FLASH CARDS

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Kalat's Book
Chapter 4
Alphabetical

ablation

ablation

Directly killing a single or few cells. Originally used to study what different parts of the brain do what (Flourens). Now used to fix heart arrhythmia, tremors or skin imperfections.

anterior commissure

anterior commissure

One of several connections between brain hemispheres. Used for perception of smell and sharp pain. Connects the amygdalas.

basal ganglia

basal ganglia

A series of nuclei that are part of the limbic system. Help control continuous movements by inhibition; use GABA as neurotransmitter.

Bell-Magendie law

Bell-Magendie law

Anterior of spine holds motor neurons; posterior (dorsal) holds sensory neurons.

binding problem

binding problem

How to get consciousness from neurons.
Part of the mind-body problem.

brainstem

brainstem

Where brain and spinal cord meet.
Includes pons and medulla oblongata.

CAT scan

CAT scan

Computerized axial tomography. Digital X-ray of brain, etc. Often used to find tumors.

central canal

central canal

Fluid filled center of spinal cord.

CNS

CNS

Central nervous system. Brain and spinal cord. Everything else is peripheral.

central sulcus

central sulcus

Fissure that separates frontal lobe from parietal lobe.

cerebellum

cerebellum

“Little brain” attached under cerebrum and behind the brain stem. Needed for motor skills, balance and coordination. More neurons than rest of brain combined but they are tiny; only 1/10th size of brain.

cerebral cortex

cerebral cortex

Brain; composed of four lobes and two hemispheres. Six layers of neurons, folded and only about 3mm thick.

cerebrospinal fluid

cerebrospinal fluid

Colorless fluid that cushions the brain & spinal cord to protect them from injury.

columns

columns

Hypercolun or cortical module. A column of neurons; usually encode similar characteristics.

corpus callosum

corpus callosum

Largest bungle of fibers connecting brain hemispheres. Looks like a wide, flat bridge.

cranial nerves

cranial nerves

Come from brain, not spinal cord.
Control face, tongue, eyes, etc.

delayed-response task

delayed-response task

A delay between stimulus and response is imposed to study attention, memory and spatial reasoning.

dorsal

dorsal

As in dorsal fin. For a human, toward the back.

dorsal root ganglia

dorsal root ganglia

Sensory neurons taking information up the back of the spine to the brain.

EEG

EEG

Electroencephalograph. Recording electrical signals on scalp. Used to measure brain waves, sleep patterns and diagnose epilepsy.

evoked potentials

evoked potentials

Evoked responses. A recorded electrical potential after a stimulus is presented, often with a probe inside the brain. The stimulus “evokes” a response. Not the same as the spontaneous signals measured in an EEG.

fMRI

fMRI

Functional magnetic resonance imaging. Measures blood flow in brain. Uses contrast that is dependent on the oxygen level in the blood. Compares oxygen-rich (arteries) and oxygen-poor (veins) regions.

forebrain

forebrain

Develops into cerebrum, thalamus, hypothalamus and limbic system.

frontal lobe

frontal lobe

Largest, most anterior, easiest to hurt lobe of the brain. Contains motor cortex, premotor cortex, orbitofrontal cortex, dorsolateral cortex and prefrontal cortex.

gray matter

gray matter

Non-myelinated brain tissue.
Capillaries & neurons look grey-brown.

hindbrain

hindbrain

Includes medulla, cerebellum & pons.

hippocampus

hippocampus

C-shaped, one in each hemisphere, lean toward each other. Pass through portions of temporal and frontal lobes. Needed to convert knowledge to long-term memory. Also involved in spatial reasoning and navigation.

hypothalamus

hypothalamus

About the size of a pearl or almond. Secretes hormones that regulate other hormones. Triggers adrenal glands to release adrenaline and cortisol. Also controls hunger and thirst.

inferior colliculus

inferior colliculus

Two structure but both carry both left and right ear signals. Integrates sound source information.

Klüver-Bucy syndrome

Klüver-Bucy syndrome

Characterized by bilateral lesions of amygdala. Symptoms vary but can include less response to fear, flat affect, overeating, difficulty recognizing faces, hypersexuality and hyper-alertness.

laminae

laminae

A thin plate or layer. Can describe outside surface of cell, bone plates of the spinal, walls of the thyroid gland, flat part of a leaf or part of a horse’s hoof.

lesion

lesion

Trauma, damage or tissue abnormality. Includes tumors, ulcers, dental caries and discolored patches of skin.

limbic system

limbic system

Includes thalamus, hypothalamus, hippocampus, amygdala, septum and a complex interactive network of nuclei. Involved in emotional response, emotional memory, encoding patterns & cognitive maps.

medulla

medulla

Medulla oblongata. Bottom part of brainstem, just above spinal cord. Controls automatic nervous system processes such as heart rate, breathing, vomiting and coughing.

