



LEARNING/TEACHING

Identifying Medical School Learning Needs: A Survey of Australian Interns

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ABSTRACT Objectives: *To survey interns regarding their opinion of medical school learning needs for a range of core skills.*

Methods: *A random sample of interns practising in New South Wales, Australia, who graduated from the state's three medical schools were surveyed two-thirds of the way through their first hospital year. They were asked whether there was a need for further medical school education for each of 226 core skills. Skills were grouped into five themes: management of clinical conditions; clinical investigations; clinical procedures; core practice; and professional development.*

Results: *Frequency distributions weighted for age, gender and medical school background were calculated for each item. The 20 most frequently identified needs related to examinations of the eye and ear, nose and throat; managing uncooperative patients and difficult patient interactions; prescribing; writing not for resuscitation orders and death certificates. Also included were procedural needs related to ear, nose and throat; plastering and wound management; and needs for more education in the management of clinical conditions related predominantly to "acute" cases such as anaphylaxis and diabetic ketoacidosis.*

Conclusion: *Interns were able to discriminate between their needs for different skills and identified many core skills for which they perceived there was a need for more medical school education. The implications for medical education are discussed.*

KEYWORDS *Core skills, medical education, learning needs.*

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Despite the need for undergraduate medical education to provide the foundation for subsequent learning and practice, there is substantive evidence that this need has not been met adequately. There are reports internationally that junior doctors are unprepared for the practice demands of their first hospital year in several areas, including clinical skills, communication skills, clinical pharmacology and medical ethics (Jolly & Macdonald, 1989; Clack, 1994; Wise *et al.*, 1995; Remmen *et al.*, 1999). In part, such deficiencies highlight the increasing need for curriculum planning in those medical schools that are designing new curricula or in those undertaking curriculum reviews.

Curricular reform, and in particular the determination of content, is a difficult business (Sanson-Fisher & Rolfe, 2000). There are many factors to be taken into account, such as responding to the requirement of guidelines (General Medical Council, 1993); the rapid advances in medicine; and the views of stakeholders such as faculty, specialist colleges and consumers (Harden, 1986). Although there are many ways of determining what should be taught in undergraduate medical curricula, Cookson (1997) has suggested that the needs of newly graduated doctors should be central to curriculum reform. This is partly because of the relative inadequacies of some university models of education which are based on knowledge and understanding; and the relative merits of a practice-based training model of education, emphasizing skills required for tasks and the operation of individuals within a system (Cox, 1990; Cookson, 1997). Arguably it is interns who know best the merits and constraints of the system within which they operate and who therefore should have a large voice in determining their education. This is particularly true as the hospital system, with all its deficiencies, is likely to be very slow to change (Cookson, 1997).

The aim of the project reported in this paper was to survey interns regarding their opinion of medical school learning needs for a range of core skills.

Methods

Subjects and Setting

This was a survey of interns registered to practice in New South Wales who graduated from the state's three medical schools (Universities of Newcastle, Sydney and New South Wales). The survey was conducted in September 1999 (two-thirds of the way through the first year of hospital practice).

Instrument

A list of core skills required at graduation from medical school was generated after reviewing the relevant medical education literature and consulting with a range of stakeholders. These included hospital-based intern supervisors; discipline heads at the Faculty of Medicine and Health Sciences, University of Newcastle, New South Wales; hospital nurses, registrars and interns from

urban and rural health services. The list of core skills was converted to a survey format asking subjects to indicate with a “yes” or “no” response whether there was a need for more medical school education for each skill.

The survey contained 226 items grouped under the following themes:

- clinical conditions—78 differentiated and 29 undifferentiated conditions; differentiated conditions were those related to a definitive diagnosis, e.g. angina; “undifferentiated conditions” related to undiagnosed symptom complexes, e.g. shortness of breath;
- investigations—18 clinical investigations;
- procedures—33 practical procedures;
- core practice—55 items that form part of routine patient care; including communication, preventive and other management skills; and
- professional development—13 skills relating to self-management.

