measured immediately. This is not the case for radiotherapy where debilitating of even lethal side effects may show up as late as 18 years after treatment. To determine the outcome or therapeutic ratio of radiotherapy, it is therefore necessary to link tumour control closely to the actuarial long-term disease free survival of the patient.

The therapeutic window for radiotherapy is narrow. In walking the tightrope between cure and complications, radiotherapy can put the odds at its side. As a precautionary measure, strict quality assurance measures including the monitoring of side effects need to be put in place. Recent studies have demonstrated that every gain in the accuracy of the beam output and treatment delivery is translated into important gains in the uncomplicated cure probability, thus sparing the lives of thousands of patients every year. QA will become all the more mandatory now that new technological developments allow much more precision in the delivery of the intended dose to the intended target volume, thus making an escalation of the dose and hence the improvement of the cancer cure rata possible.

Europe has only half the number of treatment units of America and Japan. However, it has also its own strengths. These are exactly in the field of quality assurance and education. ESTRO has become a world leader in the provision of teaching in the field of radiotherapy. The ESTRO teaching programme commands the admiration and even the envy of the International radiation oncology community. We need to capitalise on this achievement and keep it at the cutting edge of scientific and technological progress to offset, through the development of the human potential and optima) use of capital-intensive infrastructural resources, at least partially the shortage in capital investment and the past shortfall in spending for research.

For this reason ESTRO is embarking on an ambitious new project called ESQUIRE (Education, Science and Quality Assurance In Radiotherapy in Europe) which it hopes to realise with the support of EU funding. The aim of this project is to increase the confidence level of clinicians for embracing optimised RT treatment regimes by making sure they can be introduced without an increase in severe side effects. Actions proposed for this purpose: monitoring the accuracy of the dose (Talk 1:E~UAL) and the side effects (Task 2: REACT), by 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 (Task 6: BRAPHY~S), and establishing a procedure-based surveillance of quality in treatment and research (Task 4:EPOQART).

21.
THE STRUCTURE AND ACTIVITY OF INTERNATIONAL ORGANISATIONS FOR MEDICAL PHYSICS AND BIOMEDICAL ENGINEERING

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The International Union for Physical and Engineering Sciences in Medicine (IUPESM)comprises a global network of 40,000 graduate physical scientists and engineers in about 100 countries. IUPESM has two constituent organisations, the International Organisation for Medical Physics (IOMP) and the International Federation for Medical and Biological Engineering (EFMBE).

IUPESM has sponsored triennial World Congresses in many countreis since 1967. The Millennium Congress was held in Chicago, USA, with 6500 participants from 70 countries with 4000 oral presentations and posters.

Regional scientific meetings, educational courses and scientific conferences are also. IUPESM, IOMP, IFMBE have interrelated Working Groups such as the Science Committee, Publications Committee and Education and Training Committee

Many journals belong to or are associated with IUPESM through our international and national member societies, as listed on the IUPESM Global Knowledge Network for Medicine, Physics and Bioengineering (http://www.wc 2000.org/).The main area of IUPESM and IOMP activities are:

(1) Education, Training and Continued Professional Development for the 21st Century with particular reference to Developing and Emerging Countries.
(2) Global Biomedical Information Networking for Developing and Emerging Countries.
(3) Evidence Based Health Technology.This programme is aimed at international assessment of the health benefits and cost-effectiveness of existing and new technologies in Health Care.

(4) Medical Equipment Evaluation. This programme's aims are to establish and promote international protocols and standards for Performance Testing, Quality Assurance, Safety and Environmental aspects.

22.
CURRENT STATUS OF SYSTEMATIC RADIOPHARMACEUTICALS FOR THE TREATMENT OF PAINFUL METASTATIC BONR DISEASE

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Intractable bone pain secondary to bone metastasis from prostate or breast cancer, or other malignancies is a major problem in the management of the oncological patient. Treatment often includes the use of analgesic drug therapy; however, radiation therapy, hormonal therapy, chemotherapy, and surgery may also be needed. Advances in systemic radionuclide therapy have increased the number of treatment options available for patients with painful osseous metastases. This treatment modality offers three major advantages i.) by addressing all sites of involvement; and ii) by limiting irradiation of normal tissues due to selective absorption into bone which results in an improved therapeutic ratio. Patients with a positive bone scan are eligible for treatment, and indications and contraindications for use are well defined. Large, prospectively randomized clinical trials have established the efficacy of samarium-153 EDTMP and strontium-89 Cl as a first-line therapy. When these agents are used, pain relief often occurs rapidly and lasts several weeks to months with responses seen in 60-80% of patients, depending on the extent and stage of the disease. With the introduction of modern bone-seeking radiopharmaceuticals as Sm-153 EDTMP toxicity is rare and restricted to reversible myelosuppression. In summary, evidenced based literature suggests that these radiopharmaceuticals can significantly reduce pain and analgesic requirements, improve quality of life, reduce lifetime radiotherapy requirements and management costs, and may even slow the progression of painful metastatic lesions. Retreatment is safe and effective.

23.
PRINCIPLES OF RADIOIODINE TREATMENT (^{131} I) FOR PATIENTS WITH DIFFERENTIATED THYROID CARCINOMAS

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The aims of radioiodine (^{131} I) therapy for patients with differentiated thyroid carcinomas:

- Destruction of thyroid tissue remaining after thyroidectomy
- Destruction of microcarcinoma focus in site of thyroid
- Destruction of metastases in lymph nodes
- Destruction of distant metastases

Therapeutic indications for radioiodine (^{131} I) treatment in differentiated thyroid carcinomas

- **Complementary treatment**

This treatment is recommended in all patients with follicular or papillary carcinomas in stage pT_{1b-4} N_{0-1} M_0 after total thyroidectomy. In some cases it could be as the complementary treatment after incomplete thyroidectomy.
The recommended radioiodine activity for the complementary therapy is from 1.75 to 3.5 GBq (60 – 150 mCi)

- **Radical treatment**

This kind of treatment is recommended for patients with differentiated thyroid carcinomas and remote metastases. If the lesions concentrate ^{131} I in quantities sufficient for radical treatment - the patient can be treated with the isotope.

- **Palliative treatment**

Palliative treatment is recommended for patients with inoperable thyroid carcinoma or with local recurrence, or with remote metastases concentrating radioiodine in quantities non sufficient for radical treatment.

Contraindications for radioiodine (^{131} I) treatment

- Pregnancy
- Breast-feeding

The contraception for women is necessary during 12 months after radioiodine treatment. For men the 4 – 6 months contraception is recommended.

Method of radioiodine (^{131} I) administration

- Patient serum TSH concentration should be above 30 uIU/ml