Niche No Longer: Bringing Sleep Medicine to the Forefront of Neurological Practice

Emerging insights in the realm of sleep are shaping new understandings of neurological diseases.

With Logan Schneider, MD

Sleep medicine has not consistently been in a close relationship to neurological specialties, occupying instead something of a niche role in the field. That’s because sleep medicine integrates the expertise of many different fields. Continued research, however, has revealed that sleep is inextricably tied to neurological disease, serving as both a measure and a moderator of neurological function. In fact, according to Logan Schneider, MD, Chair of the American Academy of Neurology’s sleep section, no neurology education is complete without a focus on sleep. “A basic understanding of the mechanisms of sleep and wake can help to elucidate the pathophysiology of a number of neurologic disorders and their symptomatic impact,” says Dr. Schneider.

The significant emphasis on sleep, which is needed in all aspects of practice, is a direct reflection of the scientific and clinical discoveries that have occurred in recent years. “This is a very exciting time for the field of sleep neurology,” Dr. Schneider notes. “Through knowledge gained in sleep neuroanatomy and neurophysiology, the vast and complex network of systems that regulates our states of being is starting to be unraveled.” One example of this is the existence of REM-sleep behavior disorder preceding the classic manifestations of α-synucleinopathies by a decade or more, according to Dr. Schneider. Moreover, the presence of sleep disorders significantly impacts patients through quality of life and potential for recovery. “In stroke patients, fatigue and sleepiness are not only important symptomatic complaints but may also highlight underlying modifiable risk factors (e.g. obstructive sleep apnea) that also impact the potential for recovery.”

These discoveries are challenging empirically established conventions and may transform sleep medicine and offer new insights into the larger neurological spectrum, according to Dr. Schneider. “Sleep disorders offer a lens through which we can better understand neurological disease and the impact of healthy sleep on neurologic function. This neurologic ‘black box’ of sleep is just starting to be deciphered, revealing new insights into our understanding of neurologic diseases,” he says.

THE EVOLUTION OF SLEEP MEDICINE

“Since the initial descriptions of rapid eye movements (REM) and their correlation with dream mentation just over half a century ago, explorations into the functions of various sleep states has rapidly expanded,” Dr. Schneider observes. Since this time, he continues, researchers have come to realize that monitoring of sleep physiology can provide key insights into neurologic dysfunction. “From the loss of REM atonia that heralds the rostral spread of α-synuclein in neurodegenerative disease, to the role of sleep and memory consolidation, to the association between sleep disruption and fatigue in many of the central nervous system disorders that result in network inefficiency (e.g., multiple sclerosis, stroke, etc.), there are many things that sleep can teach us about neurological function.”

Moreover, when the functional reserve of the brain deteriorates, sleep’s powerful influence on health becomes even more apparent, he says, which is most evident when sleep/wake disruptions in elderly inpatient populations induce
delirium. “With stroke incidence peaking in the early morning hours and certain seizure subtypes occurring predominantly at night, the role of our body’s internal clock becomes readily apparent.” Dr. Schneider points out that there are countless examples of how addressing the quality and quantity of sleep can impact the lives of patients, such as morning headaches precipitated by a number of sleep-related factors, white matter disease burden correlating with obstructive sleep apnea, and impaired amyloid clearance during states of sleep deprivation, which may have implications for those with cognitive impairment.

Beyond the relationship of sleep to other neurological disease, Dr. Schneider believes that the disciplinary history of sleep disorders affirms their role as primarily neurological in nature. “Once housed squarely in the realm of psychiatry, narcolepsy type 1 is now known to be caused by loss of hypocretin neurons in the hypothalamus, correlating well with symptoms experienced by Ma-2-associated encephalitis and NMO patients who bear hypothalamic pathology. Additionally, the sensory integration issues related to restless legs syndrome are starting to be elucidated in the hunt for an explanation of the efficacy, but inevitable augmentation, of the dopamine agonists,” he says. Even sleep apnea, Dr. Schneider notes, is under a variety of elaborate neurologic control mechanisms, “an association which becomes readily apparent when we look at how prevalent sleep apnea is in the acute stroke period.”

