



**University of Dundee**

## **Prioritising topics for the undergraduate ENT curriculum**

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## **TITLE PAGE**

### **Title**

Prioritising Topics for the Undergraduate ENT Curriculum

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## **ABSTRACT (149 words)**

**Introduction:** Knowledge of ENT is important for many doctors, but undergraduate time is limited. We aimed to identify what is thought about ENT knowledge amongst non-ENT doctors, and the key topics that the curriculum should focus on.

**Methodology:** Doctors were interviewed about their views of ENT knowledge amongst non-ENT doctors, and asked to identify key topics. These topics were then used to devise a questionnaire distributed to multiple stakeholders in order to identify the key topics.

**Results:** ENT knowledge was generally thought to be poor amongst doctors, and it was recommended that undergraduate ENT topics should be kept simple. Highest rated topics were “clinical examination”, “when to refer”, “acute otitis media”, “common emergencies”, “tonsillitis/quinsy”, “management of ENT problems by non-ENT doctors”, “stridor/stertor”, “otitis externa” and “otitis media with effusion”.

**Conclusion:** This study identified a number of key ENT topics, and will help to inform future development of ENT curricula.

## **Keywords**

Otolaryngology; Education, Medical, Undergraduate; Education; Curriculum

## TEXT SECTION

### INTRODUCTION

ENT disorders are frequently encountered by many non-ENT doctors including General Practitioners (GPs) and Emergency Department (ED) doctors<sup>1,2</sup>. ENT problems are common, with a study of participants aged >14 years identifying the prevalence of hearing loss as 18%, tinnitus 17%, runny nose 15%, hay fever 18%, severe sore throat 31%, and dizziness 29%<sup>3</sup>. ENT problems account for 1.5% of Emergency Department attendances (overall commonest identified first diagnosis is dislocation/fracture/joint injury/amputation at 4.6%). 72% of GPs would see at least three children with ENT problems each day, and half of children that a GP sees will have ENT problems<sup>1,2,4</sup>. Referrals to ENT account for 13% of all GP referrals to secondary care, making ENT the third commonest specialty group referred to<sup>5</sup>.

However, the structure of postgraduate training is such that not all non-ENT doctors will rotate through ENT, therefore ENT in the undergraduate curriculum assumes a relatively greater importance compared to other specialties<sup>1,6</sup>. However, a 2004 study in the UK found that only 78% of medical schools had a compulsory ENT attachment, and the average length of time spent in ENT was a week and a half<sup>7</sup>. Both the proportion of medical schools offering undergraduate ENT and the duration of attachment appears to have reduced recently<sup>8</sup>. Numerous surveys have shown that most junior doctors in emergency medicine, general practice, and other specialties felt that an increase in undergraduate ENT training was warranted<sup>2,6,9,10</sup>. A link to patient

care has also been shown, as the quality of care was lower (as defined by higher emergency admission rates) in hospitals where the ENT first on-call tier service is provided by generic junior doctors rather than by ENT-specific doctors<sup>11</sup>.

Taking all of this into consideration, it is therefore necessary that the pressured undergraduate ENT syllabus focuses on the most important topics<sup>12</sup>. Our research aims to define these topics, and furthermore to establish what relevant stakeholders think of ENT knowledge amongst non-ENT doctors, and what they think of undergraduate ENT teaching.

A literature review looking for research with similar aims identified only one publication that describes a two-round Delphi review looking at which topics should be included in the undergraduate ENT curriculum<sup>13</sup>. The methodology used in that study differs significantly from this paper. The results and differences of the two studies are compared in the discussion.

## **MATERIALS AND METHODS**

Several methods for informing the content and design of medical curricula have been previously described in the literature, including panel of experts, surveys and Delphi review. In our study, we adopted a mixed methods (qualitative and quantitative) approach to establish the opinions of ENT clinicians and other important stakeholders. Mixed methods were employed as the results would provide both qualitative and quantitative data; the qualitative data would allow greater insight into the subjective

components of our research question's answers, whilst the quantitative data would serve to primarily facilitate prioritisation of responses, and secondarily to validate some of the qualitative-based interpretations. Therefore, both would contribute in different but complementary ways to the analysis and final conclusions<sup>14,15</sup>.

Clinicians were interviewed to identify a set of important ENT topics. These were then used to develop an on-line questionnaire, which was distributed to clinicians and students. The interviewees' opinions on current ENT knowledge and undergraduate ENT teaching were also explored and analysed using principles of Thematic Analysis as described by Braun and Clarke (TA)<sup>16</sup>. TA is a qualitative research method that allows identification of themes and patterns. Ethical approval for this anonymised study was obtained from Dundee University Research Ethics Committee.

