

Students sitting medical finals—ready to be house officers?

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SUMMARY

An initial survey of students approaching qualification and the preregistration house officer year revealed anxiety about competence in several important clinical skills. A questionnaire study was then undertaken to assess, first, the extent to which students had attained the skills required for the preregistration year and, second, the amount of training in these skills provided during the preregistration year. 122 medical students taking their final examinations were asked about training and practice in eight core clinical skills, and 84 graduates from the same school, approaching the end of their preregistration year, were asked about postgraduate training in these skills.

The response rate of each group was 100%. Of the eight skills studied, most had been performed few times by the students at qualification. Less than half the current preregistration house officers could recall training being given in any of the skills studied. There were no significant differences in house-officer training between teaching hospitals and district general hospitals. Regarding needlestick injuries, nearly two-thirds of preregistration house officers were unable to recall any training at either undergraduate or postgraduate level.

These results suggest that training in clinical skills can be improved. Training is already changing with use of clinical skills laboratories and logbooks. We also recommend mandatory needlestick training both in undergraduate programmes and in induction courses for preregistration house officers.

INTRODUCTION

Undergraduate medical training in the UK varies between medical schools but generally follows the recommendations set out in the General Medical Council document *Tomorrow's Doctors* which portrays undergraduate training as the first step in a continuum of education. The document regards the endpoint of undergraduate training as the start of the preregistration year and declares that newly qualified doctors must be well prepared for the responsibilities of house officers. The undergraduate course contains many components, but an essential part of the recommendations is the concept of a core content of knowledge and practical skills to be attained by all students. Regarding essential practical skills, the GMC recommendations specify only basic and advanced life support, venepuncture and insertion of an intravenous cannula. However, the document states that this is a restricted list and that medical schools should 'construct a list of those procedures in each of which they will require all students to have demonstrated competence by the time that they qualify'.

A decade ago, Calman and Donaldson² expressed concern about the lack of basic clinical skills in new medical graduates; yet, even in a school with a new curriculum and defined core skills, difficulties have been encountered in preparing undergraduates for the preregistration house year³. Nor is this solely a British phenomenon: deficiencies in the teaching of practical skills (and the 'universal precautions' that should go with them⁴) have been reported also from the USA⁵.

At Sheffield University, Bax and Godfrey⁶ identified a group of core clinical skills and investigated their acquisition: just over half, they found, were learned before graduation and the remainder during the preregistration year. Sheffield adopts a traditional approach to medical education, with teaching by clinical 'firms'. We have sought to determine the levels of certain core skills in Sheffield students taking their final examinations and the amount of training in these skills obtainable during the preregistration house year.

METHODS

In the spring of 1999, a group of 20 medical students at Sheffield University who were approaching finals expressed concern about their lack of clinical skills. They were an

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Table 1 Final year medical students: number of times each skill had been performed during their undergraduate years

No. (%) performed	Range					Median
	0	1-4	5-20	21-40	>40	
IV cannulation	0 (0)	11 (13)	44 (54)	31 (38)	14 (17)	5-20
Venepuncture	0 (0)	4 (5)	19 (23)	29 (35)	48 (59)	21-40
	Range					
	0	1-4	5-10	11-20	>20	
Rectal examination	5 (0)	70 (86)	19 (23)	4 (5)	2 (2)	1-4
	Range					
	0	1-2	3-10	11-20	>20	
Nasogastric tube	77 (94)	21 (26)	1 (1)	1 (1)	0 (0)	0
Suturing	34 (41)	28 (34)	29 (35)	6 (7)	4 (5)	1-2
Arterial blood gas	13 (16)	38 (46)	33 (40)	13 (16)	3 (4)	1-2
Catheter	321 (38)	40 (49)	25 (31)	3 (4)	0 (0)	1-2
Electrocardiogram	11 (13)	41 (50)	26 (32)	14 (17)	8 (10)	1-2

unselected group who had been randomly allocated to one teaching module at that time. Each of them was asked to nominate up to ten clinical skills which they felt would be used regularly during the house year and in which they should be competent. Eight tasks were each selected by 14 or more students—insertion of an intravenous (IV) cannula; venous blood sampling (venepuncture); rectal examination (PR); insertion of a nasogastric tube (NGT); suturing of a wound; arterial blood sampling (ABG); bladder catheterization; and performing an electrocardiogram (ECG). These skills had all been previously identified by other authors as ‘core skills’⁶. This information was used to design a questionnaire to assess the adequacy of the training that the medical students had received. Because of the increasing medicolegal issues surrounding needlestick injury and the risk of disease transmission by this route, we also enquired whether the students could recall any training regarding avoidance of needlestick injury and what they should do if they sustained one.

