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

Respondent ID: 28

Organisation name: Cancer Research UK

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To NHS Chief Executive Innovation Review Team:

Please find attached Cancer Research UK’s response to the review on the adoption and spread of innovation being led by Sir Ian Carruthers.

Please could you acknowledge receipt of our response.

Please let me know if you have any questions relating to this,

Kind regards

Emma

Emma Greenwood
Policy Manager
Cancer Research UK
Summary and key recommendations:

The NHS has the potential to make the step-change required to improve the spread and adoption of innovation. If we act now we could position the NHS as world leader, and make significant contributions not only to the health of the nation but also to the economy through efficiency savings and increased investment from industry.

We have approached the question of driving innovation in the NHS by looking at innovation in cancer, and outlining where we think certain initiatives have worked well and where there have been barriers. We have identified the main drivers for ensuring the NHS can embed a culture of innovation, and looked for opportunities presented by the current reforms to the NHS. We have made the following key recommendations:

- We have had many successes in innovating service delivery in cancer due to initiatives which we should continue to value within the NHS, including: multi-disciplinary teams and networks; national strategies and leadership; and registries for collation of disease specific data.
- The NHS Commissioning Board should set out a vision for research and innovation that outlines standards and targets for all levels of the NHS structure, and should then monitor to evaluate national progress.
- Clinical Commissioning Groups should be supported to develop their own strategies for delivering their duty to promote research in innovation, and meet nationally set targets.
- Mechanisms should be developed to open up data stored within patient records in the NHS for use in research and audit to drive innovation in the health service.
- There are significant opportunities for innovation through the introduction of stratified medicine that the NHS needs to take advantage of, including maximising the potential of genetic information in the use of research studies and development of IT systems.

1. Context

- Improving outcomes: a strategy for cancer, the Government’s new cancer plan, published in January 2011, included an ambition to drive up England’s cancer survival rates so that by 2014/15 an additional 5,000 lives can be saved every year. Improved adoption and spread of innovation throughout the NHS will be vital to meet this target.
- The Nicholson challenge to improve efficiency within the NHS could greatly affect, and hopefully improve, the delivery of cancer services if considered carefully.
- This and the ageing population are two of the major challenges for the NHS and both have significant ramifications for cancer, and thus are of particular interest for Cancer Research UK.
- When considering innovation we must also look at the environment within the NHS to conduct clinical research, as research and innovation are partners. Without a strong research base we would not have the evidence base on which innovation can flourish, and we wouldn’t have a mechanism to develop innovative thinking and challenge the status quo. We therefore consider innovation to include research, the introduction of novel techniques and interventions, and the continuous improvement
of the way things are done and services delivered. All of these need to be considered alongside each other, rather than in silos, when looking for ways to improve adoption and spread of innovation.

2. Why the UK should be good at innovation

Medical research provides the foundation for the prevention and treatment of illness and benefits the entire population. It can provide patients with early access to new and innovative treatments, it improves the quality and efficiency of health services for the wider public and it attracts investment and creates jobs.

UK medical research benefits from the unique combination of stakeholders that work together. Transforming the results of this research into innovation within the NHS requires maximising the multi-stakeholder approach. The mixture of Government support, charity and industrial partnership, university research laboratories, and a National Health Service, provides the breadth and diversity that are crucial to tackle both existing health-related challenges, and those that arise in the future. Through the National Institute for Health Research, medical research is supported with the provision of infrastructure, providing a system which is primed for innovation and a level of support which is unusual compared with some international counterparts.

In the UK we are very good at invention and have a large feedstock of new techniques and ideas that could lead to innovation. The strong research environment and the development of the required knowledge should underpin the spread and adoption of innovation to position the NHS as a world-leader. In addition, the NHS has the potential to operate as a single organisation to provide healthcare across the UK, on an unprecedented scale compared with the rest of the world.

