

# Unlocking medical technology innovation for a world-leading health system

The UK devices sector is on the threshold of a new era of partnerships to develop products for 21st century needs. One of the drivers of this change is the NHS' National Innovation Centre director Dr Maire Smith, whose championing of a networking approach to technology transfer is beginning to pay dividends.

Interview by Ashley Yeo



NIC director  
Dr Maire Smith

The UK National Health Service spends around £6bn (\$11.8bn) a year on medical devices. How much of this large amount is spent on "innovative" products is open to debate, but it is likely to be lower than it would be if the NHS were not – to use its own words – "complex, sometimes inefficient and confusing".

The NHS readily concedes that it is slow to take up new medical technology. The associated loss of benefits to patients, the economy and

industry cannot be accurately quantified, suffice to say that UK healthcare has long presided over a lose-lose situation in its hesitancy to embrace innovation.

The Wanless Report in 2002 described the UK's "slow adoption" problem, and called for investment in modern healthcare technologies. But history may recall that it was the acted-upon recommendations of the influential cross-sector 2004 Healthcare Industries Task Force (HITF) that properly established the NHS on a course of encouraging and fostering innovative medtech.

HITF made proposals for a National Innovation Centre to be set up under the authority of the NHS Institute for Innovation and Improvement, and for two more IP management "hubs" – on training and adoption of new technology – to join the existing nine.

The responsibility of setting up the NIC was given to Dr Maire Smith, a known proponent of networking and partnerships, who had been the NHS Institute's director of technology and product innovation since September 2005. The centre became fully operational in September 2006.

## ***"Translational medicine and putting inventions into practice are beginning to enter people's consciousness"***

"I wanted to help create a more entrepreneurial spirit in the NHS and establish a national innovations centre to build bridges with industry and get more development products closer to the NHS," Dr Smith told *Clinica* at the NIC's office on London's South Bank.

"The NIC was seen as a cross-governmental initiative, because the DTI and the DoH were saying that there is a gap with some of the early-stage technology." What they had in mind was an "enabling service" that put the relevant people in contact with each other in order to stimulate hybrid relationships at an early stage.

In Dr Smith, who was formerly part of the commercial directorate that had responsibility for the hubs before they were transferred to the NHS Institute, they found a solid advocate of this policy. "Getting the appropriate technology

into patient care is really important. If we don't keep up with innovation, we will miss out on new techniques."

Those who argue against innovation on the grounds of cost are encouraged by Dr Smith to look beyond the up-front expense: "You have to think of the patient. People may see it as just a cost to the system, but we've got to look at the true value of new technology, ie at its whole lifetime cost."

### **Conveying the message of translational medicine**

Albeit belatedly, technology transfer is now being taken seriously in the UK health service, and Dr Smith – erstwhile chief executive of Manchester Innovation Ltd – is keenly aware of what is at stake, noting that a major financial return for Manchester University, which developed the first computer after the war, was never realised.

Teamwork and building "integrative communication" are key aspects of the way the NIC operates. "The NHS may be a big user of technology, but there are cases where people feel that it is not easy to get their technology developed in the UK because of the complexity of the landscape. Part of our role is to put innovators into contact with the right people." The service assesses ideas confidentially, and lets the innovator know if there is likely to be a market, or whom else to approach for advice.

The HITF report spoke of the need for the NHS, medical device companies and the healthcare sector generally, including academia, to work in partnership. "Without that, we won't be able to convey the value of true translational medicine." This message was reinforced in the recent Cooksey report, which sought to "present a holistic message of UK healthcare – whether NHS- or MRC-funded".

"We are really at the start of the curve on this: translational medicine and putting inventions into practice have not been articulated very well in the past, but they are now beginning to enter people's consciousness," said Dr Smith.

This challenge was what excited her about taking the role as NIC head: "I was switched onto the idea about trying to actively promote and encourage innovation into the healthcare environment; it is a new dimension."

### **Web-based system**

The NIC provides a web portal ([www.nic.nhs.uk](http://www.nic.nhs.uk)) available to innovators – internal or external to the NHS – that is already getting 120 hits a day. The service relies on automated assessments of proposals, and at the appropriate point, there can be a meeting with NIC staff. There is an "innovation assistant" to guide users. It is currently being updated with a more specific navigator tool, to put innovators in contact with the most appropriate NHS organisation, and industry is helping to design this. "This is key, as we are trying to listen to what industry is saying."

That the work of the NIC is beginning to be noticed was evidenced when it recently gained coverage in the influential article, *Digital Healthcare*, produced in December 2006 by the

Royal Society, which commented on the potential for government health departments to undertake work with the NIC and NHS bodies such as the Purchasing and Supply Agency (PASA) and NICE alongside professional contributions from organisations such as the Royal Medical Colleges.

