

Endocrine

[ED01](#) [Mar96] [Mar97] [Jul99] Effects of a 24 hour fast:

- A. Glycogenolysis (?gluconeogenesis)
- B. Protein catabolism
- C. Acidosis
- D. Ketone production from protein
- E. All of the above

Alt version: After 24 hours without food or water a healthy young adult will:

- A. Deplete glycogen rapidly
- B. Develop a metabolic acidosis
- C. Demonstrate ketone body formation in the liver - begin to!
- D. Have decreased protein content of body

[ED02](#) [Mar96] Which hormone causes increased BSL, increased protein anabolism & increased plasma FFA?

- A. Cortisol ↑FFA, ↑BSL, ↑aa plasma level
- B. Parathyroid hormone
- C. Growth hormone
- D. Insulin ↑glycogenesis, ↓GNG, ↑protein synthesis, ↑fat synthesis

[ED03](#) [Mar96] Which hormone causes increased BSL, increased protein catabolism & increased plasma FFA?

- A. Cortisol
- B. Parathyroid hormone
- C. Growth hormone
- D. Insulin

[ED04](#) [Mar96] Which of the following are associated with adrenocortical hypofunction?
addisons. features weight loss, lethargy, hypotension

- A. Aseptic necrosis of bone. idiopathic or steroid administration
- B. Osteoporosis. oestrogen def or steroids
- C. Redistribution of body fat cushings - adrenocortical hyperfunction

D. Decreased muscle bulk

E. Delayed closure of epiphyses - ↓growth hormone or IGF-1

ED05 [Mar96] [Jul97] [Mar98] [Jul01] [Jul04] The hypothalamus inhibits the release of:

A. TSH

B. ACTH

C. FSH

D. GH GIH from hypothalamus

E. Oxytocin

ED06 [Mar97] [Jul00] [Jul01] [Mar03] [Jul03] Secretion of renin is stimulated by:

A. Increased left atrial pressure

B. Increased angiotensin II

C. Decreased right atrial pressure

D. ??erythropoietin

Alt version: Which decreases renin release:

A. PG - increases

B. Angiotensin II

C. Vasopressin

D. Baroreceptor stimulation - would indirectly by ↓SNS output

E. ANP

F. Increased right atrial pressure - volume receptor activation > ↑ANP & ↓vasopressin

- ↑volume ⇒
 - ↓vasopressin
 - ↑ANP (atrial) & ↑BNP (brain) ⇒ diuresis
 - ↳ ⇒ ↑Na excretion by kidneys
- ↓volume ⇒
 - ↑angiotensin II ⇒
 - VC
 - ↑aldosterone
 - ↑thirst
 - ↓bp ⇒ ↓glom cap pressure ⇒ ↓GFR ⇒ ↓Na filtered
 - ↓mean intravascular pressure ⇒ ↑aldosterone ⇒ ↑Na reabsorped

ED07 [Mar97] [Apr01] Regarding hyperglycaemia: Which of the following is untrue? It causes:

A. Increased H⁺

B. Increased Na⁺ (?K⁺)

- C. Increased urine output
- D. Increased ECF (or blood volume)
- E. Increased glucagon

[ED08](#) [Jul97] [Mar99] [Feb00] [Apr01] [Feb04] Mechanism of action of ADH:

- A. Insertion of water channels (pores) into basolateral membrane
- B. Increase in GFR
- C. Insertion of water channels into luminal (apical) membrane
- D. Increased Na⁺ uptake in DCT
- E. Removal of water pores from apical membrane

NOTE: the water permeability of the basolateral membranes of renal epithelial cells is always high because of the presence of other aquaporin isoforms – the permeability of the luminal membrane is hence rate limiting.

Alt version: ADH and the cortical collecting ducts

- A. Inserts water channels into the apical membrane
- B. Inserts water channels into the basolateral membrane
- C. Increases paracellular flow

[ED09](#) [Jul97] How many hours after a meal is Basal Metabolic Rate (BMR) measured?

- A. 1 hour
- B. 2 hours
- C. 6 hours
- D. 12 hours
- E. 18 hours

(Note: Another response gave 4, 8, 12, 15 & 20 hrs as the options)

[ED10](#) [Jul97] [Feb00] Which ONE of the following is a water soluble vitamin?

- A. Vitamin A
- B. Vitamin B
- C. Vitamin D
- D. Vitamin E
- E. Vitamin K

[ED11](#) [Jul97] [Jul99] [Apr01] Insulin (? OR: Insulin receptor):

- A. Receptor site intracellular
- B. Inactivates tyrosine kinase
- C. Activates membrane glucose transport
- D. Acts via activation of transport protein to increase glucose transport into cells **glut 4 insertion into cell membrane**

[ED11b](#) [Mar02] [Jul02] How does insulin act?