Procedure

Names and addresses of interns were obtained from the state medical register. The survey was divided into two parts because of its length. The first assessing clinical conditions, investigations and procedures; the second focusing on the remaining two sections. Each part of the survey was sent to a random (one in two) sample of interns. Reminder letters were also sent at one and three weeks after the initial mailing in order to maximize response rates (Dillman, 1978).

Data Analysis

Representativeness of Sample. Separate continuity corrected chi-square analyses were used to examine for differences in gender and the proportion of graduates from different medical school backgrounds who responded to parts one and two of the questionnaire. Separate one-way between-subjects analysis of variance (ANOVA) was used to examine differences in the mean age of responders and non-responders.

Need for More Undergraduate Training. Weighted frequency distributions were calculated for each item. Weightings were used to account for the influence of potential differences in medical school background, age and gender of respondents versus non-respondents in both parts of the survey (Levy & Lemeshow, 1991). We then reviewed and grouped the data in two ways. First, according to the most frequently acknowledged needs in the overall survey, irrespective of separate themes. Second, according to the most frequently acknowledged needs within each theme.

Results

Representativeness of the Sample

Part One of the Survey. A total of 193 questionnaires were sent and 96 received, a response rate of 49.7%. A significantly larger proportion of Newcastle interns (74.2%) responded to the survey than interns from Sydney (43.5%) or New South Wales (47.1%) Universities. However, there were no differences in the proportion of responders and non-responders from interns graduating from the latter two medical schools. There was no significant difference in the gender of responders (51.0% female) and non-responders (41.2% female), or in the mean age of responders (26.4 years; range 23–37 years) and non-responders (26.7 years; range 23–43 years).

Part Two of the Survey. A total of 194 questionnaires were sent and 119 received, a 61.3% response rate. A significantly larger proportion of Newcastle interns (82.8%) responded to the survey than interns from Sydney (56.3%) or New South Wales (59.4%) Universities. However, there were no differences in the proportion of responders and non-responders from interns graduating from the latter two medical schools. There was a significant difference in the gender of responders and non-responders, with proportionally more females (74.4%) than males (51.8%) responding. There was no significant difference in the mean age of responders (26.5 years; range 23–45 years) and non-responders (27.2 years; range 24–55 years).

Need for More Medical School Preparation Overall

The 20 most frequently identified needs overall are displayed in Table 1. These needs emerged from four survey themes: core practice, clinical conditions, procedures and investigations. Needs for core practice skills related to examinations of the eye and ear, nose and throat; managing uncooperative patients and difficult patient interactions; prescribing; and writing not for resuscitation orders and death certificates. Procedural needs related to ear, nose and throat; plastering and wound management. Needs for more preparation for managing clinical conditions related predominantly to “acute” cases such as anaphylaxis and diabetic ketoacidosis.

Need for More Medical School Preparation According to Theme

Tables 2–5 display the items for which at least 50% of interns acknowledged a need for more medical school preparation.

Clinical Conditions. A total of 17 of the 78 differentiated conditions and eight of the 29 undifferentiated conditions are displayed in Table 2. Differentiated

Table 1. The 20 most frequently acknowledged skills identified as needing more medical school preparation

	Valid % “yes” need
<i>Core practice</i>	
Managing a violent or uncooperative patient	74.8
Examinations—ear, nose and throat examination	73.9
Eye examination including ophthalmoscopy	72.7
Administering drugs in CPR	65.0
Prescribing sedation	64.9
Handling difficult patient interactions (e.g. complaints, self-discharge)	64.2
Prescribing for pain control in terminally ill patients	63.9
Writing a “Do Not Resuscitate” order	63.3
Completion of death certificate	62.4
<i>Clinical procedures</i>	
Packing a bleeding nose	73.8
Plaster application to a closed fracture	68.9
Exploration of a wound	62.8
<i>Clinical conditions</i>	
Anaphylaxis	72.5
Diabetic ketoacidosis	70.5
Symptomatic bradyarrhythmia	68.7
Acute respiratory failure	68.1
“Sick” child	63.7
Antepartum haemorrhage	62.2
Epileptic seizure	62.2
<i>Investigations</i>	
Performing a lumbar puncture	64.7

conditions were primarily acute emergencies (e.g. diabetic ketoacidosis, ventricular tachycardia, cardiac arrest, status epilepsy, respiratory failure), and/or drug and alcohol related. Undifferentiated conditions were also mainly acute cases.

