



The Hong Kong College of Anaesthesiologists

Intermediate Fellowship Examination

Written Paper in Pharmacology

10 July 2020 (Friday)

14:00 - 16:00 hours

Instructions:

- a. There are twelve pre-labelled answer books. Please make sure you answer the questions in the respective answer book.
- b. Write your candidate number on the cover of each answer book.
- c. Use ink or ball-point pen.
- d. Answer ALL questions. They are worth equal marks and you should spend approximately **ten minutes** for each question. For questions with multiple parts, allocation of marks is indicated in the brackets.

1. Explain the pharmacokinetic properties of ropivacaine that affect its speed of onset and duration of action.
2. Discuss the pharmacetics, mechanism(s) of action and adverse effect(s) of ketamine with reference to its use for perioperative pain management.
3. Discuss the advantages and disadvantages of using Intravenous remifentanyl patient controlled analgesia (PCA) for labour pain relief.
4. Explain with examples for the following terms about the liver metabolism:
 - i. High and low hepatic extraction ratio, (50%)
 - ii. First order and zero order kinetics. (50%)
5. What are the differences in the content of Plasma-Lyte A and 0.9% normal saline? (50%)
What are the potential advantages of transfusing Plasma-Lyte A instead of 0.9% normal saline in critically ill surgical patient? (50%)
6. Compare and contrast the mechanism of action, clinical utility, adverse effects and pharmacokinetics of neostigmine and sugammadex for the reversal of non-depolarizing neuromuscular blockade.
7. Discuss the merits and problems of nitrous oxide in contemporary anaesthesia.
8. Describe, with examples, the pharmacological mechanisms of drugs that can be used to decrease the volume and/or acidity of the gastric contents in the perioperative period.
9. Classify diuretics with respect to their mechanisms of action and give example in each class.
10. Describe the mechanism(s) of action (25%), pharmacodynamics and associated side effects of anti-muscarinic drugs. (75%)
11. Draw and explain the characteristics of a quantal dose-response curve of rocuronium. (50%)
Describe, and illustrate in the same graph, the factors that may alter this curve clinically. (50%)

12. A clinical trial was conducted to compare a new local anaesthetic cream (Cream A) and EMLA cream for the prevention of pain on venepuncture in 50 medical students. For each student, Cream A was applied to one hand (either the left or right, chosen at random) and EMLA cream was applied to the other hand. Fifteen students reported pain during venepuncture on both hands. Ten students reported pain during venepuncture for the hand treated with the Cream A but not for the hand treated with EMLA, five students reported pain for the hand treated with EMLA cream but not for the hand treated with Cream A. The remaining students did not reported pain on either hand.

(A) State the “null hypothesis” for the trial. (20%)

(B) In the answer sheet provided, construct a 2 X 2 table showing the outcome of pain upon venepuncture with Cream A or EMLA cream. (20%)

(C) Suggest an appropriate statistical test, and state 2 assumptions of the test. (60%)

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