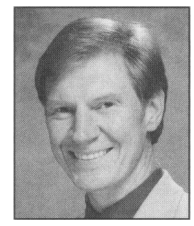
Great Medicine - Pity about the Cost



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The cost of healthcare is increasing inexorably in all countries in the world. Many governments have focused their activities on promoting the effective and economic use of resources allocated to healthcare. Medicines form a small but significant proportion of total healthcare costs and one that has been increasing consistently as new medicines appear into the market place. The writing of a prescription is the most common therapeutic intervention in medicine and yet there is much evidence to suggest that this simple task is not conducted optimally.

Healthcare spending contributes to around 14% of growth domestic products in the US economy compared to 7% in the United Kingdom. The UK, spends around £50 billion on healthcare, mainly in the public sector, which represents around £900 per person per year. The amount spent on medicines has consistently been around 10% with around 550 million prescriptions being dispensed annually.

Each patient receives on average 9.4 items but this tends to be skewed towards the elderly population. However the proportion spent on medicines is starting to rise and is currently 13% of the total. Medicines expenditure in the UK has increased by an average of 12% per year in the last five years. 81% of the costs are incurred in primary care and this constitute up to 50% of the primary care revenue costs. Within average general hospitals 3% to 5% of the total revenue expenditure is spent on medicines. This increase in expenditure was recently picked up in an independent report produced by the Audit Commission which identified potential for savings of £450 million by promoting good prescribing by general practitioners[1]. A House of Commons Select Committee enquiry into medicines expenditure was recently convened to examine these increases in costs of medicines[2].

There are a number of reasons why costs are increasing. These include:

- Demographic changes in the population. As the average age in the population becomes older and as the proportion of elderly patients becomes greater their pharmaceutical needs increase
- Health screening programmes which have been particularly targeted at the elderly have uncovered previously non-identified diseases which subsequently require treatment.
- Improved diagnostic techniques have again uncovered more treatable diseases in these patients.
- New medicines are entering the market place on a regular basis frequently offering more effective and less toxic alternatives to existing agents. Invariably these are more costly

Pharmacoeconomics has been defined as the measurement of both the costs and consequences of therapeutic decision making. Pharmacoeconomics provides a guide for resource allocation but does not offer a basis on which decisions should be made. Pharmacoeconomics can help to provide a solution for dilemmas for decision makers where, for example, medicines with a worse outcome may be available at a lower cost and medicines with better outcome and higher cost can be compared.

Costs and consequences of therapeutic decision making can be described in a number of ways. Costs can be *direct* to the organisation, ie. acquisition costs of medicines, consumables associated with drug administration, staff time in preparation and administration of medicines, laboratory charges for monitoring for effectiveness and adverse drug reactions. *Indirect* costs include lost cost to the economy and taxation system as well as economic costs to the patient.

Consequences can be measured in terms of the total cost associated with a programme where both costs and consequences are measured in monetary terms *(cost benefit analysis). Cost effectiveness* can be described as an examination of the costs of two or more programmes which have the same clinical outcome. Treatments with dissimilar outcomes can also be analysed by this technique. *Cost utility* provides a method for estimating patient preference and quality of life measurements within the economic

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setting. The dilemmas faced by decision makers on the introduction of a new treatment is indicated in figure1.

FIGURE 1

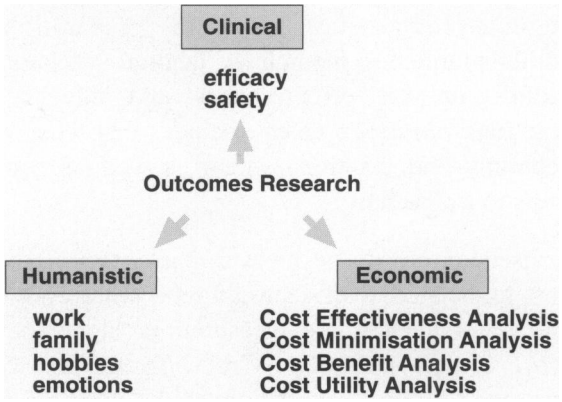
Decision matrix for a new treatment

	lower cost	**same cost**	**higher cost**
worse outcome	?	reject	reject
same outcome	consider (CMA)	optional	reject
better outcome	dominant	adopt	?

