Candidate No: _____

The Hong Kong College of Anaesthesiologists

Final Fellowship Examinations

Paper II – Critical Appraisal of Literature

10 August 2026 (Monday)

11:30 – 12:10 hours

Article

"Effect of immediate initiation of invasive ventilation on mortality in acute hypoxemic respiratory failure: a target trial emulation" Mellado-Artigas, et al. Critical Care 2024; 28:157.

Instructions:

- Write your candidate number on the first page of the answer book.
- Use ink or ball-point pen.
- There are 8 multiple choice questions in this section, based on the above paper.
- **ANSWER ALL** questions, they carry equal marks.
- For each question, choose the **ONE** best answer.
- If you mark more than one answer, you will receive **NO** mark for that question.
  No marks will be deducted for incorrect answers.

1. **Which of the following is the most accurate description of the study design in this paper?**

   A. Case-control study.
   B. Case series.
   C. Cross-sectional study.
   D. Observational cohort study.
   E. Randomized controlled trial.

2. **The sub-title of this paper is "a target trial emulation". What component(s) of this study was(were) being targeted?**

   I. Patient population eligible for the study.
   II. Treatment strategies in each group (immediate initiation of invasive ventilation or not).
   III. Outcome definitions.
   IV. Trial start and follow-up period.

   A. I only.
   B. II only.
   C. I and III only.
   D. II and IV only.
   E. All of the above.

3. In order to be included in the study, which of the following parameter(s), upon intensive care unit admission, would be considered eligible:

I. have a SpO_2/FiO_2 value of 150.
II. be a survivor for an episode of non-fatal cardiac arrest.
III. have a respiratory rate of 40 breaths per minute.
IV. not receiving oxygen.

A. I only.
B. II only.
C. I and III only.
D. II and IV only.
E. All of the above.

4. Which of the following patient characteristic(s) is(are) considered as confounding factor(s) in the study?

I. Age
II. Core temperature
III. SpO_2/FiO_2 value
IV. Platelet count

A. I only.
B. II only.
C. I and III only.
D. II and IV only.
E. All of the above.

5. What technique has been used to account or adjust for the differences between groups in the study?

A. Inverse probability weighting.
B. Non-parametrically bootstrapped Cox modelling.
C. Propensity score matching.
D. Stratified Cox modelling.
E. Weighted Cox modelling.

6. By emulating a target trial from the dataset, which of the following bias can be avoided in this study?

A. Confounding bias of unmeasured factors.
B. Outcome misclassification.
C. Missing data, because the values can be imputed.
D. Inclusion of patients who were not eligible for the study.
E. All of the above.

7. In general, what is the difference between primary analysis and sensitivity analysis?

A. Primary analysis is planned, but sensitivity analysis is not.
B. Primary analysis is mainly for safety, but sensitivity analysis is for efficacy.
C. Primary analysis uses the main and pre-set assumptions, but sensitivity tests alternative, plausible assumptions.
D. Primary analysis is always correct, sensitivity could be wrong.
E. None of above.

8. **In this target trial emulation, as the treatment assignment is not randomized, which of the following supports the conclusion that "The initiation of mechanical ventilation in patients with acute hypoxemic respiratory failure reduced the hazard of dying …" (i.e. causality)?**

   A. Between groups effect size was large.
   B. Confounding factors were adequately adjusted, and all patients had the same chance of having either tracheal intubation or not.
   C. The sample size was large (>2,900 patients).
   D. The study evaluated mortality outcomes.
   E. None of the above.

----- End of Paper -----