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Case Report: Education and training of RTTs for radiation oncology departments in Russia



V.V. Glebovskaya*, S.I. Tkachev, A.V. Nazarenko, B.I. Dolgushin, E.V. Khmelevskiy, M.V. Kislyakova

Federal State Budgetary Institution "N.N.Blokhin National Medical Research Center of Oncology" of the Ministry of Health of the Russian Federation, Russian Federation

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ABSTRACT

Modern radiotherapy is performed with sophisticated equipment that requires highly qualified professionals. In the Russian Federation the responsibilities of Radiation Therapy Technologists (RTTs) are carried out by medical nurses who receive on-the-job training. The article discusses the problems of RTT education and training, describes our own teaching experience and suggests further development for the national RTT education system in Russia.

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The title Radiation Therapist (RTT) is not officially recognised in the Russian Federation so, for simplicity and clarity, in the article we will use the title RTT to avoid conflict with the officially recognised title used by clinicians working in radiotherapy departments in the Russian Federation.

Over the last five-year period there has been a rapid growth in the number of radiotherapy clinics equipped with state-of-the-art equipment and using cutting-edge technologies in Russia. Technological advances have made radiation therapy more precise, faster, more efficient and safer. Advances in imaging technologies have provided valuable additional information, which is essential for modern radiotherapy. CT, MRI, PET/CT, PET/MRI data is very important for the definition of the accurate delineation of tumour volumes and Organs at Risk (OARs). The use of Ultrasound, Cone Beam CT and MRI allow us to define and control the tumor and the patient position during treatment preparation and radiotherapy delivery.

In many other countries the RTT is a key member of the multidisciplinary team together with the radiation oncologist and medical physicist and, as such, is responsible for treatment delivery and for elements of preparation. The ICRP, report 48 of 2000, states that

“Radiation therapy technologists have the responsibility for the set-up and delivery of the treatment, are involved in the simulation of the treatment, and have, therefore, an essential function in noticing any abnormal reaction of the patient or the machine and to report them” [1].

Unfortunately, in Russia and other countries of the former Soviet Union (with the exception of the Baltic States that became members of the European Union) the profession of RTT was not officially recognized and there was no education programme specific to that profession. The responsibilities of RTTs were performed by medical nurses who received on-the-job training, which was provided by senior staff from the radiation oncology departments. The on-the-job training period lasted from 6 to 18 months depending on the complexity of equipment.

It is quite evident that the increasing complexity of equipment and technologies requires appropriate education and training of RTTs. Currently when new equipment or techniques are introduced in the radiotherapy clinic, an acute problem arises as the education background of the middle-level medical nurses who perform the responsibilities of an RTT is not appropriate for the challenges associated with developments in radiation therapy practice.

The participation in the “IAEA/ESTRO Training Course on Best Practice in Radiation Oncology – Train the RTT (Radiation Therapists) Trainers” in 2013 encouraged us to start developing a national education programme for RTTs based on the core competences that would enable them to practice as an autonomous professional within the multidisciplinary team.

When developing the national education programme for RTTs we carefully studied the existing programmes and recommendations including *A Syllabus for the Education and Training of RTTs (Radio Therapists/Therapy Radiographers)*, IAEA, Vienna 2005, IAEA-TCS-25 [2]; *the Recommended ESTRO Core Curriculum for RTTs (Radiation Therapists) – 3rd edition* [3]; *A Handbook for the Education of Radiation Therapists (RTTs)*, IAEA, Vienna, 2014, IAEA-TCS-58 [4]. This analysis helped us to develop a short-term national programme, which provided learners with sufficient knowledge and clinical

* Corresponding author at: 23, Kashirskoye Shosse, Moscow 115478, Russian Federation.

E-mail address: oncvalery@mail.ru (V.V. Glebovskaya).

competences necessary for the accurate set-up and delivery of radiation therapy. The radiation oncology department of the N.N. Blokhin Russian Cancer Research Center (N.N.Blokhin RCRC) with state-of-the-art equipment and technologies and medical professional experience was the clinical setting chosen to organize courses and practical sessions for the RTTs working in Russia.