## **Interviews**

The telephone interview was chosen as the method to address our aims, as interviews are able to explore views, experiences and beliefs of individuals on specific matters<sup>16-18</sup>. Focus groups would be an alternative, but participants may have been more reluctant to engage with the discussions, disclose personal deficiencies or criticise others. Simple questionnaires were also discounted due to comparatively basic data provided<sup>16</sup>. Communication asynchronous in time and/or place (e.g. e-mail, on-line messages) was also deemed inappropriate as such methods suffer from a lack of instantaneous response and no social cues, verbal or non-verbal, which ultimately may lead to compromised data<sup>18</sup>. Logistically, the telephone interview was chosen in

order to increase convenience for the participant. Although the telephone interview lacks non-verbal cues, the slight anonymity given by the telephone may afford a freer discussion<sup>19</sup>.

The following questions were asked:

- What do you think of current ENT knowledge amongst non-ENT doctors?
- What do you think of current ENT undergraduate teaching?
- Are there any gaps in ENT knowledge amongst non-ENT doctors?
- What are the really important areas that should be covered in the undergraduate curriculum?
- What do you think is currently not taught enough?
- Is there anything that is taught too much at present?
- What should ENT professionals be doing to improve ENT teaching?

The questions were intended to generate data which captures the breadth and depth of the interviewees' opinions about the topic, thus allowing development of a suitably focused and relevant questionnaire, where important topics would be chosen by a greater range of different stakeholders. The interviews were semi-structured with open questions and flexibility to adjust question order and to probe into answers<sup>16,17</sup>. The first interview was initially considered a pilot, however no amendment to the interview design was required.

The interviews were recorded, anonymised and immediately transcribed in full, and then analysed with NVivo 10.2.1 software, using principles of TA<sup>16</sup>.

In an effort to maximise the potential detection of opinion diversity in the sample, purposive sampling was used; a wide range of participants including ENT, non-ENT, GP and ED trainees, ENT-based medical students, ENT and ED consultants, Emergency Nurse Practitioners (ENPs) and GPs, were invited to join in both parts of the study (i.e. interviews and questionnaire). Patients were not included as it was felt that an element of broad medical knowledge was required. Participants were recruited via explanatory posters and Participant Information Sheets. These materials were distributed locally. In order to remove conflicts of interest, there were no line-management or tutor responsibilities between the researchers and the participants.

Eight preliminary interviews were conducted: three ENT registrars, two foundation doctors, one GP, one GP trainee, and one psychiatry trainee. All interviewees had either current or previous ENT experience, or had an interest in ENT. The interviews lasted on average 9.5 minutes.

There is no standardised way of determining appropriate sample size in qualitative research<sup>20</sup>. However, Fugard & Potts provide a framework for sample size in thematic analysis, based on expected population theme prevalence and how many instances of theme occurrence are desired<sup>21</sup>. In our study, one occurrence of a topic was deemed sufficient to justify inclusion, and we set out to identify themes that are important to 25% of clinicians. Using the Fugard & Potts method, our study was sufficiently

powered, as eight interviewees would give an 80% power of observing one instance of a topic that is important to 25% of those interviewees.

## **Questionnaire**

The ENT topics identified in the interviews were used to devise an on-line questionnaire that examined how stakeholders rated and prioritised ENT undergraduate topics. A questionnaire is a time-efficient way of collecting numerous responses from geographically dispersed participants, and is ideal for closed questions where a ranking of options (i.e. prioritisation) is required<sup>22,23</sup>.

Having considered other methods, we chose a four-point descriptive categorical scale with ranked answers (not important, somewhat important, quite useful, very important) to ensure that a decision was made by the responder, one way or the other (cf. five-point scale).

Initially, the Survey Monkey®-based online questionnaire was successfully piloted amongst four ENT registrars. Email with snowball sampling was considered to be the most appropriate means of distribution<sup>24</sup>. The main predicted drawback of this was the inability to determine true response rate, however we felt this was an acceptable compromise when compared to the alternatives<sup>25</sup>. Approximately 285 stakeholders were estimated to have received the invitation to participate. Amongst the stakeholders there were the interviewees, national ENT contacts of the interviewees

and the senior author, regional GPs and GP trainees, ED doctors, Emergency Nurse Practitioners, and local final-year medical students.

Forty-four people took part; an estimated 15.5% response rate. There were 32 qualified doctors: Six were GPs, four were consultants (one in ENT), and a total of seven of the doctors specialised in ENT. The other 12 participants were medical students.