The questionnaire asked the students to quantify the numbers of each skill performed during the entire undergraduate course into ranges (for example, 0, 1-2, 3-10, 10-20, >20). After assessing the questionnaire with practising preregistration house officers we increased the range of values for more commonly performed skills (IV cannulation and venepuncture) and decreased it for rectal examination. For insertion of a NGT, suturing of a wound, AGB, male bladder catheterization and performing an ECG the same ranges were adopted.

In June 1999 medical students completing clinical finals were asked to fill in the questionnaire anonymously. These students had completed their clinical training and were

finishing their last examination before beginning as preregistration house officers.

The questionnaire was modified and given to house officers at the end of their preregistration year in July 1999. Those sampled were all graduates of Sheffield University Medical School and their curriculum had been similar to that of the students sitting finals. The same questions were applied to the last month of clinical work as a house officer. In addition, we asked whether they could recall any training being given either before or after graduation. Finally, we asked what specialty the house officer was working in, and whether in a teaching hospital or a district general hospital (DGH).

We obtained copies of the induction programmes from the hospitals where the house officers were working in order to ascertain whether training had actually been scheduled for the clinical skills we studied.

RESULTS

122 consecutive medical students sitting their final examinations filled in the questionnaire. This encompassed 75% of graduating students (students sitting finals were randomly allocated to one of four sessions for their exams, and three of these groups were given the questionnaires). There were no refusals and no questionnaires were defaced. 84 preregistration house officers who were within two weeks of finishing their house year completed the questionnaire. This included all house officers at two teaching hospitals and three DGHs with the exception of those on holiday or off sick. Within this group there were 68 house officers from teaching hospitals and 16 from

Table 2 Number of times each task was performed by preregistration house officers over preceding month

No. (%) performed	Range					Median
	0	1-4	5-20	21-40	>40	
IV cannulation	0 (0)	0 (0)	19 (16)	33 (28)	48 (40)	21-40
Venepuncture	0 (0)	0 (0)	20 (17)	29 (24)	51 (43)	21-40
	Range					
	0	1-4	5-10	11-20	>20	
Rectal examination	8 (7)	19 (16)	30 (25)	21 (18)	21 (18)	5-10
	Range					
	0	1-2	3-10	11-20	>20	
Nasogastric tube	51 (43)	30 (25)	15 (13)	4 (3)	0 (0)	0
Suturing	55 (46)	24 (20)	14 (12)	4 (3)	4 (3)	0
Arterial blood gas	2 (2)	14 (12)	46 (39)	20 (17)	17 (14)	3-10
Catheter	11 (9)	35 (29)	36 (30)	10 (8)	10 (8)	3-10
Electrocardiogram	7 (6)	10 (8)	44 (37)	17 (14)	23 (19)	3-10

DGHs. There were 37 house officers from surgical specialties and 47 from medical specialties.

Final-year medical students

Table 1 shows the results of the survey for final year medical students. A substantial number had little or no experience in some of these clinical skills. For example 38 of the 122 had never passed a urinary catheter, while more than half had negligible experience in performing ECGs (two or less).

Preregistration house officers

Table 2 indicates that the skills being studied are in regular use by most house officers. Note that the questions related only to skills applied in the past month. This will account for much of the difference by specialty—for example, 30 of

the 38 surgical house officers had done some suturing, compared with 8 of the 47 medical house officers—but over the whole house year such differences will even out and all preregistration house officers will have performed substantial numbers of all the tasks.

