

Chapter 14 – Study Guide

For brain regions / structures that are listed below as ***bold, italicized, and underlined*** – you should be able to identify them in a picture.

In addition for all brain regions / structures (whether bold, italicized, and underlined or not)
- you should know their function.
(know functions as a “package” – I won’t ask about individual functions in isolation from other functions)

For all the cranial nerves – know which numbers and names go together (example: CNVII (CN7) = facial nerve)
and know the function(s) of each cranial nerve

brain blood flow

- continuous oxygen supply needed
- continuous glucose supply needed

blood brain barrier

- permeable to: lipid substances
- permeable to: some water soluble substances by active transport
- impermeable to: proteins & antibiotics

lateral ventricles

third ventricle

fourth ventricle

choroid plexus

circulation of CSF

- starting in the lateral ventricles know what structures in what order CSF passes through

arachnoid villus

normally: CSF production = CSF reabsorption

hydrocephalus

shunt

brainstem – medulla, pons, & midbrain

medulla oblongata (medulla)

- relays impulses between brain & spinal cord
- contains cardiovascular center – regulates heart beat, blood vessel diameter
- contains medullary rhythmicity center – regulates breathing rhythm

pons

- relays impulses between R & L cerebellum
- relays impulses between medulla & midbrain
- helps control breathing

midbrain

- relays impulses from cerebral cortex to pons
- relays impulses from spinal cord to thalamus
- coordinates movements of eyeballs in response to visual & other stimuli
- coordinates movements of head & trunk in response to auditory stimuli

cerebellum

- compares intended movements to actual movements
- helps smooth & coordinate complex skilled movements
- regulates posture & balance

thalamus

- major relay station for most sensory impulses to cerebral cortex
- provides crude perception of touch, pressure, pain, temp
- includes nuclei involved in movement planning and control

hypothalamus

controls & integrates activities of autonomic nervous system & pituitary gland
regulates emotional & behavioral patterns
regulates circadian rhythms
controls body temperature
regulates eating and drinking
helps regulate sleep/wake cycle
produces hormones (oxytocin & ADH – AntiDiuretic Hormone)

cerebrum

“seat of intelligence”
provides ability to read, write, speak, remember, plan, imagine

corpus callosum

cerebral cortex

gyri

sulci

fissures

longitudinal fissure

central sulcus

frontal lobe

parietal lobe

temporal lobe

occipital lobe

precentral gyrus

postcentral gyrus

association areas – complex integrative functions

somatosensory association area

determine shape & texture by feel

determine orientation of object

sense relationship of body parts to each other

premotor area – control skilled movements (of complex & sequential nature)

basal ganglia – regulate initiation & termination of movements, regulate muscle tone

limbic system – functions in emotional aspects of behavior related to survival

CNI – olfactory nerve – smell

CNII – optic nerve – vision

CNIII – oculomotor nerve

movement of upper eyelid

movement of eyeball

accommodation of lens for near vision

constriction of pupil

CNIV – trochlear nerve – movement of eyeball

CNV – trigeminal nerve – touch, pain, temperature over much of face – chewing

CNVI – abducens nerve – movement of eyeball

CNVII – facial nerve – taste, facial expression, secretion of saliva, secretion of tears

CNVIII – vestibulocochlear nerve – equilibrium, hearing

CNIX – glossopharyngeal nerve

taste

touch, pain, temperature – posterior 1/3 of tongue

monitoring BP, O₂, CO₂

swallowing, speech

secretion of saliva

CNX – vagus nerve

taste

touch, pain, temperature, proprioception – epiglottis, pharynx

monitoring BP, O₂, CO₂

breathing rate & depth

sensation from visceral organs

CNXI – accessory nerve – swallowing movements, movement of head & shoulders

CNXII – hypoglossal nerve – movement of tongue – speech & swallowing