

# The role of organisational and cultural factors in the implementation of system-wide interventions in acute hospitals to improve patient outcomes: protocol for a systematic literature review

Hadis Nosrati,<sup>1</sup> Robyn Clay-Williams,<sup>2</sup> Frances Cunningham,<sup>2</sup> Ken Hillman,<sup>1</sup> Jeffrey Braithwaite<sup>2</sup>

**To cite:** Nosrati H, Clay-Williams R, Cunningham F, *et al*. The role of organisational and cultural factors in the implementation of system-wide interventions in acute hospitals to improve patient outcomes: protocol for a systematic literature review. *BMJ Open* 2013;**3**:e002268. doi:10.1136/bmjopen-2012-002268

► Prepublication history for this paper are available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2012-002268>).

Received 26 October 2012  
 Revised 1 February 2013  
 Accepted 4 February 2013

This final article is available for use under the terms of the Creative Commons Attribution Non-Commercial 2.0 Licence; see <http://bmjopen.bmj.com>

<sup>1</sup>The Simpson Centre for Health Services Research, Australian Institute of Health Innovation, Faculty of Medicine, University of New South Wales, Sydney, Australia  
<sup>2</sup>Centre for Clinical Governance Research, Australian Institute of Health Innovation, Faculty of Medicine, University of New South Wales, Sydney, Australia

**Correspondence to**  
 Dr Robyn Ckay-Williams;  
[r.clay-williams@unsw.edu.au](mailto:r.clay-williams@unsw.edu.au)

## ABSTRACT

**Introduction:** Little is known about the role of the organisational culture in the success and sustainability of the hospital-wide interventions, and how local culture affects patient outcomes in acute hospitals.

**Methods and analysis:** A systematic literature review will be conducted to identify organisational factors influencing hospital-wide interventions and patient outcomes. A search of English language articles will be performed in MEDLINE, CINAHL, EMBASE, Web of Science, PsychInfo and Global Health databases using Medical Subject Headings and keywords. Randomised controlled trials, quasi-randomised trials, controlled before and after design studies and interrupted time-series analysis studies will be included. ‘Grey literature’ will be excluded, however peer-reviewed journals that are likely to publish relevant studies (*JAMA*, *BMJ*, *BMJ Quality and Safety*, *Lancet* and *New England Journal of Medicine and Implementation Science*) will be hand searched for the last 5 years. Two reviewers will independently undertake a title and abstract review using inclusion and exclusion criteria. Studies will be excluded only after discussion between at least two reviewers, who will assess and agree on the inclusion, risk of bias and quality rating of the studies. One author will extract summary descriptive data from these studies; the other author will review this documentation for accuracy and completeness.

**Results:** It is likely that the studies will be heterogeneous in nature, therefore a narrative synthesis of the findings will be conducted.

**Conclusions:** We will discuss characteristics of the studies and stratify the results according to the type of hospital-wide interventions, organisational factors associated with them and outcomes measured.

## INTRODUCTION

Despite the remarkable advances in health-care delivery and considerable changes in hospital patient populations and expectations associated with modern medicine, the

## ARTICLE SUMMARY

### Article focus

- This review aims to identify the organisational factors that affect the implementation of hospital-wide interventions in acute hospitals, and how these organisational factors and hospital-wide interventions influence patient outcomes.

### Key messages

- Silos, or vertical structures within hospitals such as wards, units and departments, are well developed in acute care hospitals, but the system may fail at the intersection between silos for patients with complications of the original illness, which are outside the expertise of the admitting clinician.
- To bridge these intersections and thereby reduce the potential preventable adverse events for an increasingly aged and ill hospital population with comorbidities, organisation-wide patient-safety interventions are becoming a major focus of healthcare delivery.
- Little is known about the cultural and organisational determinants of hospital-wide interventions and their effects on patient outcomes.

