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# Abbreviations

APSS	Association for the Psychophysiological Study of Sleep
ARAS	ascending reticular activating system
ASDA	American Sleep Disorders Association
ATP	adenosine triphosphate
<i>canarc-1</i>	canine narcolepsy gene
CPAP	continuous positive airway pressure
CR	conditioned response
CS	conditioned stimulus
CSF	cerebrospinal fluid
DCSD	Diagnostic Classification of Sleep and Arousal Disorders
DSIP	delta-sleep-inducing peptide
EEG	electroencephalogram, electroencephalograph, electroencephalography
EMG	electromyogram
EOG	electro-oculogram
EPSP	excitatory postsynaptic potential
GABA	$\gamma$ -aminobutyric acid
GHRH	growth hormone releasing hormone
HLA	human leukocyte antigen
ICSD	International Classification of Sleep Disorders
IL-1	interleukin 1
IPSP	inhibitory postsynaptic potential
LDT	laterodorsal tegmental [nucleus]
LVFA	low voltage, fast activity
LVHF	low voltage, high frequency
MRF	mesencephalic reticular formation
NPO	nucleus pontis oralis
NREM	non-rapid eye movement [sleep]
NTS	nucleus of the tractus solitarius
OSA	obstructive sleep apnea
PCPA	<i>p</i> -chlorophenylalanine

PET	positron emission tomography
PGO	ponto-geniculo-occipital [spikes]
PPT	pedunculopontine tegmental [nucleus]
RAS	reticular activating system
REM	rapid eye movement
RF	reticular formation
SCN	suprachiasmatic nucleus
SIDS	sudden infant death syndrome
SPS	sleep-promoting substance
SWS	slow-wave sleep
UR	unconditioned response
US	unconditioned stimulus

# Glossary

**acetylcholine** See **cholinergic neurons**.

**action potential** The all-or-none electrical signal generated by neurons that is conducted along the axon and causes the release of neurotransmitters from axon terminals. See also **compound action potential**.

**activated sleep** Another term for REM sleep, often used with reference to REM sleep in animals. See **REM sleep**.

**adenosine** A product derived from the breakdown of adenosine triphosphate (ATP) during metabolic processes. Adenosine increases in the brain when neural activity increases, as during waking.

**agonist** A drug that facilitates or mimics the effects of a neurotransmitter.

**aminergic neurons** Neurons that synthesize neurotransmitters called the monoamines or biogenic amines. These include norepinephrine, epinephrine, dopamine, serotonin, and histamine. See also **norepinephrine, epinephrine, dopamine, serotonin, and histamine**.

**antagonist** A drug that opposes the action of a neurotransmitter.

**antidromic response** An action potential that is artificially generated at axon terminals or in the axon and conducted back to the cell body where it is recorded.

**alpha waves** A regular EEG rhythm in the frequency range of 8 to 10 Hz. It usually occurs during periods of quiet relaxation. See also **Berger rhythm**.

**ascending reticular activating system (ARAS)** A region of the mesencephalic and pontine reticular formation that, when stimulated, causes cortical arousal. See also **reticular formation**.

**autoimmune response** A response in which the destructive force of the immune system is directed against the organism's own tissue. Cells of specific types are attacked as if they were foreign intruders (e.g., invading bacteria).

**autoreceptors** Receptors on a neuron that are sensitive to the neurotransmitter released by that neuron.

**axoplasmic transport** A property of neurons in which material is transported down the axon from the cell body to the terminals (anterograde

transport) and from the terminals back to the cell body (retrograde). This property of neurons has been used for tracing neuroanatomical pathways.

