

AMERICAN ACADEMY OF NEUROLOGY

SLEEP MEDICINE

FELLOWSHIP CORE CURRICULUM

Introduction

Sleep is a complex neurobiologic process essential to normal neurological function during wakefulness: Sleep disorders can cause dysfunction in cognition, behavior, perception, motor systems, and mood, problems for which patients often see neurologists. Additional effects of sleep on cardiovascular, renal, pulmonary, metabolic, and endocrine functions, in both health and disease states, illustrate the importance of interactions between the brain and the body. How one sleeps, and especially the state of sleepiness, fundamentally affects a person's sense of well being or illness, vigor or lethargy. Sleep quality, length and timing can affect disease expression, effectiveness of treatment, and side-effects.

Sleep disorders are common, not only as primary disorders but also as secondary to other common chronic illnesses. Chronic complaints of insomnia are present in 20-35% of the population. Sleep apnea syndrome and restless legs are present in some 2-4% of the population and are even more prevalent (10-40%) in those with neuromuscular disease, stroke, obesity, renal failure, hypertension, and heart disease. Moderate degrees of sleepiness, enough to influence activities of daily living, affects 30% of the population. Familiarity with sleep medicine is essential for physicians in general and neurologists in particular because sleep-related problems are important considerations in a substantial proportion of their patients' complaints.

Sub-Specialty Definition:

Sleep Medicine is a clinical specialty that is concerned with the diagnosis and treatment of patients with disorders of sleep and daytime alertness. The spectrum of disorders is broad, from primary disorders of the neural mechanisms of sleep and arousal (e.g. narcolepsy), to sleep-exacerbated conditions (e.g., chronic obstructive pulmonary disease), to disturbances associated with medical, psychiatric or behavioral syndromes.

Core Curriculum

The core curriculum should provide adequate knowledge and experience in the diagnosis and management of common sleep/wake disorders. The program must provide basic knowledge on the function of the brain, other organ systems, and their interactions during sleep, in addition to clinical experience with disorders that impair these functions and interactions, both in health and disease. More specifically, the curriculum should include:

- the basic science of sleep and chronobiology
- pathophysiology of sleep disorders: the impact of sleep and chronobiology on the controls of all vital functions.

- the behavioral modifications and health benefits in regard to alertness and productivity.
- the impact of pathophysiology and treatment of common diseases.
- clinical aspects of specific disease states, such as
- narcolepsy, the sleep apnea syndromes, abnormal movement
- syndromes during sleep, chronobiologic disorders, parasomnias,
- and disorders of initiating and maintaining sleep.
- standard understanding of the physiological parameters and the subsequent generation electrical signals which are measured during the sleep studies
- basic electronics and electrical safety
- basic understanding of signal processing
- treatment of the wide variety of sleep disorders.

Definitions

Sleep and chronobiology medicine is a specialty that focuses on normal alertness, rapid eye movement (REM) and non-REM sleep, and their integration into a 24-hour cycle. Neuronal discharges, regardless of brain location, are different during three basic states – wakefulness, rapid eye movement (REM) sleep, and non-REM sleep. Medical school curricula have taught the medicine of wakefulness, ignoring the very different brain controls that are in place during two states of reduced alertness. The sleep states represent 75% of the life of an infant, and one-third of the life of an adult. Sleep medicine incorporates basic science and clinical sciences. It interfaces with other medical specialties from diverse divisions of medicine, including pulmonary, cardiology, endocrinology, family practice, pediatrics, intensive care (with nasal ventilation), psychiatry and surgery (particularly otolaryngology and maxillofacial surgery). Sleep medicine leads to a multi-disciplinary approach, but the fundamentals and the behavioral elements are strongly within the realm of neurology.

Content of subjects to be taught::

- Sleep states and sleep stages
- Phylogeny of sleep
- Neurophysiology of sleep, basic brain mechanisms underlying REM and NREM sleep
- Neuropharmacological and neurochemical substrate
- Ontogeny of sleep—basic mechanism
- Circadian rhythmicity (basic mechanisms)
- The characteristics of the circadian clock
- Neural basis of circadian rhythmicity
- Interaction between activity, sleep and circadian rhythm.
- Genetics of sleep states and circadian rhythms
- Metabolism—endocrine investigation and sleep
- Behavior and sleep: learning and memory, neurobiology of dreaming
- Hygiene and sleep
- Epidemiology of sleep disorders and of sleep habits

- The essentials of the patient interview in sleep medicine
- The essentials of sleep laboratory recordings
- Basic Electronics and electrical safety
- The diagnostic classification of sleep/wake disorders (ICSD-90-R)
- The disorders of initiating and maintaining sleep:
 - Recognition
 - Investigation
 - Pharmacological and behavioral treatments
 - The disorders of excessive sleepiness
 - Their clinical investigation
 - The laboratory tests
- Narcolepsy and the hypersomnias
- Sleep-disordered breathing:
 - Obstructive sleep apnea syndrome and its borders.
 - The central sleep apnea syndrome, from the central command to impairment of the muscular effector mechanism.
 - The major complications of these syndromes: from stroke to cardiovascular disease.
- Treatments:
 - Nasal, bilevel and auto continuous positive airway pressure (CPAP, BiPAP, autoCPAP).
 - The role of nocturnal oxygen.
 - The pharmacological and behavioral approach.
 - Surgical approaches.
 - Orthodontic approaches: from distraction to appliances.
- Abnormal movements during sleep
- Periodic limb movement and restless legs syndrome
- Other movement disorders and sleep (particularly Parkinson's and dystonia)
- Parasomnias
- Confusional arousals and terrors
- Somnambulism and REM behavior disorders
- Sundown syndromes
- The epilepsies and sleep
- The disorders of sleep/wake schedule
- Pediatric sleep disorders
- The medico-legal aspects of sleep disorders
- Violence during sleep
- Excessive sleepiness: industrial and driving accidents

Methods of constantly upgrading knowledge

Knowledge should constantly be upgraded by methods such as:

1. active participation with clinical and research sleep societies
2. attendance at annual specialty meetings
3. participation in specialty courses provided by the societies

4. involvement in academic research in sleep medicine
5. invitations of outside experts to present at grand rounds or to give lectures
6. journal clubs involving recently published specialty articles
7. encouragement of trainees to assist with peer teaching in regularly scheduled seminars.
8. Access to text, electronic/digital, video and slide set based learning in sleep medicine

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