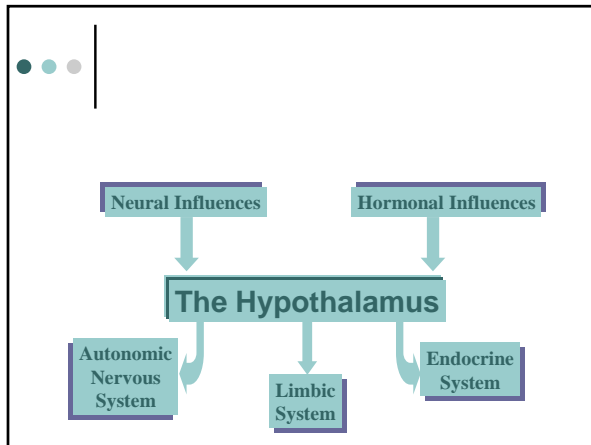


The Hypothalamus

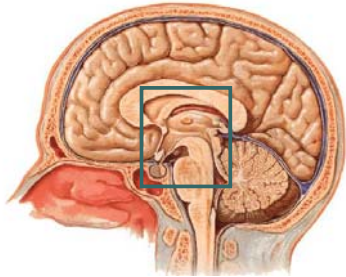
Medical Neuroscience
Dr. Wiegand



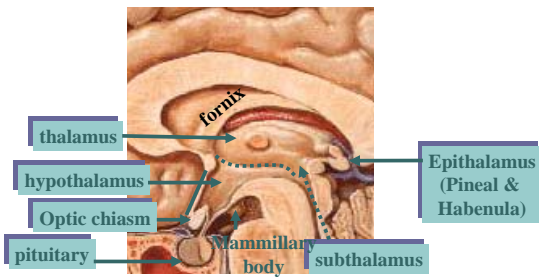
Functions of the Hypothalamus

- Autonomic nervous system regulation
- Hormone production
- Endocrine regulation
- Circadian rhythm regulation
- Limbic system interaction
- Various
 - Temperature regulation
 - Feeding

