Response to NHS Chief Executive’s Open Call for Evidence and Ideas

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Organisation name: Sheffield Teaching Hospitals NHS Foundation Trust and the Devices for Dignity Healthcare Technology Co-operative

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Email to: health.innovation@dh.gsi.gov.uk

Completed by Professor Wendy Tindale
Email: wendy.b.tindale@sth.nhs.uk
Telephone: 0114 2712688

Organisation Name (if responding on behalf of organisation)
Sheffield Teaching Hospitals NHS Foundation Trust and the Devices for Dignity Healthcare Technology Co-operative
Main role of organisation: Foundation Trust

What can the NHS and NHS Commissioning Board learn from national and international best practice to accelerate the pace and scale of adoption of innovations throughout the NHS?

Please include relevant examples, published papers or other evidence you have found useful.

1. Parallel systems
Too often, innovation and adoption are sequential processes, with no thought being given to adoption and spread of the innovation until after development and evaluation are complete. We need to adopt a parallel approach, planning for success, in which the plans for adoption and the removal of associated potential barriers are considered in parallel with the development activities. This is starting to be recognised by industry, but will only be successful through collaboration.

An ideal situation would be if all new innovations were accompanied by an adoption ‘blueprint’ where the lessons learned from early adoption are identified and shared. A broadening of the support and timing of input from the National Technology Adoption Centre (NTAC) would be helpful, to assist in predicting and avoiding adoption issues rather than post-completion of a successful clinical trial or in response to unsuccessful adoption.

A benefit of having a National Health Service is that good practice should be easy to disseminate nationally. However, the formation of individual Trusts has created a lack of ‘connectedness’. This needs to be addressed if the required pace and scale is to be achieved. ‘Do once and share’ needs to become a reality, backed by a co-operative concerted approach.

Case study 1
An example of fast adoption is the introduction of the combination of high-performance liquid chromatography and mass-spectrometry (LC/MS) into drug discovery and development in the pharmaceutical industry. Within a leading pharmaceutical company employees were selected to join the new technology team to use their technical skills and leadership capabilities to implement the new technology in practice. Senior scientists led these teams with a Director responsible for the implementation of ‘best practice’. It was seen as a development opportunity to join one of these teams. The team focused a percentage of their time to set-up and demonstrate how the new technology would be used in daily practice in 2 or 3 selected adoption sites. Following that, there was wide-spread roll out and training at each site. The NHS version of this could be a network of technology adoption champions (see 11 below) or the development of Trust Technology Review Teams each with an implementation arm?
Successful research now is not done in isolation but in large scale concerted actions. The European Commission funded research programmes are an excellent example of a parallel partnership approach, where each partner is committed to delivering part of a master plan, working in parallel and to agreed timescales, and bringing their specific expertise to further a common goal. We should investigate how the NHS can learn from this approach in order to improve the pace and scale of NHS adoption of innovations.

Case Studies 2 & 3
1. As part of the work of the Devices for Dignity (D4D) Healthcare Technology Co-operative (www.devicesfordignity.org.uk), a new service is being developed in response to the NICE guidelines on continence management (ELAROS). This involves the development of a patient diary for recording urinary symptoms. The consortium involves NHS Trusts, a UK company, and NHS Innovation Hubs with each partner working in parallel on the activities necessary for the successful implementation of a new service within the NHS. The clinical team are focused on developing the clinical evaluations while the commercial team are exploring the future opportunities in continence service tendering and working to ensure the diary is likely to be included on the drug tariff. Information from each of these parallel streams is invaluable in influencing the design and strategy of the other to fully understand the:
   1. User impact
   2. Savings to the NHS
   3. Potential of a commercial return on intellectual property
2. Another D4D example is the adoption of the Dignity Commode. The Dignity Commode is an electronic portable bidet with a wash/dry facility enabling its user to self-clean independently. The product is being marketed by Gordon Ellis Ltd and a project is ongoing within D4D to develop an adoption methodology within the NHS using the commode as an example. This project has a full-time nurse and a project manager working in partnership with D4D and the company.
Early learning from this project has been:
   • Initialising both evaluation and adoption activities in parallel is a time efficient model for easing the ‘path to adoption’ traditionally tackled at the end of a development project
   • Working in partnership: NHS and manufacturers working together is enabling maximum NHS engagement and highlighting and solving ongoing technical problems (all of which are traditionally only encountered when the NHS try to use the products and therefore lead to frustration and technology abandonment)
   • Establishing ownership & product champions is essential
   • Barriers to adoption are often focused on the minutia and it is therefore important to understand and share the practical aspects of implementation as early as possible in the process.

