A guide to successfully writing MCQ’s

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Introduction

• Background
• The MCQ
  – Why MCQ’s
  – Writing
  – Examinations
  – Examples
Types of examination

- Formative
- Summative
  - High stakes
- Viva type examinations
  - Highly subjective, even with set questions
- Essay type examinations
  - Model answers, time consuming
- MCQ’s
  - Objective, least flawed
Formative vs Summative

• **Formative**
  – Self feedback
  – To check learning at the end of a chapter
  – Low stakes
  – Low rigour

• **Summative**
  – High stakes
  – Consistency
  – Accuracy
MCQ’s in a wider context

- Knowledge is only part of being a good Dr!
  - Knowledge
  - Compassion
  - Current
  - Competent
  - Bedside manner

In other words:
Be a “Professional”

MCQ’s can only assess knowledge
MCQ: where to start

• Curriculum
  – Must cover all of it!
  – Appropriate exam setting
• Question writers
• Agreed style
MCQ: Advantages

• Computer based exam
  – Flexibility
  – Stagger question order between candidates

• MCQ bank
  – Contained costs
  – Needs to be secure

• Predetermined agreed correct answers

• Less dependent on knowledge of English

• No negative marking
MCQ: Good MCQ

- Stem
- Clear question
- 5 answers
  - 1 correct
  - 4 distractors
- Positive question
- Plausible distractors
- Same answer across Europe
MCQ: Good MCQ

• Answers same length
• Alphabetical or random
• Must be evidence base for answer
• Avoid
  – All of the above
  – None of the above
• Ensure you cannot work out one question from the information in another one!
• Assessment
• Angoff score
  – How likely a borderline candidate will get this correct?
• Modified Angoff
• Correlation with overall performance
• Range of difficulty
MCQ: Setting the pass mark

Cumulative percentage of candidates with this score or less

Score in exam

NIHR Barts and The London CVBRU
Centre for Advanced Cardiovascular Imaging
MCQ: Setting the pass mark

The Red lines are the minimum and maximum failure rates as predetermined by the standard setting group.
MCQ: Setting the pass mark

The Green lines are the minimum and maximum pass marks as predetermined by the standard setting group.
MCQ: Setting the pass mark

Draw the blue line as shown

Cumulative percentage of candidates with this score or less

Score in exam

NIHR Barts and The London CVBRU
Centre for Advanced Cardiovascular Imaging
MCQ: Setting the pass mark

Cumulative percentage of candidates with this score or less

Score in exam

Passmark

NIHR Barts and The London CVBRU
Centre for Advanced Cardiovascular Imaging
MCQ: Technical

• Standardised lexicon
• Standardised punctuation
• Avoid absolutes
  – Always, never etc
• Standard format
  – History
  – Examination etc
• No abbreviations
MCQ: Writing questions

- Individuals write
- Need a review group
- Standardised punctuation
- Face to face meetings best
  - Questions written beforehand
- Ensure adequate refreshments!
- Categorise the questions
- Electronic template
MCQ: Set the exam

• Exam setting group
  – Usually smaller

• Select questions from bank
  – Ensure the cover curriculum!

• Old questions
  – Longitudinal data

• Structure should be transparent
MCQ: Summary

- MCQ writing group
- Exam setting group
- Standard setting group
A 32 year old woman presents to the emergency department with a 3 day history of cough and increasing shortness of breath. On examination she has a respiratory rate of 30 breaths per minute and there is an audible expiratory wheeze.

What is the most likely diagnosis?

A) Acute exacerbation of asthma  
B) Diabetic ketoacidosis  
C) Hypothyroidism  
D) Myocardial infarction  
E) Uncontrolled hypertension
A 78 year old man presents to the emergency department with sudden onset chest pain of 2 hours duration with associated nausea. On examination he is cold and sweaty. His pulse rate is 65 beats per minute and his blood pressure is 125/80 mmHg. A resting electrocardiogram shows ST segment elevation across the anterior chest leads (V1-V5).

What is the most likely diagnosis?

A) Acute exacerbation of asthma
B) Diabetic ketoacidosis
C) Hypothyroidism
D) Myocardial infarction
E) Uncontrolled hypertension
A 65 year old man presents to the A/E with sudden onset chest pain of 2 hours duration. O/E pulse 65 and BP 110/75. An ECG shows STEMI.

Which of the following is NOT appropriate?

A) Aspirin and Heparin
B) Aspirin, heparin, Hydrocortisone and antibiotics
C) Oxygen
D) Plavix
E) thrombolysis
MCQ: Example 4

- Which of the following is true in severe AS?
  - A) It is always associated with a bicuspid aortic valve
  - B) TAVI is never a treatment
  - C) The incidence in Smith et al (1997) is 1.36%
  - D) May present as angina
  - E) All of the above
Conclusion

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  – Examinations
  – Examples