

## TALKING POINT

## Day surgery: does it add to or replace inpatient surgery?

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The Royal College of Surgeons has recently advocated the wider use of day surgery.<sup>1</sup> It considers this an effective means of reducing waiting lists and a way of maintaining acceptable standards of surgical care without inconvenience to patients. In planning acute services over the next 10 years some regional health authorities have assumed that day surgery, as a proportion of total surgery, will continue to increase to levels above 20%.<sup>2,5</sup> It has been proposed that the budget for acute services should be based on differential costs of day and inpatient care, assuming that day surgery substitutes significantly for inpatient surgery.

This study was done to examine the relation between inpatient and day surgery before and after the introduction of a day surgery unit in a typical district general hospital and to examine the extent to which day surgery replaces conventional inpatient treatment.

## Methods

In 1979 an autonomous six bedded day surgery unit was established at Kingston Hospital, the general hospital for Kingston and Esher Health Authority, which has provided virtually all surgical inpatient treatment for the district since 1977.<sup>6</sup> It has 100 surgical beds and serves a population of about 200 000. The number of beds in the day unit was doubled in 1982 and there are now 10 theatre sessions distributed between general surgery, gynaecology, orthopaedic surgery, and general medicine (mainly endoscopies). For this study the definition of day patient common to the Hospital Activity Analysis (HAA), the Hospital In-Patient Enquiry (HIPE), and Annual Hospital Returns (SH3) was adopted.<sup>7,8</sup>

Twelve surgical procedures which have accounted for at least 90% of all day surgical procedures at Kingston Hospital since 1980 were selected for analysis (table). All of them were included in the Royal College of Surgeons' list of recommended procedures. For the years 1975 to 1983—that is, four years before and four years after the Kingston unit opened—inpatient and day patient hospital stay and operation rates, mean and median durations of stay, and the proportion of patients admitted from the waiting list were computed by age, sex, and area of residence using data from the HAA. Rates were calculated for those treated at Kingston Hospital resident in Kingston and Esher Health Authority. The proportion of residents treated at other hospitals in the health authority and outside the district was also examined. Throughput, available beds, and numbers on the surgical waiting list were extracted from SH3 returns.

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## Surgical procedures, 1980-3

Surgical procedure*	Day cases as % of all day case surgery (No of cases)	Category of association between day and inpatient surgery†
Skin operations (910-29)	30.0 (1253)	b
Cystoscopy, including destruction of bladder lesion (607.8)	16.9 (707)	a
Inguinal hernia repair (411)	16.8 (700)	b
Varicose vein operations (893.4)	6.6 (276)	c
Partial mastectomy (381)	6.5 (273)	a
Division or anastomosis of vas deferens (651.2)	6.1 (256)	b
Sigmoidoscopy (468)	3.1 (130)	b
Anal dilatation (485)	2.0 (85)	b
Urethral dilatation (627)	1.9 (80)	b
Gastroscopy including biopsy of stomach (430.1)	1.7 (70)	d
Excision, repair, or tap of hydrocele (644.5)	0.6 (23)	c
Circumcision (660.1)	0.5 (19)	c

\*Office of Population Censuses and Surveys' classification of surgical procedures is given in parenthesis.

†The relation between day and inpatient rates separated into four categories: *a* procedures for which an increase in the day rate was associated with a reciprocal decrease in the inpatient rate; *b* procedures for which an increase in the day case rate was associated with a steady inpatient rate; *c* procedures for which an increase in the day case rate was associated with an increase in the inpatient rate; and *d* procedures for which there was no clear association.

## Results

From 1975 to 1983 inpatient hospital stay for general surgery in Kingston and Esher (21.3 patients per 1000 resident population in 1983 for the district and 20.5 per 1000 at Kingston Hospital) was about the same as that for England (20.7 per 1000 in 1983) while from 1980 the day case rate (7.8 per 1000 for the district and 5.2 per 1000 for Kingston Hospital in 1983) exceeded the reported rate for England (4.7 per 1000 in 1983). From 1978 the number of surgical day patients at Kingston Hospital rose sharply to around 1000 in 1980, where it stabilised. Over the same period the number on the inpatient waiting list had increased steadily from 400 in 1975 to 1780 in 1979 before returning in 1983 to approximately the 1976 level (760). Though day case procedures as a percentage of all surgical procedures rose from 1.8% in 1978 to 26.8% in 1983, the day surgery workload was superimposed on stable inpatient operation and discharge rates (fig 1). The

