BMA

Every doctor a scientist and a scholar

British Medical Association
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Foreword

‘The doctor’s role as diagnostician and the handler of clinical uncertainty and ambiguity requires a profound educational base in science and evidence-based practice as well as research awareness.’

John Tooke, 2008[1]

Following the success of the document *The Role of the Clinical Academic,* published by the BMA’s Medical Academic Staff Committee (MASC) in May 2014, the Committee began to consider the role of academic activity in the working lives of all doctors. The issue also arose in discussions with the chairs of the academic committees of the medical Royal Colleges. Together, we identified a shared concern that research in, and the teaching of, medicine was increasingly being seen as the preserve of a special group of doctors and not an intrinsic part of the roles of all doctors. This view can be seen in a number of reports on the medical workforce and its education and training, and in the evidence recently submitted by some parties to the Doctors and Dentists Review Body.

The members of MASC and the chairs of the academic committees all felt that they should respond to this development, warn of its consequences and consider the advantages of producing a medical workforce where, in keeping with outcome 1 of the GMC’s *Tomorrows Doctors* guidance, every doctor becomes a scientist and a scholar.

The paper has been written by the officers and members of MASC. The views of the academic chairs have been sought through the drafting process and the Committee would like to thank them all for their input.

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1 Tooke J (2008) Aspiring to Excellence: Final Report of the Independent Inquiry into Modernising Medical Careers

Introduction

Every person that becomes a patient expects the doctor looking after their care to be not only an expert in diagnosis and treatment and in empathic communication with them, but also to have an up to date working knowledge of the causes and treatments of disease. They expect the doctor to be able to weigh the scientific evidence that is relevant to their condition, and to recommend the best treatment for them. In order to do this it is in the patient's best interest that their doctor is able to understand the evidence presented from research in their sphere of practice. The doctor should also be ready to advise the patient on new research which may be of benefit to them, and of studies which may re-evaluate existing treatment strategies. Furthermore, patients are becoming more sophisticated and knowledgeable and recognise that doctors who contribute to research add to the accumulated public knowledge of diagnosis, treatment and prevention of disease, as well as to the health and wealth of society.

Behind this document lies a simple premise, often regarded as self-evident, but worth restating: doctors want all their patients to be provided with excellent standards of care. Contributing to achieving such standards is a wide range of attributes, both personal and institutional. These include the need for every doctor to have a clear understanding of scientific methods, principles and techniques as well as other important attributes, such as clinical skills, leadership, decision making and communication skills. To achieve this it is important that undergraduate and postgraduate education should equip the doctor not only with clinical skills but the scientific skills to enable lifelong learning and enquiry.

That these academic skills are fundamental was illustrated forcefully in the Keogh Report on the Mortality Review[2] Doctors working in hospitals that were more research-oriented and research-led were less likely to contribute to avoidable mortality statistics and were more likely to demonstrate high quality care. If the NHS encouraged every doctor to become research-orientated and to play a lead role in making such an approach integral to their personal working environment then the benefits to patient care and to the generation and efficient use of resources would be considerable. Conversely, a health service which fails to insert research into its DNA would not be providing the safe, effective and responsive care that we all want for ourselves, our families and friends.

We propose that every doctor should aspire to continue to develop scientific skills and academic knowledge in tandem with clinical practice throughout their career. In doing so they will enhance their skills in all five areas noted above, and ensure the delivery of optimum care and continued innovation.

Scientific skills and academic knowledge

Scientists can be described as people who have expert knowledge of, or are studying, one or more branches of the natural, social or physical sciences. This definition suggests that all doctors should regard themselves as scientists investigating the social and biological aspects of health and illnesses, and applying scientific theories and appropriate methods accordingly.

Both undergraduate medical education and postgraduate medical training in the UK are founded on the development of evidence through scientific examination of practice and research. Delivery of care in the UK is likewise based on decisions made from the application of the best available evidence to inform treatment focused on the patient's needs. A doctor's practice is, therefore, intimately linked to the evidence base. Where the evidence is not to hand, doctors are responsible for searching it out, evaluating it for scientific validity and assessing its practical application, with respect to their decisions taken with the patients for whom they care, and towards the development of innovation, new treatments and the overall evolution of medical practice.

