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## Evaluation and quantification of long-term results of the Technical Cooperation Project - BRA/6/023 – IAEA

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**Introduction.** Advances in radiotherapy technologies have led to many benefits including better quality of treatments with potential less morbidity and survival improvement. These technologies, however, require not only more advanced equipment with higher costs, but also well trained human resources. In places where this technology is being implemented, qualified personnel is desired in order to properly start the treatment by itself. There is a lack of qualified personnel in our country regarding this subject.

A Technical Cooperation Project (TCP) - “BRA/6/023- Supporting the Qualification of Human Resources in Advanced Radiotherapy Techniques” was, thus, developed with the IAEA including three reference centers in Brazil. The objective of the project was to provide personnel training in advanced technologies in radiotherapy such as Volumetric Modulated Arc Therapy (VMAT), 4D technology and Stereotactic Body Radiation Therapy (SBRT), and Image-Guided Radiation Therapy (IGRT). Overall, 17 professionals participated in specific trainings in international institutions during the period of the project, in 2012 and 2013.

The objectives of this study were to evaluate and quantify the long-term results of this training.

**Methodology.** A questionnaire with 22 queries was sent to all the 17 participants of the TCP - BRA/6/023. Training was performed through fellowships or scientific visits. The questions included demographic data, years of experience in the field, information about the specific training and the outcomes after the training program. Personal comments were allowed at the end of the questionnaire.

**Results.** Seven radiation oncologists and 10 medical physicists were trained, seven male and 10 female. The mean age was 37, and the years of experience in the field ranged from 2 to 35 years, being the majority 3 years. The home institutions of the participants were Hospital das Clínicas of University of São Paulo, São Paulo, 48.9% (41.2% from the Cancer Institute – ICESSP, and 17.7% from the Radiology Institute – INRAD); 35.3% from Hospital Sírio-Libanês, São Paulo, and 17.6% from Centro Infantil Boldrini, Campinas, respectively. Training was performed in North American and European countries being 41.2% in the USA, 23.5%, Canada; 17.6% Germany; 5.9%, Netherlands; and 11.8%, others. The training activities started in July 2012 and finished in Nov 2013 being the great majority, 85.7%, a fellowship of one month period followed by 7.1%, for 2 months and 7.1% for 2 weeks (scientific visit) training, respectively.

The topics of interest for training were VMAT: 52.9%, 4D technology: 47.1%, SBRT: 82.4%, and IGRT: 70.6%. Interestingly, besides the subjects directly related to the project, cranial radiosurgery (41.2%), brachytherapy (17.6%) and others (41.2%) were also referred as areas of having some training.

Regarding the outcomes and contribution in the daily practice, 100% answered that they are using the training in their routine; and 82.4% helped in the training of other professionals in their institution, from 3 to more than 20 people. The knowledge was reported to increase in 100%.

Development of a project in the host institution was possible for 41.2%, and 100% considered the training “Good” (35.3%) or “Excellent” (64.7%) and recommend the host institution to others.

An increase in the use of the technology that was trained was reported by 88.2%. In their respective departments there was an increase of at least 50% in the use of more advanced technology with improvement of the processes in 76.5%.

Among the general comments, besides the improvement of the professional skills, comments about the opportunity to interact with experienced professionals and “keeping in touch” with them, to have an overview

of the Radiotherapy Departments' routine, and to interact with another culture in a different language were the highlights. "The training was for me one of the best experiences that I had in my professional life".  
Conclusions. The TCP BRA/6/023 has enabled the upgrade of a good number of physicists and radiation oncologists from the centers. The implementation of new technologies was better supported with the training program, and, at the same time, the knowledge was shared and transmitted to other professionals. Overall, the training program was considered an excellent type of training by all the participants, and after almost three years, the use of the technology in the participating centers was increased in at least 50%.

## **Country**

Brazil

## **Institution**

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