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Extended matching items (EMIs): solving the conundrum

The membership examination of the Royal College of Psychiatrists is an important hurdle in the pursuit of psychiatry as a career. These examinations (MRCPsych Parts I and II), if not exactly popular with trainees, are an imperative and unavoidable part of training.

Extended matching items (EMIs) will be introduced into parts I and II of the MRCPsych examinations by spring 2003. This is a variant of the standard multiple choice question (MCQ) format. Most trainees, particularly those whose undergraduate training occurred outside the UK, might not have any prior experience of EMIs.

There are at least four MCQ formats:

1. The one in five best answer format
2. One stem and five branches, each branch being true or false
3. Individual statement question format (ISQ) and
4. EMI format, of which there are single best answer or multiple best answer formats

These different formats have various advantages and limitations. The one in five best answer format has the advantage that the candidate can correctly guess only 20% of the time. The one stem and five branches, each of which can be true or false, has the disadvantage that the candidate can guess correctly 50% of the time. Furthermore, there is the added disadvantage that it is difficult to construct a stem which fits in grammatically with each of the five branches without making the question nonsensical. The individual statement format is a modification of the stem and five branches and has the advantage that each statement can stand on its own.

EMIs are increasingly becoming the preferred format in undergraduate and postgraduate medical examinations. There is a belief that it is a format with which clinical reasoning is easy to test, particularly because a clinical scenario can be constructed with related questions (Case & Swanson, 1993). In addition, there are usually ten or more options; therefore, the candidate is only likely to guess correctly in 10% of cases.

What exactly are EMIs? What is expected of trainees and how should they prepare for them? The aim of this paper is to clarify the structure of EMIs by giving examples, in order to introduce potential candidates to this format. It will also suggest methods of preparing for these examinations.

EMIs

EMIs can be conceptualised as an extension of the more familiar MCQ format. EMIs are 'multiple-choice items organised into sets that use one list of options for all items in the set' (Case & Swanson, 1998; <http://www.nbme.org/about/itemwriting.asp>). A typical EMI has four components: a theme, an option list, a lead in statement and two or more item stems.

To help clarify these four components, the EMIs shown in Box 1 exemplify the usual structure of EMIs.

The theme is the title of the EMI or stated simply, the general subject area being targeted by the item stem. Themes of relevance to psychiatry could include: management (alcohol and drug abuse, confusion, suicide risk and other specific psychiatric conditions); investigations (overdose, suspected toxicity and potential drug interactions); risk assessment, epidemiology and treatment choice to list a few.

The lead in statement gives the instruction to examinees and links the stem to the option. In each EMI, one lead in statement applies to all item stems. Examples of lead statements are: 'for each patient described below, choose the single most likely management plan from the above list of options'; 'For each patient described below, select the single most likely diagnosis or most appropriate investigation or most accurate figure', etc. Some lead in statements might also specify 'each option may be used once, more than once or not at all'.

Lead in statements can be presented in two forms. The preferred version requires the examinee to choose a single best response – the one best answer response format. The less often used and more complex format (from a trainee's perspective) is the one requiring the choice of more than one response. For example: 'For each patient who has attempted DSH by overdose, suggest the two most appropriate courses of action or management'. These are called 'the pick N item' format of EMI.

The option list includes a range of choices, including the correct ones for the individual item stems. There is no standard or definite number for options listed and this may vary between 8 to 25. The standard practice is to keep the options as single words or short phrases and to arrange them in alphabetical or numerical order where relevant. Usually, the option list is homogenous. For example, if the theme is management of suicide risk, the

**Box 1. Examples of typical EMIs****Question 1****Theme: Culture-bound syndromes****Options:**

- | | |
|-----------------|--------------------|
| A Amok | F Pibloktoq |
| B Brain fag | G Possession state |
| C Dhat syndrome | H Susto |
| D Koro | I Windigo |
| E Latah | |

Lead in statement: For each of the vignettes described, select the most appropriate diagnosis. Each option may be used once, more than once or not at all.

Item stems:

- 1) A 45-year-old woman exhibits hypersensitivity to startle, echo phenomena and fleeting dissociative symptoms.
- 2) A 42-year-old man has acute onset of extreme excitement and restlessness followed by physical violence. On recovery, he has amnesia for the episode.
- 3) A 46-year-old man presents with fear that his penis is withdrawing into his stomach, associated with features of intense anxiety and panic. This belief is entertained as an overvalued idea and there are suggestions that it may be an epidemic.