2 Review into the quality of care and treatment provided by 14 hospital trusts in England: overview report, Professor Sir Bruce Keogh KBE, 16 July 2013

Therefore, we believe firmly that every practising doctor should want to maintain up-to-date knowledge relevant to delivering care in their specialty, and achieve an understanding of how to evaluate and apply evidence. This is a key principle of the General Medical Council's (GMC) Good Medical Practice: doctors should "provide effective treatments based on the best available evidence".

This principle should not be perceived as an option: patients will reasonably expect that every doctor will be able to weigh evidence and use this to inform both diagnosis and discussions about treatment plans with them and with their carers. In order to achieve this doctors need to develop skills during training in the application of the principles of the natural and social sciences. The key skills include:

- Evaluation
- Appraising evidence
- Interpretation
- Numeracy (including an understanding of statistics)
- Communicating data

Doctors need to be able to find, appraise and apply evidence to inform decisions, linked to a sophisticated understanding of contexts, risks, limitations and uncertainties. This implies a need to engage with research at several different levels: as teachers, as partners in considering and identifying research questions and, for some, as researchers undertaking regular scientific endeavour as part of their service delivery. Doctors are thus clinicians who can expect to be engaged in research and teaching at various levels throughout their careers. This concept of research and scholarship needs to be at the core of undergraduate and postgraduate education and training, and should underpin the form and content of lifelong learning within continuous professional development.

Research, then, is not just the territory of medical academics but of all doctors. Doctors should examine ideas and concepts carefully to see if they offer potential new treatments, new ways of interacting with patients or a more developed understanding of disease processes.

The BMA's paper, *The Role of the Doctor*, sums up these imperatives of evaluating, discovering and extending as the 'Spirit of Inquiry'. The extent and the complexity of the scientific component of doctors' education and training, and the need for it to be applied to ensure effective healthcare, sets doctors apart from other healthcare professionals and underpins their status within the healthcare system. To achieve this aspect of their education and training fully, doctors must be educated to a higher and broader level, with a specialist approach to patient care different from that of other healthcare workers.

Training

The concepts under discussion are not an entirely new idea. They represent what the GMC expects of a doctor: to be both a scholar and a scientist. The GMC believes that any graduate of a UK medical school should be able "to apply relevant scientific principles, methods and knowledge to medical practice". We believe that providing the education and training to achieve this is crucial.

1. Pre-entry to medical studies

During the later years of secondary education, students should be encouraged to demonstrate an understanding of the role of science. Thus school leavers should be equipped with the basic tools necessary for the application of the scientific basis of medicine to practical healthcare delivery of the highest quality.

Graduate entry students

Medicine currently also encourages graduates of other discipline to enter medicine through provision of graduate entry courses, particularly those from scientific backgrounds. These students have already acquired higher education level skills of evaluation and critical thinking in their first degree, which can be further developed during their accelerated courses.

2. Undergraduate education

All UK medical degrees provide a high level of scientific content. Consequently, all UK medical school graduates should be trained as critical thinkers and problem solvers. This will help them to begin to understand the principles that underlie scientific enquiry and equip them with the required skills needed to understand the role of scientific method in the study of health and in medicine. The aim is that most, if not all, go on to participate in the scientific activities of reviewing, conducting, writing and presenting research into both their own practice as well as that of others. In addition many of these graduates do, as doctors, take part in more in-depth research projects as part of their training, and a significant proportion of them will undertake higher degrees and thus will need the basic skills and experience necessary to take these more ambitious projects forward.

Undergraduate medical students must also broaden their understanding of language and grammar and hone their ability to read and critique scientific and medical publications. They should, in turn and as a consequence, develop their skills in communicating what they have learned to their colleagues and patients both orally and in writing. Through this process of scholarship, students should gain a deeper understanding of research principles and processes; for example, how to handle data. While not yet an option for all students, the opportunity to undertake a project as part of an intercalated year is an example of good practice; many other medical schools develop similar skills through special study modules and other assessed components.