- baroreceptors** Pressure receptors located in the carotid sinus that respond to changes in blood pressure. These receptors convey their blood pressure–induced signals to the brain stem. See also **carotid sinus**.
- basal forebrain** The ventral part of the telencephalon that is rostral to and continuous with the preoptic area of the anterior hypothalamus. See also **telencephalon** and **hypothalamus**.
- basal ganglia** Subcortical nuclei of the telencephalic forebrain that are involved in the control of movement. See also **forebrain** and **caudate nucleus**.
- Berger rhythm** An older term that refers to the alpha waves. Named after Hans Berger, the “father” of electroencephalography. See also **alpha waves**.
- beta waves** An EEG rhythm in the frequency range of 20 to 40 Hz, associated with states of cortical activation seen in waking and in REM sleep.
- binding phenomenon** The integration (binding) of neural activity in different parts of the brain to create a functional circuit. This is considered to be the basis of unified perceptions that involve the neural activity in anatomically disparate regions of the brain. See **gamma rhythm**.
- biogenic amines** See **aminergic neurons**.
- blood–brain barrier** The semipermeable barrier between brain cells and the blood supply to the brain that prevents certain blood-borne substances from affecting the brain.
- brachium conjunctivum** A fiber bundle from the cerebellum to the forebrain that passes through the pontine and mesencephalic reticular formation. It is also called the superior cerebellar peduncle.
- brain stem** Part of the brain that is continuous with the spinal cord at the point where the spinal cord enters the skull. The brain stem comprises the medulla oblongata, pons, and mesencephalon. Some anatomists include the diencephalon as the most rostral extent of the brain stem. See also **medulla oblongata**, **pons**, **mesencephalon**, and **diencephalon**.
- canarc-1** The gene for canine narcolepsy. See also **narcolepsy**.
- carotid sinus** An enlargement of the carotid arteries located in the neck that contain baroreceptors. See also **baroreceptors**.
- cataplexy** A sudden episode of muscle weakness or a profound loss of muscle tonus (paralysis) during waking. A symptom of narcolepsy. See also **narcolepsy** and **muscle atonia**.
- caudate nucleus** A nucleus of the basal ganglia that has functions related to movement and behavioral inhibition.
- cerebellar peduncles** Three bilateral pairs of fiber tracts that connect the cerebellum to the brain stem and the rest of the brain. They are the superior, middle, and inferior cerebellar peduncles. See also **cerebellum** and **brachium conjunctivum**.

- cerebellum** A structure attached to the brain stem at the pontine level by the cerebellar peduncles. It is involved with motor coordination, balance, and posture. See also **cerebellar peduncles**.
- cerebral cortex** Layers of cell bodies with their dendritic fields and associated axons that cover the entire cerebrum. See also **cerebrum**.
- cerebral hemispheres** See **cerebrum**.
- cerebral ventricles** Hollow spaces within the cerebrum filled with cerebrospinal fluid. See also **cerebrum** and **cerebrospinal fluid**.
- cerebrospinal fluid (CSF)** A clear fluid similar to the plasma component of blood. It is found in the four interconnected cerebral ventricles and flows from there to an enclosed space (the subarachnoid space) that covers the entire brain and spinal cord. See also **cerebral ventricles**.
- cerebrum** The telencephalic portion of the forebrain comprised of the two large cerebral hemispheres. See also **forebrain**.
- cerveau isolé** A surgical preparation in which the brain is transected between the diencephalon and mesencephalon. See also **diencephalon** and **mesencephalon**.
- cholinergic neurons** Neurons that release the neurotransmitter acetylcholine at their terminals.
- circadian rhythm** A physiological or behavioral function that occurs and repeats itself on a daily basis.
- cisterna magna** A membrane-bound reservoir that collects the outflow of cerebrospinal fluid from the fourth ventricle. Located at the base of the brain at the junction of the spinal cord, medulla, and cerebellum. See also **cerebral ventricles** and **cerebrospinal fluid**.
- compound action potential** The neural activity recorded from a fiber bundle or whole nerve. This response to a discrete stimulus is the sum of the individual action potentials that occur in near simultaneity. See also **action potential**.
- corticospinal fibers** Fibers that originate in motor cortex and project to the spinal cord.
- cytokines** Protein molecules released by the immune system in response to invading microorganisms. Cytokines produce, among other things, fever and sleep.
- declarative memory** The recall of episodes of which one is consciously aware. Also called episodic or explicit memory.
- delayed conditioning** The classical (Pavlovian) conditioning paradigm in which there is a delay (e.g., one minute) between the onset of the conditioned stimulus (CS) and the unconditioned stimulus (US).
- delta waves** An EEG rhythm in the frequency range of 1 to 3 Hz, associated with deep slow-wave, stage 4, sleep. See also **slow-wave sleep** and **stage 4 sleep**.
- dendritic field potential** The summated electrical activity recorded from the dendritic fields of a population of cells; the basis of the usual EEG

