

ALL CHANGE PLEASE

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EXECUTIVE SUMMARY

The NHS' performance in taking up and spreading innovations and existing best practice is variable. *All Change Please* is an inquiry into what can be done to improve this position.

This note sets out our preliminary findings and recommendations, based on interviews with leading representatives from healthcare policy and practice, a roundtable workshop and a review of the research literature. We are keen to stimulate debate on these recommendations and welcome feedback on them before publication of the full report.

The key challenges include NHS organisations' capacity and receptiveness for innovation, the lack of long term strategic thinking, fragmentation between healthcare organisations, professional and cultural silos and the funding system.

The use of financial incentives, carefully designed targets, improved systems for spreading knowledge and information, more coherent approaches for gathering and communicating benefits evidence, and intelligent use of the commissioning process can all be used to tackle these challenges. Competition between healthcare providers could become more influential in stimulating innovation, but this should not be at the expense of them sharing best practice.

Policy Exchange's main preliminary recommendations are:

- Linking the current payment system to an innovation agenda, through the introduction of a new tariff based on best practice, incorporating bonus payments for high quality interventions.
- Creating a one-stop shop for gathering and disseminating evidence for innovations. In the future, the guidance producing bodies could be merged into a single authoritative source in order to simplify the system.
- Developing metrics for the measurement of clinical outcomes and systematically collecting patient reported outcome data, in order to produce public tables benchmarking the quality of performance.
- Using the commissioning process to actively improve the uptake of innovations and best practices, and to foster cooperation between providers in regional health economies.

THE ISSUE

If a company isn't innovating, it's running on empty, living on its legacy. It's the same with public services. Bringing new ideas into the health service may save lives, raise the quality of the experience for patients or improve productivity. The difficult thing is finding the ideas and bringing them into everyday practice.

As a system funded through taxation, the NHS has a responsibility to manage and utilise its resources in the best possible way, in order to give citizens value for their investment and a world class health service. Costs are being driven up globally in healthcare through changes in demand, demographics, high production and labour costs, and new diagnostic and treatment opportunities. These demands mean that it must be as efficient as possible in adopting the best existing practices, and technological and process innovations for which there is evidence of benefit.

Like parents of a dysfunctional family who stay together for the sake of their children, the different communities in the UK's healthcare sector are bound by a common desire to do their jobs in the interests of patients; and the NHS continues to be a proud institution that embodies the Hippocratic commitment to patient care. But the system is inefficient, the numerous components of the system don't work together effectively and NHS organisations on the whole are slow to adopt new technologies and practices. The Darzi review is an opportunity to rethink not only the organisation of healthcare service delivery, but also the NHS' approach to innovation.

By several measures, the NHS is not performing well in this regard. For example, the uptake of new technologies associated with heart failure showed the UK to be both 'slow' and 'late' – we fit 430 new pacemakers per million of the population, compared with 900 per million in France, Germany, Belgium and Spain, despite cardiac arrhythmias being among the top 10 causes of unplanned hospital admission.¹

And in diabetes care, the position is no better. Over 40,000 patients in Germany use insulin pumps to manage their diabetes compared with less than 2,000 in the UK.² In 2001, the rate of uptake of new drugs in the UK was at best half that in Germany and a third that of France and this trend has not abated.³ Out of 19 European countries, the UK was consistently below average in the adoption of new drugs for the treatment of breast cancer, colorectal cancer, lung cancer, and non Hodgkin's lymphoma.

But it's not just a question of slow uptake of new technologies. There are also serious problems in getting new and existing practices to spread, even though they may be demonstrably beneficial. This can lead to unacceptable variations in quality, cost and access. The 2007 Comprehensive Spending Review (CSR) linked variations in NHS productivity to variable practice and technology uptake. It stated that "reducing such unnecessary variation could potentially generate net cash savings of £1.5 billion per year by 2010-11".⁴

All Change Please is a nine month inquiry into how the NHS can develop a more innovative culture with the freedom to take on board new ideas and spread beneficial practice effectively. This note sets out our preliminary findings and recommendations. Our initial focus has been on secondary care because of the level of change and innovation within this sector. In our full report, to be published in the Autumn, we will also consider primary care.

This note is based on an extensive literature review, 36 interviews with leading decision-makers from healthcare in the UK, and a round table discussion of our early findings.

DEFINING OUR TERMS – WHAT IS ‘INNOVATION’ AND ‘BEST PRACTICE’?

We follow Greenhalgh et al’s description of innovation as ‘a novel set of behaviours, routines, and ways of working that are directed at improving health outcomes, administrative efficiency, cost effectiveness, or user’s experience, and that are implemented by planned and coordinated actions’.⁵ Within this umbrella definition there are different forms of innovation – some innovations may be technological (such as a new medical device) and others may be changes in care practices or the organisational arrangements for delivering care. The boundaries are often blurred, however, with new technologies commonly requiring new practices or organisational forms for their successful introduction. Different strategies to encourage adoption and manage implementation are therefore necessary, depending on the nature of the innovation.

‘Best practice’ can be defined as the most efficient and effective way of accomplishing a task, based on repeatable procedures that are proven to work in practice. Examples of best practice can be found in pockets of excellence within the NHS, but often fail to spread.

Spreading innovation and best practice in the NHS typically involves two forces: a ‘push’ from government and commissioning organisations, as well as manufacturers, and a ‘pull’ from health service delivery organisations. Local organisations do not have the capacity to identify, collect and assess every new technology coming to market, meaning that efficient central mechanisms are required to ensure all NHS patients benefit from important advances. But to embed best practice in every area, and update it with every new innovation, would be a huge drain on resources and would negate local ‘incremental’ improvement by returning to bureaucratic governance. Therefore, incentives for self-improvement are also required.

WHAT DOES THE EXISTING RESEARCH TELL US?