Training received by house officers after qualification

By comparing the tasks performed by a medical student during training and those performed by a house officer over four weeks, we can see that new house officers lack some skills that they will often require. We therefore looked at the amount of training house officers received after qualification. Table 3 indicates that most house officers did not recall receiving any further training in the selected core skills. Seemingly, many practical skills are practised

Table 3 Percentage of house officers who recalled receiving training in a skill after qualification (number in parentheses)

	No. (%) training recalled	No. (%) training given	No. (%) not answered
IV cannulation	60 (50)	38 (32)	2 (2)
Venepuncture	79 (66)	19 (16)	2 (2)
Rectal examination	90 (76)	7 (6)	2 (2)
Nasogastric tube	84 (71)	14 (12)	1 (1)
Suturing	68 (51)	31 (26)	1 (1)
Arterial blood gas	85 (71)	14 (12)	1 (1)
Catheter	56 (47)	43 (36)	1 (1)
Electrocardiogram	80 (67)	19 (16)	1 (1)

during the house officer year despite inadequate training, and with no supervision to ensure correct technique.

We also asked house officers if they could recall any formal training in needlestick injuries. 63% claimed not to have received any such training, either as undergraduates or as preregistration house officers.

Hospital induction/training

Each of the hospitals where the preregistration house officers worked had an induction programme, from two days to one week in duration. At the two teaching hospitals the induction courses included a clinical skills teaching session that included urinary catheterization, intravenous cannulation, arterial blood sampling and electrocardiography. The DGHs did not teach, on their induction courses, any of the core skills we studied. No hospital included documented formal needlestick training on its induction programme.

DISCUSSION

The students completing this study are about three-quarters of the entire year sitting finals at Sheffield. The sample was unselected and consecutive, so is likely to be a fair representation of the whole group. The sample of house officers from teaching hospitals and DGHs (graduates of the same medical school) included all those who were present at work at the time of the study, and is also likely to be representative.

The tasks selected by our original group have all been previously identified as core skills deemed necessary by clinical firms and by preregistration house officers⁶. Undergraduates, house officers and more senior doctors tend to concur on the importance of certain clinical skills. The concerns expressed by medical students towards the end of undergraduate training seem to be borne out by the findings of this study. The students had received clinical skills teaching in the traditional ward 'firm' setting, in which there was no clear time allocation for learning of specific skills and no documentation required. The students described the acquisition of clinical skills as haphazard and random. Although 'core skills' had been previously identified at this institution⁶ the students had not received written information in what these were.

We are not suggesting that Sheffield is worse than other schools in these respects; this kind of clinical 'firm' teaching has been the traditional way to impart both clinical knowledge and clinical skills in most medical schools throughout the UK. With the advent of new medical curricula and the development of skills training centres, better methods of teaching may emerge.

At completion of training a sizeable number of students were unfamiliar with tasks that would become part of their

day-to-day work as preregistration house officers. The findings on rectal examination are of particular concern. Lack of experience in this part of complete examination of the patient may be explained partly by the current medicolegal climate, in which the general public is increasingly resistant to medical student involvement.

In addition, clinical experience as an undergraduate is known to depend on which clinical firms the students are attached to⁸. House officers who have not learned essential clinical skills may find the initial part of their preregistration house year especially taxing². Although a large number of clinical skills are attained during the preregistration house year⁶, our survey indicates that few are taught formally. There may have been a problem in some cases with 'recall', because the number recalling training was considerably smaller than the number of house officers in hospitals where such training was scheduled.

What can be done to make the training of undergraduates and preregistration house officers closer to a continuum? Logbooks and skills laboratories for undergraduates (now used at Sheffield), and induction courses for house officers, could help. A logbook indicates that procedures have been completed, but it does not certify competence, and important details of patient interactions tend to be omitted. What of skills laboratories? These are well established in the UK and provide an environment for structured learning and feedback¹⁰. They do not offer 'real patient' experience but undergraduates find them helpful¹⁰—for example, with regard to objective structured clinical examinations^{11,12}. We aim to assess the impact of a skills laboratory and logbooks in Sheffield by repeating the survey in two years' time.

In our study no formal preregistration house officer training in needlestick injury could be traced, and less than half the preregistration house officers could recall any training being given. This is an important issue in view of the risks to healthcare workers from bloodborne pathogens in the workplace, especially since acquisition of a transmissible pathogen may preclude further work in the health services. Undergraduates in America have likewise been shown unaware of the proper universal precautions for various clinical circumstances⁴. One study indicates that about 50% of ward-based doctors sustain a needlestick injury in two years and that the risk is similar for clinical medical students¹³. According to Hettiaratchy *et al.*¹⁴ most junior doctors in the UK do not routinely wear gloves for venepuncture and only 17.5% of needlestick injuries are reported. This matter requires urgent attention at both undergraduate and house-officer levels.

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