

# The experience of Australian project leaders in encouraging practitioners to adopt research evidence in their clinical practice

Amanda J Henderson, Jan Davies and Michaela R Willet

## Abstract

**Objective:** This paper describes a qualitative program evaluation which sought to identify factors that either assist or impede the adoption of clinical evidence in everyday practice.

**Design and Participants:** Thirteen Australian projects were funded in a competitive grant program to adopt innovative strategies to improve the uptake of research evidence in everyday clinical practice. Project leaders' reports were analysed to collate common themes related to 1) critical elements in successful application of research knowledge, 2) barriers to implementing evidence, and 3) lessons for other organisations that might implement a similar project.

**Results:** Despite the diversity of the methods used to establish projects and the range of topics and clinical settings, many similarities were identified in the perceived critical success elements, barriers, and lessons for adopting clinical evidence. Eighteen themes emerged across the data including: leadership support; key stakeholder involvement; practice changes; communication; resources; education of staff; evaluation of outcomes; consumers; knowledge gaps; adoption/implementing staff; access to knowledge; risk assessment; collaboration; effectiveness of clinical research evidence; structure/organisation; cultural barriers; previous experiences; and information technology.

**Conclusion:** Leaders of projects to adopt evidence in clinical practice identified barriers, critical success elements and lessons that impacted on their projects. A range of influences on the adoption of evidence were identified, and this knowledge can be used to assist others undertaking similar projects.

*Aust Health Rev* 2006; 30(4): 474–484

## What is known about the topic?

Strategies for improving the adoption of evidence in practice have variable effectiveness. Developing an understanding of critical success factors and barriers that impact on the adoption of evidence in specific contexts, and incorporating this understanding into implementation strategies, may increase the success of efforts to improve patient care.

## What does this paper add?

This evaluation of a set of funded projects, designed to improve uptake of research evidence in clinical practice, provides specific knowledge about adoption of clinical evidence in the Australian context. Common themes identified across the evaluation questions included leadership support; key stakeholder involvement; practice changes; communication; resources; education of staff; evaluation of outcomes; and consumer involvement.

## What are the implications for practice?

This paper describes the factors that project leaders experienced and perceived as influencing the adoption of research evidence in clinical practice within the Australian health care setting. These factors are shown to be similar to those experienced in other countries despite the difference in health care systems. This work provides Australian practitioners with empirical evidence to use when planning projects to increase uptake of research evidence in clinical practice. ♦

**Amanda J Henderson**, PhD, BA(Hons), Assistant Professor

College of Health Sciences, University of Sharjah, Sharjah, United Arab Emirates.

**Jan Davies**, PhD, MBA, Executive Officer

**Michaela R Willet**, BSc(Hons), Program Manager  
National Institute of Clinical Studies, Melbourne, VIC.

Correspondence: Ms Michaela R Willet, National Institute of Clinical Studies, Level 5, 499 St Kilda Road, Melbourne, VIC 3004. [mwillet@nicsl.com.au](mailto:mwillet@nicsl.com.au)

**THERE ARE WELL DOCUMENTED** gaps between research evidence and practice.<sup>1-4</sup> The reasons for these gaps are complex and multifaceted. Barriers to the use of evidence in practice can occur at the level of the individual, team, organisation or system.<sup>5</sup> These barriers vary with the clinical setting, format and nature of the evidence.<sup>6</sup> The effectiveness of different interventions to change clinician behaviour, with respect to use of evidence, also vary when applied across different settings and contexts.<sup>7,8</sup>

It is likely that the success of efforts to increase use of evidence in practice could be improved by building an understanding of the barriers for the specific context, and systematically addressing these, while taking advantage of factors supporting the adoption of evidence.<sup>9,10</sup> This paper is an exploration of these influences on the adoption of evidence, as perceived by project leaders undertaking evidence implementation projects in the Australian health care setting. This evaluation is based on the analysis of reports from 13 projects funded through the National Institute of Clinical Studies (NICS) targeted grants program to explore effective ways to address gaps between the available clinical evidence and its adoption in everyday practice. The aim of this paper is to identify factors that project leaders perceived as influencing the adoption of research evidence in clinical practice within the Australian health care setting.