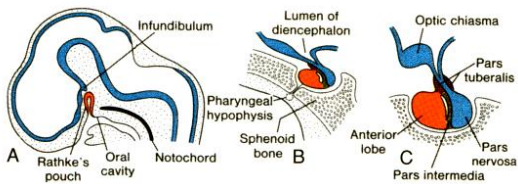
••• The Diencephalon

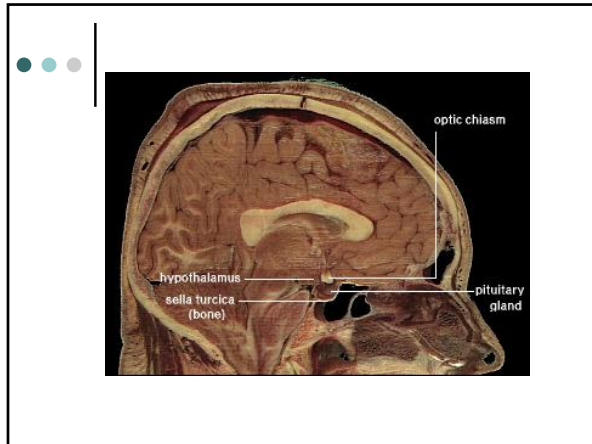


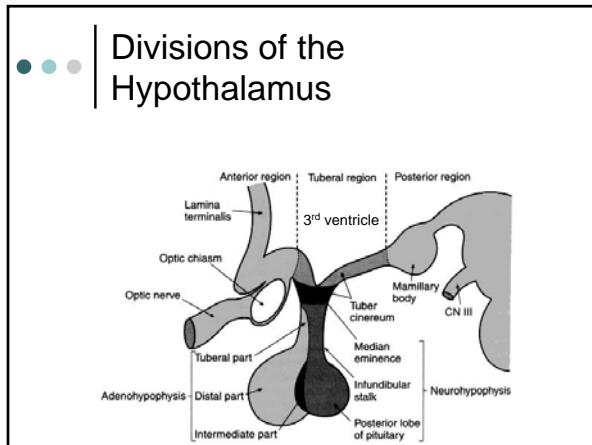
••• The Diencephalon

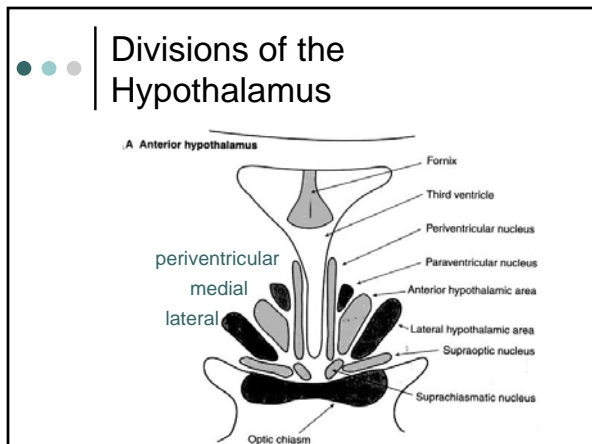


••• Pituitary

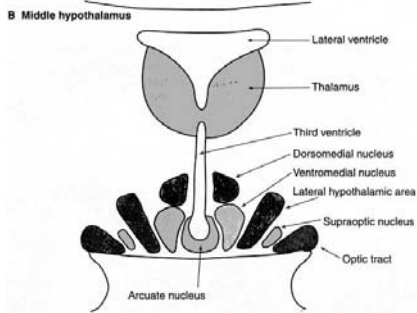




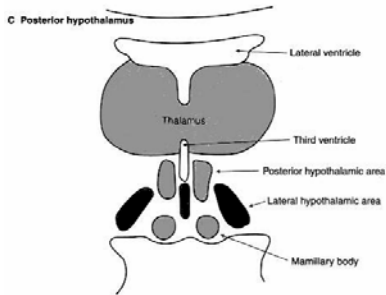


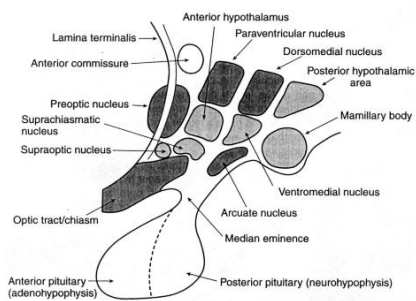


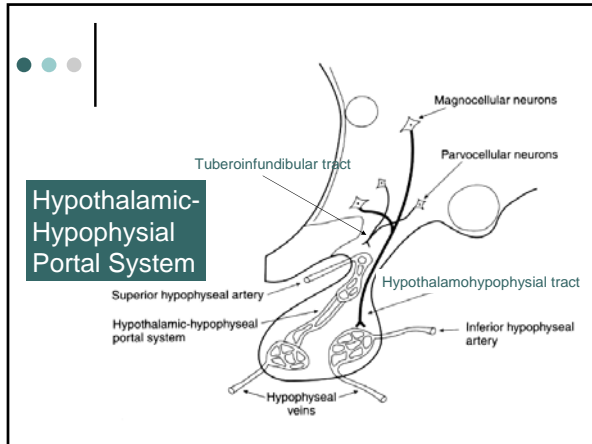
Divisions of the Hypothalamus



Divisions of the Hypothalamus







- ### Functions of the Hypothalamus
- **Autonomic nervous system regulation**
 - Hormone production
 - Endocrine regulation
 - Circadian rhythm regulation
 - Limbic system interaction
 - Various
 - Temperature regulation
 - Feeding
 - Anterior area influences PSNS through projections to brainstem PSNS nuclei
 - Posterior area influences SNS through projections to the lateral gray horn

- ### Functions of the Hypothalamus
- Autonomic nervous system regulation
 - **Hormone production**
 - Endocrine regulation
 - Circadian rhythm regulation
 - Limbic system interaction
 - Various
 - Temperature regulation
 - Feeding
 - Magnocellular regions of the supraoptic and paraventricular nuclei produce oxytocin and vasopressin (ADH)
 - Transported via axonal transport systems (hypothalamohypophysial tract) to neurohypophysis
 - Released in circulation
 - Damage to supraoptic n. ⇒ diabetes insipidus

