Facilitating technology adoption in the NHS: negotiating the organisational and policy context – a qualitative study

Sue Llewellyn,[1]* Rob Procter,[2] Gill Harvey,[1] Gregory Maniatopoulos[1] and Alan Boyd[1]

[1]Manchester Business School, University of Manchester, Manchester, UK
[2]Manchester eResearch Centre, University of Manchester, Manchester, UK

*Corresponding author

Declared competing interests of authors: none

Published July 2014
DOI: 10.3310/hsdr02230

Scientific summary

Facilitating technology adoption in the NHS

Health Services and Delivery Research 2014; Vol. 2: No. 23
DOI: 10.3310/hsdr02230

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Scientific summary

Background

New clinical technologies have the potential to bring important benefits to health care, but adoption and implementation have not been straightforward. Diffusion of technical innovations across the NHS has been acknowledged to be uncoordinated and sometimes slow. Financial considerations are a key influence on investment decisions, and there can be uncertainty as new technologies may not be covered by national Payment by Results (PbR) tariffs. Putting this alongside the typically limited evidence base and the prospect of what may be a complex implementation task, it may be that NHS managers perceive adopting new technology as risky. Adapting implementation to the wider organisational and social context is also likely to be important.

This study addresses a research gap on how organisational factors shape the take-up of new technology in the NHS by investigating technology adoption projects supported by NHS Technology Adoption Centre (NTAC). NTAC projects focus on technologies that have the potential to substantially improve services but have not achieved optimal levels of uptake. NTAC chooses three to four implementation sites to cover different adoption and implementation problems. One NTAC staff member is assigned to each site and becomes the project implementation manager. Implementation projects follow project management and stakeholder engagement principles. NTAC emphasises that an implementation project is a means to full implementation, not a process that precedes a decision on whether or not to implement. Learning across all implementation sites is distilled into an online How to Why to (HTWT) clinical technology guide intended as an informational resource for subsequent adopters. Each guide contains a technology-specific business case template for securing approval for adoption from senior managers in both the trust that provides the service and the primary care trusts (PCTs) that commission it. Since this research ended, there have been major NHS reforms which, inter alia, replaced PCTs with Clinical Commissioning Groups.

Objectives

The following research questions are addressed:

1. What are the main organisational and decision-making processes and challenges specific to the adoption of the trial project technologies? What are the barriers and enabling factors?

    i. Are processes for adoption generic or do the different types of technology require their own processes?
    ii. What role does the wider commissioning process play?

2. Actor roles:

    i. What is the role of the technology producer in supporting adoption in health-care organisations?
    ii. Facilitator organisation/NTAC:

        – How does the presence of and intervention by NTAC impact on the process of adoption within the institution?
        – Does the involvement of NTAC have an impact on the sustainability of adoption? Does the technology remain embedded after NTAC withdraws? Can the issues and processes that cause it to continue or fail to remain embedded be identified?
        – What information can be gathered from the NTAC project to assess the wider impact on how implementation is managed?

iii. Is it possible to identify best practice(s) for ensuring technology adoption? Are there key roles for managers and other decision-makers (e.g. clinicians, board members, patients)?

Methods

The primary research method was qualitative case studies supplemented by a survey. The case studies focused on three clinical technologies that NTAC identified as presenting the most complex and puzzling problems for adoption and subsequent implementation: insulin pump therapy (IPT), also sometimes called continuous subcutaneous insulin infusion (CSII); breast lymph node assay (BLNA), a diagnostic tool for metastases; and another diagnostic tool, ultrawide field retinal imaging (UFRI).

We conducted 77 semistructured interviews with key clinicians and managers in the implementation project networks. All interviews were recorded and transcribed. We also collected background documentary evidence including sources relating to NTAC's decisions to accept particular trusts as implementation sites; notes of participant and non-participant observations of meetings at trusts and of NTAC-organised awaydays for project stakeholders; and internal trust or commissioner documents on technical or funding issues. Our online survey of a network of UK clinicians actively engaged in trying to increase IPT uptake had a 28% (91/320) response rate. Anonymised e-mails from people who had contacted a patient information and support group for IPT were also analysed. In addition, we interviewed four NTAC staff and filmed seven NHS trust staff using online HTWT guides produced by NTAC.

The analysis of the qualitative case study data was iterative using thematic analysis. Core themes were identified inductively within each setting then verified or qualified through comparisons between individual participants, sites and technologies. Frequency tables and cross-tabulations of categorical and ordinal survey data were produced. Free-text comments were triangulated with the themes emerging from the case studies. The videos were analysed by observing the path through the website taken by the user and summarising what users said. Key themes from across all of the user sessions were then identified.

Findings

Generic policy barriers/issues

Neither provider nor commissioner staff perceives any central 'push' from the Department of Health or the National Institute for Health and Care Excellence (NICE) to adopt, implement or diffuse new clinical technologies.