## Methods

### *The grant program*

In 2001 and 2002, NICS offered grants ranging from \$10 000 to \$100 000 to organisations and individuals undertaking work in targeted areas: identifying or testing ways to increase the use of clinical evidence; improving patient care by implementing existing research knowledge; and reviewing research knowledge on uptake of known beneficial interventions. NICS received 394 applications for funding. All applications were assessed by a panel of experts with specialist knowledge in relevant clinical areas and implementation expertise from across the Australian health care sector. Eighteen projects were selected for

funding,<sup>11-20</sup> 13 of which sought to adopt research evidence in various health care settings. These 13 evidence implementation projects are listed in Box 1, and form the basis of this paper.

The 13 projects were diverse with respect to the clinical problem, scale, duration (12–25 months) and setting and used a variety of evidence implementation strategies. One project was discontinued at the project leader's request before completion. While NICS oversaw the program, each project leader was responsible for their project's planning, management and outcomes, and any required ethics approvals. The principal project leaders, who were responsible for signing off on the evaluation reports analysed in this paper, were from varied professional backgrounds including: nine medical, one nursing, two pharmacists, and one medical informationist (nine males, four females). Approval to undertake this evaluation was under the auspices of the grant-funding organisation. Project leaders agreed, as part of the contractual funding agreements, to information about the program being disseminated to increase knowledge about the adoption of evidence in the wider health community.

### *Evaluation of project reports*

Written project reports were completed at 6 months and at the end of the project by the project leaders for each funded project. A summative evaluation of these reports was conducted. Three open-ended evaluation questions were included in the reporting templates:

- What were the critical elements in successful application of research knowledge in your project?
- What were the barriers to implementing the research?
- What are the lessons for other organisations that might implement a similar project?

A qualitative design, using data collected from the report template completed by the project leaders, was used to explore and describe perceived influences on the adoption of research evidence. Qualitative analysis of these data was then undertaken to make judgements about these factors. This approach ensured that the themes were fluid and emergent rather than preformed and fixed from previous work in this area.<sup>21,22</sup>

## I Projects funded to improve care through adoption of clinical evidence<sup>11</sup>

Project title	Project area
Testing of a near-peer approach to implementing evidence-based mucositis prevention in cancer patients	In three oncology service sites, a nurse already working in the area ("near-peer facilitator") trained to be an on-unit resource to his/her colleagues to lead guideline implementation
Implementation of the NEXUS criteria for use of cervical spine x-rays	Implementation of a clinical decision rule for x-rays in alert and stable blunt trauma patients by inclusion of decision rules in test ordering forms, and education sessions for emergency department junior doctors
Evidence based clinical assessment and investigation of inpatients and emergency patients with suspected pulmonary embolus	Implementation of a clinical decision making rule and new diagnostic test, using multidisciplinary interactive education sessions and alteration to test ordering permission process. <sup>12</sup>
Rational Investigation Ordering Collaborative	A collaborative based on Institute for Healthcare Improvement Breakthrough Series (including workshops, conference calls, site visits, website, multidisciplinary change teams, data feedback, process change) to implement change in pathology investigation ordering in 13 hospitals
Improving analgesia in hospital emergency departments: optimising the use of pethidine	23 hospitals participated in a joint project to change pethidine prescribing, using drug use evaluation (DUE) methods (facilitated audits and feedback of prescribing data, educational materials and reminders, group discussions, teleconferences) <sup>14</sup>
Implementation of the Canadian CT Head Rule in a tertiary emergency department	A comparison of educational (new ordering form, posters, education sessions) and coercive (radiology registrars empowered to refuse scans) strategies
Improving diabetes risk management in remote indigenous communities: a cluster randomised trial	A package of patient self-management education materials delivered in conjunction with an education session for patients and health workers
Improving the outcomes of anticoagulation: an evaluation of home follow-up of warfarin therapy	Home visits by pharmacists to provide patients in transition from hospital to community care with an education and home monitoring of therapy <sup>13</sup>
Decision support systems in acute coronary syndromes	Implementation of point of care electronic decision support, integrating guideline and patient record
Implementation and evaluation of a simple patient-initiated intervention to reduce unnecessary caesarean sections	Provision of paper education materials to patients to encourage patients to prompt clinicians' detection of breech presentations <sup>15</sup>
Respecting Patient Choices – an advance care planning program	Implementation of an established program ("Respecting Choices"), which involves numerous organisational system changes and the education of health professionals to facilitate advance care planning discussions with patients and families
Increasing access to evidence in an acute hospital setting through a clinical evidence researcher service	An informationist attending clinical ward rounds and meetings provided an evidence searching and written summary service <sup>16,17</sup>
Care without pain: paediatric pain management in the peripheral hospital and community	A two hospital, multifaceted approach (tailored to results of focus groups, surveys and environmental audits) using multidisciplinary implementation team meetings, educational materials, development of hospital policy, and an education (mail-out) strategy for general practitioners