What constituted sufficient importance for a topic inclusion in the proposed curriculum was not decided in advance, as we did not know what to expect from the data. Instead we categorised the data once collected, in order to define suitable topic inclusion criteria. Statistical analysis was carried out using IBM SPSS version 22. Differences in proportion were analysed using the Fisher's exact test.

## **RESULTS AND ANALYSIS**

### **Interviews**

Complete coding across the entire dataset was undertaken, with individual data extracts coded in as many ways as applicable. A mixture of data-derived semantic codes (typically clinical conditions) and researcher-derived codes were used<sup>16</sup>. Coded data were then further reviewed to identify three non-hierarchical themes. Table I

shows the themes and all the identified associated codes, which are discussed further in the remainder of this section.

### **“Don’t know, don’t care”**

This theme suggests that some doctors know little about ENT and do not care either. For example, ENT knowledge was described by interviewees as “non-existent”, “limited”, “could be better”, “lacking”, “poor”, and “sparse”. As a result, patients were “managed quite poorly”, and “inappropriately treated”. Lack of interest in ENT was also apparent, “... if it’s an ENT problem, you just refer. ... They’d refer people without having examined them” (Dr. A). Furthermore, ENT knowledge was seemingly dependent on previous exposure, rather than the result of systematic medical education. For example, one participant’s own undergraduate ENT learning was described thus, “it was just a week. I don’t really remember much of it, it didn’t really help me when I became an ENT F2, I just had to learn it all again” (Dr A). Universally, interviewees felt strongly that improvements were required, however, notably all the interviewees and researchers had either a current or previous association with ENT.

### **“Keep it simple”**

This theme reflects that teaching should aim to teach what non-ENT doctors need to know, rather than complex ideas that are only of clinical relevance to ENT surgeons. In the current study, examples of ENT areas felt to be most important were, “what you would normally see in primary care and in the ED” (Dr E), “what the basic treatment

is” (Dr G), “understanding of the simple things” (Dr H), and relevant to, “when you are doing Emergency Medicine or a general job” (Dr G).

### **“Talk to me”**

The “talk to me” theme represents the opinion amongst interviewees that undergraduate ENT teaching is often too didactic. The interviewees expressed that theatre, lectures, and self-directed study were less useful for learning. There were no strong opinions expressed with regards to online learning. In terms of other clinical teaching environments available, there was a strong preference for clinics, shadowing, and small-group teaching. The initial questioning of what our interviewees thought of current undergraduate ENT teaching, led to them offering suggestions for improvement. Our interviewees emphasised that undergraduate ENT teaching should be interactive with an emphasis on two-way communication. They also highlighted that clinicians should be intimately involved in teaching, and should have dedicated time for this. Specific examples of the “talk to me” theme include, “you cannot teach by just talking to people” (Dr E), and specific value being attributed to the clinical setting and patient context, “it has to be in connection to the patient that is there” (Dr D); “Anything that allows them to see how to diagnose and treat is useful” (Dr A). However, there was overall acceptance that didactic teaching is required to a certain extent to ensure that the full curriculum is covered for all students. Furthermore, an important aspect to this theme is that clinicians need to be given time to teach, “it’s not easy to give students adequate time in clinic” (Dr C), “you’ve got to have an

appropriate number (of clinic patients) so that you as a doctor are providing the care to patients, but also you are able to discuss issues with the student” (Dr E).

### **The important topics**

Separate to the themes identified, our interviewees were asked to identify the most important topics that should be covered in the undergraduate ENT curriculum. The resultant list of participant-derived topics is included in Table I, and was used to populate the questionnaire for the subsequent survey.

### **Questionnaire**

All participant-derived topics from the preceding interviews were deemed “very important” or “quite useful” by at least 50% of survey responders (Table II). In order to determine how the ratings of topics compared with each other, the responses of “very important” and “quite useful” were combined into a new “positive response” category (cf. “not important” and “somewhat useful” = “negative response”). Positive responses were then calculated as a percentage of the response for each topic, with subsequent organisation into rank order (Table III). The highest rated topics in order of priority were “clinical examination”, “when to refer”, “acute otitis media”, “common emergencies”, “tonsillitis/quinsy”, “management of ENT problems by non-ENT doctors”, “stridor/stertor”, “otitis externa” and “otitis media with effusion” (Table III).

## **DISCUSSION**

### **Summary of findings**

In order to address our aims we employed a mixed methods approach. The initial interviews were designed to investigate what the stakeholders thought of knowledge amongst non-ENT doctors, current undergraduate ENT teaching, and which topics should be taught. Themes “don't know, don't care”, “keep it simple”, and “talk to me” were identified.

