TALKING POINT

Budgeting for pharmaceuticals

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Over £1 billion was spent on drug sales in Britain in 1981.¹ This is about £20 per person a year, a figure that is increasing at over 15% annually. Drugs account for over 15% of total health expenditure.² This high level has an important effect on Health Service planning because pharmaceutical budgets are virtually openended.³ No one knows at the start of the year what value of prescriptions will be issued during the succeeding 12 months, and this uncertainty limits expenditure on other budgets—for example, staff and equipment. Of the controlling factors that do exist,⁴ the most important are charges to patients for prescriptions written by general practitioners and the monitoring of each general practitioner's total prescription expenditure. These controls, however, do not apply to hospital expenditure. Hospital patients are not charged for their prescriptions, nor are the prescription expenditures of hospital consultants monitored.

In the former Cambridge Health District Addenbrooke's Hospital accounted for 80% of the total expenditure on drugs by the authority in 1980. The cost was about double the average cost per case in the district. To what extent was this relatively high level of expenditure the result of the case mix dealt with by the hospital? It was hypothesised that it was due to the presence of several regional specialty departments. If that was the case the high level of expenditure might be justified.

At Addenbrooke's Hospital, as at most other hospitals,⁵⁻⁶ only the total overall level of expenditure was known and not the expenditures by individual prescribers and departments.⁷ In this study the pharmaceutical expenditure of regional specialty departments in the hospital was monitored to determine average

in the department, when the department used high cost drugs extensively, or when costs per patient or per day seemed to vary excessively.

All departments studied reported small seasonal variations in their case mix. Hence the sample used consisted of the total number of patients discharged over an appropriate period. The study was prospective. It covered 7000 inpatient bed days and prescriptions valued at £37 500. Before the start of the survey consultants were asked to estimate their expenditure on drugs. Most would not even hazard a guess. Those who did considered it to be low or around a few pence a day.

The daily cost for drugs for a regional specialty inpatient was £5.36 in 1980 for 75 000 bed days. The comparable figure for the hospital overall (including regional specialty patients) was £3.58, based on 225 000 bed days. The average drug costs of regional specialty patients for each department are shown in table I.

Of the 11 specialties studied, only two had average daily costs per patient that were above the average for regional specialties. The average cost of drugs for radiotherapy patients was £23.64 a day, and that for haematology patients £17.02 a day. Most other regional specialties had daily costs that were close to or below the overall hospital average—for example, neurosurgery (£2.92) and transplant surgery (£2.55) had costs that were considerably lower than those of the hospital as a whole. And a large group of regional specialties, including neurology, rehabilitation, retinal detachment, urology, and plastic surgery, all had average costs that were less than half of the overall hospital average drug costs per inpatient day.

TABLE I—Drug costs per inpatient day and days sampled by specialty and consultant in 1980

Specialty	Average cost (£) per inpatient day (No of days sampled)						Not known
	All consultants	1	2	3	5	6	
Haematology	17.02	18.99 (476)	8.01 (82)	1.68 (14)	0.69 (3)		
Neonatology	3.63	3.07 (133)	5.19 (82)				
Neurology	1.80	0.60 (135)	2.44 (145)				
Rehabilitation	0.82	0.82 (802)					
Retinal detachment	0.52	0.52 (521)					
Radiotherapy	23.64	30.88 (218)	6.08 (447)	65.83 (92)	11.38 (228)	3.45 (38)	0.38 (35)
Urology	1.07	1.18 (108)	0.86 (120)				1.10
Plastic surgery	0.63	0.77 (286)	0.24 (104)				
Neurosurgery	2.92	2.40 (301)	2.99 (155)	1.51 (61)			17.18
Transplant surgery	2.55	3.25 (1188)	1.97 (100)	1.01 (56)			
Nephrology	4.38	4.38 (141)					
All specialties	5.36						

costs per case and costs per day for each specialty during 1980.⁸ On this basis it was possible to estimate annual pharmaceutical budgets for each specialty and to improve budgeting procedures.

Method and results

The case notes of each patient selected were checked and details of drug consumption recorded. The basic sample frame aimed at was a minimum of 30 patients, or 250 bed days, for each specialty. This was generally exceeded, as the sample size was increased whenever there were large numbers of cases treated

This analysis shows that the regional specialties studied were not, in general, a high burden to the hospital in terms of drug costs. There were, however, particular regional specialties that did incur relatively high costs. The cost of drugs per inpatient day for haematology and radiotherapy patients were five and seven times higher than the overall hospital average. Thus the presence of such specialties in any hospital could pose a financial burden for that hospital if budgetary procedures were not adapted to allow for that cost.