Despite the significant advancements regarding sleep disorders and the role of sleep in neurologic disease, Dr. Schneider admits that sleep remains a mystery in many ways, pointing to the lack of explanations science has given for why we sleep. “Each state of being—from wake to NREM to REM—serves different functions, and it is time to return our focus to the brain as we move forward in further developing our understanding of sleep,” says Dr. Schneider. “We must incorporate more than just respiratory analysis from our polysomnograms and implement more sophisticated analyses for disease characterization, thus striving for greater granularity. With a more nuanced understanding, he observes, sleep has the potential to provide the neurologic community with more robust treatment options, and even opportunities for preventive medicine. But most importantly, he notes, “Now that we recognize the impact that poor sleep can have on neurologic disease, simply being aware of this association is of utmost importance for better treatment, and thus better quality of life for all patients.

CHALLENGES AND OPPORTUNITIES IN DIAGNOSIS AND TREATMENT

“The two biggest challenges that most neurologists face in recognizing sleep disorders in their patients are lack of experience and time,” says Dr. Schneider. For this reason, many neurologists have little to no exposure to sleep medicine during their training and thus don’t know how to approach sleep disorders as part of their routine clinical practice. Fortunately, Dr. Schneider suggests, the breadth of the field is sufficiently limited, so as to be accessible to most neurologists. “With relatively minor modifications to one’s clinical routine, sleep disorders can readily be screened for. In fact, our AAN Sleep Medicine Section is currently working on a screening questionnaire that can be integrated into clinical/EHR workflows,” he observes. In the meantime, however, Dr. Schneider believes that being cognizant of the key characteristics of each of the major sleep disorder domains can at least cue neurologists to consider further questioning, if not referral to a sleep specialist. These areas include:

1. Excessive sleepiness, which is “best defined by falling asleep at inappropriate times or sleeping too much, which often points to an underlying sleep disorder,” says Dr. Schneider. The Epworth Sleepiness Scale is a good way to screen for this, with a score of greater than 10 being abnormally sleepy.

2. Insomnia, which is “most often assessed by the patient spending more than 30 minutes getting to sleep, or awake after falling asleep,” and is usually screened for by asking the patient directly.

3. Sleep-disordered breathing, which is most often picked by complaints of the bed partner (snoring and pauses in breathing), according to Dr. Schneider. The STOP-Bang questionnaire uses subjective reports and simple data points (e.g., BMI), to effectively screen for the most common form: obstructive sleep apnea.

4. Movement disorders, particularly restless legs syndrome, which is is the most common and clinically relevant. “The diagnosis is made on the basis of four cardinal features: patient-described uncomfortable sensation/urge to move legs, starting with rest, resolving with movement, and more predominant in the evenings.”

5. Parasomnias, which range from sleep walking to REM behavior disorder, and often require a detailed clinical history to tease out the specifics. However, Dr. Schneider notes, simply asking about abnormal sleep behaviors is the primary way to screen for them.

PRACTICAL POINTERS

• When cases require expertise beyond first-line therapies, consultation with a sleep specialist may be appropriate.

• Talk to patients about the possibility of sleep disorders. To become better familiarized with diagnostic and management strategies, consult the AAN’s sleep resources and courses.
From the standpoint of management, Dr. Schneider believes that neurologists are adequately equipped for caring for patients with sleep disorders. “While having access to a quality sleep lab often provides the essential substrate for the confirmation of a diagnosis in many cases of sleep disorders, much of the diagnostic workup is performed through a careful history and physical examination,” he observes. “Once the diagnosis has been established, treatment and continuing management require a commitment to keeping up with the literature and staying current on the relatively modest number of treatment considerations in each of the primary domains of sleep disorders.” That being said, he suggests that when cases require expertise beyond first-line therapies or necessitate a broader referral network (e.g. cognitive-behavioral therapy for insomnia or hypnosis for parasomnias), then consultation with a sleep specialist may be more appropriate.