- A. Voltage gated ion channels
- B. Tyrosine kinase membrane receptor
- C. Nuclear receptor
- D. G protein
- E. ?

[ED12](#) [Jul97] [Jul01] Heat production at rest is mostly due to:

- A. Skeletal muscle activity
- B. Na-K ATPase pump - **25% BMR but ?heat? may be slightly higher than skel mm**
- C. Dynamic action of food
- D. ?

[ED12b](#) [Feb00] [Mar02] Decreased heat production under general anaesthesia is due to:

- A. Decreased skeletal muscle tone
- B. Decreased anterior pituitary function
- C. Vasodilatation
- D. Starvation
- E. Decreased Na⁺/K⁺ ATPase activity

Mar 2002 version:

Heat loss in anaesthesia due to

- A. Loss Na/K ATPase (?)
- B. Loss of skeletal muscle tone
- C. Vasodilatation
- D. Respiratory tract
- E. ?

EM13]] [Jul97] [Mar99] [Jul00] Angiotensinogen secretion is increased by:

A. ACTH causing ↑ glucocorticoids

B. Beta-endorphin

C. Growth hormone

D. Antidiuretic hormone

E. Prolactin

- circulating level is ↑ed by:
 - glucocorticoids
 - thyroid hormones
 - oestrogens
 - cytokines
 - AT II

[ED14](#) [Jul97] [Jul01] The energy value of 1g of carbohydrate is:

A. 3 kcal

B. 4 kcal

C. 5 kcal

D. 7 kcal

E. 9 kcal

[ED15](#) [Mar98] [Jul01] Oxytocin causes:

A. Decrease in systolic blood pressure

B. Water intoxication - does have slight ADH like activity > high dose > water intox poss

C. Increase in cardiac output hypotension causing reflex tachy which actually incr CO

D. Increase in systolic blood pressure

E. All of the above

(see MD01)

[ED16](#) [Mar98] [Mar99] ADH secretion:

A. Plasma osmolality at osmoreceptors in posterior hypothalamus - anterior

B. Decreased ECF volume

C. ?

[ED18](#) [Jul98] [Jul99] [Apr01] [Jul02] G protein coupled receptors. All true EXCEPT:

A. Seven transmembrane components

B. Hydrophobic links

C. Extracellular portion for phosphorylation - residues on cytoplasmic surface are phosphorylated

D. G protein has intrinsic GTPase activity

E. The receptor is a heterotrimeric protein

(See also MD13 in Pharm MCQs)

Jul 99 version: G proteins include:

A. Multiple external phosphorylation sites

B. Alpha subunit has GTPase activity

C.

(Comment: also remembered as *ATPase activity*. The intrinsic GTPase activity resides in the alpha sub-unit. The G protein is the heterotrimer not the GPCR)

[ED19](#) [Jul98] Regarding the interthreshold range in temperature control:

A. Is constantly altered by feedback from temperature sensors in the periphery

B. Is lowered by general anaesthetic agents - **incred**

C. ?

D.

[ED19b](#) [Jul98] The set-point of temperature of an adult is normally 37.1C. This:

A. Is fixed in individuals -**no is labile. set by hypothalamus**

B. ?

C. Parallels rectal temperature

D. Decreases with exercise

E. Decreases with anaesthesia - **temp ↓s but set point is in middle of interthreshold range**

[ED20](#) [Jul98] [Feb00] Decrease in set temperature in anaesthesia due to:

A. Decreased Na⁺-K⁺ ATPase activity

B. Decreased skeletal muscle activity

C. Vasodilatation

D. Starvation

balance between the sodium and calcium concentrations (more intracellular Na -> rise in set point) being the actual mechanism by which the set point is set, but I am unsure whether the Na-K ATPase pump is involved

[ED21](#) [Jul98] [Mar99] [Apr01] Endothelins:

- A. Produced by damaged vascular endothelium
- B. Vasoactive**
- C. Found in brain & intestine
- D. ?

[ED22](#) [Jul98] [Feb04] Growth hormone:

↑BSL, ↑plasma FFA which can ⇒ ketone production

starvation & ↓BSL ⇒ ↑GH release

- A. Increases fatty acid production (or increases plasma FFA)
- B. Increases glucose output from the liver
- C. Causes ketosis
- D. Provides a source of energy during hypoglycaemia
- E. Can act as an energy source during starvation
- F. **all of above** although d&e worded poorly

[ED23](#) [Mar99] [Jul00] [Feb04] A low respiratory quotient in a septic patient is due to:

- A. Increased lactic acid
- B. Fat metabolism**
- C. Increased ventilation
- D. Fever
- E. Hypoxaemia

ix) Usually ranges .7-1.0 at rest

(1) RER = .7 indicates that only fat is being used as a substrate

(2) RER = 1.0 indicates that only CH₂O_s are being used

(3) RER = .82 is approximately the average resting RER, which represents

x) During intense exercise RER may exceed 1.0 and if the exercise is very intense may approach 1.4.

