



EDUCATION FOR HEALTH

BRIEF COMMUNICATION

Procedural skills: What's taught in medical school, what ought to be?

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Published: 17 April 2007

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Education for Health, Volume 20, issue 1, 2007

Available from: <http://www.educationforhealth.net/>

ABSTRACT

Background: Medical schools' instruction of skills is often found to be inadequate. In 1999, the American Association of Medical Colleges (AAMC) published a list of eight procedural skills that medical students are recommended to learn. This study aims to evaluate compliance with these guidelines and to examine the instruction of other skills to determine if the most important skills receive adequate instruction.

Methods: In 2004, surveys were sent to 138 educational representatives at North American (AAMC) medical schools and 1208 Canadian family physicians. The survey addressed the importance of selected skills. Findings were analyzed by χ^2 testing.

Results: Of the eight skills recommended by the AAMC, only four were taught by all schools. All eight, except for suturing, and most of the other skills, were taught at a higher rate than they were practiced. Only digital block anesthesia was practiced more commonly than it was taught.

Conclusion: Although guidelines exist for skills instruction in medical school, they are not followed completely. Furthermore, the guidelines may reflect an emphasis on skills that are more suited to specialist rather than general practice. This may come at the expense of the instruction of other more practical skills.

Key words: procedural skills, medical education, undergraduate



Background

The importance of procedural skills to a physician is obvious. Performing an appropriate procedural skill properly can be life saving. Thus it is necessary to determine those skills that are essential for the competent physician. The proportion of schools teaching a certain skill is indicative of the emphasis placed by educators on competency in that skill. Similarly, the proportion of physicians who perform a skill in their practice is an indication of its practical value. Ideally, a skill should be emphasized by educators to a level that is reflective of its practical importance.

In North America, family practice makes up the single largest proportion of residency positions matched to students. In the 2005 Canadian residency match almost 1/3 of graduating students were selected into family practice, roughly 1/3 as a second choice or lower (CaRMS, 2004; NRMP, 2005). Since such a large proportion of undergraduate students match with family practice, it is reasonable that undergraduate medical education should, at least in part, be aimed towards the goal of training students who possess the requisite skills to become a family physician.

Prior to 1999, studies consistently found North American medical schools to be deficient in teaching skills. Nelson and Traub (1993) found that most medical schools offered no more than an introductory course in phlebotomy. In 1999, the AAMC established recommendations for teaching procedural skills to medical students. Among these guidelines is a list of eight skills (Figure 1) in which “the medical school must ensure that before graduating a student will have demonstrated” competency (Medical School Objectives Writing Group, 1999).

		% of Schools That Teach	% of Family Physicians That Perform	p-value (χ^2)
AAMC Recommended	Arterial puncture	92	63	<0.001
	Foley catheterization	100	69	<0.001
	IV start	100	69	<0.001
	Lumbar puncture	98	52	<0.001
	NG tube	100	62	<0.001
	Suturing	100	95	0.051
	Thoracentesis	70	42	<0.001
	Venipuncture	99	76	<0.001
Non-AAMC Recommended	CPR	100	76	<0.001
	Central line	70	29	<0.001
	Chest tube	56	45	0.25
	Digital block	62	82	<0.001
	Drain removal	93	71	<0.001
	Dress wound	100	91	0.018
	Intubation	88	57	<0.001
	Fracture reduction	81	57	<0.001
	Injection	99	97	0.57
	Joint aspiration	88	80	0.16
	Lesion incision	93	95	0.56
	Oliguria assessment	100	74	<0.001
	Pap/vaginal smear	100	95	0.066
	Sigmoidoscopy	49	24	<0.001
	Throat swab	100	97	0.35
	Tracheostomy	32	10	<0.001

Figure 1: The instruction and performance of 24 procedural skills



This study has several aims. It will quantitatively examine current practices of education to reveal whether the deficiencies previously noted still exist and whether the recently introduced AAMC recommendations are being met. Current educational practices will also be compared against the practices of family physicians to measure which skills should be taught.

Methods

The study consisted of surveys which were directed to the following two groups: Associate Deans of Education (or equivalent) of all North American medical colleges comprised the first group or educators group and a sample of 1208 Canadian family physicians made up the second group. A list of potentially important procedural skills was generated from a review of the literature. Of a total of 152 skills mentioned in the 13 studies selected, 24 had been cited four or more times and were chosen for study (APM, 2003; Dire & Kietzman, 1995; Engum, 2003; GMEC, 1998; House & House, 2000; Hunskaar & Seim, 1983; Kowlowitz et al., 1990; Ladak, n.d.; Lawrence et al., 1983; Nelson & Traub, 1993; Reznik et al., 1988; Spike & Veitch, 1990; Taylor, 1997).

The survey was designed using the online survey service “Survey Monkey”. The “MD Select” database was used to obtain email addresses for the family physicians contacted; the sample was made up of those family physicians who provided their email addresses to the database.

The percentage of schools that recommend or require the instruction of a skill was compared to the proportion of family physicians who performed that skill via χ^2 analysis.

The study was approved by the University of Alberta’s ERB.

Results

Completed surveys were received from 79 educators (response rate =57%) and 475 family physicians (response rate =39%).

A minority of the skills investigated were taught by all schools. These included four of the AAMC recommended skills (Foley catheterization, IV starting, NG tube insertion and suturing). Among the other skills, CPR, dressing wounds, urinalysis, pap/vaginal smear and throat swab were taught by 100% of the respondents.

Fifteen of the 24 skills investigated were taught at a significantly higher rate than they were practiced by family physicians. The only skill that was taught at a significantly lower rate than it was practiced was digital block anesthesia. Eight skills had rates of instruction that were not significantly different from their rates of practice.

Conclusions

This study found several areas in which procedural skills education was lacking and not all schools taught the eight AAMC recommended skills. This may have resulted from a lack of awareness of the guidelines, or an inability or refusal to comply. In any case, it appears that steps must be taken if these guidelines are to be upheld.



The majority of the skills studied were taught at a higher rate than they were practiced. This reflects an emphasis being placed on skills that are employed in specialties other than family practice, which includes seven of the eight AAMC skills. This may result from a bias in undergraduate medical education towards training specialists and not general practitioners.

Some of the skills in this group, such as intubation or tracheostomy are skills that would be useful for any physician to know in an emergency, but may occur so infrequently in general practice that the opportunity never arises to employ them. Several other of the skills studied would only be useful in an inpatient setting, and as such might be useful to several specialties but less so to family practice. However, teaching resources are limited and their use to teach these skills may come at the expense of skills that would be useful to a greater proportion of students.

Our study identified one such skill that may be an example of this effect, i.e. digital block anesthesia which was a skill that was practiced commonly but taught at a lower rate. This is one skill that might benefit from a redistribution of teaching resources. Further research may identify other skills that are likewise taught at a lower level than appropriate.

The remaining skills where no difference was found between the rates of instruction and practice indicate areas in which education was best matched to the needs of family practice.

It is the stated aim of many medical schools to train physicians to be competent in general medicine. However, current AAMC guidelines and general educational tendencies may over-emphasize certain skills that are not germane to this goal. An adjustment to and stronger implementation of national guidelines could avoid some of these discrepancies.

This study has several limitations. The response rate, especially among family physicians, was low. Despite sample sizes large enough to determine several significant results, it is also unclear how representative the sample of family physicians used is of North American family physicians or how representative the sample of educators is.

Acknowledgements

Mr. Turner's funding is provided by the Office of Undergraduate Education and the Department of Surgery at the University of Alberta. Mr. Hansen and Dr. de Gara are funded by the Department of Surgery at the University of Alberta.

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