results are reported over a one-year period after reaching steady-state level of vaccination. Multiple probabilistic sensitivity analysis was performed to estimate the distribution of the cost difference between the two vaccines by running 5000 iterations with @Risk(r) software in Excel(r) (normal distributions for vaccine efficacy, uniform distributions for HPV typing and costs).

RESULTS: Multiple probabilistic sensitivity analysis showed an average annual cost difference of $9.3M (CDN) (95% CI: $10, $43M) in favor of cross-protection over genital warts protection. Cross-protection provided additional cost saving with an 86.3% probability. An efficacy for additional cross protection of around 12% would achieve cost neutrality. The difference in cost was most sensitive to vaccine efficacy of cross-protection, the proportion of non-vaccine oncogenic HPV-types in CIN1, and the unit cost of treating CIN1. CONCLUSION: A vaccine with additional cross-protection of at least 12% is likely to offset the costs associated with the protection against genital warts in the Canadian health care system.  

**PCN16**

**COST DIVERSITY OF DRG BASED COLORECTAL CANCER THERAPIES IN HUNGARY**

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OBJECTIVE: In Hungary, costs of anti-cancer treatments are covered by hospitals’ budget, and funds for therapy expenditures provided from the National Health Fund Administration, based on DRG accounts. The goal was to investigate the real cost of treatments, and assess a comparison of DRG based remittance and expenditures of therapies. METHODS: Cost analysis of CRC chemotherapy-protocols has been conducted from the perspective of Oncology Departments. Regimens of 5-fluorouracil/-leukovorin, irinotecan, cetuximab, bevacizumab and oxaliplatin have been investigated, focusing on cost of medication, hospitalisation and total expenditure of protocols. RESULTS: Real expenditures of protocols were assessed. The range of drug related costs were USD$18,20–3085.80 as expenditures of hospitals. Total expenditures of chemotherapy-regimens have been investigated and compared to allocation of remittances from the National Health Fund Administration. The value of remittances have been found between USD$405.70 and USD$2875.20, depending on protocols. The gap analysis of drug expenditures and remittances has resulted in a wide range of USD$347 to USD$1611. The ratio of drug related expenditures and total remittance of hospitals showed diversity from 5% to 107%. CONCLUSION: The analysis showed that fixed DRG values had not represented real expenditures of chemotherapies of CRC treatment. Remittances should have been validated regularly. Neither priority, nor incentive elements, have been found in protocols containing molecules with superior efficacy or improved safety. In general, Oncology Departments are motivated to use protocols, containing generic compounds with low expenditures and to achieve significant savings in hospitals’ budget.

**WITHDRAWN**

**PCN17**

**PCN18**

**PCN19**

**A COST-EFFECTIVENESS ANALYSIS OF LAPATINIB AT A TERTIARY CANCER CENTER**

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OBJECTIVE: As new agents become available for the treatment of diseases, there exists a need to evaluate the cost-effectiveness of the agents. This study calculates the cost-per life-year saved and the budget impact of lapatinib, a new dual tyrosine inhibitor as part of the formulary evaluation process at a major tertiary cancer center. METHODS: A decision analytical model was developed to estimate the incremental cost-effectiveness of lapatinib for advanced breast cancer. The model estimates the incremental cost-effectiveness of two strategies: combination therapy of lapatinib with capecitabine compared to capecitabine alone. The outcome of interest was time to disease progression, based on randomized clinical trials (RCTs). Direct medical costs from the institutional perspective were utilized and were calculated for a one year time period. One-way and two-way sensitivity analysis on the rate of disease progression for monotherapy and combination therapy was conducted. In addition, a budget impact model was also calculated for the institution. RESULTS: Based on outcome estimates from RCTs and the application of the institutional costs, the cost-per-life-year saved for lapatinib for treatment of advanced breast cancer was $108,300. One-way sensitivity analysis of the combination response (0–50%) indicated that lapatinib’s cost-effectiveness ratios ranged from $100,000 to $119,000 per life-year saved. Two-way sensitivity analysis indicated that the majority of the time monotherapy was more cost-effective. The lapatinib combination was only considered cost-effective, if the response rate of the monotherapy never exceeded 14.6%. The budget impact model, which incorporated both on-label and off-label usage of lapatinib, estimated that the institution will utilize about 10 million dollars worth of drugs annually, based on acquisition costs. CONCLUSION: Lapatinib appears to have similar cost-effectiveness in comparison with other targeted oncology agents. Post evaluation economic analysis will be conducted to determine how closely the economic model predicted the utilization of lapatinib at the institution.
infections in untreated patients = $31; moderate, AWIC = $287; and severe, AWIC = $4182. CONCLUSION: These data show IVIG prophylaxis cost $24,512 per patient year, compared to $4500 with no prophylaxis, or about a 445% increase in cost. The cost-effectiveness of IVIG in CLL has not been established, and availability of IVIG is limited. Further studies on other alternatives, such as prophylactic antibiotic therapy, and impact on quality of life are needed.

