



VII OGÓLNOPOLSKA OLIMPIADA
„JĘZYK ANGIELSKI W NAUKACH MEDYCZNYCH”
AGE-RELATED HEALTH CHALLENGES

pod honorowym patronatem
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PAPER 2
READING COMPREHENSION

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READING A

Task 1. Complete the text with the prompts, choosing A, B, C or D. Only ONE answer is correct.

DRIVER'S EVALUATION

1. ... of the growing population of elderly drivers, awareness about driver's evaluations should increase in the medical community, especially among physicians who manage the continuity of care for geriatric patients, such as 2. ..., internists, family practitioners, and physiatrists. Factors 3. ... driving ability include vision and hearing, cognition, distractions while driving, psychomotor functioning, and medical conditions.

Visual function is the most important sensory change in predicting driving impairment. There are significant changes with aging in visual localization, mainly in the ability to detect 4. ... or stationary objects in the outer regions of the visual field. 5. ... elderly also have slower saccadic eye movements to track horizontally moving targets and have difficulty estimating the speed of vehicles around them. Glaucoma, cataracts and age-related 6. ... degeneration (AMD) can reduce the visual field and contrast sensitivity. Glare vision and glare recovery progressively decline after the age of 40 years. Ophthalmologists can help to detect and correct specific visual problems.

Elderly people with a hearing impairment report more adverse driving events. Most elderly people, however, do not stop driving, and they do not make adaptations to driving despite their hearing 7. If a patient requires a hearing aid, audiologists can program the device while the patient is in the car to make specific modifications.

Cognitive changes can also impair driving ability in the elderly population. Speech language pathologists and neuropsychologists can assess and monitor the patient's cognitive abilities. Emphasis 8. ... be placed on reaction times and attention, as these are well-documented, age-associated problems related to driving.

Patients with dementia are 9. ... increased risk of unsafe driving because of memory disorders, visuospatial disturbances, and impaired judgment. In the first year after dementia is diagnosed, patients have an accident rate similar to that of registered drivers of all ages. However, the risk can increase 3-fold in the following years.

Psychomotor slowing due to the wasting of fast-twitch muscle fibers is evident with age. Thus, the motor component of one's reaction time generally becomes 10. ... with age. Even the movements needed to fix one's eyes on objects of interest take longer. Because of these changes, and because of decreased ROM in the cervical spine due to arthritic conditions, many elderly drivers have a static head, which leads to peripheral vision decline and which contributes to accidents. Their ability to judge safe gaps in which they may enter or cross moving traffic may be affected by visual and motor difficulties, including spatial deficits. Geriatric patients must be able to maintain their motor 11. ... and good balance to retain good driving skills.

Medical conditions that affect the geriatric population can also affect their driving skills. The ones that are most consistently related to unsafe driving are as follows: cardiac diseases, diabetes mellitus, and **12.** ... diseases (mainly stroke, dementia, seizures, and Parkinson disease). Diabetes can increase the risk of unsafe driving because of related retinopathy, peripheral neuropathy, or hypoglycemic episodes. The risk of collisions resulting in injury is substantially increased among older diabetic drivers who are taking insulin or oral agents, among those who **13.** ... diabetes for more than 5 years, and among those with coexisting cardiac disease.

Depression, sleep apnea, and foot disorders can also contribute to driving impairment. Limitations in cervical ROM due to arthritic changes can adversely affect a person's driving by decreasing his or her ability to check blind spots when changing lanes, for example. Thus, **14.** ... cervical motion has been associated with accidents and moving violations.

Medications, such as narcotics, muscle **15.** ..., benzodiazepines, tricyclic antidepressants, and hypnotics may also be factors in worse driving skills. Alcohol has been implicated in fatal accidents among those older than 70 years; however, the effect of alcohol remains more important in the younger population.

Adapted from: Geriatric Rehabilitation, by Julie A Muché, MD, and Stacy McCarty, MD. <https://emedicine.medscape.com/article/318521-overview#a8>

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|------------|-------------------------|----------------------|--------------------------|------------------------|
| 1. | a. In spite | b. In case | c. Because | d. Considering |
| 2. | a. geriatricians | b. geriatrics | c. geriatologists | d. geriatrians |
| 3. | a. effecting | b. defecting | c. infecting | d. affecting |
| 4. | a. moving | b. immobile | c. still | d. movable |
| 5. | a. An | b. A | c. ---- | d. The |
| 6. | a. molecular | b. macular | c. myopic | d. mandibular |
| 7. | a. lost | b. loose | c. loss | d. lose |
| 8. | a. ought | b. need to | c. should | d. have to |
| 9. | a. in | b. for | c. with | d. at |
| 10. | a. more slowly | b. slower | c. slowest | d. slowly |
| 11. | a. strength | b. stature | c. growth | d. torque |
| 12. | a. congenital | b. notifiable | c. acute | d. neurologic |
| 13. | a. have | b. had | c. have had | d. had had |
| 14. | a. improved | b. increased | c. impaired | d. immense |
| 15. | a. relaxants | b. laxatives | c. decongestants | d. constrictors |

SCORE: _____/15

READING B

Alzheimer's and Dementia Risk Tied to Hemoglobin Levels

Over 12 years, anemia was associated with a 34% increased risk of dementia and a 41% increased risk of Alzheimer's disease, reported M. Arfan Ikram, PhD, of Erasmus Medical Center in Rotterdam, the Netherlands, and colleagues. Compared with mid-range hemoglobin levels, low and high levels both were associated with increased dementia risk, they wrote in *Neurology*. White matter structural connectivity, cerebral perfusion, and microbleeds also were tied to hemoglobin levels.