The interviews identified a series of topics that were used in the subsequent questionnaire and survey. The questionnaire was distributed amongst stakeholders, with the aim of identifying the most important undergraduate ENT topics. The highest rated topics in order of priority were “clinical examination”, “when to refer”, “acute otitis media”, “common emergencies”, “tonsillitis/quinsy”, “management of ENT problems by non-ENT doctors”, “stridor/stertor”, “otitis externa”, and “otitis media with effusion”.

### **Methodology**

Mixed methodology had advantages in this project. The interviews gave information on clinicians' opinions of ENT knowledge and undergraduate training, something that would be difficult to obtain with a pure quantitative method. Specifically, it also allowed the identification of the “Talk to me” theme, relating to teaching methods,

rather than topics. Whilst teaching methods were not related to our original aim, our qualitative interviews allowed it to be identified by our participants as an important aspect of undergraduate ENT teaching, and something that would warrant further investigation. Essentially we were able to explore the views of the clinicians in depth. On the other hand, our quantitative questionnaires were a convenient way of grading the importance of the ENT topics, as this would be logistically much more difficult to achieve with qualitative methods. The end result is a study that contains both qualitative and quantitative data, which individually provide information relevant to the research question, and both contribute in different but complementary ways<sup>14,15</sup>.

Lloyd et al aimed to define what the ENT undergraduate curriculum should contain, but adopted a very different methodology, carrying out a Delphi review<sup>13</sup>. In Lloyd et al's study, participating stakeholders (ENT surgeons, ED doctors, GPs and Paediatricians) were asked to rate 232 ENT topics on a Likert scale of 1 – 10, with 10 being the highest. Although Delphi methodology may be superior to a simple questionnaire, our study has the advantage of working with participant-derived topics, rather than researcher-derived ones, and placing the participants in the centre of topic identification. In addition, Lloyd et al had considerable duplication amongst the 232 topics in their study, and asking participants to rate such a large number of topics risks fatigue. On the other hand, using a comprehensive list of researcher-derived topics to cover all aspects of ENT could lead to more thorough subject coverage than our study. Thus, the methodologies of our work, and that of Lloyd et al's, are different with advantages and disadvantages, yet both papers contribute

complementary and valuable information on the subject of undergraduate ENT teaching.

Our research was undertaken in Nottingham. Surveying in other regions may have given different results, although if one compares our data with published literature this would seem unlikely. It was difficult to recruit large numbers of interested participants for interviews or questionnaires, with an estimated questionnaire response rate of 15.5%. We believe that our low response rate was to some degree inevitable, as non-ENT professionals may not see a relatively small specialty like ENT as important. Moreover, they may have felt inadequately incentivised to participate. Conversely, whilst efforts are generally made to maximise response rate, those that responded are likely to be interested in ENT/undergraduate training/medical education overall, and their responses are especially valuable.

### **Opinions on ENT knowledge amongst non-ENT doctors**

The “don’t know, don’t care” theme highlights that our interviewees felt that doctors know little about ENT and do not care. They do not address their knowledge deficits and are happy to simply refer patients to ENT. Furthermore, the consensus was that these deficits are largely the result of inadequate undergraduate ENT training. One might deem the theme title (“Don’t know, don’t care”) to be provocative or perhaps disparaging, however we feel it is a fair representation of the theme, and that it would be wrong to falsely avoid this. In fact, this is amongst the most important of our findings; the strength of feeling amongst the interviewees’ comments strongly

suggests that this is in fact a serious issue. This opinion would be difficult to establish via a purely quantitative study. Hence our research question is confirmed as being important, and our qualitative methods are powerfully justified; research that used purely quantitative methods could miss this strength of opinion.

The implication of the “keep it simple” theme is that the topics delivered to *all* undergraduate medical students should be relevant to *all* newly qualified doctors on graduation. This, combined with half of graduates tending to choose general practice, suggests that ENT teaching should be aimed at the level of a generalist<sup>26,27</sup>. Interestingly, this view was shared by our interviewees with ENT backgrounds, indicating a realistic sense of perspective for ENT and its place in a medical curriculum as a whole. Although we did not investigate the reasons for our participants’ responses, a logical explanation for this theme is that the vast majority of newly qualified doctors will either rotate through general specialties (such as Emergency Medicine or General Practice), or encounter patients admitted to hospital under different specialties (e.g. cardiology) with new ENT signs/symptoms/problems. Furthermore, ENT is important to doctors outside of ENT, yet published data suggests that ENT teaching at undergraduate level fails to sufficiently prepare doctors for daily practice<sup>2,3,9,10</sup>. This study has found a generally poor opinion of ENT knowledge amongst non-ENT doctors (“Don’t know, don’t care”), and to the best of the authors’ knowledge, this is the first study to have examined this question using qualitative research methods. With reference to one of the GMC’s primary principles of Good Medical Practice i.e. “Doctors must put patients' safety first and make sure the care they provide is safe and effective”, clearly junior doctors, regardless of their specific

