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Financial impact of surgical training on hospital economics: An income analysis of 1184 out-patient clinic consultations

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ABSTRACT

Introduction: In many countries healthcare commissioning bodies (state or insurance-based) reimburse hospitals for their activity. The costs associated with post-graduate clinical training as part of this are poorly understood. This study quantified the financial revenue generated by surgical trainees in the out-patient clinic setting.

Methods: A retrospective analysis of surgical out-patient ambulatory care appointments under 6 full-time equivalent Consultants (Attendings) in one hospital over 2 months. Clinic attendance lists were generated from the Patient Access System. Appointments were categorised as: 'new', 'review' or 'procedure' as per the Department of Health Payment by Results (PbR) Outpatient Tariff (Outpatient Treatment Function Code 104; Outpatient Procedure Code OPRSI1).

Results: During the study period 78 clinics offered 1184 appointments; 133 of these were not attended (11.2%). Of those attended 1029 had sufficient detail for analysis (98%). 261 (25.4%) patients were seen by a trainee. Applying PbR reimbursement criteria to these gave a projected annual income of £GBP 218,712 (€EU 266,527; $USD 353,657) generated by 6 surgical trainees (Residents). This is equivalent to approximately £GBP 36,452 (€EU 44,415; $USD 58,943) per trainee annually compared to £GBP 48,732 (€EU 59,378; $USD 78,800) per Consultant. This projected yearly income off-set 95% of the trainee's basic salary.

Conclusion: Surgical trainees generated a quarter of the out-patient clinic activity related income in this study, with each trainee producing three-quarters of that generated by a Consultant. This offers considerable commercial value to hospitals. Although this must offset productivity differences and overall running costs, training bodies should ensure hospitals offer an appropriate return. In a competitive market hospitals could be invited to compete for trainees, with preference given to those providing excellence in training.

1. Introduction

Health care funding continues to be a topical consideration internationally. The Director of the World Health Organisation recently stated that 'In every region of the world, the costs of health care are going up as populations age, chronic diseases increase, and new and more expensive treatments become available'.[1] Governments and healthcare commissioners are consequently attempting to make their healthcare services more productive and efficient to prevent costs escalating.

Set against this is the cost of training new doctors to supply the healthcare workforce. For undergraduate medical training, attempts can be made to calculate this. University and healthcare sources have historically estimated instructional costs of $USD 40,000–50,000 (£GBP 24,745–30,931; €EU 30,155–37,693) per student per year in the United States, therefore totalling up to $USD 278,300 (£GBP 172,162; €EU 209,800) adjusting for current inflation.[2] In the United Kingdom, costs have been previously been estimated at approximately £GBP 200,000 per student in 1997

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(£GBP 298,600; €EU 363,880; $USD 482,836 adjusted for inflation), which also takes into account costs to the National Health Service (NHS) as well as costs to local University departments.[3]

The costs associated with postgraduate training are more complex and difficult to quantify given the introduction of salary and benefits balanced against the capacity for income generation through clinical activity. Additional confounding factors are introduced by the differences in efficiency potentially exhibited by trainees together with a potential decrease in productivity arising from the additional time taken for training.

Whilst these factors will apply to all medical specialities, the procedural emphasis of surgical training together with its associated long apprenticeship puts it at particular risk of placing a financial burden on employers. Understanding the income generated by trainees through their hospital service is therefore an important consideration in the economics of training. Although previous attempts have been made to analyse the costs of training in the out-patient setting,[4] little is known about the capacity for income generation by hospital clinical staff or their relative contributions towards hospital revenue in this area.

This paper aimed to quantify the income generated from surgical trainee work in the elective outpatient clinic setting.

2. Method

2.1. Financial setting

In the UK and other countries with insurance or state healthcare systems, funding structures have been introduced to reimburse hospitals for patients being seen or treated. The UK system for this was introduced in 2004 and is known as "Payment by Results" (PbR). The government has previously stated various reasons for introducing this in the National Health Service (NHS), namely: 'to support patient choice, reward efficiency and encourage activity to reduce waiting times', amongst others.[5]

PbR is the national framework for reimbursements to public hospitals based on their activity. Two concepts underpin this: 'Currencies' and 'Tariffs'. Currencies are the 'unit of healthcare for which a payment is made' (for example a new outpatient attendance at a clinic) and a Tariff is 'the set price paid for each currency'.[5] Funding amounts are then calculated by looking at the type of treatment a patient has received.

Currencies are put into clinically meaningful groups of diagnoses and interventions based on similar levels of consumption of resources known as Healthcare Resource Groups (HRG's).[6] When a patient is reviewed or treated in hospital, a Clinical Coder translates this care into the appropriate HRG codes. These are used to determine how much the healthcare commissioner owes the hospital. This system currently covers the majority of healthcare in hospitals, with tariffs reflecting national average costs for admitted patient care, outpatient attendances, accident and emergency (A&E), and some outpatient procedures.

