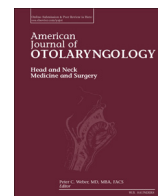




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Otolaryngology sleep medicine curriculum objectives as determined by sleep experts

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ABSTRACT

Purpose: (1) Ascertain the most important concepts and topics for otolaryngology resident education in sleep medicine and surgery, as determined by faculty who teach sleep medicine to otolaryngology residents. (2) Create learning objectives within the area of otolaryngologic sleep medicine in order to design a sleep medicine curriculum for otolaryngology residents.

Materials and methods: Two web-based surveys were sent to 163 academic otolaryngologists who teach sleep medicine. The first survey determined the topics, and their relative importance, considered most vital to learn during otolaryngology training. Using the Delphi method, the second clarified questions regarding topics determined by the first survey. Sleep medicine learning objectives for residents were ascertained from responses.

Results: The response rate of first and second surveys were 24.5% and 19%, respectively. Topics ranked most important for resident education included upper airway anatomy, polysomnogram interpretation, and understanding the range of medical and surgical therapies used to treat sleep disorders. Respondents listed surgical therapy as the most critical topic that most residents do not understand well. The second survey clarified the specific anatomic features, surgical techniques, and polysomnography data points deemed most critical for resident learning.

Conclusions: Academic otolaryngology sleep experts hold opinions regarding relative value of different topics for teaching sleep medicine, which is useful in creating a curriculum for otolaryngology residents. Otolaryngology learning objectives related to sleep medicine identified during this study are being used to create an online curriculum to supplement resident education.

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1. Introduction

Otolaryngologists care for patients with sleep disorders and are responsible for their surgical management. Residency programs are tasked with training members in sleep medicine and sleep surgery. Most training programs do not have a board-certified otolaryngology-trained faculty member who is also boarded in sleep. In a survey-based study conducted in 2010, nearly half of program directors regarded the sleep medicine training provided to residents as only “fair” [1]. Also, although resident training in oropharyngeal surgical management of obstructive sleep apneas has increased to the point of near universal proficiency, training in newer surgical techniques lags far behind, though proficiency is increasing [2]. Supplemental learning on the part of residents may therefore be useful in the field of sleep medicine.

The last 10 years have seen the creation of a one-year, ACGME-accredited sleep medicine fellowship, which shares support among various medical specialty boards and residency review committees. As the

only surgeons eligible to take the sleep medicine board examination (other specialties eligible are internal medicine, pediatrics, neurology, and psychiatry), otolaryngologists are uniquely prepared to lead in the field [3]. However, although many otolaryngologists sat for the sleep medicine boards when first offered due to eligibility criteria that included experience treating patients with sleep disorders, this opportunity has since expired; after 2011, the only way to become certified is to complete an ACGME-accredited sleep medicine fellowship and then pass the board examination. Because of this, the number of otolaryngologists obtaining sleep medicine certification has plummeted in recent years [4].

The purpose of this study was to identify key learning objectives in the area of sleep medicine in order to create a curriculum which could be communicated in a concise manner conducive to resident learning. Sleep board certified otolaryngologists and faculty who teach sleep medicine to residents were deemed most appropriate to survey regarding the importance of various topics within sleep medicine for resident education.

Online modules have been shown to be a helpful adjunct to traditional methods in the education of otolaryngology residents [5]. The information from this study was gathered with the intent to create free

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online modules for use by residents to enhance their knowledge on the topic of sleep medicine.

2. Methods

Approval for this study was obtained from the Colorado Multiple Institution Review Board.

Through the American Academy of Otolaryngology website and each academic otolaryngology program's website, 163 otolaryngologists were identified who either hold board certification in sleep medicine, teach sleep medicine to otolaryngology residents, or both. These otolaryngologists were determined to be experts in otolaryngologic sleep and are referred to as sleep experts in the remainder of the manuscript.

Two surveys were created by the authors and sent to the identified otolaryngologic sleep experts. The first attempted to elicit topics within sleep medicine and sleep surgery that residents should be comfortable with upon graduation, as well as the relative importance of these topics to one another. The second survey clarified learning objectives of particular importance within the generalized topics previously specified as important to sleep specialists in the first survey. The surveys were each sent three times, two weeks apart. Delphi analysis—a forecasting method which relies on a group of independently operating experts [6]—was performed on the data gathered by the first survey to design the second.

