

BODY FLUIDS

1. Compared to the intracellular fluid, the extracellular fluid has a high concentration of:

- a) Protein
- b) Phosphate
- c) Calcium**
- d) Magnesium
- e) Potassium

2. Oedema is due to low colloid osmotic pressure of plasma and is caused by:

- a) Heart Failure
- b) Arteriolar Dilation
- c) Liver Disease**
- d) Venous Obstruction
- e) Inflammation

3. Drinking one liter of pure water is expected to:

- a) Induce a greater increase in volume of ECF than ICF
- b) Induce a greater decrease in osmolarity of ECF than ICF**
- c) Induce an increase in urine flow
- d) Induce a greater increase in volume of plasma than interstitial fluid
- e) Induce a greater decrease in osmolarity of plasma than interstitial fluid

4. The Interstitial Fluid:

- a) Can be measured using insulin
- b) Is lower in volume than plasma
- c) Has a higher sodium concentration than plasma
- d) Has the same protein concentration as plasma
- e) Has slightly a higher concentration of chloride than plasma**

5. The osmolarity of extracellular fluid is likely to increase by:

- a) Passing hypertonic urine
- b) Infusing half isotonic NaCl solution
- c) Infusing 5% glucose solution
- d) Evaporating water from mucus membrane of respiratory system
- e) Vomitting a hypertonic gastric juice

6. Intravenous infusion of 1 liter of which of the following solutions will lead to the largest increase in ECF volume?

- a) Distilled water
- b) Isotonic NaCl
- c) Hypotonic NaCl
- d) Hypertonic NaCl
- e) Isotonic urea

7. The intracellular osmolarity is mainly due to:

- a) Chloride
- b) Proteins
- c) Potassium
- d) ATP
- e) Magnesium

8. The chief difference between plasma and interstitial fluid is that plasma contains more:

- a) Na^+
- b) K^+
- c) Electrolytes
- d) Water
- e) Protein ions

9. Body Water:

- a) Is mostly found in the interstitial compartment
- b) Is heavy water
- c) Moves between compartments by solvent drags
- d) Is the major constituent of the body
- e) Is not lost during expiration in cold weather

10. Osmolality of the extracellular fluid:

- a) Is 160-300 msom/L
- b) Is not affected by glucose concentration
- c) Is more than the osmolality of the intracellular fluid
- d) Is mainly due to Na^+ salts
- e) Is greatly increased by hyperkalaemia

11. The following are major constituents of the intracellular fluid *except*:

- a) Ca^{2+}
- b) Phosphates
- c) Chloride
- d) K^+
- e) Proteins

12. Movement of fluids from the interstitial space to plasma is due to:

- a) Blood pressure in the capillaries
- b) Plasma Na^+ concentration
- c) Plasma K^+ concentration
- d) Plasma protein concentration
- e) Plasma pH

13. The substance that contributes most of the intracellular osmolarity is:

- a) Protein
- b) Phosphate
- c) Potassium
- d) Urea
- e) Chloride

14. Which of the following combinations of substances is suitable for calculation of the interstitial fluid volume:

- a) A radioactive sodium & heavy water
- b) Heavy water & Inulin
- c) Inulin & Evan's blue dye
- d) Heavy water & Evan's blue dye
- e) Evan's blue dye & Iodine labeled albumin

15. The concentration of Ca^{2+} in the ECF is

- a) 5 mg/dL
- b) 5 mmol/L
- c) 5 meq/L
- d) 2.5 meq/L
- e) 2.5 ug/dL

16. The extracellular fluid differs from the intracellular fluid in that it has:

- a) A higher osmolarity
- b) No protein
- c) A lower calcium concentration
- d) A higher chloride concentration
- e) A higher magnesium concentration

17. Plasma Osmolarity is:

- a) Determined primarily by protein concentration
- b) Determined primarily by potassium concentration
- c) Determined primarily by sodium concentration
- d) Normally higher than that of interstitial fluid osmolarity
- e) About 250 mosm/L

18. Infusion of 1 Liter of which of the following solutions will have the greatest suppressive effect on thirst sensation:

- a) Distilled water
- b) Isotonic NaCl
- c) Hypotonic NaCl
- d) Hypertonic NaCl
- e) Tonic urea

19. Which of the following favors the development of oedema?

- a) An increase in colloid osmotic pressure of plasma
- b) A decrease in capillary hydrostatic pressure
- c) A decrease in interstitial fluid colloid pressure
- d) An increase in venous pressure
- e) An increase in arterial blood pressure

20. All of the following substances may be used to measure ECF except:

- a) Sucrose
- b) Inulin
- c) Radioactive sodium
- d) Evan's blue dye
- e) Thiosulfate

