determine the cost implications of using different types of opioid including considerations such as staff time involved, management of side-effects, concomitant medication and cost of delivery systems.
Methods: A decision tree is being developed in consultation with a panel of UK experts in palliative medicine, palliative nursing, general practice and pharmacy. The tree represents likely pathways for terminally ill patients from the time they are switched from a weak to a strong opioid, until death. Mean drug dose and duration of treatment are derived from the Mediplus database. This covers 5% of the UK population and provides details of 2000 patients with cancer receiving 11,500 prescriptions for opioids. Mediplus findings have been discussed with and confirmed by the expert panel. Other costs such as time spent by nurses or doctors in administering analgesia and the cost of managing side-effects such as constipation and nausea are based on published studies or consultation with the expert panel.
Results: The findings from this model will be presented at the meeting. The results will show the cost of each treatment option and put the cost of opioids into context in terms of the total cost of palliative care. The model will show that hospice care and hospitalisation are the key cost drivers in managing terminally ill patients. Therefore any opioid that reduces in-patient stay will have a significant impact on these costs.

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PP13. Comparison of the cost of managing constipation in cancer patients receiving oral morphine or transdermal fentanyl

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Background: The acquisition cost of a drug represents only one component of its true cost. The incidence of side-effects and the cost of treating them should be considered when comparing the costs of different types of treatment. Clinical trials have shown that patients receiving transdermal fentanyl suffer less constipation than those taking oral morphine. We used one such trial as the clinical basis for an economic model of the cost of managing this side-effect in patients with cancer pain.
Methods: A large-scale randomised, cross-over comparison of sustained-release oral morphine and transdermal fentanyl was used to provide data on the incidence of constipation associated with the two treatments. Patients received either morphine (MST Continus) or fentanyl (Durogesic) for 15 days and then the alternative treatment for a further 15 days. Short-acting oral morphine was available throughout the study for breakthrough pain. Pain scores in the two groups were comparable. Health service resource use for preventing and treating constipation were gathered from interviews with investigators from UK palliative care centres and then valued in monetary terms. Sensitivity analysis was used to assess the effect of variations within the model.
Results: The clinical trial showed that 51% of patients experienced constipation during treatment with morphine compared to 29% during treatment with fentanyl. The mean cost of managing constipation per patient for two weeks was £26.24 for those receiving morphine and £4.47 for those receiving fentanyl. The key cost-driver was hospitalisation for severe constipation. The mean doses in the clinical trial were 98.6mg bd morphine and 63.43µg fentanyl/hour giving mean acquisition costs for the two-week study period of £28.08 and £60.60 respectively. Including the cost of managing constipation reduces the cost difference between the two opioids: the model indicates that the mean cost per patient of two weeks treatment is £54.32 for morphine and £65.07 for fentanyl. The model assumed that 1.5% of patients were hospitalised for severe constipation. If this is increased to 2.5% the total mean cost of treating a patient with morphine exceeds the corresponding cost of treatment with fentanyl.
Discussion: Differences in oral laxative use between the treatment groups did not translate into major cost differences because of their low acquisition cost and the variation in types of laxatives used. Hospitalisation was the key cost-driver in the model. Since cancer patients are often admitted for several reasons it is difficult to estimate the exact contribution of constipation. Only admissions solely for the treatment of constipation were included, and this may therefore be an under-estimate.
Conclusion: Including the cost of treating side-effects may reduce the cost difference of drugs with different acquisition costs such as morphine and fentanyl.

