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Hospital occupancy and cost containment

Dr Rod Jones (ACMA)
Statistical Advisor, Healthcare Analysis & Forecasting
Camberley, UK
hcaf_rod@yahoo.co.uk

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Acute care is expensive and, where appropriate, all possible alternatives should be employed to minimise costs, however, we do need to ask the question – is closing hospital beds actually costing more than it saves?

Table One explores this intriguing possibility by looking at the effective turn-away (i.e. patients placed into the incorrect bed pool suited to their optimum care) experienced at a large Tertiary hospital operating at over 90% average occupancy.

There are several points of interest. Firstly, operation at 85% occupancy (the supposed industry standard) leads to 20% of patients being allocated to the incorrect bed pool. At present, we have no way of knowing the extent to which this contributes to longer than necessary length of stay due to the implied lower quality of care since most hospitals in the UK operate far above 85% average occupancy. Indeed how much time is wasted by consultants meandering from one end of the hospital to the other in an attempt to locate their patients or that elderly medical admission 'lost' on the Orthopaedic ward?

Secondly, in my opinion, health care administrators have wrongly attributed this to a lack of clinical 'efficiency', which is partly true; however, it is enforced lack of efficiency arising from inadequate provision of beds and the resulting organisational chaos.

Thirdly, it would seem that the far lower occupancy seen in the USA and the rest of Europe may have a sound basis (Jones 2009, 2011a, b, de Bruin et al 2008).

I would like to propose that optimum care occurs at somewhere around 0.1% to 1% turn-away (depending on the mix of elective and emergency admissions), i.e. only 1 in 1000 to 1 in 100 patients are in a specialty bed pool outside of that dictated by the specialty of the consultant, and associated supporting nursing staff administering their care.

The immediate response will be that we cannot afford to build hospitals that big and if we did those 'inefficient' consultants will fill them up with patients. Interesting therefore to note that hospital doctors take on the general length of stay of the organisation where they work, i.e. length of stay is an output of a system not a person (Westert et al 1993).

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Table 1: Optimum overnight stay beds at specialty level

Specialty	Annual Average Occupied	Annual Average Turn-away				
		0.10%	1%	3%	5%	20%
Aged Care & Rehabilitation	44	64	59	55	52	48
Cardiology	35	54	46	43	42	38
General Medicine	50	71	64	60	59	53
Endocrinology	3	10	8	7	6	5
Gastroenterology	10	21	18	16	14	12
Haematology	22	36	32	30	27	25
Neurology	19	33	28	26	24	22
Oncology & Radiology	23	38	33	31	28	26
Renal Medicine	11	22	19	18	15	14
Respiratory	14	26	23	21	19	17
Rheumatology	6	15	12	11	10	8
Medical Sub-Total	**235**	**390**	**342**	**318**	**296**	**268**
Medical Group Occupancy		**60%**	**69%**	**74%**	**80%**	**88%**
Cardiothoracic	24	40	34	32	29	27
Gynaecology	6	15	12	10	10	8
Hand Surgery	7	16	13	12	11	9
Head & Neck	7	16	14	13	12	9
Neurosurgery	32	49	43	40	39	35
Orthopaedics	43	62	56	53	51	50
Plastic Surgery	17	30	26	24	22	20
Spinal Injuries	21	35	31	29	26	24
Surgery	35	54	46	44	42	38
Urology	6	15	12	11	10	9
Vascular Surgery	7	16	13	12	11	10
Surgical Sub-Total	**202**	**348**	**300**	**280**	**263**	**239**
Surgical Group Occupancy		**58%**	**67%**	**72%**	**77%**	**85%**

Footnote: Data is from a large Tertiary hospital outside of the UK. Annual average occupied beds were calculated from a six year trend culminating in mid-2010.

Is such utopia possible? To do this we need to mimic the benefits of economy of scale. Many of the specialties in Table One are very small and can be nested alongside other similar specialties. For example, within the constraints of available wards the hospital in Table One could decide to nestle an adult Head & Neck unit (ENT, Ophthalmology & Oral Surgery) alongside Neurosurgery. A trend is constructed to reveal that such a group would account for 14,000 bed days per annum with evidence for increasing demand at around 240 bed days per annum. A monthly profile of average occupied beds is prepared, as in Table 2, and the group is allocated 60 beds (two adjacent wards) which is sufficient for all months except March and June at 0.1% turn-away. This is a saving of 5 beds over the separate bed allocation given in Table One and this represents the economy of scale achieved by combining the two specialty groups.

The lead Consultant/ward Matron are then given the drugs, consumables and laboratory tests budgets and the staff budget for 13,300 bed days (14,000 bed days less 5% of staff costs for efficiency and higher capital costs arising from lower average occupancy). Any savings can be invested at their discretion and private surgery can be increased with an agreed profit margin going to the hospital.

Table 2: Daytime beds for the proposed group

Month	Average occupied	Available Beds 0.1%	Available Beds 1%
January	33.2	51	39
February	35.5	54	41
March	41.8	61	54
April	36.9	55	42
May	40.9	60	53
June	44.2	64	57
July	34.7	53	40
August	37.5	56	43
September	36.7	55	42
October	39.7	59	52
November	40.7	60	53
December	37.0	56	43

Footnote: Includes all same day admissions.

Table 3: Surgical day of week staffing

Week Day	Relative Admissions
Monday	107%
Tuesday	143%
Wednesday	137%
Thursday	145%
Friday	110%
Saturday	29%
Sunday	30%

Footnote: Includes same day stay admissions

The suggested monthly staffing profile would be according to average occupied beds for which a further weekly sub-profile is provided to aid staff allocation. To aid staff planning a relative count of admissions by day of the week (including same day admissions) is also provided (Table 3). This is based on the assumption that nursing intensity is highest on the day of admission. Additional reports are also provided for midnight occupancy by week and day of week to aid allocation of staff to the overnight shift. All this supporting information simply requires a few pivot tables and several hours of work.

How quickly do you think it would take the consultants/nurses to reduce length of stay and release money for re-investment? How quickly would it take them to realise that certain patients are in need of complex discharge planning (Connolly et al 2009) and take the necessary steps to resolve the issues (Rae et al 2007). How long would it take to get the nurses multi-skilled across the four specialties in this mini-cluster and to juggle the skill mix to effectively gain the unequivocal benefits to both patient and staff of a lower patient to staff ratio (Rafferty et al 2007)?

Gorunescu et al (2002) have suggested that the optimum point depends on the relative costs of patients in the wrong beds (blocked to admission in their study) compared to the cost of an empty bed. The cost of a bed in a new land and build facility ranges from £14 to £28 per day at 2011/12 prices (Curtis 2010). Hence in our hypothetical example there are 22 beds which are empty (on average) costing £112,000 to £225,000 per annum. If we assume that a patient bed day costs £200 then the 14,000 bed days has a cost of £2,800,000 against which we have to make a saving of 4% to 8% to cover the costs of the extra beds. Hence even running at 63% daytime occupancy the cost benefit appears to be achievable. We are talking roughly the occupancy levels of a private hospital which, after all, do exist to make a profit. Nesting all surgical specialties into a business unit could allow somewhere near 80% average midnight occupancy for 202 occupied beds at 0.1% turn-away (the economy of scale effect). Increasing private patient work makes the business case more feasible.

There is a better way. Squeezing hospital occupancy till the blood runs from the pips is not the way to get there…. in fact it is the road to chaos, disillusioned staff and poor patient care.

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