The management strategy for each of the primary sleep disorders does, however, require a commitment on the part of the neurologist to ensure that the disorder is optimally managed. “While many initial therapies for sleep disorders—stimulants for excessive daytime sleepiness, dopamine agonists for RLS, sleep medications for acute insomnia, CPAP for OSA, etc.—are quite easy to implement, their management requires regular reassessment of the appropriateness of therapy, particularly in the case of medications that can result in tolerance/physiologic dependence or have poor adherence when implemented as set-it-and-forget-it therapies (e.g. APAP for OSA),” Dr. Schneider observes. “Toward this end, if a practitioner doesn’t feel that ongoing management of sleep problems is appropriate for his/her practice, then referral to a sleep specialist may be the most appropriate strategy to ensure optimal neurological outcomes for his/her patients.”

Given the increasing importance of sleep science in the field of neurology, however, it is incumbent upon neurologists to emphasize sleep in their practices. In addition to staying up to date with the literature, another avenue for neurologists to better engage sleep medicine is through the AAN’s sleep section. “One pillar of the strategic vision for the AAN’s Sleep Medicine Section is to improve awareness of sleep and sleep disorders through education,” says Dr. Schneider. “We have progressively added to the educational offerings through AAN resources such as Dr. Charlene Gamaldo’s ‘Sleep and the Practicing Neurologist: Mechanisms and Management,’ and Dr. Alon Avidan’s ‘REM Sleep Behavior Disorder NeuroLearn courses,’ he continues. (Both courses are available at www.toolaan.com.) Planning for further course offerings and resources for practicing neurologists is underway, with a goal of integrating them into the maintenance of certification requirements.

The AAN’s outreach efforts extend to all corners of the specialty, Dr. Schneider points out. “In collaboration with the AASM’s EHR Integration Task Force and the AAN’s Practice Management and Technology Subcommittee we are also developing additional resources, in order to create more effective screening tools that neurologists can integrate into their current practice workflows,” he says. More importantly, Dr. Schneider notes, the current priority of the Sleep Medicine Section is to target our educational efforts on residents-in-training. “By developing educational toolkits that can be employed at any residency, regardless of resources, we can ensure that sleep medicine exposure happens at the earliest stages of training, allowing residents to integrate sleep medicine into their practice over the course of their entire career.”

THE FUTURE OF SLEEP MEDICINE

Sleep medicine is intimately tied to the future of neurology, says Dr. Schneider, “not only as a subspecialty that serves to explain the variety of sleep disorders from a neurologic basis, but also as an integral feature of the management plans of most neurologic disorders.” Fundamental to integrating sleep into the future of neurologic care is a curricular focus that starts at the point of residency training. “In concert with the AASM, the AAN is striving to ensure dissemination of best practices to neurologists across the continuum of their careers. In this vein, an adaptable toolkit of resources is essential to address the impending evolution of the sleep field.”

As the future of sleep medicine unfolds, Dr. Schneider predicts that more objective criteria for the diagnosis of many of the standard sleep disorders will become available. “These new diagnostics must rely upon the explosive growth of the Internet of Things, newly discovered biomarkers, and cutting-edge, big-data analyses to improve upon the current clinical practice of polysomnography.” With better diagnostics the field will have the potential to identify mechanisms of sleep function and dysfunction, thereby opening up avenues for more effective therapies, he says. “Already, research has revealed novel targets for sleep-wake medications, such as the H3 inverse agonist pitolisant.”

In the larger context of neurological disease, Dr. Schneider believes that the growing scientific knowledge of the neurophysiologic functions of sleep will contribute to the greater understanding of the importance of optimal sleep as a measure of disease burden as well as a potential source of optimizing quality of life if not recovery from or prevention of neurologic disease. But this will require physicians to more actively engage with sleep medicine and emphasize it in practice, according to Dr. Schneider. “By bringing sleep to the forefront of the neurologist’s mind, when assessing and treating patients, we can add significantly to the quality of care we provide.”

Logan Schneider, MD is a Clinical Instructor of Psychiatry And Behavioral Sciences at the Stanford Center For Sleep Sciences And Medicine.