Editorial

Optimizing clinical research and generating prospective high-quality data in particle therapy in Europe: Introducing the European Particle Therapy Network (EPTN)

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The current issue of Radiotherapy and Oncology includes a series of scientific papers on the use of particle therapy (PT) for cancer treatment, including the first reports from the working groups of The European Particle Therapy Network (EPTN), a Task Force under the Scientific Committee of ESTRO [1–8]. The EPTN reports add to a significant amount of recent papers published in Radiotherapy & Oncology within the field of particle therapy [9–27].

Particle therapy (PT) offers both new opportunities for improvements in cancer care and new opportunities for high-quality research. The need to generate clinical evidence for PT is extremely important for the radiation oncology community. With high initial capital investment and personal costs, with the costs of servicing the hardware, the introduction of PT has been slow and difficult on the old continent. Most European countries have a high degree of public coverage of health care, and thus have also a regulated evidence-based system for investments in new and costly technology. Collaboration between PT centers for generation of scientific and clinical evidence is thus of critical importance.

There have been several European networks working in the field of PT, including ULICE, ENLIGHT and EPTN. The two former were funded by EU grants and have contributed significantly to the science and early clinical development of PT in Europe. ULICE was a 4-year project set up by 20 leading European research organizations, including 2 leading European industrial partners, to respond to the need for greater access to hadron-therapy facilities for particle therapy research. The ULICE project ended in 2014, leaving a substantial contribution of reports and white papers in the public domain. The ENLIGHT scientific network was established in 2002 to coordinate European efforts in hadron therapy research and continues to meet annually for a plenary meeting and educational sessions, focusing primarily on basic and translational research issues within ion beam therapy [8].

The EPTN was established in 2015 in response to the increase in number of clinical PT centers in Europe. The need to cooperate among centers and integrate PT in the framework of existing clinical radiation oncology research networks was identified as being of paramount importance. Especially the integration of PT into radiation oncology was a unique key aim of EPTN. PT is only one part of radiation oncology and needs to be well aligned with other radiation techniques as well as with general developments in cancer research and patient care. Therefore, ESTRO was asked to collaborate with EPTN and agreed to facilitate the group, and in 2017, EPTN was adopted as an official Task Force of ESTRO, reporting to the Scientific Committee.

The first meeting of the EPTN was hosted by ESTRO in Brussels in May 2015 and included a brainstorm on which areas of PT it might be interesting and suitable to work together. All major European centers interested in particle therapy were invited, with 28 centers and two research organizations (the European Organisation for Nuclear Research (CERN) and the European Organisation for Research and Treatment of Cancer (EORTC)) represented. Smaller working parties (WPs) with experts for different topics to further elaborate PT discussions in Europe were formed (Table 1). It was emphasized that the initiative should be fully inclusive and integrative, and all centers invited to participate in the WPs.

The second meeting in May 2016 was again held at the ESTRO headquarters in Brussels. This meeting saw 27 centers represented including EORTC and CERN. The purpose of the meeting was to receive an update on the activities of the WPs and discuss the way forward. Some key aims, deliverables and milestones were discussed, including the surveys and other work presented in the current issue of Radiotherapy & Oncology [3–7].

During the third meeting in April 2017, it was decided to use the platform of EORTC for a prospective data registration and potentially also for future multicenter clinical PT trials. It was strongly felt that using the EORTC network and clinical trial tools (1), not limited to but including databases that could handle information from multiple clinical, diagnostic and molecular sources and using the Quality Assurance digital platform [2] could benefit substantially the foreseen research performed by the members of EPTN. It was also decided to further integrate the activities of ENLIGHT and EPTN, in the first place by having back-to-back annual meetings, which will happen for the first time in London 2018. EPTN will also actively collaborate with the Particle Therapy Co-Operative Group (PTCOG), founded in 1985 with the mission of promote science, technology and clinical application of particles
for cancer care. In 2013, PTOCG North America was additionally created as a non-profit professional society to foster collaboration between US centers and to develop education and training initiatives for PT to name a few aims. The key difference is that EPTN will interact with health care policies, the various European health care systems and professional societies as an integrated part of radiation oncology, utilizing the interdisciplinary structure of ESTRO.

EPTN will promote clinical research and generate prospective data that are key for the appropriate clinical application of this costly technology. It is interesting to note that although approximately 180,000 patients have been treated with ion beam therapy, most of them with protons, no conclusive data have emerged from these remarkable multi-institutional/international cohorts. The main reasons for this disheartening observation is that PT was usually delivered in the past in remote physics’ research facilities with no clear connection with clinics and that the low number of such facilities using various beam delivery technologies hampered severally high-quality clinical research in PT. Importantly, the lack of networking between PT centers and the absence of astute trial methodology at that time additionally prohibited the generation of data in the field of particles. This will definitively change with the construction of a substantial number of PT centers in Europe and elsewhere embedded in hospital campuses using more or less homogeneous industry-generated hard-, firm- and software. Although these developments could foster data generation, a key to achieve this goal is the collaboration between members and the generation of prospective databases as proposed by Langendijk et al. in this issue of Radiotherapy and Oncology [7]. The EPTN network will also tackle some of the perceived limitations of PT, such as image-guidance, as decried by Hoffmann et al. in the same issue [3]. With the combined efforts of all these dedicated working groups and institutions, there is no doubt that European PT is ready for prime time.

References


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