

LANGUAGE AND EMOTIONAL CENTERS OF THE BRAIN

14 January 2016

USE OF LANGUAGE: speaking, listening, writing, reading (p 487)

Controlling centers found in L hemisphere in 90% population
(95% of R handed persons, 65% of L handed persons.)

L brain better at **analysis**

R hemisphere at **holistic view**

Two areas involved in language, seen in **aphasias** (without speech): (p 488)

Wernicke (#40) **SENSORY:** auditory association: speech interpretation. Damage to **temporal lobe** near auditory center therefore affects comprehension.

Broca (#44) p 488 **MOTOR: controls muscles of mouth and tongue (speech) lateral L frontal lobe** damage causes impaired (slurred) speech.

Proposed model of language, communication:

Connecting tract tells Broca's what Wernicke's thinks when speaking: **coordinates speech**

Angular gyrus connects with visual cortex:

contains programs **converting visual input into auditory pattern** in Wernicke's area.

Damage to angular gyrus leads to **alexia or agraphia**

LIMBIC SYSTEM(see p 481 for diagram)

limbic = border, boundary, "edge" because it lies between the cerebrum and thalamus, encircling the upper brain stem.

Limbic system is a motivational system, includes **dopamine pleasure receptors** making you **want** to perform tasks, sexual arousal

- functions:**
- 1) mediates **emotional responses**
 - 2) **links conscious, intellectual with unconscious and autonomic** functions of brain stem
 - 3) facilitates **memory storage and retrieval**

COMPONENTS OF LIMBIC SYSTEM: (p481)

hypothalamus regulates autonomic NS, centers for rage, fear, pain, sex arousal, pleasure

Olfactory bulbs part of olfactory tract,(C.N. I).

rhinencephalon: olfactory bulbs and associated areas

mamillary bodies Associates smell with emotions and behavior resp. on floor of hypothalamus, processes sensory, esp olfactory

Fornix "arch" tracts connect hypothalamus especially hypothalamic mamillary bodies, to hippocampus

hippocampus "sea horse" (or horse field)layer of cortex below lat ventricles, critical for long term memory.

amygdala "almond" at end of caudate nucleus, links limbic to cerebrum, fight/flight, aggression, links memories to emotions

cingulate gyrus Important in learning, long-term memory and retrieval of the cerebrum, adjacent and above corpus callosum

basal ganglia (485) "bottom knots": collection of nuclei, inhibit motor actions

caudate nucleus "tail" connected to amygdala by the caudate tail.

Figure AB-16: Limbic System

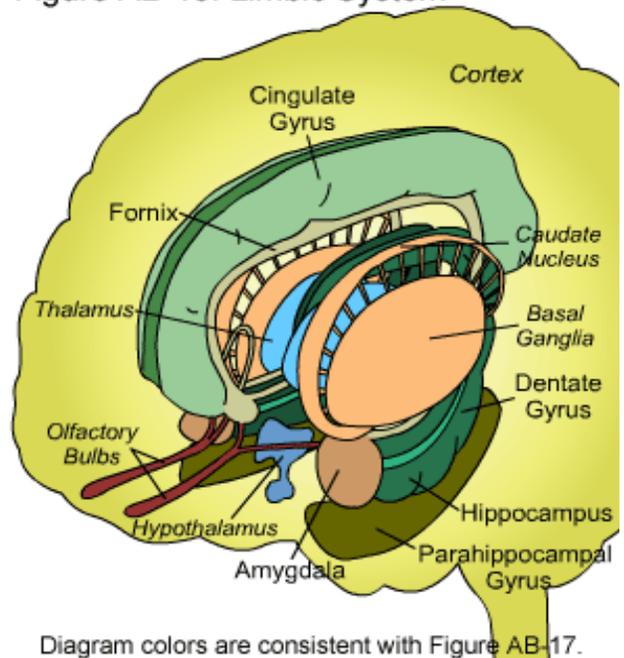
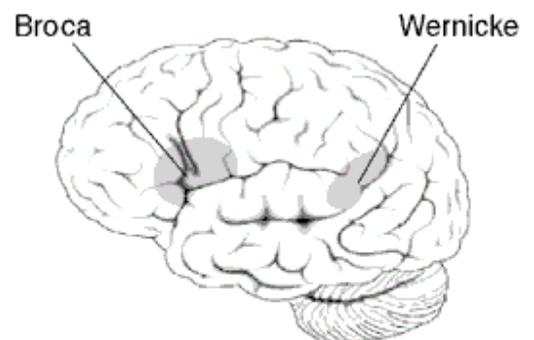


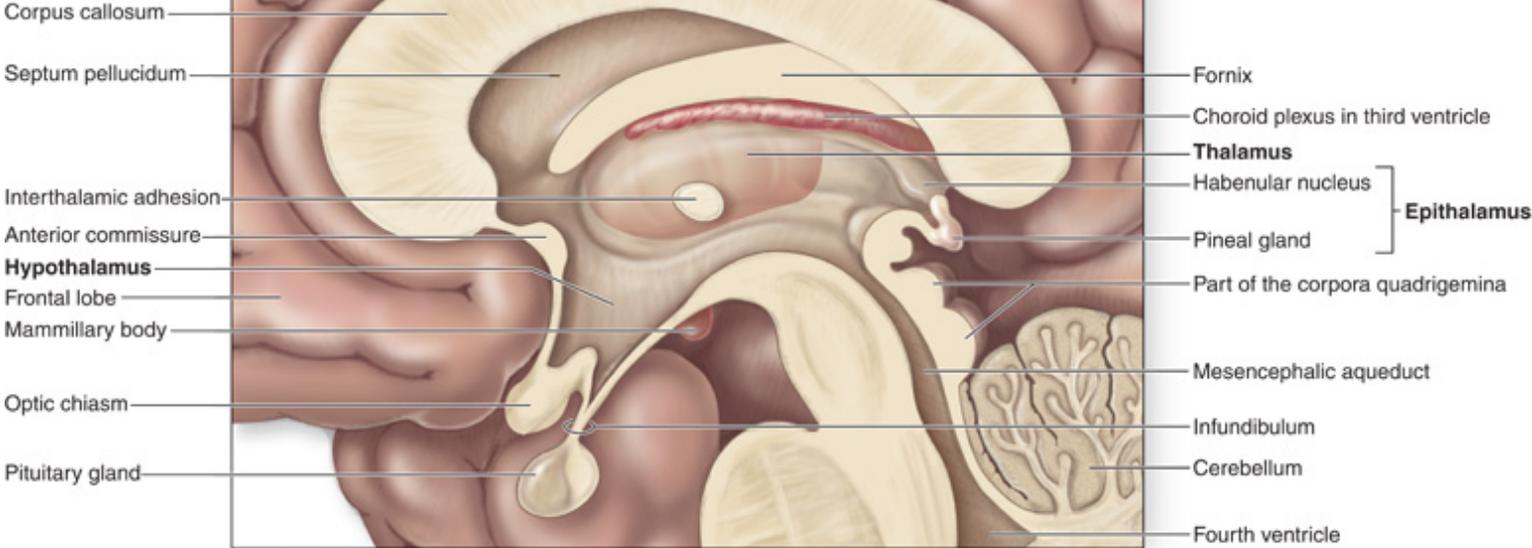
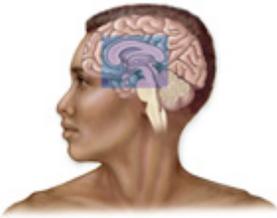
Diagram colors are consistent with Figure AB-17.



Front

Left Side View

Back



Midsagittal section