3. Results

The first survey was sent to 163 otolaryngologists identified as sleep experts who had a teaching role at allopathic otolaryngology residency programs in the United States. 40 responses were returned (24.5%). Regarding the preliminary workup of patients with sleep disorders, sleep experts noted anatomy of the upper airway to be the most important topic, followed by history and physical exam. Sleep disorder definitions and terms, and the evaluation of disorders other than apnea and snoring were ranked as less important. In diagnosis and management, experts ranked polysomnogram report interpretation as most important, followed by surgical therapies, then medical therapies and finally radiologic evaluation. Table 1 shows the anatomical sites listed as most important for residents to know.

The sleep experts were asked to comment on whether to keep or delete each of the proposed sleep disorder terms, patient history questions, and physical exam components to be included in the modules. Responses are listed in Table 2. A few write-in terms mentioned by 5% of respondents included periodic limb movement (PLM), restless legs syndrome (RLS), rapid eye movement (REM), and the stages of sleep.

When taking the history of patients with sleep disorders, sleep experts felt it most important to discuss snoring, witnessed apneas, daytime fatigue, morning headaches, and prior upper airway surgeries, all receiving 100% endorsement to keep in the module. Physical examination topics deemed 100% important by sleep experts were height/weight/BMI, septal deviation, turbinate size, base of tongue size, tonsil size, and mandible position. Table 3 lists the symptoms and physical exam findings deemed important to keep or delete from the curriculum by sleep experts.

Table 1

Upper airway structures most important for understanding sleep disorders (two or three listed per respondent).

Rank	Topic	% Responses mention
1	Tongue and base of tongue	70
2	Palate, velum, velopharynx	65
3	Nose, nasal valve	40
4	Tonsils including pillars	25
5	Hypopharynx	18
6	Lateral pharyngeal walls	15
7	Epiglottis	13

Table 2

Sleep disorder terms to keep or delete from proposed module.

Rank	Term	% Keep	% Delete
1	AHI	100	0
1	Hypopnea	100	0
1	Obstructive Apnea	100	0
1	PSG	100	0
1	BMI	100	0
1	Central Apnea	100	0
7	BiPAP	98	2
7	Mixed Apnea	98	2
7	RERA	98	2
7	RDI	98	2
11	CPAP	95	5
12	EOG	80	20
13	EEG	79	21
14	EMG	74	26
15	EKG	72	28

Regarding diagnostic work up, respondents were asked to comment on polysomnogram components they felt residents had difficulty interpreting, which are displayed in Table 4. Most experts felt that radiologic studies were not useful for residents to perform in the workup of sleep disorders (68%). Fifteen percent felt a lateral cephalogram was useful to know, while fewer believed MRI (10%), CT scan (8%), and chest X-ray (3%) should be utilized.

Several questions were asked regarding treatment options for patients with sleep disorders. We attempted to determine what therapies exclusive of weight reduction, oral appliances, and CPAP/BiPAP were important for medical management of sleep disorders. While 28% of experts felt that no other medical therapies were necessary to know,

Table 3

Symptoms and physical exam findings important for sleep disorder patient.

Rank	Term	% Keep	% Delete
1	Snoring	100	0
1	Witnessed apneas	100	0
1	Daytime fatigue	100	0
1	Morning headache	100	0
1	Prior upper airway surgeries	100	0
6	Duration of symptoms	98	2
6	Severity of symptoms	98	2
6	Weight (current and change over time)	98	2
6	Nasal airway status	98	2
6	Prior diagnostic tests and/or treatments	98	2
6	Epworth sleepiness scale	98	2
6	Hypertension history	98	2
13	Concentration issues	97	3
14	Wake up gasping for air	95	5
14	Sleep position	95	5
16	Number of hours of sleep in a 24-hour period	93	7
17	Restless Sleep	90	10
17	Exacerbating factors	90	10
19	Ameliorating factors	88	12
19	Trouble staying asleep	88	12
21	Trouble falling asleep	85	15
Physical Exam Components During Sleep Disorder Patient Physical Exam			
1	Height, weight, BMI	100	0
1	Septal deviation	100	0
1	Turbinate size	100	0
1	Tonsil size	100	0
1	Base of tongue size	100	0
1	Mandible position (prognathic, retrognathic)	100	0
7	Polyps or other masses	97	3
8	Vital signs	95	5
8	Neck circumference	95	5
8	Laryngoscopy—anterior/posterior and lateral wall collapse at rest	95	5
11	Friedman score	93	7
12	Length/size of uvula	90	10
13	Neck masses or lesions, thyromegaly	85	15

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