Project leaders' responses to each question were transcribed and grouped by question area: critical elements, barriers and lessons. Descriptive analysis of qualitative responses, using keywords and concepts in the qualitative statements, was used to identify themes in the data. The unit of analysis was each question; this generated the framework for organising the data. Cross-analysis of themes by question was then undertaken. This analysis looked for convergence in the themes, irregularities and the extent to which data belonged to a certain theme. In the final analysis themes were only counted once, irrespective of how many times they were mentioned, for each report. Data were independently reviewed by two evaluators and consensus was achieved on the final reported themes.

We did not attempt to categorise the data by using existing models of behaviour change, guideline use or diffusion of innovation such as those based on health education, social science, organisational psychology or other theories,<sup>6,23-25</sup> instead, we sought to reflect actual themes as represented by project leaders' comments. As new themes continued to emerge in the final reports, it cannot be determined if the emergent themes were exhaustive.

## Results

Eighteen themes emerged across the three evaluation questions. These themes emerged from the diverse project topics, designs and project management styles and represent data from the 12 completed projects. Results, including emergent themes and examples of typical thematic concepts, are shown for each evaluation question (Box 2).

Emergent themes across the evaluation questions were further grouped into responses that were common across all three questions (consistent themes), those that were reflected in two questions (repetitive themes) and those that were unique to one question.

### Consistent themes

Eight themes emerged that were common to all three evaluation questions: leadership support; key stakeholder involvement; practice changes; communication; resources; education of staff; evaluation of outcomes; and consumer involvement.

Adopting evidence can be complex and unpredictable and the reports suggested that the themes were interrelated. This is illustrated by extracts drawn from responses:

The main lesson learnt has been that resistance to change and the resulting compromises that are needed to generate clinician "buy in" can lead to much longer than expected delays (even when resistance to change was expected and allowed for) and significantly increased costs. Hidden issues also arose as a consequence of introducing a change. When ... systems are being implemented in a way other than duplicating traditional systems these unexpected issues and hence delays and costs can be very substantial and make completion of the project in a reasonable timeframe untenable.

In this example, three themes were identified: key stakeholder involvement, resources, and practice changes. In the next example, themes including key stakeholder involvement, resources, leadership support and communication were identified.

Common barriers that were met, and largely overcome, were factors such as: the initial resistance to change to the status quo and difficulties engaging clinician interest; conflict of interest issues for ... providers between profit margins and quality management, and difficulties in maintaining momentum caused by high staff turnover and rotation in geographically remote health organisations. A few teams lacked involved and supportive leadership making their struggles to instigate and motivate behaviour change more of a challenge. In the first half of the [project], poor communication and lack of identification and involvement of key stakeholders caused unnecessary resistance and lack of understanding in some areas. An inevitable barrier to most participants was the issue of conflicting time commitments and the realisation of the extent of the commitment required to ensure worthwhile clinical practice improvement.