### The end of the silo mentality

Breaking down the silo mentality is, in fact, key to the progress of the NIC in helping to promote 21st century medicine. "There are good intentions in the NHS; the staff – numbering 1.3 million – are well-motivated, but only in the last couple of years have they been widely encouraged to work with industry and thereby maximise the advantages of using relevant networks," said Dr Smith.

In implementing a concerted partnership approach to technology transfer, the NHS is following a path already trodden by the UK universities and the MRC. "We've started this late in the NHS, but we are there now. We are going to maximise advantages through inclusive partnerships. I believe that very strongly."

### Need for NIC expressed in 2003

It was recognised back in 2003 that there was a need for a fulcrum to help to organise the NHS regional innovation hubs for IP management to manage IP from the NHS and to look at innovations for the NHS at the pre-procurement stage: that was when the first thoughts were hatched about an innovation centre, with a dedicated HQ, to offer a co-ordination mechanism for the nine original and two subsequent specialised hubs as recommended by HITF.

"What we can do at the NIC is start to get people communicating better, point them in the right direction of contacts and funding, and generally help to accelerate the process. The ideas come from all levels – ambulance men and nurses right up to clinicians. People in the NHS are very inventive. It's an exciting space to be in."

### *"It is becoming more respectable to be commercial and work with industry"*

The NIC and hubs system is also a way of preventing IP from leaking out of the NHS system, as the NHS inventor shares his or her discovery with the local Trust. The IP is owned by the NHS and sometimes in joint appointments, other parties such as universities may be involved.

### Potential for commercial ventures

The NIC facilitates partnerships with groups such as the KTNs (Knowledge Transfer Networks) and the Medilinks, but

individual commercial companies can also become involved. If the idea is big enough to, say, result in a spin-out company, a commercial venture could be formed, by following the established approval channels.

Last year, the NIC oversaw the setting up of four or five spin-outs and some 40 licensing deals from the regional hubs. The NIC provides an opportunity that was not previously there, said Dr Smith, remarking that it took the MRC and university commercialisation offices some 5-10 years to demonstrate a durable record of success in this activity.

The hubs, like the NIC, also take on staff that have an industry, commercial or financial background, so that they understand the commercial arena.

"It is becoming more respectable to be commercial and

realise that it's not going to minimise the potential of the NHS standards and brands," said Dr Smith. "In fact, it's part of translating medicine into the 21st century, which entails breaking down barriers and working with industry. It's a question of changing culture."

The NIC is a unique body, but its emergence is an indirect response to the fact that discovery is happening simultaneously all over the world – Dr Smith gives the example of how Asia and particularly Singapore manages its healthcare research discoveries, and warns that the UK will fall behind unless it takes steps to maximise its considerable potential. It is an agenda supported fully by the government, she said.

The NIC has so far kept a fairly low profile internationally, but Dr Smith believes that people outside as well as inside the UK will now be looking at it seriously, given the size of the NHS and the fact that it offers the benefits of an integrated system.

The only real problem the NIC has encountered has been managing people's expectations of what are key changes to the almost 60-year-old NHS, said Dr Smith. "The initial growing period has been a bit of a

challenge, but now we are making some progress," she said.

"We don't expect instant results, but with the joined-up thinking of the DTI and DoH, the support of government and the drive of HITF and Cooksey, we will start to get the paradigm shift."

The UK succeeded with the so-called clusters, promulgated by Lord Sainsbury, in pushing biotech, and now the time is ripe for the medical technology healthcare arena.

"It is a time to be bold and confident, and remember that we cannot in the 21st century just sit back and think the UK has the best healthcare system in the world; we have to work to attain and maintain it," said Dr Smith.

The NIC and its partnership approach represents a fantastic opportunity: "It's a new way of thinking."

### Innovation hubs – the bridge between inventor and marketplace

Until the national innovation hubs were created, NHS employees had nowhere to go with good ideas, leading to IP leakage – often outside the UK.

The process of establishing the original nine hubs took three years, the last of them being set up in April 2005. Co-founded by the DTI and the Regional Development Agencies, their aim is to bring commercial opportunities to healthcare using local business and knowledge networks, and thereby to stimulate the interest of prospective outside investors in NHS projects.

With a combined staff of around 80, they offer advice on IP management and assist in commercial exploitation of projects. They were set up before the NIC was born, but their activities are now co-ordinated by the centre.

The network was augmented by two more hubs in 2006, a training hub, chaired by national advisor on surgery Sir Ara Darzi, based at Imperial College (Chelsea and Westminster Hospital) – the reason being

that the rapid diffusion of new technology needs a catalyst to encourage aspects of specialised training; and an adoption hub, based in the north-west, to examine factors that will increase the "pull" of healthcare technology into the NHS.

