

Some economic aspects of day surgery

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This paper highlights certain economic aspects of day surgery that need to be considered when changing to this form of treatment.

Key words: Economics, day surgery

This paper makes no pretensions to being all-embracing. Neither does the author claim to be an expert in the field, though he takes comfort in this respect from Hubert Humphrey's remark that he learnt more about economics from one South Dakota dust storm than he did in all his years in college. The aim is to highlight certain financial aspects that need to be considered when changing from inpatient to day-case surgery.

Average unit cost comparisons

Most of the papers on the economics of day surgery have compared the average unit costs of day surgery to inpatient surgery. Savings of between 19 and 70% have been reported for day surgery¹⁻⁵. There are a number of reasons for this variance. Different individual or groups of surgical procedures have been looked at. The studies have spanned some 15 yr and during this period the average length of inpatient stay has steadily fallen. The areas of costs examined have varied and no study has covered them all. In particular, capital cost comparisons have not been undertaken. All these studies show is that day surgery has a lower average cost than inpatient surgery but by what amount is uncertain.

Cost changes substituting day surgery for inpatient surgery

There is a concept that activity is inversely proportional to cost and that the unit cost, at any level of activity, for day surgery is less than that for inpatient surgery. On this basis the transfer of cases from inpatient to day-case

work results in an increase in inpatient unit cost, a decrease in day-care unit cost and an overall saving. Clearly this is over-simplistic. At very low levels of day-case activity, for instance, the few cases being treated are carrying the full fixed costs and thus the unit cost for day cases might exceed that for inpatients. In this situation a transfer of a small number of cases from inpatient to day care would result not in overall savings but in overall increased costs. Equally the concept of a straight line inverse relationship between unit cost and activity is misleading. This only pertains between critical activity levels. The true relationship is a series of straight line slopes joined by intermittent steps. These steps are against the direction of the slopes and occur as staff are taken on or laid off, or facilities are opened or closed as critical activity points are reached.

Perhaps the easiest way to understand the relationship is to use the simile of a jumbo jet. Before one passenger can be carried there are fixed costs to be met including the capital cost of the plane and the staffing costs of the pilots and the minimal number of cabin crew to meet safety regulations. The same crew can handle, for sake of argument, up to 60 passengers. As the number of passengers increases to this figure the unit cost per passenger reduces on a straight line basis until over 60 passengers need to be carried. The number of cabin crew must then be increased to cope with the increase in passengers. Unit costs suddenly increase and then fall again on a straight line basis as passenger numbers grow until further cabin crew are required. This pattern continues until the jumbo jet is full and minimum unit cost is achieved. A second plane is then required to handle further passengers. There is then a sudden and large rise in unit cost, though not to the level at the outset of the first plane, as the total costs are spread over the passengers in the first full plane and the second plane. This over-simplified description perhaps highlights areas to be looked at when relating volume to cost.

The above descriptions do not, however, take account of case mix but rather assume that all cases attract the

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same cost. Initially when cases are moved over to day surgery the inpatient case mix is little affected but as day surgery grows the majority of the more straightforward cases are removed from inpatient care, leaving increasingly more complex cases which are more costly to handle. The rise in inpatient unit costs therefore becomes steeper than it was at the outset of the move to day surgery. Conversely, in time more major cases become day cases and at this point the fall in average day surgery unit costs flattens out or may even rise.

Some of the cost effects of a change from inpatient to day surgery may now be considered.

Capital costs

The cost of building an inpatient unit to handle a given number of cases is more than that of building a self-contained day unit to deal with the same number of cases. The theatre costs of the two will be the same but the ward area in a day unit is less complex and is smaller as patients spend less time in a day unit than an inpatient ward. Thus more patients can be dealt with in a given area in a day unit and consequently the capital cost of providing ward accommodation in a day unit is considerably less than it is in an inpatient facility.

In most instances, however, the choice is not between building an inpatient facility or a day unit. More commonly an inpatient facility already exists and a new self-contained day unit is required. The choice is then between converting an old building and erecting a new building or possibly a combination of the two. Areas available for conversion may not be ideally situated in the hospital, design compromises may be required to fit an existing shell and the potential for future expansion may be limited. These factors may lead to increased revenue costs when open and a reduction in service quality. A conversion is, however, frequently cheaper than a new building though this is not always the case. A new building should achieve the ideal design from the point of view of efficient running costs and quality of services. It can also be designed for possible future expansion.

However, when moving from inpatient to day surgery work not only should the capital cost of developing the day unit be considered but also the effect the move has on existing inpatient capital investment. As day-case activity increases and inpatient work falls inpatient ward and theatre facilities will become surplus to requirements. The capital cost of these facilities still has to be serviced, unless they are over 50 yr old and have been written off or they can be sold. Capital costs can be transferred if their use can save building a necessary new facility.

All the factors mentioned above must be considered and financially modelled prior to the development of a new day unit.

Nurse staffing costs

Inpatient nursing costs are not saved by a transfer of inpatient work to day surgery until a critical number of

inpatient beds can be closed. On a 30-bedded ward about six beds must be closed before savings on day nursing salaries accrue and 15 beds must close before the night nursing salary bill can be reduced. As the lighter cases are increasingly treated as day cases, unit nursing costs for the remaining inpatients are increased as a higher nurse/patient ratio is required.

