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Editorial

Competencies in radiation oncology: A new approach for education and training of professionals for Radiotherapy and Oncology in Europe

Richard Pötter [a,b,*], Jesper Grau Eriksen [c], Andy W. Beavis [d,e,f], Mary Coffey [g], Christine Verfaillie [h], Jan Willem Leer [i], Vincenzo Valentini [j]

[a] Department of Radiotherapy, Comprehensive Cancer Center, Medical University of Vienna, General Hospital of Vienna, Vienna, Austria; [b] Christian Doppler Laboratory for Medical Radiation Research for Radiation Oncology, Medical University of Vienna, Austria; [c] Department of Experimental Clinical Oncology, Aarhus University Hospital, Denmark; [d] Radiation Physics Department, Cottingham; [e] Department of Computer Science, University of Hull; [f] Sheffield Hallam University, UK; [g] Trinity Centre for Health Sciences, Dublin, Ireland; [h] European Society for Radiotherapy and Oncology (ESTRO), Brussels, Belgium; [i] Radboud University Nijmegen Medical Centre, Radiation Oncology Department, The Netherlands; [j] Radiotherapy Department, Università Cattolica S. Cuore, Rome, Italy

Progress in radiation oncology has been significant during the last decade and will continue to undergo even more dynamic development in the decade to come [1–4]. Cancer is recognized as one of the major diseases with increasing frequency and relevance not only in the western world but also from the global perspective [5]. One major reason is the aging population, which provides great challenges with respect to management and maintaining the quality of life. In this respect radiation oncology, as a minimally invasive procedure, will provide a real opportunity to achieve this.

Developments in the multidisciplinary approach to cancer care and research

The multidisciplinary approach to cancer care, research and education is becoming more and more dominant throughout Europe and the world (e.g. Comprehensive Cancer Centers (CCCs), ECCO, European/American Association of Cancer Research (EACR/AACR)). This implies that diagnosis, planning, treatment and follow-up of the cancer patient and clinical and translational cancer research more commonly takes place within a multidisciplinary team of various specialists working closely and efficiently together. Co-operative communication and working structures between various diagnostic, therapeutic and research disciplines have been set up in the organization and workflow of care for the cancer patient, in clinical and translational research, in undergraduate, postgraduate and continuous education and also in building and securing sustainable bridges between these different fields. A strong bridge between research and patient care closely linked to education is essential to reflect the progress in both fields and the need for continuous translation between them.

The diversification goes into further specialization in cancer care with a growing number of disciplines combined and focussed on the optimal diagnosis and treatment tailored to the individual requirements of the patient ("personalized medicine"), extends beyond the classical pillars of surgical, radiation, medical and organ related oncology. These network structures are fostered enormously by the dynamic progress in information technology with new possibilities and horizons for information processing and with open internet access becoming increasingly important for the daily work of the cancer professionals. This progress has impacted on the information available to and therefore the communication process with cancer patients and on cancer education.

Societal demands for high quality in cancer care and research is applicable in radiation oncology when considering the complex process of planning and delivering radiation therapy in the multidisciplinary setting [6–8]. Finally, financial issues, cost effectiveness and appropriate economical management have become increasingly prominent [9–11], and must be considered in all treatment approaches.

The significant progress in cancer research applies to all related fields: prevention, screening, diagnosis, planning, treatment, outcome assessment (including morbidity and quality of life), the basic and translational research fields, in particular tumour and normal tissue molecular and clinical biology [3], basic and applied technology and biotechnology research and development [4] and drug design and development [12].

This significant progress in the various fields of cancer care encompasses the huge and growing diversification in multidisciplinary cancer diagnosis and treatment, the management of adverse side effects, and in supportive and palliative care which are all reflected in the revised core curricula.

The multi-disciplinary tumour board and the multi-disciplinary clinic are key instruments being introduced increasingly throughout Europe, preferably within the frame of a multidisciplinary cancer centre. Tumour boards enable the various disciplines focussed on the individual cancer patient to translate scientific and technical knowledge into cancer diagnosis and treatment. Evidence based medicine has become the major driving force for decision making in such multidisciplinary settings through the publication of guidelines [13–22], and through expert opinion and experience [23].

