

THE ROLE OF RADIOTHERAPY IN SWEDEN

A landmark study by the Swedish Council on Technology Assessment in Health Care

A number of years ago, the Swedish government commissioned the Swedish Council on Technology Assessment in Health Care (Statens Beredning För Medicinisk Utvärdering (SBU)), an agency within its ranks, to assess the role of radiotherapy in Sweden. The goal of the project was to scientifically evaluate the role of radiotherapy in the treatment of cancer, which included a review of its curative and palliative effects, its cost in relation to other cancer treatments, and its future role and potential development.

The results of this project are published in this edition of *Acta Oncologica* and represent a remarkable scientific exploration of the descriptive and prescriptive use of radiotherapy. Such a study has never been conducted before and is truly a pioneering effort that has resulted in a landmark resource that has the potential to strongly influence decision-making on the emerging issues in this era of medical delivery—the issues of cost-effectiveness and socioeconomic evaluation of medical care.

Evaluation of radiotherapy was based on a review of the scientific literature published between 1990 and 1993, with a longer period of ten years for controlled clinical trials. Studies were classified by type of study (i.e., meta-analysis, controlled clinical study, well-defined prospective study, retrospective study, literature review, or case report or other type of study on radiobiology, radiotherapy, or cancer epidemiology) and in relation to the weight of the scientific evidence (rated on a scale from 1 to 3, with 1 as the highest level). Initial review of the studies was done by a project group consisting of 17 members that represented a cross-section of medical care specialists: Oncologists, surgeons, internists, physicists, health economists, an epidemiologist, a health administrator, and chaired by Dr. Jerzy Einhorn. Each section in the report was then reviewed by at least one, but usually two or three international experts. This approach provided the best guarantee that no bias was introduced by the selection of the papers reviewed.

The goal of this two-tiered review process was to minimize subjectivity in attempting to meet the following objectives: 1) Review and grade the scientific literature; 2) describe the practice of radiotherapy in Sweden; 3) compare the practice of radiotherapy to the conceptual use of radiotherapy described in the scientific literature; 4) analyze the cost of radiotherapy in Sweden; and 5) project the future trend (15 years) of radiotherapy. Drawing conclusions from this type of literature review invariably includes some degree of subjectivity. It is therefore quite possible that colleagues in other countries would draw slightly different conclusions and would stress different aspects based on the same literature. The Swedish survey, therefore, should not be considered an unequivocal conclusive analysis on the role of radiotherapy in oncology that can be applied without any modification in other countries. However, it provides a very comprehensive base line for comparable discussion in other parts of the world as well as encouraging a continual evaluation of the role of radiotherapy.

Overall, the results of this study indicate the strong current and potential need for radiotherapy as one of the major treatments for a variety of cancer types. About 30% to 32% of all cancer patients in Sweden receive radiotherapy at some point in their treatment, which is low compared to that of other countries. For example, the use of radiotherapy in the United States is estimated to be around 57% for all cancer patients, and 44% in Australia. The lower estimated use in Sweden appears to be associated with its underuse as a palliative treatment, since as a curative treatment its use is comparable to most other countries.

The result of this study that is particularly interesting for radiation oncologists is that the overall cost of radiation oncology in relation to its usefulness, such as improvement in survival (cure) and symptoms (palliation), is less expensive than for any other form of cancer treatment as measured at this time. This will come as a surprise to many physicians, treatment planners, and government agencies. Because the initial cost of radiation equipment is high as well as extremely technology dependent, we tend to think of radiotherapy as an expensive treatment. Although up front costs of equipment and facilities are expensive, the long durability and usefulness of both the equipment and facilities make the delivery of radiotherapy in the long run very cost effective. This is especially true in relation to the high level in which radiotherapy is used for both curative and palliative treatment. This finding that the initial high cost of radiotherapy is compensated for by the great use of radiotherapy and the durability of its equipment should also help to justify the initially high cost of technological advances in radiation oncology that will better delineate the tumor area and better target the treatment. In the long run, the money invested in radiotherapy pays off in excellent results.

Like other pioneering reports, the study is not without deficiencies. These deficiencies do not, however, reflect on the abilities of or approach by the authors of the study but rather by the nature of scientific inquiry itself and the literature. The lack of substantive evaluation of quality of life issues and radiotherapy is one such deficiency, which is commensurate with the level of evaluation being done across all types of cancer treatments. In the future, quality of life analyses will be important to determine the cost effectiveness of various treatment approaches. Another deficiency is the lack of evaluation of a new role for radiotherapy to treat benign diseases, such as macular degeneration, as well as the possibility for additional uses for malignant diseases, such as for prostate cancer.

Nevertheless, this report presents a challenge to persons working with other treatment modalities to similarly evaluate the cost effectiveness and use of these modalities to treat cancer and other diseases. In an era in which the costs of medical care throughout the world have been increasing, while resources have at best remained level or in some instances shrunk, cost effectiveness, clinical and potential use of different treatment modalities, and quality of life will all be necessary to evaluate and to determine the best course of treatment. This report will serve as a landmark for similar studies on other modalities.

The committee, the Swedish government, the SBU, and the Swedish participants are to be congratulated on successfully completing this yeoman task which certainly is a landmark in the evaluation of treatment and cost effectiveness. This is a remarkable effort and deserves the support and praise from those interested in improving the quality of care in the life of the cancer patient and doing this in a cost effective way.

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