There is a 'bottom-up' adoption culture – any trust could choose to adopt any, all or none of the three clinical technologies we investigated. This is undesirable as clinically efficacious technologies should be equally available to all patients. For UFRI, this ad hoc approach to adoption was a significant issue as the technology was not 'domesticated'. Clinicians outside of recognised specialist ophthalmology centres did not understand the clinical utility of UFRI (e.g. its diagnostic potential or how and when to use it). This highlights the issue that any bottom-up adoption at individual trust level needs to be linked into wider national processes that offer vision, some central direction, further assessment and evaluation, and the infrastructure to ensure diffusion to sites that have the capabilities and capacities to best utilise the clinical technology.

Payment by Results is a significant generic policy barrier as, within the context of payment for activity, trusts require a business case based on short-term income generation. For example, BLNA brings clear patient benefits. Clinicians were very supportive and there are significant savings for the health economy, but under PbR there is loss of income for the trusts as only one operation is carried out rather than two. Moreover, there is no tariff for a new technology, no clear route to the Department of Health to provide evidence to create a new tariff and, often, no incentive to exert pressure for a tariff to be generated.

For example, for IPT, once the NICE guidance was issued, trusts were usually, but not always, able to persuade the PCT to fund the actual costs of the purchase of the pump and ongoing consumables if the patient concerned met the clinical criteria. However, trusts argued that there were 'infrastructure' costs that the PCT would not meet (e.g. funding for an IPT pump nurse specialist). As the tariff is based on national average costs (rather than trust-incurred actual costs), there is a risk for the trusts in pressing for a tariff as this may not cover their actual costs.

Generic organisational barriers/issues

Within trusts, 'clinical technology adoption and implementation' is not in anyone's job description. Initiators for adoption were sometimes clinical, sometimes managerial. If the champion was a clinician, the process (submission of a business case) was rather alien; this, in itself, could be enough to deter active adoption and implementation. Any initiative was voluntary and often executed, at least in part, outside of normal working hours. Responsibility for ongoing projects was usually limited to a self-nominated small group (two or three doctors or nurses or both). These informal 'implementation groups' often encountered resistance from other members of staff. There was no clear evidence, even for 'active implementers', that changes were significant. For example, out of approximately 300 consultants who characterise themselves as active implementers of IPT, 91 responded to our survey on the extent of increased uptake. At the current time, of those 91 'active implementers', only 35% were at trusts with uptake levels near to or over the NICE guideline (i.e. 10–15% uptake of IPT or higher). Of 62 network members at trusts who 3 years ago had only 0–5% of patients on IPT, only 47% had managed to raise this level to above 5%.

Clinical technology adoption and implementation may change the patient pathway, require new ways of working and demand new skills. In the short term, while organisational processes are redesigned and staff become accustomed to different work practices, this leads to decreased patient throughput (and associated loss of income under PbR – see above). Also, these new work practices may cross intraorganisational boundaries making agreement difficult without goodwill on both sides. For example, to carry out the intraoperative BLNA, a histopathologist must be available to carry out the test immediately, limiting his or her capacity to carry out his or her normal workload. Theatre staff were reported to be sometimes resistant to the new procedure as it introduced uncertainty into theatre scheduling. If a patient is 'node positive', operations scheduled for later in the list would be delayed and so finish later than anticipated. The breast surgeons also had to undergo training; it was reported that if they were not supportive, the BLNA initiative would not progress. In consequence of the above, there is a significant cost for early adopters in the sense that they are forging a path for later adopters to follow and solving complex adoption problems without any pre-existing guidance, excepting any provided by the mentor site (MS). There is no start-up funding available for early adopters, so projects were sometimes pump-primed (or fully funded) by individual clinicians through their 'soft research money', charitable donations or even money solicited from patients who had benefited from the technology concerned.

Implementation, beyond initial adoption, could not proceed successfully without a degree of project management and the involvement of a wide group of stakeholders. Project management and the ability to generate stakeholder engagement are not skills that are always held by clinicians (or managers) in the NHS. Even implementation projects that generated considerable enthusiasm did not diffuse knowledge and 'take-up' beyond the immediate locale.

NHS Technology Adoption Centre successes

For IPT and BLNA, the NTAC 'on the ground' process was, generally, very welcome. Respondents spoke of NTAC as 'being a catalyst', 'imposing a framework and timetable' and 'bringing everyone together, even the PCT'. Where an enthusiastic clinical lead had made some progress, NTAC channelled this enthusiasm into well-defined activities and set milestones and an end date for the project.

NHS Technology Adoption Centre was successful in assisting the trusts in addressing generic organisational barriers outlined above, particularly with regard to taking responsibility for logistics of implementation;

negotiating new patient pathways and ways of working with relevant stakeholders; and using their skills in project management and stakeholder engagement to drive implementation processes forward.

