Slide 1:

Welcome to Clinical anatomy of the head, neck and neuronal pathways
**Lecture #13**

EINSTEIN'S BRAIN
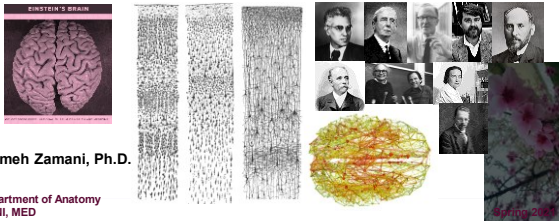
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Slide 2:

Today's lecture will cover:

Week #8 NS Barriers, Plasticity and Regeneration of Nervous System, Visual, Auditory, Vestibular, Olfactory, and Gustatory Pathways

Week #10 Somatosensory and viscetosensory; pain pathways and connections of stress analgesia

Week #11 Pathways of the somatomotor system, connections of the cerebellum and basal ganglia; spinal reflex motoric; eye movements

Week #13 Arrangement and function of the autonomic nervous system

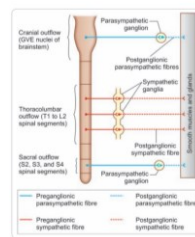**Slide 3:**

Arrangement and function of the autonomic nervous system

Functional Organization of the Nervous System
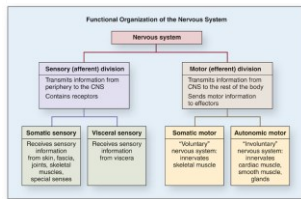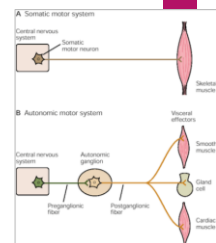
Functions:
- Contraction and relaxation of smooth muscles
- Function of all exocrine glands
- Heart rate
- Some metabolic processes

Slide 4:

Autonomic Nervous System

Sympathetic:
Thoracolumbar outflow
T1-L2

Parasympathetic:
Craniosacral outflow
CN III, VII, IX, X & S2-S4

A Somatic motor system

B Autonomic motor system

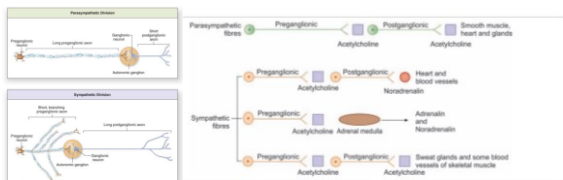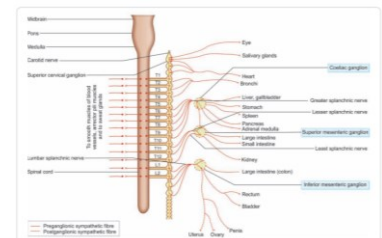**Slide 5:**

Autonomic Nervous System

Figure 14.8: Neurotransmitters of autonomic neurons
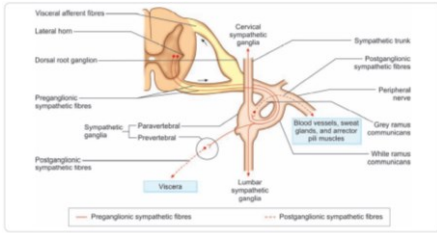
Slide 6:

Sympathetic Nervous System

Catabolic reaction (activities that are mobilized during emergency and stress situations

"Fight or Flight"

Generalized reaction of body
- Coronary artery
- Increase heart rate
- Bronchodilation
- Mydriasis
- Sweat secretion
- Glycemia

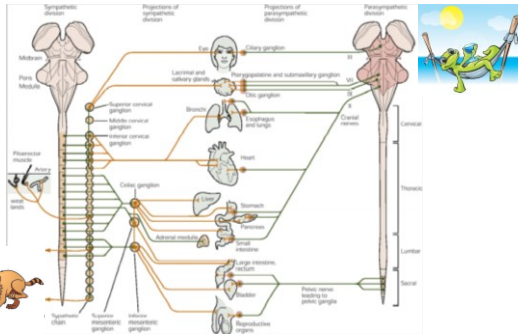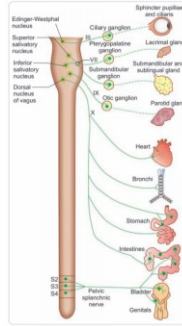## Anatomical Organization of the Sympathetic Preganglionic and Postganglionic Axons

Parasympathetic Nervous System

Anabolic reactions (activities associated with conservation and restoration of body resources
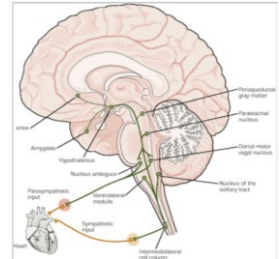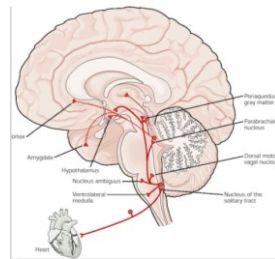
"Rest and Digest"

Localized reaction of body
- Decrease heart rate
- Bronchoconstriction
- GIT activation
- Miosis

Central parts of Autonomic Nervous System

Pathways distributing visceral sensory information in the brain   Pathways that control autonomic responses

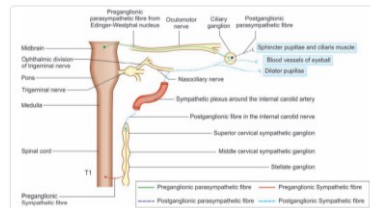## Central parts of Autonomic Nervous System

Hypothalamus (subsystem of limbic brain = visceral brain)

Ncll. hypothalamici ant.
control parasympaticus
(fasciculus longitudinalis dorsalis)

Ncll. hypothalamici medii
Control the sympaticus
(over RF, tr. tegmentalis centralis)

Innervation of the Eye

The sphincter pupillae is supplied by parasympathetic nerves.

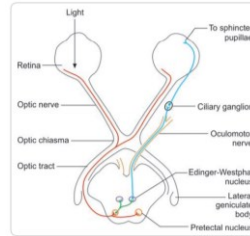The dilator pupillae is supplied by sympathetic nerves.

Pupilary Light Reflex

A reflex that controls the diameter of the pupil, in response to the intensity of light (luminance) that falls on the retina of the eye

o **mydriasis:** dilation of the pupil

o **miosis:** constriction of the pupil

   o direct response

   o consensual response

   o anisocoria
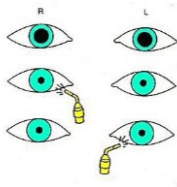
Accommodation Reflex

o Changing the radius of curvature of the lens to focus the world on the retina.

o Accommodation reflex involves convergence (voluntary), pupillary constriction and accommodation (involuntary).

Edinger-Westphal nuclei → oculomotor nerve → ciliary ganglion → short ciliary nerves → sphincter pupillae and ciliaris

Reading list
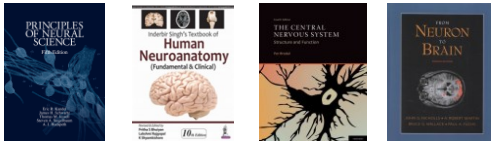
Thank you very much for your attention