2. Procurement Processes
We should not under-estimate the delays caused by NHS procurement processes; currently these are not in synchrony with the pace of technology development. A proven technology innovation can take a long time to be adopted locally and nationally because of procurement barriers and timescales. The NHS Supply Chain has been a major step forward but we need to go further with developing flexible and responsive systems. There is no doubt that the governance processes in place to protect public funding also slow down the adoption of new innovations. The NHS should look to the private sector where fleetness of foot is a characteristic. What is it that they do differently and that, with appropriate modification, the NHS could adopt?

3. Ensuring the ‘right’ innovation
We will need to create ‘pull’ for new ideas from patients and the NHS, rather than relying on the traditional top down ‘push. Structures such as the Healthcare Technology Co-operatives (HTCs) can help here; because such structures are embedded within the NHS and are part of clinical pathways and practice, it ensures that new idea implementation will be appropriate and in a form which allows for the easiest scale up within the NHS.
4. Marketing
The commercial sector devotes significant resource to marketing of new innovations. There is no NHS equivalent to this. If the NHS identifies a demonstrably valuable and cost effective innovation, there needs to be ‘marketing’ strategy to support widespread uptake. Current approaches are too passive. Industry partnerships to drive uptake of innovation through strategic marketing could be explored.

What specific actions do you think national NHS bodies, such as the NHS National Commissioning Board, need to take to encourage and stimulate the successful and rapid adoption and spread of innovations throughout the NHS?

5. Clarity
a) Improve clarity within the innovation landscape
The National Technology Adoption Centre (NTAC) undertakes Technology Implementation Projects in key areas and develops “how to why to guides” for technologies that have already demonstrated clear benefits to patients. One of its aims is to “assist organisations to navigate the complexities of the ‘DH/NHS adoption landscape’. Given the size of the adoption challenges, one might argue that it would be better to “simplify the complexity of the innovation landscape” where appropriate, and to clarify widely the roles, relationships and interactions of existing NHS initiatives within the innovation landscape. Mapping each to Technology Readiness Levels (TRLs) would be helpful here, especially to industry collaborators.

b) Differentiate between process and technology innovation diffusion
There should be a distinction in terms of process between diffusing organisational improvement ideas across the NHS and the diffusion of technologies where commercialisation is a real option. The issues are very different, with the latter very often being associated with commercial return, and hence not a ‘free good’. Processes for adoption may well follow separate paths in these two scenarios and a generic approach may therefore be inappropriate and confusing for adopting organisations.

c) Decide on and disseminate how innovation should be valued and rewarded
There needs to be greater clarity in our understanding of the value of innovation. It is variably perceived as benefit to patients, economic benefit and ‘return on investment (ROI)’. Whilst ideally it should be all of these, we need to understand and more clearly define what constitutes successful innovation and in what context. Some investment of resource is almost always required as part of the innovation process. How important to success is the identification of ROI and to whom does there need to be a return? There is a potential for organisations to benefit from the diffusion of someone else’s ideas/inventions free of charge and having made no substantive investment in developing the idea/invention. If success is demonstrating the benefit to large numbers of patients, that may not matter, but how is the innovating organisation to be recognised for the national benefit it has delivered? The situation becomes more complex when technology developments are considered – if the NHS has invested in collaborating in technology development (expertise, know how, etc) should it take a commercial return to reinvest in innovation support or is this very much secondary to patient benefit?

d) Clarity over who should receive return on investment (ROI) for innovations?
If ROI is an important measure of success, what systems and metrics need to be put in place to achieve this? Lack of clarity on these issues can be a barrier to progress and to the spread of innovations. For example, NHS initiatives aiming for long term sustainability (such as the HTCs) will look for ROI for their projects but also funding bodies such as the NIHR i4i are now seeking commercial return on investment for project grants. There is a risk of “too many bites from the ROI cherry” unless this can be clarified.

6. Unmet need generators for technology innovation pull
a) New role for National Service Frameworks
Utilise the National Service Frameworks to set the challenges for new innovation. e.g. 15% uptake target for home haemodialysis. Unmet need that is articulated clearly and endorsed by clinical and patient experts will aid this.

b) The Healthcare Technology Co-operatives (HTCs)
The HTCs were set up in response to the HITF report and are delivering this pull in certain key areas. The model developed (i.e. collaboration across NHS, industry, academia and patients) is one that should be utilised more. Projects start with an identified and validated unmet clinical need to promote technology innovation. The need may come directly into the specialist themes of the HTC or may arise from a collaboration e.g with the National Innovation Centre “WIBGI” calls (e.g. NIC/D4D Paediatric Transport System). Validation is via the HTC expert networks of clinicians and public patient groups. The next step is to form clear technology specifications to which industry can respond. The benefit to industry is that the NHS market has already been identified. Ensuring that NHS procurement of successful technologies would be assured would give greater economic security and “buy in” from collaborating industry.

