EXECUTIVE SUMMARY

February 2003
Overall ESQUIRE achievements

Every year, an estimated number of 0.8 to 1.2 million cancer patients are treated with Radiotherapy (RT) in the EU. For most types of malignant disease RT and surgery remain the only treatment modality which can achieve local tumour control and long term survival. In the past decade the cure rate for cancer has gone up by almost 5%. Earlier detection and gains derived from a multidisciplinary approach and combined modality treatments contribute to better treatment outcome. The largest single contribution to the improved outcome figures was however made by the generalised introduction of hormone therapy and RT in the treatment of prostate cancer.

It was demonstrated (Eur J Cancer 2000Mar; 36 (5):615-20) that every gain in the quality of radiotherapy delivery results in a substantial gain in the uncomplicated cure probability.

In 18% of all patients the local or loco-regional RT-treatments still fail and 6 to 8% of cured patients pay for their survival with largely avoidable late effects which severely affect their quality of life. The most important reasons for failure are considered to be poor treatments, tumours with difficult location and tumours resistant to current radiation treatment. Measures suggested to remediate this situation are: improved quality control of radiotherapy, conformal treatments, and introduction of hadrontherapy. Activities in all these fields have been initiated by the European Society for Therapeutic Radiology and Oncology (ESTRO). The most important gains in the immediate future can however be expected from a better education of the RT professionals, from the introduction of optimised high precision treatment schedules and from the implementation of stringent quality standards for RT delivery.

Thanks to the robust EU support given for 6 major action lines integrated in the ESQUIRE project, ESTRO has been able to develop a broad strategy to address these issues in a vigorous and co-ordinated way. More than 150 experts contribute to the project in very active parallel networks. As the 2nd largest cancer society world-wide (5,700 members) and well connected to the national scientific and professional RT societies, ESTRO has a choice of instruments for disseminating the results of its projects and for encouraging implementation.

ESQUIRE, has now entered its 2nd contract year. It is already clear right now that the project
- will result in lasting quality assurance (QA) infrastructures (Task 1, EQUAL Lab and Network) and Task 4 (EQART European Institute for Quality Assurance in Radiotherapy)
• in QA guidelines and newly developed QA tools, based on a broad European expert input and consensus. Guidelines, which will be the object of separate publications are being developed by task groups 2 (REACT), 5 (QUASIMODO) and 6 (BRAPHYQS),
• and in a comprehensive body of guidance for a European education system for the different disciplines involved in RT (Task 3: EDRO).

Support was provided to:
• in total 142 junior professionals for participating in 10 intensive one-week teaching courses (Task 3 EDRO)
• As a contribution to the spread of excellence in the practice of RT in Europe, 18 technology transfer grants for short visits to other departments were provided.
• Young professionals were encouraged to choose for a research career through a competition for 7 research training fellowships.

On the basis of a comparative analysis of national systems (EQART-BOSIS Network) a web-based European incident reporting system was developed. This system will allow safety officers in radiotherapy departments to share their experience and pinpoint problem situations which may lead to errors in the treatment delivery. Errors, often small breaks in the quality chain, can compromise treatment outcome if allowed to go undetected. A coincidence of several errors can lead to radiation accidents where large groups of patients are exposed to lethal doses or to under-dosage which denies them the chance of cure.

• Esquire has brought European radiotherapy to the forefront:
  - ESTRO has achieved a world leadership in the field of education for radiotherapy. Its ambitious teaching programme attracts participants from all over the world including from America’s leading institutes.
  - Two comprehensive teaching books, drawing on the extensive experience of ESTRO’s brachytherapy and radiobiology teaching teams, could be made available to a wide public at low cost thanks to a modest but decisive logistic Esquire support to the editors and private copyright ownership and publication by ESTRO which cuts out profit margins of publishers and distributors.
  - ESTRO has become a prime partner for the International Atomic Energy Agency (IAEA), which is the WHO division for the radiological disciplines. Joint EQUAL (task 1)-IAEA research projects and shared expertise for the development of QA procedures, provide a prestigious international platform for the Esquire activities and allow European radiotherapy to have a major input in setting standards for the codes of practice in RT. Recognising the quality label of the ESTRO teaching programme, IAEA supports every year the participation of up to 250 physicists and radiotherapists from applicant countries and newly independent states to ESTRO teaching courses, thus adding a considerable multiplication effect to the ESQUIRE effort.

Food scares and chemical, biological and nuclear threats currently high up in the political agenda are reflected in a new SANCO multi-annual programme with different priorities. The impact of ESQUIRE will however outlast an anticipated and hopefully temporary funding gap. A continuity in EU support, adding financial clout to moral leadership and the selfless commitment of dedicated professionals, will however be necessary to give scientific societies like ESTRO the means to

3/4
translate spectacular progress in technological and scientific developments to tangible gains for the cancer patient at the grass roots level.

Molecular imaging as biological input for individualised, tumour and cell specific RT treatment plans and customised dose delivery, combined with intensity modulated photon, high energy electron, proton or ion beams (FP6 DG RTD applications BioART and BioCARE), will set new benchmarks for the role of radiotherapy in cancer care. These developments will however put unprecedented demands on the already high complexity of the software systems needed to support them. The race of the end-users, co-ordinated by ESTRO, to develop the tools, systems and guidelines to verify them, and to provide in the education and training for their implementation, will be forced into a yet higher gear. Dosimetric audits by the ESQUIRE-EQUAL lab have already revealed that the risk of serious software errors in commercial treatment planning systems, resulting, if undetected, in potentially dangerous dosimetric deviations (see further in report), increases along with the increase in treatment complexity. Only with EU support will well structured, dynamic and representative European Scientific Societies like ESTRO, which have the capacity to spearhead implementation of a European health care policy, be able to stay on top of the developments and win that race.