## 2 Emergent themes and example thematic concepts

Theme	Critical elements to successfully implement clinical research knowledge	Barriers to implementing the research Example concepts	Lessons for other organisations
Consistent themes: emerged across all three questions			
Leadership support	Executives sponsor support within the organisation A steering committee that is committed to a change A clinical "champion" from the senior medical staff Support from senior clinicians	Lack of leadership	Obtain support of executive, professional organisations, influential clinical leaders, senior managers Identification of a clinical champion to drive the project
Key stakeholder involvement	Clinician acceptance and commitment Multidisciplinary team of major stakeholders Establishing a core group of interested and committed clinicians and managers to work together	Conflict of interest between different stakeholders Difficulties in gaining key stakeholder engagement or support Lack of medical support	Involve key individuals affected by the change in practice Include a multidisciplinary team Invite stakeholders to participate in project prior to commencement of changes
Practice changes	Should be simplified and incrementally implemented Incorporation of practice changes into current processes	Beliefs that current practice is at a high level Lack of uptake or compliance with project initiatives by practitioners Difficulty in acceptance of new practices Resistance to the status quo Lack of experience in uptake of new projects	Implement simple changes first
Communication	Oral presentations to all stakeholder groups Regular written communication A widespread campaign publicising the project to staff	Lack of awareness of project Restricted processes of communication between professional groups Poor intradepartmental communication	Convey the evidence clearly to key clinicians Use marketing or awareness raising strategies including regular updates on the progress of change
Resources	Provision of funding to initiate the application of research knowledge	Gaining funding when the project area does not easily fit into one speciality Competing demands of human resources Existing high workloads Time commitments of clinicians involved Insufficient funds to conduct projects Cost effectiveness of project not initially able to be clarified Short staff rotations	Provision of funding to initiate project to apply the evidence Identify ways to measure multiplicity of effect Allocate a budget for a project officer Allocate a training budget
Education of staff	Training of staff in the principles and practice (related to the project) Provide data and examples which demonstrate the value (of the project) Training to know how to rank the quality and generalisability of evidence	Lack of appropriate training for health workers	Commence prior to practice changes being implemented Educate staff on the reasons for making changes
Evaluation of outcomes	Effectiveness of practice changes monitored Feedback to doctors by an opinion leader Inclusion of project in a broader quality improvement framework	Weak grasp of the necessity of defining evaluation measures	Establishing continual evaluation of progress with feedback to stakeholders Support evaluation with external review, data audits Evaluate baseline practices
Consumers (patient/families)	Provision of adequate information at the point of decision making Ensuring consumer expectations and perceptions about practice are appropriate Experiences, beliefs and perception that are based on the available evidence and not obsolete knowledge or anecdote The involvement of patients and their family members in embracing the initiative through discussions about the rationale	Consumer demand for specific (other) treatment options Social barriers to behaviour changes Media influences Multiple education brochures on the same topic	Involve patients and family in practice changes and as potential agents of change Educate patients about benefits of changes in practice

Theme	Critical elements to successfully implement clinical research knowledge	Barriers to implementing the research Example concepts	Lessons for other organisations
<b>Repetitive themes: emerged across two questions</b>			
Knowledge gaps	Awareness by clinicians of their own practices Preparedness to acknowledge gaps in knowledge Knowledge of current practice patterns and outcomes based on audit results	Inadequate knowledge regarding the effect of non-evidence-based practices Lack of awareness of research evidence Preparedness to question practice	
Adoption/ Implementing staff	A project officer (to manage the project) Appropriate project team make-up Need to have mentors		Seek interested staff for formal positions in the team leading change Implement a structured support framework to discuss barriers and generate problem solving strategies
Effectiveness of clinical research evidence		Lack of evidence based literature on real-world effectiveness of clinical treatment or practice to be implemented	Ensure reliable and validated studies support practice to be implemented
Structure/organisation		Acceptance of practice across traditional organisational boundaries (hospitals and community) Difficulty in organising multicentre efforts	Understand how current systems and processes work Recognise that service provision may be fragile and affected by changes Ensure systems and processes are in place to commence projects Develop policies and procedures as required
<b>Unique themes: emerged in one question</b>			
Access to knowledge	Having ready access to good quality research knowledge in real time to all health care workers involved in the care of the patient Being able to provide ready access to good quality research knowledge		
Risk assessment	Should be completed for all new practices before evidence is applied		
Cultural barriers		Reluctance to accept care initiatives that may challenge cultural beliefs Reluctance to change current or historical practices	
Collaboration	To be established between professional groups Liaison with organisations or bodies which can confirm and support ethico-legal and process questions To be established between different health environments, for example, primary health care and hospitals		
Previous experiences		Influence of negative experiences in past efforts to change practice Personal experience is more compelling than evidence	
Information technology (IT)		Ability of software programs to produce meaningful reports Limited IT support Individual ability to use IT programs Accessibility to the IT system for users	

### **Repetitive themes**

Repetitive themes emerged across two question areas. The four themes in this category were: knowledge gaps, evidence of effectiveness of research, adoption/implementing staff and structure/organisation. Many reports stated that it was important for individual clinicians to identify where knowledge gaps existed. The “knowledge gap” theme was identified as both a critical element of success and a barrier to the adoption of evidence. If clinicians don’t question current practice it is difficult both to determine if evidence–practice gaps exist and to engage them in changing practice. One project leader reported, “Asking the question is ultimately critical in seeking and providing the research knowledge for application to individual patients.”

