

Operation Research Advances Cancer Therapeutics

OVERVIEW

Memorial Sloan-Kettering Cancer centre is the world's oldest private cancer centre. It is one of the best cancer centres with advanced treatment facilities with improving care and reduced costs. With the help of operation research approaches, the team has made use of some optimization modelling and computational techniques for the treatment of prostate cancer. Since there is a reduction in complications, posttreatment quality of life has improved. It is because of two main reasons-1. Because of the treatment plans, less radiation is delivered to adjacent healthy structures 2. Avoiding discrepancies between planned and actual placement in the target.

APPLICATIONS

1.MEDICAL ADVANCES

In the field of medical, a rapid operator-independent intraoperative treatment planning system is made use of so that it provides a groundwork for technological frontier of brachytherapy. Large number of opportunities are opened up for conducting complex clinical investigations. There would be flexibility in modelling the clinical problem by using the OR modelling paradigm. This system will facilitate the standardization of brachytherapy treatment planning in prostate cancer. This is also a foundation to treat other varieties of cancer such as breast, cervix, esophageal, brain and sarcoma.

BENEFITS

1.COST SAVINGS

Per patient the cost savings would be \$5000. There are about 218890 new cases in the United States for prostate cancer in 2007. The statistics show that 30% of the patients were treated using brachytherapy and 15% with other modalities. The entire nation adopted intraoperative real time planning and the annual cost savings would increase in the patients who have taken brachytherapy as its side effects are less when you compare beam radiation and surgery procedures.

2.QUALITY OF CARE AND QUANTITY OF LIFE FOR PATIENTS

This process improves the patient quality of care and quality of life. Considering the computer aided approaches and other adhoc heuristic algorithms, the system returns plans consistently and improves conformity ranges from 10-20. The improvement which happens latter leads to reduction in toxicity, reduction in ulcers, less bladder and rectum bleeding. In many cases clinical evidences have to be shown. Clinical evidence shows a large amount of reduction in the urethra dose and duration of symptom persistence. Therefore since there is reduction, only fewer patients require medications. This shows a large impact on both health care costs and quality of life of the patient who was being treated.