



# Neuro Quiz 53

## Pitfalls in Neuro-anesthesia

***THIS QUIZ IS BEING PUBLISHED ON BEHALF OF THE  
EDUCATION COMMITTEE OF THE SNACC***

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1. Which of the following statements about airway management of a trauma patient with suspected cervical spine injury is TRUE?

- A. Cord injury is suspected only if there is cervical spine fracture or displacement on radiological examination
- B. If cord injury is suspected, intubation should be done using a flexible bronchoscope with the patient awake
- C. Mask ventilation causes more cervical spine movement than direct laryngoscopy
- D. The cervical collar should not be removed while intubating using a direct laryngoscope

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1.A Cord injury is suspected only if there is cervical spine fracture or displacement on radiological examination

- This is INCORRECT
- Cervical spine injury should be presumed in all severe trauma patient
- Absence of bony fracture or displacement on radiological evaluation does not rule out cord injury

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1.B If cord injury is suspected, intubation should be done using a flexible bronchoscope with the patient awake

- This is INCORRECT
- In an emergency situation flexible bronchoscopy may be difficult in an anxious, restless patient with blood and vomit in the airway
- A rapid sequence induction with manual in-line stabilization is appropriate
- Awake flexible bronchoscopy may be required in a difficult airway situation

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1.C Mask  
ventilation causes  
more cervical spine  
movement than  
direct laryngoscopy

- This is CORRECT
- Cine-fluoroscopy was used to measure cervical spine displacement during airway management in 8 human trauma victims with 40 minutes of their death.
- Mask ventilation caused the most displacement (2.93mm), followed by oral intubation over a lighted stylet (1.65mm), oral intubation via direct laryngoscopy(1.51mm) and least with nasal intubation (1.2mm)

• *Hauswald et al. Am J Emerg Med. 1991; 9:535-8*

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1.D The cervical collar should not be removed while intubating using a direct laryngoscope

- This is INCORRECT
- The appropriate cervical collar will limit the mouth opening and the anterior portion of the collar needs to be removed to allow direct laryngoscopy
- However, manual in-line stabilization of the cervical spine should be performed when the collar is removed

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2. Which of the statements about postoperative visual loss (POVL) after spine surgery is FALSE?

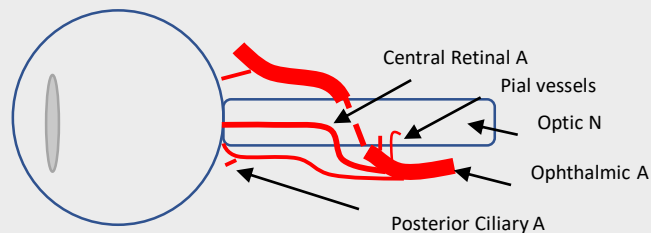
- A. Central retinal artery occlusion is usually unilateral
- B. Ischemic optic neuropathy is the most common cause for permanent POVL
- C. Ischemic optic neuropathy is associated with emboli into the retinal artery
- D. Central retinal artery occlusion is associated with direct compression of the globe



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## 2.A Central retinal artery occlusion (CRAO) is usually unilateral

- This statement is CORRECT
- Prone position increases the risk of CRAO due to external ocular compression caused by weight of the head against the headrest
- CRAO may be reversible if treated within 6h
- Treatment includes vasodilators, ocular massage and thrombolytic agents



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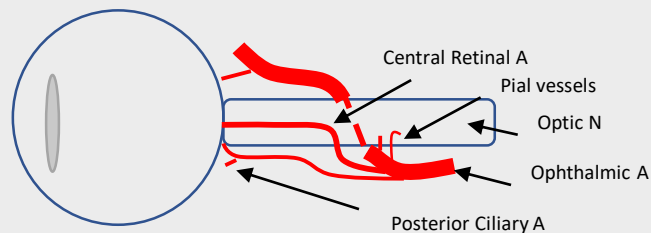




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2.B Ischemic optic neuropathy (ION) is the most common cause for permanent POVL

- This statement is CORRECT
- Prone and Trendelenburg position increase intraocular pressure and ophthalmic vein congestion leading to ION
- Anterior ION (AION) is located anteriorly to the *lamina cribrosa* and is most likely caused by posterior ciliary artery occlusion while Posterior ION (PION) is posterior and results from improper pial vessel supply.



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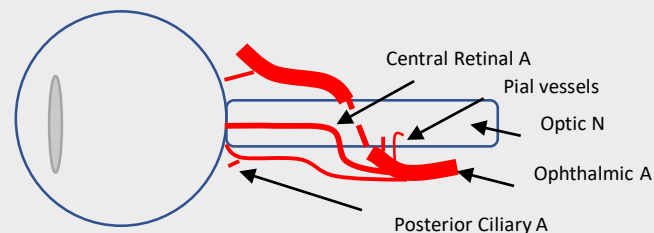
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2.C Ischemic optic neuropathy (ION) is associated with emboli into the retinal artery