● ● ●

Functions of the Hypothalamus

- Autonomic nervous system regulation
- Hormone production
- **Endocrine regulation**
- Circadian rhythm regulation
- Limbic system interaction
- Various
 - Temperature regulation
 - Feeding
- Stimulating or inhibiting hormones are transported via the tuberoinfundibular tract and released in to the pituitary portal system and ultimately to the adenohipophysis

● ● ●

Functions of the Hypothalamus

- Autonomic nervous system regulation
- Hormone production
- Endocrine regulation
- **Circadian rhythm regulation**
- Limbic system interaction
- Various
 - Temperature regulation
 - Feeding
- Input from retina to suprachiasmatic nucleus is then sent through poorly defined projections to the pineal gland

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Functions of the Hypothalamus

- Autonomic nervous system regulation
- Hormone production
- Endocrine regulation
- Circadian rhythm regulation
- Limbic system interaction
- **Various**
 - **Temperature regulation**
 - **Feeding**
- Temperature
 - Posterior n. conserves heat
 - Anterior n. dissipates heat
 - Fever starts – sweating
 - Fever ends – chills
- Feeding
 - Lateral n. induces eating
 - Ventromedial n. inhibits eating

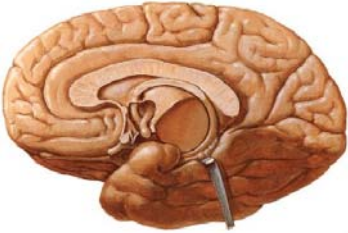
● ● ● | **Limbic System (Visceral Brain)**

Mediates complex behaviors

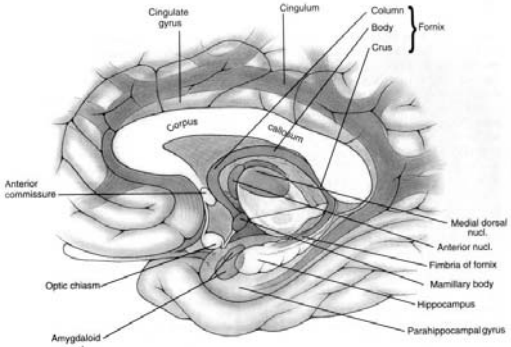
- Preservation of species
 - securing food, defense mechanisms, sexual behavior
- Emotions
- Affective behavior
- Memory
- Motivation

● ● ● | **Components**

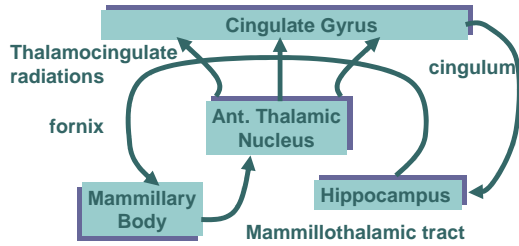
- Cingulate gyrus
- Parahippocampal gyrus
- Mammillary body
- Hippocampus
- Anterior thalamic nucleus
- Amygdala
- Septal nuclei
- Dorsomedial thalamic nucleus



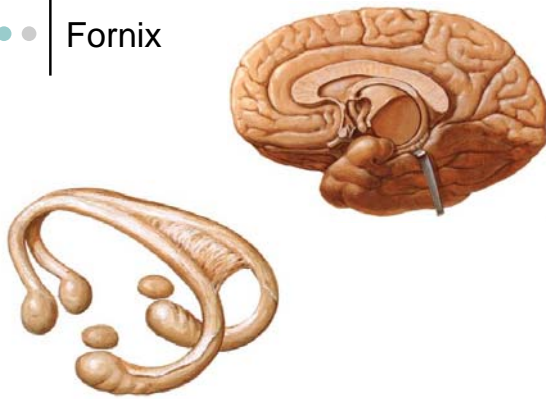
● ● ● |



● ● ● | Circuit of Papez



● ● ● | Fornix



● ● ● | Amygdala

- Located deep to uncus, **near** tail of caudate, and above most rostral part of lateral ventricle inferior horn
- Wide variety of functions, connections
 - lip smacking, chewing, autonomic responses, fear, rage, anxiety
- Klüver-Bucy Syndrome

