Sleep Medicine Practices, Training, and Attitudes*

A Wake-up Call for Pulmonologists

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Study objectives: To determine attitudes and knowledge about sleep medicine among chest physicians.

Design: Interactive survey of self-selected respondents.

Setting: Interactive session at the 1998 American College of Chest Physicians (ACCP) annual meeting.

Participants: Approximately 60 chest physicians.

Interventions: Interactive questions about the knowledge, training, attitudes, and practice of sleep medicine.

Measurements and results: Response rates demonstrated that 65% of respondents directed or were on the staff of a sleep laboratory, 18% had American Board of Sleep Medicine (ABSM) certification, and only 3% had completed formal sleep medicine training, and performance on test questions about sleep-disordered breathing was better than that on questions about “nonpulmonary” sleep disorders. We polled approximately 60 participants in an interactive session called “Issues in Sleep Medicine Education and Practice” at the ACCP annual meeting in October 1998. The group was well-credentialed, with about one third of participants being board-certified in pulmonary medicine and critical care medicine, and about 17% having passed the ABSM examination. About two thirds of the group spent ≤ 25% of their time in the practice of sleep medicine, but >30% directed sleep laboratories. Respondents thought that sleep training was better addressed in pulmonary fellowship training than in medical school or other postgraduate training experiences. Forty-three percent of the group had received training in sleep medicine as part of a pulmonary fellowship. About half of the sample thought that formal training should be required for eligibility to take the ABSM examination. When presented with two “nonpulmonary” sleep disorder cases, this well-trained and self-selected group did not perform very well. The findings suggest that pulmonologists are actively involved in the practice of sleep medicine and that they both need and desire formal training in sleep disorders during pulmonary fellowship training.

Conclusions: Participants were actively involved in the practice of sleep medicine, most had trained informally, and performance on questions about nonpulmonary sleep disorders was not good.

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Key words: board certification; credentialing; fellowship; polysomnography; rapid-eye-movement sleep behavior disorder; restless legs syndrome; training programs

Abbreviations: ABSM = American Board of Sleep Medicine; ACCP = American College of Chest Physicians; CPAP = continuous positive airway pressure; PLM = periodic limb movement; REM = rapid eye movement; SDB = sleep-disordered breathing

Since sleep apnea became recognized as a common and treatable disorder, pulmonary specialists have assumed leadership roles in clinical care, research, and education about sleep-disordered breathing. For example, a majority of individuals who seek American Board of Sleep Medicine (ABSM) certification and

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who direct sleep laboratories are chest specialists (B.A. Phillips MD; C. Wibben BA; personal communication; May 14, 1999). However, formal training opportunities for sleep disorders have developed slowly, and most pulmonologists acknowledge that they learned sleep medicine "on their own." Further, teaching about sleep and sleep disorders in most US medical schools consists of < 2 h of curriculum time.

The dearth of educational exposure to sleep disorders is clearly inappropriate, given their prevalence. In adults, obstructive sleep apnea is approximately as common as is asthma, narcolepsy is as prevalent as multiple sclerosis, and restless legs syndrome is more prevalent than is diabetes. Relative to other medical problems of similar prevalence and morbidity, sleep disorders receive little attention in the education and training of health-care professionals.

Increased awareness of and improved treatment options for sleep apnea have led to an influx of practitioners into the field of sleep medicine, and many patients have benefited as a result. Unfortunately, knowledge about the basic science of sleep, of the structure and function of sleep, and of effective methods for the diagnosis and treatment of nonapneic sleep disorders has received little attention. Consequently, sleep medicine remains "the poor stepchild" in medical school curricula, a rarely chosen topic for important basic and clinical research, and a haphazardly taught subject for residents and fellows. The end result is that many patients who are referred to a "sleep specialist" do not receive effective treatment if they have a nonpulmonary sleep disorder.

Considerable controversy exists over the place of sleep medicine in the pulmonologist's training and clinical practice. Very few chest specialists in current practice have significant formal training in sleep medicine. Although many pulmonologists have sought and obtained ABSM credentialing, others have questioned the need for either training or credentialing. It was in the middle of this controversy that we received a unique opportunity to collect data about the current knowledge, training, attitudes, and behavior of a select cohort of pulmonary physicians at an interactive session of the American College of Chest Physicians (ACCP) in Toronto, Canada, in November 1998.