Decision making in oncology must also reflect consultation with the individual patient allowing for their needs, wishes and

* Corresponding author. Address: Department of Radiotherapy, Comprehensive Cancer Center Vienna, Medical University of Vienna, General Hospital of Vienna, 18–20 Währinger Gürtel, A-1090 Vienna, Austria.
E-mail address: richard.poetter@akhwien.at (R. Pötter).

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preferences to be expressed and thereby facilitating a greater level of patient recognition and autonomy. However, in particular in the growing complexity of the multidisciplinary oncological field, the request for patient orientated shared decision making is both improved and at larger risk in particular in respect to patient autonomy [24]. In multi-disciplinary oncology the need for appropriate joint decision making is increasingly recognized as a major factor by all professionals and is often supported by the role of a "case manager" within the tumour board taking into account the individual patient needs [25]. Research in this important field of psychosocial medicine in general and psycho-oncology in particular is growing and underlines the need for a specific focus on appropriate joint and shared decision making in multi-disciplinary settings with major implications for education.

Competency as a new paradigm in radiation oncology education

These developments in oncology require experts who are able to meet the associated growing challenges. This can be achieved by providing the knowledge skills and attitudes which underpin defined competencies in areas including communication, collaboration, social actions, organization and management. Knowledge and skills necessary for the application of certain techniques in specific fields of oncology have been recognized and underlined as the major driving forces for education and training in the past [26–28], which included implicitly the ability to carry out specific activities. Now a new explicit paradigm "competency" expresses the knowledge, skills and attitude in a way that ensures professionals in current and future oncology related disciplines are educated appropriately and comprehensively in order to meet the growing demands of the more complex patient management approaches.

This need for a new paradigm addressing competencies in training and education was first put forward by the Royal College of Physicians and Surgeons of Canada [29,30], in order to describe advanced education and training in medicine to meet the growing societal needs. These developments have now been integrated by ESTRO and the European Board of Radiotherapy of the Union of European Medical Societies (UEMS) into the new European core curricula [31–34]. Competency based programmes should become the frame for the development of education programmes be set up by the UEMS and education institutes throughout Europe for the radiation oncology professional disciplines in the future.

Progress in radiation oncology

The field of radiation oncology has also experienced significant developments during the last decade [2–4,6,13,35,36]. The significant developments in radiation oncology may be characterized by progress in imaging and diagnosis, computer and information technology, molecular and clinical (radio)-biology, multidisciplinary decision making, treatment planning and delivery of radiotherapy, combined modality treatment and in supportive and palliative care all of which contribute to widen the therapeutic window.

The ESTRO perspective on European radiation oncology [37] which is reflected in the new core curricula comprises not only a comprehensive view of the very complex setting of advanced radiation oncology based on modern imaging and information technology, knowledge of tumour pathology and (radio)-biology, of normal tissue (radio)-biology but also the whole scenario of clinical implications for the complete treatment of the cancer patient. This clinical scenario comprises the application of radiotherapy alone or in combination with (simultaneous) chemotherapy/"targeted" therapies as well as supportive and palliative care for patients during and after treatment. The radiation oncology team should support and guide the cancer patient from diagnosis to treatment and provide long term support and end of life care for both long term survivors and patients with limited life expectancy.

The dynamic developments within the radiation oncology field have also contributed much to the professional specialization and diversity of the radiation oncology professionals: the clinical radiation oncologist, the medical radiation physicist, the RTT (radiation (technology) therapist), the clinical radiation biologist, the radiation oncology cancer nurse [38], the psychosocial expert and the radiation oncology administrator and manager. The radiation oncologist needs more and more specialization both in radiation oncology and in specific organ related oncology. Medical physicists and RTTs have become more and more recognized as experts in their specific domains which have become significantly enlarged, including for example imaging and computer technology. Moreover, they have become essential partners in the comprehensive multidisciplinary process of radiation oncology, in particular in treatment preparation and planning, treatment delivery and patient care.

The rapid progress in research and development in radiation oncology and oncology in general, means that a continuous bridging of cancer care and clinical and translational research is necessary in this dynamic field.