"Abnormal levels of hemoglobin, including anemia, are a very common finding," Wolters told *MedPage Today*. "Several putative biological links to the development of dementia make it important to study hemoglobin as a potentially modifiable risk factor, as well as to understand the importance of, for example, oxygenation and iron metabolism, in the process leading to neurodegeneration."

Prior studies have tied anemia to dementia but this research "looked at the whole range of hemoglobin level -- not just the cutoff for low or anemia -- and found an interesting U-shaped association with both low and high hemoglobin being associated with dementia risk and MRI changes," noted Kristine Yaffe, MD, of the University of California San Francisco, who was not involved with the study.

The finding that white matter health and microbleeds were associated with anemia is novel, Yaffe told *MedPage Today*. "This supports the idea that the level of hemoglobin -- which carries oxygen and also interacts with beta-amyloid protein -- is an important risk for Alzheimer's disease. It is often something that can be modified and knowing about its association with brain health is another reason to screen and treat."

In this analysis, researchers looked at serum hemoglobin measurements of 12,305 people without dementia in the ongoing population-based Rotterdam Study, which was started in 1990, and determined their risk of dementia and Alzheimer's disease until 2016. Mean age at baseline was 64.6 and 57.7% were women. In a subset of 5,267 participants who had brain MRI, the researchers assessed hemoglobin in relation to vascular brain disease, structural connectivity, and global cerebral perfusion. Over a mean follow-up of 12.1 years, 1,520 people developed dementia, 1,194 of whom had Alzheimer's disease. Of all incident dementia cases, 222 were preceded by a stroke, that is bleeding into the brain.

The overall prevalence of anemia was 6.1%, which steeply increased with age in men, from 1.4% age <50 to 33.3% age >90. In women, anemia prevalence was higher in pre-menopausal ages, but lower than in men in old age. Anemia was associated with a 34% increased risk of dementia and 41% of Alzheimer's disease.

Hemoglobin levels and dementia risk showed a U-shaped association: compared with the middle quintile of hemoglobin levels, the lowest quintile had a HR of 1.29 and the highest quintile had a HR of 1.20 (95% CI 1.00-1.44). On brain MRI, similar U-shaped associations were seen between hemoglobin and white matter

hyperintensity volume and structural connectivity, but not with cortical and lacunar infarcts. Low levels of hemoglobin, but not high levels, were associated with a higher prevalence of microbleeds. Hemoglobin levels were inversely correlated with cerebral perfusion.

The worldwide prevalence of anemia is much higher than what was found in this study, the researchers pointed out. "With around 10% of people over age 65 having anemia in the Americas and Europe and up to 45% in African and southeast Asian countries, these results could have important implications for the burden of dementia, especially as the prevalence of dementia is expected to increase threefold over the next decades, with the largest increases predicted in the countries where the anemia rate is the highest," Ikram said in a statement. And while this study shows associations only, not causality, "the link of hemoglobin to cerebral perfusion and white matter damage should encourage further study into hypoxia (or starving the cells of oxygen) and white matter integrity as potential explanations for increased dementia risk," Wolters noted.

Adapted from Wolters F, et al "Hemoglobin and anemia in relation to dementia risk and accompanying changes on brain MRI" Neurology 2019 by Judy George, Senior Staff Writer, MedPage Today July 31, 2019

Task 2.

Read the text carefully then circle the correct answer to the questions below where **T = True, F = False, NG = Not Given**. Only one answer is correct.

1.	Alzheimer's and dementia risk increases by the same percentage.	T	F	NG
2.	Only high level of haemoglobin is associated with an increased dementia risk.	T	F	NG
3.	In the early stages of Alzheimer's or dementia, the patients should test the level of hemoglobin once a month.	T	F	NG
4.	The degenerative processes in the neurons are driven by improper oxygenation and iron metabolism.	T	F	NG
5.	The new impact factors include the presence of microbleeds and the issue of grey matter health.	T	F	NG
6.	Hemoglobin is a well-known carrier of oxygen, but it does not influence beta-amyloid protein.	T	F	NG
7.	In the analysis, there were more than two hundred cases of cerebral haemorrhage which preceded the dementia symptoms.	T	F	NG
8.	The risk of anemia increased significantly with age only in the group of women.	T	F	NG
9.	Anemia in old age may stem from inappropriate diet and lack of physical activity.	T	F	NG
10.	The study does not reflect that actual anemia prevalence in the world.	T	F	NG

Task 3.

Circle the correct answer A, B, C, or D. Only one answer is correct.

11. The word “*putative*” in the second paragraph refers to:

- a. alleged
- b. presumed
- c. supposed
- d. A, B, C are correct

12. The study is innovative, since it describes:

- a. only the influence of the mid-range hemoglobin levels on the risk of dementia and Alzheimer’s
- b. only the influence of the lowest level of hemoglobin
- c. the influence of both a decrease and an increase in the hemoglobin level on white matter
- d. generally the processes involving hemoglobin as it has never been described before

13. According to the article, it took the scientists and physicians more than 12 years to:

- a. examine all 12 305 patients
- b. run MRI on the control group of patients
- c. write this paper
- d. run the follow-up process

14. The authors claim that higher risk of microbleeds are linked to:

- a. only low hemoglobin levels
- b. only an increased level of hemoglobin
- c. white matter intensity volume
- d. unknown processes

15. The term “*hypoxia*” used in the last paragraph denotes:

- a. syncope
- b. oxygen deprivation
- c. providing cells with oxygen
- d. brain death

SCORE: _____/15