There is a growing amount of research on the adoption of innovations and new practices in healthcare and several systematic reviews of this literature have now been published.⁶ Our concern is solely with research that has been conducted on the adoption and spread of innovations and best practice into the mainstream health services. We are not addressing the creation of innovations.

Explanations of adoption and diffusion – and the reality in health services

The central tenet of classical theories of adoption and diffusion is that the take-up of new ideas follows a predictable pattern. A slow initial phase, in which innovators and risk-takers adopt a new idea, is followed by take-off in the numbers, when the benefits have been established. This surge in uptake gradually decelerates and tails off, as ‘laggards’ adopt what is now common practice.

In the NHS, a common claim is that there is an extensive lag phase for many innovations, referred to colloquially as the ‘valley of death’ between the early adopter and the early majority.⁷

Removing barriers, and improving the capability and incentive to adopt, may accelerate the take-off, increasing the proportion of adopters more rapidly. This perspective suggests that there are factors that influence adoption and spread, such as early publicity which disseminates benefits evidence or more effective networking across different populations of potential adopters.

The literature often sees adoption and spread as a series of logical sequential stages. It is argued that it can be improved by addressing problems in the various stages – the ‘knowledge acquisition’ stage can be tackled by improving awareness of the innovation, developing and disseminating evidence; ‘implementation’ by supporting those responsible for deploying the innovation, and so on.

A limitation of classic models of adoption and diffusion is that they often focus on the introduction of new *products* rather than new *processes*, and most studies have concentrated on comparatively simple innovations – bounded, discrete, and well-defined – where adoption is explained in terms of independent individual decision-making.

However, healthcare organisations are not rational decision-making machines that move sequentially through an ordered process of stages. Deciding whether to take up a new idea or innovation involves multiple parties and is a complex, iterative, organic and untidy process, all the more so when deployment of the innovation is ill-defined.

Explanations for the successful uptake and spread of innovation usually focus on whether or not they possess certain characteristics:⁸

- Unambiguous relative advantages over existing technologies, products or practices;
- Ease of use;
- Ability to trial prior to a binding decision to adopt;
- Minimal impact on organisational or personal routines;
- Compatibility in risks and benefits with an organisation’s existing structures, procedures and values.

An important aspect of compatibility – with implications for health services – is the distribution of the risks and benefits of the innovation within an organisation or across the organisations of a local health system.⁹ The more the risks and benefits coincide with the interests and values of the various stakeholders, the easier it will be to build coalitions which can support mainstream uptake. The capacity to reinvent their features to meet the needs of users may also be important.¹⁰

Some innovations spread easily. For example, initial uncertainty about the clinical value of Magnetic Resonance Imaging (MRI) was overcome by the clear superiority of its images.¹¹ Or in the case of live polio vaccine, unambiguous evidence for its benefits and early feedback meant that it was adopted and diffused rapidly.¹²

But many other innovations spread slowly if at all, even where there is good evidence of benefits. The innovation may be ‘fuzzy’ and unbounded, perhaps with several objectives. The decisions to adopt or the implementation process may involve multiple stakeholders from across the healthcare system, and the benefits evidence may be contested.¹³ Some innovations or new practices require major modification to entrenched ways of working. When collaboration across established organisational boundaries is needed, the challenges are often greatly increased.

Despite the growing quantity of research on this topic, as two US authors put it, “we still do not know as much as we would like, and what we do know, we may not know for sure”.¹⁴ In particular, we don’t know much about ‘naturally occurring’, ‘ground level’ innovations which emerge and spread informally, compared to those that are centrally orchestrated. There is also only a limited amount of work on the sustainability of innovations beyond the initial implementation phase, as well as a lack of research on disengagement from outmoded practices.

Nevertheless, the literature offers us important pointers to the challenges and the levers for stimulating the adoption and spread of innovation in the NHS. From this we have identified the following factors which are potentially significant:

- Organisational capacity and a ‘receptive context’ for new knowledge;
- Organisational structures and internal politics;
- Leadership;
- Individual attitudes;
- Peer and expert opinion;
- Communication networks;

So how do UK health services shape up? To what extent do the organisations that make up the NHS possess the features which support innovativeness? And what conclusions can we draw that could help make the NHS embrace good new ideas?

CHALLENGES FOR THE NHS

NHS reforms have attempted to change a system operated by top-down central control to one in which decision-making is devolved to a local level. However, simply changing the structure of the health service does not change the culture that has developed over many decades, under conditions of tight budget control, and a rigid hierarchy of decision-making. The system of governance is beginning to change, but this is only the first step.

What, then, are the key challenges for improving the uptake and spread of innovation and best practice in the NHS?

Organisational culture – An ‘unreceptive context’

The NHS does not have a single organisational culture. It is made up of many organisations and many different professional groups. However, the overriding perception is that the culture militates against innovators. And there is an aversion to taking risks, because the blame for failure outweighs the reward for success. This is true of the medical professionals – who often resist change that is not clinically led, or that disrupts their current practice – and of managers and commissioners, many of whom see their role primarily as managing costs and meeting the targets set from above.

These cultural confines create unresponsive organisations and are reflected in the attitudes of organisational leaders. Even where leaders come in from other sectors, the presumption is that hospital management is about treading water, rather than swimming against the tide.

Strategic thinking

“The boards of Hospital Trusts are strategy-free zones at present”¹⁵

Achieving real change in complex organisations requires a clear, consistent agenda and commitment to the long haul, but too many Trust leaders focus on what is immediately possible. Managerial short-termism is a serious barrier to the adoption of new practices and innovations because their implementation frequently involves a struggle, and it can take years to realise the benefits.

The problem stems partly from uncertainties over the future environment, because radical policy shifts are perceived as commonplace. There have been five Health Secretaries in the last ten years, often bringing in new ideas to make their mark.

The high turnover of Trust CEOs is also part of the problem, which is linked to the comparatively modest annual salaries they receive for running large and complex businesses. It is difficult to attract and keep people with the requisite skills to lead Trusts forward, rather than simply fire-fighting and keeping their hands clean. In turn, staff are unresponsive to the latest leadership directive in the expectation that another face and another policy will come along soon.