The new European core curricula for radiation oncology professionals: competencies, skills and knowledge

This emerging comprehensive view of radiation oncology as a whole is clearly reflected in the new core curricula [31], which necessitated an update of knowledge and skills for the three professions included in the ESTRO European core curricula to date. In addition the ESTRO education branch identified the need to make explicit the requirement for professionalism and competency to meet the upcoming challenges resulting from the dynamic developments in the fields of radiation oncology related cancer care and research. For this reason the ESTRO Committee for Training and Education in 2007 selected competency based education as the most appropriate method to define the content of the revised ESTRO European core curricula. The revisions were carried out by three task groups representing the three disciplines [32–34].

The transition to competency based education and training is facilitated by insight into the structure of the learning process (e.g. from "theory to practice") which has a long history in the science of pedagogy, in the past more directed to learning processes in childhood and adolescence, but more increasingly transposed to adults ("andragogy"). These analyses of major elements of learning (e.g. the international well recognized "Blooms taxonomy") form the basis of the competency based approach presented here.

This transition has implications for European national and international activities in training and education. The transition of these major elements of these competency based curricula into national curricula and, therefore, the various sites for education and training implies changes in the organization of education programmes at the institutional level [28] and the adaptation of assessment and examination procedures on the national level [39]. Such changes should be introduced carefully in a step by step procedure as part of a continuous learning process and will likely require a significant transition period which may differ from one European country to another, for various reasons. This process has already started in some countries who have integrated "competency based education and training" into their curricula and their national programmes. These documents have been developed as instruments for the harmonization of education and training in Europe for the mid and long term. Each national society and/or education institution will

have to decide, based on their specific national situation, on the strategy for translation of these European programmes into national practice. The updated European core curricula for professionals in radiation oncology with the focus on competencies should facilitate the evolution of an efficient exchange of cancer radiation oncology professionals throughout Europe. The freedom of movement of doctors has been enshrined in European legislation since 1993 with the mutual recognition of diplomas, certifications and other evidence of formal qualification". This has recently been updated by the European Commission [40].

ESTRO (School) and UEMS to promote the new European core curricula

These new core curricula for radiotherapy and oncology may also serve as a driving force to introduce competency based education and training into the large field of diagnostic and therapeutic multidisciplinary oncology in Europe. This may be supported by upcoming activities of UEMS in this direction, the European cancer societies such as ECCO, the specific societies related to the various disciplines in oncology as e.g. ESMO, ESSO, SIOPE, organ related societies such as EAU, ESHNO, ESGO, diagnostic societies such as ESR and EANM and last but not least by the Society of European Cancer Education [41].

ESTRO has initiated the support for this transition by providing a dedication one day workshop on "competency based training and education – the new European core curricula", with the inclusion of interactive elements. This workshop was held at ESTRO 29 in September 2010 and will be repeated at ESTRO 31 in Barcelona May 2012. It is envisaged that this will become a regular feature at future congresses together with joint efforts to follow up on the process of implementation of these new European core curricula in the various national settings. Representatives from the national societies of the three involved disciplines (radiation oncology, medical physics and RTT) are invited to participate in this course.

The transition to competency based education and training will also be supported by ongoing developments in the ESTRO School with an increasing number of competency orientated didactic elements within the growing number of teaching courses and teaching sessions during congresses focussing on active learning by problem solving, interactive teaching elements, small group tutorial and workshops. Web based and e-learning educational activities started within the framework of the ESTRO School with the introduction of two major elements: the web based learning platform for contouring (FALCON) and the implementation of web based e-learning teaching courses on the EAGLE platform. Some areas of the competency based curricula are major integral elements of these web based activities which will be developed in the coming years.

Finally, these new European core curricula will form the framework for the content and methodology of future programmes in the ESTRO School for Radiotherapy and Oncology. The aim of the ESTRO School is to cover the elements of the core curricula as comprehensively as possible, complementing national and institutional training programmes in Europe and beyond. Currently the ESTRO basic and advanced teaching courses relate to the fields of multidisciplinary oncology, biology, physics and technology, imaging, brachytherapy and practice/management [42]. A recent survey by the ESTRO Education and Training Committee and the teaching course directors, showed that the content and methodology of these courses already cover the majority of essential topics as defined in the updated curricula. The inclusion of areas not currently covered will be addressed in the future programme of the ESTRO School and will include topics such as palliative radiotherapy, adverse side effects and supportive care, organ sites and malignancy topics such as CNS, malignant lymphoma and sarcoma.

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