21. The primary force moving water from the plasma to the interstitial space is:

- a) Co-transport with sodium
- b) Co-transport with H^+
- c) Facilitated diffusion
- d)** Filtration
- e) Active transport

22. The main difference between plasma and interstitial fluid is the concentration of:

- a) K^+
- b) Cl^-
- c) Mg^{2+}
- d)** Proteins
- e) Phosphates

23. With obstruction of all lymphatics from an extremity:

- a) The hydrostatic force favoring filtration is increased
- b) Limit edema formation
- c)** The main cause of edema decreases plasma oncotic pressure
- d) Interstitial hydrostatic pressure is markedly increased
- e) Interstitial colloid osmotic pressure is decreased

24. In the absence of a hydrostatic pressure gradient, movement of water across a cell plasmalemmal membrane can occur only:

- a) Up its chemical concentration gradient
- b) By primary active transport
- c) By secondary active transport
- d) Down its chemical concentration gradient
- e) Through the lipid matrix of the plasmalemmal membrane

25. Intravenous infusion of 1 liter of which of the following solutions will lead to the largest increase in ECF volume?

- a) Distilled water
- b) Isotonic NaCl
- c) Hypotonic NaCl
- d)** Hypertonic NaCl
- e) Tonic urea

26. The ratio of body water to body weight is highest among:

- a) Average adult males
- b) Obese adult males
- c) Females
- d)** Newborn children
- e) Pregnant women

27. The osmolarity of plasma is determined by the concentrations of:

- a) Glucose, protein and urea nitrogen
- b) Glucose, sodium and urea nitrogen**
- c) Sodium, calcium and protein
- d) Sodium and bicarbonate
- e) Potassium and sodium

28. Low concentration of proteins in the plasma is expected to lead to:

- a) Reduced total body water
- b) Increased cardiac output
- c) Increased lymph flow
- d) Shift of fluid from the interstitium to plasma**
- e) Decreased interstitial fluid hydrostatic pressure

29. A patient is given a small dose of radioactive sodium, most of this sodium will distribute in:

- a) Plasma**
- b) Interstitial fluid
- c) Intracellular fluid
- d) Joint fluids
- e) Adipocytes

30. What would be the osmolarity of a solution which is one mole glucose and one mole NaCl:

- a) 1
- b) 2
- c) 3**
- d) 4
- e) 5

31. The volume of distribution of substance X in an average adult male is found to be 3.5 liters. This substance could be:

- a) Inulin
- b) Radioactive sodium
- c) Tightly bound to plasma proteins
- d) Heavy water
- e) Sucrose

32. The colloid osmotic pressure of plasma is mostly due to:

- a) Globulins
- b) Fibrinogen
- c) Albumin
- d) Lipoproteins
- e) Sodium

33. The solution that is expected to induce the greatest increase in plasma volume is:

- a) Normal saline
- b) Hypotonic saline
- c) Albumin solution
- d) 5% glucose
- e) Pure water

34. The volume of distribution of which of the following substances is lower than the extracellular fluid volume:

- a) Sucrose
- b) Inulin
- c) Evan's blue dye
- d) Heavy water
- e) Radioactive sodium

35. The concentration of Ca^{2+} in the ECF is

- a) 20 mg/dL
- b) 5 meq/L
- c) 5 mmol/L**
- d) 2.5 meq/L
- e) 10 µg/dL

36. Secondary active transport and facilitated diffusion are similar in that they:

- a) Use energy
- b) Use carriers
- c) Tend to restore equilibrium
- d) Transport water
- e) Use channels

37. In a normal 70 kg adult male:

- a) Total body water is approximately 60 liters
- b) About two thirds of total body water is intracellular
- c) Most extracellular water is intravascular
- d) Intracellular fluid is about 12 liters
- e) Interstitial fluid volume is 5% of total body water

38. Oedema may result from all the following *except*:

- a) Arteriolar vasoconstriction
- b) Venous obstruction
- c) Decrease in the oncotic pressure
- d) Increase in the interstitial fluid protein concentration
- e) Increase in capillary hydrostatic pressure

39. The osmolarity of plasma:

- a) Is lower than interstitial fluid osmolarity
- b) Is higher than intracellular fluid osmolarity
- c) Is determined mainly by plasma proteins
- d) Is determined mainly by sodium
- e) Ranges from 300 to 310 mosm/l

40. Which of the following decreases plasma osmolarity?

- a) Forming 1 liter of hypertonic urine
- b) Secreting 1 liter of sweat (150 mosml/liter)
- c) Loosing 1 liter water in expired air
- d) Vomitting 1 liter of gastric fluid (300 mosml/liter)
- e) Bleeding 1 liter of blood