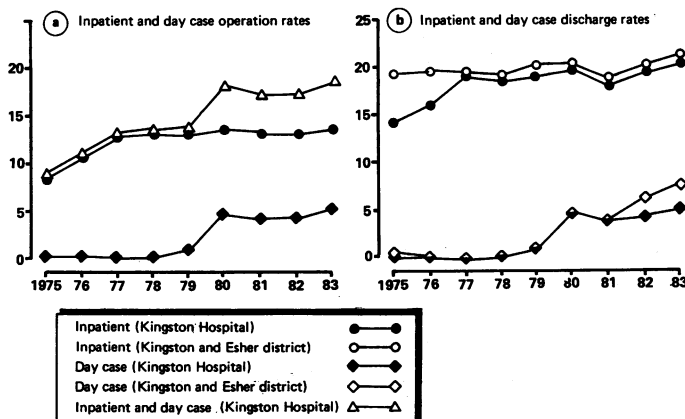


FIG 1—Inpatient and day case rates (per thousand population) for general surgery, Kingston Hospital, 1975-83.

apparent increase in Kingston Hospital's inpatient rate between 1975 and 1977 (fig 1b) shows the amount of surgery then being performed in units outside the general hospital.

A convincing relation between increasing day patient and decreasing inpatient rates could be recognised for only two operations, partial mastectomy and cystoscopy (fig 2a). For the latter operation age differentials were marked, both inpatient and day patient rates being highest in the elderly (fig 2b and 2c).

Skin surgery was the single most common procedure carried out on a day basis, accounting for between 20% and 45% of all day surgery after the unit was introduced. Minor skin operations made up more than 80% of this day surgery. Figure 3a shows, for all ages, the increase in the skin operation day patient rate together with the corresponding steady inpatient rate. The inpatient rate, however, rose differentially in the elderly (fig 3b) while the day rates were roughly equal in all age groups (fig 3c).

Since 1979 the inguinal herniorrhaphy rate doubled (fig 4a). For those aged 15-44 there was a reciprocal relation between increasing day rates and falling inpatient rates, but in the elderly the inpatient rate continued to rise over a stable day patient rate. For varicose vein surgery, on the other hand, the increasing day patient rate was superimposed on a rising inpatient rate, being greatest for those aged 15-64 (fig 5).

The day pattern differed for the two gastrointestinal endoscopic pro-

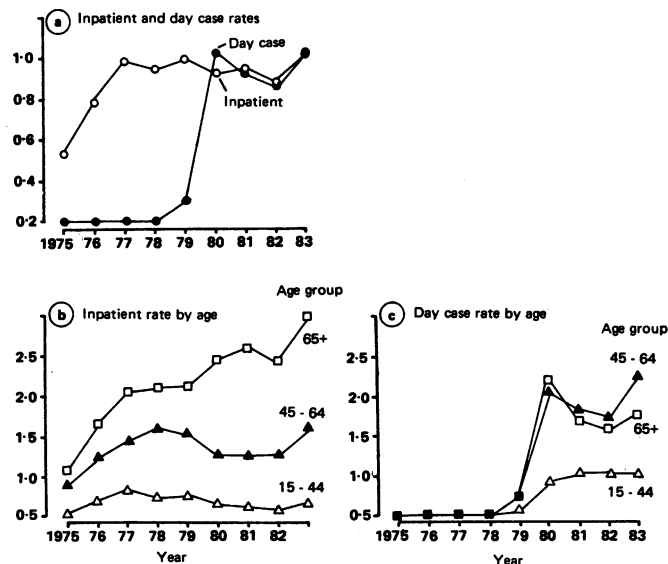


FIG 4—Inpatient and day case rates (per thousand population) for inguinal herniorrhaphy, Kingston Hospital, 1975-83.

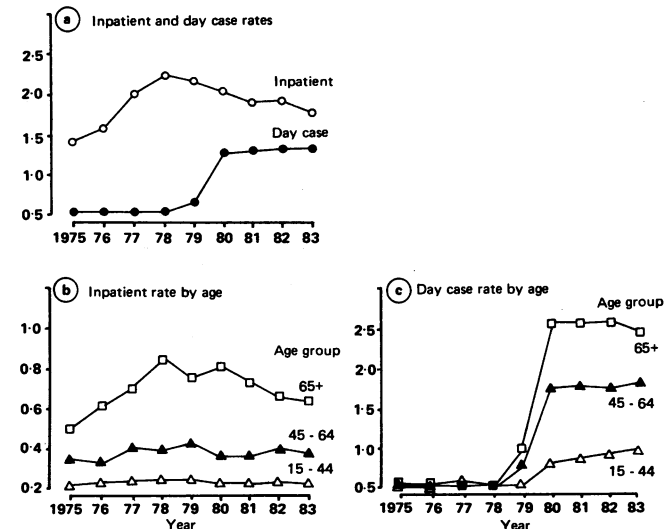


FIG 2—Inpatient and day case rates (per thousand population) for cystoscopy, Kingston Hospital, 1975-83.

