

MULTIPLE CHOICE

BIOEFFECTS - PRACTICE SET

PROPOSED FOR REVIEW - questions are the author's verbatim Q&A; distractors are auto-selected from other answers in the same bank and must be checked by a subject-matter reviewer (a distractor could coincidentally be correct). Not authoritative assessment content.

1. What is a small electronic thermometer?

- A. Calorimeter
- B. Flow phantom
- C. Hydrophone
- D. Thermocouple

2. Does transient cavitation have oscillating or bursting bubbles?

- A. Oscillating bubbles
- B. No gas bubbles
- C. Soft tissue bubbles only
- D. Bursting bubbles

3. A thermal index of what value is concerning because the temperature elevation is reaching the upper limit considered acceptable?

- A. 0.2
- B. 2
- C. 1
- D. 10

4. Which factors are relevant with regard to the thermal mechanism of bioeffects?

- A. Pressure and frequency only
- B. Temperature and exposure time
- C. Gain and compression
- D. Pixels and bits

5. Which measure of intensity is related most closely to tissue heating?

- A. SPTA
- B. Mechanical index
- C. Pulse repetition period
- D. SPPA

6. What is a shadowing system that allows us to view the shape of a sound beam?

- A. Calorimeter
- B. Schlieren
- C. Thermocouple
- D. Hydrophone

7. What are two techniques used to study bioeffects?

- A. Empirical and mechanistic approaches
- B. Stable and transient cavitation
- C. Axial and lateral resolution
- D. Thermal and mechanical indices

8. How is a sound beam's total power calculated?

- A. By measuring Doppler shift and wall filter
- B. By measuring attenuation and impedance only
- C. By measuring PRF and imaging depth
- D. By measuring the temperature rise and time of heating

9. Which bioeffect is more likely to occur in the lungs than anywhere else?

- A. Cavitation
- B. Registration error
- C. Electrical shock
- D. Thermal heating

10. What has the greatest amount of attenuation?

- A. Soft tissue
- B. Blood
- C. Water
- D. Bone

11. True or False? Cavitation describes the interaction between sound waves and small gas bubbles.

- A. True
- B. False

12. True or False? Stable cavitation describes the rhythmic swelling and shrinking of gas bubbles.

- A. False
- B. True

13. True or False? There are no bioeffects associated with ultrasound having characteristics typical of those in diagnostic ultrasound.

- A. False
- B. True

14. Which thermal index assumes that cranial bone is in the near field?

- A. Cranial bone thermal index (TIC)
- B. Soft tissue thermal index (TIS)
- C. Mechanical index (MI)
- D. Bone thermal index (TIB)

15. What type of research is performed inside a living body?

- A. In vitro
- B. In vivo
- C. In situ
- D. Ex vivo

16. What measures the total power in a sound beam through absorption?

- A. Thermocouple
- B. Hydrophone
- C. Calorimeter
- D. Liquid crystal

17. True or False? A cracked transducer housing exposes patients to the greatest risk of electrical shock.

- A. True
- B. False

18. What small transducer measures the characteristics of a sound beam?

- A. Hydrophone
- B. Liquid crystal sheet
- C. Flow phantom
- D. Calorimeter

19. True or False? Bioeffects identified through in vitro research are not considered real.

- A. True
- B. False

20. What is the interaction of sound waves with stabilized, microscopic gas bubbles called?

- A. Calorimetry
- B. Cavitation
- C. Schlieren imaging

D. Dosimetry

21. What two terms is mechanical index related to?

- A. Frequency and peak negative pressure
- B. Output power and receiver gain
- C. Thermal index and exposure time
- D. Frequency and pulse duration

22. What is a small hypodermic needle that has a small piece of piezoelectric material attached to the end?

- A. Schlieren system
- B. Needle hydrophone
- C. Calorimeter
- D. Thermocouple

23. Which component of an ultrasound system is most likely to expose a patient to harm?

- A. Scan converter
- B. Receiver
- C. Transducer
- D. Display monitor

24. Of the two techniques used to study bioeffects, which approach searches for a relationship between cause and effect?

- A. Empirical approach
- B. Mechanistic approach
- C. Epidemiologic approach
- D. Calorimetric approach

25. What type of research is performed outside a living body?

- A. In situ
- B. In vitro
- C. In utero
- D. In vivo