Clinicians, where they are enthused by an exciting new development, face a huge number of hurdles in persuading boards to endorse adoption. Management focuses on financial considerations and meeting targets above clinical efficacy, meaning innovative clinicians must fight against the system in order to introduce a new treatment. Many complain that the financial apparatus of Trusts is inflexible and funding inaccessible, due to silo-budgeting and financial short-termism.

This is not to say that the clinician is always right. The old system of clinically-led change led to ad hoc service development and huge waste. Rather, clinicians and managers need clear protocols for working together in the joint pursuit of quality, efficiency and organisational development.

Organisational structures – inside and outside Trusts

Despite the advent of Foundation Trusts with devolved freedoms, the management culture in the NHS often assumes the need for central direction; consequently the benefits of autonomy are being neglected, although there are some that are starting to break the mould.

A common complaint is that Trusts' managerial structures are too complex, with an excessive layer of middle-managers exercising control over small areas of the organisation. This leads to a 'meeting culture' and overly complicated decision-making processes, in turn resulting in a large number of people who are able to say 'No' to a change and few, if any, who can say unequivocally 'Yes'. Thus creating a coalition for adoption is notoriously difficult in Trusts.

There are also major barriers *between* organisations in the NHS. Where an implementation effort requires collaboration, there will be a complex spread of costs, risks and benefits, and every organisation must be satisfied that they are getting a good deal if the project is to succeed.

There is a great deal of concern that hospital Trusts and primary care providers do not work together effectively, limiting the opportunity to transfer care from expensive acute hospital settings into primary care ones, and reducing the likelihood that innovative service delivery models that cut across boundaries will succeed.

The artificial barrier between health and social care is a further division. Social care is not part of the NHS system; yet caring for those with long-term conditions requires effective communication and collaboration between different professional teams that span this divide. This often proves difficult.

Cultural silos

‘There’s no question that one of the barriers to innovative medicine in the UK is the medical profession. And they’re very, very conservative ... I would argue, exceptionally so, to the disadvantage and detriment of their patients.’

Managers naturally rely on the advice and ideas of senior clinicians, because they lack clinical training, and the culture of the NHS old guard is often characterised as conservative, parochial, and territorial. Clinicians are justifiably protective of their autonomy over clinical matters, but in some circumstances this can be used to resist uncomfortable changes, such as innovations that disrupt their professions, or the push for greater transparency through clinical audit. It is very difficult for managers to lead service change in the health service, and thus to respond to pressures from commissioners and the centre to improve quality.

Case Study 1: Mediracer diagnostic device

Carpal tunnel syndrome (CTS) causes pain and tingling in the hands and is 3-5% prevalent in the adult population. Currently, diagnosis requires referral to a neurophysiologist, which can add up to six months to the treatment pathway. A new hand held device for diagnosing CTS has now been developed, which can be used in outpatient and primary care settings. The technology has been taken up by a team in Leicester, who created a one-stop clinic for diagnosis and treatment of CTS. In less than two years they had secured over 90% of referrals from the Strategic Health Authority (SHA) saving the NHS £1.7million and earning an innovation award from Medical Futures. Since publicising their work, the team has encountered significant opposition from third parties. For example, neurophysiologists argue that the test is not as accurate as the gold standard (the new test is sensitive (94%) and specific (98%) compared to a conventional EMG test performed by a specialist). Instead of looking for ways to incorporate the greatly improved pathway and make sure problem cases are referred for further tests, there has been a resistance to dialogue. This technology could greatly reduce waiting times and Medical Futures estimates the potential national savings to be over **£72 million.**^{16, 17}

There are also divisions between different professional groups, who can have diverging interests. Tightly-knit professional networks can operate as channels for new ideas to spread. But they also serve to create cultural divisions between professions, reducing the spread of innovations that impact on multiple clinical areas and require close inter-professional collaboration. The simple rule for adoption in the NHS is; the more parties that are involved, the less likely it is to happen.

Money matters

‘What constipates the system is that if you have a prospective plan you can’t generate the money for that plan, whereas in any other business you would have a bit of leeway ... it’s very difficult to get going in the NHS because of that.’

NHS organisations work to an annual budgetary cycle. Hospital Trusts are expected to stick rigidly to their budget for the financial year, and if they generate a surplus it will be taken from them and their budget may be reduced the following year. Foundation Trusts can keep their annual surplus although overspend is strictly capped. This leaves very little headroom for investment in projects that have high start-up costs but that could have major benefits years down the line. The focus is

therefore on initial costs, stifling the uptake of complex or expensive innovations that have significant long-term benefits. This is a major factor behind short-termism and risk-averse behaviour.

The payment and reimbursement system operating within the NHS causes its own problems. NHS providers are paid for their activity according to a tariff system. This is set each year by taking an average cost for groups of procedures from the previous year's data. The tariff creates an incentive to reduce costs, for Foundation Trusts at least, because this generates a bigger surplus. However, since costs are bundled, there is no specific financial benchmark for Trusts to measure their activity against.

There is no financial incentive to introduce the latest medical advances and a Trust may actually be penalised for doing so. This is because new technologies and refined pathways may reduce activity. If this frees up capacity, income can be recovered, but the Trust will need to invest to utilise this capacity. And where an innovation improves efficiency, there is no incentive to spread it through the system, because this could lead to a reduction in the tariff, reducing income and annoying everyone still using the old method. In addition, there is no mechanism to subsidise Trusts for adopting new practices that improve quality at greater expense.

This financial environment also reinforces the tendency towards a lack of disengagement from outdated practices. Several interviewees suggested that because of a failure to do this, the NHS is wasting a huge amount of its precious resources which could be spent on introducing the latest treatments and improving quality.

