The cost of teaching an intern in New South Wales

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Abstract

Objective: To determine the cost of formal and informal teaching specifically provided for interns and to determine how much of an intern's time is spent in these activities.

Design, setting and participants: Costs of formal teaching for 2012 were obtained from the New South Wales Health Education and Training Institute (HETI) and costs of informal teaching by a survey of all interns in a random sample of prevocational networks.

Main outcome measures: The cost of formal intern education provided by HETI; the number of hours of formal teaching provided to interns in hospital; intern estimates of the amount of non-timetabled teaching received in a typical week.

Results: The cost of formal teaching was $11 892 per intern per year and the cost of informal teaching was $2965 per intern per year (survey response rate, 63%) — a total of $14 857. Interns spent 2 hours per week in formal teaching and 28 minutes per week in informal teaching, representing 6.2% of a 40-hour week.

Conclusion: The time of professionals paid by NSW Health represents most of the expenditure on teaching interns. An increase in time spent on intern teaching beyond the current 6.2% of an intern's 40-hour week would be an investment in better health care.

In Australia, the first year after medical graduation is called the intern year, a transition between formal medical school education and subsequent vocational training. Its successful completion is a requirement for medical registration.

In New South Wales, the Health Education and Training Institute (HETI), a statutory health corporation, is responsible for setting and monitoring standards for internship and postgraduate training. HETI allocates interns to one of 15 prevocational training networks. Each network provides a mixture of rotations at metropolitan, rural, and regional hospitals to ensure wide clinical experience. Intern training is supervised by Directors of Prevocational Education and Training (DPETs).

Teaching received by interns can be regarded as formal or informal. Formal teaching is organised by the DPET in each hospital, who is assisted by Junior Medical Officer (JMO) managers in each network. It consists of timetabled teaching sessions in protected time, delivered as lectures, tutorials or practical sessions. This requires infrastructure and financial support. Some of this is provided at HETI, such as training grants and the committees and staff required for statewide governance of intern teaching. Some is provided where the interns work, such as JMO managers, education support officers, DPETs, teaching facilities and skills-training facilities.

We defined informal teaching as being spontaneous, non-timetabled and sporadic. It may occur during a ward round, a walk along a corridor or at the end of a consultation. It can be initiated by the intern or the intern's supervisor as well as registrars, staff specialists and other health care professionals.

Intern education also includes department meetings and grand rounds, which interns may be encouraged to attend but which are not aimed specifically at them. A further mode of education involves the acquisition of skills and knowledge by observation and practical experience. These forms of education were not included in this study.

The aims of this study were to determine: the salary-related and infrastructure costs of timetabled, formal teaching provided specifically for interns; the amount of non-timetabled informal teaching received by interns and its salary-related cost; the total cost per intern of providing teaching, by combining these estimates; and how much of an intern's time is committed to formal and informal teaching.

Methods

Formal teaching

The cost of formal intern teaching for 2012 was estimated by HETI after wide consultation with administrators, educators and clinicians within HETI and the prevocational training networks. It included costs of medical and administrative staff responsible for the organisation and local delivery of formal, timetabled intern teaching, infrastructure costs and governance costs. In NSW, the prevocational training program manages teaching for resident medical officers (RMOs) as well as interns, but costs were allocated on a pro-rata basis depending on what proportion of the program was allocated to intern teaching. Time involved in preparing teaching sessions was not included.

A telephone survey of JMO managers in the sampled networks (see below) was conducted to determine the number of hours of formal, structured teaching provided each week for interns in their networks.

Informal teaching

The salary-related cost of non-timetabled teaching was estimated from a self-completed internet cluster sample survey of interns in May 2012. The clusters were the 15 prevocational training networks. These were numbered sequentially and a sample of five was drawn by random numbers. During 2012, the total number of interns in the 15 networks was 870. Every intern within each of the five sampled networks was invited by email to participate in the survey. Those who agreed were sent an online survey form that asked for separate estimates of the amount of non-timetabled teaching received in a typical week during their current rotation from five categories of teacher:

- RMO, registrar or Fellow;
- general practitioner;
- visiting medical officer (VMO), staff specialist or university academic;
- nurse;
- allied health or other professional.

