TALKING POINTS

Bed requirements for undergraduate teaching

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In 1709 Hermann Boerhaave was appointed professor of botany and medicine at Leyden and proceeded to make that university the centre of clinical teaching in Europe. He had 12 beds at his disposal. Few modern professors would be content with this modest allocation but it is probably true that if teaching were exclusively conducted by case demonstrations a few beds might suffice. It is, however, the universal practice in British medical schools to require students to "clerk" patients personally in sizable numbers and for this many more beds are required.

The Secretary of State for Social Services has a statutory duty under the NHS Reorganisation Act of 1973¹ to make available "such facilities as he considers are reasonably required" for teaching in hospitals associated with medical schools. So proposals for the deployment of resources, particularly of hospital beds, usually include an assessment of whether the number of beds likely to be provided in the future will meet the needs of the appropriate medical school. Almost invariably this assessment has been based on the guidelines published by the University Grants Committee in its annual survey for 1975-6.² These recommended a total of 1000 acute beds for an annual intake of 100 students, and similar totals were suggested in the Goodenough Report³ in 1944 and in the Todd Report⁴ in 1968. In particular, the UGC recommendations were quoted in full in *Towards a Balance*.⁵ This discussion document by the London Health Planning Consortium dealt exclusively with London but it is likely that similar comparisons of service provision and teaching needs are being made in other regions. The consortium stated that, "Some medical schools—for example, Westminster—have independently assessed their need

numbers of beds for 1988 in the Thames regions published in *Acute Hospital Services in London*⁶ with the bed distribution suggested by the UGC. This comparison is made in table I with respect to the proportions of the beds allotted to five major specialties. The UGC figures do not reflect the likely distribution of beds among the specialties and it is reasonable to inquire whether this is a genuine mismatch between service and teaching requirements or whether there is another explanation for this discrepancy.

Type of patient

It is necessary, firstly, to be quite clear about the types of patient included under the various specialty headings. No great confusion arises in relation to orthopaedics and gynaecology but the extent to which medical subspecialties are included in the general medical bed complement varies so much from hospital to hospital that comparison of separate sets of figures may be misleading. Thus, cardiological and neurological beds are separately identified by the UGC² and in *Acute Hospital Services in London*⁶ but if the patients in these beds are used for the teaching of general medicine they must be included in the general medical complement in any comparison of service and teaching needs. Further confusion may arise if general medical teaching takes place in acute assessment wards for the elderly, correctly designated geriatric in service planning documents.

The problem is similar for general surgery and urology, but much greater confusion can occur if it is not specified whether the surgery of children is included under general surgery or under paediatrics. It is easy to assume that a proposed total of paediatric beds includes all beds occupied by children. This is far from being the case and Fleming has shown that the percentage of children aged 0 to 14 admitted to hospital who occupy paediatric beds ranges from 16.2 to 51.8 in different areas.⁷ For teaching and, probably, for planning services it would be better to specify a number of children's beds. Within this total the medical and surgical beds will almost certainly be used for teaching paediatrics; other children's beds—for example, those for ENT and ophthalmology—may not.

I cannot emphasise too strongly that the uncritical acceptance of figures for bed allocation can lead to serious misconceptions about the resources available or used for teaching. The method of calculating bed requirements for undergraduate teaching used at Westminster Medical School is based on the premise that a medical school is primarily concerned with the number of patients whom its students should see rather than with the number of beds occupied by those patients. Determination of the number of patients required clearly depends on the maximum number of students on the firms of the specialty concerned and on a statement of the number of new patients to be "clerked" by a student each week. For any given number of patients the number of beds required will vary with the local bed utilisation statistics, particularly the throughput per bed per annum.

Though practice varies from school to school, the principles of the calculation are of general application and may be exemplified for general medicine and general surgery. In most medical

TABLE I—Comparison of service and teaching bed requirements

Specialty	Projected bed numbers in Thames regions in 1988	Projected bed numbers scaled to total of 600	UGC guidelines
General medicine	11075	219	200
General surgery	8129	161	200
Paediatrics	2011	40	50
Trauma and orthopaedics ..	5962	118	100
Gynaecology	3148	62	50
Total	30325	600	600

for clinical facilities on the basis of the number of patients to be seen by each student but this approach has not yet gained general acceptance." The principles of this method of assessment are set out in this paper, which also includes some comments on the interpretation of figures of bed numbers in various specialties and on the confusion that may arise from their misinterpretation. Throughout the paper calculations are made with reference to an annual intake of 100.

To illustrate the problem I have compared the projected

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schools all new clinical students will be on medical and surgical firms early in their course, usually in hospitals near the main medical school buildings. Later in the course it is common practice to send students to hospitals some distance from the medical school to ensure that they see a large number of patients. For junior clinical students experience suggests that two new patients per student per week is a reasonable number. If this is the case and if half an annual intake of 100 students is studying medicine and half surgery at any one time a total of 5200 new medical and the same number of surgical patients are required per annum. Division of these numbers by the appropriate figures for throughput per bed gives a preliminary estimate of bed requirements. Thus, if the figures for throughput per bed projected for 1988 in *Acute Hospital Services in London* are used (27.5 for general medicine and 37.1 for general surgery), the bed requirement for medicine is 189.1 and for surgery 140.2.

