



The Royal Academy
of Engineering

NHS Chief Executive Innovation review

Response from The Royal Academy of Engineering to the Department of Health

August 2011

1. Introduction

- 1.1. This submission has been prepared by the Biomedical Engineering Panel of The Royal Academy of Engineering.
- 1.2. The terms of reference and membership of the Biomedical Engineering Panel of The Royal Academy of Engineering are attached to this submission. A key purpose of the Panel is “to advise government and the NHS on barriers and incentives affecting the field”.
- 1.3. We welcome this timely call for evidence on how the NHS can make better use of innovation for more effective patient care. The UK enjoys global leadership in many areas of biomedical engineering that can make an important contribution to UK growth. The introduction of such innovation across the NHS at pace and scale will stimulate international interest and help open up world markets for this vital sector.
- 1.4. Although the Panel covers the whole field of biomedical engineering, the timing and authorship of this submission have led to it being written from the perspective of medical technology (med tech), which is taken here to include both medical devices and information technology (IT). Our submission seeks to highlight two of the obstacles preventing the large-scale take-up of innovative med tech in the NHS, as illustrated by two case studies, and makes two recommendations for helping to overcome these barriers.

2. Barriers to innovation in med tech for the NHS

- 2.1. As stated on page 5 of the call for evidence and ideas, there is plenty of invention in the NHS, as well as local adoption – at least up to the prototyping stage. The main problem, as we perceive it, is the next step, diffusion, the systematic uptake across the NHS.
- 2.2. In the specific case of med tech, especially products based on information and communication technologies, there is a tension between the pace of technological development and the requirement for high-grade medical evidence. The highest level of evidence is the randomised controlled trial (RCT), but such clinical trials are costly to organise and take a long time to run. This leads to the first obstacle to successful innovation in this sector: the time taken to gather and analyse high-grade evidence is comparable, if not greater than, the lifetime of the technology, as illustrated in the first case study below.
- 2.3. The second obstacle is the difficulty in disseminating throughout the NHS worthwhile innovations developed at regional level, through lack of appropriate commissioning procedures and/or resources. This can lead to duplication of effort, with Trusts (or GP consortia in the future) often not aware that a tried-and-tested solution already exists elsewhere within the NHS for the problem under consideration. This barrier to innovation is illustrated in the second case study.
- 2.4. The two case studies are drawn from work in the Oxford Radcliffe Hospitals (ORH) Trust and the University of Oxford, not because they are better examples of innovation, but because their details are known to the authors of this submission.

3. Case study 1 – mobile healthcare apps

3.1. The example of innovative technology given in the call for evidence is mobile healthcare apps. The use of these apps has been investigated in Newham PCT, one of the three sites chosen for the RCT at the core of the Whole-System Demonstrator (WSD) project. The contract for the use of these apps was negotiated with t+ Medical (a spin-out from the University of Oxford) in 2007 but the results from the RCT (which are generally thought to be positive) will not be available until late 2011 or even early 2012. In the meantime, the technology at the core of mobile healthcare apps has moved on, so that the technology tested in the WSD RCT is now obsolete.

3.2. Mobile healthcare apps are now to be found on the new generation of smart phones (iPhones and phones using the Android or Windows 7 operating systems). Interestingly, NHS Bristol did not wait for the results of the WSD RCT to sign a £1.4 million contract (in July 2011) with technology company Safe Patient Systems for 600 patients with either COPD or CHF to be issued with smartphones loaded with a health application. According to the press release, a 50-patient pilot of the Safe Patients System smartphone application at NHS South Birmingham was sufficient evidence to convince the NHS Bristol commissioners.

4. Case study 2 – StrokeNav (wireless data collection and analysis system to support stroke care delivery)

4.1. StrokeNav is a web-based system which supports clinicians and managers involved in stroke care. Users can enter and review data via laptop or desktop computers and other devices such as an iPad. The system offers data collection modules for each aspect of treatment, including multi-disciplinary team meetings, handover lists, therapy assessments and goal planning. Where possible, the modules share data to avoid duplication. The information is transferred seamlessly between acute and rehabilitation hospitals, supporting continuity of care. The system also calculates nationally-collected metrics, offering a real-time graphical dashboard of service performance.

4.2. StrokeNav has been in routine clinical use in Oxfordshire for over 18 months, with approximately 1,500 patients registered. It is also being piloted at Milton Keynes Hospital, and there is some interest from the Royal United Hospital Bath NHS Trust. However, there are no resources available to make information about StrokeNav and its capabilities known to all other acute Trusts which care for stroke patients.

5. Proposals for overcoming barriers to med tech innovation

5.1. Recommendation 1

5.2. NICE's Medical Technologies Evaluation Programme evaluates the benefits of innovative technologies taking into account a broader range of evidence than RCTs alone. The Programme is also able to promote the development of further evidence on devices that are potentially important to the NHS. NICE's process enables new technologies with a value proposition to be rapidly evaluated using appropriate types of evidence that recognise the special features of med tech.

- 5.3. There are many innovation prizes or awards in the NHS at the moment (for example, NHS Innovation Challenge Prizes, Innovation and Progress Transformation Awards, E-Health Insider Awards, and HealthInvestor Awards). These should be retained (although some rationalisation or consolidation is needed), but an award or prize should be seen as only the first step in an enhanced innovation process.
- 5.4. *We recommend that those making awards for innovation build into their award criteria the concept of 'providing value to the NHS', using an approach that is consistent with Health Technology Assessment (HTA) methods used by NICE to determine the value of technologies to the NHS. We also recommend that award winners should be advised to contact NICE to explore evaluation of their new product by the Medical Technologies Advisory Committee (MTAC).*

5.5. Recommendation 2

- 5.6. The purpose of innovation is to improve patient outcomes and/or reduce the costs of healthcare delivery. There needs to be a recognition that rapidly-evolving technologies are different from drug therapies and that commissioning should be flexible enough to incorporate formal evaluation of novel technologies in the adoption process. For example, if a new stroke patient management system were to be commissioned in ten Acute Trusts, this could be done on a cluster-randomised basis. Five of the Trusts would be randomised to use the new system, while the other five would act as the control group. If the cost-benefit analysis demonstrated the value of the innovation, it would then be rolled out to the Trusts in the control group. For application in the Primary Care sector, cluster randomisation would take place at the Practice level.
- 5.7. *We recommend that services enabled by novel technologies (devices and/or software) should be commissioned with a proper cost-benefit evaluation included as part of the service roll-out, based on cluster randomisation. We further recommend that the results of these evaluations should be made public, for example by reporting them on a high-profile website, such as that of the Centre for Evidence-Based Medicine.*

6. Conclusion

- 6.1. The Royal Academy of Engineering Panel for Biomedical Engineering supports the aim of accelerating the take-up of innovation across the NHS, and we believe that our recommendations, if implemented, would help to achieve this for the med tech sector. We recommend (i) more widespread use of the Medical Technologies Evaluation Programme recently set up by NICE (for example by linking it to the criteria for innovation awards); and (ii) making it possible to commission services which include a formal evaluation component as part of the service roll-out. Our two recommendations would not only improve patient care but also make a significant contribution to UK economic growth through the med tech sector.
- 6.2. We hope that our submission is helpful and we would be delighted to discuss these points further with the response team.