more beds, open as well as semi-secure. Arrangements must also be made to ensure that these services, if established, continue to be properly financed. One of the dangers of the present programme is that the new units would soon become dumping grounds for the most undesirable patients and might receive the lowest funding in competition with more attractive services, as prisons and mental hospitals always did in the past. It would perhaps be necessary for the DHSS to manage such a service directly (as with the special hospitals).

This approach could succeed only if sufficient accommodation were provided to cope with the whole problem, not simply the very few patients who need security.

A third solution is to build more special hospital accommodation. Park Lane Hospital when complete will only relieve overcrowding in Broadmoor, which itself is then to be rebuilt. Further maximum security facilities would be a logical alternative to a network of regional secure units but would fail to provide for the problems presented by those who are not dangerous.

A fourth answer, suggested by Scott,²⁴ is to put our resources into developing treatment facilities in prisons, where he felt much expertise still resided. There are sound arguments for this proposal, but it is unlikely to find much general support and would require a change in philosophy that is unlikely to be acceptable.

Finally, it has been seriously suggested that consultants who refuse to provide treatment on the grounds of personal prejudice and misconceptions should be challenged in a test case to decide if this refusal is indeed "reasonable."

Our present difficulties have much to do with changing attitudes and sympathies within the profession. They are also a reflection of discontent created by all the Health Service's problems of funding, staffing, and reorganisation. The least attractive and least vocal of our patients are the first to lose out, and there is a danger of their becoming pawns in a political game. The present policies should therefore be re-examined. The Butler Committee recommended the constitution of a national advisory body to keep under review the progress made in carrying out its recommendations, "to report where problems are arising and to assist towards solutions." This has never been

established. Perhaps now is the time for such a body to be set up with executive powers to deal with these issues.

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Contemporary Themes

Cost of outpatient chemotherapy

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Over the past ten years cytotoxic drugs have been used increasingly in the treatment of patients with advanced malignant disease. As combinations of drugs have become more effective

there has been mounting pressure to use such agents in more and more patients. This applies not only to the lymphomas and leukaemias, where advances have been most encouraging, but also to the more common solid tumours such as lung, breast, gastrointestinal, and ovarian cancers, where progress has also been made. The potential number of patients who may be given chemotherapeutic agents, therefore, could be very large indeed.

Of even greater significance is the promise shown by early drug treatment. Some success has already been obtained in the solid tumours of childhood,¹ breast cancer,^{2,3} osteosarcoma,⁴ and lymphomas.⁵ Clinical trials are now exploring the potential of this new idea for almost-all adult solid tumours.

Usually cytotoxic drugs are given on an outpatient basis, so saving the cost of inpatient care. Although such drugs have

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been widely used in the past, the emergence of the medical oncologist has given impetus to evaluating new treatment protocols. It is important, therefore, to consider the cost of chemotherapy.

We set out to examine the cost of drugs used in treating patients with cancer, comparing this with the cost of drugs commonly used in other chronic and acute diseases, and to contrast inpatient and outpatient treatment.

Methods

The department of clinical oncology is responsible for staffing five outpatient clinics each week. The patients attending one of these clinics were studied over a two-month period. Most patients had the common solid tumours such as lung, breast, gastrointestinal, gynaecological, and urological neoplasms. We excluded patients who required admission for infusions that had to be given in three- or five-day courses. About 90% of all chemotherapy is given on an outpatient basis.

This clinic is staffed by four doctors and 40-45 patients are seen each session. Two technicians perform haematological estimations at the clinic. In addition to the outpatient nursing staff, a pharmacist, a dietitian, and a health visitor attend. Patients are seen and examined and drugs are given, the time taken being from 10 to 15 minutes per patient. As many as possible of the oral drug preparations are pre-packed and labelled to minimise the patient's waiting time. Intravenous preparations are given by the medical staff, and where multiple solutions are used a "butterfly" system is employed. Before the clinic all the case sheets are reviewed and routine investigations arranged ahead of the patient's visit.

During the clinic, medical students and nurses are taught and relatives are interviewed. The approach is a team one, which has been built up over the years. To quantify the cost of it is difficult, and no costing of medical, nursing, and ancillary staff has been made as the staff are not specially appointed to the clinic.