3. Postgraduate education

Postgraduate education continues at Foundation, Core and Specialist level, in primary and secondary care and in public and community health. Doctors should continue to develop scholarship and a deeper understanding of research-related problem-solving throughout their training.

As set out in the competences required in Foundation training, all doctors should learn how to appraise research and interpret evidence related to healthcare delivery. All specialities must encourage trainees to understand the processes by which research is translated into practice, to question 'dogma', or cultural assumptions, and to understand the limits or risks of what is being done. Core training must ensure these principles apply to all doctors, and demonstrating some form of research activity, of whatever kind, should be a key component of the assessment of doctors in training. Care must be taken to ensure that the training curriculum is not just a collection of clinical practice guidelines but a 'living' development of evidence based best practice.

Trainees must have the opportunity to experience supervised quantitative or qualitative research, and a nominated research tutor should be available within every programme to advise trainees on the suitability of projects. While in core specialist training, research may be limited to case reports or a small literature review. However, we believe that, during the course of training, all trainees should have the opportunity to participate in original research. Trainees undertaking postgraduate medical diplomas should also receive sufficient leave to take the required examinations.

We look to a future where all medical trainees develop broader and more robust scientific skills as part of their training, whether or not they then pursue a clinical academic career. All doctors should be able to find, appraise and apply the best available evidence with confidence. They should be able to support the recruitment of participants for research (understanding Good Clinical Practice for example), and they should ensure that they collect and collate accurate data for audit, evaluation and research as well as for clinical purposes.

Practice

1. Secondary care

The artificial divide between the 'teaching hospital' and the 'district general' is unhelpful and does not always accurately reflect the local position. Every secondary care centre should be able to facilitate excellence in research and teaching; all service delivery should be informed by best practice in research and educational processes. In particular, all secondary care providers should be contributing to the data that inform medical research.

Recent reports on poor NHS healthcare have demonstrated that hospitals with higher than expected death rates are less engaged in research activity and teaching. Successive CQC reports, reinforced by the Keogh Report, have shown that improvement and transformation of these hospitals is at least in part reliant upon embracing an educational and scientific ethos. We note that a number of hospitals that have been put into special measures have helped themselves out of this position through the expansion of their research and development departments and the appointment of research leads. The Keogh report[3] commented that these failing hospitals were 'academically, professionally and in some cases geographically isolated'. Indeed one of the remedies being put into practice to improve the performance in these hospitals is to involve the hospitals in Academic Health Science Networks (AHSNs) and to link these hospitals with more successful counterparts characterised by having high scientific, research and education profiles. Settings which have a strong academic staff resource should, therefore, consider whether teaching and research links effectively open these resources up to others in the region.

2. Primary care

In primary care, there is a wealth of opportunity to access large ranges of conditions, both medical and social. All GPs should have the opportunity to participate in research, and indeed 40% of practices are estimated to contribute to community based research. However, GP training is the shortest of any speciality, and the extension to four year training, which included the development of higher competencies for evidence-based practice and research, has been delayed due to other initiatives such as the Shape of Training review. This means younger GPs are entering the workforce having had less time to participate in academic components as part of their specialist training than their peers in secondary care.

In addition, academic career pathways in general practice have been under-resourced, and even though all medical schools now have academic primary care staff the numbers of Academic Clinical Fellow (ACF) posts allocated to general practice remains disproportionately small. This contributes to the low proportion of general practitioners following an academic career. We would argue that there is a particular need for this opportunity to be made available to GPs, not least as a means of making a career in general practice a more attractive option for young doctors. Good links between University departments and research networks supporting community based research and the contribution of primary care data to databases that could be used for the full spectrum of analysis are essential.

3. Public Health and Population Health

Acquiring public health knowledge and skills is now part of the curriculum of a range of specialities. Placements as registrars in public health are mandatory for some specialities (such as Sports and Exercise Medicine and Reproductive and Sexual Health) and encouraged in a range of specialities (such as General Practice, Community Paediatrics, and Psychiatry). These placements are a route to acquiring and using academic skills. The mapping exercise (funded by DH) of all postgraduate speciality curricula against the public health curriculum indicated that public health is covered in all curricula mainly to enable the specialities to acquire skills as a 'scientist and scholar'.

