How does the teaching of a structured tool for communication within and between teams contribute to student learning: a Best Evidence Medical Education (BEME) systematic review

Protocol(August 2012)

1 Review group members and affiliations

Lucy Ambrose (University of Keele, clinical skills and medical education)

Elizabeth Anderson (University of Leicester, nursing, interprofessional education (IPE), patient safety)

Sharon Buckley (University of Birmingham, corresponding author, medical education, IPE, systematic reviews)

Jamie Coleman (University of Birmingham, medicine, pharmacology and therapeutics)

Marianne Hensman (University of Birmingham, physiotherapy)

Christine Hirsch (University of Birmingham, pharmacy)

James Hodson (University of Birmingham, statistician)

David Morley (University of Birmingham, medical education)

Sarah Pittaway (University of Birmingham, information scientist)

Jon Stewart (Heart of England Foundation Trust, medicine, human factors)

2 Wider advisory group

Marilyn Hammick (Educational Consultant, Best Evidence Medical education Collaboration (BEME))

Stuart Marshall (Monash University, health professions education and educational research)

Rona Patey (University of Aberdeen, patient safety and medical education)

3 Sources of funding

National Teaching Fellowship Sharon Buckley (c£5K). Funds will be used to support study retrieval, data entry, reviewer training and management of the review process.

4 Background and context

In general terms, patient safety can be defined as *'the prevention of errors and adverse effects associated with health care'* (World Health Organisation (WHO) 2012). Health professions worldwide are placing increasing importance on patient safety; and have recognised the need to enhance clinicians' awareness and capability in this area (WHO 2011a; Kohn, Corrigan and Donaldson 2000).

In response to these developments in clinical practice, regulatory bodies now require educational providers to include patient safety in their pre-registration curricula (for example General Medical Council 2009; Nursing and Midwifery Council 2010). The WHO (2011b) has recently produced a multi-professional curriculum guide, which encompasses a diverse range of patient safety themes and topics, ranging from medication safety through ethics to team work.

Errors in clinical communication between members of the multidisciplinary team account for a significant proportion of untoward incidents (Leape 1994; Sutcliffe, Lewton and Rosenthal 2004; Neale, Woloshynowych and Vincent 2001). The use of standardised and systematic approaches to communication, either written or verbal, are increasingly seen as a way of improving communication between different team members (NHS institute for Innovation and Improvement 2012). For example, the use of a checklist has been shown to reduce communication difficulties within surgical teams (Lingard et al 2008); and to be associated with reductions in surgical morbidity and mortality (Haynes et al 2009). The use of Introduction Situation Background Assessment Recommendation (ISBAR) improved the transfer of key clinical information in handovers by junior doctors (Thompson et al 2011). However, some authors have highlighted the importance of contextual, social and organisational factors in the success or otherwise of interventions such as these; and the importance of knowing how and why such interventions are effective (Bosk, Dixon-woods, Goeschel and Pronovost 2009).

Recognising the importance of effective team communication, the World Health Organisation Curriculum Guide for Patient Safety includes 'being an effective team player' as one of the eleven topics recommended for inclusion in pre-registration curricula and provides resources for the teaching Introduction Situation, Background, Assessment, Recommendation (ISBAR) (WHO 2011b).

The introduction of ISBAR into pre-registration curricula has been reported in the literature (Marshall, Harrison and Flanagan 2009), as have educational interventions to improve handover (Gordon and Findley 2010) and more general aspects of patient safety curricula (Wong et al 2010). However, many questions remain to be answered about appropriate approaches to teaching concepts such as these. To our knowledge, there has been no systematic review that focuses clearly on the range of structured communication tools that are taught as part of pre-registration patient safety curricula. We propose to undertake such a review as part of the BEME collaboration. We will consider the extent to which the use of structured communication tools currently form part of pre-registration teaching programmes and explore both the nature of such teaching and its influence on student learning.

Our review will be of interest to clinical faculty who are introducing and developing patient safety curricula for their undergraduate programmes, informing decisions about curricular content and teaching methodologies etc.