Because of the reforms to the NHS outlined in the Health and Social Care Bill, and the emphasis placed in the Plan for Growth for life sciences to be a driver of economic growth, we are faced with significant opportunities to embed a culture of research and innovation at all levels throughout the NHS.

3. Examples of where innovation hasn’t been adopted

The UK has a strong track record of leading initial invention, however significant challenges seem to exist in spreading the fruits of this to mainstream clinical practice. Below are several examples of innovations that were developed within the UK but have been more swiftly adopted elsewhere.

**Temozolomide** is an important treatment for glioblastoma – an aggressive form of brain tumour and the most common primary brain tumour in adults.

The use of temozolomide both during radiotherapy and for six months post radiotherapy is now the gold standard treatment for most cases of glioblastoma.

Temozolomide was developed in the UK, with work originally starting in the late 1970s at Aston University in Birmingham, where Professor Malcolm Stevens led a team of Cancer Research UK-funded pharmaceutical scientists.

Since its introduction, the drug has achieved annual sales of over $1 billion; however compared with other worldwide markets its adoption in the UK was slow due to differences in routes to market.
Radiotherapy is a major treatment for cancer patients; it is thought to be used in 40 per cent of cases where cancer is cured. The UK leads the world in running clinical trials to determine who will benefit most from intensity modulated radiotherapy (IMRT). This new form of radiotherapy alters the radiotherapy dose according to the shape of the cancer. This means that the central part of the cancer receives the highest dose of radiotherapy, sparing surrounding areas of healthy tissue.

In spite of these research achievements, availability of IMRT in the UK lags woefully behind other European countries. An expert meeting in 2008 that highlighted that 20% of cancer patients would benefit from IMRT but that it is currently only used to treat around 7% of patients.

Proton Beam Therapy (PBT) is an alternative type of radiotherapy that uses a different kind of radiation beam. UK provision of proton beam therapy currently means the NHS paying to send patients abroad for treatment, to Switzerland, France, or sometimes to the USA. In 2008-09 the NHS sent about 25 patients overseas for proton therapy, at a cost of up to £40,000 a time.

Proton beam therapy has only been established in a small number of facilities, and is still relatively undeveloped compared with other forms of radiotherapy. The reason for this under-development, and the dearth of proton facilities, is that proton beam therapy is considerably more expensive than conventional forms of radiotherapy.

Britain has one proton therapy centre, at Clatterbridge Hospital, Wirral, and can only treat up to 130 of the 1,500 patients a year who could benefit from this treatment. It is a low-energy facility, suitable only for treating certain eye cancers such as malignant melanomas of the retina.

The reason for the slow uptake of this new therapy within the UK has been attributed to the initial cost required to set up a facility, with each new facility estimated to cost between £75 million and £100 million. There has been progress in establishing a possible site for a new facility, but it has been slow.

4. Barriers to innovation

The failure to translate invention into innovation within the NHS can be attributed to a number of barriers that stifle innovative thinking and the culture to drive improvements:

**Cultural responsibility and training:** Embedding an innovative culture needs to be supported at every stage within the NHS, on a national and local level. It requires all teams and individuals working within the NHS and in partnership with the NHS, to take responsibility for the promotion of innovation, and to be receptive to it. For example, clinicians play a vital role in the spread of innovation, or alternatively can greatly hamper innovation if they take too conservative an approach, and instead foster a culture of inertia.

There is currently a lack of appropriate training that incorporates the skills needed to approach research and innovation. If staff at all levels within the NHS are to be empowered

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1. Achieving a world-class radiotherapy service across the UK, Cancer Research UK, 2010
to take responsibility for introducing innovation, they must be provided with the requisite training and support to capitalise on new technology, or to enable efficient implementation of new procedures and improved systems. For example, staff should be incentivised to change practice if they think a different approach would be more efficient.

**NHS Metrics:** Health research and innovation can be seen to be in direct conflict with managerial goals for every day service delivery. This is compounded by the short time frames of NHS plans (often 1-3 year cycles). There are Government commitments to research and innovation being truly embedded in the NHS. However, there are a lack of targets for NHS organisations to incentivise engagement in research and innovation.