7. CQUINS
One of the 2 national payment targets for acute providers is: “Improve responsiveness to personal needs of patients”. However, the 5 assessment criteria by which this is measured are non-specific and offer no opportunities to identify where and how improvements might be made; this seems to be missing an opportunity for patient identification of new unmet service needs.

8. ‘Connectedness’ from innovation to procurement
Create a seamless process that can take an innovation from inception to wide-scale adoption. The NIHR Invention for Innovation (i4i) scheme is excellent but at the adoption end of the process the NHS procurement system remains a significant barrier to innovation of new products to promote patient benefits. For example, from our own experience we are aware that i4i have funded a D4D project on continence management products which identified the need for choice and personalisation of continence products and which set out to innovate new evidence-based designs of products. However, the Formulary Product Range of the CPS (NHSSC) actively restricts choice and quality of life by determining that provision of “adequate functionality” (as perceived by a clinical stakeholder group, not patients) to only 80% of patients is acceptable. There seems to be a “disconnect” between the outputs of excellent NIHR funding schemes and the likelihood of those innovations becoming adopted by the NHS. Innovation needs to link much more closely to procurement processes. The NIHR clearly recognise the barrier to adoption in its new evaluation processes (as within i4i) but there does not seem to be a mechanism to influence the process. We would suggest there may be benefits in examining the opportunity for NIHR to influence adoption and procurement processes at a national level.

It would also be helpful for there to be greater connectedness between the National Technology Adoption Centre (NTAC) and NIHR i4i. Funded i4i technology projects could be aided in parallel by NTAC to ensure that innovations become adopted; NTAC would need to be resourced appropriately to support this. Other linkages from NTAC to the HTCs would also be helpful; the Devices for Dignity HTC is exploring possible collaboration areas with NTAC.

Furthermore, NTAC and NHS Evidence should interface so that there are “ready made but adaptable” business plans and support for identifying NHS value (as may be defined in 5c above) where necessary and supporting the case for adoption (as already identified at the Adoption & Spread of Diagnostic-related Innovation in NHS Workshop (23rd June 2011).

9. Intelligent Information Management
Information technology is frequently introduced into hospitals with a “push” approach, where the technology is developed, assessed in some limited clinical settings, and then pushed in a large scale adoption, a process that is frequently resisted by the medical professionals who
often perceive these changes as being not fit for purpose and as intrusive disruptions of their already busy daily work. The alternative - a “pull” approach where the information, digitally stored in our hospitals but also in the points of primary care and possibly also in the homes of our citizen/patients, becomes the centre of a continuous innovation process, offers the potential to generate new data, information, and knowledge through integration of what is already available. A data- and information-centric approach would ensure that the users of innovation and the providers of innovation interact synergistically, always keeping in mind the problem to be solved, and constantly monitoring how effectively a tentative innovation is in solving that problem – a genuine partnership approach driven by NHS information which is effectively managed and exploited to the full.

Intelligent information management needs to address the following objectives:

a. **Maximising the fraction of information that is already generated or exchanged during every healthcare process that is captured and stored in digital form**; this should include not only the primary information, but also process information such as the duration of the events, the personnel involved, the instrumentation used, etc. This would make possible the objective identification of needs, not only in relation to the improvement of health but also in term of improving the healthcare provision. This would not necessarily require the collection of more data than is now routinely carried out but rather would require the collection of higher quality data, as a natural and integral part of the healthcare process, with a focus on interoperability, in order to enable maximum exposure of the data for further exploitation.

b. **Making all information relative to every healthcare process virtually accessible by any other information system, regardless of its technology, physical location, management policy**, etc. This implies the ability to warehouse information originally collected using a variety of information systems, including primary care services, and potentially even information stored in the citizen/patient personal health record, without increasing the security risk. Appropriate anonymisation of data would allow sharing of information across boundaries, enabling integrated clinical information to be available to drive innovation in areas of evidence-based unmet need (with the information providing the evidence), to support benchmarking and drive up quality and to assist in providing information to drive the pace of adoption.

c. **Developing exploratory data analysis tools that make it possible for every decision-maker, from the general practitioner to the chief nurse, to discover areas in need of improvement**, both in terms of healthcare outcome and healthcare provision.