A question of evidence

"We've created a culture where people feel that if it's not passed the NICE test then you can't innovate a new service."

The evidence for the efficacy of a new idea, practice or innovation is important in persuading clinicians and managers – and the public – that it should be adopted.

There are numerous problems with the evidence base that need to be addressed. The sheer quantity of evidence and the finite resources of the health service mean that it must be efficiently collected, assessed and disseminated. Currently, there are too many sources of evidence, making it inaccessible, the assessment process is slow, dissemination is passive, and there is a lack of detailed guidance for managers and commissioners, particularly on the costs of adoption.

The NHS has the apparatus in place to assess the latest technologies and establish evidence based practice, but there are problems with the system as it stands. The National Institute for Health and Clinical Excellence (NICE) is responsible for producing national guidance on new technologies and clinical practice. However, it does not have the resources to assess all of the new technologies coming onto the market that could benefit patients.

The quality and rigour of NICE Health Technology Assessments (HTAs) and Clinical Practice Guidelines (CPGs) are widely praised, but recommendations and guidance are not always adopted quickly and uniformly. And where there is a lack of NICE guidance, as there often is, this can act as an excuse not to adopt.

There are particular problems with the assessment of medical devices because the development cycle is far shorter than that of drugs, and can be as little as two years. Devices generally come on the

market with a less robust evidence base than pharmaceuticals, partly because unlocking the benefits depends on process redesign and the skill (and retraining) of the user.

Case study 2: Oesophageal Doppler Monitoring (ODM)

Since 1995, seven peer reviewed clinical studies have demonstrated that the use of ODM during major surgery can shorten the length of stay by up to three days and improve outcomes, by allowing the surgical team to measure and optimise the amount of blood flowing through the system (haemodynamic optimisation). In January 2006, NICE declared that ODM was already standard practice and would not be reviewed. Yet despite the fact that this technology has been on the market for nearly a decade and has a clear evidence base (as well as a recommendation from Lord Darzi), it is used in less than 5% of major operations in the NHS. The first NHS Trust to implement the widespread use of ODM during surgery, the Medway Maritime NHS Trust in Kent, reported savings of over £1 million pounds a year. The leading manufacturer suggests that if the length of stay were reduced by just two days, the NHS could save **£400 million**.^{18 19 20}

LEVERING CHANGE

“We’re getting people into Foundation Trusts slowly but surely, who’ve got real business credibility. But ... they take their brain out at the door ... They don’t really see a long-term strategic future.”

A recent study identified a strong association between poor hospital Trust performance and CEO turnover, and found that pay wasn’t being linked to performance under the current governance arrangements.²¹ Measures need to be taken to attract and keep effective leaders, and to give them clear incentives to improve performance, as well as the freedom to develop and pursue long term strategies.

Tackling existing cultures in the NHS is fundamental to building an innovative environment. The message to leaders in local Trusts is often restrictive – as one interviewee put it, “don’t rock the boat, don’t change anything, just leave things alone, run your own business well and don’t get too excited.”

Changing organisational cultures is hard but it can be achieved. Leaders can begin to tackle this by using long-term change methodologies, engaging with their workforce and empowering everyone by involving them in the process of change.

Case study 3: Leading change

The NHS Institute has recently led a change programme working with Chief Executives from ten Trusts. The Institute worked with them for six months to create a transformational vision for their organisation, focusing on key priorities, and they were encouraged to disseminate the vision throughout the organisation. After nine months, the organisations formed a network to share their different strengths, using tools, techniques and metrics developed with the Institute. The results were substantial, with improvements in mortality, patient experience and the adoption of clinically appropriate innovation. The combination of vision, engagement, and best practice transfer led to this improvement. And the organisations were happy to do this, even though they were in direct competition in some cases.

Incentives

"We don't actually reward anybody in the NHS for making people better, we just reward them for seeing them and treating them."

Stakeholders in the healthcare system could be incentivised to change behaviour, adopt innovations or use recognised best practice, but currently the tools for doing this are blunt. There is a lack of incentives to improve quality, because the tariff system pays for activity rather than outcomes and, as such, does not reward improvements in the standard of care that patients receive. Steps are now being taken to improve the tariff as an instrument for supporting innovation.

Case study 4: Levering efficiency

The tariff should in theory incentivise cost reduction. However, the NHS Institute for Innovation and Improvement has looked at nine common conditions, and found a great deal of variation in the cost of treatment, reflecting variations in clinical practice. They sent clinically led teams with analysts, general managers and improvement specialists to the best and worst performers, in order to understand how they differ from one another. This research was used to design care pathways that reflect efficient, high quality performance. Instead of basing the tariff retrospectively on an average of the variable cost data, the Institute is looking into the possibility of rolling out a prospective 'normative' tariff, based on a reproducible, productive, and high quality pathway, allowing for a surplus to reward successful process redesign. Organisations would then have a strong incentive to implement best practice in time for the change in payment.

Case study 5: Levering best practice

Another approach is to be piloted in North West England from October 2008, whereby the care given to patients with targeted diagnoses is being monitored. The scheme offers quality bonus payments for delivering the correct interventions above an agreed threshold. This follows the strategy of a pilot project run by Premier Inc. in the USA, using a large sample of hospitals providing care under the Medicare and Medicaid programmes. Five clinical conditions were chosen and the top 5% of the hospitals were given a 2% bonus payment above the tariff. Between the sixth and tenth percentile they got a 1% bonus. They also set an absolute level at the threshold between 19-20%. If by the end of the year performance had not been raised to that level, 1% would be withheld. All the hospitals in all of the conditions improved their conformity with the performance measures every quarter. North West SHA has taken the decision not to withhold payment for fear of destabilising services.

Targets

The government has used targets to lever change in accordance with political priorities, with some success. However, the danger is that this conveys the message that these priorities are the sole criteria for success or failure, creating pressures that outweigh a long-term innovative strategy for organisational development.

