1. Appearance of Primitive Streak
   1. from EPIBLAST
   2. Appears caudally; on dorsal aspect of embryonic disk
   3. Elongates by addition of cells to caudal end
      1. while cranial end proliferates to form
         1. primitive node
            1. primitive pit = small depression in node
      2. develops primitive groove
         1. deep cells (mesenchyme) eventually form supporting tissues of embryo
2. Development of Notochordal Process
   1. Notochord process elongates by invagination of cells from the primitive pit
      1. Primitive pit extends under embryonic endoderm to form the notochordal canal
         1. Grows: Cranially
            1. Oropharyngeal Membrane

future: Oral cavity

* + - 1. Grows: Caudally
         1. Cloacal Membrane

future: Anal cavity

* + - 1. Notochord induces embryonic endoderm on top of notochoral canal to form NEURAL PLATE
         1. future: CNS
         2. at DAY 18, neural plate invaginates to form NEURAL GROOVE

with 2 NEURAL FOLDS

first sign of brain development

Fuse to form: NEURAL TUBE with a NEURAL CANAL

Rostral End

closes ~ 25 days

failure: ancephaly

Caudal End

closes ~ 27days

failure: spina bifida

leftover: NEURAL CRESTS

form: PNS, ANS

NEURAL TUBE = Brain/Spinal cord

Mesenchyme around TUBE forms MENINGES

Pia, Arachnoid, Dura mater

Subarachnoid space: CSF (5th week)

on either side of TUBE, SOMITES develop

later develop into: Axial Skeleton & Muscles

**Brain**

NEURAL TUBE: Cranial 🡪 4th pair somites

* + - * + 3 PRIMARY VESSICLES

Prosencephalon (Forebrain)

Telecephalon

Cerebral Hemispheres

Diencephalon

Thalami, 3rd ventricle

Mesencephalon (Midbrain)

Midbrain

tectum = roof

Rhombencephalon (Hindbrain)

Pontine flexure: divides Metencephalon from Myelencephalon

Cervical flexure rostrally

Metencephalon

Pons, cerebelum, 4th ventricle

Myelencephalon

Medulla

Caudal part (closed) looks like SC

Rostral part (open)

**Spinal Cord**

NEURAL TUBE: 4th pair somites 🡪 Caudal

Terminates: L2-3 (newborn), L1 (adult)

NEURAL CANAL = ventricular system and central canal of spinal cord

SULCUS LIMITANS

Extends to midbrain/forebrain jxn

therefore: alar/basal plate differentiation is only noted in midbrain and hindbrain

Dorsal to: alar plate (afferent, sensory)

Ventral to: basal plate (efferent, motor)

IMPORTANT CELLS

Neuroblasts

Neurons

Glioblasts ("glue")

Astrocytes

structure & support of brain

Oligodendrocytes

create myelin

Microglial cells

Immune system

1. Gastrulation
   1. Defined: Formation of 3 germ layers which are precursors to embryonic tissues
   2. during which: bilaminar disc --> trilaminar disc
   3. beginning of: Morphogenesis (development of body form)