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

Respondent ID: 92

Organisation name: Nottingham University Hospitals NHS Trust

Type of response: Letter
NHS Chief Executive Innovation Review Team  
Department of Health  

Dear Sir Ian Carruthers OBE  

I am pleased to have this opportunity to contribute to the pool of ideas that is being formed as a result of your call for evidence. Firstly I would like to highlight why my experience equips me to make a contribution on this topic. I have worked in the NHS for almost 18 years during which have produced several innovations supported by patents as well as licensing and other IP agreements. My specialist field of practice as a clinical scientist has been bioengineering or medical/clinical engineering. Therefore in the following which is merely an outline of ideas and suggestions, the focus is on technology related innovations.

My suggestions are mainly based on evidence, some of which come from personal experience, as I have experimented with prosecuting innovative ideas through various routes since 1994 and found the DIY option produced the best results. This is not to say that there cannot be an effective system in place to deal with innovations. The experience merely shows that the previously existing mechanisms were inadequate. Throughout the years, despite “incentives” there have always been a set of disincentives concealed in what could be termed the human components within the NHS.

I found that presenting an innovative idea to a colleague, a manager, and a businessman, can produce distinctly different reactions. This is inevitable when experience and knowledge, motivations, values and personal objectives are so very different. I have always found the most consistent and clear reaction to come from the businessman because of the transparency and synergy of motivations, values and objectives. If these elements partly define the working culture, then the working culture within the NHS requires overhaul in favour of innovation.

Although much of the following pages may seem like statement of the obvious, I have tried to bring under focus some of the nuts and bolts of the system where specific actions can potentially create both savings as well generate an environment that is favourable to innovation. If you find my suggestions are of interest, it will be my pleasure to discuss them further at your convenience.

Yours sincerely  

Hamid Rassoulian

H Rassoulian BSc, MSc, PhD, MIPEM, ChSci, CEng, FI MechE, CS  
Consultant Clinical Engineer  
Queens Medical Centre  
Medical Physics & Clinical Engineering  
Nottingham University Hospital NHS Trust  
Nottingham, NG7 2UH  
Hamid.Rassoulian@NUH.NHS.UK  
Hamid.Rassoulian@Nottingham.ac.uk  
Tel: 0115 – 924 9 924 – (61107), Mobile: 07794 02 72 68  
Personal: 02081 443 423
Changes in the nature and face of technology

With advancement of science and the consequent convergence of technologies (medical, technical, chemical and biological) the traditional barriers between classical engineering and scientific disciplines are being removed. This has already led to formation of new fields such as nano-science and nano-technology as well as novel manufacturing processes that enable rapid manufacture and miniaturisation of devices and their integration with medicines. Development of mobile, wireless and remote monitoring technologies together with intelligent analytical techniques built into software considerably increase the predictive power of diagnostic tools and allow active patient participation in their own clinical management. In response to such paradigm shifts in technology and patient management and the consequent regulatory changes it is essential that the scientific skill base and the Human components and their configuration within the NHS change to enable adoption and diffusion of innovations.

The human component can make or break innovation

Eppendorf is an innovative technology company that started from a small two-man workshop in Hamburg General Hospital and in 2008 had a revenue of 410 million Euros.

Apple occupies its own space within the telecom sector. One might argue that their products have an edge to them that others lack. But it is really the individuals behind those products that give Apple the edge.

There are many examples of success that help define models, structures and relationships that foster innovation. The primary common feature of all such models is the human component, the individuals that make it happen, such as James Murray Spangler, a janitor who sold his design to William Henry Hoover and the rest is history.

Synergy between motivation, values and objectives.

An innovation-centred approach is characterised by the synergy that exists between individuals’ motivations, values and objectives. When those participating in the development and prosecution of innovation enjoy common values and their objectives are aligned and similar motivations fuel their effort then the elements of a winning scenario come together that can translate the innovation into practice.

In my own experience an innovative genetics device received different treatments from colleagues who were totally supportive, the manager who was worried about the costs to his budget and if he will have to deal with a queue of would be innovators in the face of an ever decreasing budget and the local university’s research support office that was primarily concerned with producing a glittering annual report and finally patent agents whose admin charges were spiralling out of control. In addition, different layers of decision making made it impossible to accurately identify who was responsible for what. Two years and several thousands of pounds later, the local University and the NHS Trust decided to pull the plug on this venture and in a daring move the R&D manager, agreed to assign the IP rights to me. In a few months I secured three patents and later obtained public-private funding to form a company to produce a prototype under licence.
Removing disincentives is more essential than creating incentives

Whilst innovation is born out of individuals’ enthusiasm and motivation, the innovators’ main incentive is always to see it succeed. This creates a motivating and self-incentivising loop which can only be broken by external disincentives, the main source of which are the human components in the environment surrounding the innovation.

In 1994 I devised a solution to be used in the operating theatres in Southampton General Hospital. It is now more than 12 years that InterSurgical has been marketing that innovation around the world, quite profitably and have been paying royalties. I have not felt incentivised by the system to generate another innovation. In fact the strength and number of disincentives have only increased throughout the years.

Parts of the human components have become better equipped to rapidly discourage the individual into “just doing the day job”. The tools that were intended to help manage innovations are used to scrutinise innovative ideas about their validity, their feasibility, viability, usability, marketability, and in short their… ability to prove themselves before having had the chance of even being born into physical reality.