It is difficult to cost all of the drugs used as some are supplied free of charge for investigative purposes by the National Cancer Institute. Moreover, several non-chemotherapeutic drugs—for instance, antiemetics and antibiotics—are also prescribed. Some of these are included in the cost of the clinic; some, however, may be prescribed by the general practitioner. A specific drug trolley is kept at the clinic and over the study period this was checked at the end of each session and a note made of all drugs used. These drugs were then individually costed, with standard National Health Service pricings. These costs were then compared with those of various other preparations used for treating acute or chronic illnesses.

Results

Over the two-month period there were 324 visits by patients, and the total drug cost was £2433. This comprised £1553 for chemotherapeutic drugs and £880 for other drugs, including antiemetics, analgesics, and antibiotics. The cost of drugs per visit was therefore £7.50.

In treating solid tumours it is conventional to use standard regimens for specific neoplasms. Cyclophosphamide, methotrexate, and fluorouracil (CMF), for example, are commonly used together in breast cancer. The cost of 12 courses (spanning one year) is between £150 and £250, depending on the height and weight of the patient. A more expensive combination—doxorubicin (adriamycin), cyclophosphamide, and vincristine (ACV)—would cost £450-800 for eight to 10 courses lasting six to nine months. One of the most commonly used drugs in gastrointestinal neoplasms is fluorouracil. A course lasting one year (weekly doses) would cost about £150. One of the hormone preparations, tamoxifen, costs around £300 for a full year's supply. Vincristine and bleomycin given weekly for 6 months cost about £420.

How do these costs compare with other drug prices for acute illnesses? A week's course of parenteral nutrition, for example, would cost between £150 and £200, depending on the particular solutions chosen. A three- to five-day course of streptokinase would cost £300-700. The antibiotics fucidic acid and gentamicin are £30-50 respectively for a 10-day course, and sufficient calcitonin to control hypercalcaemia would cost around £300 a week.

Such drugs are used to treat acute conditions, and it is perhaps more appropriate therefore to compare the long-term treatment of

cancer by drugs with the cost of treating other chronic diseases such as arthritis, hypertension, cardiac arrhythmias, and diabetes (table). The costs of these drugs have been calculated on average doses in average patients and can therefore only be an approximation.

Cost of drugs used for treating chronic illnesses

Drug	Daily dosage (mg)	Approximate cost for 12 months (£)
Thyroxine	0.2	2.00
Digoxin	0.25	1.20
Prednisolone	40	15.00
Azathioprine	50	45.00
Chlorpropamide	375	30.00
Propranolol	80	26.00
Methyldopa	1000	60.00
Spironolactone	100	94.00
Cimetidine	600	140.00

Discussion

Clearly, from the costs detailed, the drug cost of outpatient chemotherapy for the cancer patient is not particularly high at around £7.50 a visit. The yearly cost of each patient's drugs is usually greater than that for many of the other chronic diseases. Nevertheless, it is relatively cheap compared with the cost of inpatient care (£200-300 per week). In comparison with drug treatment in acute illness, however, it is relatively cheap. No additional expenditure has been included for staffing. To do this comparatively the cost of running a diabetic, hypertension, or thyroid clinic would also need to be detailed.

The cost of some of the cytotoxic drugs that need to be given on an inpatient basis is higher than the outpatient costs but would approximate to the cost of treating acute medically or surgically ill patients intensively with antibiotics, intravenous feeding, and other supportive measures. We have not, however, compared the costs of surgery or radiotherapy as it is extremely difficult to quantify these.

We concluded that chemotherapy can be given to patients with cancer on an outpatient basis and that the cost of running such a clinic may add considerably to the hospital drug bill. We consider, however, that the benefits of outpatient treatment are important as the patient may stay at home and in contact with his general practitioner and local health services. As the number of patients needing such treatment grows a careful watch must be kept on cost effectiveness and the efficiency of patient management. The possibility of using such drugs outside specialist units should also be considered.

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ONE HUNDRED YEARS AGO Dr Alford, in his report on the Taunton Rural Sanitary District, details the particulars of a local outbreak of lead-poisoning for which he could not account, as it occurred in the same part of his district, but in houses far apart. He analysed the water, cyder, preserved fruits, etc, but without detecting any lead; but on careful inquiry, he found that the families had one thing in common—viz, they all had their flour from the same mill. An analysis of the flour showed the presence of lead; and, on going to the mill, he ascertained that, during the miller's absence, the holes in the stones had been filled up with lead. Of course the lead was removed, and the disease gradually disappeared. Some of the cases were of a very severe form; and it appeared, on further inquiry, that this is a practice of by no means uncommon occurrence; so that, especially in country districts, this source of lead-poisoning must not be forgotten. (*British Medical Journal*, 1878.)