PCN21 SYSTEMATIC REVIEW OF COST-EFFECTIVENESS-ANALYSIS STUDIES OF TRASTUZUMAB (HERCEPTIN™) IN TREATMENT OF HER2-POSITIVE BREAST CANCER

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OBJECTIVE: There have been numerous studies on cost-effectiveness of trastuzumab in both treatments of adjuvant and metastatic breast cancer (BC). Nevertheless, the results reported were varied depending upon the assumptions and/or perspectives of the studies. We performed a systematic review of cost-effectiveness-analysis (CEA) studies of trastuzumab in treatment of HER2-positive breast cancer. METHODS: Literature search from 1996 to December 2007 on databases including PubMed, Ovid MEDLINE, and HealthSTAR was performed to retrieve CEA studies of trastuzumab, using MESh terms and keywords such as “trastuzumab,” “costs and cost analysis,” “economics,” “breast neoplasm,” “cost effectiveness,” “cost utility,” and “breast cancer.” Additionally, abstracts on CEA studies were also obtained from American Society of Clinical Oncology (ASCO) and ISPOR annual meetings. Only CEA studies reported incremental cost-effectiveness ratio (ICER) or cost-utility ratio (ICUR) as cost per quality-adjusted life years were included in this review. RESULTS: Thirty five studies (20 published articles and 15 abstracts) were identified, of which 18 studies (14 adjuvant, 3 metastatic BC studies, and 1 study of product life-cycle of trastuzumab) representing societal health care perspectives from 12 countries were satisfied the criteria. The mean (median) ICERs of trastuzumab are $24,069/QALY ($23,766/QALY) [ranged from $4,767 to $38,414/QALY] and $88,373/QALY ($80,000/QALY) [ranged from $60,120 to $125,000/QALY] for HER2-positive adjuvant and metastatic breast cancer treatments, respectively. Majority of sensitivity analyses showed the main cost driver was the acquisition cost of trastuzumab. In addition, over the product life-cycle of trastuzumab, the overall ICER is $34,400/QALY (Garrison et al., 2006). CONCLUSION: This review suggests that the average costs per QALY of trastuzumab in both treatments of adjuvant and metastatic HER2-positive breast cancer are consistent and below the suggested cost effectiveness threshold of $100,000/QALY.

PCN22 IS CAPECITABINE A COST-EFFECTIVE ADJUVANT TREATMENT OF STAGE III COLON CANCER IN ONTARIO?

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OBJECTIVE: To explore the cost-effectiveness of capecitabine as adjuvant treatment for Stage III colon cancer. Phase III clinical trials show that capecitabine improves disease-free survival. However, these trials involved younger patients than reflected clinically and overall survival was not significantly better than with usual care. We conducted a modeling study comparing the cost-effectiveness of capecitabine and standard care (Fluorouracil/Leucovorin (F ULV)) in a public-payer context (Canada), using an older cohort, and with overall survival as the main outcome. METHODS: A Markov model was developed to determine the cost-effectiveness of capecitabine compared with 5FU/LV. The base case was a 70-year-old man after total mesorectal resection excision of Stage III colon cancer. A five year time horizon was used. Health states included treatment phase, remission, recurrence, disease progression, and death; throughout the model (except during the active treatment states) patients could die from other risk-related causes. Ontario health economic data were used for costs. Probabilities were obtained from the published literature, and sensitivity analyses were conducted. RESULTS: The base case costs for capecitabine and 5FU/LV were $12,999 and $12,191, respectively. Overall survival was 4.132 and 4.069 years, respectively. The incremental cost-effectiveness ratio of capecitabine was $12,821 per life year gained. However, the incremental cost-effectiveness ratio of capecitabine was greater than $50,000/life year when the annual probability of relapse was greater than 0.96 or when drug costs were assumed to be greater than $1,410 per cycle (both values within the plausible range). CONCLUSION: Capecitabine produced modestly improved survival over 5FU/LV ($0.063 extra years) with a favourable cost-effectiveness ratio. However, because the model was sensitive to variations in relapse rate and drug costs, the relative attractiveness of capecitabine over 5FU/LV is not certain. In addition, utilities and indirect costs were not considered in the model. Because capecitabine is administered orally, this could be an important factor warranting further research.

PCN23 COST-EFFECTIVENESS ANALYSIS OF LAPATINIB PLUS CAPECITABINE VERSUS CAPECITABINE ALONE IN THE SECOND LINE TREATMENT FOR BREAST CANCER TREATMENT

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OBJECTIVE: Compare two therapy regimens, Lapatinib plus Capecitabine to Capecitabine alone, for advanced or Metastatic HER2-positive breast cancer patients who were pretreated with regimens that included an anthracycline, a taxane, and trastuzumab. METHODS: A Markov model, written in Microsoft Excel(r), is used to simulate progression of breast cancer in a hypothetical cohort of breast cancer patients in a societal perspective. The model consists of three health states: Clinical Benefits and the 95th percentile of the utility for Progressive Disease, the ICER is USD$281,091.34/QALY and 95% CI USD$230,864.99 per QALY), which may be cost effective, based on the threshold of USD$150,000/QALY. If the value of Lapatinib price increases at least 13.4%, the combination is not cost-effective, based on the threshold of USD$150,000/QALY. All costs are adjusted to 2007 dollars. RESULTS: Lapatinib plus Capecitabine increases discounted life expectancy and quality-adjusted life expectancy by 0.43 years and 0.54 years, respectively, when compared to Capecitabine alone. This result yields an incremental cost-effectiveness ratio (ICER) of USD$135,701.69 per QALY (upper 95% CI USD$230,864.99 per QALY), which may be cost effective, based on the threshold of USD$150,000/QALY. If the value of Lapatinib price increases at least 13.4%, the combination therapy is no longer cost-effective. The same outcome is observed if we increase the transition probability from the Clinical Benefits state to the Progressive Disease state in the combination therapy by 12.5% or if we decrease it by 19.3% in monotherapy. Additionally, by using the 5th percentile of the utility for Clinical Benefits and the 95th percentile of the utility for Progressive Disease, the ICER is USD$281,091.34/QALY and USD$201,232.58/QALY, respectively. CONCLUSION: Based on a threshold of USD$150,000/QALYs, the treatment with Lapatinib plus Capecitabine is cost-effective in the base case for