

# Assessment of the otoscopic skills of general practitioners and medical students: is there room for improvement?

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**SUMMARY.** Ear, nose and throat problems are common in general practice, yet undergraduate and postgraduate teaching in the subject is variable and often sparse. The assumption that direct experience in otoscopy in practice will compensate for inadequate previous tuition was tested by assessing a group of 53 general practitioners and 59 medical students. Confidence in otoscopy was assessed using a visual analogue scale and skill was assessed by clinical examination of four ears. Otoscopy was divided into identifying the tympanic membrane, distinguishing a normal from an abnormal membrane and identifying specific features of the membrane. The medical students and general practitioners were comparable in both confidence and skill for all parameters except skill in identification of specific features of the tympanic membrane, in which the students' ability was greater (Student's *t*-test,  $P < 0.01$ ). In both groups the percentage of false negative observations was reassuringly low — for students the mean was 3.0%; and for general practitioners 4.3%.

There is room for improvement in general practitioner's training in otoscopy. Supervised tuition is essential and cannot be compensated for by unsupervised experience. More involvement with ear, nose and throat problems in vocational training or attendance at continuing education courses is suggested.

**Keywords:** otoscopy; diagnostic skills; professional competence; learning needs.

## Introduction

DISEASES of the upper respiratory tract are responsible for 10–20% of consultations in general practice.<sup>1</sup> Thus, it is generally agreed that skill in the diagnosis of such conditions should be acquired at some stage of vocational training.<sup>2</sup> Otoscopy is an important skill for the general practitioner, but this skill is rarely assessed at either undergraduate or postgraduate level.<sup>3</sup> At present it is assumed that omissions in formal vocational training schemes can be compensated for by direct experience in subsequent practice.<sup>4</sup> Since over 80% of vocational training schemes omit otolaryngology it is important that this assumption is shown to be valid.<sup>3</sup> This is particularly relevant in the light of the recent changes to the National Health Service, as general practitioners may now be under

pressure to exercise a higher degree of selectivity in referral for specialist treatment.

The aim of this study was to investigate the confidence and clinical skill in otoscopy of a group of general practitioners and medical students in order to test the assumption that practical experience in otoscopy will compensate for a lack of previous tuition.

## Method

The study group comprised 53 general practitioners and 59 fourth year medical students. The general practitioners were attending three continuing education courses in ear, nose and throat problems held at the Institute of Laryngology and Otology, London and at the North Devon Medical Centre during 1990. All but three of the general practitioners had trained in the United Kingdom and they all had at least four years' experience in general practice. The medical students had completed three four-week attachments to the ear, nose and throat department at the Royal National Throat, Nose and Ear Hospital, London, in 1990 during which they attended outpatient clinics (six half days), theatres, lectures and teaching in clinical methods. None of the students had received prior teaching in this subject, and the mean number of ears which each student examined during the course was 25 (range 10–56).

### Assessment of confidence in otoscopic skill

Each subject was asked to indicate his or her degree of confidence in three aspects of otoscopy on a 100 mm visual analogue scale<sup>5</sup> from zero to maximum confidence (0–100%). The three aspects were ability to identify the tympanic membrane, ability to distinguish a normal from an abnormal tympanic membrane and ability to identify specific features and abnormalities of the tympanic membrane.

### Assessment of clinical skill

All 59 medical students and 23 randomly selected general practitioners were assessed clinically using volunteer patients. A total of four ears — two normal and two abnormal — were examined by each subject. Different groups of ears were examined by each course group, however each group of ears was standardized for the degree of difficulty as far as possible. For example, the abnormal cases consisted of one intact and one perforated tympanic membrane in each test group. The types of abnormalities included inactive and active chronic suppurative otitis media, myringitis, glue ear, mastoidectomy cavities, tympanosclerosis and grommets. They were asked to state whether they could identify the tympanic membrane, whether they considered it to be essentially normal or abnormal, and finally they were asked to draw and label every structure seen in each ear. This final aspect allowed them to label both normal visible structures and abnormal features. The authors agreed on a point scoring system for each drawing (5–8 points per ear) with the final score out of 20–25 being converted into a percentage.

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### Statistical methods

Values which approximated to a normal distribution were compared using Student's *t*-test, and those which deviated from a normal distribution were compared using the Wilcoxon rank sum test and the Mann-Whitney *U* test. The computer software used was the statistical package for social sciences (SPSS). Where the *P* value for a comparison was less than 0.05 the difference was considered significant.

## Results

### Confidence in otoscopic skill

The medical students and general practitioners showed a similar pattern of confidence scores (Table 1). A decline in confidence with increasing complexity of the process is seen, with identification of specific features of the tympanic membrane being perceived as the most difficult task.

### Clinical skill in otoscopy

The two groups showed similar abilities at identifying the tympanic membrane and distinguishing normal from abnormal ears (Table 2). When the latter was subdivided into false positive rate (percentage of normal ears wrongly categorized as abnormal) and false negative rate (percentage of abnormal ears wrongly judged as being normal) the two groups were again statistically

**Table 1.** Mean confidence scores for each aspect of otoscopy.

	Mean % confidence score (SD)	
	General practitioners (n = 53)	Medical students (n = 59)
Ability to identify the tympanic membrane	80.7 (14.9)	77.8 (18.8)
Ability to distinguish normal from abnormal tympanic membrane	70.0 (15.3)	61.5 (18.6)
Ability to identify specific features of the tympanic membrane	43.4 (17.5)	45.6 (22.3)

SD = standard deviation. *n* = total number of practitioners/students in group.

