

An answer shared is a problem solved: encouraging a knowledge sharing culture in the NHS.

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The National Health Service (NHS) has a wealth of wisdom and expertise stored within its employees. To encourage NHS health professionals to share their knowledge, the health service in the UK has commissioned two web sites; one providing access to summaries of quality research on knowledge management when applied in health care settings, and the other providing support for the implementation of knowledge management in the NHS. Together with a community of practice, both sites provide a practical, research-based environment to support the implementation of knowledge management throughout the NHS.

Keywords: NHS, knowledge management, communities of practice, collaboration

1. Introduction

The National Health Service (NHS) in England provides a very high standard of care, “yet where serious failures in care do occur they can have devastating consequences” for all involved. (Department of Health 2000). Learning from mistakes and sharing experiences could avoid many of these errors. These findings have motivated the nurturing of a knowledge-sharing culture in the NHS.

The NHS Information Strategy (NHS Executive 1998, Sensky 2002) highlighted three explicit needs of clinicians:

- fast, reliable and accurate information about patients in their care;
- access to knowledge to inform clinical practice;
- access to information to underpin evaluation of clinical practice, planning and research, clinical governance and continuing professional development.

The strategy recommended that a National electronic Library for Health (NeLH) be developed, whose aim it would be “to provide easy access to best current knowledge to improve health and health care, patient choice, and clinical practice” (Gray 1999). The justification for this digital library was that unless decision makers have access to good knowledge they would face barriers in providing high quality health care.

Following on from this, a report of an expert group on learning from adverse events in the NHS, was published. The findings of “An Organisation With A Memory” (Department of Health 2000), chaired by the UK Chief Medical Officer, showed that human errors were often caused by systems failures rather than carelessness or incompetence (Leape 2000). The report suggested that to improve patient safety, better reporting systems should be introduced together with a more open culture, within the NHS, allowing people to learn from mistakes.

As a consequence of these documents, and other initiatives in the NHS, the Department of Health and the National electronic Library for Health commissioned two web sites, with the aim of supporting a knowledge-sharing culture within the National Health Service.

Knowledge Management Research (KMR) provides NHS employees with a quality knowledge base, and the Specialist Library for Knowledge Management contains practical examples of knowledge

management applied to health, and the opportunity to join a community of practice to share experiences. The sites were designed to complement each other, and together they provide the following:

- access to quality research on knowledge management in health care;
- information on tools to implement knowledge management in health care;
- networks to discuss and share ideas;
- glossary to make knowledge management more understandable;
- diary dates so that health professionals can attend relevant events;
- good practice examples, in the form of case studies, strategies, and lessons learned.

2. The National Health Service

The National Health Service in England operates in accordance with policies developed by the Department of Health. These policies are implemented by Strategic Health Authorities, who manage the Primary Care Trusts (PCTs) and Acute Trusts. The Primary Care Trusts are responsible for managing the majority of local community health services and the Acute Trusts provide hospital care.

Thames Valley Strategic Health Authority is in the South East of England, and covers three counties, - Oxfordshire, Berkshire and Buckinghamshire. During the 2001 census, the population for the Thames Valley region was registered at 2.1 million people. The health of this population is serviced by:

- 5 acute hospitals
- 15 Primary Care Trusts managing:
 - 24 community hospitals
 - 285 GP practices

This is an example of one Strategic Health Authority. In September 2004, the NHS employed 1.3 million staff across 28 Strategic Health Authorities, 299 Primary Care Trusts and 126 Acute Trusts, in addition to other services provided by the NHS, such as 59 Mental Health and Learning Disability Trusts, rehabilitation services and dentists.

From this, we can see that the NHS will contain an abundance of relatively uncontrolled knowledge, which needs to be co-ordinated and appropriately distributed. Furthermore, over recent years, there have been many changes to the organisation, leading to promotion, re-deployment, redundancy and resignation, with large quantities of valuable expertise leaving individual departments and the NHS as a whole.

