

between time with side effects, time to progression and duration of survival for MAB versus bilateral orchiectomy.

Results: Two hundred and ninety seven patients were included in the analysis (148 in the orchiectomy arm and 149 in the MAB arm). Based on Q-utility scores obtained using time-trade-off questions in a study by J.C. Weeks *et al.* (J Urol, abstr in press) the mean quality adjusted survival was 40.6 and 35.4 months for the MAB and orchiectomy arms respectively. Thus the adjustment resulted in a 5.2 month difference (95% C.I. -1.1;11.5 months) in favour of MAB.

Discussion: A Q-TWIST analysis may be preferred over the classical approach in clinical trials where the health states are clearly distinct, and differ significantly either in duration or QOL or in both. Individual treatment choices may be obtained for patients using the results of the threshold utility analysis.

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PP54. Economic impact of the harmonization of practice using guidelines: The example of breast cancer surveillance

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Background: We are interested in the development of guidelines and the evaluation of their implementation in practice. A previous study on the adjuvant treatment of breast cancer measured the changes in practice induced by the implementation of a local guideline in a French cancer center. There was an increase of practice conform with the recommendations in the guideline. However the amount of non conform practice for follow-up remains significant. Our goal is to assess the economic impact of this harmonization, particularly for post-therapeutic surveillance in breast cancer.

Methods: We performed a retrospective survey of 200 medical records from patients treated and followed in the Centre Léon BÉRARD, in Lyon France between 1993 and 1995. We collected the quantitative data, i.e. the number of examinations and visits during the clinical surveillance. Second, we attributed a monetary value to these physical quantities to compare the cost of follow-up conform with the guidelines and non conform follow-up.

Results: We obtained 106 usable records for a total of 2610 months of follow-up, with a median of 21.5 months per patient. Of these records, 37 met the guidelines and 69 did not (Table 1).

Table 1. Information in 106 records of patients followed up after treatment for breast cancer

Year	In accord with guidelines					Not in accord				
	1	2	3	4	Total	1	2	3	4	Total
Usable records	37	25	3	2	682	69	57	36	24	1928
Months of surveillance	median: 17					median: 28				
Mammography*	26	18	4	1	49	47	44	27	16	134
Visits*	83	44	5	3	135	169	111	68	39	687
Thoracic radiotherapy*	2	2	0	0	4	60	37	14	10	121
Tumor markers*	8	5	0	0	13	99	75	36	11	221
Liver ultrasonography*	2	1	0	0	3	45	25	5	3	78

* : No of clinical exams

The results are being evaluated in monetary terms, and the overall costs are being analysed. We have already observed a large difference between minimal and intensive follow-up, the latter being much more costly.

Discussion: No significant difference has been showed in global survival with intensive and with minimal surveillance. Follow-up of breast cancer patients is of real economic interest from the point of view of reducing costs by decreasing the number of clinical examinations. Standardization of current practice is not necessarily synonymous with cost reduction. Other therapeutic aspects of adjuvant treatment of breast cancer are also interesting, and the next step in our project is a similar study on

chemotherapy, for which results might be different in view of its importance in breast cancer, in health-care programs.

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PP55. Brain stem tumors treatment: Economical cost

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Background: Annual cancer incidence in childhood is 120 new cases per million children under 15 years of age. Tumors of Central Nervous System are, after leukemias, the most common group of malignant tumors (21%). The Brain Stem Tumors are rare in pediatric oncology (5% of all childhood CNS Tumors) and their current prognosis is poor despite the therapeutic advances (Overall Survival 15-20%). In the last years some studies directed to evaluate the impact in the survival of these children of combined treatment (Radiotherapy + Chemotherapy) have been started.

Methods: In our Unit, in the last five years, 13 brain stem endophytic tumors have been diagnosed in children aged between 4 and 11. It has been about a not explained increment of incidence. All were diagnosed through neurologic examination and MRI. All the 13 children were treated with radiotherapy (RT Linac 55-65 Gy) and chemotherapy using chemotherapeutic agents like: Vincristine, Carboplatin, VP-16 and Cyclophosphamide. To evaluate the cost of this treatment we have used an informatic program (ICM) developed in our Unit for the control of our patient treatment costs. We have quantified the expense of chemotherapeutic agents, diagnostic and therapeutic procedures and material since the moment of the diagnosis until the end of the treatment. The admission expenses for intercurrent process conditioned by the side effects of drugs have been included too.