1 New South Wales Ministry of Health costs for intern teaching*

Item	Proportion towards intern teaching	Amount ($)	Basis for calculation
Expenses at HETI			
HETI Medical Director	20%	$86 564	Senior staff specialist with 30% on-cost plus private practice allowance
Accreditation program and surveys	66%	$901 825	Salaries, expenses and overheads
Clinical Chair, accreditation	66%	$43 948	Senior staff specialist plus all costs, 0.2 weeks
Prevocational training program	66%	$316 680	Salaries, expenses and overheads
Clinical Chair, training council	66%	$54 935	Senior staff specialist plus all costs, 0.25 weeks
Prevocational training grants	66%	$548 055	Subsidy from HETI for prevocational training costs
Intern assessment process	100%	$11 597	Printing, distribution and collection of forms
Prevocational committees	66%	$50 708	Secretariat and committee members' time
Expenses at workplace			
JMO managers and support officers	66%	$1 853 280	2 days/week at 60 sites at $90 000 per annum
Term supervisors for interns	100%	$1 976 279	Average of 1 day of work/term
Directors prevocational education and training	66%	$1 948 878	0.8 days/week at 60 sites, senior staff specialist plus all costs
Intern training committees	100%	$48 447	Committee members' time
Formal education sessions specifically for interns	100%	$998 810	0.25 days/week at 60 sites, senior staff specialist plus all costs
Orientation, venepuncture, cannulation and plastering training	100%	$875 163	Staff time plus disposables
Teaching facilities	100%	$870 000	Infrastructure, maintenance and depreciation, estimated at $1000 per intern
Total		**$10 345 829**	

HETI = Health Education and Training Institute. JMO = junior medical officer. * Workforce-related costs, such as intern allocation, intern accommodation while on rotation, and human resources management of interns are not included in these calculations. ◆

Respondents could report an estimate of teaching time received in steps of 5 minutes, ranging from zero to 60 minutes, then in categories of 1.5 hours, 2 hours and 3 or more hours. Those who had agreed to participate but who did not complete the survey initially were reminded on two occasions.

The times reported for each category of teacher were summed across all respondents and the total multiplied by an appropriate hourly dollar rate to give an estimated weekly total dollar value for each teacher category. These were then summed over all teacher categories to give an overall estimated weekly total cost for the whole sample. The various hourly rates were determined as follows. As the senior staff specialist rate[1] with all on-costs is about midway between the VMO (specialist) rate[2] and the senior academic rate[3] with on-costs, the senior staff specialist hourly rate ($160.06) was used for calculating the value of teaching by these three groups. The GP rate ($167.35) was based on the NSW Health Award 2012 rate for a GP with at least 5 years' experience.[2] Junior hospital staff teaching costs were based on the second-year registrar rate plus on-costs ($58.31).[4] Because of the variation between different awards for nursing, allied health and junior hospital staff, the junior hospital rate was used as an approximation for these three groups.

Results were expressed as total time or dollar values, means and standard deviations or medians as appropriate. Confidence intervals were at the 95% level.

The study was approved by the University of Sydney Human Research Ethics Committee.

Results

Formal teaching

For 2012, HETI estimated the expenditure provided by the NSW Ministry of Health for the teaching of 870 interns to be $10 345 829 (Box 1), equivalent to $11 892 for each intern.

The telephone survey of JMO managers showed that an intern received an average of 2 hours of formal, structured teaching. This figure validated the 0.25 days per week (2 hours) provided by HETI for formal teaching sessions.

Informal teaching

Of the 243 interns in the five sampled networks, 154 responded, giving a response rate of 63%. The response rate differed significantly among the networks ($P = 0.001$; χ^2 test), ranging from 45% to 79%. In all networks the distributions of estimated total weekly teaching time were distinctly positively skewed with maxima ranging from 75 to 255 minutes but medians ranging from only 20 to 30 minutes (Box 2). The overall weekly median was 28 minutes, with no significant difference among the five networks ($P = 0.21$; Kruskal–Wallis test).