recordings. This neural activity in response to a discrete stimulus is the basis of the evoked (field) potential.

**desynchronized sleep** See **REM sleep**.

**desynchrony** An EEG pattern characterized by low voltage, fast activity waves seen during waking and REM sleep.

**diencephalon** The caudal portion of the forebrain located between the telencephalon, rostrally, and the mesencephalon, caudally. See also **forebrain**.

**dopamine** See **dopaminergic neurons**.

**dopaminergic neurons** Neurons that release the neurotransmitter dopamine at their terminals.

**dream sleep** See **REM sleep**.

**dyssomnias** A category of sleep disorders characterized by difficulty in falling asleep and remaining asleep. Ordinarily called insomnia.

**EEG desynchronization** A recording (usually from the cerebral cortex) of low voltage fast activity (LVFA) waves indicative of a state of waking or of REM sleep. See also **electroencephalogram**, **low voltage, fast activity (LVFA) waves**, and **REM sleep**.

**EEG synchrony** A recording (usually from the cerebral cortex) of high voltage, low frequency (HVLF) waves indicative of a state of slow-wave sleep (SWS). See also **electroencephalogram**, **high voltage, low frequency (HVLF) waves**, and **slow-wave sleep (SWS)**.

**electroencephalogram (EEG)** An electrical record of brain wave activity.

**electroencephalograph (EEG)** The machine that records brain wave activity.

**electromyogram (EMG)** An electrical record of muscle activity.

**electro-oculogram (EOG)** An electrical record of eye movements.

**encéphale isolé** A surgical preparation in which the brain is separated from the spinal cord by a transection between the medulla and spinal cord. See also **medulla oblongata**.

**encephalitis lethargica** A brain disease characterized by constant sleep. This is caused by the destruction of cells in the reticular formation and posterior hypothalamus that are necessary for wakefulness. See also **reticular formation** and **hypothalamus**.

**encephalization** The evolutionary process characterized by the forebrain becoming larger, more complex, and gaining some degree of control over lower parts of the brain. See also **forebrain**.

**episodic memory** See **declarative memory**.

**evoked field potential** See **dendritic field potential**.

**excitatory postsynaptic potential (EPSP)** A brief depolarization of dendritic or somatic membrane by action of a neurotransmitter. The summation of this potential with other EPSPs increases the likelihood that an action potential will be generated in the postsynaptic neuron. See also **action potential**.

**explicit memory** See **declarative memory**.

**extrathalamic projection nuclei** Subcortical nuclei that project directly to the cortex without first synapsing in the thalamus. See also **thalamus**.

**field potential** See **dendritic field potential**.

**forebrain** The most rostral part of the brain, comprising the telencephalon (cerebral hemispheres) and the diencephalon. Also called the prosencephalon. See also **telencephalon** and **diencephalon**.

**GABA ( $\gamma$ -aminobutyric acid)** An inhibitory neurotransmitter.

**GABAergic neurons** Neurons that release the neurotransmitter GABA at their terminals. See also **GABA**.

**galvanometer** A voltage-measuring device.

**gamma rhythm** A low voltage EEG rhythm in the frequency range of 30 to 60 Hz (often called a 40 Hz rhythm), associated with the binding phenomenon. See also **binding phenomenon**.

**gliosis** A proliferation of a type of glial cells as a reaction to nerve cell damage and nerve death. Gliosis is a form of neural scar tissue.