Ref: Ahmedzai & Brooks, Journal of Pain & Symptom Management, 1997, 13:254-61

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PP14. Cost of serious adverse drug reactions related to anti-cancer chemotherapy

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Therapeutic agents used in neoplastic diseases have a narrow therapeutic index which increases the risks of iatrogenic events. The incidence of adverse drug reactions (ADRS) in cancer treatment could impair the efficiency of care and the quality of life of the patients. In order to assess the clinical and economic impact of ADRs in patients treated by anti cancer chemotherapy, we investigated the frequency of serious ADRs (i.e. those leading to hospitalization of the patient or increasing the length of stay/ life threatening ADRs/ ADRs leading to the death) occurring during one year (1995) in a French regional cancer institute.
Patients with a serious ADR were identified by searching the hospital databases using the ICD-9 code of a " noxious effect of a drug ". We found 467 hospitalizations relative to 305 patients. Excess hospital days related to ADRs represented at least 1,300 days (3% of the total hospital days). These ADRs concerned 6.7% of the total of inpatients in 1995. Nine patients died because of the seriousness of the ADR. In almost cases, ADRs were expected side effects of drugs. The average excess cost per patient to treat ADRs was 5,645 French Francs. The highest cost was due to blood transfusions (2,233 FF/patient, 28% of the total blood products cost), followed by pharmaceutical cost (1,620 FF/patient, 4% of the total drug cost) and laboratory cost (1,147 FF/patient). These results emphasize the high incidence and excess costs of ADRs related to anticancer chemotherapy. Use of blood transfusion and drugs such as antibiotics or growth hematopoietic factors represent the major health care costs despite the use of supportive care.

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PP15. Methods for conducting economic analysis of the long-term management of breast cancer: Description of two current Canadian studies

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Background: This paper provides details of two ongoing studies of the long-term management of women with breast cancer. Both studies are funded by the National Cancer Institute of Canada (NCIC) and include a substantive prospective economic component but with markedly different research designs. The studies differ in the phase of cancer studied, in the method of analysis and in the specific health care and economic issues addressed.
Methods: One of the studies is a randomised clinical trial comparing the follow-up of breast cancer patients in remission by either their family practitioner or a specialist physician. The study is multi-centred and a total of 1045 patients will be enrolled. Early stage breast cancer patients are eligible for the study 1 year post initial diagnosis, and are followed for five years. An economic analysis is fully integrated with the RCT and will be conducted on a sub-sample of the study population: 414 women. Data are

being collected on both resource use by patients and patients' utility values. The data collection process had to be designed such that direct contact between patients and study nurses is limited (to avoid introducing bias into the care of patients) and is therefore dependent on self-administered questionnaires.
The second study is designed to assess the size and scope of the use of health care and other services by women with advanced breast cancer. This is a longitudinal cohort study and will enrol 130 women at two Ontario centres. The study will contribute to the development of an assessment instrument to predict the health care needs of patients in an attempt to reduce the number of unplanned health care encounters. The economic component of the study will assess both the costs of treating women with advanced breast cancer and will facilitate modelling the potential economic impact of the assessment instrument. The study has been designed to deal with the many data collection problems associated with a patient group expected to become terminally ill during the course of the study. Potential improvements to the quality of data collected by increasing the number of patient interviews, have to be weighed against the need to reduce respondent burden and minimise missing data.
Discussion: The NCIC is becoming increasingly interested in the application of health economics to studies of cancer control strategies. The two studies outlined illustrate the potential variety of study designs and questions which may arise as interest in the economics of cancer care increases. Specific problems within the design of the studies have had to be addressed. The success of these initiatives will assist in the design of future studies, particularly involving terminally ill patients and patients cared for in the community. The studies will provide information to address the fundamental economic questions raised. In addition, they will provide original data on both the costs and utility values of women at differing stages of breast cancer progression. Such data will be extremely useful for further research.

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PP16. Multi-centre economic evaluation of chart in the treatment of patients with head and neck cancer and carcinoma of the bronchus: Lessons for future studies