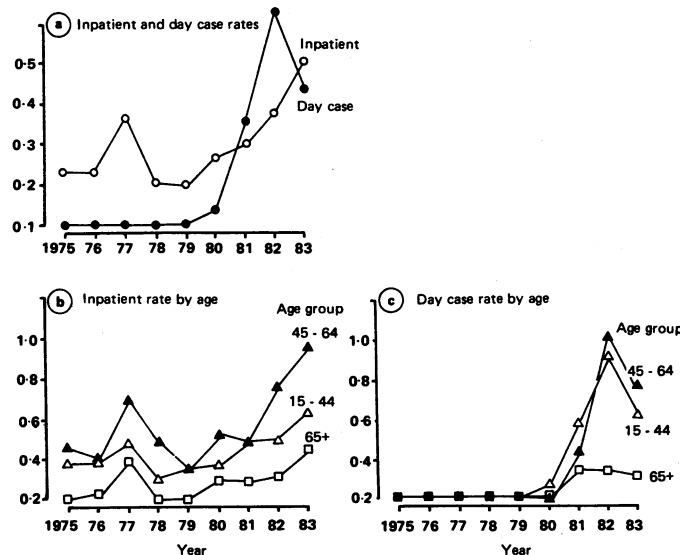


FIG 5—Inpatient and day case rates (per thousand population) for varicose vein operations, Kingston Hospital, 1975-83.

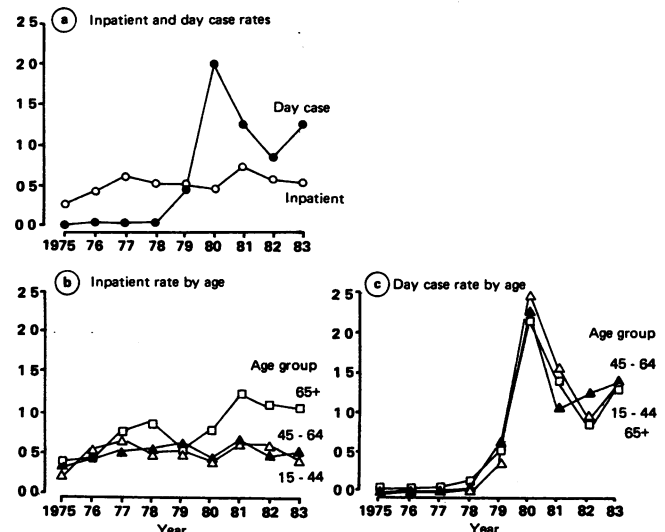


FIG 3—Inpatient and day case rates (per thousand population) for skin operations, Kingston Hospital, 1975-83.

cedures examined. For sigmoidoscopy the day rate was additional to a steady inpatient rate while for gastroscopy low day levels were associated with an initial fall in the inpatient rate which then reverted to the original levels. Too few circumcisions, anal and urethral dilatations, and hydrocele repairs were done at Kingston Hospital for a detailed analysis of trends (table).

Patients' length of stay showed a downward trend for inguinal hernia repair, varicose vein surgery, skin operations, and orchidopexy (for which there was no day surgery), while for cystoscopy, partial mastectomy, urethral dilatation, anal dilatation, sigmoidoscopy, gastroscopy, and circumcision it remained steady. Length of stay tended to rise only for operations on the vas deferens.

**Discussion**

This study has relied on routinely available data. The accuracy of HAA has been questioned repeatedly. In general, however, reliability of more than 90% has been shown for the main diagnosis and procedure recorded, the extent of clinical detail required for this

study.<sup>9-10</sup> Though under-reporting of day surgery is a problem, for Kingston Hospital since 1980 the concordance between day patients recorded by the day surgery unit and day patients reported to HAA exceeded 90% and for three of those years was more than 96%.