### Strengths and limitations of this study

- This study aims to increase our knowledge of organisational culture, which we believe is an important element in the success or failure of the implementation of hospital-wide interventions.
- We will investigate how the adoption of a system-wide intervention can affect patient outcomes.
- We will be including observational studies as well as controlled before and after studies in the systematic review, as it is likely they will provide valuable information.
- We include only English language studies.
- Risk of bias will be assessed using standard Cochrane criteria.

fundamental organisation of hospitals has changed little for the 21st century. The system is constructed around the admitting doctor and patient relationship.<sup>1</sup> In acute hospitals, wards are able to manage the day-to-day aspects of a patient's condition, but the system can fail when the patient's condition deteriorates and the admitting doctor no longer has the skills or knowledge to neither recognise nor manage the deteriorating patient.<sup>1-3</sup> One of the first organization-wide and patient-centred systems, known as the Medical Emergency Team (MET) or Rapid Response System (RRS) has been implemented in many hospitals around the world to address this situation.<sup>2</sup> When the criteria that define an at-risk or deteriorating patient are met, a team of clinicians with appropriate skills urgently responds to the patient. However, because of the nature of hospitals, and depending on the existence of necessary infrastructure to provide the continuity of care,<sup>4 5</sup> the effectiveness of the few implemented hospital-wide interventions, such as an RRS, varies significantly from one health organisation to another.<sup>6</sup> Ultimately, we are interested in determining why interventions such as MET are successful in some settings but not in others. By examining hospital-wide interventions in acute care systems (including non-MET interventions) via this systematic literature review, we hope to shed some light on the problem.

While there is keen interest in how to optimise and implement the system, little is known about the role of organisational culture<sup>7-10</sup> in the success and sustainability of the hospital-wide interventions, and how the culture could affect patient outcomes in acute hospitals. Patient safety interventions working at an organisational level that include participative principles, such as the involvement of workers in design and implementation, may provide the greatest hope of improving patient safety.<sup>11-13</sup> We note the identification of limitations in the literature such as those identified by Kaplan *et al.*<sup>14</sup> including the lack of a practical conceptual model, the lack of clear definitions of contextual factors and the lack of well-specified measures. This protocol details the processes of a systematic literature review that aims to identify the organisational and cultural factors<sup>9 15</sup> affecting the adoption and success of hospital-wide interventions in acute hospitals, and to assess the effects of those factors on patient outcomes.

## METHODS AND ANALYSIS

### Search strategy

We will search MEDLINE, CINAHL, EMBASE, Web of Science, PsychInfo and Global Health, using Medical Subject Headings and keywords, from 1946, 1991, 1947, 1934, 1967 and 1910, respectively, to September 2012. The general search strategy is shown in box 1 and the subject heading will be adjusted for each database. We will use multiple terms to identify culture and intervention. The search will be restricted to English language

### Box 1 General search strategy

- Organisational culture OR organisational climate OR organisational context OR organisational characteristics OR workplace culture OR organisational goal OR organisational value
- AND ((adopting organisation) OR (adherence to protocol) OR (organisational innovation) OR (diffusion of innovation) OR (intervention) OR (diffusion) OR (organisational change) OR (protocol change) OR (practice change) OR (structure change) OR (adoption) OR (leadership))
- AND (patient outcome)
- AND (healthcare organisation OR hospital OR healthcare facility)

articles (access to translation services is not available for the review), however we note that a recent systematic review of empirical studies on the effect of English-language restriction on systematic reviews found 'no evidence overall of a systematic bias from the use of language restrictions in systematic review-based meta-analyses in conventional medicine.'<sup>16</sup> In addition to searching the specified databases, to check that the database searches have not missed any studies that may be relevant to our review we will hand search the journals, *JAMA*, *BMJ*, *BMJ Quality and Safety*, *Lancet* and *New England Journal of Medicine and Implementation Science*, separately published during the last 5 years (from 2007 to 2012). The topic of hospital-wide interventions is broad and complex, and it is possible that relevant articles may be classified differently to the review search terms. The hand search will serve to check that our search criteria are broad enough, and that an extension of the search criteria is not required. These peer-reviewed journals were chosen as the most likely to publish studies that meet the inclusion criteria, in particular, validated patient outcomes. We will also hand search the reference lists of the relevant Cochrane systematic reviews. Two researchers will conduct the hand search; if disagreement about inclusion of a study occurs a third researcher will arbitrate.

