

SAJAA CPD ANSWER FORM – September/October 2022

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per edition

Please answer the following questions:

Waste not, want not: the anaesthesiologist and the environment

1. Of the commonly used volatile agents, which one has the highest global warming potential (GWP)?

- Sevoflurane
- Desflurane
- Halothane
- Isoflurane

2. Of the commonly used volatile agents, which one has the lowest GWP?

- Sevoflurane
- Desflurane
- Halothane
- Isoflurane

3. N₂O is potentially more harmful than volatile agents due to its

- low minimum alveolar concentration (MAC).
- high GWP.
- slow alveolar uptake.
- low ozone-depleting potential (ODP).

4. From a sustainability perspective, what is the potential concern regarding propofol?

- Its high GWP
- Its aquatic bioaccumulation and toxicity
- Generation of high plastic waste during total intravenous anaesthesia (TIVA)
- Its high ODP

5. Anaesthesia delivery contributes what proportion of total theatre waste?

- 10%
- 25%
- 40%
- 60%

The vagus nerve: current concepts in anaesthesia and ICU management

6. Regarding vagus nerve (XN) tone:

- XN tone is heightened in stress conditions either of inflammatory and/or infectious origin.
- A shift toward parasympathetic prevalence may contribute to age-related conditions, such as hypertension, and heart failure.
- Normal ageing is associated with an increase in sympathetic prevalence and/or decreases in the vagal tone.

7. SARS-CoV-2 neuroinvasion:

- In SARS-CoV-2 infection, XN stimulation improves clinical outcomes by limiting neuronal invasion and the ensuing inflammation.
- SARS-CoV-2 is prone to neuroinvasion from the lung along the XN up to the brainstem autonomic nervous centres involved in the coupling of cardiovascular and respiratory rhythms.
- The lethal outcomes of SARS-CoV-2 may rely on critical hyperactivity of the efferent XN cholinergic pathway.

8. The XN and long COVID:

- Long COVID is a potentially disabling syndrome affecting 20–25% of individuals infected with SARS-CoV-2.
- Symptoms associated with long COVID include dysphonia, dysphagia, dizziness, paroxysmal tachycardia, orthostatic hypotension, and diarrhoea.
- In individuals with symptoms suggestive of long COVID, an ultrasound of the XN in the neck may show atrophy and decreased echogenicity of the XN.

9. Regarding the auricular branch of the vagal nerve (ABVN) and transcutaneous auricular vagus nerve stimulation (TAXNS):

- Invasive XN stimulation is superior, more reliable, and has a better safety profile when compared to TAXNS.
- The ABVN and the great auricular nerve have been found to be solely on the antihelix in 50% of patients.
- The ABVN provides ramification for the cymba conchae in almost 100% of patients.

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10. Regarding the safety of invasive electrical stimulation of the XN (IXNS) and TAXNS:

- Reported adverse events of TAXNS include voice alterations, dyspnoea, and stridor.
- TAXNS should only be performed in the left ear due to its arrhythmogenic potential.
- Recurrent intraoperative obstructive episodes as a result of tetanic contraction of the left-sided musculature of the larynx can occur in patients with IXNS in whom laryngeal mask airways are inserted.

Evaluation of serum troponin I following the use of a modified-cardioplegia chemical composition for myocardial protection: a case series

11. Regarding cardioplegia solution and the calcium paradox:

- The best cardioprotective effect is observed when the concentration of calcium given is below 0.5 mmol/L.
- The depletion of calcium will provide protection for the heart because it will cause re-initiation of the heartbeat.
- Calcium concentration below 0.1 mmol/L can be dangerous for the heart because no contraction occurs.
- A large amount of calcium (minimum 0.1 mmol/L) is required to maintain the structural integrity and function of the glycocalyx-plasma membrane complex.

12. The consideration to use Ringerfundin as the base for del Nido cardioplegia is based on the evidence that it

- reduces the risk of myocardial damage.
- has a high calcium concentration.
- shows unstable metabolic effects but decreases oxygen consumption.
- will not cause electrolyte imbalances when more than 3 L is administered.

13. The reason why del Nido cardioplegia provides a theoretical advantage over other cardioplegia solutions is that

- its components will not limit calcium influx.
- it significantly lowers extracellular calcium levels.
- it results in high intracellular calcium levels.
- it is calcium-free and contains lidocaine as a Na⁺ channel blocker.

14. Del Nido cardioplegia solution increases intracellular potassium concentration, and as a result,

- diastolic cardiac arrest occurs non-electromechanically so that a more precise operating field will occur.
- systolic cardiac arrest occurs electromechanically so that the contraction will be preserved.
- diastolic cardiac arrest occurs electromechanically, aiming to protect the myocardium from ischaemic injury.
- systolic cardiac arrest occurs electromechanically, aiming to protect coronary perfusion.

15. A common cause of cardiopulmonary bypass machine-related adverse effects is

- myocardium irritation.
- low potassium concentration.
- low calcium concentration.
- disturbance of coronary perfusion.

Upper airway obstruction and sepsis following endotracheal intubation in paediatric cardiac surgical patients in South Africa

16. Subglottic stenosis

- is a major concern following intubation, especially within the paediatric population.
- does not warrant steps to minimise the risk of its development.
- is not related to intubation and mechanical ventilation.

17. The use of cuffed tubes

- decreases the need for repeat laryngoscopy and tube exchange.
- was shown to be more prevalent amongst senior staff.
- did not improve ventilation.

18. Complications from both cuffed and uncuffed endotracheal tubes (ETTs)

- have led to improved designs of ETTs with a low pressure/high volume cuff.
- always lead to sepsis.
- should be treated with surgery.

19. Cuff pressure monitoring

- was not performed by 60% of doctors.
- is not important in the role of development of subglottic stenosis.
- should not be routinely performed and documented in ICUs.

20. ETT size is important in children

- since overestimating the size increases the risk of airway complications.
- however not as important as whether a cuffed or uncuffed tube is used.
- and all brands of tubes have the same dimensions.

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