There are already a number of knowledge management initiatives in health care, and in particular the NHS, including:

- Care pathways are step-by-step guides to local procedures, and guidelines are evidence-based documents defining the best method of intervention for different conditions. Guidelines and care pathways are available, via the National Library for Health (<http://www.library.nhs.uk>).
- “Health Networks” (<http://www.networks.nhs.uk/>) encourages NHS employees to register their clinical networks, and build on existing relationships and knowledge.
- The Modernisation Agency developed “Eureka’s”, providing examples of innovation in the NHS, and Lessons Learned, which are cards containing short stories of lessons learned from experience.

This demonstrates that throughout the NHS, there are many innovative schemes in place to gather and use clinical knowledge. The aim of the Department of Health and the National Health Service is to provide a gateway to these initiatives, encourage the development of new ideas, and to support a knowledge-sharing environment.

3. Background to Knowledge Management Research (KMR)

In 2004, the Department of Health R & D Division commissioned a web site to improve access to research on knowledge management in health care, with the purpose of improving use of tacit and explicit knowledge within the NHS. An Academic Advisor, with the support of a Steering Group, and an Information Scientist, led the project. The completion date for the project was March 2005.

The aim was to create a web site providing health care professionals with evidence of the application of tacit and/or explicit knowledge to the daily activities involved in patient care, thereby bridging the gap between use of knowledge and clinical practice, with a view to improving patient safety. The web site would contain links to summaries of research and where possible, full-text access to articles on examples of knowledge management when applied to clinical practice.

The web site was named Knowledge Management Research (KMR) and can be accessed via the following URL: <http://www.nelh.nhs.uk/kmresearch>

3.1 Phase I – Development of the KM Research web-site

The Academic Advisor worked on the project for one day per week. Being an expert in the field of clinical knowledge management, he was responsible for the quality of the site, by selecting and reviewing the content.

In August 2004, an Information Scientist was employed for four days per week, to work on the project. The Information Scientist was a qualified librarian, with a background in knowledge management, user education and primary care, and basic experience of web development.

A Steering Group representing primary care, secondary care, consumer information, higher education, social care, work and pensions, professional bodies, National Institute for Health and Clinical Excellence, Connecting for Health and the National Library for Health, was set up to oversee the development of the KMR site.

The first meeting was held in London on 12th July 2004. Prior to the meeting a list of topics to be covered by the web site, including research on the following areas, was compiled:

- Issues related to knowledge management in health care;
- Storage of knowledge, for example knowledge harvesting;
- Presentation, accessibility or format of knowledge;
- Disseminating knowledge;
- Technical applications for using knowledge.

One of the issues raised was whether the content of the site should be referred to as “clinical knowledge management” or “knowledge management.” It was evident that a clear definition had not been agreed upon, and the first task of the group was to create and agree on a definition of the term “knowledge management” to guide the content of the site. This process took several months, but was finally agreed upon, in November 2004. The following definition was created by the Academic Advisor, and was accepted by the Steering Group, as a suitable definition to use for the purpose of the project:

"Clinical knowledge management means enhancing the identification, dissemination, awareness and application of the results of research relevant to clinical practice in health and social care."
(Professor Jeremy Wyatt)

It was also agreed that a user survey was necessary to identify the key requirements for potential users. Because of the short lifetime of the project, it was agreed that the questionnaire would be sent out as quickly as possible, and that a report would be presented at the next steering group meeting in October.

And thus, the inaugural meeting of the steering group concluded that the priorities for the Information Scientist were to:

- carry out a survey to identify user needs;
- build a search strategy to retrieve suitable material to populate the site;
- develop a web site to house the material found.

3.2 User Survey

The Information Scientist developed a questionnaire, and this was sent to the National electronic Library for Health email discussion group for knowledge management, consisting of 97 members. The questionnaire asked questions about current experiences and practices of knowledge management, sources of relevant research and what their desires would be from a knowledge management research web site.

The questionnaire was sent out on 1st September, with a closing date of 10th September. The time limit was very short due to the time constraints of the project, and it is possible that some potential respondents could have been on holiday during this time, and this may have affected the results. Sixteen people responded (16%), and all asked to be kept up-to-date with the progress. Some were involved with the later testing of the site. The responses received were very comprehensive and gave clear guidance on what was required from the site.