**Use of Data:** Within the NHS, all patients have unique patient identification data that is invaluable for improving healthcare in the long term. The information required to follow the entire process of patient care is already available, and could be used to evaluate the impact of new innovation and to provide evidence for improvements in healthcare, or demonstrate where improvements still need to be made. There are currently difficulties with how patient data stored in NHS records is accessed for use in research and audit – but again we know that when it is used it can produce results that lead to improvements in healthcare delivery.

We also know that sharing information can lead to innovation, for example the adoption of new surgical techniques has been improved by the collection and sharing of data on surgery by the National Cancer Information Network\(^3\).

**Evidence Base:** The considerable emphasis that we can place on the need for an extensive evidence base can stifle innovation. In some cases it might be worth reconsidering the level of evidence required, or the extent to which a lack of evidence should be interpreted as a signal for inactivity.

**Capital Investment:** The need for considerable initial capital investment can greatly hamper innovation, as demonstrated in the delivery of proton beam therapy. In some instances, this has been overcome by involvement in clinical trials that enable a level of required infrastructure to be put in place to support the trial. This opens the door to service delivery once the trial has been deemed a success.

While the barriers described above are considerable and rife throughout the NHS, they are all surmountable, and if addressed their solutions could have significant benefits for the UK to set the NHS as a world leader in healthcare provision.

### 5. Where innovation has already worked well

While it is vital to consider the stumbling blocks and obstacles that have hampered the spread and adoption of innovation, it is worth appreciating that there are many exemplars of best practice, where there is a drive to support and encourage innovation. There are certain elements that combine to encourage the spread of innovation:

- Supportive evidence (usually well documented)
- Political will
- Appropriate distribution of resource
- Clear strategic vision
- Regular monitoring and reporting of spread of innovation
- Setting targets where relevant to drive innovation

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\(^3\) NHS treated cancer patients receiving major surgical resections, NCIN, March 2011
To improve cancer outcomes, there is a need to develop innovative new approaches to tackling cancer at every stage of the care pathway, including prevention, earlier diagnosis, surgery, radiotherapy, drug treatment, survivorship and end of life care.

The development of the NHS Cancer Plan in 2000, led by Professor Sir Mike Richards, National Cancer Director, following Calman-Hine, was the first comprehensive strategy to tackle cancer in England. The plan outlined the Government's National Cancer Programme for investment in and reform of cancer services in England. The programme worked with the DH, NHS Cancer Screening and national initiatives involved in helping to deliver the targets within the strategy. It aimed to reduce mortality rates, improve prospects of survival and quality of life for cancer sufferers by improving all aspects of the patient pathway.

The original plan has since been updated with the development of the Cancer Reform Strategy (December 2007), and more recently with publication of Improving Outcomes: A strategy for cancer (January 2011). This clearly demonstrates the value that having a clear strategic vision has brought to healthcare delivery in the area of cancer. An analysis conducted by Cancer Research UK highlights just how important and useful Cancer Plans have been. They set direction and make the best use of resources to reduce cancer incidence and mortality. To continue to improve cancer outcomes, and to make our outcomes among the best in the world in the coming years, we need to maintain comprehensive cancer plans that set national direction, incentivise action and dedicate resource to beating cancer.

Several initiatives developed as a result of these strategies are good examples of innovative practice to drive service improvement, for example the creation of the National Cancer Action Team (NCAT) to support delivery of strategic commitments. The role of NCAT spans the cancer patient pathway, from supporting cancer networks in the development of early diagnosis initiatives through to developing better information for cancer patients. NCAT also provides support for the National Cancer Intelligence Network (NCIN) (part of the National Cancer Research Institute (NCRI)). The NCIN is producing innovative information analyses which are helping us to understand variations in cancer outcomes and what we can do to improve them. Their role includes producing a variety of literature including data briefings on topics such as routes to diagnosis, and reports, for example the recent report on major surgical resections in England.

