WORLD SLEEP SOCIETY

Advancing Sleep Health Worldwide

Sleep and Circadian Health Education Curriculum

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Reviewed by the World Sleep Society Education Committee

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Curriculum Overview

The World Sleep Society (WSS) is dedicated to advancing sleep health and promoting the understanding of sleep disorders. In this context, the WSS has created a Sleep and Circadian Health Education Curriculum to provide a comprehensive framework for sleep professionals, that includes the knowledge base, skills, and competencies necessary for the sleep and circadian professional.

The curriculum is based upon a survey of our global membership. That is why there are emphases in this curriculum that are not in other published sleep curriculum. It will be updated regularly, by our membership. As a continually evolving educational resource, the curriculum will adapt to incorporate the latest scientific research and educational strategies.

Curricular Scope

The curriculum covers a broad scope, including the history of sleep, normal physiology, sleep disorders, clinical assessments, diagnostic tools, research methodologies, and the latest technological advancements.

Curricular Purpose

The curriculum is intended to be dynamic, accommodating different levels of expertise, and applicable across various settings and cultural contexts. This curriculum forms the foundational basis for all WSS programs and activities, ensuring it remains current with the latest consensus, guidelines, and developments in the sleep health field.

Vision

We offer this curriculum as a valuable tool for our affiliate member societies, encouraging its adoption to enhance their educational offerings. We respect the unique contributions of other educational programs from our affiliate societies and uphold a commitment to collaborative growth and mutual respect in all our endeavors.

Curricular Organization

The curriculum organization has three levels.

- **PG stands for Program Goal.** PGs are broad statements about what the World Sleep Society intends to achieve with the curriculum.
- **CLO stands for Core Learning Outcome.** CLOs are more specific than PGs. CLOs are key competencies that students are expected to develop.
- **SLO stands for student learning objective.** SLOs are more specific than CLOs. SLOs are specific skills or knowledge that students gain in particular courses or programs. SLOs in this curriculum are ranked in order of increasing mastery, based on Bloom's taxonomy of knowledge (K), application (A), or synthesis (S).

Disclaimer

This curriculum is designed specifically for the World Sleep Society (WSS) and its associated programs.

PG 1: Improve sleep health.

CLO 1: Define the multidimensional nature of healthy sleep.

Knowledge (K)

1.1.1: Identify key components of sleep, including duration, quality, timing, efficiency, regularity, development, and alertness.

1.1.2: Identify key components of circadian rhythm concepts.

1.1.3: Describe and differentiate sleep architecture and its role in maintaining health, well-being, and performance.

Application (A)

1.1.4: Describe the biological, psychological, and social factors contributing to healthy sleep.

1.1.5: Demonstrate the multidimensional concept of sleep health and apply self-report and objective measures of multidimensional sleep health.

1.1.6: Employ behavioral techniques to improve sleep health.

Synthesis (S)

1.1.7: Illustrate the impact of sleep promotion on health, performance, well-being, and society.

1.1.8: Evaluate "healthy sleep" in real-world settings.

CLO 2: Evaluate changes in sleep health across the lifespan.

Knowledge (K)

1.2.1: Identify common sleep disorders associated with different life stages and their impact on health, well-being, and performance.

Application (A)

1.2.2: Differentiate the adverse outcomes of poor sleep across the lifespan and articulate how the brain regulates non-REM and REM sleep under natural and pathological conditions.

Synthesis (S)

1.2.3: Describe changes in sleep duration, quality, timing, efficiency, regularity, development, and alertness across the lifespan.

1.2.4: Explain the relevance of circadian rhythms within sleep-wake cycles.

1.2.5: Evaluate strategies to promote healthy sleep at various life stages.

CLO 3: Analyze the influence of gender identity on sleep health.

Knowledge (K)

1.3.1: Recognize the influence of gender identity on sleep and circadian rhythms.

Application (A)

1.3.2: Explain how gender identity can impact individual sleep and circadian rhythms.

1.3.3: Demonstrate how to assess sleep in individuals of different gender identities by using specific questions that address their unique experiences.

Synthesis (S)

1.3.4: Analyze the outcomes (health, well-being, and performance) of poor sleep faced by transgender and gender non-conforming individuals

1.3.5: Evaluate the impact of hormonal treatments on sleep in transgender individuals.

CLO 4: Evaluate sleep health metrics and their relevance to sleep quality.

Knowledge (K)

1.4.1: Identify key metrics used to measure sleep quality and their relevance.

Application (A)

1.4.2: Discuss the role of sleep hygiene practices in improving sleep quality. Apply these practices to populations with insufficient sleep.

Synthesis (S)

1.4.3: Evaluate the effects of technology use on sleep quality.

CLO 5: Assess lifestyle impacts on sleep health.

Knowledge (K)

1.5.1: Identify physiological mechanisms through which physical activity influences sleep.

Application (A)

1.5.2: Explain the relationship between physical activity and sleep duration, quality, timing, efficiency, regularity, development, and alertness, including the effects of exercise timing.

Synthesis (S)

1.5.3: Examine the role of community-based approaches in developing sleep interventions.

1.5.4: Integrate nutrition and sleep medicine in clinical practice.

CLO 6: Analyze the relationship between sleep and daytime waking performance.

Knowledge (K)

1.6.1: Define key indicators of daytime waking performance (cognitive function, mood, alertness).

Application (A)

1.6.2: Discuss how poor sleep influences cognitive flexibility, executive functioning, decision-making, emotional control, and athletic performance.

Synthesis (S)

1.6.3: Evaluate assessment tools for monitoring daytime performance in clinical and non-clinical settings.

1.6.4: Explain oxytocin's role in sleep-wake neurophysiology.

PG 2: Establish foundational knowledge in sleep science and medicine.

CLO 1: Analyze the mechanisms and functions of basic sleep processes.

Knowledge (K)

2.1.1: Identify how neurotransmitters influence sleep cycles.

2.1.2: Describe the neurophysiology and neurobiology of sleep, including REM and NREM stages and sleep-wake regulation mechanisms.

2.1.3: Recognize the role of the orexin system in regulating sleep-wake states.

2.1.4: Outline key pathways involved in subcortical and cortical sleep regulation.

Application (A)

2.1.5: Examine the effects of sleep deprivation on physiological and cognitive functioning.

2.1.6: Analyze glioneuronal circuits responsible for controlling wakefulness, NREM, and REM sleep.