The questionnaire was sent out entitled “Clinical Knowledge Management”, because it was felt that there was a need to differentiate between clinical knowledge management and knowledge management. However, this may have alienated some health professionals. For example, a public health employee felt that the site would only meet the needs of practising clinicians, and therefore would be of no use to him, whereas the project aim was for the site to be useful to anyone working for the NHS. A knowledge-sharing culture would not be successful without the commitment of staff working for the National Health Service. For this reason, it was agreed to drop the word ‘clinical’ and refer to the site as the “Knowledge Management Research” web site, but emphasising in the publicity that it would contain health-related evidence of knowledge management. It was felt that this would make the site more accessible to all NHS employees.

3.3 Search Strategy

The Academic Advisor provided the Information Scientist with a list of gold standard articles, by which the effectiveness of the search strategy could be measured. The list of 15 references ranged from 1986 to 2002, and this time-span proved to be the key factor in building a search strategy for knowledge management. The references for the gold standard articles are listed in **Appendix 1**.

The Information Scientist built a complex search using natural language and controlled vocabulary/thesaurus/MeSH (Medical Subject Headings), but was only able to find three of the gold standard references. On examining the MeSH terms for each reference, it was found that they were all indexed with different terms, and there was no specific term collating them as articles about knowledge management in a clinical setting. This is because the term “knowledge management” is fairly new, and for many databases, including Medline, it is not a MeSH term. The term “knowledge” was added as a MeSH term to Medline and the Cochrane Library in 1997, but it is too broad. PsycInfo has had “knowledge level” as a MeSH term, since 1978, and this term is more appropriate for the needs of this project. CINAHL (Cumulative Index of Nursing and Allied Health Literature) added the MeSH term “knowledge management” to its thesaurus in 2002. Therefore, although each article was working along the same theme, the keywords allocated to each article did not reflect this, as there was not a common MeSH term available. The Information Scientist made a list of all the MeSH terms that were used in all 15 references, and those terms that were applicable to knowledge management, were incorporated into a new search strategy, comprising of 100 steps. An alert was set up and whenever articles matching the search criteria were found, they were emailed to the Information Scientist. The articles were shown to the Academic Advisor, who decided whether they were suitable for inclusion on the web site or not, based on a set of criteria, described in **Appendix 2**.

At present, only the databases Medline and Cochrane Library are searched. The Information Scientist is aware that more material is available on other databases, including CINAHL, Campbell Collaboration, LISA, SIGLE, Embase and PsycInfo, but time constraints and the volume of material available have restricted the search process. However, there is a second stage to the search strategy, which possibly overcomes these limitations.

ZeTOC is the British Library's Table of Contents and Current Awareness service. The Information Scientist receives the content pages of more than 130 journals covering 13 subject areas, including nursing, medicine, physiotherapy, occupational therapy, knowledge management, dietetics, mental health, pharmacy, library and information science, information technology, health management, evidence-based practice, and dentistry. The Information Scientist scans each of the contents pages, to find suitable references, which can be summarised for the web site. Alerts of new research are received from the British Medical Journal, Biomed Central, Health Technology Assessment Bulletins, Journal of Medical Internet Research, IDEA Knowledge, Health Networks, Knowledge Exchange, and the Health Informatics Community. A list of references meeting the selection criteria (**Appendix 2**) is then compiled for the Academic Advisor to review.

3.4 Web Development

A basic web site was created in time for the next meeting in October, where it was presented to the Steering Group for comments. Changes were suggested and these were implemented, where technical skills allowed, for the next meeting in late November. Four main topic headings were displayed on the homepage. The summaries were stored under these headings together with links to the full text of the article where available, or the abstract. A feature for new research not yet summarised, was made available on the home page of the site, together with a section containing information for researchers.

3.5 Summary Design

The summaries started with a table containing key points from the research, a clinical question, bottom line, and link to the abstract or full text, where possible, followed by a brief summary of the article. An example of the layout can be seen in **Appendix 3**.

3.6 Topic Headings

Categorising the web site into recognisable topic headings was the most debated part of the project. The topic headings needed to have meaning to all NHS employees, not only clinicians, but also those involved with health care administration. The headings finally selected were:

- *Issues* (containing articles on barriers to applying knowledge);
- *Tools* – (articles about tools, which increase the use of knowledge);
- *Training* – (research on the use of training to increase knowledge levels);
- *Communities* – (research on the effectiveness of communities of practice).

