

PHYSIOLOGY: Calcium MCQs - answers

1. When serum calcium (Ca^{++}) is high

- A: activity of renal 1 alpha hydroxyls is inhibited ✓
- B: expression of intestinal Calbindin-D is increased
- C: PTH secretion is increased
- D: 24, 25-dihydroxycholecalciferol production decreases

2. Calcitonin

- A: inhibits bone resorption ✓
- B: inhibits urinary excretion of calcium
- C: is deficient in Zollinger Ellison syndrome
- D: is produced in the parathyroid glands

3. Glucocorticoids

- A: can lead to hypercalcaemia
- B: increase intestinal absorption of calcium and phosphate
- C: inhibit protein synthesis in osteoblasts ✓
- D: suppress PTH secretion

4. Calcium

- A: crosses the brush border of intestinal epithelium via a $\text{Na}^+/\text{Ca}^{++}$ exchanger
- B: 50 000 mmol /day exchanges between bone and plasma
- C: 85% is stored in bone
- D: is more plasma-protein-bound at higher pH ✓

5. Phosphorus

- A: 85-90% is in the skeleton ✓
- B: 85-90% of daily intake is excreted in urine
- C: homeostasis is independent of vitamin D
- D: intestinal absorption is by diffusion down a concentration gradient

6. Regarding calcium in the kidney:

- A: absorption in the distal tubule is variable ✓
- B: is reabsorbed in the collecting duct
- C: is secreted in the ascending limb of the loop of Henle
- D: 98% is reabsorbed in the proximal tubule

7: PTH (Parathyroid hormone) increases

- A: osteoblast activity in the short term
- B: reabsorption of Ca^{++} in the distal tubules ✓
- C: reabsorption of urinary phosphate in the distal tubules
- D: serum albumin

8: Trabecular bone

A: has a low surface to volume ratio

B: is supplied with nutrients via Haversian canals

C: makes up 80% of bone in adults

D: receives nutrients via diffusion from extracellular fluid ✓

9. Osteoclasts

A: are relatively inactive in children

B: attach to bone via integrins ✓

C: dissolve hydroxyapatite using alkaline secretions

D: increase activity in response to growth factors that act on fibroblasts

10. Vitamin D3

A: has limited first pass metabolism

B: has little absorption from the gastrointestinal tract

C: is bound to albumin in plasma

D: is produced by the action of sunlight on 7-dehydrocholesterol ✓