Environmental Medicine – Unit Quiz Key

1. Why is it incorrect to think of water contamination as a localized problem?
A. Water evaporates too quickly
B. Water remains chemically stable
C. Water systems are isolated
D. Water moves through interconnected environmental pathways
(Answer: D)

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2. Which scenario BEST illustrates the concept of the "water cycle as an exposure cycle"?
A. A chemical spill entering groundwater and later appearing in drinking water
B. Rain evaporating from a lake
C. Water freezing into ice
D. Water remaining in a reservoir
(Answer: A)

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3. Why might two homes using the same municipal water source experience different exposures?
A. Water loses all contaminants before entering homes
B. Plumbing materials and stagnation alter water quality
C. Municipal water is identical at every tap
D. Exposure only depends on intake volume
(Answer: B)

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4. Which mechanism BEST explains increased metal exposure after water sits overnight?
A. Increased oxygen content
B. Microbial death
C. Chemical interaction with plumbing materials
D. Reduced water pressure
(Answer: C)

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5. Why is "clear water" not a reliable indicator of safety?
A. Only microbes affect clarity
B. Chemical contaminants may be invisible
C. Metals always discolor water
D. Filtration guarantees purity
(Answer: B)

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6. Which BEST explains why biofilms are difficult to eliminate?
A. They dissolve easily in water
B. They are composed only of minerals
C. They form protective communities attached to surfaces
D. They exist only in flowing water
(Answer: C)

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7. Why is air considered a more constant exposure pathway than water or food?
A. It contains more nutrients
B. It is always filtered
C. It is inhaled continuously without conscious control
D. It is chemically simple
(Answer: C)

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8. Which BEST explains why indoor air often contains higher pollutant concentrations?
A. Outdoor air is always cleaner
B. Pollutants are destroyed indoors
C. Indoor air is constantly replaced
D. Limited ventilation allows accumulation
(Answer: D)

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9. Why is CO_2 used as an indicator of indoor air quality?
A. It is toxic at all levels
B. It directly causes disease
C. It reflects ventilation effectiveness
D. It replaces oxygen completely
(Answer: C)

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10. What does elevated indoor CO_2 MOST strongly suggest?
A. Increased oxygen levels
B. Poor air exchange
C. Increased humidity
D. Reduced particle levels
(Answer: B)

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11. Which activity is MOST likely to produce rapid spikes in fine particulate matter (PM2.5)?
A. Sleeping
B. Reading
C. High-heat cooking
D. Sitting quietly
(Answer: C)

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12. Why do HEPA filters not fully address indoor air quality?
A. They increase humidity
B. They remove all gases
C. They cannot remove volatile chemicals
D. They block airflow completely
(Answer: C)

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13. Which BEST explains how humans directly influence indoor air chemistry?
A. Humans remove all contaminants
B. Human emissions are negligible
C. Humans only affect CO_2
D. Skin, breath, and oils release reactive compounds
(Answer: D)

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14. Why are modern energy-efficient homes more prone to air quality issues?
A. They contain more oxygen
B. They allow greater airflow
C. They reduce ventilation and trap pollutants
D. They eliminate humidity
(Answer: C)

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15. What is the MOST important implication of taking ~23,000 breaths per day?
A. Air exposure is minimal
B. Only large exposures matter
C. Small exposures can accumulate significantly

D. Oxygen becomes toxic
(Answer: C)

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16. Which BEST defines body burden from a systems perspective?
A. A single exposure event
B. Total accumulated internal load over time
C. Only chemical intake
D. Genetic predisposition alone
(Answer: B)

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17. Why is the “last drop” concept misleading in exposure analysis?
A. It is always the largest exposure
B. It occurs first
C. It masks the role of cumulative buildup
D. It is unrelated to thresholds
(Answer: C)

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18. What does a “threshold effect” represent?
A. Immediate toxicity
B. A point where accumulated exposure produces noticeable effects
C. Random biological variation
D. Elimination of substances
(Answer: B)

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19. Which BEST explains why individuals respond differently to similar exposures?
A. Exposure levels are always identical
B. Only genetics matter
C. Body processing, storage, and elimination vary
D. Environment has no effect
(Answer: C)

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20. Why are fat-soluble substances more likely to contribute to long-term body burden?
A. They dissolve quickly
B. They are excreted immediately
C. They remain only in blood
D. They are stored in fatty tissues
(Answer: D)

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21. Which BEST describes the concept of half-life in environmental exposure?
A. Time to double concentration
B. Time for half of a substance to be eliminated
C. Time to reach toxicity
D. Time to enter the body
(Answer: B)

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22. Why can low-dose exposures still have significant biological effects?
A. Only high doses matter
B. They are always harmless
C. Repeated exposure can accumulate and interact
D. They are eliminated instantly
(Answer: C)

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23. Which BEST distinguishes bioaccumulation from biomagnification?
A. Bioaccumulation occurs in ecosystems only
B. Biomagnification occurs within a single organism
C. Bioaccumulation is buildup within one organism; biomagnification increases up the food chain
D. They are identical processes
(Answer: C)

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24. Why are top predators more likely to have higher contaminant levels?
A. They metabolize faster
B. They drink more water
C. They are exposed to sunlight
D. They consume organisms that have already accumulated substances
(Answer: D)

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25. Which BEST explains contact exposure as a significant pathway?
A. Skin is completely impermeable
B. Contact exposure is rare
C. Repeated surface contact can allow absorption
D. Only ingestion matters
(Answer: C)

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26. Why are "tracked-in exposures" important in environmental design?
A. They are visually obvious
B. They represent a major indoor exposure source from outside
C. They only affect shoes
D. They are easily eliminated
(Answer: B)

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27. Which BEST reflects a systems-level approach to environmental health?
A. Avoiding one specific toxin
B. Focusing only on acute exposure
C. Understanding patterns of exposure, accumulation, and response
D. Eliminating all environmental interaction
(Answer: C)

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28. Why is environmental design considered more effective than simple avoidance?
A. Avoidance eliminates all exposure
B. Design changes reduce repeated exposure patterns
C. Design only affects aesthetics
D. Avoidance is always easier
(Answer: B)

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29. Which BEST explains why repeated exposures reshape biological "terrain"?
A. The body remains unchanged
B. Exposures are isolated events
C. Systems adapt and shift over time
D. Only genetics determine outcomes
(Answer: C)

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30. Which statement BEST captures the core principle of Environmental Medicine at this level?
A. Health depends on single exposures
B. The environment remains external
C. Only large exposures matter

D. Continuous interactions between environment and body shape long-term outcomes
(Answer: D)