Synthesis (S)

2.1.7: Evaluate sleep's effects on metabolic, cardiovascular, and mental health.

2.1.8: Develop models explaining how glioneuronal mechanisms support memory and decision-making.

CLO 2: Assess the structure and functions of sleep architecture.

Knowledge (K)

2.2.1: Describe the structure of sleep stages, including NREM stages 1 through 3 and REM cycles.

2.2.2: Identify tools, such as polysomnography, for measuring sleep architecture and microstructural sleep features.

Application (A)

2.2.3: Explain how sleep cycles progress and change with age, health, and external factors.

2.2.4: Examine the roles of microstructural features like spindles and K-complexes in regulating sleep.

2.2.5: Analyze how each sleep stage contributes to memory, physical recovery, and emotional health.

Synthesis (S)

2.2.6: Evaluate relationships between microstructural and macrostructural sleep patterns.

2.2.7: Investigate how medications, substances, and environmental factors alter sleep quality.

2.2.8: Assess changes in sleep patterns across the lifespan.

CLO 3: Apply principles of chronobiology and homeostasis to sleep regulation.

Knowledge (K)

2.3.1: Describe how circadian rhythms influence sleep-wake patterns.

2.3.2: Explain the mechanisms of the circadian system, including the suprachiasmatic nucleus and peripheral clocks.

Application (A)

2.3.3: Analyze environmental cues, such as light-dark cycles, that synchronize circadian rhythms.

2.3.4: Evaluate neurotransmitters' roles in regulating sleep-wake cycles.

Synthesis (S)

2.3.5: Apply chronobiology concepts to develop sleep medicine interventions.

2.3.6: Assess how sleep deprivation impacts homeostasis and sleep architecture.

2.3.7: Assess how recovery impacts homeostasis and sleep architecture.

CLO 4: Investigate genetic and epigenetic factors influencing sleep patterns.

Knowledge (K)

2.4.1: Define the role of genetics in regulating sleep and circadian rhythms, including major genes influencing sleep architecture, duration, and quality.

2.4.2: Identify genetic mutations linked to disorders like insomnia, narcolepsy, and sleep apnea.

Application (A)

2.4.3: Analyze hereditary and familial risk factors for sleep disorders.

2.4.4: Examine how environmental factors lead to epigenetic changes affecting sleep.

Synthesis (S)

2.4.5: Evaluate current and potential future roles for genetic testing in diagnosing and managing sleep disorders.

2.4.6: Assess how epigenetic changes influence sleep patterns across the lifespan.

CLO 5: Understand how sleep interacts with other body systems to maintain health.

Knowledge (K)

2.5.1: Explain the relationship between sleep and endocrine function, including hormone secretion (cortisol, melatonin, growth hormone, insulin).

2.5.2: Describe the role of sleep in modulating immune function, including cytokine production and immune cell activity.

2.5.3: Discuss the role of sleep disorders, such as sleep apnea and insomnia, in cardiovascular diseases like hypertension and stroke.

2.5.4: Discuss the impact of neurodegenerative diseases on sleep architecture and how sleep disruption may exacerbate these conditions.

2.5.5: Discuss sleep as a restorative process for multiple systems and its implications for health and disease prevention.

Application (A)

2.5.6: Analyze the bidirectional relationship between sleep disturbances and endocrine disorders, such as diabetes and thyroid dysfunction.

2.5.7: Discuss the impact of sleep deprivation on immune responses, including infections, inflammation, and autoimmune conditions.

2.5.8: Explore the relationship between sleep and cardiovascular health, including effects on blood pressure and vascular function.

2.5.9: Explain how sleep affects neural plasticity, cognitive function, and emotional regulation through its interaction with the CNS.

2.5.10: Evaluate the interconnectedness of sleep with multiple systems and how disruptions lead to systemic health consequences.

Synthesis (S)

2.5.11: Evaluate the impact of sleep disorders on metabolic health, particularly obesity, insulin resistance, and metabolic syndrome.

2.5.12: Analyze the role of sleep in memory consolidation, learning, and mental health.

2.5.13: Critically assess research on sleep's role in homeostasis and therapeutic interventions across endocrine, immune, cardiovascular, and nervous systems.

CLO 6: Analyze the effects of sleep deprivation on health and behavior.

Knowledge (K)

2.6.1: Describe the impact of sleep deprivation on cognitive functions, including attention, memory, decision-making, and reaction time.

2.6.2: Explain the physiological changes caused by acute and chronic sleep deprivation, including metabolic, hormonal, cardiovascular, and immune alterations.

2.6.3: Discuss the long-term consequences of chronic sleep deprivation.

Application (A)

2.6.4: Analyze the behavioral effects of sleep deprivation, such as mood disturbances, increased risk-taking, and impaired judgment.

Synthesis (S)

2.6.5: Evaluate the relationship between chronic sleep deprivation and the development of neuropsychiatric disorders, including depression, anxiety, and cognitive decline.

2.6.6: Evaluate strategies for mitigating the risks associated with sleep deprivation in professional and personal settings.

PG 3: Examine the historical development of sleep science and medicine.

CLO 1: Analyze beliefs and practices related to sleep in ancient civilizations.

Knowledge (K)

3.1.1: Identify key ancient civilizations that documented beliefs and practices related to sleep.

Application (A)

3.1.2: Explain how ancient civilizations described the relationship between sleep and health.

Synthesis (S)

3.1.3: Explain the practices related to sleep and circadian rhythms in ancient civilizations. Analyze their role in cultural, religious, and daily practices

CLO 2: Assess early scientific approaches to sleep and circadian rhythms before 1850.

Knowledge (K)

3.2.1: List significant figures in sleep and circadian science before the 1850s.

Application (A)

3.2.2: Explain how sleep and circadian health were perceived before the Industrial Revolution in different regions.

Synthesis (S)

3.2.3: Analyze the transition from mystical interpretations of sleep to scientific approaches.

3.2.4: Evaluate early sleep practices and beliefs across cultures.

3.2.5: Create timelines capturing major milestones in the understanding of sleep from ancient history to 1850.

CLO 3: Evaluate developments in sleep science from 1850 to 1950.

Knowledge (K)

3.3.1: Identify key studies and researchers in sleep science during the late 19th and early 20th centuries.

Application (A)

3.3.2: Describe the impact of industrialization, urbanization, and globalization on sleep practices and circadian rhythms. Examine the evolution of sleep science and circadian health knowledge during this period.