The 154 respondents received a total of 101 hours of teaching per week. Slightly over half (51.4%) of the total teaching time was from RMOs, registrars or fellows, and slightly over a third (34.5%) was from VMOs, staff specialists or academics. Slightly less than 10% (9.3%) was from nurses, and less than 1% (0.7%) was from GPs. Allied health and other professionals contributed slightly less than 5% (4.3%). At the relevant hourly

2 Distribution of total teaching time (min) over the five categories of teacher among the five sampled networks

Network	Minimum	Maximum	Median	Skewness
A	0	200	20	2.5
B	0	165	25	2.0
C	0	75	30	0.5
D	0	255	23	2.7
E	0	180	30	2.1
Median	–	–	**28**	**2.5**

3 Estimates, by 154 interns who responded to the survey, of non-timetabled one-to-one or small-group teaching received in a typical week of their current rotation

Provider of teaching	Received teaching, no. (%)	Did not receive teaching, no. (%)	Total hours/week (% of overall total of 101 hours)	Hourly rate	Total cost/week
Resident medical officer, registrar or fellow	129 (83.8%)	25 (16.2%)	51.9 (51.4%)	$58.31	$3026
General practitioner	3 (2.0%)	151 (98.0%)	0.7 (0.7%)	$167.35	$117
Visiting medical officer, staff specialist, or academic	115 (74.7%)	39 (25.3%)	34.8 (34.5%)	$160.08	$5571
Nurse	61 (39.6%)	93 (60.4%)	9.4 (9.3%)	$58.31	$548
Allied health professional or other professional	23 (14.9%)	131 (85.1%)	4.3 (4.3%)	$58.31	$251
Total	–	–	**101.1**	–	**$9513**

salary rates for the various categories of teacher, the total cost of informal teaching to the 154 sampled interns in a typical week was $9513 (Box 3). Assuming 48 working weeks per year, the annual cost of providing informal teaching for the 154 interns sampled was $456 624, or $2965 per intern.

The combined cost of formal ($11 892) and informal ($2965) teaching was $14 857 per intern per year.

The time allocated to formal intern teaching (2 hours per week) and the median for informal teaching (28 minutes per week, Box 2) show that in the networks sampled, 2 hours and 28 minutes of teaching was received by interns each week. Assuming a 40-hour working week, this amounts to 6.2% of their time.

Box 4 shows how the total cost would increase if a proportion of an intern's salary was considered to be a teaching cost. For example, assuming that an average 20% of an intern's time was spent receiving teaching would add an additional $15 303 to the cost, totalling $30 160.

Discussion

Most of the $14 847 overall cost of teaching an intern was for formal teaching ($11 892), and most of this was provided by professionals (staff specialists, VMOs, nurses and clinical academics) whose payment came from NSW Health. Relatively little was provided by university-paid staff.

The cost is based on an assumption that none of an intern's salary is related to teaching and that the intern performs a service role only.

Alternatively, it could be argued that part of the intern salary is a teaching expense, with intern work being part of their education rather than for service provision. For example, in the emergency department, interns are effectively supernumerary: their work provides them with invaluable educational experience, but adds little to patient throughput. In contrast, in surgical wards, interns free residents and registrars from clerical and ward duties and increase total work capacity. The real contribution of interns to work productivity in health services would require a different study.

There is much more involved in intern education than the formal and informal teaching considered in this study. The intern's experiential learning includes observation, self-learning practical experience, self-reflection and the influence of role models. The importance of these experiences should not be underestimated.

