

Achieving clinical excellence through research

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Constant evolution and changes in clinical knowledge and thus in medical care activities have and will always occur in parallel with new knowledge generated by biomedical research and innovation. The fact is that the level of knowledge attained in biomedicine in recent years has unequivocally had a positive influence on human health and furthered life expectancy and quality of life. At the beginning of this century, the complete sequence of the human genome became known. Currently, basic research is focused on issues such as the structure, functions and interactions of genes and proteins, and the study of physiological pathways and biological systems as mechanisms, the knowledge of which allows for rapid diagnosis, prognosis and treatment of human disease. Genetics, structural biology, genomics, proteomics, metabolomics, pharmacogenomics, bioinformatics, new imaging techniques and regenerative medicine are driving research towards a more scientific and therefore more rational approach to managing human disease¹.

All this scientific progress will shortly be incorporated into healthcare activities, so it is imperative that conceptual and structural changes occur to allow Spanish biomedicine to attain the international level it deserves as an economically developed country. To my mind, one aspect that needs to be considered with some urgency is to ensure that scientific knowledge in Spanish doctors reaches a higher level. In this regard, there are many aspects that should be taken into account (newly created Institutes of Health Research, a highly positive development; translational research, an appropriate policy of human resources, real and effective coordination between different research entities, the promotion of innovation and the creation of biotechnological companies with a sound academic base, clusters of public-private

partnerships, and the introduction once and for all of an appropriate external evaluation policy before taking risky decisions on scientific policy, among other actions) but all these cannot be covered in this brief editorial^{2,3}.

The actual incorporation of research activity in hospitals has only occurred in the last 40 years. In the past, policy makers did not consider that hospitals and primary care centers should be involved in research. Health managers had never even raised this possibility and it is fair to say that physicians with research activity were not well considered by their peers. Fortunately, the situation today has undergone a great positive change and it is fully accepted that clinical research should be undertaken as a normal activity at healthcare institutions. This change has occurred gradually but it is now fully established that clinical research improves healthcare activity. More than 15 years ago, the Royal College of Physicians of London recommended post-residency training scholarships in biomedical research to be carried out in UK university hospitals. One editorial⁴ stated that biomedical research helped physicians to increase their medical knowledge and to acquire a critical capacity, which in turn improved their training in medical care. The editorial concluded that learning and developing basic clinical research techniques during under graduate and postgraduate training made for better physicians and quality care of patients.

For care activity to be innovative, it is imperative that physicians engage in clinical research, the only way to improve care and evidence-based medicine (tests). When talking about innovation in health sciences we do not have to involve the concept of patentability. Many paradigmatic changes that have occurred in recent years are virtually not patentable. Examples of this abound:

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new therapeutic indications of a drug originally marketed for another reason, such as the use of beta-blockers for the treatment of portal hypertension and the use of aspirin for myocardial infarction. It is estimated that 40% of drug sales correspond to new therapeutic uses identified after clinical research and marketing. Other examples are the development of organ transplant or outpatient surgical techniques. These innovations can only be enshrined by clinical guidelines, employed to improve healthcare services. Therefore, assuming that innovation is necessarily a health center activity, there is a clear need for physicians with research experience. This is the only way to achieve clinical excellence demanded by our society^{5,6}.

One aspect that requires re-structuring in our country is the training of physicians at the undergraduate and graduate level. Radical changes that may be resisted by medical faculties and lecturers should be introduced during the first degree course, although that would mean a complete change in the way medical training is delivered. Currently, problem-based clinical training is well established in most developed countries. In this regard, it would be useful if the division between basic and clinical training could be eliminated and clinical training introduced as from the beginning of medical studies. On the other hand, the medical curriculum in our country must be adapted to meet the corresponding requirements of the European Union Higher Education. Today, the graduates of modern medical schools must be highly qualified from a technical and scientific standpoint, but also trained in human, social and ethical values in order to cope with the difficulties of practising medicine in a global community. Health promotion and disease prevention should be the common thread through out the medical school curriculum, with emphasis on evidence-based medicine and an analytical/critical approach. Simultaneously, the curriculum needs to incorporate contributions from the behavioural and social sciences, medical ethics and the health economics, to ensure appropriate behaviour in professional practice and enhanced communication skills, decision making, leadership and social influence. An

aspect worthy of further attention is the fundamental role of self-education in medical training. One objective of European Union Higher Education is for the student to acquire competencies and skills rather than factual knowledge^{7,8}.

Postgraduate education in Spain is excellent. The current MIR system is remarkably successful and is not questioned. Specialist and Family Medicine physicians trained in the national Medical Residency system generally attain the standards set by their respective national specialty committees. However, training in biomedical research is not contemplated⁹. Post-MIR research contracts have been successfully implemented and this has been an important incentive for young physicians wishing to embark on a scientific career in health centers. However, it should also be noted that there is still no training program in basic sciences for medical students in Spain. Other countries, such as USA, have for many years offered basic research programs before, during and after the residency period (MD / PhD programs). The results of these programs have been fundamental for the scientific and technical development of biomedicine in the countries where they have been implemented¹⁰. All these considerations suggest that biomedical research, especially clinical research, is essential for medical professionals to attain the highest possible level in their healthcare activities.

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