Materials and Methods

Questions were developed and shared among the authors in our roles as Chair of the Fellowship Training Committee of the American Sleep Disorders Association (R.G.), Chair of the ACCP Section on Sleep Disorders (N.C.), and President of the ABSM (B.P.). Our goals were the following:

1. to elicit basic demographic data from the participants;
2. to collect data about the practice of sleep medicine by the participants;
3. to collect data about the training of the participants;
4. to collect data about the board certification(s) of the participants;
5. to explore attitudes about board certification and credentialing; and
6. to learn how participants would handle two clinical sleep medicine problems.

Participants were self-selected attendees at an interactive session entitled “Controversies in Sleep Medicine” at the 1998 ACCP annual meeting. Questions and responses were followed by brief didactic discussions pertinent to each question. We presented the questions to the audience using interactive computer technology that allows a multiple choice question to be displayed on a screen, with responses from audience members displayed nearly instantaneously. Participants were advised at the beginning of the session and throughout that we were collecting data that we hoped to publish, and they were requested to respond carefully and consistently.

Questions were presented in the following three segments: demographics/certification/credentialing; general knowledge; and training.

Results

The numbers of responses ranged from 60 to 69. Ninety percent of the respondents were men. Thirteen percent of respondents were 26 to 35 years old, 50% were 36 to 45 years old, 28% were 46 to 55 years old, and 8% were ≥ 56 years old.

Regarding the practice of sleep medicine, the majority of the group (67%) indicated that ≤ 25% of their practice consisted of sleep disorders medicine. The largest percentage (35%) said they referred patients to a sleep laboratory where someone else interprets the test results, but 32% of the sample were currently serving as medical directors of accredited sleep laboratories (13% had directed the American Sleep Disorders Association, which is now the American Academy of Sleep Medicine), and 19% had directed nonaccredited laboratories. Another 33% of respondents were affiliated as a consultant to a sleep laboratory. Not surprisingly, the majority of sleep patients treated by respondents had sleep-disordered breathing (SDB). Seven percent of physicians saw only patients with SDB in their practices, 75% of the physicians saw 75 to 90% patients with SDB, and 10 to 25% of physicians saw patients with non-SDB sleep disorders. The remaining 19% of the physicians evaluated ≥ 50% patients with non-SDB sleep disorders. Unfortunately, we did not collect data about private, hospital-based, or academic affiliation.

The group was well certified. The largest fraction of physicians (38%) was board-certified in both pulmonary diseases and critical care medicine. Thirteen percent of physicians were certified in pulmo-
nary diseases, critical care medicine, and sleep disorders, and 4% were certified in pulmonary diseases and sleep disorders, adding up to 17% of this sample having board certification in sleep disorders. Twenty-two percent were not certified in pulmonary, critical care, or sleep; the majority of these individuals were probably in fellowship training. In response to a question about current plans to seek ABSM certification, 18% answered that they were already certified, 11% were planning to take the examination in the current cycle, and 24% were planning to seek certification in the next 2 to 5 years. Thirty-six percent of physicians said they had no plans to take the examination. Data about private, hospital-based, or academic affiliations were not obtained.

Two questions were included to assess attitude about board certification: (1) which of the following best describes your beliefs about pulmonary board examination credentialing; (2) which of the following best describes your beliefs about credentialing for the ABSM examination? Responses are listed in Table 1.

Thus, although almost half of the sample thought that formal training should be required for eligibility to take either examination, approximately an equal number thought that specific credentialing was unnecessary for either examination. Thirty-eight percent of physicians believed that the completion of a pulmonary fellowship should confer sleep board eligibility.

In actuality, training in sleep disorders was accomplished in a variety of ways for 68 respondents. Formal training was achieved either within the pulmonary fellowship during elective time (43%), during additional training outside the pulmonary fellowship (9%), or during a 1-year sleep fellowship (3%). Continuing medical education courses (25%) and clinical experience (21%) made up the remaining training pathways. Respondents thought that sleep training was better addressed during a pulmonary fellowship (88%) than in medical school or during residencies in internal medicine, neurology, or psychiatry. With regard to training for sleep medicine, one third of physicians spent < 6 months of pulmonary fellowship time studying sleep disorders medicine. Almost half of the sample (48%) had learned about sleep medicine by clinical experience. Only 3% of the sample had completed a 1-year sleep medicine fellowship.

Most respondents indicated that either a specific sleep course (37%) or an additional 6-month addendum to the pulmonary program (42%) would be necessary for sleep training. Only 3% indicated that a full 1-year sleep fellowship was needed. No one thought that routine exposure within the usual confines of the pulmonary fellowship alone was adequate to address issues in sleep medicine. The respondents thought that the most important adjunct to the pulmonary fellowship would be a course in polysomnographic scoring and interpretation (96%).