NSW Health makes a significant contribution to medical student teaching as well as intern teaching. At Sydney Medical School, we recently showed that the cost of medical education was $90 576 per student per year. The cost to the university was $56 250 and the cost of non-university-paid staff (mainly from the NSW Health Department) was $34 326 per student per year.[5,6]

Considerable concern has been expressed in Australia and overseas that relatively little time is spent on education during the intern year,[7-16] and it has been suggested that the intern year should have a greater educational emphasis than service emphasis.[15] There are few estimates in the literature of the proportion of interns' time devoted to education. It has been reported that, on average, junior doctors in the Netherlands spent about 5% of their time per week receiving organised formal education.[7] In the United Kingdom, junior doctors' spent most of their time on routine work and most considered that training constituted less than 10% of their working time.[11] A survey of Australian junior doctors found that half spent 1–2 hours per week receiving education, and 10% reported spending no time receiving education, including bedside teaching, tutorials or grand rounds.[9]

Regarding a 2009 survey of junior doctors conducted by the Australian Medical Association (AMA), the chair of the AMA Council of Doctors in Training concluded,

> We are concerned that the survey shows that the obligation of hospitals to teach and train junior doctors is being outweighed by the demand for service delivery, and this trend is worsening.[17]

Workload issues are regarded as a major factor in reducing the emphasis on education.[7,10,12,15,16] This is not helped by the fact that the Medical Board of Australia currently has no minimum attendance or participation requirements to qualify interns for progression to general registration.[18] However, the Australian Medical Council is currently completing work for the Medical Board of Australia aimed at providing a standard framework for intern training in the national registration and accreditation scheme which came into effect in July 2010.[19]

4 Cost of intern education, by proportion of an intern's salary considered to be teaching cost

Proportion of intern salary* considered as teaching cost	Formal teaching costs (HETI and health services)	Informal teaching provided during work hours	Total cost of intern teaching
0	$11 892	$2 965	$14 857
10% ($7 651)	$11 892	$2 965	$22 508
20% ($15 303)	$11 892	$2 965	$30 160
30% ($22 954)	$11 892	$2 965	$37 811
50% ($38 257)	$11 892	$2 965	$53 114

* $76 515 per annum including on-costs. HETI = Health Education and Training Institute. ◆

Our finding that 6% of an intern's paid time is spent in formal and informal teaching is consistent with these findings. It is in stark contrast with the recommendation of the Special Commission of Inquiry in its final report on acute care services in NSW public hospitals that prevocational clinical staff in Year One should spend a minimum of 20% of their ordinary rostered time participating in training programs.[20] This recommendation recognises that better education will enhance patient care.

Considerable public benefit could result from intern positions being restructured so that 20% of interns' time was spent receiving formal and informal teaching: doctors would be better trained and more competent; medical errors would be fewer; and the care of patients managed by interns would improve.[21] However, this raises the question of who would pay for this additional teaching, as well as the problem of finding the required extra number of interns to provide a service role if 20% of their time were devoted to education rather than direct service.

Quarantining 20% of intern time for education would require hospitals to increase their intern numbers. This would help to resolve the current imbalance between new graduates and available intern posts.

However, there would be a cost. The first step in determining this increased cost would be to unravel the current cost of intern training. Understanding the true cost of intern training is complex, as some of it is hidden within the cost of providing clinical services. While we have looked specifically at formal and informal teaching costs, the current work of the Independent Hospital Pricing Authority may be able to "unbundle" some of the hidden education oncosts, resulting in a suitable mechanism to provide activity-based funding for education and training.

A component of activity-based funding for intern education and training would defray some of the cost of increased intern positions. This would be a federal government contribution, similar to the federally funded direct and indirect graduate medical education payments provided to hospitals in the United States.[22]

It could be argued that universities could also contribute to better intern education if universities saw their medical degree courses as just one step in the medical education process.

Finally, private hospitals could fund some intern positions. Interns are now taking up positions in private hospitals, some supported by federal funds. Private hospitals would benefit from the service interns could provide and be expected to contribute to their training costs.

Whatever funding mechanism is determined, it should be recognised that adequate funding of intern teaching is an investment in the future, as many of these interns will continue to provide services to patients in hospitals in NSW and other states throughout their professional careers.

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