**Table 2.** Mean clinical skill scores for each aspect of otoscopy.

	General practitioners (n = 23)	Medical students (n = 59)
Ability to identify the tympanic membrane (mean % clinical skill score (SD))	99.3 (3.7)	96.4 (14.1)
Ability to distinguish normal from abnormal tympanic membrane (mean % clinical skill score (SD))	82.1 (15.7)	78.7 (17.5)
False positive rate (%)	13.0 (14.8)	18.4 (15.7)
False negative rate (%)	4.3 (12.3)	3.0 (8.4)
Ability to identify specific features of the tympanic membrane (mean % clinical skill score (SD))	27.8 (13.0)	43.1 (20.3)**

SD = standard deviation. *n* = total number of practitioners/students in group. \*\**P*<0.01, Student's *t*-test.

similar. The false negative rate was low for both groups, so few patients with significant ear pathology were missed by either group.

The medical students' ability to identify specific features of the tympanic membrane was, however, significantly higher than that of the general practitioners (*P*<0.01). Among the subjects in both groups who had difficulty identifying specific features of the tympanic membrane, an inadequate knowledge of basic anatomy of the landmarks related to the tympanic membrane and middle ear was demonstrated. Ossicles were often unspecified, described simply as 'ossicle' or labelled as pathological structures such as a cholesteatoma.

## Discussion

Undergraduate education aims to create a basic doctor who can be moulded by subsequent training, rather than a comprehensively trained practitioner.<sup>6</sup> Ear, nose and throat medicine must by necessity occupy a small proportion of the already crowded curriculum<sup>7,8</sup> and this currently averages just 57 hours of teaching.<sup>3</sup> However, given the undoubted importance of upper respiratory tract diseases in general practice, some provision to build on this basic teaching is necessary.<sup>9</sup>

When vocational training schemes for general practice were in their infancy, ear, nose and throat medicine was prominent in proposed schemes,<sup>10</sup> but a recent survey showed that only 16% of formal schemes incorporated any form of attachment to an ear, nose and throat department.<sup>3</sup> The assumption is that subsequent on-the-job experience will compensate for this lack of formal tuition.<sup>4</sup> However, this study of otoscopic skill has shown no such increase in either confidence or clinical skill of a group of general practitioners over and above that achieved by junior and inexperienced medical students. It was interesting to note that there seemed to be a tendency to over confidence among general practitioners when considering their skills at identifying specific features of the tympanic membrane. To claim that the group of general practitioners studied is representative of the profession as a whole would be unreasonable, but to claim that they are 'poorer' than average would also be unreasonable since they have had the initiative, commitment and insight to attend a specific course on the subject. Indeed, they may be among the more skilled practitioners, and the observations of one author during the courses concerned would support this.

It must be acknowledged that this study does not address the wider issue of clinical decision making, in which the history is of primary importance and signs of secondary importance. An experienced practitioner with some otoscopic skill is likely to be better than a highly skilled student otoscopist in this respect.

It can be concluded that although a fair degree of skill was shown by the general practitioners sampled in this study, there is substantial room for improvement. This would increase the overall quality of care, rationalize (and hence minimize) referrals to ear, nose and throat departments and improve job satisfaction for the individual practitioner. The false positive rates found in this study give an indication of the potential rate of unnecessary referrals. Otoscopy is not a mystical art, and can be mastered with a small amount of effort. A study involving medical students has shown startling improvement in performance after only 50–100 minutes of teaching.<sup>11</sup>

One approach would be to improve the undergraduate curriculum in ear, nose and throat medicine. However, since no increase in the numbers of academic staff is planned, this could not be achieved by spending more time on the subject, and must instead focus on targeted teaching towards specific goals.<sup>12</sup> The

second approach would be to increase the prominence of ear, nose and throat medicine in vocational training schemes. This need not involve full time senior house officer attachments, but could consist of clinic visits during which clinical skills could be monitored and built upon. The final approach would be to foster the attendance of courses for established practitioners, many of which already flourish,<sup>13</sup> and allow revision of basic anatomy as well as more clinically related knowledge.

Whatever the approach, the fundamental principles of learning a clinical skill should be understood: a clear understanding of the task, supervised practice, direct experience, repetition, knowledge of the results and persistence.<sup>14</sup> Supervised practice is far superior to unsupervised practice since feedback is essential. During the training of general practitioners in otoscopy this feedback can only come from otolaryngologists or specially trained general practitioners (such as clinical assistants<sup>13</sup> or hospital practitioners). An acceptable level of competence, or further improvement in a competent practitioner's skill, can be achieved after supervised practice with as few as 12 cases.<sup>11,14</sup> The enthusiasm of both the trainee and trainer are also important and more difficult to quantify.

One of Oxford's distinguished educators, Sir George Pickering, noted that '...the mastery of clinical methods is perhaps the most important objective of the clinical curriculum. Today it is mostly badly done. This requires more attention by teachers.'<sup>6</sup> The 'mastery' of otoscopic skills should be actively fostered beyond final MB qualification for all trainees in general practice and prospective studies of such skill acquisition should be carried out. There is room for improvement.

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