I. Brain- Origin and Organization
   A. Neural tube (CNS)
      1. “folding” of ectoderm
      2. neural crest
   B. Swellings of neural tube
      1. prosencephalon (forebrain)
         a. telencephalon
         b. diencephalon
      2. mesencephalon (midbrain)
      3. rhombencephalon (hindbrain)
         a. metencephalon
         b. myelencephalon
   C. Ventricles
      1. remnants of hollow neural tube
      2. filled with CSF
      3. continuous with central canal of spinal cord

II. Cerebrum
   A. Cortex
      1. gray matter surrounding white matter
      2. gyri and sulci
   B. Lobes
      1. frontal
      2. parietal
      3. temporal
      4. occipital
      5. insula
   C. Primary motor and sensory areas
      1. precentral gyrus
2. postcentral gyrus
3. homunculus

D. Electroencephalogram (EEG)
1. measures electrical currents generated by synaptic potentials
2. four pattern types
   a. alpha - awake, relaxed, eyes closed
   b. beta - visual stimuli, mental activity
   c. theta - usually kids only (awake)
      “stress-induced; nervous breakdown”
   d. delta - sleep, dreams

E. Basal nuclei (ganglia)
1. gray matter deep in cerebrum
   a. putamen
   b. caudate nucleus --- damage -- chorea
   c. amygdala
   d. claustrum
   e. globus pallidus
2. control of voluntary movements; thought
   - planning and execution of movement

F. Cerebral Lateralization
1. control of one side of body by contralateral hemisphere
2. sensory input “crosses over”
3. hemispheres communicate via corpus callosum
   a. relieves some severe epilepsy when severed
   b. demonstrates lateralization
4. cerebral “dominance”
   a. left - language, analytical
   b. right - visuospatial, visual recognition,

Usually hold true for general population
correlates with handedness (96% of righties left categorical)
only 70% lefties left categorical
G. Language

1. Broca’s area - organizes muscles for speech

2. Broca’s aphasia (disorder from injury to categorical hemisphere)
   a. slow speech, poor articulation
   b. may still comprehend speech well
      c. understanding but no speech
      d. muscle innervation unaffected

3. Wernicke’s area - recognition of spoken or written language

4. Wernike’s aphasia
   a. speech rapid and precise but “nonsensical”
   b. no comprehension of language

5. angular gyrus
   a. junction of parietal, occipital and temporal lobes
   b. processes text to speech
      c. damage leads to aphasias:
         some speak and understand but cannot read or recognize pictures
         “anomic aphasia”

Read Meninges pg. 463-465.