Basic salaries for junior doctors in recognised NHS training posts are provided by their regional training bodies (Deaneries), while hospitals fund their on-call supplement. Trainees are therefore potentially valuable income-generators relative to the NHS-funded component of their salaries due to the revenue they earn the hospital for service provided and reimbursed through the PbR funding system.

2.2. Study setting and data collection

Nottingham University Hospital is a large regional teaching hospital and tertiary referral centre. This study was undertaken as a service provision audit, with approval granted by Nottingham University Hospitals NHS Trust.

Data from all colorectal general surgery out-patient appointments taking place in the Queen's Medical Centre Campus was collected retrospectively from the hospital's clinic attendance list generated by the Patient Access System (PAS) over a 2 month continuous period. No private or independent treatment centre appointments were included. The out-patient case mix included a full range of routine and specialist colorectal surgical referrals in addition to some routine non-subspecialist general surgical appointments e.g. inguinal hernias, etc. Care was provided under the responsibility of 7 individual Consultants (Attendings), who worked as 6 full-time-equivalents. These consultants supervised a total of 6 surgical trainees (Residents) working in the department, 1 Staff Grade doctor and 5 Nurse Practitioners.

Staff grade doctors are senior non-consultant, non-training grade clinicians running independent clinics under the indirect supervision of a consultant. These doctors are primarily employed in the United Kingdom in a service provision role, without the administrative or training responsibilities additionally undertaken by a consultant. Nurse practitioners are senior nurses undertaking an extended role within a defined and limited scope of practice indirectly supervised by a consultant who takes clinical responsibility. This is comparable to the role of physician extenders in North America.

Clinic attendance or non-attendance by the patient was recorded. For those patients attending their appointment, this was then categorised according to the three potential PbR funding payments at the prevailing rate: a new appointment (£GBP 180; €EU 219; $USD 291), a review appointment (£GBP 92; €EU 112; $USD 149) or a procedure (rigid sigmoidoscopy) (£GBP 189; €EU 230; $USD 305) as per Department of Health Payment by Results 2008/09 Outpatient Tariff (Outpatient Treatment Function Code 104; Outpatient Procedure Code OPRSI1).

The representative trainee salary was derived from the prevailing NHS Employers National Pay and Conditions for Medicine and Dentistry during the study period.[7] The basic salary (i.e. the proportion funded by Deaneries rather than the on-call supplement provided by hospitals) without banding was calculated as the mean income before tax based on speciality training registrar (StR) years 1–9 (where years 1 and 2 are the equivalent of the former Senior House Office (SHO) grade).

The grade of doctor providing the clinical care was also recorded: Consultant, surgical trainee, Staff Grade, Nurse Practitioner or research/teaching fellow. This was based on the grade of staff member dictating the relevant clinic letter together with the contents of this if it was clear the letter was being dictated on behalf of another grade of clinician.

The out-patient clinic system was run such that patients were seen by either a Staff Grade doctor in their named clinic (typically without trainees present), by a Nurse Practitioner in their named clinic (typically without trainees present) or by a Consultant in their named clinic (which included trainees). No trainee-only clinics were run. New patient referrals could be seen in either a Staff Grade, Nurse Practitioner or Consultant-led clinic, depending on the presenting complaint. New referrals would not necessarily be seen by a Consultant at their first appointment. Patients seen by trainees would only be reviewed by the Consultant if required.

Financial conversions from £GBP to $USD and €Euro are based on prevailing market rates on 27 December 2012 using the Citibank exchange rate (Citibank N.A, New York, USA), rounded to the nearest whole unit of currency.

3. Results

During the two-month study period 78 out-patient clinics offered 1184 appointments. Of these, 133 (11.2%) appointments were not attended by the patient. Of those patients who attended, 1029 (98%) had sufficient detail (i.e. a clinic letter summarising the consultation) for inclusion. From these 491 (48%) patients were new referrals to the department, 538 (52%) were review appointments and 269 underwent rigid sigmoidoscopy ('procedural appointments'). A detailed breakdown of clinic types and appointment categories is provided in Table 1.

Variations were seen in the number of patients seen by the various staff groups. Consultants saw 398 (38.7%), surgical trainees (resident-grade clinicians) 261 (25.4%), Staff Grades 106 (10.3%), Nurse Practitioners 223 (21.7%) and research/teaching fellows 41 (4.0%).

Applying PbR payment criteria to these appointments ('new', 'review' or 'procedural'), the total income generated during the study period was £GBP 143,025 (€EU 174,293; $USD 231,271). Extrapolated to 12 months this represented £GBP 858,150 (€EU 1,045,390; $USD 1,387,629) of hospital income. These figures are summarised in Table 2.

Table 1
Breakdown of out-patient clinic details during the two-month study period.

Out-patient clinic appointments	
Total appointments	1184
Not attended by patient	133 (11.2%)
Exclusions due to insufficient detail	22 (1.9%)
Total included in analysis	1029
Out-patient clinic types	
Total clinics	78
Consultant-led	35
Staff-grade led	14
Nurse-practitioner led	29
Out-patient appointment types	
Total new patients included	491
Total review patients included	538