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Background: We conducted a cost-effectiveness analysis of an innovative approach to treating cancer patients with radical radiotherapy. The study was conducted alongside a multi-centre randomised controlled trial and used patient specific data and stochastic statistical analysis. In addition to the results, important issues for future stochastic economic analyses are explored.
Methods: Two multi-centre clinical trials were conducted comparing conventional therapy and continuous hyperfractionated accelerated radiotherapy (CHART) in patients with head and neck cancer and carcinoma of the bronchus. Patient specific resource use data were available for 526 head and neck patients (314 CHART and 212 conventional) and 286 bronchus patients (175 CHART and 109 conventional). We compared the total treatment costs for each regimen. In addition, we explored the degree of variation in costs between treatment centres and the quality of reporting of community service resource use from two alternative sources: patients and GPs.
Results: For head and neck cancer patients, CHART cost £ 1092.13 ($p<0.0011$,95 % CI £ 763 to £ 1421) more than conventional therapy. For bronchus patients, CHART cost £ 697.79 ($p<0.001$, 95 % CI £ 392 to £ 1003) more than conventional therapy. No differences between regimens in long-term morbidity or quality of life were found. Survival was greater for bronchus patients treated by CHART - 30 % at two years compared to 20 % ($p=0.006$). There was only a small and non-significant improvement in disease free survival for head and neck patients, although there was a trend for those patients with more advanced disease (T3 and T4) to gain benefit. Costs varied significantly within each treatment-disease site sub-group. For patients treated by CHART, there was large variation between treatment centres. However, for conventionally treated patients variation in costs occurred within treatment centres rather than between centres. GPs returned significantly fewer community services forms than patients. There was statistically significant differences between community resource use as reported by the patient and by the GP. GPs reported greater GP-patient contacts but fewer contacts with other community services.
Conclusions: Although more costly, given its survival benefits CHART should be a cost-effective therapy for patients with carcinoma of the bronchus. In addition, it may be cost-effective for patients with advanced head and neck cancer. Variation in costs between centres was only significant in the experimental treatment (CHART). The most significant factors accounting for the degree of variation related to logistical issues in the management of care: provision of hostel facilities, timing of treatment, methods of reimbursement for out of hours therapy. Thus, although variation between centres occurred it is likely that it may be reduced once centres adopt more efficient methods of care. There were differences in both the quality of reporting of community resources and the quantities of resource use reported. In this case, differences did not effect the study's results. However, in future studies the potential impact of alternative sources of resource use may be considered. Study results may be pertinent to economic analysis conducted alongside clinical trials.

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PP17. An economic comparison of inpatient versus outpatient treatment of febrile neutropenia in a pediatric oncology ward

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Objectives: To document the cost implications of a switch to OPAT for third party payers and patients in a pediatric oncology department.
Background: Several trials have described the safety and clinical efficacy of outpatient parenteral antibiotic treatment (OPAT)[1] and the conditions for OPAT management of such patients to be successful[2]. OPAT has also potentiel economic advantages by lowering the cost of treatment,
Methods: In order to document the cost implications to third party payers and patients of a switch to OPAT in a pediatric oncology department of a teaching hospital, a quasi experimental before-after design was used. Patients were divided in to 2 groups: a retrospective control group consisting of the cases seen over the last 6 months (N=1 1) and a prospective intervention group consisting of all new patients admitted for FNE (upo to N=30) after implementation of the new policy starting in june 1997.
The cost of inpatients were assessed through their billings, with all expenditures allocated on a daily basis including additional patient out-of-pocket expenses . The chosen once-daily antibiotic treatment for OPAT consists of Ceftriaxone® as single agent or in combination with an aminoglucoside or with Teicoplanin® in case of suspected gram positive strain.
Results: Results from the retrospective control group show a median inpatient length of stay (LOS) of 8 days. The minimum LOS was 5 days and the maximum 12 days. The average total per diem cost varied between 20,929 BF (±1622) and 24,441 BF (±2265) with however a slight increase observed on day 3 related to swithching to a more expensive antibiotic therapy for some patients.
These cost estimates will be compared with the preliminary cost estimates of the prospective OPAT group in which each OPAT patient will serve partially as his own control (inpatient treatment during the first two days versus outpatient treatment during next days).
Discussion: Although OPAT is in theory a less costly alternative than traditional hospitalitzation, potentiel savings for the health sector from a switch to OPAT have to take into account complementary costs of outpatient management and possible shifts of costs to the patients which should be compensated for.

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