

Knowledgeshare

Web alert: tools and models for quality improvement in health care

Ben Skinner BSc (Hons) MA

Evidence-Based/Knowledge Management Librarian, *KnowledgeShare*, The Library, Audrey Emerton Building, Royal Sussex County Hospital, Brighton, UK

Introduction

No needless deaths. No needless pain or suffering. No helplessness in those served or serving. No unwanted waiting. No waste.

These are the ambitious goals aimed at by the Institute for Healthcare Improvement (IHI), an organisation focused on leading improvement in health care all around the world. Their work centres on ‘quality improvement’, a set of theories and processes that were originally developed in manufacturing and other commercial industries, which have been defined as ‘systematic, data-guided activities designed to bring about immediate improvements in healthcare’.¹

Although it is difficult to quantify the impact that improvement methods have made within large and complex systems like the NHS, there is a growing collection of individual healthcare organisations claiming that concepts such as statistical process control, root cause analysis and lean thinking have made a significant, positive difference to their outcomes.^{2,3} The IHI itself announced in 2006 that their campaign to prevent 100 000 avoidable deaths in the US healthcare system had exceeded its goal, although inevitably the exact figures have been called into question.⁴

The tenets of quality improvement include the idea that managers should aim to ‘design quality in’ rather than ‘inspect errors out’, eliminating the blame culture that may prevent mistakes from being reported. There is a principle of hiring good staff and then trusting in their abilities and judgement, for example by decentralising the implementation of decisions and devolving responsibility for problem solving. A key concept is to make good use of data in order to control unwanted variations, and the ‘plan-do-study-act’ cycle involves staff in gathering data, testing possible improvements on a small scale, studying the results of those experiments, and adopting those that are successful.⁵

Perhaps because of the commercial origins of the concepts involved in quality improvement, much of the language used can be off-putting to clinicians and those with an aversion to ‘management speak’. Nevertheless, the reductions in unnecessary surgery, waiting times and inappropriate or dangerous use of medications, which improvement methods seem to bring, suggest that any such reservations should be put aside, if possible. The following web resources, taken together, form a huge body of supporting materials, explaining improvement concepts in lay terms, and providing a wide range of tools, guidance and case studies to help design better healthcare systems.

Models and theories explained

Before looking in detail at the web portals that collect information on the various improvement models and theories, it is worth pointing out a handful of individual documents containing useful introductions. *Maps and Journeys: redesign in the NHS* (www.hsmc.bham.ac.uk/publications/pdf-reports/mapsjourneys-execsumm.pdf), written by the Health Services Management Centre at the University of Birmingham, aims to put NHS redesign in context and talks about combining the best elements of different improvement approaches. In order to challenge existing ways of thinking, focus on patient perspectives, re-examine existing processes and eliminate processes that do not add value, the report says, it is necessary to find a balance between ‘the incremental, negotiated and participative approach of [Total Quality Management]’ and ‘the radical, lateral vision of re-engineering’. Although it is a few years old now, *Maps and Journeys* is a good starting point for understanding improvement in the NHS, and the Health Services Management

Centre website (www.hsmc.bham.ac.uk/publications) can be used to find many additional publications on the subject.

Making Numbers Work (www.idea.gov.uk/idk/aio/5866347), written by the Ad Esse management consultancy but hosted on the UK Government's Improvement and Development Agency website, is a six-page introduction to the concept of 'Six Sigma'. This methodology, based on the use of statistical tools to reduce errors and gain measurable cost savings was developed at Motorola in the late 1980s. The article is written for those who hate maths, and talks intelligibly about data presentation and understanding variation.

Another improvement model that developed in the private sector (at Toyota) but has become widely used elsewhere is the A3 process. A step-by-step tutorial on this process, with examples and a case study that are relevant to health care can be found at www.coe.montana.edu/IE/faculty/sobek/A3/index.htm.