Results: The OS in this group of patient is 16%. The cost average per patient has been of 6410.5 \$ (current change) which has represented a global cost of 83336.5 \$ (current change) for all the 13 patients.

Discussion: The historic Overall Survival (OS) and Event Free Survival (EFS) of Brain Stem tumors in our Unit until that moment was of the 15% with radiotherapy treatment only. Despite the use of chemotherapy we could not have demonstrated an increment of the survival of our patients affected of brain stem endophytic tumors. However, the use of chemotherapy has represented an increment of economical cost without evidence of increments in the OS rate.

In our experience the design of therapeutic protocols should do under a strict economical control that allows to identify clearly the criterions of cost/effectiveness.

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PP56. A model of patients' preferences for chemotherapy outcomes in advanced colorectal cancer: Do gains in survival justify the toxicity?

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Background: New aggressive chemotherapy protocols have been developed recently for the treatment of advanced colorectal cancer. They show promising results, measured either as response rate, progression-free survival or overall survival. However, these results seem to be obtained at the expense of increased toxicity. As a consequence, oncologists and patients are faced with puzzling choices between a large variety of treatments, each involving a large variety of risks and benefits. The aim of this study is to show how these puzzling choices may be broken down into simpler choices, and how patients' preferences between various treatments may be predicted.

Methods: We focused on the choice between two treatments: 5-FU protracted low dose and Irinotecan (CPT-11). First, a panel of oncologists and nurses developed descriptions of the states of health that patients may experience with either treatment: response, stabilization, progression, nausea/vomiting, diarrhoea, febrile neutropenia, mucositis, hand-foot syndrome and alopecia. The health states were described as per dimensions derived from the Health Utility Index (HUI) Mark II and III. Second, 63 nurses from 2 countries were asked to place values on each of the health states. We used standard gambles to elicit these values. Nurses were used as proxies for patients, since eliciting values directly from patients using standard gambles may cause them too much distress. Finally, these values were fed into a model and the outcome of each treatment was measured as a value-adjusted survival (QALY). The comparison of the two value-adjusted survivals calculated by the model predicts the preference for one treatment. The parameters for the model were estimated from the efficacy and toxicity results of a meta-analysis of 5 phase II trials for 5-FU protracted low dose and from the pooled results of 4 phase II trials for CPT-11.

Results: Median survival is estimated to 7.7 months for 5-FU protracted low dose and 9.5 months for CPT-11. Both treatments are well tolerated, but 5-FU is somewhat better tolerated than CPT-11. The model predicts that this potential 2 months difference on survival will drive patients to prefer CPT-11 to 5-FU, with a 0.1 to 1.3 months difference on value-adjusted survival (QALY) in one country, and a 0.3 to 1.3 months difference in the other country. It also predicts that a 1.2 to 1.6 months difference is a threshold difference for patients to prefer CPT-11 to 5-FU, considering the difference on toxicity. This result will be especially useful to interpret the data from the on-going phase III randomized trials comparing 5-FU to CPT-11.

Discussion: Of course, this method does not provide a definitive answer to the question of which treatment to choose. The answer depends on many parameters that could not be entered into the model. But this method provides useful insights into the trade-offs between survival and toxicity that determine patients' choices. And it should help physicians select therapeutic options taking more into account patients' preferences, as it provides a way to reveal patients' values and feelings. The results will be updated when the data from the phase III randomized trials will be available.

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PP57. Economic burden of colon cancer in the US using a national database

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Introduction: Colon cancer is the second leading cause of cancer deaths in the Western world. US annual incidence rates were 200 per million citizens in the early 1990s.

Objective: To evaluate the economic burden of colon cancer and comorbidities utilizing the US Healthcare Cost and Utilisation Project (HCUP) national database.

Methodology: In the 1991 and 1992 releases of the HCUP database, all discharge records for patients with diagnoses of any form of colon cancer were isolated up to fifteen diagnoses for each patient. The following risk factors were also evaluated: Crohn's disease, familial polyposis, a 'family history of cancer' and ulcerative colitis. Colon cancer incidence is age dependent. The economic cost is in seven separate age categories: 0-29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years, 70-79 years and 80 years and older. Direct charges were provided by the HCUP database. Median length of stay (LOS) values were estimated as conservative estimates of days of lost productivity. We examined costs from the payor perspective as well. Further, the economic consequences of lost work were calculated for average US citizens.