3.7 Phase II – Launch and Evaluation of the KM Research web site

With the project finishing in March 2005, it had been hoped to launch the web site in December, with evaluation of the site taking place in January 2005. Because of the deliberations over the topic headings, the web site launch was delayed until February 2005.

3.8 User Evaluation

To measure user opinion, a questionnaire to evaluate the site was sent out but only seven responses were received. The majority were constructive, but the lack of technical expertise available for the design of the web site, was clearly an issue.

3.9 Limitations

There were a number of constraints, which hindered the development of the web site. These included the short time-scale, the lack of technical skills, inappropriate searching terminology, and difficulties

with the taxonomy. However, the site has potential and with support in these areas, should deliver valuable content to the relevant areas.

4. Next Stage

Funding for this project was not extended, but during the lifetime of the project, Dr J A Muir Gray, Director of the National Knowledge Service, which is responsible for the National electronic Library for Health (NeLH), took over the role of Desk Officer for the project. At the final Steering Group meeting, in March, it was agreed that the Steering Group would become the advisors for the content and development of the NeLH Specialist Library for Knowledge Management (SLKM), and that the content on the KM Research web site would be migrated to the Specialist Library. This would mean that all the information to support the practice of knowledge management in the NHS, would be stored on one web site. The site would be launched early September 2005.

5. Background to Specialist Library for Knowledge Management (SLKM)

The Specialist Library for Knowledge Management prototype was launched in 2003, as part of the range of Specialist Libraries offered by the National electronic Library for Health, to provide access to high quality information for NHS employees.

The site is an introduction to knowledge management, containing articles describing knowledge management, and information on a range of KM tools and techniques, such as exit interviews, white papers, communities of practice, etc. The site provides evidence of knowledge management in practice to support health professionals working in the NHS.

The Information Scientist has updated the material on the prototype site, and has migrated the content to a new resource management system, on the National Library for Health site (<http://www.library.nhs.uk>). The new system means that the content is more accessible, the site is easier to navigate, and there is the facility for RSS feeds (Really Simple Syndication), which allows the web site to send a link to new content to subscribers.

This project is being funded as part of the National Knowledge Service Mobilisation work-strand (<http://www.nks.nhs.uk>).

5.1 Content Selection

At present, the content is theory-based, but future plans for the site include:

- case studies;
- lessons learned, providing examples of knowledge management applied in the NHS or other health care settings;
- details of events and training opportunities;
- sample knowledge management strategies and job descriptions.

The Modernisation Agency Clinical Governance Support Unit have produced Lesson Cards (http://www.cgsupport.nhs.uk/Resources/Lesson_Cards/default.asp), containing the experiences and learning from the work of teams in the NHS, and Eureka's (<http://www.cgsupport.nhs.uk/Resources/Eurekas/default.asp>), which are examples of service improvements, and how they have been implemented. Links will be provided to these resources because they provide clear examples of knowledge management applied in the NHS.

The University of Sheffield organised a FOLIO course called "Getting to Grips with Knowledge Management", (available online at <http://www.nelh.nhs.uk/folio/>), and links will eventually be provided to the course material.

The Information Scientist finds material to populate the site using the same search strategy as for the KM Research site. The Clinical Lead and the Advisory Group, ensuring that it matches the requirements of the users, check the content of the site.

5.2 Community of Practice

A scoping exercise for the Specialist Library for Knowledge Management, was held in the Northumberland, Tyne and Wear Strategic Health Authority region, in March 2004. One of the key requests from stakeholders who attended the meeting was for a means of communication by which they could share experiences and best practice in knowledge management, with other NHS practitioners. The people who completed the user survey for the KM Research site also made this request.

With this in mind, a community of practice for all NHS employees is being cultivated in the North of England. At present, discussion takes place via a weblog, "Talking Knowledge Management", (<http://talkingkm.blogspot.com>), but investigations are being made into other services, which allow for more interactive discussion.