Synthesis (S)

3.3.3: Critically evaluate the methodologies used in sleep research from 1850 to 1950.

CLO 4: Analyze advancements in sleep science from 1950 to 2000.

Knowledge (K)

3.4.1: List major milestones in sleep research and circadian rhythm science between 1950 and 2000.

Application (A)

3.4.2: Illustrate the development and global dissemination of sleep disorders as a recognized medical field.

Synthesis (S)

3.4.3: Evaluate advancements in sleep and circadian health from 1950 to 2000. Analyze how cultural shifts, initiatives, and technological advancements influenced sleep during this period.

CLO 5: Assess trends and innovations in sleep science from 2000 to the present.

Knowledge (K)

3.5.1: Identify key studies and advancements in sleep and circadian rhythm sciences from 2000 to the present. List current trends in sleep and circadian science and practices.

Application (A)

3.5.2: Examine the influence of modern technology, social changes, and economic factors on sleep and circadian health

Synthesis (S)

3.5.3: Assess the impact of global health initiatives and research on improving sleep in diverse populations.

3.5.4: Evaluate the role of policy, education, and healthcare systems in shaping the future of sleep and circadian health globally.

3.5.5 Review the efficacy of new interventions and therapies for addressing sleep and circadian rhythm disorders.

3.5.6: Predict future challenges and opportunities in sleep health.

PG 4: Develop expertise in the clinical assessment of sleep disorders and diagnostic procedures.

CLO 1: Evaluate sleep disorders using standardized diagnostic criteria.

Knowledge (K)

4.1.1: Define the major categories of sleep disorders as classified by the ICSD and DSM-5.

4.1.2: Review the most common sleep disorders in children and identify current consensus updates in pediatric sleep medicine.

4.1.3: Explain the criteria used to classify sleep disorders, including primary and secondary distinctions, and discuss emerging trends and challenges in classification.

Application (A)

4.1.4: Explore the interactions between different sleep disorders and their comorbidities.

Synthesis (S)

4.1.5: Explain comprehensive diagnostic approaches in classifying sleep disorders. Recognize the key distinctions between parasomnia and seizure disorders.

CLO 2: Conduct comprehensive sleep histories and physical examinations.

Knowledge (K)

4.2.1: Describe the key components of a comprehensive sleep history, including sleep patterns and lifestyle factors.

4.2.2: Explain the role of physical examination in diagnosing sleep disorders.

Application (A)

4.2.3: Explain the importance of identifying symptoms of sleep disorders through interviews and questionnaires.

Synthesis (S)

4.2.4: Discuss the interpretation of sleep studies in patients with excessive sleepiness

CLO 3: Use diagnostic tools for evaluating sleep disorders.

Knowledge (K)

4.3.1: Identify key diagnostic tools used in sleep medicine, including polysomnography, MSLT, and actigraphy.

4.3.2: Review available ambulatory devices that provide data to assess sleep.

4.3.3: Identify the advantages and disadvantages of different devices for diagnosis.

Application (A)

4.3.4: Discuss MSLT and MWT tests in assessing excessive daytime sleepiness and narcolepsy.

4.3.5: Discuss recent technological advances in sleep monitoring and diagnosis.

4.3.6: Explain the importance of a comprehensive clinical evaluation, including patient history and physical examination, in guiding the selection of appropriate diagnostic tools.

Synthesis (S)

4.3.7: Explain the role of polysomnography in diagnosing disorders such as apnea and parasomnias, recognize the limitations of conventional PSG metrics in managing obstructive sleep apnea, and describe how various advanced polysomnogram metrics are quantified to guide patient care.

4.3.8: Evaluate the effectiveness of actigraphy in monitoring sleep patterns and circadian rhythms.

4.3.9: Identify how advanced signal processing techniques can be used to better differentiate central apnea from obstructive events.

CLO 4: Examine the role of artificial intelligence in sleep diagnosis.

Knowledge (K)

4.4.1: Describe the role of AI in improving the accuracy and efficiency of diagnosing sleep disorders.

Application (A)

4.4.2: Explain the strengths and limitations of AI in diagnosing and scoring sleep data.

Synthesis (S)

4.4.3: Evaluate the benefits and challenges of AI in interpreting diagnostic tools and discuss its potential in personalizing sleep disorder treatment plans.

4.4.4: Understand the principle, performance, and application of novel algorithms to assess sleep structure using heart rate variability and body movements.

4.4.5: Recognize the limitations of current approaches for quantifying sleep and events from polysomnography and gain insight into methods that may overcome them.

4.4.6: Analyze the ethical considerations surrounding the use of AI in sleep medicine, including issues of privacy, bias, and accessibility.

CLO 5: Investigate the role of biomarkers in sleep diagnosis.

Knowledge (K)

4.5.1: Identify key biomarkers associated with disturbed or interrupted sleep.

Application (A)

4.5.2: Discuss the use of genetic and neurophysiologic markers in detecting sleep disturbances. Determine how physiologic endotypes may be extracted from PSG to guide care.

Synthesis (S)

4.5.3: Evaluate current research on biomarkers and their clinical applications.

CLO 6: Assess specialized diagnostic tools for specific populations.

Knowledge (K)

4.6.1: Identify assessment tools used for diagnosing sleep disorders in dental, ENT, and pediatric populations.

Application (A)

4.6.2: Discuss the role of dental assessments in diagnosing sleep-related breathing disorders. Explain how ENT evaluations identify anatomical factors contributing to sleep disorders.

Synthesis (S)

4.6.3: Evaluate pediatric assessment tools for diagnosing and managing sleep disorders, considering developmental differences.

4.6.4: Recognize clinical and research implications of REM sleep without atonia and excessive movements detected through video analysis during REM sleep.

4.6.5: Assess anatomical and physiological factors detected with drug-induced sleep endoscopy that contribute to OSA

CLO 7: Assess the role of psychometric testing in evaluating sleep disorders.

Knowledge (K)

4.7.1: Identify commonly used psychometric tools for assessing sleep patterns and disorders. Discuss their development through classic sleep experiments.

Application (A)

4.7.2: Explain the role of self-report questionnaires and psychometric testing in diagnosing sleep disorders and how they complement physiological assessments.

4.7.3: Recognize opportunities for using sensor data in sleep and circadian research. Evaluate the capabilities and limitations of mathematical models in sleep analysis.