One of the steps touched on in the A3 process, and a method that is particularly relevant to patient safety, is root cause analysis. This says, among other things, that you usually won't reach the root cause of a problem until you've asked the question 'why?' at least five times in a row. Too often it is tempting to try to address the symptom of a problem, rather than its underlying cause. For the basics on root cause analysis, written from a management perspective, see *The Top 10 Elements of a Root Cause Analysis Effort* (www.reliability.com/articles/article75.htm) from the Reliability Center in the US. In addition it is worth having a look at the *Canadian Root Cause Analysis Framework* (www.patientsafetyinstitute.ca/uploadedFiles/Resources/RCA_March06.pdf), an in-depth tool for identifying and addressing the root causes of critical incidents in health care, published by the Canadian Patient Safety Institute.

Other techniques for health improvement include the 'health needs assessment', resources for which can be found in a KnowledgeShare article published earlier this year,⁶ and 'health impact assessment'. The latter is an approach that allows healthcare organisations to identify the connections between their work and their customers' health; a good publication to begin with is *Improving Health and Reducing Inequalities: a practical guide to health impact assessment from the Wales Centre for Health* (www.wales.nhs.uk/sites3/Documents/568/ImprovingHealthReducingInequalitiesEng.pdf).

Institute for Healthcare Improvement: www.ihf.org/ihf

The website of the IHI contains so many resources to support health improvement that it's difficult to know

where to begin. The majority of the free resources are collected in the 'Topics' section, which is subdivided under headings such as 'Improvement', 'Flow', 'Patient-centred care', and 'Reliability', as well as condition-specific topics including 'Diabetes', 'Critical care', 'Perinatal care' and 'Last phase of life'. Each of these topic areas holds a mass of information. Each has a 'model for improvement', with guidance on setting aims, forming teams, measuring, selecting options and testing changes. The key measures that teams should use to gauge progress are given their own subsection, alongside the key changes that should be made, all based on high-quality evidence from systematic research. The 'Improvement stories' under the different topic areas make interesting reading, as they focus on the results of changes made in specific organisations, and then there is the vast array of 'Tools', 'Resources' and 'Literature', which consist of guides, protocols, forms, and links to further information on each topic.

You can use this site to find tools for creating flowcharts or cause-and-effect diagrams, tools for gathering information, such as with staff satisfaction surveys or walk-throughs of clinical areas, and suggestions for more effective group working. There are also tools for documenting work, for example project planning forms and plan-do-study-act worksheets. Clear site layout, helpful explanations and suggestions at every turn make it easy to find what you're looking for.

Admittedly there is a strong US flavour to a lot of what can be found here, as with much of the most useful quality improvement information, but there is evidence that their resources are already well used in other countries. This can be seen in the 'Workspace' section, an area of the site that supports health managers even more directly by providing an online, interactive facility for tracking your improvement, making graphs of your data and producing customised reports for different stakeholders. Other interactive tools allow you to assess the chances of failure in a process and evaluate the potential impact of changes. Organisations have the option of keeping their improvement data private or allowing other users to view their progress. Those that are currently visible on the site come from America, Australia, the UK, and many more nations around the world.

NHS Institute for Innovation and Improvement: www.institute.nhs.uk/

The NHS Institute for Innovation and Improvement was set up to help rapidly develop and spread new ways of working, new technology and world class

leadership. The section of their website entitled 'Quality and value' looks at improvement opportunities in the three key areas of commissioning, provisioning services and clinical care, and contains a selection of guidance documents and case studies. Clearly the focus on what works in the NHS rather than looking at these models in purely commercial terms is advantageous for those working in health care, and particularly those in the UK. There are a number of resources aimed at supporting lean thinking and lean six sigma, including a new practical and interactive 'lean simulation' that helps teams to understand the relevant principles, as well as leaflets, book reviews, presentations, and full-text published articles.