### Study selection and exclusion criteria

Under the review's inclusion and exclusion criteria, research must focus on a hospital-wide intervention, that is, mere implementation in the operation theatre, a few general units or intensive care unit is not sufficient. Other inclusion criteria include investigating the organisational factors that may affect the implementation. Studies should also provide patient outcome data before and after the hospital-wide intervention. The review will only include interventions in an acute care setting, that is, rehabilitation centres, primary health cares, ambulatory services and psychiatric facilities will be excluded. Other inclusion criteria include that the study report on empirical research, in peer-reviewed, English language and scholarly journals, as well as the abstract and full text are available. The 'grey literature' will be excluded

as it is unlikely to yield study designs that meet inclusion criteria.

We will not limit our search to randomised controlled trial studies, since we believe observational studies and controlled before and after studies—with validated data about patient outcomes—can provide useful information to identify the organisational and cultural determinants of hospital-wide interventions.

References identified in the search will be reviewed for inclusion by two researchers. Studies will be excluded only after discussion between at least two reviewers, who will assess and agree on the inclusion and quality rating of the studies. The methodological quality of the reported research will be assessed in accordance with Cochrane Collaboration guidelines.<sup>17</sup> The quality of the reporting of the identified studies will be assessed using appropriate critical appraisal tools, such as CONSolidated Standards of Reporting Trials (CONSORT),<sup>18</sup> Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)<sup>19</sup> or Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).<sup>20</sup> All papers excluded by consensus will be depicted in a document explaining reason for exclusion. Our review will be conducted according to PRISMA guidelines<sup>20 21</sup> and literature selection will be presented in a PRISMA flow chart.<sup>20</sup> The selection criteria may limit the generalisability of study findings, however the scope of the search is appropriate to identify the majority of articles published in the peer-reviewed literature and meeting the study criteria.

### Participants

Participating hospitals may include any acute care facility, including metropolitan or rural, and private or public hospitals.

### Type of interventions

As noted, we will only include interventions that are hospital-wide and are associated with patient outcomes through validated data collected before and after implementation of the intervention. Also, the organisational elements of the intervention should have been explained in the study to make it qualified for our review.

### Comparisons

Comparisons may include acute hospitals with similar nursing–patient ratio, size and region with no intervention.

### Types of outcome measures

Patient outcomes may include death rate, the rate of adverse events, patient satisfaction and infection rate.

### Assessment of risk of bias

Two reviewers will independently assess risk of bias in eligible studies as outlined in the *Cochrane Handbook for Systematic Reviews*<sup>17</sup>: selective outcome reporting and blinding of the research personnel to data collection and analysis. For any non-randomised trials included in

the review, the authors will assess any selection bias that may lead to confounding of the outcome. Disagreement regarding assessment of risk of bias will be resolved through discussion between two reviewers. If a consensus is not reached, a third reviewer will be consulted.

### Data collection and analysis

Using a standard form created for the review, one author will extract summary descriptive data from these studies. The same author will compile a tabular presentation the study participants and setting, objective, design and method, type of hospital-wide intervention, organisational/cultural factors, patient/process outcomes and findings. The second author will independently review this documentation for accuracy and completeness.

### Strategy for data synthesis

If suitable data are available, a meta-analysis will be completed; however, it is likely that included studies will be heterogeneous in nature. Where trial data cannot be combined, two of the authors will conduct a narrative synthesis of the findings in accordance with the review objectives. We will discuss characteristics of the studies and stratify the results according to the type of hospital-wide interventions, organisational factors associated with them and outcomes measured.

### Limitations

The review findings will be limited by the number and quality of studies identified by the search strategy. A potential limitation is in selection of the search terms. The concept of a ‘hospital-wide intervention’ is subject to classification, and it is possible that studies could be published that would meet our inclusion criteria, but are not identified by the search engines owing to the use of alternate terms or categorisation. We have attempted to ameliorate this with a hand search over the last 5 years of six prominent general medical journals that we believe are likely to publish studies relevant to our review. The hand searching provides an additional check on the reliability of the search strategy of the electronic databases and will serve to check that an extension of the search criteria is not required. By restricting the search to English language articles we are also potentially eliminating relevant studies from inclusion in our review.

