

Shaping our future

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Beliefs, in short, are really rules for action; and the whole function of thinking is but one step in the production of habits of action. If there were any part of a thought that made no difference in the thought's practical consequences, then that part would be no proper element of the thought's significance.¹

We are living through an era of big changes. The economic crisis affecting Europe and North America will alter the way of life of millions of people. Health-care is not going to be spared by these changes: an ageing population, the growing prevalence of chronic diseases and a declining labour force will cause rising costs to the extent that it will be impossible to sustain the health-care system in the way that we know it. Nuclear medicine is increasingly becoming a fundamental part of health-care systems, and its clinical application in the diagnosis and therapy of various diseases is going to be affected by a reduction in the budget available for many hospitals and universities. In addition, in the search for the most appropriate and cost-effective way to diagnose and treat patients, competition with other modalities will leave no room for ineffective procedures.

This new situation requires rapid evolution in our way of thinking and, above all, fast implementation of actions designed to foster the new nuclear medicine. We need to carefully plan the sequence of our next steps, always bearing

in mind our ultimate goal: benefit to patients. Our actions will determine the nature of our discipline in the coming decade and beyond. Personalized medicine is the key goal for future medicine. Molecular imaging with radiopharmaceuticals offers a powerful technique for the implementation of personalized medicine. The ability to identify *in vivo* a specific target for a specific therapeutic molecule is the best way to provide the patient with personalized therapy. The effectiveness of such therapy is increased when specific radiopharmaceuticals are used after identification of the target with their diagnostic analogue.

Radiopharmaceutical applications are at the heart of our discipline and we must therefore make every effort to ensure that the highest possible number of radiopharmaceuticals are available in clinical practice and that there is easy access to these molecules for clinical and preclinical research. Lobbying at the European and national levels is mandatory if these efforts are to be successful. Therefore, we need strong data to show the effectiveness of nuclear medicine procedures, and the only way to get these data is to organize and run randomized multicentre trials in collaboration with clinical societies. Those procedures for which we cannot demonstrate clinical effectiveness are going to disappear and we shall be focusing on the many effective procedures that offer a direct benefit for the patient. The time of single-centre studies with a small number of patients is definitively over. We must make an effort to share our data and ideas in order to promote the design and organization of robust trials aimed at demonstrating the ultimate benefits of our procedures, both diagnostic and therapeutic. In many countries the necessary organizational and technical infrastructure is already available—we just need to make use of it. When the necessary means are not available in a particular country, participation in a multicentre clinical trial will offer a way of obtaining access to the missing technologies.

¹ William James, *Philosophical Conceptions and Practical Results*. University Chronicle, Vol 1, September 1898, No. 4, p. 290, Berkeley, September 1898.

An address delivered before the Philosophical Union, at Berkeley, August 26, 1898, by William James, M.D., LL.D., Professor of Psychology in Harvard University.

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Insufficient availability of radiopharmaceuticals precludes the full use of our procedures. Up-to-date imaging devices and treatment facilities should be homogeneously distributed throughout Europe. We must not forget that one of the main goals of the European Union is to provide equal access to health-care for all patients in the member states. We can take advantage of European sources to achieve this goal. In this context, we have to consider networking among centres as a must. It is not acceptable to have duplication of high-end technologies and facilities. Centres of excellence should take responsibility for making the resources available in all countries. Intelligent allocation of resources and networking between hospitals will be the way to allow patients to gain access to and knowledge of nuclear medicine in every corner of Europe.

High-end technology is available and we should use it to its full capability. To effectively use radiopharmaceuticals in diagnosis and treatment, we need to have full control of the PET/CT, PET/MR and SPECT/CT scanners installed in our departments. A nuclear medicine specialist should be able to interpret all the modalities used in her/his clinical or research activities. The future will see the disappearance of technology-based specialists and the rise of organ-based specialists. We should be able to control all imaging modalities related to the use of radiopharmaceuticals in our clinical field of interest: oncology, cardiology, neurology, infectious disease and so on. Subspecialization will relate to very specific niches, for instance head and neck tumours in oncology. This process requires a strenuous effort in education: physicians must have deep knowledge of the clinical aspects of diseases and of what can be achieved with different imaging techniques and different therapeutic applications of radiopharmaceuticals. Specific knowledge of the nonclinical aspects of our specialty will reside even more in the hands of the professionals working in our field: physicists, chemists, pharmacists, technologists and nurses. An additional effort will be necessary to harmonize the education and competences of these different professionals, thereby further enriching nuclear medicine.

The envisaged evolution will require strong collaboration with other imaging and clinical specialists. This collaboration will need to take place between scientific societies. Even more importantly, it will need to take place among peers in the context of our daily clinical and scientific work, with mutual recognition of specific competences and the common aim of establishing a new generation of imaging specialists.

Standardization of imaging procedures throughout Europe can ensure that our discipline receives the credit it deserves as a trusted modality which can have a strong and efficient impact on the clinical management of patients. The same holds true for therapeutic procedures. Scientific societies must support this common effort to achieve the implementation of strong standards at both the national and the European level. This is the first step towards the application of standards such as European recommendations and national rules. Industry, from the pharmacological and technological world, should be a partner in many of our efforts. The early support of standards will not only facilitate the use of nuclear medicine techniques but also increase the use of these procedures in order to develop and clinically apply new therapeutic agents in different medical fields.

Attracting young doctors to our discipline is essential to ensure its successful future. We need to provide young colleagues with an interesting and challenging environment where they can appreciate the benefits that nuclear medicine can offer patients and its rapid pace of development. The full picture that can be seen through the eyes of a multimodality imaging specialist and the possibilities offered by targeted radionuclide therapy are the best advertisements for our young colleagues: we just have to make them aware of the possibilities. At the European level, we must make every effort to ensure that young doctors have equal opportunities to gain full access in their home country to the possibilities offered by our discipline.

We cannot predict the future, but we can shape it. Thinking ahead, and acting and working hard to realize our visions, is the key to success.