These figures cannot be accepted without further qualification, however, as some thought must be given to the case mix in the hospital concerned; for one reason or another some patients are unsuitable for clerking (in the full sense of the word) by students. In addition, some allowance must be made for the discrepancy between "available" beds, obtained by the calculation, and bed complement. A survey by the teachers of medicine and surgery at Westminster Medical School suggested that an increment of about 15% was required to take account of these factors. The effect of this adjustment is to increase the bed requirements to 217.5 for general medicine and 161.2 for general surgery.

Duration of attachments

Similar calculations may be made for gynaecological and for paediatric—that is, children's—beds. The duration of the attachments to those specialties and thus the number of students concerned must be taken into account. These vary considerably from school to school but using as a basis the average figures quoted in the General Medical Council's survey of basic medical education,⁸ at any one time 12 to 13 will be studying gynaecology and 16 to 17 paediatrics out of an annual intake of 100. If the same assumption that each student should clerk two new

thus low throughput per bed, can lead to a bed requirement of nearly 150. The service provision in this specialty is usually as large as for orthopaedics. So finding sufficient patients to be seen by students is rarely a problem, especially if advantage is taken of the current trend towards outpatient and day hospital care of psychiatric patients. Clerking such patients is as feasible in day hospitals as in hospital wards and perhaps as much as half the psychiatric bed requirement could be replaced by day hospital places. Calculation of bed requirements in obstetrics may have to be based on a requirement for each student to attend a certain number of deliveries; the figure specified by the University of London is 15. Perhaps as many as one-third of deliveries may not be available for medical students and, if this adjustment is made and a figure of 30 deliveries per bed per annum is assumed, a requirement of about 75 obstetric beds for an annual intake of 100 is obtained.

Bed requirements in the medical and surgical subspecialties can be calculated if necessary but the need for this will depend on whether these subjects are taught separately or as part of general medicine and surgery. In addition, it may be appropriate to include figures for oncology and acute geriatrics if, as may be the case, these beds are used in teaching general medicine. It is important, however, to specify requirements in terms of patient numbers in the first instance and to use the appropriate figures for throughput per bed in the calculations.

Outpatient teaching

Determining the number of beds required for teaching is less critical for specialties such as ear, nose, and throat surgery, ophthalmology, and dermatology, in which much of the teaching takes place in outpatient clinics. An approximate estimate can be made, however, by stating the optimum number of new patients to be seen in each teaching clinic. The annual total derived from this may be converted into bed numbers by means of the ratio between the number of new outpatients and the number of locally available beds. For example, in the North-west Thames Region in 1976 and 1977 the ratio of new ENT outpatients per available ENT bed was about 120.⁹

Circumstances vary so much from hospital to hospital and from school to school that little purpose would be served by quoting in full the estimated bed requirements of one London medical school. The necessary calculations must be made using the bed utilisation statistics for the hospitals concerned. The total requirement by Westminster Medical School was assessed as between 920 and 1090 acute beds by the methods described in this paper. This is remarkably close to the previous estimates quoted above, though, as has been shown, the distribution of beds among the specialties is rather different.

TABLE II—Estimated teaching bed requirements for an intake of 100 students

General medicine	220
General surgery	165
Children's beds	50
Trauma and orthopaedics	say, 125
Gynaecology	40
Total	600

patients per week is made basic requirements of 25.1 gynaecological and 38.9 children's beds are obtained. In these subjects experience suggests that the increments for case mix should be larger and figures of 25% for children's beds and as high as 50% for gynaecology are reasonable. These adjustments result in figures of 37.6 for gynaecology and 48.6 for children's beds. The problem in orthopaedics is rather different as the service requirement for this specialty is so large in relation to the likely teaching needs that ample numbers of patients can quite easily be made available.

The calculated figures for the five specialties considered are listed in table II (rounded up to the nearest five). The proportional distribution of beds among the specialties is much closer to the likely service provision than are the UGC figures (table I).

Calculation of bed requirements in other specialties may be made as required but two specialties require separate consideration. The relatively long duration of stay in psychiatry, and

References

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- ² University Grants Committee. *Annual survey 1975-6*. Cmnd 6750. London: HMSO, 1977.
- ³ Ministry of Health. *Report of interdepartmental committee on medical schools*. London: HMSO, 1944.
- ⁴ Royal Commission on Medical Education 1965-8. *Report*. Cmnd 3569. London: HMSO, 1968.
- ⁵ London Health Planning Consortium. *Towards a balance*. London: London Health Planning Consortium, 1980.
- ⁶ London Health Planning Consortium. *Acute hospital services in London*. London: HMSO, 1979.
- ⁷ Fleming JR. *Variation in the provision and usage of hospital services for children in England and Wales*. BSc dissertation. University of Exeter, 1980.
- ⁸ General Medical Council. *Basic medical education in the British Isles: report of the General Medical Council survey 1975-6*. London: Nuffield Provincial Hospitals Trust, 1977.
- ⁹ North-west Thames Regional Health Authority. *Annual patient statistics 1976 and 1977*. London: North-west Thames RHA, 1977 and 1978.

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