Institution: University of Bradford

Unit of Assessment: A3

Title of case study: Improving medicine management across the UK's children's hospice service

1. Summary of the impact

University of Bradford research into medication error management has directly impacted upon policy and practice, informing changes to mitigate potential harm across the 49 children's hospice services in the UK. Implementation of a research-informed medicines management toolkit co-produced by the Bradford team and Children's Hospices UK (now *Together for Short Lives*) resulted in hospices identifying key vulnerabilities and using guidance from the toolkit to make significant service improvements. This impact of this research has resulted in changes in both practice and behaviour by strengthening systems for error reporting including the analysis of contributory factors - staff are now identifying more errors and near misses, consequently leading to a reduced risk to the children.

2. Underpinning research

The Bradford medicines management team included Gerry Armitage (Lecturer 2000-2005, Senior University Teacher 2005-2007, Senior Lecturer 2008-2012, Professor 2012-present), Rob Newell (Professor 2001-2011), Kay Marshall (Senior Lecturer 1997-2007, Professor 2007-2013), and Mrs Jennifer Adams (Lecturer 2003-present). The research started in 2004 with the award of a Department of Health Research Development Award (2004-7) to Armitage, and continues to the present. Armitage conducted a programme of work investigating contributory factors in medication errors and strategies for increasing reporting and learning from errors (1,2,3). There is a considerable literature on the need to improve medical error reporting so as to advance organisational learning – a central imperative in improving patient safety. Empirical work conducted by Armitage, and supported by Newell and Wright involved: the documentary analysis of 1250 incident reports; a systematic review of the contributory factors in medication error, and 40 in-depth interviews with a multi-disciplinary sample of practitioners who had been involved in medication errors. The research identified key vulnerabilities in the medicines management pathway and ways in which error reporting systems could be strengthened using design and structure to enable more effective analysis of causes and, in turn, increase organisational learning. A novel medication error reporting scheme with accompanying guidance was then designed. Following this, the process of error management was examined in a study with one of Armitage's external PhD students (Sirriyeh) in the *adult* hospice setting; several challenges were identified, including the impact of error on those involved and their managers, and the conceptualisation of blame (4).

Following involvement in local improvement work on medication error management with several hospices in Northern England, Armitage & University of Bradford researchers were invited by Children's Hospices UK (now *Together for Short Lives, TfSL*) in 2010 to co-lead a further Department of Health funded project to develop a medicines management toolkit for use in hospices (5). The children's hospice sector provides care to approximately 8000 children, many of whom have complex needs and medication regimes. Drawing upon the above underpinning research, the toolkit focused on key areas of risk, applying the findings to enable children's hospices to identify key vulnerabilities in systems and processes. Content included detailed advice on: medicines regulation; requisite competencies; medicines reconciliation and transcribing (where accurate information about current medication is critical to reducing discrepancies); non-medical prescribing, and medication error reporting. The toolkit also offered an evidence based format for completing an error report, which was directly informed by the underpinning research described above.

3. References to the research

1. Armitage G. (2008) Double checking medicines: defence against error or contributory factor? *Journal of Evaluation in Clinical Practice* 14(4): 513–519.

2. Armitage G. (2009) Human error theory: relevance to nurse management. *Journal of Nursing Management* 17(2): 193–202.

3. Armitage G, Newell RJ, Wright J. (2010) Improving Drug Error Reporting. *Journal of Evaluation in Clinical Practice* 16(6): 1189–1197.

4. Sirriyeh R, Armitage G, Gardner PH, Lawton RJ. (2010) Medical Error: perspectives from Hospice Management. *International Journal of Palliative Nursing* 16(8): 377-386.

5. Adams J, Armitage G, Marshall K, Shah K. (2011) *Medicines Management: a Toolkit for Children's Hospice Services*. Children's Hospices UK. ISBN 9780954729691

Evidence of Quality
The research outputs were published in several leading journals: *Journal of Evaluation in Clinical Practice* - Impact factor: 1.5; ranking: 2012: 16/23, Medical Informatics; 48/82, Health Care Sciences & Services; *Journal of Nursing Management* - Impact factor 1.4; ranking 17/101 Nursing Social Science; 19/103 Nursing Science; 73/172 Management. The core research (paper 3) was peer reviewed by the Department of Health Research Development Award panel and shortlisted for an award. In addition the work on improving medication error reporting received a Highly Acclaimed (Runner-up) award in the National Bupa Foundation Patient Safety Awards 2007.

Evidence of the quality of the research is also demonstrated by the award of the following peer reviewed and competitive research grants:
Armitage G, *Doctoral Research Development Award*, National Institute for Health Research 2004-2007 £250,000
Blackburn M, Shah K, Armitage G, Marshall K, Adams J. *30 Million Stars*, Department of Health 2010 £30,000

4. Details of the impact

The research described above has achieved impact through: i) Adoption of the medicines management toolkit as national policy and good practice guidance; ii) Adoption of best practice in identifying error causation and error reporting by individual hospices. It has had national reach, being adopted across all children's hospices in England, Scotland and Wales.

i) Adoption of the toolkit as policy and good practice guidance
In 2011, Together for Short Lives (TfSL) adopted the medicines management toolkit as policy and issued it to all its 49 member hospices across the UK. TfSL recommended it to be used to review internal systems and processes and as a good practice guide to improve medicines management across the sector, advance multi-disciplinary/cross agency working, and make medicines safety a priority. TfSL's then Director of Practice & Service Development, advised all hospices in 2011 to implement a review of systems and processes and to consider changes based on the toolkit guidance (a).