Synthesis (S)

4.7.4: Evaluate the reliability, validity, strengths, and limitations of psychometric tools, including sleep questionnaires and scales, in clinical and research applications.

PG 5: Advance knowledge of sleep-related breathing disorders (SRBD).

CLO 1: Classify and evaluate sleep-related breathing disorders.

Knowledge (K)

5.1.1: Define and classify the different types of sleep-related breathing disorders, including obstructive sleep apnea, central sleep apnea, and hypoventilation syndromes.

5.1.2: Review sleep apnea pathogenesis, emphasizing individual variability.

5.1.3: Summarize the epidemiological and experimental evidence identifying short sleep duration as a risk factor for obesity, hypertension, and cardiovascular mortality.

Application (A)

5.1.4: Discuss the epidemiology of sleep-related breathing disorders, including prevalence rates and risk factors.

5.1.5: Explain the importance of standardized definitions and classifications in diagnosing and treating SRBD, including recent insights into OSA subtypes, risk factors, ethnic differences, and treatment outcomes.

5.1.6: Consider therapeutic strategies for OSA at present and in the future.

Synthesis (S)

5.1.7: Evaluate the global burden of SRBD and its impact on public health, including trends in prevalence and diagnosis.

5.1.8: Assess current evidence on OSA treatment and its impact on cardiovascular outcomes.

CLO 2: Analyze the pathophysiology of sleep-related breathing disorders.

Knowledge (K)

5.2.1: Describe the pathophysiological mechanisms of obstructive and central sleep apnea, including their cardiometabolic impact.

5.2.2: Recognize mechanisms linking insomnia and OSA.

Application (A)

5.2.3: Explain how anatomical and functional factors contribute to SRBD development, including neurochemical regulation of airway patency and its dysfunction.

5.2.4: Understand the interaction between the respiratory and cardiovascular systems in patients with OSA.

5.2.5: Examine the pathophysiological features of pediatric OSA and their association with clinical management outcomes.

Synthesis (S)

5.2.6: Evaluate recent research on SRBD pathophysiology and implications for treatment.

5.2.7: Analyze the impact of sleep-related breathing disorders on cardiovascular, metabolic, and neurological systems, including state-dependent changes to upper airway, soft tissue, and craniofacial structures.

CLO 3: Evaluate special considerations for SRBD across the lifespan.

Knowledge (K)

5.3.1: Identify the prevalence of SDB (Sleep-Disordered Breathing) in preschool children and its consequences when untreated.

5.3.2: List pediatric sleep screening tools and structural and functional airway assessments.

5.3.3: Identify the key differences in the clinical presentation of sleep-related breathing disorders across the lifespan, including craniofacial features linked to pediatric OSA.

Application (A)

5.3.4: Discuss challenges in diagnosing and managing SRBD in pediatric, adult, and geriatric populations, including treatment options and pharmacotherapy considerations.

5.3.5: Explain age-related changes influencing SRBD presentation and progression.

Synthesis (S)

5.3.6: Evaluate diagnostic tools and treatment approaches for different age groups, including pediatric pharmacology and stepped-care approaches.

5.3.7: Analyze the impact of sleep-related breathing disorders on growth, development, and aging.

CLO 4: Assess diagnostic tools and technologies for SRBD.

Knowledge (K)

5.4.1: Identify key diagnostic tools, including polysomnography, home sleep apnea testing, and drug-induced sleep endoscopy (DISE).

5.4.2: Describe the clinical manifestations of sleep-related breathing disorders and their impact on daily functioning and quality of life.

Application (A)

5.4.3: Explain alternatives to the apnea-hypopnea index (AHI) and discuss emerging diagnostic technologies, including multi-night OSA severity assessments.

5.4.4: Assess ethnic differences in airway structure and their impact on SRBD diagnosis.

5.4.5: Discuss the role of patient-reported outcome measures and their routine use in OSA care and research.

5.4.6: Explain the role of clinical history and physical examination in diagnosing sleep-related breathing disorders.

Synthesis (S)

5.4.7: Evaluate the limitations and challenges of current diagnostic methods and explore the potential of biomarkers in SRBD assessment.

5.4.8: Understand the mechanism of action of oral appliances and upper airway surgery in patients with OSA.

CLO 5: Analyze risk factors and comorbidities in SRBD.

Knowledge (K)

5.5.1: Identify primary risk factors, including obesity, genetics, and lifestyle.

5.5.2: Detect cardiovascular complications associated with obesity hypoventilation syndrome and the cardiac response to obstructive events in OSA patients.

Application (A)

5.5.3: Discuss the relationship between SRBD and comorbidities like hypertension, diabetes, and cardiovascular disease.

5.5.4: Explain behavioral, genetic, and environmental influences contributing to SRBD.

5.5.5: Assess the relationships between bariatric surgery and airway changes in OSA patients.

Synthesis (S)

5.5.6: Evaluate the impact of treating SRBD on reducing comorbidity risks, including CPAP's effect on cardiovascular risk profiles.

5.5.7: Analyze how comorbid conditions complicate the diagnosis and management of sleep-related breathing disorders.

5.5.8: Evaluate craniofacial risk factors and how these vary between ethnic groups.

CLO 6: Examine differential diagnosis strategies for SRBD.

Knowledge (K)

5.6.1: Discuss the importance of differential diagnosis in guiding treatment and identifying diagnostic pitfalls.

5.6.2: Identify OSA subtypes that best respond to specific non-PAP treatments.

Application (A)

5.6.3: Differentiate SRBD from conditions like asthma and COPD.

5.6.4: Describe progress and challenges in implementing multi-night measurement of OSA in clinical practice.

5.6.5: Recognize the limitations of the AHI (Apnea-Hypopnea Index) and additional metrics for OSA clinical evaluation.

5.6.6: Determine the prevalence and predictors of obesity hypoventilation syndrome and approaches for screening and diagnosis.

5.6.7: Detect differences in OSA characteristics between genders.

Synthesis (S)

5.6.8: Evaluate the role of advanced diagnostic techniques, including imaging and biomarkers, in improving SRBD diagnosis.

CLO 7: Evaluate therapeutic approaches for managing SRBD.

Knowledge (K)

5.7.1: Describe management strategies, including CPAP therapy, surgical interventions, and advances in device-based therapies.

5.7.2: Describe targeted orthodontic interventions for pediatric OSA.

Application (A)

5.7.3: Discuss the role of hybrid therapy and positional therapy for OSA treatment.

