Benchmarking Radiation therapist (RTT) Education
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Introduction
A benchmark is a point of reference to enable comparison with best practice in the area and to continue to improve and update. A benchmark document for RTTs should encompass technological, clinical and psychosocial aspects that impact on professional practice. A benchmark report is the end point of research and analysis of the specific area and reflects the recommendations developed as a result of this process.

In addition, to enable mobility, consistent with the aspiration of the European Community, it is necessary to be able to describe the level of the qualification in a transparent way that allows direct comparison between institutions and countries. This is achieved by describing programmes in terms of learning outcomes and in terms of the European Qualifications Framework.

Radiation therapists (RTTs)
RTTs are the group of professionals with responsibility for the delivery of radiotherapy to cancer patients and, as part of the multidisciplinary team, for elements of treatment preparation and patient care. This encompasses the safe and accurate delivery of the radiation dose prescribed, the support of the patient on a daily basis throughout the treatment preparation, treatment and immediate post treatment phases and the identification and early intervention with respect to acute side effects. The RTT is often the link person for the patient within the multidisciplinary team comprising essentially the radiation oncologist, radiotherapy medical physicist and the RTT. RTTs liaise also with all the other allied health professionals in ensuring the needs of the patient are met.

The purpose of this ESTRO benchmarking document is to clearly define the competencies that a graduate RTT should have consistent with European Community aspirations as expressed by the European Higher Education Area publications. These competencies have been defined based on current clinical
practice across Europe and reflect the wide range of roles and responsibilities taken by RTTs in different clinical settings. The lack of radiotherapy specific education results in inconsistency of practice, restricts professional development, limits free access and puts the patient at risk. The European Federation of Radiographer Societies (EFRS) previously produced a Benchmark document for EQF level 6 (Bachelor Degree).\(^1\) Within this document they indicate that the majority of learning outcomes for diagnostic radiography, nuclear medicine and radiation therapy are similar. This is in direct contrast to the situation for radiologists and radiation oncologists, who have appropriately clearly demarcated learning outcomes. ESTRO was part of the Medical Radiation Protection Education and Training consortium (MEDRAPET) on which some of the EFRS Benchmarking document sections are based. However ESTRO was unhappy that some of the suggestions made by ESTRO in the final review were not included in the MEDRAPET final document but agreed to endorse it for expediency given the importance of the topic to all disciplines. ESTRO did not endorse the EFRS document, as the necessary basic learning outcomes required for the safe practice of radiotherapy were absent. This is in direct opposition to the principle of safe treatment that underpins all activity of ESTRO. Similarly, generic learning outcomes in relation to numeracy and risk management, competences that are paramount to the safe delivery of radiotherapy, were presented in the EFRS document. The EFRS chose not to address the ESTRO concerns raised regarding the unsuitability of generic learning outcomes for individual professions. Therefore ESTRO has produced its own benchmarking document at EQF level 6 (Bachelor Degree) which is specific to the educational requirements of Radiation Therapists across Europe. This document will also assist in the free transfer of Radiation Therapists as its content is both specific to the profession and is defined at an appropriate level.

This ESTRO benchmarking document can be used to ascertain the level of radiotherapy education programmes relative to the European standard and to assist in the identification of strengths and weaknesses of programmes in relation to radiotherapy-specific education. The standard of education in radiotherapy has been defined by the 3rd Revision of the ESTRO Core Curriculum for RTTs.

Radiation Therapists (RTTs), who are critical members of the radiation oncology team responsible for the safe and accurate delivery of the radiotherapy prescription, have endeavoured for many years to attain professional recognition specific to their discipline, at an international level. Professional recognition encompasses the provision of defined education programmes underpinning graduate competence. The changing face of radiation oncology with increasingly complex treatment approaches is now, more than ever, dependent on an appropriately educated, competent workforce to ensure accurate preparation and delivery of treatment within a safety aware environment for all patients.

The European Society for Radiation Therapy and Oncology (ESTRO) has a long history in the provision of a wide range of educational material to support the discipline of radiation oncology as a whole and to meet the requirements of the individual professions it represents. This includes development of core curricula, annual scientific conferences, guidelines on best practice and a range of short courses covering the essential topics of professional competence. ESTRO, therefore, is in a position to assist in the development of appropriate education programmes for RTTs.

The ESTRO, through the RTT committee has sought, over a twenty-five year period, to address the educational and professional issues of RTTs. In this respect the RTT committee of ESTRO, over a twenty-year period, has produced three core curricula reflecting developments both in the discipline and in educational theory and defining the educational programme requirements for this profession. The core curriculum is designed to assist education institutes in
the preparation of new programmes and the updating of existing programmes
and contains detailed information on subject content and pedagogic approaches.

In 2014 the RTT committee produced its first benchmarking document defining
the knowledge, skills and competences expected of a graduate RTT. This
approach is consistent with the aspirations expressed in the Bucharest
Communique of 2012\(^2\) which reiterated... the need for graduates to be able to
“combine transversal, multidisciplinary and innovation skills and competences
with up-to-date subject-specific knowledge so as to be able to contribute to the
wider needs of society and the labour market”.