5. Review question

Our review will address the question: how does the teaching of a structured tool for communication within and between teams contribute to student learning?

Within this main question, a number of sub-questions will be considered:

- Which structured communication tools are taught within pre-registration curricula?
- What teaching methods are employed?
- How does the teaching of a structured communication tool contribute to the development of students' knowledge, skills and attitudes?
- How does education about structured communication tools vary with profession?
- Does learning about such tools occur mainly in uni- or interprofessional settings?

From our findings, we will then consider:

- What recommendations for the teaching of structured communication tools can we make to clinical faculty engaged in developing patient safety curricula?

6 Definitions

Patient safety

We will adopt the definition of patient safety used by the World Health Organisation in their patient safety curriculum guide, namely 'the reduction of risk of unnecessary harm associated with health care to an acceptable minimum' (WHO 2011b).

Patient safety curriculum

Curriculum content or activity within the eleven topics identified by the World Health Organisation Curriculum Guide (WHO 2011b) that contributes to the development of students' knowledge, skills and attitudes towards patient safety. Such content may be either within a specified patient safety theme or module or embedded into clinical learning (without a specific patient safety 'badge').

Team

The Team STEPPS programme (Agency for Health Care Quality and Research 2012) identifies several different types of team: core teams (those directly involved in a patient's care), co-ordinating teams (responsible for co-ordinating and resourcing the work of core teams), contingency teams (formed to deal with specific events of emergencies), ancillary service teams, support services and administration. Our definition of team will include all these types. Such teams may be temporary or long standing and will involve two or more individuals either from the same or different professions. Although the patient is increasingly considered an active member of the team (WHO 2011b), our review will focus on communication between health care professionals and associated staff.

Structured communication tool

We will define a structured communication tool as any standardised and systematic approach to communication that is taught to students in order to enhance their ability to communicate effectively within or between professional teams. Examples of likely tools include:

Type of tool	*Description*	*Example(s)*	*Comment*
Verbal tools for patient handover/handoff	Tools for healthcare practitioners to use in any given situation to ensure that clear, relevant and concise patient information is passed across disciplines.	Introduction Situation Background Assessment Recommendation/Request (ISBAR). Variations on ISBAR e.g. SBARD (D decision); ISOBAR; I PASS THE BATON	ISBAR type tools were originally adapted from a US Military communication format.
Verbal tools for raising concerns within a team	This group of tools give a recognised language to help junior clinicians assert themselves. Particular terms are recognised as signals for raising concern	Concerned Uncomfortable Scared (CUS) Probe Alternative Challenge Escalate (PACE)	In CUS: C represents "concerned" U represents the use of the term "uncomfortable" and S is "scared".
Written tools for interprofessional communication	This group of tools help to standardise written instructions.	Example: The Australian National Inpatient Medication Chart (NIMC)	This tool standardises the process of ensuring that on admission into hospital, patients' medications are accurate and validated with the primary/secondary care interface. This results in a reduction in medication error at points of transfer across the patient journey

7 Inclusion/exclusion criteria

This review will consider all relevant primary research studies using the following inclusion/exclusion criteria:

Population: undergraduate students from any clinically focussed profession
We define this as students engaged in a course of initial training regardless of their qualification on entry: for example, studies involving graduate entry students on courses of medical training will be included.

Intervention: any structured communication tool of sufficient substance to be reported as such in the primary literature. Written tools may be embedded within standard documentation but will be recognisable as a discrete, systematic approach to communication. Tools such as Medical Early Warning System (MEWS), whose primary purpose is to reduce patient harm through routes other than communication, but which have been used as the basis for communication, will be excluded, as will any tool to assist communication between professional and patient.

Study types: primary research articles of any study type that describe and evaluate the use of a structured communication tool. No study will be excluded on the grounds of study design, geographical location or, as far as is possible, language. Studies must include evaluative data (of any type). Purely descriptive narratives will be excluded.