5.7.4: Recognize the potential of neuromuscular stimulation in OSA management.

Synthesis (S)

5.7.5: Evaluate the effectiveness of different treatment modalities in improving patient outcomes and quality of life.

5.7.6: Analyze the role of patient education and adherence in the long-term management of sleep-related breathing disorders.

5.7.7: Discuss challenges in managing complex cases with comorbidities.

CLO 8: Investigate the role of animal models in SRBD research.

Knowledge (K)

5.8.1: Describe the use of animal models in studying SRBD pathophysiology.

Application (A)

5.8.2: Explain how findings from animal studies have contributed to our understanding of sleep-related breathing disorders in humans.

5.8.3: Discuss the advantages and limitations of different animal models in sleep research.

Synthesis (S)

5.8.4: Evaluate the translational potential and ethical considerations of using animal models in sleep research.

PG 6: Advance knowledge of insomnia and its management.

CLO 1: Classify and evaluate insomnia disorders.

Knowledge (K)

6.1.1: Define and classify the different types of insomnia, including acute, chronic, and comorbid insomnia.

6.1.2: Explain the key differences between insomnia classifications and their relation to epidemiological trends.

6.1.3: Discuss the epidemiology of insomnia, including prevalence rates and contributing factors.

Application (A)

6.1.4: Understand the effectiveness of CBTI

6.1.5: Understand the significant morbidity associated with co-morbid insomnia.

6.1.6: Describe the need for valid subtyping of insomnia for treatment planning.

6.1.7: Explain the importance of standardized classifications in diagnosing and treating insomnia.

Synthesis (S)

6.1.8: Analyze trends in insomnia prevalence and diagnosis over time.

6.1.9: Evaluate the strengths and limitations of current epidemiological methods.

CLO 2: Analyze the pathophysiology of insomnia.

Knowledge (K)

6.2.1: Describe the underlying pathophysiological mechanisms of insomnia, including hyperarousal and sleep-wake regulation.

6.2.2: Explain how psychological, behavioral, and neurobiological factors contribute to insomnia.

6.2.3: Recognize mechanisms linking insomnia and OSA.

6.2.4: Identify advances in understanding the relationship between insomnia and OSA.

Application (A)

6.2.5: Illustrate physiological systems influencing insomnia using examples.

6.2.6: Understand the relevance of hyperarousal in chronic insomnia.

6.2.7: Understand the role of REM sleep instability in insomnia.

6.2.8: Understand why insomnia affects emotional regulation and mental health.

6.2.9: Recognize pathological noradrenergic tone in insomnia and associated risks.

6.2.10: Illustrate how different physiological systems interact to influence insomnia.

6.2.11: Review recent trials on CBTi and CPAP for comorbid insomnia and sleep apnea (COMISA).

6.2.12: Discuss the role of circadian rhythm disruptions and homeostatic drive that contribute to the development of insomnia.

Synthesis (S)

6.2.13: Evaluate current models of insomnia pathophysiology, including genetic and biopsychosocial factors, and treatment implications.

6.2.14: Apply knowledge of insufficient LC-NA system silencing and novel treatments.

6.2.15: Critique insomnia pathophysiology, treatment implications, and their roles in neurocognitive and physical development.

6.2.16: Analyze the impact of insomnia on neurocognitive and physiological functioning.

CLO 3: Evaluate insomnia across the lifespan.

Knowledge (K)

6.3.1: List differences in insomnia prevalence and symptoms across pediatric, adult, and geriatric populations.

6.3.2: Explain how insomnia manifests differently across developmental stages.

Application (A)

6.3.3: Demonstrate how to assess insomnia across different age groups.

6.3.4: Apply updated evidence to age-specific pediatric pharmacotherapy approaches.

6.3.5: Understand the role of pharmacotherapy in pediatric sleep disorders.

6.3.6: Compare the risk factors and underlying causes of insomnia in different age groups.

6.3.7: Analyze the impact of insomnia on growth, development, and aging.

Synthesis (S)

6.3.8: Evaluate age-specific diagnostic tools and treatment effectiveness.

CLO 4: Assess clinical presentations and diagnostic tools for insomnia.

Knowledge (K)

6.4.1: Describe insomnia symptoms and diagnostic criteria.

6.4.2: Identify key diagnostic tools such as sleep diaries and polysomnography.

6.4.3: Explain the role of clinical history and examination in diagnosing insomnia.

Application (A)

6.4.4: Use clinical guidelines to diagnose insomnia through case studies.

6.4.5: Describe how sleep misperception and variability affect CBT response.

Synthesis (S)

6.4.6: Compare and contrast diagnostic tools such as questionnaires, polysomnography, actigraphy and emerging tools such as wearables.

CLO 5: Analyze risk factors and comorbidities associated with insomnia.

Knowledge (K)

6.5.1: Identify common risk factors and comorbid conditions associated with insomnia.

6.5.2: Discuss genetic and environmental influences contributing to insomnia.

Application (A)

6.5.3: Identify common risk factors and comorbidities associated with insomnia.

6.5.4: Apply knowledge of insomnia-suicidality links in clinical practice.

Synthesis (S)

6.5.5: Evaluate how risk factors exacerbate insomnia.

6.5.6: Assess insomnia treatment impact on comorbidities.

CLO 6: Evaluate differential diagnosis strategies for insomnia.

Knowledge (K)

6.6.1: Identify common diagnostic pitfalls in diagnosing insomnia.

6.6.2: Explain the importance of accurate differential diagnosis.

Application (A)

6.6.3: Compare clinical features of insomnia with other disorders.

Synthesis (S)

6.6.4: Analyze the impact of misdiagnosis on outcomes.

6.6.5: Evaluate advanced techniques in differential diagnosis.

CLO 7: Assess management and therapeutic approaches for insomnia.

Knowledge (K)

6.7.1: Identify the main therapeutic approaches, including pharmacological and non-pharmacological treatments.

6.7.2: Describe advances in clinical CBT-I and other practices.

6.7.3: Explain design elements in insomnia clinical trials.

Application (A)

6.7.4: Demonstrate selection and implementation of appropriate management strategies.

6.7.5: Describe combination treatment effectiveness with CBT-I personalized interventions, and hypnotics.

6.7.6: Determine effects of insomnia and affective disorder severity on treatment.

Synthesis (S)

6.7.7: Evaluate treatment modalities, including pharmacologic and CBT-I combinations.

6.7.8: Assess long-term effectiveness and adherence.

