The Royal College of Pathologists
Pathology: the science behind the cure

Briefing: The Topol Review

8 March 2019

Background

This policy briefing responds to the Topol Review into how technology and digital tools will affect patient care and clinicians' lives and the implications for training and upskilling professionals.

Introduction

Digital healthcare technologies, genomics, digital pathology, artificial intelligence (AI) and robotics all have a current and future role in pathology disciplines: robotics in blood sciences; genomic testing of bacteria in microbiology; digital pathology in histopathology and haematology; point of care testing (PoCT), self-testing and personalised therapy such as CAR-T cell therapy in lymphoma treatment.

The College agrees that digital technologies will not replace the vital role of clinicians but will enhance and change it. They have the potential to significantly aid our overstretched workforce in providing patient care. We believe that mobile devices and AI could also be used to promote or encourage health-benefitting habits and uptake of cancer screening.

Patients

The central role of patients is especially important when evaluating technology and we welcome this central tenet. The College has an excellent public engagement programme which is ideally placed to incorporate public education about genomics which will enhance the patient's role in shared decision making.

PoCT and self-testing also have enormous potential to help patients manage their own health. The key factor is the governance around use of such devices to ensure accurate, reliable results, not

just MHRA regulation of devices but ongoing quality systems accredited by UKAS to ISO 22870:2016. We agree that connectivity of such devices is important to ensure a link with the patient record.

Artificial intelligence

There is great potential for the development of artificial intelligence to support the diagnostic process in pathology, especially image analysis in histopathology. Investment in digital pathology systems with joined up IT systems and information sharing across organisations is an immediate priority in order to begin to understand the potential for AI-assisted diagnostics. We should draw on experiences such as in Wales where there is a single Welsh Laboratory Information Management System (WLIMS), single results portal (the Welsh Clinical Portal) and investment in digital pathology nationwide. We welcome the call for educational resources to educate health professionals in data governance, ethics, appraisal and interpretation of AI and similar technologies. We also advise caution when advocating digital technology as a replacement for pathology testing – the former must be based on strong evidence of quality and reliability.

Genomics literacy

Medical genetics services will continue to be central to the increase in genetic and genomic testing, with skilled medical and scientific staff interpreting the results. This workforce is key to delivering the potential of genomic testing. It is important that genetic testing is accurate and reliable and meets the standards of UKAS 15189:2016. For clinicians putting these results into practice in how they treat patients, there is a huge gap in technical and practical knowledge that will need to be bridged, particularly around when and what to test and how to counsel the patient. Geneticists are ideally placed to lead on this education, both in terms of training doctors and scientists and carrying out broad upskilling of the existing workforce.

Population-level education about the limits of interpretation are also important, so that we do not over-promise and convey the impression that genomics has the answer to everything. A basic understanding of the role of gene expression and of proteome in creating the phenotype is urgently needed to help put genomics into perspective, and also to help support healthy living choices.

We would strongly advise caution around blanket whole-genome sequencing as there are many risks around interpretation, unintended impacts and the creation of a population of ‘worried well’ who could unnecessarily overwhelm healthcare services. The College responded to the announcement by Matt Hancock MP, Secretary of State for Health and Social Care, that people would be offered the chance to pay to have their DNA mapped in return for voluntarily donating their anonymised data to help researchers develop treatments (see Appendix 1 for the response as published in *The Times*).

The College will be submitting evidence to the Science and Technology Committee inquiry into commercial genomic testing.

Workforce

We welcome the intention to build a genomics workforce that includes clinical scientists and medical doctors. This should include their role in education for the wider community of healthcare professionals and the public. However, the workforce implications of genomics testing go beyond genetics services. Similar considerations must be made for the histopathology and microbiology workforce in particular, as well as other disciplines where incorporation of genomic information into pathology reports – while already routine – will become more widespread and more detailed. Our training processes and paradigms will need to be adapted to the advent of digital images across all disciplines, and we will work closely with stakeholders to ensure that trainees and our existing workforce have access to the most up to date and accessible resources for training.

Conclusion

We live in exciting times, with technological advances changing the way we care for patients. The aims of the Topol Review are admirable, though they must be viewed in the context of an NHS that struggles to deliver basic technological support for its workforce.

Immediate priorities include:

- modern laboratory information management systems (LIMS) that help rather than hinder pathologists
- connectivity of pathology LIMS
- easy to use electronic test requesting and reporting systems
- adoption of digital pathology and speech recognition technology.

These will be the foundation for the great advances to come.

Contact details

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About the Royal College of Pathologists

The Royal College of Pathologists is a professional membership organisation with more than 11,000 fellows, affiliates and trainees, of which 23% are based outside of the UK. We are committed to setting and maintaining professional standards and promoting excellence in the teaching and practice of pathology, for the benefit of patients.

Our members include medically and veterinary qualified pathologists and clinical scientists in 17 different specialties, including cellular pathology, haematology, clinical biochemistry, medical microbiology and veterinary pathology.

The College works with pathologists at every stage of their career. We set curricula, organise training and run exams, publish clinical guidelines and best practice recommendations and provide continuing professional development. We engage a wide range of stakeholders to improve awareness and understanding of pathology and the vital role it plays in everybody's healthcare. Working with members, we run programmes to inspire the next generation to study science and join the profession.

Appendix 1: The College's response to *The Times*' article on gene testing

The Times Letters: Concerns over sale of gene tests on NHS

On 29 January 2019, *The Times* published this letter, written in response to the article *Gene test for sale on NHS,* published on 26 January.

Sir, You report ('Gene test for sale on NHS', Jan 26) that the NHS intends to sell whole genome sequencing to healthy adults who will receive a 'personalised' test report. The UK leads the world in collaborative genomic research and in the provision of a high-quality genomics clinical service. Genomics has already transformed the lives of many and promises much more in the future.

Selling whole genome sequencing to healthy people breaches a core principle of the NHS. It will create two-tier access to services, where people who can pay are able to access services that are denied to those who cannot. Furthermore, without additional resourcing the extra demand that it will create on laboratory and clinical capacity may compromise the provision of diagnostic genome sequencing and clinical care for NHS patients for whom there is already proven benefit, such as those with rare diseases and cancer.

Helen Firth, Chairwoman, Joint Committee on Genomics in Medicine; Andrew Goddard, President, Royal College of Physicians; Jo Martin, President, Royal College of Pathologists; Bob Steele, Chairman, UK National Screening Committee; Dian Donnai, Emerita Professor of Medical Genetics, University of Manchester; William Newman, Professor of Translational Genomic Medicine, University of Manchester; Paul Pharoah, Professor of Cancer Epidemiology, University of Cambridge; Jane Hurst, President, Clinical Genetics Society; Anna Middleton, Chairwoman, Association of Genetic Nurses and Counsellors; Andrew Wilkie, Nuffield Professor of Pathology, University of Oxford; Eamonn Sheridan, Professor of Clinical Genetics, University of Leeds