Cancer survival rates have doubled in the past 40 years. This improvement in England has been greatly influenced by the opportunity to incorporate an innovative approach to service delivery and patient care. There are also examples of innovation to improve service delivery which have not only led to improved patient care but that have also saved money:

> we know that offering appropriate patients the opportunity to have their breast cancer treated as a day case or on a 23-hour pathway rather than as an inpatient improves their experience and reduces their length of stay, saving commissioners money.

In addition, there are examples where the value that working innovatively can have on healthcare delivery and patient benefit has already been realised:

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5 Routes to Diagnosis, NCIN Data Briefing, November 2010
6 NHS treated cancer patients receiving major surgical resections, NCIN, March 2011
7 Improving outcomes: a strategy for cancer, January 2011, DH
**Flexible-sigmoidoscopy in England**

Bowel cancer is strongly related to age, with 84 per cent of cases arising in people aged 60 years or older. Results from a 16-year randomised trial showed that a single flexible sigmoidoscopy examination (“Flexi-Scope”) in people aged between 55 and 64 reduced the incidence of bowel cancer by a third and reduced mortality by 43 per cent\(^8\).

Given that bowel cancer is the third most common cancer (38,000 cases per year) and the second biggest cancer killer in the UK (16,000 deaths per year), these are very important results. We expect the results to get even better as we monitor the people who took part in the study for a few more years.

The flexi-scope test is a highly cost-effective intervention and has the potential to be cost-saving for the NHS. It demonstrates the value of innovation in improving the tool being used, and the method by which it is delivered, to produce benefits for both healthcare and the economy. The Government announced, in October 2010, a commitment of £60m to roll out this bowel cancer screening test in the NHS over the next four years.

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**Stratified medicine**

Advances in our understanding of the molecular genetics of cancer enable clinicians to stratify patients by the molecular characteristics of their tumours; thereby ensuring patients receive targeted treatments with fewer side effects and better outcomes. Cancer Research UK has built a partnership with pharmaceutical companies and the Government to improve molecular diagnostic testing for cancer patients in the UK, while capturing genetic data so that we can compare it to patient outcomes to inform future research.

The proof of concept programme is designed to rely on cross organisational working. Core funding is provided by Cancer Research UK, AstraZeneca and Pfizer. The Technology Strategy Board (TSB) is investing £5.6 million in support of the programme, providing 50% of funding to support industry-led partnerships that will either try and develop low-cost genetic tests, or develop systems to gather and store information.

The programme is also coordinated with the Department of Health (DH), the National Institute of Health and Clinical Excellence (NICE), the Human Genomic Strategy Group and the Medical Research Council (MRC).

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**6. Real opportunities in the future**

The NHS has the potential to make the step-change required to improve the spread and adoption of innovation. The Health and Social Care Bill provides an opportunity to ensure that innovation is promoted at all levels within the NHS combined with the need to find efficiency savings in the NHS. If we act now we could position the NHS as world-leader, and make significant contributions not only to the health of the nation but also to the economy through savings and increased investment from industry.

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\(^8\) Atkin W, et al. (2010). Once-only flexible sigmoidoscopy screening in prevention of colorectal cancer: a multicentre randomised controlled trial. Lancet 375 (9726), 1624-1633
For many years cancer has been a source of innovation in the NHS, with methods and practices initially introduced to tackle cancer spreading to other disease areas. As we outlined in Section 4, there are many initiatives in the field of cancer that have led to significant innovation and improvements for patients. We need to ensure that we protect initiatives in cancer that have proven to be effective in innovating, including multi-disciplinary teams and networks; national strategies and leadership; and registries for collation of disease specific data.