**glutamate** An excitatory neurotransmitter. See also **glutamatergic neurons**.

**glutamatergic neurons** Neurons that release the neurotransmitter glutamate at their terminals. See also **glutamate**.

**glycine** An inhibitory neurotransmitter.

**graded potentials** Voltages (potentials) that occur with varying amplitudes (graded). Postsynaptic potentials (EPSPs and IPSPs) and dendritic field potentials are graded, in contrast to single nerve cell action potentials, which have all-or-none amplitude characteristics. See also **dendritic field potential**, **action potential**, **EPSP**, and **IPSP**.

**growth hormone releasing hormone (GHRH)** A hormone produced by cells of the hypothalamus that causes the release of the growth hormone from the pituitary gland. Another group of hypothalamic neurons produces GHRH as a neurotransmitter that has a sleep-inducing effect.

**high voltage, low frequency (HVLF) waves** EEG rhythms comprising of sleep spindles and delta waves seen during sleep stages 3 and 4. See also **slow-wave sleep (SWS)**, **sleep spindles**, and **delta waves**.

**hindbrain** The most caudal part of the brain stem, comprising the pons and medulla oblongata. Also called the rhombencephalon. See also **pons** and **medulla oblongata**.

**hippocampus** A structure in the telencephalic forebrain involved in emotional behavior and memory function.

**histamine** See **histaminergic neurons**.

- histaminergic neurons** Neurons that release the neurotransmitter histamine at their terminals. See also **tuberomammillary nucleus**.
- human leukocyte antigens (HLA)** A family of genes that, when expressed, trigger an autoimmune response. See also **autoimmune response**.
- hypersomnia** An increased amount of sleep.
- hypnogenic** A substance or manipulation that induces sleep.
- hypnogogic hallucination** Imaginary, dreamlike perceptions that occur during waking or the transition between sleep and waking.
- hypnogram** A graphic representation of the stages of sleep over the course of a night. It summarizes the durations and timing of the sleep stages in histogram form.
- hypnotoxin** A substance that induces sleep.
- hypocretin** A peptide neurotransmitter localized to a group of cells in the hypothalamus. Also called orexin.
- hypopnea** A decrease in the respiration rate
- hyposomnia** A reduced amount of sleep.
- hypothalamus** A group of nuclei located in the ventral diencephalon and involved in the neural control of autonomic or visceral processes. Certain nuclei control circadian rhythms and other functions related to sleep and waking. See also **diencephalon**.
- immune response** Physiological processes used by the body to combat invading microorganisms as well as other foreign materials. See also **cytokines**, **human leukocyte antigens (HLA)**, **muramyl peptides**, and **autoimmune response**.
- implicit memory** See **procedural memory**.
- inhibitory postsynaptic potential (IPSP)** A brief hyperpolarization (a graded potential) of the dendrites or soma of a neuron by the synaptic action of a neurotransmitter. This renders the neuron less likely to generate an action potential. See also **graded potential** and **action potential**.
- intergeniculate leaflet** Part of the lateral geniculate nucleus of the thalamus that provides light information to the suprachiasmatic nucleus of the hypothalamus. This influence participates in the control of circadian rhythms. See also **thalamus**, **suprachiasmatic nucleus (SCN)**, and **circadian rhythm**.
- internal capsule** A large fiber bundle in the telencephalon with ascending and descending components that connect the cerebral cortex with regions below the cortex. See also **cerebral cortex**.
- intralaminar nuclei** Thalamic nuclei that project to broad areas of the cerebral cortex. They are sometimes referred to as “nonspecific” or “diffuse” projection nuclei. See also **thalamus**.
- K-complex** A sharp, high voltage transient wave seen during stage 2 sleep that occurs spontaneously and intermittently or may be triggered by a sensory stimulus. See also **stage 2 sleep**.

