

Editorial

Nuclear Medicine Training in Europe: “All for one, one for all”

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The crucial question with respect to nuclear medicine training requirements, is what we are aiming for:

Do we aim for a “driving license”, allowing to drive safely in standard conditions, or is it our ambition to train “race car or Formula 1 drivers”, experts that know every part of a car, competent to get the maximum out of it in different terrain and weather conditions and to provide engineers the necessary feedback on every detail for further improvement of the car’s performance?

When it comes to nuclear medicine training, both options allow to safely and adequately perform diagnostic and (depending on the “license”) therapeutic nuclear medicine procedures in clinical routine. However, only the last, “race car or Formula 1 driver” option ensures that the next generation nuclear medicine physicians will have the necessary skills and competence for shaping the best conditions for the further development of molecular imaging and radionuclide therapy.

Nuclear medicine in Europe has never been in a better shape than today. This is no coincidence, but the result of nuclear medicine being an independent specialty with a 4- to (mostly) 5-year dedicated training program in most European countries. The advantage of such a dedicated training programme is that it covers the pathophysiology and biology of diseases, therapy related radiobiology and dosimetry, integration of functional and molecular imaging in the clinical context and patient management. This clinical and translational approach has been the cornerstone of nuclear medicine since its foundation +/- 50 years ago as a joint initiative of internal medicine physicians, physiologists and clinical biologists. This “genetic” link between “molecule and man” providing an insight in the potential of radiopharmaceuticals as well as in the clinical need in patient management, is undoubtedly the key to success, resulting in the recent major advances in molecular imaging and theranostics, opening the door for patient-tailored image guided therapy.

From a technical point of view, the emerging field of hybrid imaging during the past decade has tremendously contributed to the increased impact of nuclear medicine on patient management facilitating the localisation of molecular findings and hence improving diagnostic accuracy. The

introduction of hybrid imaging has created the need for changes in the nuclear medicine training program to provide sufficient expertise in anatomic cross-sectional imaging allowing an integrated interpretation and report of the hybrid examination.

While professional activity is regulated by national law in EU Member States, the European Union of Medical Specialists (UEMS) and European Boards provide specialty-based recommendations for decision-makers at the National and European level Directive to comply with the European Directive (2005/36/EC) establishing the mechanism of automatic mutual recognition of qualifications for medical doctors according to training requirements within all Member States. During the council of the UEMS held in Tel-Aviv, April 2017, the Training Requirements for the Specialty of Nuclear Medicine have been discussed and officially endorsed [1]. This document provides definitions of specialist competencies and procedures as well as how to document and assess them; it aims to provide the training requirements not only for trainees, but also for trainers and training institutions. Compared to the previous version, hybrid imaging is now fully integrated in the content of training regarding both the theoretical knowledge as well as the practical and clinical skills.

Due to the many differences between EU Member States with respect to national laws on professional activity (e.g. the use of unsealed radioactive sources is in most EU countries restricted to nuclear medicine physicians, while in other countries its use is authorised for other specialties; a double specialisation is allowed in one EU country and prohibited in another, ...), there is a wide diversity of nuclear medicine training programs across Europe, resulting in significant differences in competencies between nuclear medicine physicians, particularly in the field of hybrid / cross-sectional imaging.

In most EU countries, a dedicated nuclear medicine training programme is applied, often consisting of 1-2 years of training in internal medicine and integrating education and training in hybrid imaging in the nuclear medicine curriculum, with or without a dedicated training in anatomic cross-sectional imaging in radiology. Some countries changed their nuclear medicine curriculum recently.

In the UK, nuclear medicine services are provided by two groups of specialist registered consultants: nuclear medicine physicians who can provide a comprehensive radioisotope service including both diagnostic and therapeutic services and Radionuclide Radiologists who provide diagnostic radioisotope services. A new training curriculum for nuclear medicine physicians was implemented in August 2015, expanding the training programme from 4 years to 6 years [2,3]. After completion of core medical training and the Royal College of Physicians membership exams or equivalent, the first 3 years are primarily dedicated to the acquisition of radiological skills under the auspices of the Royal College of Radiologists. The second 3 years are primarily dedicated to nuclear medicine training under the Royal College of Physicians. As a result, nuclear medicine physicians who complete the new curriculum will have equivalent diagnostic radiology skills to their radiology peers without having lost any opportunities in terms of clinical or scientific experience, training and qualifications, offering the best of both worlds. The curriculum of Radionuclide Radiologists (5 years of radiology training + 1 year of radionuclide subspecialty radiology training) remained unchanged.

In the Netherlands, a combined 5-year residency curriculum for radiology and nuclear medicine [4] has been implemented, with 8 differentiations or subspecialties including one “nuclear medicine and molecular radiology” subspecialty, consisting of 20-month nuclear medicine training. Whether this new training program will allow automatic mutual recognition of qualifications of future Dutch “nuclear radiologists” as a nuclear medicine physician in other EU-countries and vice-versa is still an open question. The same applies for the short and long term effects on the development of nuclear medicine related research at a national level.

Given the wide diversity of national nuclear medicine training programs across Europe and the changes in educational needs of the nuclear medicine community, the EANM decided to review and modernise its educational system by founding in 2016 the European School of Multimodality Imaging & Therapy (ESMIT) [5] as response to the rising demand for education and training in multimodality imaging and the fast-evolving field of theranostics. ESMIT is structured in 3 levels. Level 1, the entry level, is a 100% electronic learning platform covering basic topics. All eLearning contents can be viewed for free and build the basis of knowledge


preparing all users appropriately for the upcoming levels. Level 2, the intermediate level, goes to the heart of evidence based teaching, focussing on clinical practice by providing a mixture of theoretical and practical, interactive 3-day courses in academic centres all over Europe. In level 3, the advanced level, knowledge is deepened and expanded for individuals developing subspecialty areas of interest. These high-end courses are held in the EANM Learning Center in Vienna. Currently, EANM/ESMIT and UEMS/EBNM (European Board of Nuclear Medicine) are working closely together to provide certification for each ESMIT-level by next year.

In conclusion, the translational and clinical roots of nuclear medicine are the strength of the specialty and the driving force behind the fast-emerging field of diagnostic and therapeutic applications with radiopharmaceuticals, catalysed by the introduction of hybrid imaging. In Europe, these clinical and translational genes of the specialty are still dominant and expressed in the nuclear medicine training program in most European countries, consistent with the Nuclear Medicine Syllabus of the UEMS and providing the current and future nuclear medicine trainees the necessary dedicated background for contributing to the further development of nuclear medicine throughout Europe. Recent technological and radiopharmaceutical developments contributed to tremendous progress in the field of nuclear medicine, creating the need for changes in the nuclear medicine training program. ESMIT is EANM's answer to this need for education in cross-sectional and multimodality imaging as well as in the fast-emerging new diagnostic and therapeutic nuclear medicine procedures by providing a 3-level (basic up-to expert level) education structure; a certification for each level is under development in collaboration with UEMS/EBNM.

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