MEG

MEG

Magnetoencephalograph. Measures magnetic fields naturally produced by brain. Records changes in ion currents as neurons depolarize. Like fMRI, MEG measures activity over time but much more precisely. Used to study multiple sclerosis, Alzheimer’s & schizophrenia.

meninges

meninges

Tri-layer protection for brain and spinal cord. Composed of dura mater (tough and thick), anachnoid (thin, transparent web) and pia (thin, waterproof layer that conforms to surface of brain).

midbrain

midbrain

Top of the brain stem, just above pons. Nuclei include the superior colliculi (vision), inferior colliculi (audition), the red nuclei (motor coordination), and substantia nigra (motor planning).

MRI

MRI

Magnetic resonance imaging. Water molecule has 10 protons. MRI uses a electromagnetic field from a radio frequency generator to spin and align these protons. When generator is turned off, protons spin back & machine measures change. Used to study brain, muscle & detect tumors.

neuroanatomy

neuroanatomy

The study of neuron structure, organization and function.

nucleus basalis

nucleus basalis

In contrast to occipital lobe (what you actually see), tells the brain what it should expect to see. Best guess of what's important. Degrades in Parkinson's & Alzheimer's diseases.

occipital lobe

occipital lobe

Located at the back of the head. Primary vision cortex. Processing visual input then sends summaries to the parietal (where) and temporal (what) lobes for further analysis.

parietal lobe

parietal lobe

Named for location under parietal bone at top-back of head. Integrates sensory information into 3-D view of perceived world. Help locate where things are (where stream) and how they are spatially related (how stream).

PET scan

PET scan

Positron-emission tomography. After an injected radioactive isotope (usually a version of glucose) spreads thru body, scans for pair of gamma photons that move in opposite directions. Used to create 3-D view of scanned area to detect tumors and track their growth.

phrenology

phrenology

Franz Gall’s theory that skull topology reveals underlying mental function, faculties & personality characteristics. Popular in the 1800’s.

pituitary gland

pituitary gland

Small gland on bottom of the hypothalamus. Secretes peptide hormones. Anterior pituitary secretes HGH, TSH, ACTH, beta-endorphin, LH, & prolactin. Posterior pituitary secretes oxytocin & vasopressin.

PNS

PNS

Parasympathetic nervous system. Part of autonomic nervous system. It’s the rest-and-digest system.

pons

pons

Just above the medulla on the brain stem. Composed of two stalks or peduncles, it connects brain to cerebellum. Help regulate bladder control, posture, breathing in and out, sleep paralysis and dreams.

postcentral gyrus

postcentral gyrus

Front part of parietal lobe. Contains primary somatosensory cortex for sensing touch.

prefrontal cortex

prefrontal cortex

Part of the frontal lobe of the brain. Composed of three regions: dorsolateral, orbitofrontal & ventral medial.

prefrontal lobotomy

prefrontal lobotomy

Cutting the connections between either the two frontal lobes or between the prefrontal cortex of the frontal lobe and the rest of the brain. Developed in the 1930’s to treat depression, schizophrenia and epilepsy.

primates

primates

Includes humans, apes, chimpanzees, gorillas, monkeys, lemurs, lorises, galagos (bushbabies), etc. Characteristics include domed cranium, forward-facing eyes, binocular vision & complex social relationships.

raphe system

raphe system

Nuclei in brain stem that release serotonin.

reticular formation

reticular formation

Coordinates 100+ neural circuits to regulate wake-sleep cycle.

somatic nervous system

somatic nervous system

Part of peripheral nervous system. Controls voluntary movements and reflex arcs. Carries messages from skin and touch receptors to brain.

spinal cord

spinal cord

A spinal column of 31 bony segments protects a long thin bundle of neurons that runs down the back. Damage can cause loss of sensation, movement or both.

stereotaxic instrument

stereotaxic instrument

Uses 3-D coordinates to perform breast surgery, ablation and implantation.

substantia nigra

substantia nigra

Parkinson’s disease shows damage here. Involved in eye movement, learning, motor planning, addiction and rewards.

superior colliculus

superior colliculus

Specialized nuclei for vision. Helps direct eye movements.

sympathetic nervous system

sympathetic nervous system

The flight-flight aspect of the autonomic nervous system. Maintains homeostasis.

tectum

tectum

Includes specialized nuclei, such as superior colliculi (vision) and inferior colliculi (audition).

tegmentum

tegmentum

Floor of midbrain. Includes substania nigra and reticular formation.

temporal lobe

temporal lobe

Lobe on side of brain. Involved in language, memory, vision and emotion. Identifies what we are looking at (“what stream”), supplies names for objectives and stores your dictionary-encyclopedia of knowledge.

thalamus

thalamus

One in each hemisphere. Relays signals to and from cerebrum, including specialized centers for vision (LGN) and audition (MGN). Also important for sleep.

tract

tract

Pathway. Can describe neural circuits or digestive functions.

transcranial magnetic stimulation

transcranial magnetic stimulation

Used to treat depression. Magnetic fields stimulate neurons near scalp in hopes of improving mood.

ventral

ventral

Toward stomach or anterior.

ventricle

ventricle

Can describe heart chambers or regions in the brain that are filled with cerebrospinal fluid.

white matter

white matter

Myelinated brain tissue. Axons are covered with a white fatty substance (myelin) to insulate signals.