Identifying knowledge gaps logically precedes seeking knowledge to reduce the knowledge deficit.

The theme “effectiveness of clinical research evidence” emerged in the barrier and lesson questions. It was reported that projects needed to have reliable and valid information (strong evidence) to support practice change. For example, one project leader reported, “Validation of the strategy at a site outside of the institution that developed the risk assessment should allay some of the clinical concern about the . . . new approach.”

The question of efficacy research and effectiveness research may have been the underlying concept being considered here, although it was not explicitly stated. Although the efficacy, or extent to which an intervention produces a beneficial outcome under ideal conditions, may be published, the effectiveness of the practice/treatment in different settings under ordinary circumstances may not be as widely reported.

The “adoption/implementing staff” theme is the only theme in this category that was not identified in response to the barriers to implementation question. This may have been because in these projects, staff were appointed and recruited specifically for the projects.

### **Unique themes**

Unique themes emerged in only one of the question areas. Themes that uniquely emerged from the critical element question were: access to knowl-

edge, risk assessment and collaboration. For example, project leaders reported that having access to good quality research had an impact on the ability to apply this information, but this was not described as a barrier in the existing projects.

Themes that were unique to the barrier question were culture, previous experiences and information technology. Cultural barriers were identified to be related to initiatives that may challenge cultural beliefs and a reluctance to change historical practices. Previous experiences were discussed with respect to prior negative experiences in change programs and personal experiences with care delivery or practices which were at odds with new evidence-based practices.

No unique themes emerged from the lesson question.

## **Discussion**

The NICS grant program aimed to promote the uptake of evidence in clinical practice and add to knowledge about the factors inhibiting or supporting this process. This knowledge is elicited from responses to the report template questions which reflect the project leaders’ experiences. While many of the project leaders were clinicians, their role in undertaking the project required a significant administrative component. Hence this paper focuses on the project leaders’ processes and perceptions of implementing evidence. These perceptions are not necessarily the same as those of other clinicians participating in the projects. Project leaders used a variety of approaches within the projects to improve the adoption of evidence. This evaluation did not analyse the effectiveness of the approaches used. Systematic reviews of the effectiveness of different change strategies, and methods of evidence implementation, have shown that no approach is superior for all situations,<sup>8</sup> and it is difficult to separate the success of a change approach from the implementation process and the setting. Irrespective of the project approach, and the level of success achieved by the individual projects, different project leaders reported similarities in the perceived critical elements of success, barriers and lessons across projects.

The targeted grant program was focused on implementing existing research knowledge; hence the effectiveness of existing research was an area of particular interest in this evaluation. The “effectiveness of clinical research evidence” was a theme that emerged in the barrier and lesson questions. A question raised by some clinicians who were impacted by the projects was “How do we know that the evidence is going to be appropriate to implement in our clinical setting?” Project leaders were required to address these questions in their projects. Disputes over the nature of evidence are commonly reported as a barrier to implementing evidence. In this program, the project leaders were implementing established clinical evidence. However, some clinicians affected by the project were still uncertain of how well the evidence would translate to their clinical setting. This illustrates the multifaceted aspects of meaningful and credible evidence in health care decision making and suggests that evidence of the effectiveness—the “real world” results—of a treatment, as well as clinical trial efficacy, is needed.<sup>26</sup>

While research evidence in support of a treatment or care process is required, leaders of evidence adoption projects also need information and experience in using different approaches to implement evidence.<sup>9,27,28</sup> The individuals leading these projects were concerned with the “how to” and “which method works best” questions of adopting the evidence in their local setting. Sources of evidence for different change approaches include systematic reviews from the Cochrane Effective Practice and Organisation of Care group.<sup>29,30</sup> This evaluation supports the importance of combining this implementation evidence with knowledge of the local context and project, change management and leadership skills.

