

VISUAL SYSTEM II OBJECTIVES

First of two hour lecture : Basic Visual Physiology (S. Shefchyk)

After the lecture and suggested reading the student should be able to:

1. Describe the mechanism for focussing light on the retina, and define myopia, hypermetropia and astigmatism.
2. Define photopic and scotopic vision.
3. Describe what problems occur in the visual system and photoreceptor function in an individual who has a Vitamin A deficiency.
4. Identify the three major pigments used for colour vision; also be able to name and describe three types of colour blindness (including information about the sex-linkage, colours lost and incidence of each type of colour blindness).
5. Describe the connections and pathway of ganglion axons entering the optic nerve through the brainstem (identify the three main brainstem target regions for this information and describe their general functional relevance) and the course of the pathway to the visual cortex (review material from Med I core concepts).
6. Identify and name the visual field defects encountered with lesions along the visual pathway (review material in Med I core concepts).
7. Describe the visual and autonomic parasympathetic pathways mediating miosis and lens accommodation (refer to ANS lectures in Neuroscience course)
8. Describe the consequences of increased autonomic sympathetic outflow to the eyes (refer to Neuroscience lectures and tutorial on the autonomic nervous system).
9. Define consensual reaction of the pupils.

Suggested readings:

Kingsley 2nd edition Pages : 433-470.
Cecil Pages 827-831.

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2nd hour lecture : Control of eye movements (D. McCrea)

10. Before class review the muscles that control eye movements, their actions and the location of their nuclei in the brainstem (Kingsley p. 366-369). Review the innervation of the eyelid (including the corneal reflex, Kingsley Fig. 10.18), and the parasympathetic and sympathetic control of the pupil (Kingsley, p. 379).
11. Be able to define the following types of eye movements (p. 369-373): saccadic, smooth pursuit, vestibulo-ocular, optokinetic, convergent (p. 379). Which muscles are involved in each?
12. We will make a simple diagram of the connections between the frontal cortex, the pontine gaze centres, the brainstem levels of the III and VI motor nuclei, and their MLF interconnections. Use this diagram to explain why, after a stroke involving one of the frontal cortices, the eyes may deviate toward the lesion and away from the paralyzed side of the body.
13. Define the term intranuclear ophthalmoplegia and understand how lesions of the MLF can produce this condition (Kingsley p377-379).

Attached handout: outline diagram to be completed during the class.