Part of the lean way of working is the idea of 'rapid improvement events', which provide a mechanism for making radical changes to current processes and activities within very short timescales. The 'Quality and value' section includes a more detailed explanation of this idea, a document looking at the quantitative and qualitative benefits, and some success stories. Other concepts covered here are 'experience-based design', a new way of capturing how users feel when they come into contact with the service, and a series centred on the idea of productivity in various settings. The institute website also contains an area that looks at 'Building capability', including a set of guides for improvement leaders, and other ideas for building leadership capability.

The Health Foundation: www.health.org.uk

For a nicely designed web portal with feature articles and the latest news on quality improvement, the Health Foundation is well worth a look. An independent charitable foundation, the Health Foundation conducts its own research into NHS and other health-related issues, looking for evidence of what works to improve quality and performance. Recent reports have shown a direct link between increased spending and improved health outcomes, and have looked at how to estimate health and productivity gains. The foundation also seeks out the best ideas and fosters them as 'demonstration projects', encouraging uptake throughout the health service.

You can visit the site to see details of freely available leadership development opportunities or viewpoints on policy issues. Much of the content on the site is organised under the topics: 'leadership', 'patient safety', 'international comparisons', 'patient engagement' and 'clinical measurement'.

Curious Cat Management Improvement Connections: <http://curiouscat.net/library>

The Curious Cat website is not specific to health care but it helpfully gathers together large quantities of online information about management theory, which can then be applied in all sorts of settings. The site is run by an enthusiastic individual, rather than an organisation – a management consultant with many years experience of quality improvement who believes passionately that these models and processes can make life better, for both employees and customers.

For anyone who is new to a lot of the terminology involved in quality improvement there is a glossary on the site, defining terms such as A3 report, balanced scorecard, critical path method, and so on, providing related terms, and linking through to websites with more information. The author has then taken some of the central concepts and created a regularly updated document library for each topic. New articles from the leading writers in quality improvement are included, as well as reports, guidebooks, and book excerpts, all freely available online. These collections cover the usual suspects: lean thinking, six sigma, statistical process control, and there is a separate section for articles on public sector improvement.

The Improvement Foundation: [www.improvement foundation.org](http://www.improvementfoundation.org)

The not-for-profit Improvement Foundation is based in Manchester, with centres ranged across England. They aim to engage frontline staff in improvement initiatives and thereby develop capacity and capability in public services. The 'Topics' menu on their website provides access to their many multi-agency improvement programmes, most of which focus on health care. A number of these programmes look at aspects of commissioning, both practice based and in primary care trusts. Resources to support the development of commissioning systems include case studies, discussion forums, webcasts and guidance such as 'High impact changes for practice teams'.

King's Fund – Commissioning: [www.kingsfund.org.uk/ health_topics/commissioning. html](http://www.kingsfund.org.uk/health_topics/commissioning.html)

Another place to look for information that is specific to commissioning is the King's Fund website. The independent health management charity makes its briefings and research freely available online. A recent example is *Practice-based Commissioning: from good idea to effective practice*, which considers the current implementation of practice-based commissioning in the UK, and how it might be moved forward. The 'Commissioning' strand of their site also reports related news from other sources, and highlights newly published journal articles on the subject.

National Patient Safety Agency – Health Professionals: www.npsa.nhs.uk/health

The NHS National Patient Safety Agency (NPSA) has a 'Health professional zone' on its website containing useful resources, frequently asked questions, and information on current projects. At the time of writing their projects include 'Design for patient safety', 'Cleaning and nutrition', 'Hospital at night' and 'Medication practice'. Their section of NPSA resources includes various models and tools to aid in service redesign to reduce clinical risk. You will find help with processes such as root cause analysis, incident decision trees (which are a key component of the move away from asking who was to blame and instead finding out why an individual acted in a certain way), as well as the report: *Seven Steps to Patient Safety*. This section also makes available reports from the Patient Safety Observatory, which collects and analyses data in order to quantify, characterise and prioritise patient safety issues.