Most respondents (63%) indicated that they would pursue alternative diagnoses in a sleepy patient who did not have significant SDB. An additional 33% would refer that patient to a sleep disorders specialist.

This sample believed that practicing pulmonary physicians should have access to the following for sleep-related problems: a multidisciplinary sleep laboratory through their hospital (48%); a complementary laboratory for referral of patients with problems other than SDB (26%); or on-line (18%) or medical library (8%) access for sleep questions.

In the next section of the program, we tested the audience’s knowledge on nonpulmonary sleep disorders by presenting them with two cases and querying them about the management of the cases. The first case was of a 48-year-old man complaining of excessive daytime sleepiness and loud snoring. In this scenario, the patient underwent a sleep study that showed repetitive obstructive sleep apneas and hypopneas. He was titrated during a second full night of sleep study to nasal continuous positive airway pressure (CPAP) at 10 cm H2O. Table 2 compares the baseline sleep study to the CPAP titration study.

<table>
<thead>
<tr>
<th>Table 1—Beliefs About Credentialing</th>
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<tbody>
<tr>
<td>Responses</td>
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<tr>
<td>Formal, standardized training should be required for eligibility to take the examination</td>
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<tr>
<td>Anyone who has finished a pulmonary fellowship should be board eligible</td>
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<tr>
<td>Anyone who wants to take the examination should be able to do so without specific credentialing</td>
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<tr>
<td>Who cares? The examination is not meaningful, so neither is credentialing</td>
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</tbody>
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Table 2—Comparison of Baseline Sleep and CPAP Titration Studies

<table>
<thead>
<tr>
<th>Sleep Study</th>
<th>Baseline</th>
<th>Nasal CPAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sleep time, min</td>
<td>405</td>
<td>421</td>
</tr>
<tr>
<td>Sleep latency, min</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Sleep efficiency, %</td>
<td>88</td>
<td>95</td>
</tr>
<tr>
<td>Respiratory disturbance index, events/h</td>
<td>53</td>
<td>4.3</td>
</tr>
<tr>
<td>Low SaO₂, %</td>
<td>71</td>
<td>88</td>
</tr>
<tr>
<td>PLM index, events/h</td>
<td>6</td>
<td>17</td>
</tr>
</tbody>
</table>

*SaO₂ = arterial oxygen saturation.

had an initial improvement in symptoms, but then the excessive sleepiness recurred. A review of the patient’s record concerning sleep hygiene and time receiving CPAP showed that both had been adequate. The patient had no change in weight and denied any symptoms of cataplexy. The first question asked was, “What would you do next in managing the patient?” The majority of respondents chose the correct answer: start the patient on a regimen of carbidopa/levodopa (Sinemet; Dupont Merck Pharmaceutical Co; North Billerica, MA). The other choices were as follows: increase CPAP to 14 cm H₂O (6% of respondents); add oxygen to CPAP (2% of respondents); start the patient on a regimen of methamphetamine (5% of respondents); and put the patient on an autoadjusting CPAP (14% of respondents). To deduce the correct answer, the physician needed to note from the table that the patient had had an increase in periodic limb movements (PLMs; 17 events/h) with CPAP and that this was the likely cause of continued excessive daytime sleepiness.

PLMs in sleep are a very common finding on overnight polysomnography. They are stereotyped, repetitive, nonepileptiform movements of one or both lower extremities, which may also rarely occur in the upper extremities. The number of PLMs that is considered “pathologic” is debatable, but most physicians consider that number to be > 5 PLMs/h of total sleep time. However, it has been shown that asymptomatic elderly subjects may have 25 events/h of total sleep time. In our patient, the best decision based on the available data was to treat a PLMs disorder, given the fact that the patient was compliant with his CPAP and that the pressure should have been adequate given the data that he had had a full night titration and no change in weight.

The case continued, showing that the patient had an initial good response to carbidopa/levodopa at a dose of 25 mg/100 mg controlled release, but, again, symptoms recurred, so the dose was doubled. The patient again had a decent initial response with subsequent recurrence of sleepiness, and his wife noted that his sleep was particularly restless between 3:00 AM and 6:00 AM. The audience was asked what their management would be at this point. Again, the majority chose the correct answer, but there was a wider spread of incorrect responses. The correct answer was to discontinue carbidopa/levodopa therapy and to start pergolide therapy (Permax; Lilly; Indianapolis, IN) 0.05 mg (51%). The incorrect answers were as follows: increase the dose to 75 mg/300 mg (2% of respondents); start methamphetamine therapy (2% of respondents); repeat the sleep study with multiple sleep latency testing (29% of respondents); and discontinue carbidopa/levodopa therapy and begin amitriptyline therapy (Elavil; Merck and Co; Whitehouse Station, NJ) 50 mg (17% of respondents).