training programmes, want to know ‘enough’ about other specialties in order to keep their patients safe<sup>28</sup>. One can argue that perhaps rarer, more interesting, or conceptually more challenging ENT topics may help to cultivate interest in ENT amongst undergraduates. However, despite all of our interviewees having at least some current interest or previous experience in ENT (some were in fact ENT registrars), they unanimously agreed the theme. Therefore, in the context of a very busy curriculum, and ENT being comparatively one of the smaller specialties, it is essential that we “keep it simple” when delivering the common, important, and emergency-related topics within the undergraduate ENT syllabus.

### **Key ENT topics**

The “talk to me” theme represents the opinion amongst interviewees that current undergraduate ENT teaching can often be too didactic. The interviewees said that this could be improved by having more clinicians to teach, and for them to use more interactive teaching methods such as those afforded in clinics, shadowing, and small-group teaching. This resonates with the concept of student-centred teaching, which has been recognised for years<sup>29,30</sup>. The “talk to me” theme is in alignment with the contemporaneous move away from didactic teaching towards interactive, integrated and multifaceted learning<sup>31,32</sup>. However, the theme also identified concerns from our interviewees that clinicians need time within their schedule and/or clinical sessions to deliver excellent care for patients, whilst simultaneously providing high quality teaching.

An attempt was made to try to categorise topics into ones to either be included or excluded, but there were no topics that were obviously deemed by many to be of little or no use, so there was no clear way to exclude topics. Similarly, the least favoured topic received over 50% of responses as either “very important” or “quite useful” (i.e. positive response), and one would find it difficult to justify exclusion of such a topic.

Formal topic inclusion/exclusion criteria for the proposed curriculum were not set in advance. Scientifically, it would have been more rigorous to do so, but as we did not know in advance what to expect of the data, we examined and categorised the data once available. In this study, our value judgement decided that if more than half of respondents rated a topic as “very important” or “quite useful” (i.e. a positive response), then this would amount to inclusion. Asking stakeholders for their definitions of inclusion/exclusion criteria was also considered, however given the response rates already encountered, this was deemed unlikely to be successful. Furthermore, pre-defined exclusion criteria would have risked exclusion of potentially important topics. Thus it was logical to include all topics in the survey questionnaire, and to then apply a ranking system based on the proportions of positive ratings, with subsequent prioritisation.

We found that the highest rated topics in our survey were “clinical examination”, “when to refer”, “acute otitis media”, “common emergencies”, “tonsillitis/quinsy”, “management of ENT problems by non-ENT doctors”, “stridor/stertor”, “otitis externa” and “otitis media with effusion”; this supported our second interview

response theme, “keep it simple”. The relatively low number of participants precluded a meaningful subgroup analysis (e.g. ENT doctor versus non-ENT doctor).

There were a few unexpected findings in our study. For example, “common conditions seen outside of ENT” was rated low, and it may have also been expected that “practical aspects”, “epistaxis” and “sleep apnoea” would rate higher given that they are common/important. Certainly these categories scored well in Lloyd et al’s Delphi review<sup>13</sup>. However, as our work and the Delphi review have starkly differing methodologies, a direct comparison should be made cautiously.

Despite the difficulty of the comparison, Lloyd et al’s findings were similar to ours. They found that key topics are those relating to conditions that are “common, urgent, life-threatening or important”<sup>13</sup>; this is in keeping with our “keep it simple” theme. Therefore, our research and Lloyd et al’s complement each other, both providing undergraduate educators with data that allows the design of evidence-based ENT curricula. It is hoped that this new information will be used to decide what topics to include, and how to prioritise them.

### **Future work**

As alluded to earlier within the methodology discussion, our qualitative interviews identified the “talk to me” theme which summarised opinions of teaching methods used in undergraduate ENT teaching. Whilst teaching methods do not strictly relate to our original aims, clearly they are related to undergraduate ENT teaching as a whole.

Furthermore, the strength of opinion within the qualitative interviews justifies their discussion.