Outcomes: whilst we would anticipate that teaching about structured communication tools would advance student learning primarily in the area of patient safety, it is possible that such teaching influences other areas of student learning. For example, the heightened awareness of communication issues resulting from such teaching may influence students' communication skills more widely. Our review will therefore consider all reported outcomes from the teaching of a structured communication tool. No study will be excluded from the review on the grounds of outcome type.

8 Key words

Patient safety, communication tool, instrument, multi-disciplinary team, interprofessional, initial training/pre-licensure, systematic review.

9 Search sources and strategies

Synonyms: articles of relevance to the research question will be identified using detailed search strategies involving the following synonyms:

Tool (intervention)	AND	Patient safety	AND	Students (population)	AND	Healthcare education
Instrument		Human factors		Freshers		Medical Education
Checklist		Error		Undergraduate		Clinical teaching
Form		Quality improvement (QI)		Sophomore		Clinical skills
SBAR				Freshman/men		Clinical training
Critical event training				Senior		Clinical education
Significant event training						Clerkship
Simulation						Preceptorship
Briefing						Pre-registration
Critical language						Initial training
Information transfer						Pre-qualifying
Referral						*OR*
Handover						Nurs(ing)
Handoff						Physiotherapy
Transition						Dental
Situation awareness						Midwifery
Reminder system						Pharmac* (pharmacy/pharmacology)
Protocol						Medical
Record						Military
Assertiveness						Allied health
Graded assertiveness						
PACE						
CUS						
Medic* reconciliation						
Critical incident training						
Adverse event training						

Electronic searching: The following databases will be searched electronically from their dates of inception.

MEDLINE, EMBASE, PsycINFO, Web of Science (Science Citation Index & Social Science Citation Index), CINAHL Plus, British Nursing Index, ASSIA, British Education Index, Australian Education Index and ERIC; Cochrane Central Register of Controlled Trials (Clinical Trials, or CENTRAL); TIMElit (Topics in Medical Education Database).

Initial scoping searches with two databases have yielded approximately 2,000 potentially relevant citations. Given that these databases are likely to yield the most numerous results, we anticipate that our review will need to handle approximately 3,000 citations maximum once duplications have been removed.

Hand searching

The reference lists of included articles will be hand searched during the data extraction process. Grey literature will not be included in this review.

10 Review timetable and procedures for extracting data

A flow diagram and timeline showing full details of the review process is given in Table 1.

Following initial searches and drafting of the data extraction form, reviewers will attend an away day training event, which will consider issues of reviewer consistency and finalise the data extraction form. Details of the training event are given in Appendix 2.

Methodologies for study selection and data extraction are shown in Appendix 3.

Following data extraction and initial analysis of outcomes, a further away day will be held at which reviewers will consider the outcomes of the review, in particular the main messages from higher quality studies. This discussion will inform data synthesis and preparation of the review report.

11 Assessment of study quality

No study will be excluded from the review on the basis of methodological quality. Rather, the methodological quality of the available literature will be assessed and described as part of the review process.

Quality indicators to be used in assessing included studies are given in Appendix 4. These are based on the checklist used in the previous BEME systematic review of the effects of portfolios on undergraduate student learning (Buckley et al 2009); and are intended to reflect characteristics of methodological rigour that are applicable to any study type. We anticipate that this approach will allow us to comment on the strengths and weaknesses of included studies, as well as make global assessments of their overall methodological quality.

Study outcomes will also be categorised according to the Kirkpatrick hierarchy as adapted for use in systematic reviews in education. The purpose of will be not to consider the quality of each article, but will form part of the description of the outcomes of our review (Yardley and Dornan 2012, Thistlethwaite et al 2012).

Higher quality studies, as assessed by our checklist of quality criteria, will be analysed separately in order to draw messages from that part of the literature in which it is appropriate to place greater confidence.