d. **Using such a warehouse of clinical information to develop predictive models which can**

   i. anticipate specific health states (events or outcomes) from the available information, with the aim of providing greater personalisation of care
   
   ii. encapsulate new tentative knowledge about why a certain disease or condition is recognised, develops, is treated with variable efficacy, and produce side-effects or is related to other co-morbidities
   
   iii. help in directing the need for new clinical information to aid understanding of the disease process

Research, innovation and adoption are all part of the same spectrum of knowledge acquisition, implementation and systems improvement and they rely on data and information to progress and succeed. The NHS is data-rich, but is often information-poor because of inadequate information management. Making data widely available in an appropriate and accessible form and working in partnership with the information management and technology international research community and industrial partners could be a powerful driver for the translation and adoption of radically new technology innovations. This encapsulates the vision of the ‘Virtual Physiological Human (VPH)’ Project, an EC funded pan-European programme of research, which is now ripe for clinical translation and exploitation, followed by at-scale adoption. There could be fewer better places to demonstrate the impact of such an at-scale adoption than the NHS.
The realisation of such a grand vision would require a co-ordinated strategic initiative at a national level. The rewards could, however, be transformational, impacting upon acute and chronic care, in-hospital and community care, active and healthy ageing and personal health forecasting. We recommend the establishment of a joint strategic programme of translation and adoption between EPSRC, MRC, NIHR and DH, co-ordinated in collaboration with the UK clinical and academic centres which are already involved in the adoption of VPH technologies in the UK.

10 Streamlining

a) Implement a revised ethics system that uses a risk-related scale of effort and has greater flexibility. Although the IRAS system has streamlined the application process there is still a disproportionate level of effort and time required to gain ethics approval for low-risk technology assessment. This is a major disincentive to technology innovation (particularly to industry working with the NHS) and its adoption. Does low risk technology assessment as part of an innovation strategy really require ethics approval at all? Should there be a national toolkit which can support a rapid approval process for low risk innovations? The NIHR Office for Clinical Research Infrastructure (NOCRI) and the Medical Research Council developed a model contract for collaborative commercial clinical research with engagement from industry, universities, the NHS and government to support all collaborative research scenarios. Similarly, ethical approval could be an area that NOCRI and NTAC could investigate to reduce the negative impact of ethics on innovation and subsequent adoption.

b) Reassess the value of the National Drug Tariff Part IX restrictions on FP10 primary care prescribing of certain medical devices such as urology, ostomy and orthotic appliances (not drugs) that require the DT1 form and the impact of Formularies on patient access to devices. The Urology Trade Association that represents 15 of the urology companies in the UK has worked with commissioners to improve the process. However, the current process remains a barrier to new SMEs wishing to penetrate the market or to the introduction of a new device because providing the cost-effectiveness evidence to achieve a reimbursement value is challenging for a new product and restricts competition. Furthermore, despite a national agreed tariff, local Formularies (e.g. NHS SBS), can decide to set their own restricted list of products for clinicians that can be supplied to patients on NHS prescription. In many cases formularies do not make clear that all products on the Drug Tariff should be available to patients, and the bureaucracy involved for clinicians to prescribe off-formulary products is extremely prohibitive. (See: HS126: http://www.publications.parliament.uk/pa/cm201011/cmpublic/health/memo/m126.htm). This emphasis on short term cost savings is a major disincentive to companies to innovate and improve products.

11. Network of Adoption Champions and Early-Adopter Organisations

Implement a national network of NHS Trust-based and community adoption champions whose remit would be to identify and spread innovations at pace and scale. This could be linked to an incentive system at organisational level (X innovations adopted by Y organisations in Z months). The adoption network would form part of the new NHS innovation ‘marketing’ workforce (see 4 above).

Linked to this could be a network of early-adopter organisations. The status of ‘early adopter organisation’ should carry some prestige (a coveted label of ‘Innovation Trust’ for example) – could there be a parallel model to AHSCs but focused on innovation?

12. Promote initiatives such as the HTCs to support collaboration, co-operation and integration

a) Broaden the extent and scope of successful pilot initiatives such as the Healthcare Technology Co-operatives (HTC) which have demonstrated success at “collaboration, co-operation and integration across all organisations and across the public and private sectors”.

b) A key success factor in the HTCs has been the forming of expert teams of “clinical translators”. These are individuals with in-depth experience of various disciplines and sectors who can communicate effectively between and across the language and
knowledge barriers that can hamper development and adoption. The Devices for Dignity HTC has found this to be a particular asset in its collaborative projects. This model has similarities in the successful EC “Concerted Action” model, i.e. a framework for increased co-ordination (see 1 above).

d) In addition, because of the close focus in all projects on both the relevant patient group and clinicians, the HTCs ensure there is a close alignment between idea implementation and patient/staff needs.

