Study Guide Chapter 16 (0723)
Special Senses

16-1 Intro

1 What is a transducer? What does a transducer do? What is meaning of "subjective awareness"?

2 What are examples of sensory receptors? What part of the neuron is the receptor? What may the stimuli do to a dendrite?

3 What is the difference between a general sense and a special sense?

4 Study slide #10. How is the position of the receptors matched to their subjective awareness? Explain.

5 What is the difference between phasic and tonic receptors? Why do we need both? Give examples of each.

6 What is the difference between an non-encapsulated generator potential, an encapsulated generator potential, and a receptor potential? What is type of structural neuron in all three cases? Location? Give example for each type of potential.

7 What is the significance of the somesthetic projection pathway (also called somatic sensory)? What two things are connected by this pathway? Destination location?

16-2 Vision

8 What is the mucous membrane on the anterior surface of the eye? What is not covered by this membrane? Why? What occurs if this membrane becomes infected? Called?

9 What are the structure of the three layers of the eye? Function of each? What structure develops at the forward edge of the choroid layer? What three structures extend from here? Significance of each?

10 What are the two chambers anterior to the lens? Explain how the fluid moves between these two chambers? What type of molecule fills the space behind the lens?

11 What is the significance of the optic disc? What is the common name for this structure? Why?

12 Where is the greatest resolution on the retina? What is the region called? What is the middle of this spot? What type of photoreceptor is concentrated their? What type of light intensity is required here to generate an action potential? What is unique about the retina? What else can you see over the surface of the retina?

13 What type of muscle is the iris? How are the fascicles of the iris arranged? Why? What are these fascicles called? What type of reflex may you test with a flashlight in your bathroom? Do it!

14 What is emmetropia? Why is this appropriate from the perspective of evolution?

15 What is near vision? What three mechanisms allow you to read a book? What is the role of the ciliary muscle? How does the lens change when the ciliary muscle contracts? Significance? (slide 26)

16 In order for the image to be in focus the light's focal plane must meet on the surface of the retina. The shape of the lens determines if the focal plane if on the retina. However, if the lens is OK but the shape of the eyeball is not correct, then the focal plane will not fall on the retina and the image will be out of shape. What is the problem with the shape of the eyeball if a person is farsighted? What is the problem with the shape of the eyeball if the person is nearsighted? What are the correct terms to use for farsighted and nearsighted?

17 What tissue is affected by cataracts? Cause? May this be corrected? How?

18 What is glaucoma? Cause? Danger?

19 What are photoreceptors? Which photoreceptor requires more photos to generate an action potential? How are the two photoreceptors positioned over the retina?

20 What is rhodopsin? Common name? What photoreceptor uses rhodopsin? What are the two components of rhodopsin? What is the difference between cis and trans retinal?

16-3

21 What is sound?

22 Why do young children have a higher incident of middle ear infections?

23 What are the two functions of the inner ear? What structures are responsible for these functions? Where are these structures located (within what bone)?

24 What is the structure of the cochlea? (draw and label picture) Where is the location of the oval and round windows? Functions? (see slide 17 - 18 - 21 - 23)

25 What is the difference between pitch and loudness? At what point may loudness cause damage to the ear?

26 What is the significance between the size of the tympanic membrane and the oval window? What must this concentrated force overcome?

27 What type of gate creates the action potential for hearing?

28 What are the two type of hearing loss? What type of hearing loss did Beethoven have?

29 What two nerves innervate the inner ear? What cranial nerve is formed when these two nerves merge?

30 What is the function of equilibrium? What is another term used to describe equilibrium? What are the three receptors for equilibrium? What type of equilibrium is measured by each receptor? (slide 41)

31 What is the difference between static and dynamic equilibrium? What are the two forms of dynamic equilibrium?

32 Starting to move in an elevator or in a car are examples of dynamic linear equilibrium. What receptor creates the action potential for each form of dynamic linear equilibrium? Where are these receptors located?

33 What receptor senses dynamic rotational equilibrium? Why are three semicircular ducts needed?

34 What is the relationship between the semicircular ducts and the ampulla? Structure and function? Significance?

35 How do the special senses work together? (slide 55)