Much has been written on the subject of different teaching methods, with one college identifying 150 different ones<sup>33</sup>. Two broad educational strategies can be chosen: Either teacher-centred, where the teacher transmits information and the student passively receives it (didactic); or student-centred, where students themselves gather and synthesise information, and develop generic communication, critical thinking and problem solving skills, with the teacher acting as a coach and facilitator<sup>30</sup>.

Technological advances offer potential improvement in teaching methods but they need to be evaluated and used appropriately<sup>34,35</sup>. For example, online-learning has been found to be useful in teaching basic knowledge and simple technical skills, but not in understanding complex spatial anatomy<sup>36</sup>. In Fung's recent study, they suggested that the ideal ENT curriculum, as designed by students, would include 32% lectures, 31% lab training (including practical sessions and simulation), 22% clinician-lead tutorials, and 15% computer-assisted / online-learning<sup>36</sup>. However this may not represent the full picture, as a recent large comprehensive review of educational interventions to improve musculoskeletal teaching (including anatomy) examined small group teaching, patient educators, and computer-assisted / online-learning<sup>12</sup>. This study found that all these teaching methods, including online-learning, provided significantly greater benefits than traditional didactic teaching<sup>12</sup>. This is particularly topical with the recent changes, improvements and ongoing review by ENT UK and

SFO UK of their considerable catalogues of high-quality, peer-reviewed online learning resources e.g. elef-ENT.

Whilst online learning is not necessarily a two-way conversation between teacher and student it does offer numerous advantages. These include the fact that the student can choose what to learn and when. This is particularly relevant when one considers that the circumstances in which a newly qualified doctor learns in are very different to the circumstances of an undergraduate medical student. For example, a junior doctor's working patterns dictate that time for independently directed learning tends to be out of hours. Furthermore, newly qualified doctors are no longer in purpose-built educational buildings but rather they are in hospitals and other clinical environments. Therefore online-learning affords considerable mobility of learning resources and convenience of access, which helps to alleviate these changes of circumstance. Also, junior doctors may often miss scheduled teaching seminars or lectures within working hours, due to unpredictable on-call or clinical commitments. This can be circumvented with the provision of online podcasts or video-recorded lectures. As mentioned previously, this does not typically afford a two-way teacher-student conversation, but nonetheless this is strictly feasible due to recent technological advances. The online student-teacher conversation can be in real time, however more commonly, the conversation tends to be asynchronous via discussion boards and blogs. Whilst the asynchronicity may be seen a potential drawback, this actually offers a number of advantages. Perhaps most important of these, a discussion board provides a permanent record of current and previous learning conversations between the students and teachers. This allows for collaborative learning and peer

support, which might well suit medical students and trainee doctors, given the practical circumstances of their training.

One can appreciate that online learning resources encourage more independent, self-directed, and proactive learning from the student. This has formed the basis of what has become somewhat of a revolution in education, where the more traditional teaching process has been challenged. This refers to “the flipped classroom” as defined in the literature. It describes a process where the student has more ownership and responsibility for their learning, and is often made possible by online resources or “Technology Enhanced Learning” (TEL)<sup>37-39</sup>. Finally, in accordance with the GMC’s ‘Good Medical Practice’ and ‘Promoting Excellence’ guidelines, doctors are expected to be lifelong learners in a process that starts during their undergraduate training<sup>28,40</sup>. This infers that doctors should be encouraged to be responsible for their own training and learning. Therefore, in order to cultivate these behaviours and maximise the continuity of teaching methods from undergraduate to postgraduate training, it may be beneficial to make online teaching methods and resources such as elef-ENT, available to medical students.

This discussion of teaching methods highlights that we need to gain further understanding of this aspect of undergraduate ENT teaching. Previous studies looking at general undergraduate medical teaching have identified that there is a clear preference for student-centred approaches and small group learning, and that these methods often achieve better outcomes<sup>12,41</sup>. Furthermore, we have described how these methods may be delivered on an online platform. However we do not know that

this is necessarily the case for ENT. It is likely that methods that students value are also ones that provide the best education and lead to better knowledge, skills and behaviours and ultimately patient care, but this cannot be assumed. Just because a method is popular it does not mean that it is the best way of achieving desired educational outcomes. This, in combination with our “talk to me” theme and recent advances within ENT online learning, invites the prospect of future valuable research in this area in order to further optimise the delivery and design of the undergraduate ENT curriculum.