The notion of “culture” in the adoption of evidence did not emerge from the evaluation as strongly as we expected and was only identified in the barrier question. Schein’s work suggested that practitioners may not be aware of their own culture until they are challenged by alternative perspectives.<sup>31</sup> The health care environment has numerous groups and subcultures, each having their own unique norms and values, and prevailing culture

can determine the outcomes of efforts to change practice. Reluctance to change historical practices, beliefs that practice is at a high level and a lack of preparedness to ask questions might be linked to professional culture. Although these barriers were identified, it is difficult to conclude how culture might be changed.<sup>32</sup> Project leaders within this program took it upon themselves to challenge current culture and practice in undertaking projects to improve the use of clinical evidence.

This evaluation identified a number of key themes consistent with contemporary research examining factors which aid or impede the adoption of evidence.<sup>23,33-35</sup> Bradley et al identified eight critical factors for the successful adoption of evidence in clinical practice, based on an analysis of four case studies. These were: supportive senior management; effective clinical leadership; data; supportive infrastructure; culture; level of coordination across departments; relationship between the organisation and the adopters; and relevance of the innovation.<sup>34</sup> In a systematic analysis of the broader literature in this field Greenhalgh et al outlined many factors required for successful innovation and implementation. Typical factors were shown to be: the nature of the innovation; motivation; practitioner capacity and competence; elements of the organisation structure, resources and leadership; early involvements and cooperation of staff at all levels; training; evaluation and feedback; embeddedness in inter-organisational networks and conducive external pressures.<sup>23</sup> Many of these factors are similar to those found in our work; for example, supportive senior management, effective clinical leadership, training, supportive infrastructure, culture, level of coordination across departments, and evaluation and feedback. Two factors that were not explicit in our data were: relationship between the organisation and the adopters, and relevance of the innovation and conducive external pressures. These may not have emerged because the project leaders in our program voluntarily sought competitive funding to undertake their chosen project. The relationship between the project leader and their organisation was not explored, and the context of the program was not related to any known external pressures.



This evaluation identified project leaders' perceptions about organisational and other factors developed through their experience of introducing evidence into practice. We, and others,<sup>9</sup> believe that the identification of potential influences on evidence implementation is an important starting point in undertaking change. Investing time in the identification of barriers and enablers of change before commencing a project enables careful selection of the implementation approach with respect to these barriers and the early involvement of relevant stakeholders. Although knowledge about the effectiveness of strategies tailored to identified barriers is not yet well developed, the concept of tailoring evidence implementation strategies is gaining recognition and interest.<sup>36</sup> While not exhaustive, the emergent themes for barriers, success factors and lessons identified in this evaluation give an indication of the types of barriers and enablers that exist across different health care settings in Australia. The next stage is to use these themes in implementation studies as baseline information to develop a framework evaluating the qualitative components of the adoption of evidence.

### Limitations of the evaluation

The constraints of the evaluation include the diverse nature of projects; variations in the project leaders' own evaluation approaches; project reporting based on the project leaders', rather than participants', perceptions; and potential variability in the interpretation of the template questions. It is also noted that the qualitative nature of the data reported meant that judgement was incorporated into the interpretation and analysis of the data at both project and program levels. The data cannot be used to generalise about how clinical evidence is adopted in the Australian health sector; however, they potentially identify factors affecting the adoption of clinical evidence. Most importantly, these results stand on their substantive significance and allow extrapolation to other similar cases.<sup>22</sup>

### Conclusion

Individuals leading projects to improve the use of evidence in clinical practice need access not only

to evidence, but also to knowledge on the likely influences that may impact the successful implementation in their clinical settings. This knowledge, as well as skill in applying it, may help to enhance the implementation process of delivering projects that are often at odds with peer practice and prevailing culture. This evaluation identified a range of perceived influences on the adoption of evidence, and this knowledge can be used to assist others undertaking similar projects. Like most grant programs, this program drew many disparate project areas together. Project topics, management approaches, and environments in which projects were undertaken were all different. However, this evaluation identified common themes that underpinned the adoption of evidence. Finally, the evaluation of this funded program allowed a comparison of diverse efforts to improve practice, and established knowledge about the barriers, critical success elements and lessons for adopting evidence in future practice in Australian settings.