Utilising the existing potentials pays more dividends

Investment in support infrastructure for innovation can be an effective incentive but quite costly. However, a more efficient method is to use the existing potentials within hospital trusts. Most university hospital trusts have a Medical Physics and Clinical Engineering department. These have traditionally been centres of innovation and development of clinically applied technology. Since early 1990s due to the need to identify and justify R&D costs, many of the highly skilled physicists and engineers reduced their R&D activity and instead assumed managerial or routine clinical roles. The trend has continued to this day that highly educated individuals are employed as “clinical scientists”, are highly paid (similar or higher than an associate professor in their local university) and yet have less scientific output than a newly appointed lecturer.

There are many examples among this group undertaking tasks that are normally undertaken by someone of a much lower grade in a similar role but outside the NHS. There is no demand on this group who are essentially the technology enablers and producers to produce any technologies at all. This group, some of whom are trained to PhD level have access to clinical, experimental and production facilities, yet go through their careers without a single credible or even failed attempt at innovation. The reason seems to be that innovation has less value than managing the status quo.

Innovation centred approach requires sustained partnerships

The lifecycle of innovation requires participation of clinical leads, technology producers, market forces and academia. Regional innovation centres or clusters should bring all the above together under one roof creating clusters of well over the critical mass required for success.

Each regional centre can then undertake activities to produce and/or introduce innovations. Adopting an innovation centred approach means placing a demand on NHS organisations to generate innovations to nurture them and bring them to fruition, with targets to meet.
**Suggestion(1): Innovation Centre**

The NHS employs over 31000 qualified health care scientists, over 38000 consultants and over 11000 senior managers. These three groups make a total of well over 80,000 highly skilled staff. If innovation is of value to NHS then it should be prepared to invest in innovation by dedicating a small fraction, in effect less than 0.07% of its workforce to producing and introducing it into the service.

This means a humble 1% of the above three groups equating to 800 staff who will have the opportunity to transform the way 1.2 m of their colleagues care for the health of the Nation.

This 800 staff are not new staff but they come from the above three groups in relative proportions. They are chosen first from among those who have a history of innovation and have the fire in their belly. However, since their numbers are not large enough more will be needed from their colleagues who are motivated to dedicate their time to innovation. They bring together a wealth of knowledge about the health service, its problems and potentials (particularly about their own locality). In addition their individual expertise and skills complement each other and fuel their collective motivation such that the total will be much greater than the sum of the parts.

This can potentially be an incredibly highly motivated, exceptionally skilled pool of innovative minds who can be the envy of the world from the start.

The way this group will work and will be funded can and should be both innovative and sustainable such that points the way to how health care innovation will be funded in the years to come. However, it is without a doubt that if the layers of red tape are not removed and interference by those who only wish to “keep a finger in the pie” is not prevented, then the net result will be just an additional expense for the NHS.

**Suggestion(2): Sustainable partnerships**

Innovation always requires to mature and to be formed into a shape appropriate to end use. This may require further scientific and technological input as well as market orientation. The role of industry and commerce as well as academia should be considered at the outset and their participation secured before any innovative ideas are considered for implementation.

The above mentioned innovation centre can and should be complemented by a similar pool of members from academia and industry.

**Suggestion(3): Capitalising on existing potentials**

The workforce statistics quoted above, come from the Department of Health’s website and suggest that over 80,000 potential innovators are spread throughout the NHS. Hospital Trusts in particular, should be encouraged to deliver innovations at a rate that is proportional to the pool of talent they employ. A figure of 0.01% does seem to be a moderately low target. This means the NHS in England should be able to show evidence of innovation at a rate of about 100 every year.
Setting the performance measures can determine how deeply rooted the innovation culture will form. For example, metrics can include, success to attract funding, success to secure patents, success to win a prize at a competition, success to propagate to other NHS Trusts and win converts, etc. It is not difficult to see how the above metric can be tuned to be either easily achievable or be challenging enough to encourage real change.

For example to attract funding above a threshold without academic participation can encourage the NHS based scientists to develop their own track record in the applied development as opposed to lab based basic research. It can also encourage the NHS to explore options with industry partnership which can then grow with success feeding further success.

Setting targets can focus the attention on discovering internal potentials and reconfiguring the human asset to produce results. In terms of technology production and introduction, the NHS Physicists and Engineers and other scientists should be incentivised to enable technology adoption and propagation with direct patient impact. Targets should be set in a way that reflect the expected capacity of each department and hospital. The shortfall in achieving the target will obviously be the evidence of the actual capacity and will aid to identify where new skills injections may be required.

**Suggestion (4): Removing disincentives**

It is important to ensure that for every incentive that is introduced at least two disincentives are removed. This could be a target itself and will ensure innovation is not only pulled or pushed but also facilitated. The dynamic nature of the health care environment creates opportunities for innovation as well as disincentives. A continuous or regular review should be the policy to ensure regular weeding out of disincentives.

The major disincentive to innovation is the human component that opposes any form of lateral thinking, is inflexible in the way things are done and prescribes unachievable timetables. This leaves no time, energy or will for innovation by the employees.

Another disincentive to innovation is fear of failure. This exists at both management level as well as innovators’. The managers’ fear of failure is translated into risk averse attitudes whilst the innovators fear failure because of being punished or blamed for wasting resources. Failure should be seen as opportunity to learn but in the current environment managers’ learning goal is how to avoid this in future, which effectively means how to stifle future innovative attempts. However, the goal for learning should be “innovation centred”, i.e. how to ensure success instead of failure in future.

“Do nothing to avoid failure” is probably the most deeply rooted cultural weed in the NHS. I recall from almost two decades ago, the early days of joining the NHS, whilst preparing a business case for an orthotics and prosthetics service, my manager who reviewed the plan found it deficient as I had overlooked to include the option “do nothing”. To my astonishment he was not prepared to compromise and I was forced to include this option into the plan. I was also surprised to find out that it was this option that was ultimately favoured by the management.