Approximately 30% of patients get augmentation of symptoms with carbidopa/levodopa. Therefore, the correct answer was to change to a different medication, pergolide.

Medications that have been shown in randomized, placebo-controlled studies to be efficacious in the treatment of PLMs include the following: clonazepam,¹⁰ carbidopa/levodopa,¹¹ pergolide,¹¹ triazolam,¹² and temazepam.¹⁰

The next case presented was of a 67-year-old man who complained of restless sleep. His wife complained that he hit her during the night while he was asleep. Further information included the fact that the patient had no history of somnambulism (sleep walking). The question asked was the following: “which piece of historical information would assist you the most in determining the diagnosis?” The choices were as follows: What time of night do the events occur (24% of respondents)? Does the patient remember dream material (58% of respondents)? How often do the events occur (3% of respondents)? Does the patient drink a lot of caffeine (5% of respondents)? How long has he been having these episodes (10% of respondents)? Although all these questions are important to ask when obtaining a sleep history, the most important one for this patient is “what time of night do these events usually occur?” The primary sleep parasomnias can be divided between the sleep states of origin (non-rapid eye movement sleep vs rapid eye movement [REM] sleep). Non-REM parasomnias tend to occur in stage 3 and stage 4 sleep and, therefore, predominate in the first half of the sleep episode. REM sleep predominates in the latter half of the sleep episode. In this patient, with unusual behavior, the main two syndromes in the differential diagnosis would be sleep terrors, which occur in slow-wave sleep, and REM sleep behavior disorder, which this patient had, and which occurs only during REM sleep.

The last question of this section queried the physicians as to which medication they would use to
treat this patient after they knew that he had REM sleep behavior disorder. Again, the majority of respondents had the right answer, but there was a large spread of wrong answers as well. The right answer was clonazepam (46%). Wrong answers were as follows: fluoxetine (10% of respondents); oxycodone (1% of respondents); amitriptyline (40% of respondents); and physostigmine (3% of respondents). Clonazepam is clearly the drug of choice in this disorder, with >90% of subjects having a favorable response.

**Discussion**

These results indicate an appreciation of sleep disorders among session participants but demonstrate a lack of consensus on the optimal time frame and manner of training. It was clear, however, that respondents recognized a need for supplemental training, familiarity with the technical aspects of sleep medicine, and access to other specialists in the field.

It is important to note that this is a self-selected group and may not be representative of the membership of the ACCP, or even of those who attended the annual meeting. The group might be reflective of those physicians who are experts in and had an interest in sleep education; conversely, it might include those who thought that they were not very expert and needed more sleep education.

This rather well-trained and self-selected group did not perform very well on questions about two nonpulmonary sleep disorders. While pulmonologists can (and do) provide excellent care to patients with sleep-related breathing disorders, a “sleep specialist” ought to be able to address competently the broad range of sleep disorders. Just as the pulmonologist may be the last stop (and best hope) for the patient with lymphangioleiomyomatosis, the sleep specialist needs to be able to offer expert care to patients with parasomnias, circadian rhythm disorders, and other nonpulmonary sleep disorders.

Unfortunately, credentialing requirements and subject matter for board examinations drive medical education and training. Sleep disorders are common and a large fraction of pulmonologists have acquired or are seeking board certification in sleep disorders. Thus, it appears to be important for those in a position to affect pulmonary fellowship training to become aware of the scope of issues in the field and of the training and credentialing issues for sleep medicine. The ABSM has developed a policy of requiring 6 months of training for board eligibility, effective beginning in 2003. The completion of an accredited fellowship will be required beginning in 2005. We were pleased by the consistency of the attitude of this group toward training and credentialing in pulmonary diseases and sleep disorders.

The series of questions that were asked to test the audience’s knowledge of nonpulmonary sleep disorders showed that although the majority of the respondents answered three of the four questions correctly, there was insufficient knowledge shown for the group as a whole. The questions asked were about two well-known sleep disorders that physicians practicing sleep medicine should be acquainted with. This suggests that there needs to be more emphasis on teaching pulmonologists practicing sleep medicine about nonpulmonary sleep disorders.

**References**