### Acknowledgements

The National Institute of Clinical Studies (NICS) is Australia's national agency for improving health care by helping to close important gaps between best available evidence and current clinical practice. NICS is funded by the Australian Government. NICS would like to thank the project investigators and their teams for completing the project reports, their ongoing support throughout the program, and for their comments on this manuscript. Project lead investigators (and current organisational affiliation): Sanchia Aranda, Peter MacCallum Cancer Centre and University of Melbourne; Adrian Bauman, University of New South Wales; Kevin Chu, Royal Brisbane Hospital; Enrico Coiera, Centre for Health Informatics, University of New South Wales; Neil Cottrell, University of Queensland; Stacy Goergen, Monash Medical Centre; Rohan Hammett, Therapeutic Goods Administration and Clinical Practice Improvement Unit, Northern Sydney Health; Carol Harvey, Melbourne University and North West Area Mental Health Services; Karen Kaye, NSW Therapeutic Advisory Group (formerly NSW Therapeutic Assessment Group); Paul Lamberth, The Canberra Hospital; Robyn McDermott, University of South Australia; Greg Peterson, University of Tasmania; Paddy Phillips, Flinders Medical Centre; Christine Roberts, Centre for Perinatal Health Services Research; Bill Silvester, Austin Health; Ruth Sladek, Flinders Medical Centre; Stella Stevens, Griffith University; Martin Wright, Sunshine Hospital.

## Competing interests

Amanda Henderson was an employee of NICS when the grant program was initiated and was paid a consultancy fee for her role in the evaluation, which was funded by NICS.

## References

- 1 National Institute of Clinical Studies. Evidence-Practice Gaps Report, Volume 1. Melbourne National Institute of Clinical Studies, 2003. Available at: [http://www.nicsl.com.au/asp/index.asp?page=materials/materials\\_year\\_article&cid=5212&id=406](http://www.nicsl.com.au/asp/index.asp?page=materials/materials_year_article&cid=5212&id=406) (accessed Sep 2006).
- 2 National Institute of Clinical Studies. Evidence-Practice Gaps Report, Volume 2. Melbourne National Institute of Clinical Studies, 2005. Available at: [http://www.nicsl.com.au/asp/index.asp?page=materials/materials\\_year\\_article&cid=5212&id=405](http://www.nicsl.com.au/asp/index.asp?page=materials/materials_year_article&cid=5212&id=405) (accessed Sep 2006).
- 3 McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003; 348: 2635-45.
- 4 Chassin MR, Galvin RW. The urgent need to improve health care quality. Institute of Medicine National Roundtable on Health Care Quality. *JAMA* 1998; 280: 1000-5.
- 5 Ferlie EB, Shortell SM. Improving the quality of health care in the United Kingdom and the United States: a framework for change. *Milbank Q* 2001; 79(2): 281-315.
- 6 Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA* 1999; 282: 1458-65.
- 7 Grimshaw JM, Thomas RE, MacLennan G, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess* 2004; 8(6): iii-iv, 1-72.
- 8 Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003; 362: 1225-30.
- 9 Grol R. Beliefs and evidence in changing clinical practice. *BMJ* 1997; 315: 148-21.
- 10 Van Bokhoven K, Van Der Weijden G. Designing a quality improvement intervention: a systematic approach. *Qual Saf Health Care* 2003; 12: 215-20.
- 11 National Institute of Clinical Studies. National Institute of Clinical Studies targeted grants website project page. 2004 [cited 2005 10 Oct]. Available at: [http://www.nicsl.com.au/asp/index.asp?page=programs/programs\\_article&cid=5263&gid=190&id=423](http://www.nicsl.com.au/asp/index.asp?page=programs/programs_article&cid=5263&gid=190&id=423) (accessed Sep 2006).
- 12 Goergen SK, Chan T, de Campo JF, et al. Reducing the use of diagnostic imaging in patients with suspected pulmonary embolism: validation of a risk assessment strategy. *Emerg Med Australas* 2005; 17: 16-23.
- 13 Jackson SL, Peterson GM, Vial JH, Jupe DM. Improving the outcomes of anticoagulation: an evaluation of home follow-up of warfarin initiation. *J Intern Med* 2004; 256(2): 137-44.
- 14 Kaye KI, Welch SA, Graudins LV, et al. Pethidine in emergency departments: promoting evidence-based prescribing. *Med J Aust* 2005; 183: 129-33.
- 15 Roberts CL, Cameron CA, Nassar N, Raynes-Greenow CH. A simple patient-initiated intervention to increase antenatal detection of breech presentation at term. *Paediatr Perinat Epidemiol* 2004; 18(5): 371-6.
- 16 Sladek RM, Pinnock C, Phillips PA. The informationist: a prospective uncontrolled study. *Int J Qual Health Care* 2004; 16(6): 509-15.
- 17 Sladek RM, Pinnock C, Phillips PA. The informationist in Australia: a feasibility study. *Health Info Libr J* 2004; 21(2): 94-101.
- 18 Stevens S, Scott I, Von Hellens L, Iselin G. "Closing the loop": the role of health care leaders in integrating research and practice. *Aust Health Rev* 2004; 27(1): 56-64. Available at: [http://www.aushealthreview.com.au/publications/articles/issues/ahr\\_27\\_1\\_290304/ahr\\_27\\_1\\_56-64.asp](http://www.aushealthreview.com.au/publications/articles/issues/ahr_27_1_290304/ahr_27_1_56-64.asp) (accessed Sep 2006).
- 19 Westbrook JI, Gosling AS, Coiera EW. The impact of an online evidence system on confidence in decision making in a controlled setting. *Med Decis Making* 2005; 25(2): 178-85.
- 20 Westbrook JI, Coiera EW, Gosling AS. Do online information retrieval systems help experienced clinicians answer clinical questions? *J Am Med Inform Assoc* 2005; 12(3): 315-21.
- 21 Blumer ME. Sociological research methods: an introduction 2nd ed. Basingstoke: The Macmillan Press Ltd, 1984.
- 22 Patton M. Qualitative research and evaluation methods. 3rd ed. Thousand Oaks: Sage Publications, 2002.
- 23 Greenhalgh T, Robert G, Macfarlane F, et al. How to spread good ideas: a systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organisation. London: National Co-ordinating Centre for NHS Service Delivery and Organisation R&D (NCCSDO), 2004 April.
- 24 Michie S, Johnston M, Abraham C, et al. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care* 2005; 14(1): 26-33.
- 25 Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. *Med J Aust* 2004; 180 (6 Suppl): S57-S60.
- 26 Atkins D, Siegel J, Slutsky J. Making policy when the evidence is in dispute. *Health Aff (Millwood)* 2005; 24(1): 102-13.