Clinical Investigations. A total of nine of the 18 investigations acknowledged by more than 50% of interns are displayed in Table 3. Most needs related to procedural investigations such as performing lumbar punctures; or radiological interpretations.

Clinical Procedures. A total of 15 of the 33 practical procedures are displayed in Table 4. Procedures were mostly simple ones, such as those related to wounds and orthopaedics. The minority related to more complex cases such as airway management, chest drain insertion and packing a bleeding nose.

Table 2. Clinical conditions for which at least 50% of interns indicated there was a need for more medical school preparation

	Valid % "yes" need
<i>Differentiated conditions</i>	
Anaphylaxis	72.5
Diabetic ketoacidosis	70.5
Acute respiratory failure	67.7
Epileptic seizure	62.2
Ventricular tachycardia	61.4
Status epilepticus	59.9
Narcotic withdrawal	57.4
Antidepressant drug overdose—non-life-threatening	57.4
Benzodiazepine withdrawal	57.4
Supraventricular tachycardia	56.9
Hyperglycemia—Type II diabetes	56.8
Cardiac arrest	56.5
Paracetamol drug overdose—non-life-threatening	55.5
Hyperglycemia—Type I diabetes	52.9
Benzodiazepine drug overdose—non-life-threatening	51.8
Alcohol withdrawal	51.4
Narcotic abuse	50.2
<i>Undifferentiated conditions</i>	
Symptomatic bradyarrhythmia	68.7
"Sick" child	63.7
Antepartum haemorrhage	62.2
Acute joint pain	54.1
Painful red eye	54.1
Acute back pain	52.0
Acute confusion/agitation	51.1
Unconsciousness/coma	50.5

Core Practice. A total of 20 of the 55 core practice skills are displayed in Table 5. These skills related predominantly to clinical skills such as patient examinations; complex communication skills (such as counselling bereaved families and difficult patients, and family negotiations); prescribing; clinical ethics (such as consent and not for resuscitation orders), death certification and defibrillation.

Professional Development. At least 50% of interns identified a need for more undergraduate preparation for two of the professional development skills: medico-legal issues and dealing with emotionally distressing events. Nearly half (40–50%) of interns identified a need for more preparation in critical appraisal of medical evidence, time management, role understanding and knowing ones clinical limitations.

Table 3. Clinical investigations for which at least 50% of interns indicated there was a need for more medical school preparation

	Valid % "yes" need
Performing a lumbar puncture	64.7
Distinguishing an abnormal ECG	61.7
Performing joints aspiration	59.7
Identification of an abnormal skeletal X-ray	59.1
Recording a 12 lead ECG	58.4
Performing a pleural aspiration	57.2
Performing a cervical smear	53.6
Identification of an abnormal chest X-ray	52.9
Identification of an abnormal abdominal X-ray	51.7

Table 4. Clinical procedures for which at least 50% of interns indicated there was a need for more medical school preparation

	Valid % "yes" need
Packing a bleeding nose	73.8
Plaster application to a closed fracture	68.9
Exploration of a wound	62.8
Application of simple traction	61.4
Mixing intravenous drugs	60.1
Syringing of an auditory canal	59.9
Draining an abscess	57.9
Airway management of an unconscious patient (not intubation)	57.3
Bandaging a sprain	55.5
Intubation	55.5
Dressing application to a wound	55.5
Suturing a simple wound laceration	55.1
Chest drain insertion	52.3
Determining appropriate position of nasogastric tube	52.2
Nasogastric tube insertion	51.1

