

Physiologic Changes Associated with Aging: Review Questions

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QUESTIONS

Choose the single best answer for each question.

1. **Which of the following results of a physiologic change associated with aging is most likely to cause an elderly person to drive at a slow, steady rate of speed during both day and night?**
 - A) Cataracts
 - B) Dilated pupils
 - C) Macular degeneration
 - D) Memory loss
 - E) Stiffening of the lens
2. **Which of the following results of a physiologic change associated with aging is most likely to cause an elderly person who is driving to decelerate when approaching a green light on a dark road?**
 - A) Glaucoma
 - B) Macular degeneration
 - C) Memory loss
 - D) Stiffening of the lens
 - E) Yellowing of the cornea and lens
3. **An increase in which of the following is a physiologic change known to be associated with aging?**
 - A) Amount of sleep required
 - B) Extracellular fluid volume
 - C) Hepatic blood flow
 - D) Size of alveolar ducts in the lungs
 - E) Subcutaneous fat as a percentage of total body mass
4. **Which of the following is the most common cause of legal blindness in persons in the United States who become legally blind after age 65 years?**
 - A) Cataracts
 - B) Diabetic retinopathy
 - C) Glaucoma
 - D) Hypertensive retinopathy
 - E) Macular degeneration

(turn page for answers)

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EXPLANATION OF ANSWERS

- 1. (E) Stiffening of the lens.** As the lens stiffens with age, it takes more time for the eyes to accommodate from a more distant focal length (eg, the road) to a nearer focal length (eg, the speedometer). By driving more slowly, a person travels a shorter distance during the time it takes to check the speed of the vehicle and also reduces the perceived risk of getting a speeding ticket. The steady pace reduces the frequency with which the speed needs to be checked. Cataracts, although present in increased incidence in elderly patients, are the result of pathologic processes and not physiologic changes associated with aging. Dilated pupils also are not a result of a physiologic change associated with aging; instead, the pupils tend to constrict with increased age. Macular degeneration can lead to decreased vision (especially in low ambient light), which may cause a person to drive at a slow, but not necessarily steady, speed. In fact, as unexpected hazards suddenly come into the reach of the headlights, a person with macular degeneration would be expected to exhibit erratic changes of speed and direction. Memory loss severe enough to impair a person's ability to drive is a pathologic—not physiologic—change, because it is severe enough to interfere with occupational functioning.¹
- 2. (E) Yellowing of the cornea and lens.** Yellowing of the cornea and lens causes an elderly person to see through a yellow filter. Not only does this reduce the amount of light reaching the retina, but it also causes a frequency shift of that light. The result is impaired color discrimination under conditions of low ambient light. Glaucoma has no effect on color perception in a low-light environment. Macular degeneration can lead to impaired visual acuity, but it should not have a significant effect on color vision. Memory loss severe enough to impair a person's ability to drive is a pathologic—not physiologic—change, because it is severe enough to interfere with

occupational functioning.¹ Stiffening of the lens affects only focus and accommodation; it has no effect on color perception.

- 3. (D) Size of alveolar ducts in the lungs.** Increased size of alveolar ducts in the lungs leads to decreased lung surface area with aging. An increased amount of sleep is not required with aging. In fact, elderly persons require less sleep, and part of the sleep is often acquired in short naps during the day. Increased extracellular fluid volume does not occur with aging. Extracellular fluid volume decreases with aging. Increased hepatic blood flow is not a feature of aging; rather, the flow actually decreases. Increased subcutaneous fat, as a percentage of total body mass, is not a change associated with aging. Although fat, as a percentage of total body mass, increases in elderly persons, it redistributes from subcutaneous to truncal areas. This leads to a net loss of subcutaneous fat and creates an increased risk for decubitus ulcers.
- 4. (E) Macular degeneration.** Macular degeneration accounts for the majority of cases of legal blindness (ie, vision uncorrectable to better than 20/200) after age 65 years. A small subset of patients with macular degeneration may benefit from intervention by an ophthalmologist; therefore, referral for slit lamp examination is advisable. Whereas diabetic and hypertensive retinopathy each cause more cases of legal blindness than does macular degeneration, sufficient numbers of patients with those disorders become legally blind before age 65 years to leave macular degeneration the most common cause in those losing vision after age 65 years. Cataracts and glaucoma are treatable conditions and thus cause relatively few cases of legal blindness.

REFERENCE

1. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. 4th ed, text revision. Washington (DC): American Psychiatric Association; 2000:148–9.

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