Results: Over one million colon cancer hospital discharges occurred in the US during 1991 (1,091,985 events) and 1992 (1,092,618 events). Median charges per discharge were \$14,084 in 1991 and \$14,548 in 1992. Median LOS was 9 days in both 1991 and 1992 but was clearly age dependent; thirty year olds medians were 7 days whilst 80 year olds medians were 10 or more. Annually, approximately 3.59% of all US hospital discharges

records had a colon cancer diagnosis. Of all familial polyposis diagnoses 10.7% have comorbid colon cancer, but only 1.2% of ulcerative colitis diagnoses are comorbid with colon cancer, 1.6% of family history of cancer diagnoses and 0.35% of Crohn's disease discharges have comorbid colon cancer. Using seven age categories allowed us to observe that a major increase in costs starts in the 50s (charges totaled \$275 million in 1991 and \$300 million in 1992.) The charges associated with treating colon cancer by payor did not change from 91 to 92 (HMO/PPO median charge 1991=\$12,036, 1992=\$13,233.) HMOs and PPOs were the principal payors (706,835 cases in 1991 and 666,045 cases in 1992) of colon cancer cases before the age of 60, then Medicaid and then Medicare take over this burden. HMOs and PPOs consistently have the shortest length of stay within all age groups. HMOs had a median 8 day LOS both years, Medicare 10 days 1991 and 9 days 1992. Patients 60 years of age and older, Medicare had 719,040 admissions at a charge of \$13,579 per discharge in 1991 and 740,640 admissions at a charge of \$15,157 per discharge in 1992. Medicaid had 13,250 admissions at a charge of 13,263 per discharge in 1991 and 14,060 admissions at a charge of \$16,251.50 per discharge in 1992. In 1991, we calculate that 9,827,865 days were lost directly due to hospitalization. In 1992, this figure rose slightly to 9,833,562 days.

Discussion: Treating colon cancer is expensive. For the US alone, in 1991, direct charges were over \$14 billion with lost wages pushing costs to \$16 billion. In 1992, direct charges were over \$15 billion. If lost wages are added over \$17 billion. A conservative estimate of over 9.8 million work days are lost due to hospitalization for colon cancer annually.

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PP58. Medico-economic evaluation of colorectal cancer screening programs: The Nord/Pas-de-Calais/Picardie experience

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Background: Since the late eighties, colorectal cancer screening programs have been held in different French regions at an experimental level. In Nord/Pas-de-Calais and Picardie, two regions located north of Paris, recipients of salaried workers health insurance system (covering more than 80% of the total population) may benefit from a free of charge screening program based on the Hemoccult II® test (fecal occult blood test). CRESGE has been involved in the global assessment of these campaigns, particularly in the economic field. We give and discuss the main results of this assessment after 6 years of follow-up.

Methods: The evaluation performed by CRESGE can be divided into three main categories

- an "epidemiologic" one assessing the participation rate to the campaign (measured by the number of tests performed divided by the number of individuals concerned by this action),
- a "medical" one consisting of determining both the test-related positivity rate and the nature and results of complementary exams prescribed to those patients with a positive Hemoccult test,
- finally, an "economic" one where costs of the strategy are considered together with its efficacy (e.g. number of cancer detected ...) to produce a cost-effectiveness ratio.

The cost estimation takes into account the following: 1) advertising; 2) printing, packaging and postage of incitative or recall letters; 3) acquisition and reading of Hemoccult tests; 4) printing, packaging and postage of response letters indicating the result of the test; 5) complementary exams. Furthermore we assume that all complementary exams have been performed in an outpatient context. We combine the two indicators of efficacy (number of benign lesions detected, number of cancers detected) to produce a single measure of efficacy taking into account the ability and growth rate of benign lesions to become cancerous ones (notion of "cancer equivalent").

Results: During the second campaign (1993-1995), only 22% of the population did perform the test despite the greater implication of general practitioners (20% in the first campaign). The mean positivity rate is about 4%. 9 out of 10 individuals with a positive test performed a colonoscopy. 750 cancers have been found during the 2 campaigns. From an economic point of view, it costs about