**Acknowledgements** We acknowledge Dr Isla Hains from the Centre for Health Systems and Safety Research in the Australian Institute of Health Innovation who provided guidance regarding the search strategy.

**Contributors** All authors conceived the study and were responsible for designing the protocol. HN and RCW codrafted the protocol manuscript and FC, KH and JB revised it for a methodological and clinical content. All authors critically revised successive drafts of the manuscripts and approved the final version.

**Funding** This research is supported under the NSW Department of Health Capacity Building Infrastructure Program, Projects scheme (project RG093684) and National Health and Medical Research Council (NHMRC) program grant 568612.

**Competing interests** None.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** Data available on request from the corresponding author.

## REFERENCES

- Hillman K, Chen J, Young L. The evolution of the health care system. In: DeVita MA, Hillman K, Bellomo R, eds. *Medical emergency teams*. New York: Springer, 2006:18–23.
- Hillman K, Chen J, Aneman A. Continuum of hospital care: the role of intensive care. *Curr Opin Crit Care* 2010;16:505–9.
- Hillman KM. Restructuring hospital services. *Med J Aust* 1998;169:239.
- Hillman K, Parr M, Flabouris A, et al. Redefining in-hospital resuscitation: the concept of the medical emergency team. *Resuscitation* 2001;48:105–10.
- Sakai T, DeVita MA. Rapid response system. *J Anesth* 2009;23:403–8.
- Hillman K, Chen J, Cretikos M, et al. Introduction of the medical emergency team (MET) system: a cluster-randomised controlled trial. *Lancet* 2005;365:2091–7.
- Braithwaite J. A lasting legacy from Tony Blair? NHS culture change. *J R Soc Med* 2011;104:87–9.
- Braithwaite J, Hyde P, Pope C. *Culture and climate in health care organisations*. Basingstoke, UK: Palgrave Macmillan, 2009.
- Mannion R, Davies H, Harrison S, et al. Changing management cultures in the English National Health Service. In: Braithwaite J, Hyde PPope C, eds. *Culture and climate in health care organisations*. Basingstoke, UK: Palgrave Macmillan, 2009:19–30.
- Mannion R, Davies H, Harrison S, et al. *Quantitative explorations of culture and performance relationship: changing organisational cultures and hospital performance in the NHS*. Birmingham, UK: National Institute for Health Research Service Delivery and Organisation Programme, 2010:42–72.
- Braithwaite J, Coiera E. Beyond patient safety flatland. *J R Soc Med* 2010;103:219–25.
- Grayson ML, Russo PL, Cruickshank M, et al. Outcomes from the first 2 years of the Australian National Hand Hygiene Initiative. *Med J Aust* 2011;195:615–19.
- Larson EL, Early E, Cloonan P, et al. An organizational climate intervention associated with increased handwashing and decreased nosocomial infections. *Behav Med* 2000;26:14–22.
- Kaplan HC, Brady PW, Dritz MC, et al. The influence of context on quality improvement success in health care: a systematic review of the literature. *Milbank Q* 2010;88:500–59.
- Cameron K, Freeman S. Culture, congruence, strength and type: relationship to effectiveness research in organizational change and development. *Res Organ Change Dev* 1991;5:23–58.
- Morrison A, Polisena J, Husereau D, et al. The effect of English-language restriction on systematic review-based meta-analyses: a systematic review of empirical studies. *Int J Technol Assess Health Care* 2012;28:138–44.
- Higgins JPT, Green S, Collaboration C. *Cochrane handbook for systematic reviews of interventions* Wiley. Chichester, UK: Online Library, 2008.
- Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMC Med* 2010;8:18.
- von Elm E, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Prev Med* 2007;45:247–51.
- Liberati A, Altman DG, Tetzlaff J, et al. Research methods and reporting: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ* 2009;339:b2535.
- Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* 2009;6:e1000097.