12 Synthesis of extracted evidence

Whilst necessarily working within the overall paradigm of systematic review, we will seek strenuously to survey and draw conclusions from the full range of literature available; and to make recommendations that will be of practical use to clinical educators wishing to introduce or develop further their patient safety curricula. To this end, our evidence synthesis will include:

a. A holistic overview of all included studies, including a range of descriptive statistics about how particular tools are used in different settings and circumstances.
b. Detailed consideration of the outcomes from higher quality studies and their implications for patient safety curricula.
c. Recommendations for ways in which the educational effectiveness of structured communication tools can be enhanced.

13 Plans for updating the review

Updating of the review will be undertaken in accordance with BEME guidelines.

14 References

Agency for Health Care Quality and Research, U.S. Dept of Health and Human Services. Team strategies and tools to enhance performance and patient safety. Available at: http://teamstepps.ahrq.gov/ [Accessed 13 08 12]

Bosk C. L., Dixon-Woods M., Goeschel C.A., Pronovost P.J. 2009 Reality check for checklists. The Lancet 374 (9688) 444-445

Buckley S., Coleman J.J., Davison I., Khan K.S., Zamora J., Malick S., Morley D., Pollard D., Popovic C., Sayers J. 2009. The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review. BEME Guide no 11 Medical Teacher 31 (4) 282-298

General Medical Council 2009. Tomorrow's Doctors: outcomes and standards for medical education. Available at: http://www.gmc-uk.org/

Gordon M., Findley R. 2011 Educational interventions to improve handover in health care: a systematic review. Medical Education 45: 1081-1089

Haynes A.B., Weiser T.G., Berry W.R., Lipsitz S.R., Breizat A-H., Dellinger E.P., Herbosa T., Joseph S., Kibatala P.L., Lapitain C.M., Merry A.F., Moorthy K., Reznick R.K., Taylor B., Gawande A.A. 2009 A surgical safety checklist to reduce morbidity and mortality in the global population. The New England Journal of Medicine 360 (5) 491-499

Kohn, LT., Corrigan JM., Donaldson MS., 2000. Eds to Err is Human: building a safer Health system Committee on Quality of Health Care in America, Institute of Medicine, National Academy Press, Washington D.C. available from: http://www.nap.edu/openbook.php?booksearch=1&term=communication&record_id=9728 [Accessed on 24 01 2012].

Leape L.L., 1994 Error in medicine. Journal of the American Medical Association 272 (23): 1851-1857

Lingard L., Regehr G., Orser B., Reznick R., Baker G.R., Doran D., Espin S., Bohnen J., Whyte S. 2008 Evaluation of a Preoperative Checklist and Team Briefing Among Surgeons, Nurses, and Anaesthesiologists to Reduce Failures in Communication Archives of Surgery 143(1) 12-17

Marshall S., Harrison J., Flanagan B. 2009 The teaching of a structured tool improves the clarity and content of inteprofessional clinical communication. Quality and Safety in Health Care 18: 137-140

Neale G., Woloshynowych M; Vincent C. 2001 Exploring the causes of adverse events in NHS hospital practice *Journal of the Royal Society of Medicine* 94 (7): 322–30.

NHS Institute for Innovation and Improvement 2012. Available from: http://www.institute.nhs.uk/safer_care/safer_care/Situation_Background_Assessment_Recommendation.html [Accessed 17 05 2012]

Nursing and Midwifery Council 2010. Standards for pre-registration nursing education. Available at: http://standards.nmc-uk.org/Pages/Welcome.aspx [Accessed 10 05 12]

Sutcliffe K., M., Lewton E., Rosenthal M., M. 2004 Communication Failures: An Insidious Contributor to Medical Mishaps Academic Medicine: 79 p186-194

Thistlethwaite J., Daview H., Dornan T., Greenhalgh T., Hammick M., Scalese R. 2012 what is evidence? Reflections on the AMEE sysmposium, Vienna, August 2012. Medical Teacher 34: 454-457

Thompson J.E., Collett L. W., Langbart M.J., Purcell N.J., Boyd S.M., Yuminaga Y., Ossolinski G., Susanto C., McCormack A. 2011. Using the ISBAR handover tool in junior medical officer handover: a study in an Australian tertiary hospital Postgraduate Medical Journal 87:340-344. doi:10.1136/pgmj.2010.105569