What specific actions do you think local NHS bodies, such as providers and Clinical Commissioning Groups, need to take to encourage and stimulate the successful and rapid adoption and spread of innovations throughout the NHS?

1 Incentivise
Set locally-driven innovation and adoption challenges and provide incentives.

2. Adoption Champions
With reference to 11 above, fund locally-based clinical adoption champions to work with innovators to overcome adoption challenges. Often it can be simple things which prevent uptake and adoption; it needs a focused approach, with a champion truly embedded within the clinical community to understand and overcome the barriers.

Case study 4
For example, D4D is working on a RIF-funded dignity commode adoption campaign project (see case study 3 above). One challenge for the commode adoption within the community was something as trivial as needing a longer electrical cable, imposed due to local primary care health and safety protocols (extension cables banned in service user homes) and a shortage of sockets in users’ homes. This level of detail would not have been known (or solved) without an on-site clinician tasked with promoting adoption.

3 Promote local sites as Early Adopter Organisations (see 11 above)

What specific actions do you believe others, such as industry, academia, patient groups or local authorities, could take to accelerate adoption and spread, and what might encourage them to do so

1. Partnership Working
Involve all the stakeholders in the innovation process at the outset so that they have buy-in and an incentive to accelerate adoption. One of the biggest disincentives to companies innovating is ensuring that there is a genuine need and a large enough market for their product; by working in collaboration with the NHS, industry have access to healthcare professionals, clinicians and through collaboration (and indeed through more intelligent information management and data sharing – see 9 above), access to relevant clinical data, for example epidemiological data on disease prevalence and potential user numbers to inform potential market size and demographics (e.g. NHS statistics on devices and equipment usage). Provide access to key opinion leaders and disease-specific centres of excellence as evaluation sites. Close collaboration with the NHS and expertise held within the service can significantly impact industry when seeking investment or grant funding. Funders and investors have access to unbiased professional input (as part of the due diligence) that can significantly de-risk high stake, technical and scientific investment or grant funded opportunities.
2. Knowledge Exchange

Offer more opportunities for NHS employees to exchange knowledge across sectors and for industry to access NHS clinical expertise (e.g. “preceptorships”). One way this could be achieved is by broadening the scope of the knowledge transfer partnerships (KTP) scheme to include NHS employees as KTP expert advisors (academics) and Associates and also to allow the NHS to qualify as a business for the KTP scheme. Currently the KTP scheme is set up to be a three-way project between an academic, a business and a recently qualified person (known as the Associate). KTP projects strengthen the relationship between the academic and the business community, providing opportunities for ongoing collaboration. Enabling the KTP scheme to be open to NHS applicants would afford such collaborative commercial benefits to the NHS and offer clinical insight and experience to business. For example, a D4D project is already working indirectly with a KTP between Loughborough University and Mediplus Ltd and has seen the benefits in this approach from accessing materials expertise for a new urinary catheter. Clinical expertise has also been invaluable (albeit not a formal part of the KTP process), demonstrating a major opportunity in the future for a KTP system that includes the NHS.

Do you have any further comments about accelerating the adoption and spread of innovation in healthcare?

1. The NHS tends to disseminate through traditional routes such clinical conferences, journal papers and more recently large national events such as NHS EXPO. However, these are not ones typically accessible to the NHS customer. We know that social media and national media are a powerful way of broadcasting to NHS customers; perhaps the NHS should make more savvy use of this form of marketing for successful NHS case studies of new innovation to create patient demand? The excellent FAST campaign for early stroke intervention is a good example where this has been used.

2. As identified in the Adoption & Spread of Diagnostic-related Innovation in NHS Workshop (23rd June 2011), the NHS needs to move away from silo accounting and to create a radically different way of funding adoption of new innovations (which by definition will not have a track record).

3. The decentralisation of the NHS by encouraging individual Trusts to compete for income against each other actually forms a barrier to adoption. Innovation should be promoted and rewarded to benefit the NHS as a whole.

4. Remove procurement barriers to innovation and address silo budgeting. Many service improvements and processes work well at Trust and regional level, however, innovation and barriers to adoption of innovative technology might be better served and administered at national level with the authority to mandate innovation into the NHS.

Permissions

We would like to be able to follow up interesting comments and case studies. Can we contact you for this purpose? *  Yes

Do you want to be kept in touch with the next steps in this process? *  Yes

Do you want to be included in a wider community of interest? *  Yes