

MCQ's från tidigare EDAIC pt I (Grön = True, Röd = False)

The following factors enhance the diffusion of a drug across the blood-brain barrier

- a. high plasma protein binding
- b. high degree of ionisation at physiological pH
- c. high molecular weight
- d. high lipid solubility
- e. high plasma-brain concentration gradient

The blood-brain barrier

- a. is composed mainly of endothelial cells
- b. is functionally affected by infections of the central nervous system
- c. restricts passive diffusion of glucose from blood to brain
- d. is less permeable in neonates than adults
- e. is freely permeable to hydrogen ions

Cerebrospinal fluid (CSF)

- a. Has the same PaO₂ as arterial blood
- b. Has fewer proteins than venous blood
- c. Has the same pH as arterial blood
- d. Has the same sodium ion concentration as venous blood
- e. Has the same chloride ion concentration as venous blood

In normal individuals with a normal PaCO₂, cerebral blood flow

- a. autoregulates between cerebral perfusion pressures of 50 and 100 mmHg.
- b. is reduced when breathing 100% oxygen
- c. increases with hypothermia
- d. is normally 45 ml/mg per min
- e. increases following administration of 0,5 g/kg mannitol

Regarding cerebral fluid

- a. It is an ultrafiltrate of plasma
- b. It is actively secreted
- c. It is mostly stored in the lateral ventricle
- d. It is absorbed via the venous plexus of the spinal cord
- e. The specific gravity is reduced during pregnancy

Cerebrospinal fluid

- a. production in an adult is 150 ml/24 h
- b. is mainly reabsorbed in the lateral ventricles
- c. does not accurately reflect acute changes in base excess in arterial blood
- d. is virtually free of glucose
- e. specific gravity (relative density) is 1,015-1,020

The transmitter substances in all the ganglia of the autonomic nervous system include

- a. Acetylcholine
- b. Noradrenaline
- c. 5-hydroxytryptamine
- d. Butyrylcholine
- e. dopamine

Intracranial blood volume is increased by

- a. halothane
- b. vecuronium
- c. thiopentone
- d. nitroglycerine
- e. ketamine

Cerebral oxygen consumption is significantly decreased by

- a. Propofol
- b. Thiopentone
- c. Nimodipine
- d. nitrous oxide
- e. fentanyl

Measurement of the relationship between intracranial pressure and volume assesses

- A. the integrity of the blood-brain barrier
- B. cerebral compliance
- C. cerebral blood flow
- D. cerebral metabolic rate
- E. cerebral vascular diameter

Postoperative cerebral vasospasm in a patient with a subarachnoid haemorrhage

- a. does not occur provided that the aneurysm has been clipped successfully
- b. may be treated with calcium antagonists
- c. usually occurs two weeks after operation
- d. is prevented by postoperative ventilation
- e. may produce a hemiplegia

In the diagnosis of brain-stem death

- a. clinical criteria are invalid in a hypothermic patient
- b. caloric testing is used to test the integrity of the Vth cranial nerve
- c. an isoelectric EEG is pathognomonic
- d. absence of neuromuscular blockade should be confirmed with a peripheral nerve stimulator
- e. reflex movements of the legs may still occur

Methods of reducing intracranial pressure include

- A. mannitol
- B. sodium nitroprusside
- C. ventricular drainage
- D. isoflurane
- E. nimodipine

Acute subdural haematoma

- a. results from haemorrhage from the middle meningeal artery
- b. is frequently bilateral
- c. is often associated with secondary bleeding following decompression
- d. is a complication of chronic alcoholism
- e. carries a good prognosis when associated with a basal skull fracture

The following are associated with increased intracranial pressure following head trauma:

- a. papilloedema
- b. pulmonary oedema
- c. hypertension
- d. a Glasgow coma score greater than 12
- e. bradycardia

Positive end expiratory pressure (PEEP) decreases

- A. intrathoracic blood volume
- B. PaCO₂
- C. functional residual capacity
- D. intracranial pressure
- E. pulmonary capillary wedge pressure

The "blood-brain barrier"

- a. is formed by the arachnoid villi
- b. is less permeable in the newborn
- c. is freely permeable to bicarbonate ions
- d. does not permit free passage of organic anions
- e. has similar functional characteristics to a cell membrane

The blood-brain barrier:

- a) anatomically, is at the arachnoid villi
- b) is less permeable in the neonate
- c) results in the total exclusion of many certain from the brain
- d) results in very low catecholamine levels in the brain and spinal cord
- e) is functionally similar to a cell membrane

The effects of opioids at a desired CNS receptor site depend on:

- a) route of administration
- b) volume of distribution
- c) ionisation and protein binding
- d) cerebral blood flow
- e) permeability of blood-brain barrier

Cerebrospinal fluid

- a - has a composition almost identical to plasma
- b - is produced by the choroid plexus
- c - circulates from the subarachnoid space into the cerebral ventricles
- d - is absorbed into the arachnoid villi
- e - is produced at a rate of 150ml/day

Cerebral autoregulation

- a - is shifted to the left in systemic hypertension
- b - is generally expressed as the relationship between cerebral blood flow and systolic blood pressure
- c - attempts to keep cerebral blood flow constant at normal blood pressures
- d - is rarely impaired following a head injury
- e - is most likely explained by the myogenic theory

Cerebral blood flow

- a - averages 20ml/100g/min
- b - is dependent on the mean arterial pressure and the intracranial pressure
- c - increases by 2-4% for each mmHg increase in PCO₂
- d - usually matches cerebral metabolism (flow-metabolism coupling)
- e - cannot be measured using the Kety-Schmidt equation

Intracranial pressure (ICP)

- a - is usually between 0 and 10mmHg
- b - if raised causes hypertension and tachycardia
- c - can be reduced by improving the cerebral perfusion pressure
- d - and its relationship with intracranial volume is shown on the elastance curve
- e - is increased when a patient is put head-down