Wong B.,M., Etchells E.,E, Kuper A, Levinson W, Shojania KG 2010 Teaching Quality Improvement and Patient Safety to Trainees: A Systematic Review Academic Medicine 85 (9): 1425-1439

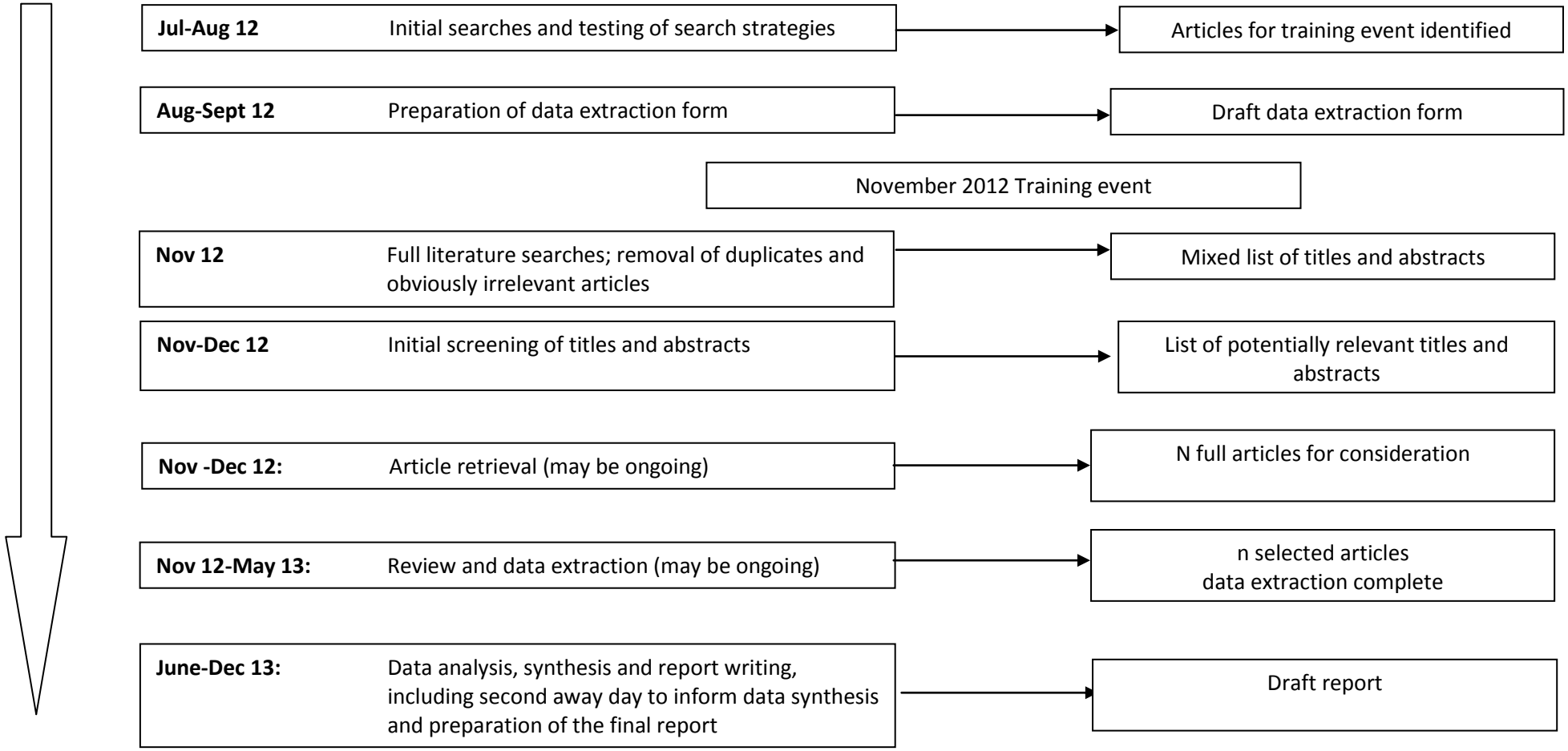
World Health Organisation 2011 (a) Topic Patient Safety Available from: http://www.who.int/patientsafety/en/ [Accessed on 24 01 2012]