- lateral geniculate nucleus** A nucleus of the thalamus that receives visual information from the retina, processes it, and relays it to the visual cortex. See also **thalamus**.
- laterodorsal tegmental (LDT) nucleus** One of the peribrachial nuclei of the reticular activating system. See **peribrachial nuclei** and **ascending reticular activating system (ARAS)**.
- ligand** A chemical that binds to a protein, such as a postsynaptic receptor. Neurotransmitters are natural ligands that bind to receptor sites.
- limbic system** Brain structures, many of which are in the forebrain, that participate in the control of emotional behaviors. See also **forebrain**.
- locus coeruleus** A nucleus in the dorsal pons that is the major source of norepinephrine cells in the brain. See also **pons**.
- low voltage, fast activity (LVFA) waves** An EEG rhythm comprising beta waves seen during waking and REM sleep. Also called low voltage, high frequency waves. See also **beta waves** and **REM sleep**.
- low voltage, high frequency (LVHF) waves** See **low voltage, fast activity waves**.
- mandibular advancement appliance** A dental appliance attached to the lower jaw (mandible) that pulls the jaw forward to facilitate keeping the airway open. Used for preventing sleep apnea. See also **sleep apnea**.
- marsupial mammals** The order of mammals that carry their immature young in pouches.
- medulla oblongata** The most caudal part of the brain stem. See also **brain stem**.
- melatonin** A hormone secreted by the pineal gland that is involved in the control of seasonal breeding cycles and daily sleep and waking cycles. See also **pineal gland**.
- memory consolidation** The neural events in the brain responsible for memory storage.
- mesencephalon** The part of the brain stem located between the forebrain and hindbrain. Also called the midbrain. See also **brain stem**, **forebrain**, and **hindbrain**.
- microsleep** A period during which a person falls asleep briefly (on the order of seconds). Usually occurs in sleep-deprived individuals during boring and tedious tasks.
- midbrain** See **mesencephalon**.
- midpontine pretrigeminal section** A transection of the brain stem at the midpontine level just rostral to the sensory and motor roots of the trigeminal nerve. See also **brain stem** and **pons**.
- monotremes** The most primitive order of mammals. They secrete milk, but also lay eggs.
- muramyl peptides** Protein residues of killed and digested bacteria that stimulate the immune system and produce sleep.

- muscimol** A GABA agonist. See also **GABA** and **agonist**.
- muscle atonia** A decrease or loss of muscle tension seen during REM sleep and cataplexy. See also **REM sleep** and **cataplexy**.
- narcolepsy** A sleep disorder characterized by excessive daytime sleepiness that often culminates in sudden sleep attacks. See also **cataplexy**.
- noradrenaline** Another name for norepinephrine. See **noradrenergic neurons**.
- noradrenergic neurons** Neurons that release the neurotransmitter norepinephrine (noradrenaline) at their terminals. See also **noradrenaline** and **norepinephrine**.
- norepinephrine** Another name for noradrenaline. See **noradrenergic neurons**.
- nucleus of the tractus solitarius (NTS)** A nucleus located in the pons. Stimulation of a region of this nucleus will produce EEG cortical synchronization. See also **pons** and **EEG synchrony**.
- nucleus pontis oralis (NPO)** A cell group in the rostral pons that has an excitatory influence on cholinergic cells of the basal forebrain (BFB). Activation of the BFB, in turn, produces the EEG cortical activation seen in REM sleep. See also **pons**, **cholinergic neurons**, and **basal forebrain**.
- nucleus subcoeruleus** Located in the pontine reticular formation. A lesion of this nucleus produces a loss of muscle atonia during REM sleep (i.e., muscle tonus remains during REM sleep). See also **REM sleep**.
- ontogeny** The developmental history of the individual organism.
- orexin** A peptide neurotransmitter also known as hypocretin. See **hypocretin**.
- orthodromic activity** An action potential that is conducted down an axon in the normal direction, (i.e., from the cell body to the axon terminals). See also **action potential**.
- paradoxical sleep** Another term for REM sleep, usually used for animals. See **REM sleep**.
- parasomnias** Disorders of arousal, REM sleep, and the transition state between sleep and waking. Examples are sleepwalking and sleeptalking, nightmares, and sleep paralysis. See also **REM sleep** and **sleep paralysis**.
- pedunculopontine tegmental (PPT) nucleus** One of the peribrachial nuclei of the reticular activating system. See **peribrachial nuclei** and **ascending reticular activating system (ARAS)**.
- penetrance** The degree of probability of a gene being expressed: high penetrance, high probability.
- peribrachial nuclei** The peribrachial nuclei are the pedunculopontine tegmental (PPT) nucleus and the laterodorsal tegmental (LDT) nucleus located at the pontomesencephalic junction. The cholinergic cells of these nu-

