

Geology and Human Health Intersections

Medical Geology · Answer Key · 10 Questions

1. Which naturally occurring fibrous silicate mineral, historically used in construction, is definitively linked to the development of mesothelioma and asbestosis?

A) Chrysotile

- B) Talc
- C) Muscovite
- D) Orthoclase

2. Chronic ingestion of water with high concentrations of naturally occurring inorganic arsenic, often leached from geological formations, is primarily associated with which long-term health condition?

A) Type 1 Diabetes

B) Hyperkeratosis

- C) Pernicious Anemia
- D) Hypocalcemia

3. The geological prevalence of which trace element is essential for the prevention of goiter and cretinism, as it is a critical component of thyroid hormones?

A) Selenium

B) Fluorine

C) Iodine

D) Cadmium

4. Excessive long-term intake of fluoride from groundwater, exceeding geological safety thresholds, leads to which skeletal condition?

A) Skeletal fluorosis

- B) Osteoporosis
- C) Rickets
- D) Osteopetrosis

5. Which radioactive noble gas, a decay product of uranium-238 found in granite and shale, is the second leading cause of lung cancer globally?

A) Radon

- B) Argon
- C) Neon
- D) Helium

6. The geological distribution of which mineral, when present in soil and dust, is a primary environmental cause of silicosis among miners and stone cutters?

A) Quartz (Crystalline Silica)

- B) Halite
- C) Gypsum
- D) Calcite

7. Excessive exposure to manganese, often found in geological deposits near manganese ore mines, is clinically associated with symptoms resembling which neurological disorder?

A) Parkinson's disease

- B) Multiple Sclerosis
- C) Huntington's disease
- D) Alzheimer's disease

8. Which heavy metal, naturally occurring in geological deposits of sulfide ores, is known to cause 'Itai-itai' disease characterized by severe bone softening and kidney failure?

A) Lead

B) Cadmium

- C) Mercury
- D) Arsenic

9. What is the primary physiological mechanism by which selenium, often concentrated in specific geological substrates, acts as a health-protective micronutrient?

A) Enhancement of bone density

B) Antioxidant defense system support

- C) Regulation of blood glucose levels
- D) Facilitation of iron absorption

10. Which mineral particulate, if inhaled in volcanic ash plumes, is most likely to induce acute respiratory distress due to its high crystalline silica content and small particle size?

A) Cristobalite

- B) Biotite
- C) Olivine
- D) Magnetite