Answers:

- 1) Latah
- 2) Amok
- 3) Koro

Question 2**Theme: Antipsychotic side effects****Options:**

- | | |
|------------------|----------------|
| A Amisulpiride | F Haloperidol |
| B Chlorpromazine | G Olanzapine |
| C Clozapine | H Quetiapine |
| D Fluphenazine | I Risperidone |
| E Flupenthixol | J Thioridazine |

Lead in statement: For each patient described below, choose the single most appropriate drug responsible for the side-effect. Each option may be used once, more than once or not at all.

Item stems:

- 1) A 42-year-old woman with a diagnosis of schizophrenia presents with complaints of sharp chest pain. Chest X-ray is essentially normal and the ECG reveals diffuse ST segment elevation in all chest leads.
- 2) A 42-year-old woman with a schizoaffective illness presents with palpitations and shortness of breath, ECG reveals a QTc interval of 440 msec and T wave inversion.
- 3) A 44-year-old woman with a chronic psychotic illness complains of recent onset of polyuria and malaise. Her blood sugar levels are consistently in the range of 13–16 mmol/l.

Answers:

- 1) Clozapine
- 2) Thioridazine
- 3) Olanzapine

list of options could include: admit to a medical ward, admit to a psychiatric ward, counselling, detention under the Mental Health Act 1983, initiate treatment with antidepressants, refer to police and no treatment. Option lists could include laboratory findings, lists of drugs, diagnostic categories, etc.

The item stem is a crucial component of the EMI. The most common form is a clinical vignette, describing a patient. The length of vignettes can vary from being very brief to rather lengthy. The different item stems within an EMI ought to be similar. For example, the item stems for the theme 'management of suicide risk',



with options being a range of treatment strategies, could include: 'a 22-year-old man, following an argument with his wife, took an overdose of 28 tablets of zopiclone 7.5 mg'; 'a 19-year-old girl slashed her wrist with a razor very superficially and brought herself to A & E', etc. Although clinical vignettes are most commonly used as item stems, they need not necessarily be. However, non-vignette item stems tend to lose the advantage of EMIs over MCQs – i.e., testing logical and reasoning skills over 'hard' memorised facts and figures.

Preparing for EMIs

Having clarified the nature of EMIs, it is imperative that trainees familiarise themselves well by going through more worked-out examples. Clearly this calls for innovation, given the lack of readily-available revision books. It is encouraging to note that a change in exam format (ISQs to EMIs) does not mean a change in the required level of knowledge.

A useful starting point to familiarise with more EMIs would be United States Medical Licensure Examination (USMLE) & Professional and Linguistic Assessments Board Examination (PLAB) revision books in psychiatry. As would be expected, these questions are very basic with regard to the depth of knowledge assessed, but do provide an idea of the broad range of subject areas covered and the various ways in which questions can be framed.

Until more structured guides become available, it is worthwhile to try writing your own questions, either individually or in groups. There is no better way to learn than to design your own questions, so that in the process of searching for the correct answers there is an incentive to read more widely. For example, if a group of four trainees were to share the responsibility of writing 100 EMI questions in basic sciences, they could each agree to focus on one specific area, e.g. psychopharmacology, neurophysiology, neuropsychology and so on. The breakdown of a broad subject area would depend on the examination curriculum requirements. Having decided on the specific subject area targeted, you can start attempting to write a question.

The basic steps in this process are: firstly, selecting the theme, then generating a list of options, then

deciding on the lead statement and finally, writing the item stems. Some might prefer to write the items first and then generate the option list. Keeping in mind the explanation of the four structural components of EMIs given earlier, in conjunction with the worked-out examples, generating EMIs in your preparation for exams should not pose undue difficulties. Candidates preparing to tackle EMIs also need to be aware of how best to manage their time while answering these questions. This tends to be more relevant than when answering MCQs, as there is more text to be read in the same amount of time. The preferred technique is to read the item first and then to pick the correct option, rather than reading the options first.

Conclusion

The MRCPsych examination format (Parts I & II) is currently in a state of flux, as attempts are underway to modify it to best test the examinees' knowledge, within the specifications of the curriculum. EMIs will be introduced into the MRCPsych examinations by 2003. However, guidelines are not available for candidates preparing for these examinations. Although EMIs are not conceptually different from MCQs, the unfamiliarity of trainees with them can create some difficulties. Hopefully, in the next year or so more practical guides will become available. This brief article on what EMIs are, along with a few examples, will help in solving this conundrum. However, I do need to emphasise that this is only an introductory note on the subject and for aspects that are not entirely clear, reading of the key references listed is recommended.

References

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