The NTAC's facilitation of adoption projects provides a space for social learning among the various stakeholder groups with, often, quite different ways of making sense of adoption issues. This is important in building consensus to identify new patient pathways, skills and work practices.

Limitations of the NHS Technology Adoption Centre process

For UFRI, the process failed. Two implementation sites pulled out before start-up, having misunderstood the capability of the technology. The remaining site decided later that the technology was too expensive and did not 'fit' its pre-existing patient pathway. The project was disbanded.

There were some specific staffing problems on the UFRI project, which contributed to its early closure, but, disregarding these, it is very doubtful if the NTAC process could have resolved the very difficult implementation issues associated with this technology. The lack of agreement on the most appropriate location, the complex training issues involved in its use by optometrists, the lack of consensus on clinical utility and, if the technology was adopted, the PbR implications of possible loss of income in the trusts all conspired to place this technology outside of the realistic scope of NTAC. This is an example of a technology for which the efficacy can be properly assessed only in specialist centres or within the context of Academic Health Sciences Networks (AHSNs). This project found examples of successful implementation and business cases for UFRI only at specialist centres.

From the online survey, 46% of consultants interested in IPT adoption had not heard of NTAC. Only three consultants had used the HTWT guide to develop a business case to present to their trust and the majority (54%) were neutral with regard to the helpfulness of the guide. The qualitative evidence also indicates that the HTWT guides were not widely used and were unlikely to substitute for concrete NTAC support for implementation at the trusts. The interview data indicate that clinicians wish to discuss adoption with colleagues who have prior experience of success with the technology concerned. If possible, they want to 'go and see' the technology in use.

Of those who knew of the online HTWT guide, 96% of consultants had used it as an informational resource. However, the guide was valued only to a degree: 34% of consultants found the IPT guide 'somewhat helpful' or 'extremely helpful'.

The NTAC process does not address diffusion across the NHS as a whole. The HTWT guides were designed to encourage diffusion but there is little evidence of success in this.

Negotiating barriers

Different sources 'pushed' for the adoption of each technology. Patients had a significant voice over IPT. There is some evidence that the rate of adoption of this technology responds to patient demand. Currently there is limited patient awareness of BLNA, and clinicians are the main instigators for adoption. Outside of specialist centres, knowledge of the potential of UFRI was limited, and industry is the primary source of an adoption 'push'.

For BLNA and IPT there is evidence that, where this impetus for adoption is augmented by other 'enablers' (e.g. the NICE guideline for IPT or agreement between the histopathologists and breast surgeons for BLNA), then some of the *organisational* barriers to implementation (see above) can be overcome.

National Technology Adoption Centre skills in project management and stakeholder engagement added further momentum to implementation processes. There is evidence that NTAC's 'on the ground' active commitment to projects worked to overcome organisational politics, prevented delays and stalling and set realistic timetables.

These enabling processes did not, however, overcome policy barriers. Specifically, there was no evidence of the trusts working with commissioners to negotiate new tariffs, although with BLNA a pass-through payment had been negotiated at one site. There was very little evidence that a 'bottom-up adoption culture' could enable the diffusion of clinical technologies beyond the trusts engaged in implementation projects.

Conclusions

Although there were definite enabling factors that could be mobilised to overcome generic organisational barriers, without central policy direction for clinical technology adoption, wider diffusion of efficacious clinical technologies could not be guaranteed. Whenever there is a clear and coherent national strategy supported with appropriate infrastructure and resources, for clinical technology adoption, implementation and diffusion, NTAC-like project management and stakeholder engagement skills are likely to be successful.

Funding

Funding for this study was provided by the Health Services and Delivery Research programme of the National Institute for Health Research.

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: nihredit@southampton.ac.uk

The full HS&DR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hsdr. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Health Services and Delivery Research* journal

Reports are published in *Health Services and Delivery Research* (HS&DR) if (1) they have resulted from work for the HS&DR programme or programmes which preceded the HS&DR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

HS&DR programme

The Health Services and Delivery Research (HS&DR) programme, part of the National Institute for Health Research (NIHR), was established to fund a broad range of research. It combines the strengths and contributions of two previous NIHR research programmes: the Health Services Research (HSR) programme and the Service Delivery and Organisation (SDO) programme, which were merged in January 2012.

The HS&DR programme aims to produce rigorous and relevant evidence on the quality, access and organisation of health services including costs and outcomes, as well as research on implementation. The programme will enhance the strategic focus on research that matters to the NHS and is keen to support ambitious evaluative research to improve health services.

For more information about the HS&DR programme please visit the website: www.netscc.ac.uk/hsdr/

This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its proceeding programmes as project number 08/1820/254. The contractual start date was in October 2009. The final report began editorial review in March 2013 and was accepted for publication in September 2013. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).