In 2013 we launched the first one-month course for RTTs at the N.N. Blokhin RCRC. The target group was medical nurses from radiation oncology departments from various regions and cities across Russia (Kazan, Izhevsk, Volgograd, Omsk, Yakutiya, Armavir). The total number of participants was 15 and the training period was four weeks (144 academic hours). The programme, with both academic and clinical radiotherapy components, was designed in partnership with the faculty of the chair of “Diagnostic Radiology, Radiation Therapy and Medical Physics” of the Russian Medical Academy of Continuous Postgraduate Education. The purpose of the programme was to give the theoretical and practical knowledge and skills, necessary for independent professional work as an RTT in the radiation oncology department.

For more efficient acquisition of knowledge and practical skills the learners were divided into four groups. The education and training was delivered by the radiation oncologists, medical physicists, radiobiologists and RTTs from the N.N.Blokhin RCRC. The timetable was composed in such a way that theoretical lectures were followed by very intensive practical sessions. The academic content included the principles of CT and MRI procedures, quality assurance and radiation safety. Clinical practice was on the linear accelerator with 2D, 3-CRT, IMRT and VMAT techniques and on the brachytherapy units. In addition the participants took part in discussions at the weekly conference of the radiation oncology department where complex radiotherapy alone and combined treatment plans were presented [5].

The second course in 2014 was carried out together with the Medical College of Specialised Professional education. 25 participants from cities across Russia (Vologda, Magadan, Armavir, Kaluga, Balashikha, Petrozavodsk Yakutiya) registered for the course. Because of an RTT shortage and the long absence necessary to attend, the four-week course was reduced to two weeks with the programme content remaining the same. This necessitated the participants studying more intensively in two shifts. The focus was given to clinical practice. The practical sessions were devoted to treatment preparation and delivery and the operation of the linear accelerator including use of immobilization devices. The 3rd, 4th and 5th courses followed the same format. In addition the participants of the 4th course participated in the nurse programme of the Oncological Congress in November 2015 in Moscow where the RTTs were able to present clinical and administrative aspects of their job.

Traditionally, the last day of the course was devoted to the testing of the participants' knowledge and included questions on each topic taught. Upon completion of the test, the most complicated questions were discussed and certificates awarded.

The senior radiotherapy staff took part in the “Regional Follow up Education of RTTs in Europe: Progress Achieved and Action Plan for the Future”, Vienna, Austria, 14–16 December 2015. The main goal of the workshop was to report on the progress made and develop future plans for RTT educational activities. The member-countries

discussed the common problems of RTTs such as staff shortage and lack of long-term national education programmes. It was highly recommended that the radiotherapy component of education programmes should be sufficient to prepare the graduates of the course to become qualified specialists and successfully use the acquired knowledge and skills in their daily work in radiotherapy departments.

In November 2016 two experts representing the IAEA visited the N.N.Blokhin RCRC to assess the programme of the national training course for RTTs. They visited the radiotherapy department, analysed the existing programme and had long discussions on the programme with the senior radiotherapy staff. We were very thankful for their recommendations and advice which helped us to improve the education programme for RTTs and move forward with the strong intention to expand it to a course of 2–3 years duration at the medical college. They also took part in the RTTs section of the Congress of the Russian Society of Radiographers and Radiologists (RSRR) held on 7 – 9 November, 2016 in Moscow, where a presentation on the “Defining Curriculum for RTTs – the ESTRO and IAEA experience”, which was based on identified RTTs competences, was delivered.

In 2017 – 2018 we continued with our educational activities by organizing the education and training course for RTTs. For 2019 – 2020 we have developed the following plan:

- Proceed with the organization of and participation in the RTT section at the annual RSRR congress;
- Continue with the delivery of the 2–4-week basic and refresher education courses for RTTs once or twice a year until the launch of the 2–3 year education programme in the medical college;
- Introduce the specialty of RTT in the medical register;
- Set up the Russian association for RTTs;
- Develop the national programme for RTTs in collaborative partnership with the following Russian non-profit professional organization: Radiation Oncology Society (ROS), Russian Association of Therapeutic Radiation Oncologists (RATRO), Russian Society of Radiographers and Radiologists (RSRR).

Only through joint professional efforts will we be able to develop a national education programme for RTTs, which will meet the standards of RTT professional education set by International Atomic Energy Agency (IAEA) and European Society for Radiotherapy and Oncology (ESTRO).

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