

# EDUCATION, SCIENCE AND QUALITY ASSURANCE IN RADIOTHERAPY IN EUROPE

Germaine Heeren

ESTRO Public Relations Officer

Received December 6<sup>th</sup>, 2001; received in a revised form January 25<sup>th</sup>, 2002; accepted February 1<sup>st</sup>, 2002



EUROPEAN COMMISSION  
Directorate General Health and Consumer Protection - Europe Against Cancer Programme

**ESQUIRE Project:**  
Education, Science and Quality assurance In Radiotherapy in Europe  
**The ESTRO ESQUIRE Project**

Grant Agreement (2001CVG2-005)

Optimised radiotherapy (RT) has opened unprecedented perspectives for improving the cure rate of cancer. A better understanding of the underlying physical and biological mechanisms along with exciting new technological developments make the specialty one of the most challenging disciplines in medicine. That is, if all the members of the multidisciplinary team involved in RT manage to stay on top of the developments and to steer the necessary changes.

The Board of ESTRO considers it as its priority Nr 1 to help and guide its members on this road. Without increased efforts in the field of Quality Assurance and Education the most promising technology turns into a needlessly complicated and potentially dangerous gimmick with no or even adverse effect on the outcome for the patient.

Fortunately, the Society can at any time count on the selfless commitment of its members who contribute substantial parts of their scarce free time to countless working parties to help ESTRO face up to this task. Robust support has also come from the European Commission in the way of funding for the most ambitious project ESTRO has ever undertaken: ESQUIRE.

Unfortunately, the optimism generated by the project was seriously tempered

when the message was received that the "applicant states" of the EU would not be able to participate this time because no agreement had at that point been reached with them about the ratification of the EU treaty on Health and Consumer Protection, SANCO, the budgetary source of the project. Apart from some small concessions granted by the understanding and sympathising EC staff, there was no way for ESTRO to influence this political decision. But, if Central Europe misses out on the educational fellowships, the 4 tasks in the field of quality assurance will not benefit the total radiation oncology community. Below we give the aims of the project and the goals we hope to achieve in a 2 - year period.

**ESQUIRE: Education, Science and Quality Assurance In Radiotherapy in Europe**

The outcome of radiotherapy (RT) is largely dose-dependant. The limiting factor in the therapeutic window of the dose delivered to the surrounding healthy tissues and organs at risk. Inaccurate dose delivery may result in serious side effects showing up as late as 15 years after the treatment. Underdosage boosts the risk of tumour recurrence. For this reason, the outcome

of RT (therapeutic ratio) cannot be based on the cure rate alone but needs to take into account the long term disease free survival of the patient. Strict quality assurance procedures, including the monitoring of side effects need to be implemented as a precautionary measure. This will become even more mandatory with the introduction of conformal (CT) and intensity modulated therapy (IMRT) that make dose escalation and hence the enhancement of the cancer cure rate possible. The aim of this project is to increase the confidence level of clinicians for embracing optimised RT treatment regimes by making sure these can be achieved without an increase in severe side effects. Actions proposed for this purpose: monitoring the accuracy of the dose (Task 1: EQUAL) and the side effects (Task 2: REACT), stepping up education for the implementation of new technology (Task 3: EDRO) by developing quality assurance procedures for optimised RT (Task 5: QUASIMODO) and brachytherapy (interstitial and intracavitary treatment) (Task 6: BRAPHYQS), and establishing a procedure-based surveillance of quality in treatment and research (Task 4: EQART).

**Task 1:** EQUAL will try to include in its external mailed TLD dosimetric audit up to 80 % of all the RT departments in Europe, while developing a methodology for checking also more complex asymmetric and MLC (multileaf collimated) fields.

**Task 2:** REACT (Register, Educate and Ameliorate the Consequences of Treatment) intends to involve patients in the assessment of consequences of treatment by developing a patient questionnaire. A consensus will be sought on levels of complexity for scoring them, and an education programme for their recognition and recording will be put in place. Finally methods will be developed for the management of side effects .

**Task 3:** EDRO (Education for Radiotherapy), will focus on creating a European space for training and mobility in RT by the development/reviewing and promotion of European curricula for the educa-

tion and practical training of all the disciplines involved in RT, by producing an easy-to-audit monitoring instrument for their professional training and development including Continuing Medical Education (CME): [the European Training Manual/ Record (TMR)], by stimulating the production and reproduction/publishing of cutting edge teaching material, by encouraging participation of trainees in state-of-the-art educational activities, by facilitating the transfer of technology and know how and by creating a broadened recruitment basis for research through research training fellowships.

**Task 4:** EPOQART (European Permanent Office for Quality Assurance in RT) will serve as a co-ordinating structure for all the QA initiatives in the field of RT and develop a platform for the auditing and surveillance of Quality in the total Treatment Process and in Research in RT.

**Task 5:** QUASIMODO (Quality Assurance for Intensity Modulated Radiation Oncology) will promote the safe introduction of advanced technology in RT by developing procedures for the QA of Treatment Planning Systems (TPS) to be published as a new issue in a series of ESTRO Physics Booklets, and by exploring a new methodology for the verification of Intensity Modulated Radiotherapy.

**Task 6:** BRAPHYQS will investigate methods for improving QA in Brachytherapy (the use of radioactive implants as opposed to external beam radiotherapy). QA procedures in different countries in Europe will be analysed and European guidelines published as a new issue in a series of ESTRO Physics booklets. A method for a mailed QC system will be developed for checking both dosimetric and geometric accuracy in brachytherapy departments.

**Follow up:** The progress in the different tasks will be followed up closely by the ESTRO Board and its relevant committees.

**Methods:** - development of guidelines, measuring tools and a physical infra-

structure for carrying out the QA of important parameters in RT; - creating a European framework for education and training in radiotherapy and facilitating technology transfer and access to training for research.

The ESQUIRE project will give a substantial boost to ESTRO's sustained effort for setting a benchmark for quality in the practice of radiotherapy in Europe. By developing the human potential through education and optimising the use of capital intensive infrastructure, the outcome of radiotherapy treatment can be substantially improved. According to a re-

cently published EORTC study (Eur J Cancer 2000 Mar; 36 (5): 615-20, every gain in the accuracy of beam output and treatment delivery will be directly translated into an important gain in uncomplicated cure probability and result in saving the lives of thousands of cancer patients every year. 50% of Europe's cancer patients are treated with RT. It has been estimated by the Swedish Council of Technology Assessment that theoretically it would be possible to increase the 5-year survival of these patients by more than 10% during a 10 year period if the radiation treatment quality is improved.