CLO 8: Investigate animal models in insomnia research.

Knowledge (K)

6.8.1: List common animal models used in studying insomnia mechanisms and treatments.

Application (A)

6.8.2: Describe how animal models inform understanding of insomnia.

Synthesis (S)

6.8.3: Evaluate translational potential of animal models for insomnia therapies.

PG 7: Advance knowledge of central disorders of hypersomnolence (CDH).

CLO 1: Classify and evaluate central disorders of hypersomnolence.

Knowledge (K)

7.1.1: Classify the different types of CDH, including narcolepsy, idiopathic hypersomnia, and Kleine-Levin syndrome.

7.1.2: Discuss the epidemiology of CDH, including prevalence rates and demographic factors.

Application (A)

7.1.3: Compare and contrast the diagnostic criteria and classifications of central disorders of hypersomnolence

Synthesis (S)

7.1.4: Analyze trends in CDH prevalence, diagnosis, and public health impacts.

7.1.5: Critically evaluate challenges in diagnosing and classifying CDH, considering symptom overlap and variations in epidemiological data.

7.1.6: Evaluate the latest research on pathophysiological models for the diagnosis and treatment of CDH.

CLO 2: Analyze the pathophysiology of CDH.

Knowledge (K)

7.2.1: Explain the pathophysiological mechanisms of CDH, including sleep-wake regulation, neurotransmitter imbalances, and genetic factors.

Application (A)

7.2.2: Discuss the role of the hypocretin/orexin system in narcolepsy and its treatment implications.

Synthesis (S)

7.2.3: Evaluate the latest research on pathophysiological models for the diagnosis and treatment of CDH, including how hypothalamic pathology impacts REM sleep and cataplexy expression.

CLO 3: Evaluate CDH presentations across the lifespan.

Knowledge (K)

7.3.1: List the key differences in the presentation and diagnosis of CDH in pediatric, adult, and geriatric populations.

Application (A)

7.3.2: Discuss age-related challenges in diagnosing and managing CDH, including differences in risk factors, comorbidities, and potential complications.

7.3.3: Address pediatric pharmacology, including pharmacokinetics, adverse effects, and comorbidity management in narcolepsy.

Synthesis (S)

7.3.4: Evaluate diagnostic tools and treatments for different age groups.

CLO 4: Assess clinical presentations and diagnostic tools for CDH.

Knowledge (K)

7.4.1: Identify the key clinical features and symptoms associated with central disorders of hypersomnolence

7.4.2: Describe how the clinical picture of central disorders of hypersomnolence may differ between conditions and age groups. Explain how hypersomnolence impacts quality of life.

7.4.3: Identify diagnostic tools, including MSLT, polysomnography, and actigraphy.

Application (A)

7.4.4: Compare and contrast various diagnostic methods. Discuss emerging technologies and biomarkers.

Synthesis (S)

7.4.5: Critically evaluate the effectiveness of diagnostic tools and procedures in diagnosing CDH, considering the potential for misdiagnosis and differential diagnoses.

CLO 5: Analyze risk factors and comorbidities in CDH.

Knowledge (K)

7.5.1: Identify risk factors, including genetic, environmental, and lifestyle influences.

Application (A)

7.5.2: Examine how comorbid conditions influence the severity and management of CDH.

Synthesis (S)

7.5.3: Evaluate the impact of treatment on reducing comorbidities.

7.5.4: Critically evaluate the role of comorbidities in CDH diagnosis and treatment and assess the impact of therapies on reducing comorbid burden.

CLO 6: Evaluate differential diagnosis strategies for CDH.

Knowledge (K)

7.6.1: Identify the conditions to consider in the differential diagnosis of CDH.

Application (A)

7.6.2: Compare the pathophysiological mechanisms of different CDH and their impact on cognitive, emotional, and physical functioning.

Synthesis (S)

7.6.3: Evaluate the diagnostic process for CDH, including tools to rule out other conditions.

CLO 7: Assess management and therapeutic approaches for CDH.

Knowledge (K)

7.7.1: Describe current management strategies, including pharmacotherapy and lifestyle modifications.

Application (A)

7.7.2: Compare pharmacological and non- pharmacological interventions and their role in individualized CDH treatment plans.

Synthesis (S)

7.7.3: Assess long-term outcomes, side effects, and adherence associated with different therapies.

CLO 8: Investigate legal implications and safety concerns.

Knowledge (K)

7.8.1: Identify the impact of CDH on driving and safety-sensitive activities. Describe clinician approaches to evaluating patient fitness.

Application (A)

7.8.2: Discuss legal and workplace safety regulations for individuals with CDH.

Synthesis (S)

7.8.3: Evaluate how legal and ethical considerations guide decisions about activity restrictions.

CLO 9: Examine the role of animal models in CDH research.

Knowledge (K)

7.9.1: Analyze the use of animal models in CDH research, including therapeutic testing, advantages, and limitations.

Application (A)

7.9.2: Describe how animal models can test therapeutic interventions.

Synthesis (S)

7.9.3: Evaluate the translational relevance of findings from animal models to clinical practice.

PG 8: Advance parasomnias knowledge and treatment.

CLO 1: Classify and evaluate parasomnias.

Knowledge (K)

8.1.1: Define and classify the different types of parasomnias, including non-REM parasomnias, REM parasomnias, and other unspecified parasomnias.

8.1.2: Discuss the epidemiology of parasomnias, including prevalence rates across populations and contributing factors.

Application (A)

8.1.3: Explain the importance of standardized definitions and classifications in diagnosing and treating parasomnias.

8.1.4: Analyze trends in the prevalence and diagnosis of parasomnias over time.

Synthesis (S)

8.1.5: Evaluate the global burden of parasomnias and their impact on public health.

CLO 2: Analyze the pathophysiology of parasomnias.

Knowledge (K)

8.2.1: Describe the underlying pathophysiological mechanisms of parasomnias, including the role of sleep-wake transitions and abnormal brain activity.

8.2.2: Explain how disruptions in sleep architecture contribute to the development and persistence of parasomnias.

Application (A)

8.2.3: Discuss the neurobiological and genetic factors associated with parasomnias.

8.2.4: Analyze the impact of parasomnias on cognitive, emotional, and physical functioning.

Synthesis (S)

8.2.5: Evaluate the latest research on the pathophysiology of parasomnias and its implications for treatment.

CLO 3: Evaluate parasomnias across the lifespan.