In conclusion, this mixed methods study aimed to identify what doctors thought of ENT knowledge amongst non-ENT doctors and of undergraduate ENT training, and what topics should be included in the curriculum. Qualitative interviews with doctors identified a consensus that ENT knowledge amongst non-ENT doctors is poor (*“Don’t know, don’t care”*), and that this is a serious issue that needs to be addressed. They also identified that ENT topics taught at undergraduate level should be common and important (*“Keep it simple”*), and taught interactively (*“Talk to me”*). Highest rated ENT topics were “clinical examination”, “when to refer”, “acute otitis media”, “common emergencies”, “tonsillitis/quinsy”, “management of ENT problems by non-ENT doctors”, “stridor/stertor”, “otitis externa” and “otitis media with effusion”. Future research, which considers the question of best teaching methods for the delivery of undergraduate ENT teaching, would be valuable.

This study would be useful to educators reviewing undergraduate ENT curricula, with the ultimate aim of improving and prioritising teaching in the busy curriculum and improving patient care in the future.

## **CONFLICTS OF INTEREST**

We have no conflicts of interest, and therefore have none to declare.

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## **SUMMARY SHEET**

### **What is already known on this subject**

- Ear Nose and Throat (ENT) disorders are common, and are frequently encountered by many non-ENT specialist doctors, especially in Emergency Medicine and General Practice.
- Not all doctors will experience ENT during their postgraduate rotations; this highlights the importance of undergraduate ENT training.
- One previous quantitative study concludes that undergraduate ENT topics should be relating to conditions that are “common, urgent, life-threatening or important”.

## **What this paper adds to our understanding**

- We demonstrate the strength of feeling amongst junior doctors that: 1. ENT knowledge amongst doctors is poor; 2. Improvements in undergraduate ENT training are required.
- We provide stakeholder-derived ENT topics, as opposed to researcher-derived topics, and deem that this uniquely adds to the quality of our findings and conclusions.
- When formulating undergraduate ENT curricula, it is essential that we “keep it simple” by delivering the most common, important, and emergency-related topics.

## TABLES

**Table I: Themes and associated codes**

| “Don’t know, don’t care”   | “Keep it simple”   | “Talk to me”   |
|--|--|--|
| <ul style="list-style-type: none"> <li>• ENT knowledge is poor</li> <li>• ENT knowledge is variable</li> <li>• Just refer on</li> <li>• Knowledge depends on experience</li> <li>• Knowledge depends on experience</li> <li>• Poor patient care</li> <li>• Poor recall</li> <li>• Undergraduate teaching depends on student</li> <li>• Undergraduate teaching is variable</li> <li>• Undergraduate teaching is limited or short</li> <li>• Undergraduate teaching is poor</li> </ul> | <ul style="list-style-type: none"> <li>• Aim teaching at non-ENT doctors</li> <li>• Teach basics</li> <li>• Common conditions</li> <li>• Non-ENT causes of non-ENT symptoms</li> <li>• Red flags / very important points</li> <li>• When to refer</li> <li>• What non-ENT doctors should do</li> </ul> | <ul style="list-style-type: none"> <li>• Clinicians need dedicated teaching time</li> <li>• Clinicians should be involved in teaching</li> <li>• Clinicians are too busy to teach</li> <li>• Clinics are useful</li> <li>• Good to see lots</li> <li>• Interactive teaching is good</li> <li>• Learn by through experience</li> <li>• Lectures / didactic teaching less useful</li> <li>• Mixed teaching methods are best</li> <li>• Need to cover curriculum</li> <li>• Online material</li> <li>• Self-directed learning less useful</li> <li>• Shadowing is useful</li> <li>• Small-group teaching</li> <li>• Structured teaching</li> <li>• Theatre less useful</li> </ul> |

**Table II: How participants rated different ENT topics (Numbers indicate the number of participants rating a topic in that category, with percentages in brackets)**

