

## **PROTOCOL FOR PROPOSED BEME TOPIC REVIEW GROUP**

### **A SYSTEMATIC REVIEW OF THE UTILITY OF SELECTION METHODS FOR SPECIALIST TRAINING**

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## Background to the topic

*“Whatever the method, it is clear that excellent people are matched into the orthopaedic residency each year. But it is probably also clear that in this subjective process, excellent individuals are missed.”*<sup>1</sup>

Selecting medical graduates with appropriate competencies and skills for further postgraduate or specialty training is an important but challenging task. The prime objective of selection is to predict the likelihood of candidates being successful on undertaking specialty training successfully and to reject those who are likely to perform poorly (predictive validity).<sup>2</sup> The current literature, however, indicates a lack of consensus regarding specific attributes that are indicative of success during residency/specialty training.<sup>3</sup> While there is a body of literature exploring the predictive powers of cognitive and non-cognitive factors influencing success in undergraduate medical training, fewer studies have focused on predictors of success in postgraduate training and, of these, the majority are centred around cognitive factors of success.<sup>4</sup>

Based on the premise that past performance is often considered to be the best predictor of future performance, there have been several efforts to examine the predictive attributes of cognitive metrics such as academic grades at undergraduate level and scores in various standardised tests such as licensing examinations for medical registration. However, there does not seem to be any conclusive evidence except for the acknowledgement that quantifiable measures such as test scores and grades alone are not sufficient to select applicants as they tap only a narrow band of the complex spectrum of the multidimensional role of a physician.<sup>5-8</sup>

Non-cognitive attributes such as such as integrity, reliability, diligence, trustworthiness, commitment, respect and empathy, and interpersonal skills such as communication and team working are now being heralded as important predictors of resident performance.<sup>3,9</sup> Empirical evidence for the predictive validity of such non-cognitive attributes is, however, limited, mainly due to difficulty in obtaining reliable quantifiable measurements.

Apart from the predictive paradigm, the selection process has also been conceptualised as an assessment; and therefore, principles underlying any good assessment (e.g. fair, reliability, validity, cost-effectiveness, acceptability and feasibility) are applicable when designing selection criteria and methods.<sup>10</sup> However, longstanding issues with subjectivity, reliability and validity have been reported for one of the most widely used selection methods: the interview.<sup>11, 12</sup>

There also exists disparity in selection criteria and methods across various nations. For instance, selection for residency programs in the US is primarily based on university grades, United States Medical Licensing Examination (USMLE) Step 1 scores, letters of reference (dean’s letters), membership of prestigious organisations such as Alpha Omega Alpha, and interview impressions. In the UK, however, innovative approaches are being trialled such as selection centres, which use multiple selection methods including work based simulations.

Considerable research findings exist for several non-medical occupations such as law, military and aviation which may inform and improve selection procedures in work based training.<sup>11</sup> Disciplines

such as organisational psychology can facilitate better understanding of job-analysis of complex roles such as that of a physician.

With the changing nature of healthcare service and delivery coupled with an increasing focus on competency based curriculum frameworks, it is imperative to select those candidates who are best suited to work as specialist practitioners or consultants in contemporary healthcare environments. Given that this process involves high-stakes decisions and is resource-intensive, it is necessary to adopt an evidence-based approach in designing, implementing and improving selection criteria and methods; with this aim in mind, we propose the current review. While there is a substantial literature focussing on selection into medical school, this is not conclusive as to the optimal methods. However we were unable to find a comprehensive review on the criteria and methods of selection into postgraduate training.

One of the TRG members (Professor Thistlethwaite) carried out a review with colleagues for the Medical Schools Council (MSC) (UK) in 2009.<sup>12</sup> The MSC was in the early stages of reviewing its processes for selection into the foundation year (pre-registration/intern/ F1/PGY1) and wished to review the evidence for selection methods. In this review, the literature was searched between 1990 and 2009. There were 82 papers included that related to postgraduate selection, but these were not all for specialty training. While overall there were between 4-10 papers per year before 2000, after 2000 there were between 8 and 23 per year. These findings have influenced the search span of this review.

This review will help inform the Royal Australasian College of Physicians (RACP) in its decision about selection into specialty physician training, as currently there are no standardised criteria and methods of selecting suitable candidates.

## **Review questions and objectives**

The goal of this review is to explore, analyse and synthesise the evidence<sup>1</sup> related to selection into postgraduate medical specialty training. The review focuses on two main components of selection: evidence for predictors of success in postgraduate training and evidence on designing a valid, reliable, feasible and defensible selection system based on the literature from medical as well as appropriate non-medical fields.

### ***Questions***

- What are the underlying frameworks and principles of selection into medical specialty training?
- What are the cognitive and non-cognitive predictors of success in medical specialty training? (By success we mean doctors who complete their training and continue into employment as specialists in their chosen disciplines.)

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<sup>1</sup> 'Evidence' in this review is defined as empirical data and grey literature published in the English language during 1998-2013 in the area of selection into postgraduate medical specialty training.

