Hospital respectively. These figures were significantly lower from those published in the literature. d. The State reimburses the Hospitals with 5,130 Drs and 2,760 Drs per fraction for the linear accelerator and the cobalt unit respectively. This amount covers a small percentage of the cost, causing financial problems to radiotherapy centers in Greece.

Kardamakis D, University of Patras Medical School, Department of Radiology &Radiotherapy, 265 00 Rion Patras, Greece

PP40. Economic Analysis of cancer treatments taking QoL into consideration

Koinuma N, Ito M
Tohoku University School of Medicine, Sendai, Japan

Background: Economic recession and budget constraints increasingly determine the provision of health care services and both QoL and economic aspects seems to be indispensable to build a social consensus in the interest of securing financial resources for cancer treatment costs that are expected to balloon in the future. The purposes of this study are to clarify the relationship between the input resources and economic effects of cancer care and to attempt to combine the economic evaluation of cancer care with its QoL evaluation.
Methods: We developed a system model of prognosis of seven principal cancers and analyzed the balance of patient labor productivity and accumulated cancer treatment costs during the survival period, based on the average remaining life. We estimated the five-year survival rates of prognostic paths, the probability of the paths to follow any of the routes, and cancer treatment costs. To provide a system model most similar to the true clinical developments of cancer cases, the following conditions were assumed;

1) The disease progresses more rapidly in young cases than in aged.
2) The cancer accelerates as prognostic stages advance.
3) Treatment costs rise among young cases but gradually diminish with age.

The labor productivity is calculated using the age-specific wage census. Living expenses are 50% of productivity. Discount rates are set at 3% to 5%. Results are calculated according to age, route and treatment. Decline in QoL was taken into consideration as a decrease in survival years using time trade-off method (QALYs).
Results: The prognostic paths in tree structure of the system model are 50 routes in stomach, 51 in colon, 51 in rectum, 51 in lung, 52 in breast, 77 uterus and 109 in prostate cancers respectively. The cost-benefit ratios of lung(0.36), colon(0.86) and rectum(0.93) cancers are below 1, while those of other cancers are above 1. Treatment costs per QALY gradually increase as the age advances, and those of lung and colon cancers are relatively high.
Discussion: Sensitivity analysis of the cost-benefit ratio in breast cancer treatment by changing the non-resection rate showed that medical expenses change little with an increased non-resection rate. This is because reduced medical costs by increasing the non-resection rate is offset by an increase in the number of patients undergoing mastectomy after recurrence. Increased non-resection rate and decreased medical expenses did not show a linear relationship, but a critical point in the non-resection rate, providing the lowest medical cost, did exist. The economic contribution of cancer treatment is often underestimated. We can, however, define the true benefit of cancer treatment by economic analysis.

Koinuma N, 2-1, Seiryo-machi, Aoba-ku, Sendai, 980-77, Japan

PP41. Economic analysis of patients with breast cancer in a health maintenance organization

Konski A[1], Wilder L[2], LeSage J[3]
[1]Dept. of Rad. Onc., Flower Hospital, Sylvania, OH, USA; [2]Dept. of Economics, Bowling Green State Unievrsity, Bowling Green, OH, USA; [3]Dept. of Economics, University of Toledo, OH, USA

Background: Breast cancer's impact on Health Maintenance Organizations (HMO's) has increased because of increased enrollment of Medicare patients. This study investigates patients with breast cancer in a Northwestern Ohio, USA based HMO.
Methods: Billing claims of patients with a diagnosis of breast cancer between 1990-1993 were identified from Paramount Health Plans insurance data. Paramount Health Plan is an accredited health plan in Northwest Ohio with an average enrollment of 12741 female members during the study period. Data collected from the medical record included stage at diagnosis, tumor size, method of diagnosis, type of surgery performed, treatment received, disease status, age at diagnosis, whether the patient had a previous mammogram, if they were in the insurance plan for the entire study period, mean income level, and cost measured from a payer's perspective. Average household income obtained from 1990 United States census data was used as a proxy for income. Only cost pertaining to the treatment of breast cancer were tabulated and discounted to the year of diagnosis. Regression analysis was performed with the Matlab statistical program.
Results: A total of 59 women had claims with a diagnosis of breast cancer during the study period. Of these, only 41 had the diagnosis made between 1990-1993, and of the 41 women, 30 had sufficient information in the hospital record to complete all data variables. Women diagnosed by mammography had statistically smaller cancers than if diagnosed by themselves or by a physician. Even though mammography is a covered procedure, the majority of patients were self diagnosed by feeling a lump in the breast. Patients diagnosed by themselves tended to have a lower mean income compared to mammographic diagnosis but this difference was not statistically significant. A statistically significant difference did not exist in total cost of treatment between the different types of surgery used, i.e. lumpectomy and radiation, mastectomy, and mastectomy and reconstruction. A difference, which approached statistical difference p=0.0514, was noted in mean income between patients undergoing mastectomy and reconstruction, $52,690.40, and modified radical mastectomy, $32,745.87. Results of the regression analysis will be presented.
Discussion: Although mammograms are a fully covered service in this health plan, the majority of patients had the diagnosis of breast cancer made by themselves. The cost associated with treatment as well as outcome was better in patients diagnosed by mammography. The differences in choice of surgical procedure may be related to socioeconomic status.

Konski A, Flower Hospital Radiation Oncology, 5200 Harroun Rd., Sylvania OH 43560, USA

PP42. Cost-efficacy evaluation of fludarabine phosphate in the treatment of chronic lymhocytic leukemia refractory to other therapies

Laplante S; Grenier JF
Berlex Canada Inc., Montreal, Canada

Background: The advent of purine analogs such as fludarabine phosphate (FLU) bas changed the therapeutic approach of chronic lymphocytic leukemia (CLL), from palliative to curative. However, the costs associated with these medications are often perceived as high and thus, a careful evaluation is required prior to allowing their extensive use.
Methods: A cost-efficacy evaluation was conducted to compare FLU to the most common alternative treatment in Canada, i.e. cyclophosphamide-vincristine-prednisone (CVP). Efficacy data was obtained from review articles and published studies identified in MEDLINE. Costs and their structure were obtained from official tariffs and discussions with experts. As a Ministry of Health perspective was adopted, only direct medical costs were considered. Costs of treating Grade III/IV toxicity were factored into the model. In the basic scenario, 5 cycles of FLU resulted into an overall response rate of 51% - complete response (CR): 38%, partial response (PR). 13 %, survival: 3.6 years (CR), 2.8 years (PR). Whereas for CVP, the response rate was 30% (CR: 0% and PR: 30%) with a survival in responders of 1.3 years. Sensitivity analyses were performed on efficacy parameters and duration of treatment.
Results: Both alternatives appear to be highly cost-effective with cost per year of life gained (YLG) in the magnitude of CDN $3,000-$4,000. FLU is the best option generating savings of CDN $476 per YLG (FLU=$3443 YLG; CVP=$3914/YLG). Sensitivity analyses reveal that the relationship is