|  | Not important | Somewhat useful | Quite useful | Very important |
|--|---------------|-----------------|--------------|----------------|
| <b>General</b>   |               |                 |              |                |
| ENT clinical examination                                   | 0             | 0               | 7 (15.9)     | 37 (84.1)      |
| Common conditions seen outside                             | 4 (9.1)       | 10 (22.7)       | 15 (34.1)    | 15 (34.1)      |
| Common ENT emergencies                                     | 0             | 2 (4.5)         | 7 (15.9)     | 35 (79.5)      |
| Management of ENT problems by                              | 0             | 3 (6.8)         | 11 (25.0)    | 30 (68.2)      |
| When to refer to ENT                                       | 0             | 0               | 14 (31.8)    | 30 (68.2)      |
| Practical aspects/procedures                               | 5 (11.4)      | 7 (15.9)        | 21 (47.7)    | 11 (25.0)      |
| <b>Ear conditions</b>                                      |               |                 |              |                |
| Hearing impairment, types and                              | 3 (6.8)       | 7 (15.9)        | 21 (47.7)    | 13 (29.5)      |
| Hearing tests: audiology, free-                            | 3 (6.8)       | 18 (40.9)       | 19 (43.2)    | 4 (9.1)        |
| Tinnitus   | 3 (6.8)       | 8 (18.2)        | 26 (59.1)    | 7 (15.9)       |
| Vertigo, including BPPV and Epley                          | 0             | 7 (15.9)        | 23 (52.3)    | 14 (31.8)      |
| Otitis externa   | 0             | 3 (6.8)         | 18 (40.9)    | 23 (52.3)      |
| Acute otitis media   | 0             | 1 (2.3)         | 18 (38.6)    | 26 (59.1)      |
| Otitis media with effusion                                 | 0             | 4 (9.1)         | 17 (38.6)    | 23 (52.3)      |
| Chronic suppurative otitis media                           | 0             | 12 (27.3)       | 14 (31.8)    | 18 (40.9)      |
| <b>Nose conditions</b>                                     |               |                 |              |                |
| Epistaxis, nasal packing                                   | 1 (2.3)       | 9 (20.5)        | 10 (22.7)    | 24 (54.5)      |
| Sinusitis, polyps  | 3 (6.8)       | 7 (15.9)        | 23 (52.3)    | 11 (25.0)      |
| <b>Head &amp; Neck/airway</b>                              |               |                 |              |                |
| Stridor and stertor  | 0             | 3 (6.8)         | 10 (22.7)    | 31 (70.5)      |
| Airway physiology  | 2 (4.5)       | 4 (9.1)         | 19 (43.2)    | 19 (43.2)      |
| Tonsillitis, quinsy, indications for tonsillectomy         | 0             | 2 (4.5)         | 18 (40.9)    | 24 (54.5)      |
| Epiglottitis, deep neck infections                         | 0             | 7 (15.9)        | 13 (29.5)    | 24 (54.5)      |
| Obstructive Sleep Apnoea                                   | 3 (6.8)       | 9 (20.5)        | 22 (50.0)    | 10 (22.7)      |
| Dysphagia, globus  | 1 (2.3)       | 7 (15.9)        | 24 (54.5)    | 12 (27.3)      |
| Head & Neck cancer   | 0             | 8 (18.2)        | 16 (36.4)    | 20 (45.5)      |
| Thyroid disorders  | 1 (2.3)       | 4 (9.1)         | 21 (47.7)    | 18 (40.9)      |
| Neck lumps   | 0             | 5 (11.4)        | 17 (38.6)    | 22 (50.0)      |
| Complications of ENT infections (e.g. intracranial spread) | 1 (2.3)       | 9 (20.5)        | 19 (43.2)    | 15 (34.1)      |

**Table III: Ranking of ENT topics. Positive rating represents the proportion that rated a topic/method as either “very important” or “quite useful”.**

| Rank | TOPICS   | % positive rating |
|------|--|-------------------|
| 1    | ENT clinical examination                                   | 100               |
|      | When to refer to ENT                                       | 100               |
| 3    | Acute otitis media   | 97.7              |
| 4    | Common ENT emergencies                                     | 95.4              |
|      | Tonsillitis, quinsy, indications for tonsillectomy         | 95.4              |
| 6    | Management of ENT problems by non-ENT doctors              | 93.2              |
|      | Stridor and stertor  | 93.2              |
|      | Otitis externa   | 93.2              |
| 9    | Otitis media with effusion                                 | 90.9              |
| 10   | Thyroid disorders  | 88.6              |
|      | Neck lumps   | 88.6              |
| 12   | Airway physiology  | 86.4              |
| 13   | Vertigo, including BPPV and Epley                          | 84.1              |
| 14   | Epiglottitis, deep neck infections                         | 84.0              |
| 15   | Head & Neck cancer   | 81.9              |
| 16   | Dysphagia, globus  | 81.8              |
| 17   | Complications of ENT infections                            | 77.3              |
|      | Sinusitis, polyps  | 77.3              |
| 19   | Hearing impairment, types and causes                       | 77.2              |
|      | Epistaxis, nasal packing                                   | 77.2              |
| 21   | Tinnitus   | 75.0              |
| 22   | Practical aspects/procedures (e.g. nose packing)           | 72.7              |
|      | Chronic suppurative otitis media                           | 72.7              |
|      | Obstructive Sleep Apnoea                                   | 72.7              |
| 25   | Common conditions seen outside of ENT                      | 68.2              |
| 26   | Hearing tests: audiology, free-field testing, tuning forks | 52.3              |