COST VARIATION BETWEEN PRESCRIBERS

Appreciable variations in cost between prescribers were noted (table I; columns numbered 1 to 6) for each of the consultants employed by the specialty. Different consultants, however, may have treated different types of patients; this would be reflected

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TABLE II—Cost per inpatient day by selected types of drug and regional specialty, 1980

Type of drug	Cost (£) per inpatient day and regional specialty, 1980										
	Haematology	Neonatal intensive care	Neurology	Rehabilitation	Retinal detachment	Radiotherapy	Urology	Plastic surgery	Neuro-surgery	Transplant surgery	Nephrology
Analgesics	0.92		0.08	0.06	0.03	0.21	0.13	0.01	0.15	0.01	0.02
Hypnotics	0.14		0.15	0.05	0.02	0.51	0.02	0.16	0.23	0.09	0.07
Antidepressants	0.01		0.13			0.02				0.05	0.07
Antibiotics	1.01	2.66	0.09	0.25	0.05	0.19	0.17	0.37	0.74	0.60	0.15
Anticoagulants	0.51		0.09							0.14	
Gastrointestinal	0.53		0.47	0.05		0.21	0.13	0.05	0.03	1.05	1.01
Cancer chemotherapy	13.30					22.00					
Corticosteroids	0.02		0.03		0.11	0.47	0.01		0.60	0.09	0.02
Diuretics	0.34	0.01	0.03	0.01	0.02	0.08	0.02			0.06	1.09
Hypoglycaemics			0.05	0.17	0.32		0.21			0.11	0.08
Antifungals	0.01		0.25	0.10		0.01	0.18	0.01	0.06	0.16	
Respiratory	0.01	0.55				0.02				0.05	
Cardiovascular	0.11		0.01	0.05			0.05	0.01	0.03	0.07	0.48
Steroid hormones			0.13	0.02		0.01	0.02	0.01			0.01

For other types of drug the cost did not exceed 10p per day for any regional specialty.

in cost variations. Furthermore, some consultants seemed to treat large numbers of patients while others treated only small numbers in the same department. At times the number of patients treated by a consultant was too small to obtain a useful average cost figure. The largest cost variations per inpatient day were in the departments of neurosurgery (£1.51 to £17.18), haematology (£0.69 to £18.99), and radiotherapy (£0.38 to £65.83). In the haematology and radiotherapy departments the highest cost prescribers seemed to be those that treated the largest numbers of patients. So the average costs per inpatient day of these specialties are relatively close to those of the highest cost consultant.

Many patients travel quite large distances across regional and district boundaries to be treated in Addenbrooke's Hospital. It might be thought that these "migratory" patients were relatively seriously ill and, therefore, high cost cases. The study did not support this hypothesis, as average costs for each individual specialty did not differ according to the geographical origin of the patient.

Table II shows expenditure by drug category. Most drugs prescribed in hospital cost less than 25p per patient per day and nearly all cost less than £1. The few remaining relatively expensive categories account for a disproportionately large part of total hospital expenditure on drugs. Expenditure on antibiotics in the haematology and neonatal intensive care departments and on diuretics in the nephrology department was over £1 per patient per day. The highest expenditure (£13.30 and £22) was on cancer chemotherapy in the haematology and radiotherapy departments. Expenditure on this category of drugs accounted for over 75% of the total drug bill for these specialties. Subtracting the costs of cancer chemotherapy does not bring haematology in line with the costs of other departments, as this specialty also had higher than normal costs in other drug categories, notably analgesics, antibiotics, anticoagulants, and gastrointestinal drugs. A further range of drugs used by specialties was not priced, as they were available to the hospital free of charge for research purposes at the time of the study.

The total annual cost of drugs for each specialty in 1980 was estimated from these data (table III). Radiotherapy and haematology accounted for over £400 000, or between a third and a half of the total drug bill of the hospital. This result could have important implications for the allocation of resources as most patients in these specialties were "migratory" patients from other health districts. In principle, forecasts of drug expenditure may also be made with these data by adjusting for changes in prices and work loads of departments. These would be useful for planning purposes, as hospital pharmaceutical budgets are frequently underestimated.

Discussion and conclusions

Hospital drug costing and budgeting is a relatively new area, but the procedures seem straightforward. A continuous monitor-

TABLE III—Estimated future drug costs for regional specialty patients

Regional specialty	Drug cost per inpatient day 1980 (£)	Estimated number of inpatient days	Estimated annual drug cost at 1980 prices (£'000)
Haematology	17.02	4469	76.05
Neonatal intensive care	3.63	4272	15.5
Neurology	1.80	8130	14.6
Rehabilitation	0.82	6481	5.3
Retinal detachment	0.52	1917	1.0
Radiotherapy	23.64	15093	356.8
Urology	1.07	10777	11.5
Plastic surgery	0.63	4574	2.8
Neurosurgery	2.92	17442	50.9
Transplant surgery	2.55	2448	6.2
Nephrology	4.38	2372	10.4

ing procedure could well adopt a more efficient method than that used for this study as an adaptive sampling strategy could be used. Alternatively, there is now a range of minicomputers that will produce labels for prescriptions dispensed and, at the same time, store information on the nature and quantities of items dispensed. These are primarily intended for the retail pharmacy trade as aids to the efficient control of stocks in store. Facilities of this type could, with minor amendments, provide the total cost and a breakdown of items dispensed to individual specialties. In the year after this study pharmaceutical expenditure declined by 10%, or £100 000 in Addenbrooke's Hospital. The study cost the hospital £11 000.

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