

## Annual report, January 2011

**BEME review title:** A systematic review on the relation between case mix and learning in work-based clinical settings.

### **Names and Affiliations of Key Topic review Group (TRG) Members:**

1. Jip de Jong, MD, GP, department of General Practice/Family Medicine, AMC-University of Amsterdam, The Netherlands, Postbus 22660, 1100 DD Amsterdam, jipdejong@amc.uva.nl, +31205667189
2. Mechteld Visser, Msc, PHD, senior researcher, department of General Practice/Family Medicine, AMC-University of Amsterdam.
3. Rien de Vos, PHD, director Department Paramedic studies, Amsterdam School for Health Professions, Amsterdam
4. Margreet Wieringa- de Waard, MD, PhD, Professor of General Practice, department of General Practice/Family Medicine, AMC-University of Amsterdam
5. Cees van der Vleuten, Professor of Medical Education, Department of Educational Development and Research, Faculty of Medicine, Maastricht University, Maastricht, The Netherlands
6. Faridi van Etten-Jamaludin, clinical librarian, Medical Library, AMC-University of Amsterdam.

### **Review question:**

What is the relation between patient mix<sup>1</sup> and learning in work-based clinical settings?

### **Inclusion and exclusion criteria:**

#### **Inclusion:**

- Empirical, quantitative studies
- Studies will not be excluded on the grounds of language of publication

---

<sup>1</sup> Based on the majority of the recent publications, we now prefer the term patient mix, instead of case mix.

**Exclusion:**

- Theory-only medical curricula (not work-based)
- paramedical curricula
- veterinary medicine
- dental medicine
- qualitative studies

**Rationale for BEME review**

In a work-based curriculum trainees have to encounter an adequate patient mix to build the experience necessary for developing clinical competence. A theoretical base for the need of experience in order to develop competence was described by Ericsson with the concept of deliberate practice.<sup>2</sup>

Medical professionals carry out many different tasks and therefore have to be competent in a variety of skills, each one not necessarily generalizing to other or to complex skills. Mastering a variety of competences therefore demands a variety of experience. A patient mix that is adequate in diagnosis-variety and in diagnosis-quantity may therefore be assumed to be an important training condition.

We started this review to address the knowledge derived from literature on the relation between patient mix and learning in work based clinical settings.

**Search strategy**

The search strategy was composed by the clinical librarian together with the first reviewer. First a 'golden standard set' was composed, containing 38 important articles prior known by the reviewers. Our target was to create a search strategy that was rigorous on methodological grounds and able to find at least the golden standard set. We developed a search strategy this way and over 40000 articles were found in Pubmed only. We considered this search strategy too sensitive. The search strategy therefore was made more specific, but still able to find the golden standard set. This resulted in the following search strategy for Pubmed.

((((("Diagnosis-Related Groups"[Mesh] OR diagnosis related group\*[tiab] OR case mix\*[tiab] OR casemix\*[tiab] OR diagnosis cluster\*[tiab] OR patient distribution\*[tiab] OR clinical exposure\*[tiab] OR clinical encounter\*[tiab] OR clinical experience\*[tiab] OR patient mix\*[tiab] OR logbook\*[tiab] OR consultation[tiab] OR selected conditions[tiab] OR disease management[tiab] OR clinical method\*[tiab] OR diagnosis cluster\*[tiab] OR distribution patients[tiab]))) AND (("Curriculum"[MeSH] OR curricular\*[tiab] OR "Education, Medical"[Mesh] OR medical education[tiab] OR "Clinical Competence"[Mesh] OR clerkship\*[tiab] OR trainee\*[tiab] OR training[tiab]

---

<sup>2</sup> Ericsson KA. Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Acad Med.* 2004;79:S70-S81.

OR resident\*[tiab] OR residency[tiab] OR (("work"[MeSH Terms] OR work[tiab]) AND (based[tiab]) AND ("learning"[MeSH] OR learn\*[tiab]))) AND (((("Hospitals, Teaching"[Mesh] OR teaching hospital\*[tiab] OR "Specialties, Medical/education"[Mesh] OR "Primary Health Care"[Mesh] OR student\*[tiab] OR practice[tiab])))

This strategy was translated to the other databases.

The duplicates were removed, first automatically, than by hand. This resulted in the following numbers:

Pubmed	3792
Cochrane	1615
EMBASE	1195
Web Of Science	1102
Eric	1063
Total	8767

Automatic duplicate removal:	8751
Manual duplicate removal:	<b>8414</b>

## Reviewing Process

When we started to review, we noticed that our inclusion criteria were short of criteria for patient mix and for learning. We therefore refined our inclusion and exclusion criteria. We also made the criteria for the study population and for learning more explicit. In addition, non-conventional medicine was excluded.

### Inclusion:

- Empirical, quantitative studies will be included
- Studies will not be excluded on the grounds of language of publication
- Patient mix, clinical encounters, clinical experience, workplace learning had to be mentioned or described. These must include patient exposure or alike (no simulations)
- Learning must be described. Measures for this may include a description of student performance, student self efficacy, student satisfaction, health care outcome or other
- Study population: health care professionals, undergraduate, graduate or postgraduate medical students.

### Exclusion:

- Theoretical medical curricula (not work based)
- Skill training only (without real patient exposure).
- Dental curricula, and veterinary curricula

- Any paramedical curricula, nursery curricula, physician assistant curricula, nurse practitioner curricula, dietetically curricula.
- Qualitative studies
- Non-conventional medicine

### **Screening process:**

Two authors individually and independently screened the title and abstract of all articles by hand, using the inclusion and exclusion criteria. In case of doubt the article was included. The most difficult challenge still was the definition of patient mix. We therefore further refined the definition by these criteria:

- Patient mix: preferably as broad as possible, but no single cut-off for the width of patient mix can be given.
- Studies on subjects trained in both general medicine and other medical specialties can be included, but only if the patient mix is diverse.

Learning was more refined as well:

- If learning was measured or described as the competence on one single skill, the study was excluded.

In a series of sessions the results were compared and consensus was achieved about in or exclusion of the studies.

After the first screening, a total of 282 full text articles were retrieved. These were hand screened independently by two authors, using the same criteria as defined above. If the authors disagreed about inclusion, a final decision was reached by negotiated consensus.

### **Present situation:**

At the end of this month this second screening process will be completed. We expect the screening process to result in about 50 articles that are suitable for coding.

At the moment we are adapting the standard BEME coding sheet to the specific needs of our study. At the same time an overview table is composed with the included articles.