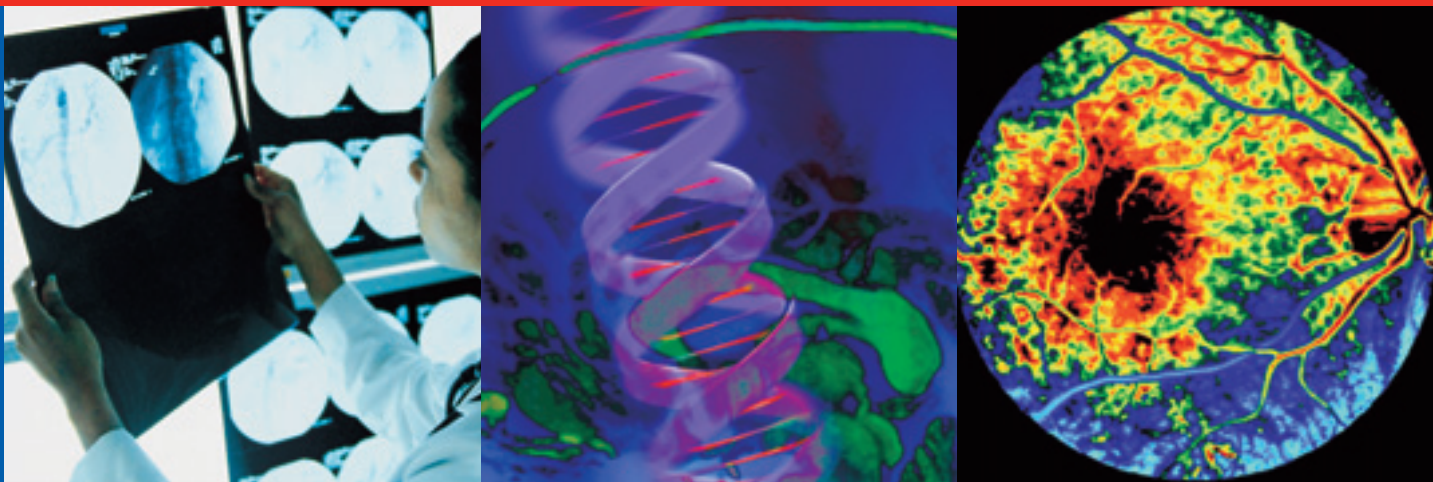


Integration and Implementation of Diagnostic Technologies in Healthcare

A report from the Science Council's Science in Health Group



Executive Summary

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1. Executive Summary

Diagnostic testing is at the heart of medical and surgical practice as well as preventative healthcare. The past decade has witnessed an unprecedented explosion in technologies derived from the biological, chemical, physical and mathematical sciences. These have been harnessed to provide a new generation of diagnostics that have come together to offer better ways of preventing and diagnosing disease and monitoring responses to treatment. In addition the genomic revolution is adding a further level of complexity by revealing how molecular pathways interact in a complex system and is leading to the identification of subphenotypes within a single disease.

Set against this technologically driven push is an ever-increasing demand for diagnostic tests in the NHS to ensure that patients receive appropriate treatment as soon as possible. The NHS Improvement Plan published in 2004 set out a challenging access target that by December 2008 no patient would wait more than 18 weeks from referral to the start of hospital-based treatment inclusive of all diagnostic tests and procedures.

Taken together, there is an urgent need to capture new advances in science and technology and to improve the precision and efficiency of diagnostic testing. This has prompted the Science in Health Group to undertake this enquiry into Integrated Diagnostics.

Our objectives were to:

- 1 Investigate the range of new technologies used in diagnostics, how these are evaluated and their implementation to improve patient pathways.
- 2 Identify the methodology in place for quality assurance for current and new diagnostic tests
- 3 Define the role of information technology to improve the application

and diagnostic precision of new diagnostic tests.

- 4 Assess the level of training and education for those involved in the requesting and carrying out of diagnostic tests.
- 5 Determine how new diagnostic technologies are being used in patient pathways and identify opportunities to replace inefficient and outdated testing.

To help focus the outcome this enquiry was restricted to imaging, pathological tests, endoscopy and physiological measurement because these represent most of investigations performed on patients. The enquiry took the form of an extensive review of the literature, written evidence received from both individuals and organisations, and horizon scanning. In addition we formed five working groups to review the large amount of material received and to help identify specific issues. This report represents a summary of our findings with eight recommendations. A catalogue of the evidence is appended as a CD-ROM at the back of this report.

Of special concern to us was the relatively low profile of diagnostic testing and those who undertook this in the NHS compared with the attention given to the use of drugs and surgical interventions. Based on our assessment of the evidence received, we have drawn up eight recommendations which are listed below.

- 1 We recommend that a system is established involving both the NHS and other healthcare providers that identifies new diagnostic technologies or novel use of existing technologies that have the potential to exert a marked impact on patient care pathways and outcomes, especially in the fields of pathology, imaging, physiological measurement and endoscopy.
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2 We recommend that all the available evidence about a new diagnostic test that is considered to improve patient care is systemically assessed by a competent authority for its potential to benefit patients and guidance drawn up for its introduction into the wider NHS.

3 We recommend that all diagnostic technology should be subjected to evidence-based appraisal and be trialled in patient care pathways, to identify their utility, phase out outmoded tests and to optimise the use of new tests.

4 To prevent incorrect advice being given to the public, we recommend that some form of regulation or accreditation should be introduced into the independent sector to ensure diagnostics are performed to defined standards.

5 We recommend that, at least within the NHS, a new position of Technology Adoption Specialist is created in each hospital trust to evaluate and facilitate the uptake and use of new diagnostic procedures. Such an individual could also oversee the integration of diagnostic tests between individual fields within the same hospital trust, between hospital trusts and the primary healthcare setting, and across care pathways and networks.

6 We recommend that an organisation such as the National Institute for Health and Clinical Excellence (NICE) develops appraisal mechanisms that examine the cost-effectiveness of diagnostic tests, helps develop coherent standards for their use and develops guidelines for their application to the patient care pathways. This process should evaluate the contribution that new

diagnostic tests have on patient care pathways and should not simply focus on the technical performance of the test itself.

7 We recommend that greater emphasis is placed on moving diagnostic technologies from hospitals to primary care settings, recognising the importance of training and access to specialty advice through improved telecommunications.

8 We recommend that imaginative and efficient use is made of information technology to improve the use of new diagnostic tests within decision support systems in order to improve diagnostic precision and closer delivery to the point of patient care. This includes self-care testing, the use of patient-structured interviews and image libraries, and links to patients' electronic records.

Whilst most of our recommendations are directed to the NHS and associated bodies, we believe that higher educational institutions and independent sector healthcare providers have a key role to play in taking forward our recommendations.

During our study we repeatedly encountered comments that indicated there is a need to address concerns expressed over the level of training and education available to those who undertake or use diagnostic tests. Because of the importance of this aspect of diagnostics we have decided that rather than making any recommendations, a further in-depth enquiry was needed in these areas.