- 27 Pearson A. Getting research into practice. *Int J Nurs Pract* 2004; 10(5): 197-8.
- 28 Shojania KG, Grimshaw JM. Evidence-based quality improvement: the state of the science. *Health Aff (Millwood)* 2005; 24(1): 138-50.
- 29 Mowatt G, Grimshaw JM, Davis DA, Mazmanian PE. Getting evidence into practice: the work of the Cochrane Effective Practice and Organization of Care group (EPOC). *J Contin Educ Health Prof* 2001; 21(1): 55-60.
- 30 Gruen R, Buchan H, Davies J, et al. A new EPOC in Australian health research. *Med J Aust* 2006; 184(1): 4-5.
- 31 Schein EH. Culture: the missing concept in organization studies. *Adm Sci Q* 1996; 41(2): 229-40.
- 32 Scott T, Mannion R, Davies HT, Marshall MN. Implementing culture change in health care: theory and practice. *Int J Qual Health Care* 2003; 15(2): 111-8.
- 33 Dopson S, Locock L, Chambers D, Gabbay J. Implementation of evidence-based medicine: evaluation of the Promoting Action on Clinical Effectiveness programme. *J Health Serv Res Policy* 2001; 6(1): 23-31.
- 34 Bradley EH, Webster TR, Baker D, et al. Translating research into practice: speeding the adoption of innovative health care programs. *Issue Brief (Commonw Fund)* 2004 Jul; (724): 1-12.
- 35 Solberg LI, Brekke ML, Fazio CJ, et al. Lessons from experienced guideline implementers: attend to many factors and use multiple strategies. *Jt Comm J Qual Improv* 2000; 26(4): 171-88.
- 36 Shaw B, Cheater F, Baker R, et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2005(3): CD005470.

(Received 13/02/06, revised 31/08/06, accepted 1/09/06) □