopeduncular nucleus. Premature movements result from damage to the subthalamus and, because it generates bursts of neuronal activity, the subthalamus may play a pacemaker role in rhythmic movements. (In primates, subthalamic lesions produce hemiballismus.) *Note: Thalamus* is derived from the Greek word for “inner chamber.”

sulcus [Level 1]

Refers to a surface groove located on the cerebrum, cerebellum, or spinal cord. In the cerebral cortex, sulci demarcate gyri; in the cerebellum, they demarcate folia. *Note: Sulcus* comes from the Latin word for “furrow.”

T**thalamus** [Levels 2–4]

The thalamus is the source of all input to the cerebral neocortex. Close to three dozen nuclei are included within the thalamus. The following components are labeled in the Atlas:

rostral thalamic nucleus [L 2] is concerned with affective behavior; it has connections with the hippocampus and cingulate gyrus.

thalamic external medullary vellum [L 3] is white matter separating groups of thalamic nuclei (an internal medullary vellum is also present).

thalamic pulvinar nucleus [L 4] is the most caudal thalamic nucleus (except for geniculate nuclei). Damage to it is associated with visual attention deficits.

thalamic reticulate nucleus [L 4] is the thalamic nucleus that does not project to the cerebral cortex. Located lateral to the external medullary vellum, it contains inhibitory neurons that receive input from the cerebral cortex and send output

to the thalamus.

ventral caudal thalamic nucleus [L 3, 4] relays information from conscious pathways (e.g., spinothalamic tract and medial lemniscus) to the primary somatosensory area of the cerebral cortex. The lateral part of the nucleus deals with spinal input, the medial part relays trigeminal information; taste is most medial in the nucleus.

third ventricle [Levels 2–4]

A narrow chamber within the diencephalons, derived from the embryonic neural cavity. It is lined by ependyma, filled with cerebrospinal fluid, and covered by a thin roof to which bilateral choroid plexuses are attached. Rostrally, the ventricle communicates bilaterally with lateral ventricles (via intervertebral foramina); caudally, the ventricle communicates with the mesencephalic aqueduct. The center of the ventricle is obliterated by the interthalamic adhesion. *Note: Ventricle* is from the Latin for “small belly.”

transverse pontine fibers [Levels 7, 8]

Situated superficially on the ventral surface of the pons, the fibers arise from contralateral pontine nuclei and proceed to form the middle cerebellar peduncle. They convey information to the cerebellum from motor areas of the cerebral cortex. *Note: Pontine* is derived from the Latin word “pons,” which means “bridge.”

trapezoid body [Level 9]

Associated with hearing, it is composed of bilateral axons from ventral cochlear nuclei along with ventral nuclei of the trapezoid body (diffuse gray matter among the fibers). The axons ascend as lateral lemniscus fibers; some of the axons synapse in dorsal or ventral nuclei of the trapezoid body. *Note: Trapezoid* is derived originally from the Greek word for “table.”

trigeminal motor nucleus [Level 8]

The nucleus is composed of somatic efferent neuron cell bodies that innervate jaw muscles for mastication, plus mylohyoideus and tensor tympani muscles. *Note: Trigeminal* is derived from the Latin “tri-” for three and *geminus* for “twin”.

trigeminal nerve [Level 8]

Cranial nerve V. It innervates muscles of mastication (somatic efferent fibers) and conveys sensation from the face (general somatic afferent). Within the cranial cavity, distal to the trigeminal ganglion, the nerve divides into three branches: ophthalmic, maxillary, and mandibular. *Note: Trigeminal* is derived from the Latin “tri-” for three and *geminus* for “twin”.

tuber cinereum [Level 3]

Refers to a swollen area on the ventral surface of the hypothalamus that gives rise to the infundibulum and hypophysis. Neurons in this region produce releasing factors that, via the hypothalamic-hypophyseal portal system, regulate hormone secretion by the adeno-hypophysis. *Note: Tuber* is the Latin word for “swelling,” and *cinereum*, derived from the Latin word for “ashen color,” pertains to gray matter.

U V

vagus nerve [Levels 10, 11]

Cranial nerve X. It innervates muscles of the larynx, pharynx, and esophagus (somatic efferent fibers from nucleus ambiguus) and thoracic and abdominal viscera (visceral efferent fibers from the parasympathetic nucleus of the vagus). The vagus nerve conveys general visceral afferent fibers and special visceral afferents (pharyngeal taste) to the solitary tract. The vagus also innervates the external auditory canal (general somatic afferent fibers). *Note: Vagus* is the Latin word for “wandering.”

ventral funiculus [Level 12]

One of three major bilateral regions of spinal white matter, ventral funiculus refers to white matter located medial and ventral to the ventral gray horn. The funiculus contains the fibers responsible for driving extensor muscle tone and standing (pontine reticulospinal and lateral vestibulospinal tracts). *Note: Funiculus* is Latin for “small rope.”

ventral horn of spinal cord [Level 12]

Refers to the profile of the ventral column of spinal gray matter when seen in transection. The ventral gray matter contains motor nuclei (alpha and gamma neurons and interneurons). *Note: Venter* is the Latin word for “belly.”

ventral pons [Levels 7, 8]

Ventral pons refers to the anatomically distinct ventral region of the pons division of the brain stem. Corticospinal/corticobulbar fibers conveying motor commands run longitudinally through the ventral pons and send collateral branches to pontine nuclei. The nuclei give rise to transverse pontine fibers that decussate and become the middle cerebellar peduncle. *Note: Pons* is the Latin word for “bridge.”

ventral reticular nucleus [Level 11]

This nucleus is related to the parvocellular reticular nucleus. The rostral end of the nucleus plays a role controlling inspiratory breathing (ventral respiratory group). *Note: The term, reticular* is from the Latin “reticulum,” meaning “small net.”

ventral tegmental area [Level 6]

Located in the midbrain, lateral to the interpeduncular nucleus, this area contains neurons with dopamine and serotonin neuromodulators, and it is a target of agents such as cocaine. The area is part of a pleasure/reward circuit, connecting with the accumbens nucleus. *Note: Tegmentum* from the Latin word for “covering” is applied to mid-regions of the midbrain and pons.

vestibular nuclei [Levels 9, 10]

These nuclei generate vestibular reflexes. They receive vestibular input both directly from the vestibular nerve and indirectly from the flocculonodular lobe of the cerebellum. They send output to extrinsic eye muscle nuclei and to neck muscle nuclei (via the medial longitudinal fasciculus) and to limb muscle nuclei (via the lateral vestibulospinal tract). There are four nuclei: **rostral** [L 9] and **caudal, lateral, and medial** [L 10]. The lateral vestibular nucleus gives rise to the lateral vestibulospinal tract. *Note: Vestibular* comes from the Latin word for “entrance court”; parts of the vestibular apparatus are housed in a bone chamber called the “*vestibule*.”