

Abstract

The aim of this study was to examine the long term cost effectiveness of radiotherapy (RT) in the treatment of cancer at the Department of Radiation Oncology, Westmead Hospital, from its inception in 1980 to December 1993. A Kaplan-Meier survival curve was constructed for all patients treated by RT during the study period. The area under this curve represented the average survival. The total number of life years was calculated by multiplying the number of patients by the average survival. Costing for one RT treatment field had previously been derived. The cost included capital costs, building costs and overheads as well as labour, goods and services, and operating costs. The cost per field was multiplied by the total number of fields given each year and the yearly total summed to give the total cost. The total cost was divided by the number of life years to give a cost per life year. An overall percentage survival gain was estimated from departmental results and the literature. Cost per life year gained (LYG) was derived by dividing the cost per life year by the percentage survival gain. Sensitivity analysis was performed with best- and worst-case survival scenarios, and high and low cost per field estimates. A total of 9868 patients were treated by radiotherapy between January 1980 and December 1993. Median follow-up was 4.2 years. Median survival was 2 years. The 5- and 10-year survival rates were 35% and 22%, respectively. The area under the survival curve (the average survival) was 4.75 years. The total number of life years of survival was thus $4.75 \times 9868 = 46,873$. In 1993, the cost per field was \$71.52 (Australian dollars). The total number of fields treated in the study period was 758,097. Hence, the total cost in 1993 dollars was \$54,219,097. The survival gain (excluding skin cancer) with RT was 16.1% and the cost/LYG was \$7186. Sensitivity analysis of best and worst case scenarios gave costs/LYG of \$3920 and \$15,632 respectively. Efficient resource allocation can be aided by examining the relative cost-effectiveness of different prevention and treatment strategies. RT is shown to have a lower cost/LYG than other accepted treatments in current practice. Other major treatment modalities should be subjected to the same scrutiny of cost effectiveness as has been applied to RT.