The toolkit, referred to as the CHUK medicines management toolkit, is cited as one of two key medicines management resources in a regional strategy for children's hospices across London (University of Kent /CHAL 2011) (b). At the time of this submission, impact is continuing to build as a University of Bradford team led by Armitage has been funded by TfSL to evaluate the current edition of the toolkit and prepare a second edition.

ii) Evidence of adoption of best practice

The Director of Care at TfSL has surveyed hospice leads to gather evidence of the use and effects of the medicines management toolkit and has reported that all hospices in the network have reviewed their approach to medicines management since the toolkit was launched in 2011 (a)

Key changes made by hospices in response to the toolkit, and specifically the guidance provided for improving error management have resulted in better identification of errors emanating both from within the hospices and from local NHS Trusts. There have also been improvements in taking action following errors, thus mitigating the future risk to patients. A number of examples, clearly influenced by the Bradford research, are described below.

The East Anglia Children's Hospices (EACH) now routinely interrogate medicines incidents every quarter with clinical quality staff; they have instigated reflective reviews of causation and action taken at medicines management meetings three times per year and the Director of Care at EACH suggests that there are now systematic opportunities for learning (c). Furthermore, their clinical educators use the toolkit as a resource in their medicines management training. At the Rainbow's Hospice in Leicestershire, the Director of Care has adopted a reporting scheme based on the toolkit; the contributory factors framework is used to audit medication incidents, and there has been a rise in the number of near miss incidents, seen as a reflection of an open and just safety culture (d). The Director of Care has reported that, "*I have used the form a lot for auditing drug incidents and it has been really helpful in changing some of our practice*."

At the Welsh hospices (Hope House and Ty Gobaith) the reporting process has similarly been adopted and incidents are assessed by a quarterly, multi-disciplinary medicines management group; the number of reported incidents has increased, but not the number of harm events. The number of discrepancies identified during medicines reconciliation has also increased. All reported dispensing errors from referring NHS Trusts (the reporting rate of which has also increased) are shared with the Director of Pharmacy at the partnering NHS Trust. The Director of Care at Welsh Hospices has explained how medicines management is now *"more pro-active and organise"*, and that there is increased staff vigilance which has *"empowered parents to take greater ownership of their children's medicines management"* (e).

The Children's Hospice Association of Scotland (CHAS) made further changes in response to both the toolkit and the supporting research papers. Armitage was invited to lead a study day for senior staff (April 2012) which resulted in the implementation of a tailored reporting tool as part of a new 'Medication Management Strategy' directly based on the principles advocated in the Bradford research (f). Secondly, following advice from the Bradford team, the first pharmacist post within CHAS was planned and established in 2012 to strengthen medicines governance. The job description and person specifications were written following consultation with University of Bradford staff (g), and the first of two pharmacists is now in post. CHAS have built their medication management strategy on the central principles of a human factors approach as advocated in the toolkit, with a particular focus on learning from error through their clinical incident reporting scheme (h).

Evidence of impact on error reporting systems and on hospice staff culture comes from the report of the regulator's (Healthcare Improvement Scotland) unannounced visit to CHAS (February 2013) which explicitly acknowledged a *"strong culture of reporting medication incidents, with staff being encouraged to report openly and honestly"*. The report also commented on how "*management was able to see the frequency and type of errors that were occurring and that the new pharmacist was involved in their review"*. Importantly, the regulator complimented the reporting scheme which was seen to be gathering more detail and using a *'more robust method of assessing possible harm*'. The regulator also noted the need for further improvement and asked that staff continue to audit medicines administration and related staff training (i). In summary, the toolkit has made a positive, demonstrable impact on safety attitudes, safety policy and routine medicines management across the UK children's hospice service.

5. Sources to corroborate the impact (indicative maximum of 10 references)

a. Testimonial from the Director of Practice and Service Development at Together for Short Lives.

b. Billings J, Jenkins L. A learning and development strategy for hospices across London. 2011. Centre for Health Services Studies, University of Kent/Childrens Hospices Across London (CHAL)
http://kar.kent.ac.uk/27698/1/CHAL_report_4th_april.pdf

c. E-mail from Director of Care at East Anglia's Children's Hospices (EACH) to Director of Practice and Service Development at Together for Short Lives detailing how the implementation of the management toolkit in East Anglia has affected practice and training.

d. E-mail from the Director of Care, Rainbows Hospice for Children and Young People detailing their implementation and use of the Medicines Management Toolkit.

e. Paper by Director of Care for the Welsh Hospices documenting how they have implemented the use of the Medicines Management Toolkit and the transformational effects this has had on practice.

f. Children's Hospice Association Scotland Medication Management Strategy 2012 – 2016.

g. Job description and person specification for pharmacy post created by Children's Hospice Association Scotland written after consultation with University of Bradford researchers.

h. Children's Hospice Association Scotland Clinical Incident Report Form – Medication.

i. Health Improvement Scotland, Unannounced Inspection Report: Independent Health Care. Rachel House Children's Hospice, Kinross, April 2013. p13.