clei are a major component of the reticular activating system responsible for the cortical arousal seen in waking and in REM sleep. See also **ascending reticular activating system (ARAS)**, **cholinergic neurons**, **pons**, and **mesencephalon**.

**pharynx** The rear part of the oral cavity, where the opening to the trachea (airway) is located. See also **trachea**.

**phylogeny** The evolutionary history of a species or other taxonomic category.

**pineal gland** A gland located at the dorsal extent of the diencephalon that secretes melatonin. See also **melatonin** and **diencephalon**.

**pituitary gland** A major endocrine gland located just below the hypothalamus. See also **hypothalamus**.

**placental mammals** mammalian species that are protected and nourished by the placenta in the uterus prior to birth and nourished by milk after birth.

**pons** The rostral portion of the hindbrain located between the medulla oblongata, caudally, and the mesencephalon, rostrally.

**ponto-geniculo-occipital (PGO) spikes** Sharp transients in the EEG recorded from the pons, lateral geniculate nucleus of the thalamus, and the occipital (visual) cortex. They occur intermittently during REM sleep. See also **electroencephalogram (EEG)**, **pons**, **lateral geniculate nucleus**, and **REM sleep**.

**preoptic area** The most rostral part of the hypothalamus that is continuous with the basal forebrain area. See also **hypothalamus** and **basal forebrain**.

**procedural memory** The learning and retention of certain skills—like those involved in motor learning. One is not consciously aware of the process by which these skills are acquired. Also called implicit memory.

**prone** Lying with the face and belly down.

**prosencephalon** See **forebrain**.

**pyramidal tract** A fiber tract that originates in motor cortex that carries messages to motor nuclei of cranial nerves and to motor neurons of the spinal cord. See also **corticospinal fibers**.

**raphé nuclei** Nuclei located along the midline of the entire brain stem. Raphé neurons synthesize serotonin as their neurotransmitter. See also **serotonergic neurons**.

**rapid eye movement (REM) sleep** The stage of sleep during which dreaming occurs. (Dreams have also been reported during other stages of sleep.) This sleep stage is characterized by a desynchronized EEG record, rapid eye movements (REMs), loss of muscle tonus (atonia), and PGO spikes. See also **EEG desynchronization**, **muscle atonia**, and **PGO spikes**.

**receptor antagonist** A drug that blocks the action of a neurotransmitter at the receptor site for the transmitter.

**recruiting waves** A form of EEG synchronization that resembles sleep spin-

dles. Elicited by low frequency stimulation of the intralaminar nuclei of the thalamus. See also **EEG synchronization**, **sleep spindles**, **intralaminar nuclei**, and **thalamus**.

**reticular formation** A network of neuronal cell bodies interspersed among nerve fibers located throughout the brain stem tegmentum from the medulla to the mesencephalon. It contains many nuclei, some of which are important for the regulation of sleep and waking. See also **brain stem** and **tegmentum**.

**reticular nucleus of the thalamus** This nucleus plays a major role in regulating the arousal state of the cortex via its control function over other nuclei of the thalamus. See also **thalamus**.

**retinohypothalamic tract** A component of the optic tract that projects from the retina to the suprachiasmatic nucleus (SCN) of the hypothalamus. It provides information about light and darkness for the entrainment of certain circadian rhythms. See **circadian rhythm** and **suprachiasmatic nucleus (SCN)**.