Jul 2000 version: **Respiratory exchange ratio** increased in septic patient because

note RER and not RQ

- A. Increased CO₂ output
 - B. Increased O₂ uptake
 - C. Increased fat utilisation
 - D. ?
- (? respiratory quotient)

[ED23b](#) [Mar03] [Jul03] Respiratory exchange ratio:

measured at mouth but equal to cellular level V_{CO_2}/V_{O_2}

RQ = only metabolism

RER can include buffering or acid base disturbance confounders eg from strenuous ex or sepsis

- A. Always equals respiratory quotient Usually RER = RQ. but see prev sentence
- B. Increases in strenuous exercise
- C. Decreases after payment of oxygen debt
- D. Is measured at steady state
- E. ?

[ED24](#) [Feb00] Lactate

- A. The way products of glucose enter the citric acid cycle
- B. Formation used to regenerate NADP - formation from pyruvate regenerates NADH back into NAD⁺ (NADP recycled by hexose monophosphate shunt of EM pathway in order to maintain glutathione)
- C. ?

Alt version: Normal blood lactate level is 2 mmol/l. Where does this come from

- A. Even in resting individuals there is some anaerobic metabolism
- B. Lactate is the substrate that is produced to enter the citric acid cycle

[ED25](#) [Jul00] [Mar02] [Jul02] [Mar03] [Jul03] Phosphorylase:

causes breakdown of glycogen 1:4a linkage

- A. Is found in all human cells
- B. Present in liver & muscle
- C. Increased activity by adrenaline
- D. In liver increases glycogen production and reduce breakdown of glycogen

E. "Something about cAMP/adrenergic transmission"

The following MCQ fragment has also been submitted BUT looks like its the same MCQ:

During starvation:

- A. Glucagon causes increased phosphorylase activity in liver/muscle - only has action in liver
- B. Adrenaline causes increased phosphorylase activity in liver/muscle
- C. ?

[ED26](#) [Jul99] [Feb00] [Apr01] [Jul01] [Jul02] [Jul04] Creatine phosphate:

- A. Is a source of creatinine for protein synthesis.
- B. Is a source of cyclic AMP for second messenger systems.
- C. Is a high energy phosphate source for muscle contraction.
- D. Is a source of urea for loop of Henle gradient
- E. Energy source for ADP production.

(This was Q No. 54 on the Jul 01 paper)

Previous versions which are considered to be the above question remembered differently :

Creatine phosphate is important in:

- A. Readily usable phosphate for muscle upon intensive exercise
- B. Synthesis of urea
- C. Supply of ATP
- D. ?

?Creatinine ?Creatine

- A. ?Phosphorylcreatine is synthesised in the liver
- B. ?Phosphorylcreatine is excreted in the urine
- C. ?During exercise phosphorylcreatine reacts with ADP
- D. ?
- E. Rate of creatinine (?excretion/production) remains constant throughout life

[ED27](#) [Apr01] Metabolic rate is increased least with:

- A. Exercise
- B. Specific dynamic action of food
- C. Hot climate
- D. Cold climate
- E. Increased CNS activity

[ED28](#) [Apr01] Glucocorticoids

A. Increases RBC

B. Increases lymphocytes

C. ?

- Mild increase in number of RBCs
- Increased Platelets and neutrophils
- Decrease in lymphocytes and eosinophiles

[ED29](#) [Jul01] ADH secretion is decreased by:

A. Morphine

B. Nicotine

C. Nausea (?and vomiting)

D. Hypoxia (or: ACTH)

E. Alcohol

[ED30](#) [Mar03] [Jul03] Calcitriol - Main actions on calcium by

A. Increased absorption of Ca^{++} and PO_4 from gut

B. Negative feedback on PTH - true but indirect action on Ca

C. Increased absorption of vit D from gut

D. Increased parathormone levels

[ED31](#) Brown fat MCQ - recoded as [MF05](#) as its an old MCQ which has re-surfaced

[ED32](#) [Jul06] Basal insulin secretion in an otherwise healthy person (70kg) :

A. 10 U/hr

B. 7 U/hr ?8

C. 5 U/hr ?6

D. 2 U/hr

E. 1 U/hr

- I'm pretty sure the choices were 1 / 2 / 4 / 8 Units/Hr
- I'm pretty sure they were 1/2/6/10 units/hr!