World Health Organisation 2011 (b) Patient Safety Curriculum guide: multi-professional Edition ISBN 978 92-4 150195 8. Available from: http://www.who.int/patientsafety/education/curriculum/en/index.html [Accessed on 24 01 2012]

World Health Organisation Europe 2012. Topic Patient Safety. Available from http://www.euro.who.int/en/what-we-do/health-topics/Health-systems/patient-safety [Accessed on 13 07 12]

Yardley, S., Dornan, T., 2012. Kirkpatirck's levels and education 'evidence'. Medical Education 46: 97-106.

15 Appendix 1 Review flow diagram and timeline



Appendix 2 Training event

In order to provide consistent selection and data extraction, we will run an away day to train the reviewers and test the study selection/data extraction form. The following process will be followed.

Prior to the event

10 papers selected from literature searches to reflect the range of papers retrieved
'Expert reviewer' checks that proportion likely to be included in the review

Articles circulated to reviewers for pre-reading and assessment against inclusion/exclusion criteria

Calculation of Fleiss Kappa statistics to determine levels of consistency across the team

At the event

1. Reviewer consistency

Review of Fleiss Kappa statistics to determine levels of consistency across the team

Discussion of discrepancies and consensus
Collation of 'guidance' for reviewers about particular issues

Agreement on inclusion/exclusion of sample articles that will form a body of 'case law' that can be called on during the review

2. Assessment of data extraction form

Reviewer pairs attempt data extraction on 2 selected articles:
Article 1: Reviewer 1 (main); reviewer 2 (confirm)
Article 2: Reviewer 2 (main; reviewer 1 (confirm)

Plenary discussion whole team: amendments and clarifications of data extraction forms
Collation of 'guidance' for reviewers about particular issues

After the event

Distribution of guidance to reviewers on matters of consistency
Distribution of decisions from sample studies

Appendix 3 Review process (selection and data extraction)

1. Initial screening (titles and abstracts)

Reviewer pairs receive list of titles and abstracts

Each reviewer independently assesses the titles and abstracts against the selection criteria: Include/exclude/unclear

Reviewer pairs consult and agree selections on the basis of abstracts

Include/include:	obtain full article and proceed to data extraction
Inconsistency:	obtain full article and review
Exclude/Exclude:	no further action

2. Second screening (full articles)

Reviewer pairs receive full articles

Each reviewer independently assesses the full article against the selection criteria: **Include/exclude/unclear**

Reviewer pairs consult and agree selections on the basis of abstracts

Include/include:	Proceed to data extraction
Inconsistency:	discussion and consensus (with 'expert' reviewer if necessary)
Exclude/Exclude:	no further action

3. Data extraction

Data extraction: second reviewer confirms the findings of the first **Where discrepancies occur, discussion and consensus**

Second reviewer 'hand' searches bibliography of included articles to identify any further possibilities

4. **Reviewer pairs**

Sharon Buckley	Jon Stewart
Jamie Coleman	Marianne Hensman
Lucy Ambrose	David Morely
Liz Anderson	Christine Hirsch