**rhombencephalic sleep** Another term for REM sleep. See **REM sleep**.

**rhombencephalon** See **hindbrain**.

**sagittal section** A vertical section that extends from the front to the back of the brain. A medial or midsagittal section divides the brain into left and right halves. Other sagittal sections are parallel to that.

**serotonergic neurons** Neurons of raphé nuclei that release the neurotransmitter serotonin at their terminals.

**serotonin** See **serotonergic neurons**.

**sleep apnea** A cessation of breathing during sleep that lasts 10 seconds or more.

**sleep paralysis** Loss of muscle tonus and of voluntary movement that some people experience during a brief transition state between sleep and waking.

**sleep spindles** An EEG waveform having a frequency of 12 to 15 Hz that waxes and wanes in amplitude, with the highest waves in the middle of a burst 1 to 2 seconds long. The envelope of this waveform is spindle shaped and occurs during stages 2 and 3 of sleep. See also **high voltage**, **low frequency (HVLF) waves**, **slow-wave sleep**, **stage 2 sleep**, and **stage 3 sleep**.

**slow-wave sleep (SWS)** Stages 3 and 4 of sleep, characterized by sleep spindles and delta waves. See also **sleep spindles**, **delta waves**, **high voltage**, **low frequency (HVLF) waves**, **stage 3 sleep**, and **stage 4 sleep**.

**somnogenic** See **hypnogenic**.

**stage 1 sleep** A sleep stage characterized by a low voltage, high frequency EEG, similar to beta waves seen in waking and in REM sleep. Also called stage 1 non-REM (NREM) sleep. Considered by some to be a transition state between waking and sleep. See also **low voltage**, **high frequency (LVHF) waves** and **beta waves**.

- stage 2 sleep** A sleep stage characterized by sleep spindles interspersed between low voltage, high frequency (LVHF) waves. See also **sleep spindles** and **low voltage, high frequency (LVHF) waves**.
- stage 3 sleep** A sleep stage characterized by sleep spindles interspersed between delta waves. See also **sleep spindles** and **delta waves**.
- stage 4 sleep** The deepest stage of non-REM sleep, characterized by delta waves. See also **delta waves**.
- stereotaxic instrument** A device used in brain surgery to hold the head rigid and in a fixed, standard orientation. This device permits the accurate placement of probes to manipulate (stimulate, record, lesion) regions within the brain.
- superior cerebellar peduncle** See **brachium conjunctivum**.
- supine** Lying on the back with the face up.
- suprachiasmatic nucleus (SCN)** Located in the hypothalamus. The control nucleus for the circadian clock. See also **circadian rhythm** and **hypothalamus**.
- synchronized sleep** Sleep characterized by EEG slow waves, namely, sleep spindles and delta waves. See also **slow-wave sleep (SWS)**, **high voltage, low frequency (HVLF) waves**, **sleep spindles**, and **delta waves**.
- tegmentum** The central core of the brain stem that contains the reticular formation and numerous brain stem nuclei and fiber tracts. See also **brain stem** and **reticular formation**.
- telencephalon** The rostral part of the forebrain. See also **cerebrum**.
- thalamus** A complex of nuclei located in the dorsal part of the diencephalon. They comprise the main input to the cerebral cortex. The various nuclei of the thalamus are involved in sensory, motor, emotional, and arousal functions. See also **diencephalon**, **lateral geniculate nucleus**, **intralaminar nuclei**, and **reticular nucleus of the thalamus**.
- theta waves** An EEG rhythm at 4 to 8 Hz, most often at 6 Hz.
- trachea** The airway passage leading from its opening in the pharynx to the lungs. See also **pharynx**, **sleep apnea**, and **mandibular advancement appliance**.
- tuberomammillary nucleus** A nucleus of the posterior hypothalamus, the cells of which synthesize histamine as their neurotransmitter. See also **histaminergic neurons**.
- ventricles** See **cerebral ventricles**.

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