Twenty four per cent of all the surgical procedures treated in England in 1983 were reported as day surgery.<sup>11</sup> The best estimate of the level of day surgery that can be achieved in the United Kingdom is based on a prospective study of 2000 consecutive referrals to the general surgery outpatient clinic at the Great Western General Hospital, Edinburgh.<sup>12</sup> Though 40% of the 1045 patients put on the waiting list were considered suitable for day surgery, only 8% received relatively major operations such as inguinal hernia repair and varicose vein surgery.

A recent American study has compared geographically based rates for inpatient and day patient surgery and has suggested that in New York State the difference between the highest (67.1 per 1000 population in Erie County) and the lowest (45.4 per 1000 population in Onondage County) inpatient rates might be explained by significant substitution of inpatient by ambulatory procedures.<sup>13</sup> Saltztein *et al*, however, in an earlier American report from Milwaukee, noted over the 18 months of their study in 1972-3 that as the amount of day surgery increased inpatient hospital stay did not change.<sup>14</sup>

Within general surgery for the four years after the Kingston day surgery facility opened day surgery procedures ranged from 23.5% to 26.8% of all the operations performed. Over that period relatively major procedures, such as inguinal hernia repair, varicose vein operations, and partial mastectomy, made up about 26% of procedures treated in the unit and only about 7% of all the surgical operations at Kingston Hospital.

The proportion of non-resident patients treated at Kingston Hospital was not higher than that expected by known cross boundary flows, the only exception to this being varicose vein surgery, for which a substantial proportion (30-40% of patients since 1979) came from outside the district.

There was a convincing reciprocal relation between day and inpatient surgery for only two operations in this study—namely, partial mastectomy and cystoscopy. For patients aged 15-44 a similar relationship was seen for inguinal herniorrhaphy. From 1980 to 1983 these day procedures, for which the equivalent inpatient rates declined, accounted for only 25.4% of all day surgery operations and 6.5% of the total operative workload. Results suggest that the selective application of day surgery to younger and fitter patients facilitates surgical treatment of the elderly, particularly as inpatients, and especially for inguinal herniorrhaphy and skin surgery.

The additive nature of day surgery may reflect a transfer from outpatient treatment rather than an increase in service, though it has been emphasised that outpatient and day patient surgery are not synonymous.<sup>15</sup> The only information available for procedures done on an outpatient basis is anecdotal, and further study of the outpatient process is required. At Kingston Hospital few surgical procedures are now performed in the outpatient department (personal communication). Within general surgery procedures previously done in outpatient clinics, such as vasectomies, seem to have developed as day surgery. For the district, since 1981, day surgery has been supplemented by minor procedures, mostly skin operations and injections into soft tissues and joints, carried out under local anaesthesia by general practitioners in an outpatient theatre at a peripheral hospital.

Although the type of anaesthesia given for day surgery operations might seem the obvious method for identifying those procedures which replace inpatient operations, data available were inadequate for this purpose. The way in which suitable operations develop as

day surgery procedures may largely depend on the particular interests of individual surgeons. Only crude waiting list figures were available from Kingston Hospital. More detailed information, including at least age, sex, diagnosis, and operation proposed, might have shown a clear relation between day surgery and the waiting list for specific procedures.

The critical or irreducible surgical rate for a given population is not known. In 1983 the rate of admission of surgical patients in Syracuse, New York, was 45.4 per 1000 resident population, more than twice the rate for England, South West Thames Regional Health Authority, and Kingston Hospital. For all recorded surgical procedures operation rates in New York State for 1981-2<sup>16</sup> were more than two and a half times those for England and Wales,<sup>7</sup> and in 1983 the operation rate for day patients in Syracuse (26.9 per 1000) was three and a half times that for Kingston and Esher district (7.8 per 1000). Perhaps the New York figures do show that only when a population is adequately or even overprovided can day surgery become a substitute for inpatient surgery.

Evaluation of day surgery will require further studies in other districts across the country. Allowing for the limitation of the available data, this study has shown that for all the operative procedures investigated bar three (mastectomy, cystoscopy, and inguinal hernia repair in patients aged 15-44) increasing day surgery rates have been superimposed on a steady or increasing inpatient rate. Managers may not be able to force the inpatient workload down by encouraging more day care. Additional day surgery per se or that which represents a shift from outpatient rather than inpatient care would, instead of saving funds, be more costly, but could provide substantial benefit to those treated. It is important, however, that suitable facilities are provided to allow day surgery to develop. With present levels of provision it would be unwise to apply differential costs when determining budgets for surgical care, assuming a fall in inpatient activity.

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