Public health also has a history of working with a range of clinical specialities in research and is involved in 'teaching' for registrars in other specialities, loosely termed 'public health

3 Ibid.

in clinical specialities'. These cover the range of skills that doctors need to acquire as a 'scientist and scholar'. These resources would provide considerable scope for doctors in training to access a wide range of skills and experience both in research and teaching.

Specific academic career pathways in public health are popular, with examples of joint posts between public health and the clinical specialities being established. Most universities have excellent departments of 'population/public health' research supporting and collaborating with researchers in both primary and secondary care.

Appraisal and revalidation

The processes involved in continuing professional development (CPD) and the cycle of appraisal and revalidation play a significant role in reflective practice. These processes are themselves primarily a form of audit, but when applied properly they should prompt research questions, and in turn these questions will often have a translational component.

The requirement to demonstrate engagement with continuing professional development (CPD) as part of appraisal and revalidation will also help to as enable doctors to keep abreast of a broad range of medical and scientific developments, and then feed back into the development and expansion of practice.

The pattern of appraisal and revalidation encourages practitioners to reflect on their career development. Appraisal provides an opportunity for doctors to develop and to document how their scientific thinking and skills have progressed. This culminates in the revalidation process, at least every five years, during which they can redefine research questions. This in turn requires that appraisers should be trained in research principles as well as in skills

The development of the revalidation processes should also play a role in developing the scholarly and scientific roles of a doctor. This is the reason that MASC argued strongly for doctors' research and teaching activities to be recorded separately in the agreed appraisal form that underpins revalidation.

The present and the future

Fall in research

Despite the high level of scientific activity amongst some trainees, there was a fall in the total volume of medical research conducted in the UK, as judged by the number of research projects being examined by the IRAS system.[4] In addition, the House of Commons Science and Technology Committee has commented on the fall in the number of clinical trials based in the UK.[5] One potential reason for the reduction in scientific activity might be the under-valuing of research by a service focussed on immediate clinical activity, with insufficient regard for the needs of the future patient and the long-term strength of UK medical research and its contribution to the economy. If this fall in the volume of research in the UK continues there are potential implications for health based research in the long term. As evidenced by the outcome of the 2014 Research Excellence Framework, the UK currently has a place at the top of world medical research activity. This, however, is a reflection of past levels of investment and activity which need to be built on for the future.

Future Changes

The Shape of Training Review Report (2013) has highlighted a pathway for clinical academic training, and gives some support to the need for flexibility in this training. The report does not mention, however, the need for all medical postgraduate training (that is not only for those intent upon an academic career) to include an academic or scientific component,

4 BMJ. 2010 May 17;340:c2375. doi: 10.1136/bmj.c2375, Falling research in the NHS, Rees M, Wells F.
5 Page 6, Para 3, *Clinical trials*, House of Commons Science and Technology Committee, Third Report of Session 2013–14

which is important for all specialities including community-based as well as hospital practice. To achieve these objectives, all medical royal colleges are including research training in their CCT curricula. This training will help enable doctors to achieve a high level of scientific awareness and competence on which to build a clinical career. In order for this to become normal NHS practice we would hope to see that all doctors on achieving CCT are supported in their continuing careers to practice in an environment that supports medical science.

In Primary Care, the move to four year training could, and should, provide the opportunity for academic training for all trainees. We note that the fourth year has been said to need to be 'cost neutral'. We believe, however, that financial support would be required to achieve this objective, but that the benefits for current and future patients and to the research outputs of the UK would make this a very worthwhile investment.

Summary

In this document we have put forward a case that every doctor needs to be engaged as a scholar and scientist. In order to achieve this we would expect that the following principles should be endorsed and embraced by all stakeholders:

- Clinically led services must be informed by the best available evidence especially through the commission process.
- Understanding and weighing evidence should be an essential component of education, training and continuing professional development for all doctors.
- Every career structure for doctors should include ongoing education in and exposure to research as integral components.
- The NHS should develop an ethos where research is part of the 'DNA' of the service. This means valuing, supporting, rewarding and celebrating scientific endeavour.

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March 2015

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BMA 20150185