- This statement is INCORRECT
- The central retinal artery and the posterior ciliary artery are branches of the ophthalmic artery. The veins of the retina drains into the cavernous sinus
- Prone and Trendelenburg position increase intraocular pressure and ophthalmic vein congestion leading to ION
- Central retinal artery occlusion is caused by emboli of the retinal artery
- Frontiers in Surgery 2017; 4:34 doi: [10.3389/fsurg.2017.00034](https://doi.org/10.3389/fsurg.2017.00034)



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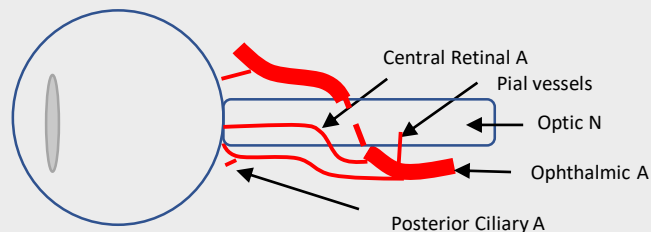
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2.D Central retinal artery occlusion is associated with direct compression of the globe

- This statement is CORRECT
- Central retinal artery occlusion (CRAO) is a result of emboli and globe compression resulting in a loss of blood supply of the surface layer of the optic disk



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3. The risk factors for hypotension during decompressive craniotomy for intracerebral bleed include all EXCEPT?

- A. [Low Glasgow Coma Scale score](#)
- B. [Absence of basal cisterns on CT scan](#)
- C. [Bilateral dilated pupils](#)
- D. [Elevated Fibrinogen](#)



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## 3.A Low Glasgow Coma Scale score

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- Low GCS indicates a high ICP



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## 3.B Absence of basal cisterns on CT scan

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- Absence of basal cisterns indicates a raised ICP



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## 3.C Bilateral dilated pupils

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- A bilateral dilated pupils indicate raised ICP



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## 3.D Elevated Fibrinogen

- This is INCORRECT
- Elevated Fibrinogen Degradation Products (FDP) may predict intraoperative hypotension during decompressive craniotomy
- Coagulation disorder triggered by traumatic brain injury can lead to intraoperative hemostatic disorder, hemorrhage and postoperative cerebral edema
- JA Clin Rep. 2018; 4: 8 doi: [10.1186/s40981-018-0146-5](https://doi.org/10.1186/s40981-018-0146-5)

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4. Which of the following is a relative contraindication for 'awake' craniotomy?

- A. [Temporal lobe tumor](#)
- B. [Epilepsy](#)
- C. [Tumor involving the motor cortex](#)
- D. [Anxiety & Psychiatric disorders](#)



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## 4.A Temporal lobe tumor

- This is INCORRECT
- Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for 'awake' craniotomy

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## 4.B Epilepsy

- This is INCORRECT
- Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for 'awake' craniotomy
- Awake craniotomy allows an accurate electrocorticogram recordings and assists complete resection of the epileptic focus



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## 4.C Tumor involving the motor cortex

- This is INCORRECT
- Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for 'awake' craniotomy
- Awake craniotomy helps delineate the primary and secondary motor cortex and facilitates complete tumor resection while preserving the motor function



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## 4.D Anxiety & Psychiatric disorders

- This is CORRECT
- Patients with severe anxiety and psychiatric disorders may be inappropriate for 'awake' craniotomy
- Patients with difficult airways and/or obstructive sleep apnea present relative contraindication for 'awake' craniotomy

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5. Which of the following statements about intracranial pressure (ICP) is TRUE?

- A. ICP provides a direct measurement of cerebral blood flow
- B. ICP should be maintained below 30 mmHg
- C. ICP monitoring is not indicated in patients with severe traumatic brain injury with a normal CT scan
- D. Hyperventilation to reduce ICP should be used only for brief periods as it can cause brain ischemia



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5.A ICP provides a direct measurement of cerebral blood flow (CBF)

- This is INCORRECT
- ICP monitoring does not provide direct information about the CBF, it allows one to calculate the cerebral perfusion pressure (CPP)



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5.B ICP should be maintained below 30 mmHg

- This is INCORRECT
- The ICP should be maintained below 20 mmHg

[PREVIOUS QUESTION](#)





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5.C ICP monitoring is not indicated in patients with severe traumatic brain injury (TBI) with a normal CT scan

- This is INCORRECT
- ICP monitoring is recommended in all salvageable patients with severe TBI (GCS $\leq$ 8) and an abnormal CT scan (hematomas, concussion, swelling, herniation or compressed basal cistern)
- It is also indicated in severe TBI with normal CT scan provided age $>$ 40, motor posturing or systolic blood pressure  $<$ 90 mmHg
- Guidelines for the management of severe traumatic brain injury VI. Indications for intracranial pressure monitoring. J Neurotrauma. 2007;24 (Suppl 1):S37–S44. Brain Trauma Foundation



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5.D Hyperventilation to reduce ICP should be used only for brief periods as it can cause brain ischemia

- This is CORRECT
- Hyperventilation is routinely used to provide brain relaxation and optimize surgical conditions
- However, the decrease CBF from hyperventilation-induced cerebral vasoconstriction can potentially cause or exacerbate cerebral ischemia