Discussion

Several limitations should be taken into account when interpreting the results of this study. First, our response rate for separate sections of the survey was 50 to 61%. Although this is usual for the junior doctor population (Rolfe *et al.*, 1998), it is still relatively low and may have affected the validity of our results. Second, our list of core skills, although determined in a systematic manner by a range of stakeholders, may not be comprehensive. Our list did include the management of many patient conditions. Most surveys in the literature have

Table 5. Core practice skills for which at least 50% of interns indicated there was a need for more medical school preparation

	Valid % "yes" need
Managing a violent or uncooperative patient	74.8
Physical examination: ear, nose, throat	73.9
Physical examination: eye including ophthalmoscopy	72.7
Performing basic CPR: administering drugs	65.0
Prescribing for (non-complex cases): sedation	64.9
Handling difficult patient interactions (e.g. complaints, self-discharge)	64.2
Prescribing for (non-complex cases): pain control in terminally ill	63.9
Writing a "Do Not Resuscitate" order	63.3
Completion of death certificate	62.4
Performing basic CPR: defibrillation	61.3
Counselling bereaved families	58.8
Physical examination: neonatal check	58.5
Verification of death	57.8
Obtaining consent to manage an incompetent patient	56.8
Physical examination: pelvic	56.7
Physical examination: orthopaedic (joint)	53.2
Negotiating with anxious patients and families	51.3
Creating a problem list and management plan	50.9
Prescribing for (non-complex cases): pain relief	50.5
Basic fluid & electrolyte management	50.2

only focused on practical skills and procedures, partly because the number of patient conditions that need to be included make survey lengths prohibitive (Le Beau & Lawson, 1999), and partly because some institutions believe the responsibility for managing specific cases does not lie within the realm of undergraduate medical education (Scott *et al.*, 1991). Finally, the nature of self-completed surveys is that they can be subject to report bias.

The above limitations notwithstanding, our study highlights some interesting findings, not the least of which is that interns are able to discriminate among their learning needs and identify many areas which they think need improvement. The fact that two-thirds of the way through their first hospital year, doctors identified so many medical school learning requirements may imply a number of things. These may include interns' perception that they are inadequately prepared for practice, and also that the undergraduate medical education environment should assume part of the responsibility. We did not ask interns, however, whether there was a need for additional postgraduate training for the core skills listed. This raises the important question of whose responsibility it is to educate junior doctors. It is perhaps easy to argue that medical school establishes the foundations for what should be a continuum of life-long learning. However, it is difficult to define foundation learning, and further still to define how to continue intern education adequately in such a

busy and stressful practice environment (Cookson, 1997). Our study shows at the least there are training needs across a wide range of areas and that undergraduate institutions at least in part need to move further to meet them.

Many of the needs identified in our survey are supported from data arising from studies that evaluated preparedness for internship. These include areas of intern deficiencies in complex interactional skills, practical skills and procedures (Jolly & Macdonald, 1989), ethics (Clack, 1994), and prescribing (Clack, 1994; Wise *et al.*, 1995; Pearson, 1999). Our findings also emphasized learning needs in the management of acute patient cases, some relating to subspecialty areas such as ophthalmology and ear, nose and throat. There were also needs in areas which medical schools may consider routine, such as writing death certificates, but which are often the responsibility of interns. Personal issues raised such as the need for learning how to deal with emotionally distressing events, should be given careful attention, considering the substantive stress that is associated with internship and the consequent emotional morbidity for junior doctors (Hume & Wilhelm, 1994).

The findings from our study may also be relevant for other medical schools in the industrialized world but are less likely to apply to those in the developing world. Using the same research design but using different lists of core skills, a similar study could be executed at some institutions of the developing world and may prove useful in guiding medical school educational design.

It is important to ensure that medical students receive optimum preparation for the demands of their intern year. Data from this survey may assist medical schools in curricula revision, particularly that which is oriented towards the practice environment.

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