Appendix 4 Checklist of quality indicators

Quality Indicator	Detail	
Research question	*Is the research question or hypothesis clearly stated?*	☐ Y ☐ N ☐ Unclear
Study subjects	*Is the subject group appropriate for the study being carried out (number, characteristics, selection, and homogeneity)?*	☐ Y ☐ N ☐ Unclear
'Data' collection methods	*Are the methods used (qualitative or quantitative) reliable and valid for the research question and context?*	☐ Y ☐ N ☐ Unclear
Completeness of 'data'	*Applies to both qualitative and quantitative studies. Have subjects dropped out? Is the attrition rate less than 50%? For questionnaire based studies, is the response rate acceptable (60% or above?)*	☐ Y ☐ N ☐ Unclear
Control for confounding	*Have multiple factors/variables been removed or accounted for where possible?*	☐ Y ☐ N ☐ Unclear
Analysis of results	*Are the statistical or other methods of results analysis used appropriate?*	☐ Y ☐ N ☐ Unclear
Conclusions	*Is it clear that the data justify the conclusions drawm?*	☐ Y ☐ N ☐ Unclear
Reproducibility	*Could the study be repeated by other researchers?*	☐ Y ☐ N ☐ Unclear
Prospective	*Does the study look forwards in time(prospective) rather than retrospective*	☐ Y ☐ N ☐ Unclear
Peer review	*Has the paper been peer reviewed?*	☐ Y ☐ N ☐ Unclear
Ethical issues	*Were all relevant ethical issues addressed*	☐ Y ☐ N ☐ Unclear
Triangulation	*Were results supported by data from more than one source?*	☐ Y ☐ N ☐ Unclear

Appendix 5 CVs for review group members and conflict of interest statement

Three members* of the group have experience of completing a BEME systematic review successfully (Buckley et al 2009 BEME Guide No.11)

Lucy Ambrose MBBS MSc MRCGP MD Lucy Ambrose is a General Practitioner and Senior Lecturer and Director of Clinical Skills for the School of Medicine at Keele University. Her research interest is in patient safety and skills development and she has recently completed her MD in medical education and patient safety.

Elizabeth Anderson SRN, SCM, HV, BSc, PhD, PGCinHE. Elizabeth Anderson is Senior Lecturer in Shared Learning at the University of Leicester and Lead for Patient Safety. She has published widely in the field of inteprofessional education and patient safety.

Sharon Buckley PhD PGCE PGD Sc.Comm* Sharon Buckley is a Senior Lecturer in Medical Education in the College of Medical and Dental Sciences at the University of Birmingham, where she chairs the cross-College steering group for Interprofessional Education (IPE). Sharon led the review group that successfully completed BEME Guide No.11.

Jamie Coleman MBChB MA(MedEd) MD MRCP(UK)*Jamie Coleman is a Senior Lecturer in Clinical Pharmacology and Medical Education at the University of Birmingham and Honorary Consultant Physician at the University Hospitals Birmingham. His research interests include drug safety, e-Health and Professional Education.

Marianne Hensman MSc MCSP Marianne Hensman is a Clinical Tutor in Physiotherapy at the University of Birmingham. Her teaching and research interests include interprofessional education and the development of practical skills and professionalism in students with a focus on safe practice.

Christine Hirsch PhD MRPharmS Adv Dip CPT Christine Hirsch is a lecturer in Clinical Pharmacy at the University of Birmingham. Her research interests include areas around the safe and effective use of medicines particularly related to palliative and end of life care. She also has a strong interest in the applications of inter-professional education for enhancing medication safety.

James Hodson BSc (Hons) James Hodson is a statistician at Queen Elizabeth Hospital Birmingham. He provides statistical support to both the hospital, and the neighbouring University of Birmingham.

David Morley MA (open and distance education)* David Morley is an Education Development Specialist in the College of Medical and Dental Sciences, University of Birmingham. His interests include student transition to and experience of learning in the clinical setting and the development of clinical skills. He is currently working towards a Doctorate in Education.

Sarah Pittaway M Phil PhD Sarah Pittaway is a Subject Advisor in Library Services at the University of Birmingham. She supports learning, teaching and research in the College of Medical and Dental Sciences and the College of Life and Environmental Sciences.

Jonathan Stewart MD PGC FRCS(Ed) FRCS(Eng) Jonathan is a consultant colorectal surgeon, Head of Faculty at the Hollier Simulation Centre and clinical Lead for Simulation at the University of Birmingham. He has a strong interest in the influence of team performance on patient safety, particularly the application of human factors to clinical settings.

The authors report no conflicts of interest.