Outcomes research is now examining the value of medicines in society by seeking their clinical effectiveness in terms of efficacy and toxicity but, as importantly, the humanistic outcomes in terms of quality of life and health gain which are patient specific (Figure 2). The third dimension of cost effectiveness can help society through governments make priorities in healthcare decision making. The use of evidence based medicine is becoming a sought after goal and medicines, by virtue of the licensing process and use of formularies, are one of the only group of clinical interventions which have been subjected to health technology assessment.

FIGURE 2

The three dimensions considered in outcomes research which examine the overall and relative effectiveness of a particular health care intervention.



The costs associated with adverse drug reactions can be considerable. eg. The cost for each case of nephrotoxicity of aminoglycosides was calculated to be $2500 per case in 1987[3]. Failure to effectively monitor aminoglycosides levels led to irreversible vestibular damage in a women who received a prolonged course of aminoglycosides. Subsequent legal costs against the hospital were $1.5 million[4]. The costs of the bizarre side effects and fatalities of the anti-arthritic drug benoxaprofen, introduced in the early 1980's are only now starting to be realised.

The costs of non-compliance with medicines are significant. In the US it has been calculated that 11.4% of all admissions to hospital has been directly associated with some form of non compliance at a cost of $2150 per patient. Two million hospital admissions a year result from medication non-compliance at a total cost of $8.5 billion and it has been estimated that lost work productivity through non- compliance in the US is more than $50 billion per year[5].

Decision analysis offers a method of pictorial representing treatment decisions. If the results from clinical trials are available probabilities can be placed within the arms of the decision tree and outcomes can be assessed in either monetary or quality units[6].

This model can be used for a number of clinical situations. For example one study examined the incidence of wound infections which occurred by giving prophylactic antibiotics too early or too late in the surgical process and compared with giving them on induction. A decision tree can be created for the costs associated with surgery, together with the wound infection rates published in the original paper. Using this model it can be shown that there is an average £51 saving for each operation if the antibiotic is given on time. Commuted to an average hospital undertaking 10,000 surgical operations a year this reflects a potential cost saving of half a million pounds. This approach is referred to as *risk management* and is a part of quality assurance in any given process[7].

An example of the cost effectiveness of the addition of GMCSF after autologous bone marrow transplantation for lymphoid cancer. A randomised controlled double blind trial was undertaken in 40 patients to ascertain the effect of GMCSF with placebo. Outcomes measured included length of stay, total charges department, departmental charges, re-hospitalisation and outpatient charges. In all cases except pharmacy costs the charges were less with the GMCSF treatment indicating an overall saving to the organisation at a better treatment outcome[8].

A fundamental element of the use of pharmacoeconomics in practice is the view point from which the analysis is conducted. Ideally this should be

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from a societal perspective but frequently it is from a Government, or Department of Health viewpoint. Purchasers of healthcare may also have a different perspective to provider units as might clinicians and patients may also differ. The pharmaceutical industry will have another viewpoint which will be focused on their particular products.

Health economics which is applied to medicines might compare:

- medicines versus surgery eg H pylori elimination v HSV
- medicines versus hospitalisation eg avoidance of admission by using specific antibiotics
- the place of diagnostic test costs eg. MRI
- the costs and consequences of prevention programmes
- the setting in which patients are treated eg. hospital, outpatient or home - eg home intravenous antimicrobial therapy
- risk management in avoiding unwanted effects of medicines
- total quality management where the best outcomes are sought

A recent study of three groups of health service decision makers sought to explore the reasons for the impact, or lack of impact, of the results of economic evaluations of medicines. An anonymous postal questionnaire was sent to directors of pharmacy, health authority directors of public health and NHS prescribing advisors. The results

identified the educational need of these individuals to appreciate studies on cost effectiveness and highlighted that the biggest barrier to implementing decisions on clinical and economic grounds was the inability to move funds around within the system[9].

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