Waiting times were a national embarrassment and there has been a sustained political drive through the use of targets to improve things. This was a reasonable objective, and one which has stimulated new thinking in order to achieve it. Perhaps an inevitable consequence, though, was that everybody focused on throughput at the expense of improving the quality of services.

Setting a target that is appropriate to patients needs, easy to communicate, challenging but not impossible to deliver, and which only has the consequences that are desired is difficult. Sometimes the need of politicians to convey a clear political message has over-ridden the required sophistication. It is often argued that there are too many inappropriate targets and that different targets can work against each other. Some targets have had to be revised because what was clear and simple turns out not to be nuanced enough for the complexity of clinical service delivery.

There is a role for targets but the burden on organisations must be kept to a minimum.

Case study 6: the Unscheduled Care Collaborative Programme (UCCP)

In 2004 the target for hospitals to assess, treat and admit or discharge 98% of patients for emergency care within four hours was introduced in Scotland. As well as tackling the flow of patients within the acute hospital, emphasis was also placed on reforming out-of-hospital unscheduled care processes. The target was initially received with scepticism, but it had the effect of stimulating a large amount of creative thought and small-scale innovative actions. These were supported by a national collaborative programme. Ideas tried on one site were recorded and shared through informal networks and national events.

Information and knowledge transfer

Ideally, there should be a systematic way of identifying pockets of excellence in terms of cost efficiency and clinical efficacy, and disseminating practical knowledge to underperforming organisations. A lot could be achieved through more effective benchmarking of performance, and using 'disruptive information', whereby outcome data is used to produce league tables, to stimulate change. More clinical audit and comparative data collection would arm commissioners with the knowledge of where the problems are in their area and where to find best practice. It would challenge underperforming clinicians to learn better methods and reward the best performers by shining the spotlight on their achievements. Benchmarking league tables give the CEOs of Foundation Trusts clear criteria for success and highlight where profits should be sensibly invested. This could also profitably inform commissioner and patient decisions. Another measure would be to provide patients with clear, up-to-date information on best practice for their condition, and on where different services are currently available.

Before NICE was created in 1999, innovations were implemented on an ad hoc basis, and spread primarily through publication in reputable journals, word of mouth, and through professional networks. Many networks were self-selecting so that the people engaged in them were largely those who wanted to innovate, while this mechanism meant innovation projects were segregated into professional silos. But organisational change requires a whole-system approach to innovation. Another lever for improving spread, therefore, is to broaden the channels of communication by developing inclusive networking arrangements, where managers, commissioners, multi-disciplinary clinicians, and industry representatives share ideas and priorities. Improving communication in the NHS is also a fundamental goal of the national IT programme, and this should help to build bridges over the old divisions.

Evidence

More could be done to make evidence accessible and to spread knowledge throughout the health system. There is a huge amount of information and evidence in the system, but this is not easily accessible to the people making decisions.

NICE was created to provide a single authoritative source of evidence. Initially, there was no implementation strategy for NICE guidance, but it quickly became apparent that publishing evidence is not enough. NICE now spends a significant portion of its budget on interventions to raise awareness, motivate people, develop practical support and monitor uptake of their recommendations. However, there is more to be done. GPs in particular cannot keep track of developments in every clinical area, especially rarer conditions. They need to be actively told when something changes their practice, and 'flagging' systems for professionals is one of the aspirations of Connecting for Health.

Existing research shows that clear evidence does not guarantee spread. Careful thought is needed on what knowledge key decision-makers need to drive an implementation project forward.

Commissioning

"World class commissioning is still a dream and in fact I don't even know what world class commissioning is."

Innovation is currently largely supply side driven; it should be more demand side driven. 'World class commissioning' is the latest issue on the policy agenda. This means challenging providers to use the best diagnostics, the latest medical devices and the best available drugs, and it means leveraging disengagement from outdated practices. To do this, they need more clinical and technological firepower, either through consultancy with clinical leaders or central support.

The general consensus is that commissioning in the NHS is still finding its feet and is largely impotent, partly because of the numerous reorganisations of purchasing authorities, and because the expertise in delivering services are on the provider side. Primary Care Trust (PCT) personnel are not in a position to argue with specialists about how to deliver specialist services, and they are not in a position to challenge the management of the far larger hospital Trusts on how to run a hospital. PCTs and Practice Based Commissioners are close to the patient and can play a role in leveraging improvement, but they are too small to engage in whole system planning. SHAs are responsible for developing plans for improving health services in their local area, so they are ultimately responsible for spreading best practice.

SHAs have an overview of the health and social care organisations in their region, and the goal is for them to lead the procurement of efficient care pathways that the organisations involved adhere to. To do this they need the data to assess practices in their region, and they need to know what best practice is and what practices are outdated. The NHS Institute for Innovation and Improvement now provides material and support tools to aid commissioners in the task of moving more care into the community, complete with an optional consultancy service in how to use them. They also provide tools to assist them in re-commissioning care pathways, to help them achieve the 18-week referral target.

Although the tariff sets prices, this does not negate the need for contracts between commissioners and providers, which must continue to specify the range of services to be made available, as well as any referral or treatment protocols (i.e. care pathway description) and relevant performance criteria.

Contracts can contain incentives and penalties, and they provide an opportunity to specify evidence based practices and an efficient care pathway across different organisations.

Patient choice

"Patient choice is the true reform lever"

If patients begin to make informed choices over where they receive their care based on specific, comparative performance based information, then this will create another pressure on providers to improve their services.

Many are sceptical that patients will choose on any basis other than access, but it would only take a minority of more informed and demanding patients to begin to exercise a significant financial influence. And patient choice could become more influential with time, partly because older people are increasingly well-informed – some 70% of an individual's healthcare costs are in the last two years of their life, and we have an aging population. There is a great deal of scope for educating and empowering patients, allowing them to make the right choices and drive improvements through consumer pressure.