Knowledge (K)

8.3.1: Discuss the unique challenges in diagnosing and managing parasomnias across the lifespan.

8.3.2: Explain how developmental and age-related changes influence parasomnia presentation and progression.

Application (A)

8.3.3: Identify the key differences in the clinical presentation of parasomnias in pediatric, adult, and geriatric populations.

8.3.4: Analyze the impact of parasomnias on growth, development, and aging.

Synthesis (S)

8.3.5: Evaluate the effectiveness of age-specific diagnostic tools and treatment approaches for parasomnias.

CLO 4: Assess clinical presentations and diagnostic tools for parasomnias.

Knowledge (K)

8.4.1: Describe the clinical manifestations of parasomnias and their impact on daily functioning and quality of life.

8.4.2: Identify the key diagnostic tools used, including polysomnography, video-EEG monitoring, and sleep diaries.

Application (A)

8.4.3: Explain the role of clinical history and symptom assessment in diagnosis.

8.4.4: Discuss the use of emerging diagnostic technologies and biomarkers in parasomnia assessment.

Synthesis (S)

8.4.5: Evaluate the challenges and limitations of current diagnostic methods.

CLO 5: Analyze risk factors and comorbidities associated with parasomnias.

Knowledge (K)

8.5.1: Identify primary risk factors for developing parasomnias, including genetic predisposition, sleep deprivation, and stress.

Application (A)

8.5.2: Discuss the relationship between parasomnias and common comorbidities, such as mood disorders, epilepsy, and sleep-disordered breathing.

8.5.3: Analyze how comorbid conditions complicate diagnosis and management.

8.5.4: Discuss the role of environmental, behavioral, and genetic factors in the development of parasomnias.

Synthesis (S)

8.5.5: Evaluate the impact of treating parasomnias on reducing associated comorbidities.

CLO 6: Evaluate differential diagnosis strategies for parasomnias.

Knowledge (K)

8.6.1: Explain the process of differentiating parasomnias from other sleep disorders, such as epilepsy and REM sleep behavior disorder.

Application (A)

8.6.2: Identify common diagnostic pitfalls and challenges in differentiating parasomnias.

8.6.3: Discuss the importance of accurate differential diagnosis in guiding treatment plans.

Synthesis (S)

8.6.4: Evaluate advanced diagnostic techniques for improving differential diagnosis accuracy.

CLO 7: Assess management and therapeutic approaches for parasomnias.

Knowledge (K)

8.7.1: Describe current management strategies, including behavioral interventions, pharmacotherapy, and safety measures.

Application (A)

8.7.2: Discuss the latest advances in therapeutic approaches, including novel pharmacological treatments and cognitive-behavioral therapy.

8.7.3: Analyze the role of patient education and adherence in long-term management.

Synthesis (S)

8.7.4: Evaluate the effectiveness of different treatment modalities in improving patient outcomes and quality of life.

8.7.5: Discuss the challenges and considerations in managing complex cases with multiple comorbidities and treatment-resistant parasomnias.

CLO 8: Investigate animal models in parasomnia research.

Knowledge (K)

8.8.1: Describe the use of animal models in studying parasomnia pathophysiology and treatments.

Application (A)

8.8.2: Discuss the advantages and limitations of different animal models.

Synthesis (S)

8.8.3: Evaluate the ethical considerations and translational potential of using animal models in research.

PG 9: Advance knowledge of sleep movement disorders and their management.

CLO 1: Classify and evaluate sleep movement disorders.

Knowledge (K)

9.1.1: Define and classify sleep movement disorders, including restless legs syndrome (RLS), periodic limb movement disorder (PLMD), and bruxism.

9.1.2: Discuss the epidemiology of sleep movement disorders, including prevalence rates and demographic factors, incorporating insights from the latest literature.

Application (A)

9.1.3: Identify and characterize RLS in medical conditions and neurodevelopmental disorders, applying diagnostic criteria and scoring methods.

Synthesis (S)

9.1.4: Analyze trends in the prevalence and diagnosis of sleep movement disorders.

CLO 2: Analyze the pathophysiology of sleep movement disorders.

Knowledge (K)

9.2.1: Describe the pathophysiological mechanisms of sleep movement disorders, including dopaminergic pathways, genetic factors, and neurotransmitter involvement.

9.2.2: Identify abnormal sensory-motor integration, polysomnographic changes, and dysfunctions involved in RLS and REM behavior disorder (RBD)

9.2.3: Recognize the pathophysiological mechanisms underlying dopaminergic augmentation and the insidious worsening of RLS symptoms.

Application (A)

9.2.4: Discuss the neurobiological and genetic factors associated with sleep movement disorders.

9.2.5: Analyze the impact of sleep movement disorders on sleep architecture and overall health.

Synthesis (S)

9.2.6: Evaluate the latest research on pathophysiology and treatment implications.

CLO 3: Evaluate sleep movement disorders across the lifespan.

Knowledge (K)

9.3.1: Discuss age-related differences in the presentation and management of sleep movement disorders across the lifespan, including developmental changes.

Application (A)

9.3.2: Develop pediatric pharmacology knowledge, including adverse effects.

Synthesis (S)

9.3.3: Analyze the impact of movement disorders on growth, development, and aging.

9.3.4: Evaluate age-specific diagnostic tools and treatment approaches.

9.3.5: Manage difficult and comorbid RLS cases.

CLO 4: Assess clinical presentations and diagnostic tools.

Knowledge (K)

9.4.1: Describe clinical features of sleep movement disorders.

9.4.2: Explain the role of clinical history, genetic factors, and diagnostic tools such as polysomnography and actigraphy.

Application (A)

9.4.3: Summarize research findings related to neurocognitive impairments, biomarkers, and iron status in RLS.

Synthesis (S)

9.4.4: Evaluate challenges in diagnosing movement disorders, including the role of emerging technologies.

CLO 5: Analyze risk factors and comorbidities in sleep movement disorders.

Knowledge (K)

9.5.1: Identify primary risk factors, including brain iron deficiency and lifestyle factors.

Application (A)

9.5.2: Discuss the relationship between movement disorders and comorbidities, including neurological and cardiovascular conditions.

Synthesis (S)

9.5.3: Evaluate the impact of treatment on reducing risk factors and comorbidities.

CLO 6: Evaluate differential diagnosis strategies for movement disorders.

Knowledge (K)

9.6.1: Explain how to differentiate movement disorders from epilepsy and insomnia.