Nurses in day units in the UK only work weekdays between 8 a.m. and 6 p.m. and units close on bank holidays. Clearly costs are less than for providing inpatient nursing care 24 hr a day 365 days a year. Salary bills can be minimized and job satisfaction increased by training staff in day units to be multiskilled. That is, every nurse is trained to work in the ward area, assist anaesthetists, scrub in theatre, recover patients and give advice to patients and relatives. They can also be instructed in assisting in patient selection, thus releasing time spent by junior medical staff.

The lack of antisocial working hours and the good use that can be made of part-time staff in a day unit makes staff recruitment easier than for inpatient work⁶. This, combined with the experience of many day units that staff retention is better than for inpatient wards and theatres, results in reduced personnel costs.

Other costs

Unit medical staff costs may be slightly lower in a self-contained day unit as there is some evidence that a greater number of cases can be undertaken in a given period of time than when the same cases are dealt with on an inpatient basis^{7,8}. Theatre disposables, dressings and analgesic costs are the same for day cases as inpatients. Day-case anaesthetic drug costs are often said to be higher than those for inpatient surgery. Perhaps this reflects a willingness to compromise quality for cost benefits in inpatient anaesthesia. Laundry costs are likewise similar but catering costs for day surgery are less. The costs of other services such as heating, lighting, maintenance and cleaning are less per case treated in a day unit than in an inpatient unit, as more cases are treated in a smaller area.

Careful consideration must be given to the apportionment of a hospital's central overheads between the inpatient and day-care units. Such costs may include those for general management, finance, marketing, training, personnel, etc. Day units on hospital sites are often loaded with more than the correct percentage of these costs. This is reflected in studies which have shown the cost of day surgery treatment in free-standing units to be less than that of self-contained units on inpatient hospital sites⁹. Day units on hospital sites may also be burdened with paying a disproportionate part of the cost of certain 24-hr services such as portering, communications, pathology and radiology.

It is understandable that managers of hospitals with both inpatient and day-case facilities should try to spread their costs to make the inpatient ward more competitive.

However, for prudent management the true cost apportionment must be known so that the financial viability of both the inpatient and day units can be determined. The move to day surgery and the consequent reduction in inpatient work, albeit more complex, may reduce income to below the critical level to sustain quality inpatient services and essential 24-hr overhead costs. If this point is reached consideration must be given to closing the inpatient facility or merging it with another.

Admission, readmission and complication costs

The cost of treatment in any area should include the cost of dealing with any problems that might arise as a result of that treatment. Admission costs only apply to day surgery though perhaps inpatient care beyond the projected time of discharge should also be considered. Admission rates for day surgery of between 0.7 and 6%^{10,11} have been published and the average length of inpatient stay is just over 1 night.

Readmission rates following inpatient or day surgery for the same procedure seem similar and run between 0.3 and 2.8%¹². Likewise complication rates for day surgery are no greater than for inpatient surgery⁹.

Transferred costs

Costs are variably incurred by the community and primary healthcare services and/or the patients and their relatives before, during and after hospital treatment. The term transferred costs has been given to the costs, previously met by the hospital, incurred by the above following day surgery. Clearly such costs should be included in the total treatment cost but this should not be confined to day surgery but also included for inpatient work, particularly in view of the ever-reducing length of inpatient stay. Perhaps these costs should be termed non-hospital costs.

In the 1970s considerable use was made of community nursing services following day surgery and it was estimated that this accounted for 12% of the savings made from changing treatment to day care¹³. More recently the Audit Commission⁸ reported little use of such services. At present some day units are considering employing their own community nurses who can be targeted on the few cases that require this service.

General practitioner contact following day surgery is reported at between 3 and 9%^{14,15}. No study has compared community and general practitioner involvement following inpatient and day-case surgery for the same procedure.

Studies from North America show savings to patients and their relatives from a move to day surgery^{4,16}. Loss of earnings for relatives caring for patients at home, travelling costs to and from the hospital and the speed of return to work of the patients are some of the factors that need to be taken into account. Further work is required in this area.

Conclusion

It is impossible to generalize about the level of savings that may accrue from a move to day surgery. Indeed it may well be that in the short term a transfer to day surgery may increase the total cost of patient treatment to a hospital and in the long term potentially make a hospital's inpatient unit non-viable. Despite this, provision of day surgery may well be essential to a hospital's survival. Increasingly patients are asking for day-case treatment and purchasers and funders of health care are contracting for this form of treatment. For a hospital not to provide this service will in the longer term lose it this increasing share of the market. Hospitals have to decide whether an investment in day surgery is or is not worthwhile in view of their long-term business strategy, and in line with this decide how to handle the resulting increase in the unit cost of inpatient care.

These decisions can only be made on the basis of detailed financial analyses and projections, paying attention to the areas discussed above and modifying or adding to these as local circumstances dictate.

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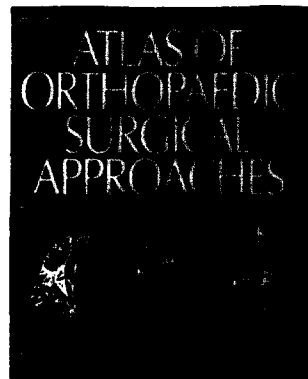
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