Patient choice and commissioning provide the basis for competition between providers. Coupled with good comparative indicators of performance, the hope is that providers will compete to establish themselves as leaders in different services.

The problem with this vision is that it may act to increase the barriers between different providers, by reducing the willingness to collaborate with directly competing organisations. Competition pressures are an important mechanism for leveraging organisational self-improvement, but it is equally important that organisations continue to share best practice and collaborate as part of the broader NHS community. This means creating an information-rich environment, with good channels of communication, and using effective commissioning to foster collaboration in a competitive environment.

RECOMMENDATIONS

This section of the paper sets out our recommendations, which are also summarised in appendix 2.

Making the case

There is scope for the assessment process to be speeded up. NICE needs to work more effectively with industry, enabling companies to collect the data and establish an evidence base for adoption that NICE can then quality assure. Early evidence for adoption and effective horizon scanning would enable NICE to forewarn commissioners and managers of new products that are likely to come on the market, enabling them to prepare for uptake.

This is more challenging for medical devices and diagnostics because of the shorter development cycles. NICE predominantly focuses on pharmaceuticals, but training and the need to embed devices and diagnostics in care processes make them more difficult to implement. As a consequence, the NHS is prone to poor adoption of these technologies. NICE should receive more funding to produce implementation and commissioning guidance. It should also expand its post-

approval research to monitor adoption, in addition to supporting the Royal Colleges in the development of appropriate training programmes.

The authors recommend the creation of a one stop shop for clinical evidence, which different organisations such as NICE, the NHS Institute for Innovation and Improvement, and the Centre for Evidence-based Purchasing (CEP) could feed into. This could be integrated into the Connecting for Health Programme, to send new guidance to the relevant professions, especially GPs who have limited time to search for evidence relevant to their range of practice. Actively disseminating evidence on recommended innovations is important, in order to raise awareness and motivate people. However, NICE can't assess everything. Therefore, a further step would be to ensure the output from the medical research councils, Universities, and peer reviewed journals is collated in a suitable way, so that important findings are easily accessible.

There is a need for detailed service delivery guidelines, for NICE guidance and existing best practice. These should provide a business case for adoption, focusing on costs and benefits, and give a clear steer on what complementary changes are required and how to address potential implementation problems.

Some innovations are harder to implement than others, such as those that cross organisational boundaries or require a large coalition for adoption. The new NHS National Technology Adoption Centre is running implementation projects on a number of priority innovations that are failing to spread, such as Oesophageal Doppler Monitoring (see case study 2). This type of intervention may prove fruitful by demonstrating the practical benefits of a technology in real time clinical settings, and supporting implementation projects elsewhere with detailed, innovation specific implementation support.

Spreading the technologies that have proven benefits could have a major impact on NHS productivity and patient outcomes. However, this type of central initiative is not a substitute for effective organisational development, and the ultimate aim should be for providers to pull the best practices into service delivery, and for commissioners to push them, rather than relying excessively on central organisations to do this.

In the future, as providers and commissioning organisations find their feet, and information in the system is developed in accordance with their needs, the authors suggest that the functions and budgets of NICE, the NHS Institute, and other bodies could be merged into a single guidance producing authority. The authors will put forward specific recommendations for simplifying the system in the final report.

Developing the information environment

Improving information in the system to observe variations in outcomes, costs, productivity and so on is essential. There should be a systematic drive to increase clinical audit and the collection of patient reported outcomes, with an emphasis on system-wide comparability. If necessary, financial rewards or targets could be used to encourage organisations to provide the data.

The authors support the use of 'disruptive information' to flag up unacceptable performance and identify where best clinical practice can be found. The NHS Institute has recently produced benchmarking data for organisations across a range of surgical procedures which show a wide spectrum of performance. Produced on a larger scale, with an emphasis on outcomes, this information could be used to produce tables reflecting the comparative performance of hospital

departments. This would provide an invaluable resource for commissioners and managers, and would give patient choice a firm basis, potentially creating financial rewards for improving quality. Good performance would also be its own reward. It would introduce a barometer of success for leaders and clinicians, and give laggards a clear signal to retrain and improve, thus leveraging cultural change.

The government has introduced initiatives allowing information to be accessed by phone, internet, digital TV, and by direct mailing, and has set up NHS Direct as its flagship national information service. These mechanisms should be used to provide patients with up-to-date information on the evidence for different treatments and services, and where they can receive them.

For more on how to improve information in the NHS, see Policy Exchange's recent publication on the topic: *Measure for Measure*²².

Targets

The government should refocus targets to promote the introduction of efficient, evidence based pathways, for increasing the uptake of new medical devices and diagnostics, and for improving outcome information. So that methods aren't prescribed, and innovation stifled, targets should predominantly relate to patient outcomes. It is crucial that incentives promote the redesign of services with improvements for the patient in mind, not satisfying a process-based target.

The current targets should be set over longer periods so that they don't dominate the short-term agenda of leadership, and should be developed as a package to ensure they don't counteract each other, lead to undesired consequences, or place excessive demands on leaders. Targets can be effective if they are used sparingly, and are sensitive to the complexity of health service delivery. They should be reduced in number if possible and refocused around an innovation agenda, using financial incentives and commissioning leverage to the same ends. One profitable role would be to lever the collection of comparable data through the use of targets.

World class commissioning

Commissioners need to play an active role in improving technology implementation and disengagement. This should go beyond what is required for introducing NICE guidance. SHAs need to identify regional priorities, based on areas of weak performance, regional variation in disease prevalence, and government priorities, and identify technologies and practices that hold the promise of improving services.

Commissioners should engage key decision-makers in drawing up comprehensive plans for re-commissioning care pathways, and identifying the challenges for implementation. They should be supported in this by efficient pathway maps and simulation modelling tools. There is also a need for contract templates that specify improvements in the delivery of care, and incorporate incentives and penalties to lever improvements.