- What are the existing criteria and methods of selection into medical specialty training?
- How effective are the existing methods in terms of validity, reliability, feasibility, acceptability and other indicators of a good assessment?

### **Theoretical framework**

We are considering the utility of selection processes as a type of assessment, where utility has been defined by van der Vleuten as: validity, reliability, feasibility, acceptability, cost-effectiveness and educational impact (i.e. impact on learning) .<sup>13</sup> We will also use the concept of employability to inform our findings. Employability has become an important consideration in selection processes for other graduate entry professions. Employability skills have been defined as: ‘skills required not only to gain employment but also to progress within an enterprise so as to achieve one’s potential and contribute successfully...’<sup>14</sup> Another term for employability is workplace readiness.

### **Search sources and strategies**

The review will focus on selection into work based medical specialty training, which includes disciplines such as general practice, internal medicine, surgery, paediatrics, obstetrics/gynaecology, radiology and other specialist training programs in medicine. We are excluding from this review selection into medical school and into undifferentiated postgraduate training such as the foundation programme (in the UK) and PGY1 (in Australia). However, as in the USA doctors go straight into residency/specialty training programmes after graduation, we will be including the intern year in the US.

Literature from organisational psychology will be explored in relation to job-analysis for work based training.

### **Possible search terms**

Combinations and variants of the following terms will be used: ‘selection’; ‘entry’; ‘specialist’; ‘resident’; ‘postgraduate’; ‘trainee’; ‘training’; ‘predictors’; ‘performance’, ‘work based’, ‘job analysis’. We will seek guidance from an informational technologist at the University of Queensland in developing a detailed search syntax, and make use of the search syntax developed for the MSC review.

## Possible databases

Medline, Cinahl, EMBASE, ERIC, PsycINFO, Health Business Fulltext Elite.

## Study selection criteria

**Focus:** Selection into work based postgraduate medical specialty training is the prime focus of the review.

**Target population:** Trainees entering postgraduate medical specialty training such as general practice, physician training (various specialities of adult medicine and paediatrics), surgery, radiology and other specialty training fields.

**Study designs:** Papers must include empirical data for selection with respect to one or more of the following: validity, reliability, feasibility, acceptability, cost-effectiveness. Empirical research involving: surveys, prospective follow-up studies, retrospective analysis such as of postgraduate assessments, experimental studies and systematic reviews and the use of qualitative, quantitative and mixed data will be included.

**Grey literature:** We will search for grey literature such as major review reports related to selection criteria, methods, job-analysis and employability. We will contact the royal colleges of Australia and check other college websites for details of their selection methods and any reviews of utility.

**Year of publication:** 1998 -2013 (last 15 years).

**Language:** English language.

### Exclusion criteria:

- Medical school selection
- Health professions other than medicine
- Not in English
- Not empirical
- Publications before 1998

## Pilot scoping search

We will test our search syntax and inclusion/exclusion criteria over the last 2 years (2010-2012). This will enable the development of a suitable BEME coding sheet.

## Procedure for extracting data

All identified titles/abstracts will be entered into a dedicated EndNote library. All abstracts will be read by two of the TRG for relevance in relation to the inclusion/exclusion criteria. Studies beyond the scope of the review will be rejected. If there are disagreements about inclusion/exclusion, a third TRG member will arbitrate. The second stage will involve extracting the full-text papers of the relevant studies; these will be read by two TRG members independently and a decision made on whether to include or exclude the papers at this point. Again a third TRG member will arbitrate if there is no consensus.

## Synthesis of extracted data

The underlying methodology which seems suitable for synthesis of extracted data in this review is realist synthesis which is used to investigate 'what works for whom, under what circumstances and why'.<sup>12</sup> Commonly used by healthcare education researchers, this method is useful for synthesising qualitative as well as quantitative data and is generally used for providing guidance for specific policy questions.<sup>13</sup>

We will appraise primary studies and extract data based on the *apriori* framework of utility index, employability and 'fitness for purpose' in terms of practical applications of the selection methods in developing policies for selection. We will modify the standard BEME coding sheet to extract relevant data. Each paper will be coded by two TRG members and in case of a dispute; a third member's opinion will be sought. A table of a summary of key findings will be developed from these sheets. Differences in coding will be discussed among the TRG.

## Project timetable

Steps	Anticipated timetable	Duration
Forming a review group and refining review questions	December 2012 – April-2013	5 months
Pilot study report-pilot literature search, refining syntax, analysis and synthesis of data	May –August 2013	4 months
Developing BEME coding sheet	August-September 2013	2 month
Literature search and coding of papers	October-December 2013	3 months
Discussion and synthesis of findings	January-March 2014	3 months
Draft report	April-May 2014	2 months
Final report (depending on referees' timing)	June-July2014	2 months

## Conflict of interest statement

Some of the members are involved in developing a policy on selection into training for the Royal Australasian College of Physicians, Australia.

**Plans for updating the review**

The review will be updated two years after its completion.

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