**Cultural responsibility and training:** The duty to promote research and innovation will lie at every level within the NHS. At a national level, from the NHS Commissioning Board, there will need to be clear standards set that fit into a long-term vision for research and innovation, and monitoring to evaluate national progress. While there is considerable transition taking place at a local level within the NHS, there is a significant opportunity to integrate responsibility for innovation within the new structures, such as the clinical commissioning groups. Chief Executives of organisations should also be personally responsible and accountable for promoting innovation to embed a supportive culture.

Healthcare professionals should be empowered to approach healthcare innovatively by constantly seeking to find new ways of delivering care and streamlining processes, enabling a culture of innovation to permeate the health system. Relevant training should be commonplace – including in the training of junior doctors, the development of clinicians, consultants, nurses and other NHS staff.

**NHS Metrics:** A system of metrics for research and innovation, on which the NHS is monitored and regularly reported on, needs to be developed. If this can be got right, the opportunities are significant: improved clinical outcomes, fewer complications from treatment, more efficient patient care and the UK’s reputation for research bolstered.

The NHS is a single organisation, with many decision-makers at the local level. This should act as an enabler for the spread of innovation, but if there are no central levers, this is not being realised. Hospital tariffs and the routes by which services are commissioned should be used to drive innovation and remove such barriers. This should be combined with simple checklists to provide standard procedures for encouraging innovation.

**Use of Data:** Mechanisms should be developed to open up data stored within patient records in the NHS for use in research and audit to drive innovation in the health service.

There should be a commitment from those involved in research and innovation to share information on ‘innovative Trusts’, e.g. those quickly adopting new interventions and processes. This information gathering should be a key aspect of the NHS Commissioning Board’s evaluation of national performance, in order to drive improvements.

**Horizon Scanning:** Most importantly when considering the spread of innovation the NHS needs to ensure that it is ready to implement new technologies. The next exciting opportunity for innovation transfer for cancer will be genetics. If cancer can provide an innovative approach to the delivery of healthcare the lessons learned will swiftly transfer to other disease areas. In order for the opportunity and potential to be realised, the use of genetics in cancer treatment must be supported. The Government should continue to work extremely closely with Cancer Research UK and other organisations that are at the cutting edge of this research.

Stratified medicine has the potential to save money in healthcare; the central tenet of stratified medicine is to use a (relatively) cheap diagnostic test to restrict the use of expensive interventions to the patients that will benefit from them. Complex diagnostics will lead to better targeted decisions, avoid errors and increase the targeted use of medicine.
If the UK was world leading in these areas we would be more attractive to pharmaceutical companies. Stratified medicine could provide an opportunity to reduce the drug development timeline by enabling a more targeted approach to drug development.

The opportunities for innovation through stratified medicine that the NHS needs to take advantage of are:

- Maximising the potential of genetic information in the use of research studies.
- Being able to map patients throughout the entire treatment pathway, from initial diagnosis through to post-treatment checkups, presents a brilliant opportunity to track innovation and demonstrate its value. If we get the information systems right, this will enable long-term surveillance – e.g. phase 4 drugs - providing significant opportunities for pharmaceutical companies.

7. About Cancer Research UK

Cancer Research UK\(^9\) is leading the world in finding new ways to prevent, diagnose and treat cancer. We are the largest independent funder of cancer research in Europe. Over half of all cancer research in the UK is carried out by our doctors and scientists. Cancer Research UK’s research is entirely funded by the public. In 2010/11 we spent £332 million on research, supporting the work of more than 4,000 scientists, doctors and nurses.

Cancer Research UK funds research into all aspects of cancer from exploratory biology to clinical trials of novel and existing drugs, as well as epidemiological studies and prevention research.

This research does not take place in isolation. We work closely with our partners within the sector, including public and private organisations and charities, to meet our research aims.

We would be happy to provide any further information or an expert to discuss these issues further, as required. Please contact Dr Harriet Teare, Policy Adviser at Harriet.Teare@cancer.org.uk or on 020 3469 8052.

\(^9\) Registered charity no. 1089464