Commissioners need to ensure that providers do not suffer financially in the short-term for improving efficiency. Where adoption reduces activity, commissioners should continue to provide a stable income until the capacity generated can be put to another use.

Financial incentives

Financial incentives can be used to create an appetite for improvement, by linking the tariff to an innovation agenda. The latest tariff prices (HRG4) have gone a long way towards unbundling the tariff. In the future, it is anticipated that the adjustment of tariff rates 'normatively' to incentivise a particular response will be a key tool for standardising efficient best practice, in addition to using bonus payments to incentivise improvements in quality, outcomes, and the adoption of recommended technologies.

The NHS Institute has mapped out and costed nine transferable best practice processes. A sample of these should be used to set a 'normative' tariff for roll-out over two years, bringing organisations into line with the most efficient, high quality practices (see case study 5). Much depends on the support organisations receive in redesigning their pathways in such a way that standards are maintained.

The 'normative' tariff should include incentives for specific evidence-based interventions that are known to improve outcomes (see case study 4). For example, the tariff could be linked to NICE Clinical Practice Guidelines and accredited new technologies. Where a new health technology or process has a strong evidence base, a premium could be paid to organisations that demonstrate its use, through a rigorous quality assurance framework. The payments could be staggered to incentivise faster adoption, so that the extra funding reduces over three or four years. A failure to disengage from an outdated practice could also be penalised after a period of transition. Thus, the standard tariff is set according to efficient, transferable practices, and Trusts could earn more by using high quality methods.

Organisational development

Case study 3 demonstrated the value of vision, engagement and best practice transfer in organisational development. This means improving leadership, and improving communication inside and outside of Trusts, so that staff are engaged with a leadership agenda, and organisations share their knowledge for mutual benefit.

Effective, entrepreneurial leaders can be encouraged to enter hospital management by paying figures closer to the market rate for those with exceptional skills. NHS Trusts need to pay for the right leadership skills and secure them on long-term contracts, which include payment incentives for improving quality. This does not mean increasing wages across the board, because money should not be wasted on current incumbents who are proving themselves deficient.

Leaders should look at ways to increase organisational flexibility by simplifying the chain of command, and should retain a greater portion of their budgets for special implementation projects, above and beyond what they are expected to spend on NICE recommendations. This would increase financial flexibility, and enable the board to pursue strategic goals.

There may also be scope for reducing the restrictions on Foundation Trusts, giving them the freedom to spend funds as they see fit without applying for approval. The authors support the full roll-out of Foundation Trust status, with new leadership if necessary, in order to increase the financial flexibility of hospital providers. The situation could be improved further by linking budgets to the three-year plan cycle so that leaders can invest to save in the longer-term.

Foundation Trusts are now able to exploit their intellectual property and enter into commercial ventures that could boost their income and spread best practice. They should be developing long-

term business strategies based on their strengths and the service gaps in their local health economy. And they should be actively seeking out best practice. Arguably, providers will begin to pull best practice in as they develop, if they have the incentive to do so and are given access to better information on where best practice exists. Ambition can be encouraged by providing funding for, and publicly endorsing, innovative business strategies, while allowing for failure where an acceptable risk is involved.

CONCLUSIONS

Lord Darzi's much-anticipated review of the NHS offers an opportunity to rethink the approach to innovation in healthcare. One idea that is underway is to establish a 'Health Innovation Council' – with a fund of £100 million – to bring together NHS, academia and industry to develop healthcare technologies and accelerate the pace of medical innovation.

However, a focus on 'high tech' medical technology is only a small part of the story. Far more needs to be done to tackle the barriers to the uptake and spread of innovation, and simply make sure that acknowledged best practice spreads.

Most of the NHS' problems lie in its complex organisational and funding system, and deeply embedded cultures. This note highlights the breadth of the challenge – and the opportunities. We have highlighted a number of other areas where work is needed to ensure improvements are delivered. We will be addressing these in more depth in the full report.

Appendix 1. Interviewees

Dr David Colin-Thomé	National Clinical Director for Primary Care	Department of Health
Miles Ayling	Director of service design	Department of Health
Prof. Sir Michael Rawlins	Chairman	NICE
Dr Carole Longson	Head of HTA	NICE
Dr Gillian Leng	Head of Implementation	NICE
Prof. Bernard Crump	CEO	Institute for Innovation and Improvement
Lyn Maher	Head of Innovation Practice	Institute for Innovation and Improvement
Prof. Michael Thick	Chief Clinical Officer	Connecting for Health
Michael Bainbridge	Senior Clinical Architect	Connecting for Health
Prof. Sir John Bell	Chair	OSCHR and Academy of Royal Colleges
Richard Hamblin	Head of Information	Healthcare Commission
Dr William Moyes	CEO	Monitor
Vanessa Bourne	Head of Special Projects	Patients Association
John Bewick	Director of Development	South West SHA
Steven Singleton	Regional Director for Public Health	North East SHA
Nigel Edwards	Head of Policy	NHS Confederation
Dr Michael Dixon	Chairman	NHS Alliance
Michael Sobanja	Chief Officer	NHS Alliance
Andy Goldberg	Founder	Medical Futures
Natacha Deshamp Smith	Policy and Project Manager	ABPI
Oliver Wells	Research and Innovation Chair	ABHI
Tom Sackville	Director	International Federation of Health Plans
Geoff Benn	Group Development Director	Care UK
Colin Morgan	Managing Director of Ethicon	Johnson and Johnson
Elaine Warburton	Entrepreneur	Opaldia/Quantum DX
Mark Treleaven	Health	Microsoft
Peter Ellis	Director	People in Health
Mark Outhwaite	Strategy Consultant	Outhentic consulting
Margaret Parton	CEO	NHS National Technology Adoption Centre
Colin Callow	Project Manager	NHS National Technology Adoption Centre
Lynn Chipperfield	Project Manager	NHS National Technology Adoption Centre
Gareth Redmayne	External Relations Manager	NHS National Technology Adoption Centre
Bob Gomersall	Chairman	LEAN Healthcare Academy
Judith Clarkson	External Relations Manager	LEAN Healthcare Academy
Dr Tim Green	Trauma & Elective Orthopaedics	Leicester Royal Infirmary
Dr Steffen Bayer	Simulation modelling expert	Imperial College London