I&DeA Knowledge: [www.idea.gov.uk/idk/core/ page.do?pageId=76209](http://www.idea.gov.uk/idk/core/page.do?pageId=76209)

The Improvement and Development Agency (I&DeA) is a UK governmental organisation that collects together news and guidance on improvement topics for use in the public sector. Although the site is not aimed

specifically at health care (although public health does get some coverage), their section on performance management is very relevant for anyone interested in service improvement. As with many of the sites discussed here there is a useful selection of guidance, case studies and tools available.

There is also a discussion forum to help you request advice from other professionals in the field. Currently the most popular discussion is on the management guru Deming and his concept of 'systems thinking', which treats public services as complex adaptive systems rather than trying to divide problems into manageable, but separate, elements. *System Failure* by the think-tank Demos (www.idea.gov.uk/idk/aio/4626371) is a report that explains this subject in more detail, with specific reference to the NHS.

Health Management Specialist Library: [www.library.nhs.uk/ healthmanagement](http://www.library.nhs.uk/healthmanagement)

The Health Management Specialist Library from the National Library for Health gathers together important resources on NHS policy, structures, activities, staff, quality and monitoring. A search for publications with the word 'improvement' in the title currently retrieves about 50 items, including cancer service improvement guides, collected resources from the *BMJ* and items from the Care Services Improvement Partnership (www.csip.org.uk). Also, the regularly produced 'Hot topics' sometimes discuss improvement issues, for example their issue on *Lean thinking* (www.library.nhs.uk/healthmanagement/ViewResource.aspx?resID=126358&tabID=290).

CHAIN Network: [http:// chain.ulcc.ac.uk/chain/ index.html](http://chain.ulcc.ac.uk/chain/index.html)

There are now four Contact, Help, Advice and Information Networks (CHAINs) acting as informal ways for health and social care professionals to exchange ideas and share knowledge. CHAIN 3 has been set up for staff interested in innovation and improvement and is an excellent way to remain up to date with the latest developments in these areas. It is easy (and free) to sign up and not only will you have the chance to ask questions of other members, or search for members with specific interests, you will also receive occasional emails alerting users to new quality-improvement

publications and websites. Membership also gives access to a social bookmarking site, where members share their favourite web resources for others to see.

ACKNOWLEDGEMENTS

Thanks to Judy Lehmann, Head of Library Services at Brighton and Sussex University Hospitals NHS Trust for her contributions.

REFERENCES

- 1 Lynn J, Baily MA, Bottrell M *et al.* The ethics of using quality improvement methods in health care. *Annals of Internal Medicine* 2007;146:666–73.
- 2 Health Foundation. *Annual Review 2005/06: quality improvement in action*. London: The Health Foundation, 2006. www.health.org.uk/about_us/annual_review/annual_review_0506.html (accessed 7 September 2007).
- 3 Institute of Health Improvement. *Success Headlines*. www.ihl.org/IHI/Results/SuccessHeadlines/ (accessed 7 September 2007).

- 4 Wachter RM and Pronovost PJ. The 100 000 Lives Campaign: a scientific and policy review. *Joint Commission Journal on Quality and Patient Safety* 2006; 32:621–7.
- 5 Buetow SA and Roland M. Clinical governance: bridging the gap between managerial and clinical approaches to quality of care. *Quality and Safety in Health Care* 1999; 8:184–90.
- 6 Lambert MF and Gray J. Resources to develop successful primary care commissioners. *Quality in Primary Care* 2007;15:119–21.

ADDRESS FOR CORRESPONDENCE

Ben Skinner, Evidence-Based/Knowledge Management Librarian, *KnowledgeShare*, The Library, Audrey Emerton Building, Royal Sussex County Hospital, Eastern Road, Brighton BN2 5BE, UK. Tel: +44 (0)1273 523307; fax: +44 (0)1273 523305; email: ben.skinner@bsuh.nhs.uk; website: www.KnowledgeShare.nhs.uk