All graduates seeking to pursue a career as an RTT should be able to think
critically, examine practice, problem solve and make decisions based on
scientific evidence. They should be able to reflect on their practice and consider
ways in which it can be improved. This is consistent with the fundamental
concepts of a competency where ‘a competency encompasses any quality that
contributes to successful job performance’ ... it includes any attribute,
knowledge, skill, ability or other quality that contributes to successful job
performance.\(^3\). To ensure that the competencies defined in the benchmarking
document accurately reflect current practice across Europe the RTT committee
used the information gained from a comprehensive questionnaire covering
education level and content, as well as roles and responsibilities expected of
RTTs originally circulated as part of the ESTRO third revision of the core
curriculum. The eleven competencies thus defined and described in detail in the
benchmarking document were: Professionalism, Inter and Intra professional
communication, Positioning and immobilisation, Image acquisition and virtual

\(^2\) EHEA Ministerial Conference, Bucharest 2012. Making the Most of Our
Potential: Consolidating the European Higher Education Area, Bucharest

\(^3\) Defining core competencies. Leadership Development Programme 2012.
University of California, Berkeley
simulation, Treatment planning, On treatment verification, External beam treatment delivery, Quality assurance, Brachytherapy, Research and Education.

To achieve this level of overall competency and to ensure that the aspirations of the European Community expressed in the Bucharest Communique are met, any appropriate education programmes should be at the EQF level 6 consistent with the 3rd Revision of the ESTRO Core Curriculum for RTTs. Level 6 ensures provision of quality higher education underpinning mastery of the profession together with strengthened mobility, which will enhance education and graduate employability across Europe. However the level is only one component of appropriate education and the content of the programme must also be considered as reflected in the pedagogic recommendations and curriculum content of the ESTRO documents.

**Using the ESTRO Benchmarking document in RTT education**

Over the last decade there has been a lot of publicity highlighting major incidents that have occurred in radiotherapy. This has led to an increased awareness in the importance of safety. Education is a key component of safety in radiotherapy, it underpins understanding of the disease, the technology and their interactions and thereby the consequences of incorrect exposure. The RTT must be constantly aware of the potential for harm that can result from incorrect or inaccurate treatment preparation or delivery. This also supports knowledge based reporting and learning from minor or near incidents now a requirement of European Legislation Council Directive 2013/59/Euratom.

The rapid technological developments over the past decades have resulted in role development and expansion and an increased level of responsibility being taken by the RTT. Unfortunately education programmes have not responded to these changes and still fail, in the majority of instances, to prepare graduates to contribute fully to their evolving environment. Weekly or daily online verification is now routine with the RTTs making necessary adjustments within defined parameters. In some centres, where adaptive radiotherapy is in place, RTTs are responsible for selecting the plan of the day and it is likely that this will
become a routine part of practice in the future. Combined chemotherapy and radiotherapy is now common for many tumour sites and the RTT must be familiar with the side effects resulting from both modalities and their interaction with each other as side effects are frequently enhanced by this combined approach. RTTs are responsible for patient positioning and immobilisation for image acquisition for treatment planning purposes and in several countries the RTTs are directly involved in treatment planning. RTTs may also be involved in defining Organ at Risk volumes and in all centres directly responsible for the actual treatment delivery with all that this encompasses. Any education programme should be of sufficient academic rigour to enable graduate RTTs to work at this level of competency and to be able to adapt accordingly to the inevitable developments that will take place in the coming years. A graduate RTT from an appropriate academic programme will be able to progress in their career and enhance their profession through participation in research within the multidisciplinary team and to initiate and manage research and innovation within their own scope of practice.

The current situation with regard to education for this professional group is very varied across Europe and in the majority of instances radiotherapy is only a minor component of an education programme designed primarily for another discipline. Table 1 outlines the percentage of radiotherapy specific content within a wide range of education programmes. This information was acquired through the extensive questionnaire circulated as part of the third revision of the ESTRO core curriculum for RTTs.
Table 1: Percentage of radiotherapy in education programmes

<table>
<thead>
<tr>
<th>Academic centre</th>
<th>Clinical centre</th>
<th>Percentage of Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4yrs</td>
<td>2 yrs</td>
<td>&lt;2yrs</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Current degree programmes include some radiotherapy and award a licence to practice as an RTT as well as in another area. Institutions offering such education programmes at level 6 will argue that graduates are competent to work not only in radiotherapy but also in areas as widely diverse as diagnostic imaging or nursing. The issue with the majority of these programmes is that the radiotherapy specific content is minimal (Table 1). The perception is that having a mixed education allows graduate to fulfill a variety of roles within the healthcare setting giving greater flexibility for the service and wider opportunities to the individual. However this is an insufficient argument in the context of meeting the radiotherapy specific competencies underpinning accurate and safe practice and continuity of care.

Given the current complexity of radiotherapy, the ongoing technical developments that will be introduced into clinical practice within the coming years and the biological and molecular agents that will be commonplace in clinical care within a decade, it is essential that education programmes are specific for RTTs and are designed to incorporate the core sciences subject underpinning safe and accurate practice. This is lacking in the majority of programmes as seen in Table 1.

Using this benchmarking document together with the ESTRO 3rd Revision of the Core Curriculum for RTTs to evaluate current education programmes with
respect to both level and content will help to underpin accurate and safe radiotherapy for all patients across Europe.