Appendix 2. Recommendations

Problems	Recommendation
Poor leadership	Secure leaders with a reputation for innovation and excellence. Pay them the market rate and secure them on long-term contracts, with incentives for improvement. Link the funding cycle to the 3-year plan cycle. Set targets over longer periods. Full roll-out of Foundation Trust status.
Short-termism	
Risk aversion and the over-reliance on NICE guidance	Funds for adoption projects with long-term goals and good evidence of benefits that are not required by NICE.
Silo-budgeting in Hospital Trusts	Give competent organisations complete freedom over their budgets. Boards should retain an innovation fund.
Barriers between organisations	SHAs should provide forums for debate and engage the entire healthcare community in local process redesign. Connecting for Health should explore new approaches to networking.
Cultural silos	Secure effective leaders with a mandate for addressing internal divisions and creating a coherent, positive organisational culture.
Poor commissioning	More central mapping of efficient care pathways, including simulation models that can be adapted for local differences. Contracting templates that incentivise process redesign and quality improvement. Benchmarking information to aid strategy and decision-making.
Financial incentives	Commissioners should support organisations by subsidising additional expenses incurred (until reflected in the tariff) and by providing stable funds while an organisation brings freed capacity on-line.
	A premium should be paid to organisations providing specific high quality interventions and penalties should be introduced for provision of out-dated practices.
Slow assessment	NICE needs to work more effectively with industry, enabling companies to collect the data and establish an evidence base for adoption that NICE can then quality assure.
Planning ahead	Early evidence for adoption and effective horizon scanning would enable NICE to forewarn commissioners and managers of new products that are likely to come on the market, enabling them to prepare for uptake.
Gaps in the guidance	NICE should receive more funding to produce implementation and commissioning guidance. The NHS Institute should focus on establishing best existing practice and disseminating guidance on process redesign.
Passive dissemination	Flagging systems for professionals highlighting relevant evidence.
Sources of evidence	All of the guidance produced by different central organisations should be available in a single place. Important emerging evidence should also be collated for assessment by individuals and organisations. In the future, all guidance producing organisations should be merged.
Identifying problems and solutions	Benchmarking of performance by department, using system-wide clinical audit and patient-reported outcome data. This would challenge poor performance and reward good performance. It would inform commissioner and managerial decision-making and patient choice.
Resistance to change	
Lack of information	League tables reflecting weighted outcomes (by demographic groups) and up-to-date accessible patient information on what treatments are available and where.

Appendix 3. Glossary

(Acute) Hospital Trust	Hospitals are managed by acute trusts.
Centre for Evidence-based Purchasing (CEP)	CEP is part of the Purchasing and Supplies Agency (PASA) and collates evidence to inform procurement of new products.
Clinical Practice Guidelines	These are recommendations, produced by NICE, based on the best available evidence, on the appropriate treatment and care of people with specific diseases and conditions.
Cultural silos	The separation of different groups within the health service community, leading to tension and a failure to collaborate.
Disruptive information	Information that disrupts ingrained working practices by making problems public.
Foundation Trust	Foundation trusts are run by local managers, staff and members of the public and have been given more financial and operational freedom than other NHS trusts.
Health Technology Assessment (HTA)	HTA analyses technology through the synthesis or systematic review of scientific evidence, and is used by NICE to inform its technology appraisals.
Medical research councils	The Government currently funds health related research through two main routes, the Medical Research Council (MRC) and the National Institute for Health Research (NIHR), which are overseen by the Office for Strategic Coordination of Health Research (OSCHR).
National Institute for Health and Clinical Excellence (NICE)	The National Institute for Health and Clinical Excellence (NICE) is the independent organisation responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health.
National Institute for Innovation and Improvement (NHS Institute)	The NHS Institute for Innovation and Improvement supports the NHS by developing and spreading new ways of working, new technology and leadership guidance.
NHS Direct	Healthcare information service for patients.
NHS National Technology Adoption Centre	A new organisation which works directly with NHS clinicians, managers and commissioners to overcome barriers to the adoption of beneficial technologies that are failing to spread.
Normative tariff	Sets costs in accordance with a prescribed standard, which is modelled on efficient, evidence-based practice.
Oesophageal Doppler Monitoring	Uses an ultrasound probe placed in the Oesophagus to monitor blood flow during surgery.
Patient choice	Patients now have a free choice upon referral of any provider that meets NHS standards and the tariff price.
Patient pathway	The patient journey from GP visit to the conclusion of treatment.
Primary Care Trust (PCT)	PCTs manage primary care provision and control 80% of the NHS budget, commissioning care to meet local needs.
Royal Colleges	Royal Colleges represent different medical professions and are responsible for representing their members and maintaining professional standards.
Silo budgeting	Separate budgets controlled by different people leading to an inflexibility accessing funds.
Simulation Modelling	Computer models of care pathways which can be used to estimate the impact of different variable values on outcomes.
Strategic Health Authority (SHA)	SHAs manage regional commissioning and (most) provision, setting local strategic priorities.
Targets	The current healthcare targets were published in July 2004 by the Department of Health in "National Standards, Local Action: Health and Social Care Standards and Planning Framework 2005/2006 – 2007/2008", and set out the government's priorities.
Tariff	The tariff sets the national price for groups of procedures, based on the cost data provided by NHS Trusts
World Class Commissioning	The world class commissioning aims to deliver a more strategic and long-term approach to commissioning services, with a clear focus on delivering improved health outcomes. There are four key elements to the programme; a vision for world class commissioning, a set of world class commissioning competencies, an assurance system and a support and development framework.

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