In May 2005, the community of practice held its first face-to-face event, in Newcastle. The day consisted of case studies of effective use of knowledge management in the NHS, presentations from other communities of practice, and opportunities to network and learn from each other. As a result of the success of this day, it is hoped that further events will be organized around the UK, as the community of practice is open to all NHS employees.

6. Future of Knowledge Management in the NHS

There is still a lot of work that needs to be done to build a knowledge-sharing culture in the NHS. The Community of Practice needs to be more flexible, and allow for networking, information sharing, collaboration, etc. This is only possible with new software, which is currently being investigated.

It is hoped that the resources from the SLKM (incorporating the KM Research content and Talking KM), will be used and promoted by health professionals and other workers in the NHS, to help them manage knowledge in their teams and organisations. There is an enormous amount of research on knowledge management, and much of it can be applied to health care. The Specialist Library for Knowledge Management will filter out irrelevant material, so that health professionals will find the information they need to apply knowledge management to their local and national practices.

The Specialist Library for Knowledge Management will be live from September 2005, and the URL for the site is <http://www.library.nhs.uk/knowledgemanagement>. Although the site will be live, it will not be complete. As knowledge management grows in the NHS, more content will be created by NHS staff, which will be added to the site. This continuing development will support the ultimate aim of reducing medical mistakes and inefficiency, by enabling staff to learn from each other and build on innovative practice, which can be shared locally, nationally, and perhaps on a global scale.

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Appendix 1 - Gold Standard References for KM Research Web-site

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Appendix 2 – Content Selection Criteria

The types of research that will be included are:

- systematic reviews
- controlled clinical trials
- evaluation studies
- guidelines
- meta-analysis
- randomised and non-randomised controlled trials
- empirical research
- observational studies
- intervention studies
- validation studies
- health care surveys
- cross-sectional studies
- questionnaires

The content will also meet the following criteria:

- 1) language – English.
- 2) location of study – UK is preferable, but other locations will be included, where appropriate.
- 3) length of article – excluding short articles, such as letters, editorials, etc.
- 4) relevance to customer base – i.e. those working with knowledge in clinical environments.
- 5) quality of methodology.

The research material will be selected from high quality, peer-reviewed journals, and databases.

Appendix 3 – Example of Summary

Implementation of recommendations for the care of children in UK emergency departments: national postal questionnaire survey

Salter R, Maconochie IK.

British Medical Journal, 2005, 330(7482) pp. 73-74

| | |
|-------------------------------|---|
| Key question | What needs to be done to improve the care of children in UK emergency departments? |
| Bottom line | More investment into staffing and facilities must be injected to improve the services available to children seeking emergency treatment |
| Number of participants | 139 emergency departments responded out of 219 approached |
| Type of study | postal questionnaire |
| Length of study | 3 months - October 2003 to January 2004 |
| Study setting | emergency care |
| Full text link | Click here to access the PDF version of this article |

Overview

25% of all patients seeking emergency care are children. In 1999, a working party comprising of representatives from the Royal College of Paediatrics and Child Health, British Association of Accident and Emergency Medicine, British Association of Paediatric Surgeons, Faculty of Accident and Emergency Medicine, Royal College of Nursing and Royal College of General Practitioners, wrote a report - Accident and Emergency Services for Children - detailing 32 recommendations to be in place by 2004. The authors of this article sent questionnaires to 219 lead emergency doctors asking about the recommendations and whether they have been met.

Results

63% of the departments with inpatient paediatric facilities responded to the survey and of these 34% treated more than 18,000 children per year. 29% of the emergency departments with separate paediatric emergency facilities replied. One of the original recommendations was that by 2004, for all hospitals seeing more than 18,000 children in emergency situations, a consultant in paediatric emergency medicine should be in post and by 2010 every emergency department should have an emergency medicine paediatric consultant on it's staff.

Many of the other recommendations have also not been met, and can only be met with more investment in staff and facilities to provide a child centred emergency service.

Limitations

Many of the departments that did not complete the survey see more than 18,000 children annually, and of these, 47% were from emergency departments with separate paediatric emergency departments.

Tables (available in article)

Table 1: Facilities, function, and staffing of 139 UK paediatric emergency departments

Date of Summary: 2nd February 2005