

Space Medicine and Human Physiology

Space Medicine · Answer Key · 12 Questions

1. What is the primary cause of 'space adaptation syndrome' experienced by astronauts during their initial transition to microgravity?

- A) Increased atmospheric pressure
- B) Disturbance of the vestibular system**
- C) Dehydration from cosmic radiation
- D) Cardiac arrhythmia

2. During long-duration spaceflight, what happens to bone mineral density in astronauts without rigorous countermeasures?

- A) It increases significantly
- B) It remains entirely unchanged
- C) It decreases due to lack of mechanical loading**
- D) It crystallizes into new minerals

3. Which fluid shift phenomenon occurs in astronauts due to the absence of gravity pulling blood toward the legs?

- A) Cephalad fluid shift**
- B) Peripheral vascular collapse
- C) Pulmonary edema
- D) Severe localized anemia

4. What is a known ocular change observed in some astronauts after long-duration missions, often referred to as SANS?

- A) Corneal scarring
- B) Spaceflight Associated Neuro-ocular Syndrome**
- C) Permanent color blindness
- D) Cataracts from solar flares

5. Why are astronauts at an increased risk of developing kidney stones during space missions?

- A) Excessive oxygen consumption
- B) Increased bone resorption releasing calcium into the blood**
- C) Radiation exposure to the renal cortex
- D) High humidity in the International Space Station

6. What happens to the human heart muscle during extended periods of weightlessness?

- A) It expands significantly
- B) It undergoes atrophy due to reduced workload**
- C) It becomes more efficient at pumping
- D) It develops thicker arterial walls

7. Which type of radiation poses the greatest biological health risk to astronauts traveling outside of Earth's magnetic field?

- A) Radio waves
- B) Galactic cosmic rays**
- C) Infrared light
- D) Visible light

8. How is aerobic capacity generally affected by long-duration spaceflight?

- A) It improves due to altitude training
- B) It stays the same
- C) It decreases**
- D) It fluctuates based on solar cycles

9. In space, muscle atrophy is most pronounced in which functional muscle groups?

- A) Hand muscles
- B) Anti-gravity muscles like the calves and back**
- C) Facial muscles
- D) Bicep muscles

10. What is a potential medical concern regarding the immune system during spaceflight?

- A) Increased production of white blood cells
- B) Dysregulation or suppression of immune response**
- C) Enhanced allergic reactions
- D) Spontaneous healing of wounds

11. What effect does microgravity have on the height of a human astronaut during spaceflight?

- A) Height decreases due to spinal compression
- B) Height increases temporarily due to spinal elongation**
- C) Height remains constant
- D) Height is unaffected until re-entry

12. Which medication is frequently used by astronauts to mitigate motion sickness during the first few days of spaceflight?

A) Promethazine

B) Acetaminophen

C) Amoxicillin

D) Magnesium sulfate