Application (A)

9.6.2: Identify diagnostic pitfalls and misdiagnosis risks when differentiating RLS, RSD, and insomnia.

Synthesis (S)

9.6.3: Evaluate the role of advanced diagnostics in improving differential diagnosis accuracy.

CLO 7: Assess management and therapeutic approaches for movement disorders.

Knowledge (K)

9.7.1: Describe current management strategies for movement disorders, including pharmacotherapy, behavioral approaches and intravenous iron therapy.

Application (A)

9.7.2: Decide on treatment initiation for RLS and manage augmentation strategies, including challenges in complex and comorbid cases.

Synthesis (S)

9.7.3: Evaluate treatment modalities, including intravenous iron therapy and pharmacological options.

9.7.4: Develop comprehensive management plans for patients.

CLO 8: Investigate animal models in movement disorder research.

Knowledge (K)

9.8.1: Describe the use of animal models in studying movement disorders.

Application (A)

9.8.2: Discuss advantages and limitations of animal models and their translational potential in developing therapies.

Synthesis (S)

9.8.3: Explore the neuromodulative properties of brain stimulation in movement disorder treatment.

PG 10: Advance research, innovation, and societal impacts in sleep medicine.

CLO 1: Explore advancements in sleep medicine.

Knowledge (K)

10.1.1: Identify the latest advancements in sleep medicine, including novel therapies and emerging research areas.

10.1.2: Describe principles of epidemiological study design and interpretation.

10.1.3: Recognize key methodological considerations in sleep epidemiology.

10.1.4: Identify novel tools used to study sleep in both animal models and humans.

10.1.5: Understand the role of AI in diagnosing and treating sleep disorders.

10.1.6: Discuss how meta-analyses contribute to advancements in sleep research.

Application (A)

10.1.7: Analyze the impact of technological innovations on sleep disorder diagnosis and treatment.

10.1.8: Evaluate contributions of recent clinical trials to sleep medicine.

10.1.9: Discuss the role of interdisciplinary and global collaboration in advancing sleep research.

10.1.10: Review epidemiological evidence about sleep disorders from major studies.

Synthesis (S)

10.1.11: Assess the role of personalized medicine in advancing sleep research.

10.1.12: Evaluate future directions in sleep medicine research and clinical applications.

CLO 2: Assess public health and sleep medicine.

Knowledge (K)

10.2.1: Explain the significance of sleep health as a public health priority.

10.2.2: Identify advantages, challenges, and risks of telemedicine in sleep medicine.

10.2.3: Recognize industry-engaged strategies for managing sleep in shift workers.

10.2.4: Discuss how new technology personalizes sleep management for shift workers.

Application (A)

10.2.5: Analyze the role of public health initiatives in improving sleep across populations.

10.2.6: Discuss integration of sleep health into public health policy.

10.2.7: Examine how shift work impacts health, mood, and performance.

10.2.8: Explore the role of sleep health disparities in public health challenges.

Synthesis (S)

10.2.9: Evaluate effectiveness of sleep health education campaigns.

10.2.10: Assess impact of community-based programs on sleep health.

10.2.11: Develop strategies to address sleep health disparities at a population level.

10.2.12: Analyze longitudinal sleep tracker data to identify population trends and uncover insights beyond traditional survey methods.

CLO 3: Investigate innovative diagnostic tools in sleep medicine.

Knowledge (K)

10.3.1: Describe the development and impact of wearable and mobile sleep diagnostic tools.

10.3.2: Recognize strengths and limitations of polysomnographic, actigraphic, and wearable sleep assessments.

10.3.3: Understand self-applied polysomnography and biomotion devices in clinical and research settings.

Application (A)

10.3.4: Discuss how precision diagnostics improve sleep disorder assessment.

10.3.5: Compare strengths and weaknesses of different wearable sleep technologies, including ethical considerations.

Synthesis (S)

10.3.6: Evaluate the impact of novel diagnostic tools on clinical practice.

10.3.7: Explore future directions of digital health technologies in sleep medicine.

CLO 4: Assess sleep technology and consumer health.

Knowledge (K)

10.4.1: Recognize the role of consumer sleep technology (CST) in research and clinical settings.

10.4.2: Identify health insights derived from CST measurements.

10.4.3: Understand how AI enhances sleep and circadian rhythm analysis.

Application (A)

10.4.4: Analyze impact of wearable sleep trackers on consumer behavior.

10.4.5: Examine role of consumer sleep technologies in public sleep health awareness.

Synthesis (S)

10.4.6: Evaluate the accuracy and reliability of consumer sleep technologies in measuring sleep parameters.

10.4.7: Explore the potential of sleep technologies to bridge gaps in sleep healthcare access.

10.4.8: Discuss the potential of big data in advancing understanding of individual differences in sleep-wake patterns.

10.4.9: Evaluate how consumer technologies inform personalized interventions and clinical decision-making.

CLO 5: Assess societal impacts of sleep health.

Knowledge (K)

10.5.1: Discuss the societal impacts of sleep health, including its influence on productivity, safety, and well-being.

10.5.2: Analyze the relationship between sleep health and social determinants of health.

10.5.3: Discuss the role of public policy in addressing the societal impacts of sleep health.

10.5.4: Explore the influence of media and culture on public perceptions of sleep health.

10.5.5: Become familiar with novel approaches for investigating relationships between sleep and social processes.

Application (A)

10.5.6: Evaluate the impact of societal norms on sleep health and behavior.

10.5.7: Analyze the economic implications of sleep health and sleep disorders.

10.5.8: Conceive practical methods to identify sleep health differences between and within racial/ethnic and sociodemographic groups that may support the development of tailored behavioral sleep interventions.

Synthesis (S)

10.5.9: Evaluate strategies to address the societal impacts of sleep health at the community and national levels.

10.5.10: Recognize the societal implications of sleep health disparities and how they might be addressed through tailored interventions.

CLO 6: Manage private sleep medicine practices.

Knowledge (K)

10.6.1: Discuss the key considerations in managing a private sleep medicine practice, including financial management, marketing, and patient care.

10.6.2: Be aware of the appropriate standards for sleep laboratory facilities and personnel.

Application (A)

10.6.3: Analyze the challenges and opportunities of running a private sleep medicine practice in a competitive healthcare market.

10.6.4: Discuss the impact of healthcare regulations and policies on private practice.

10.6.5: Explore the role of technology in enhancing the efficiency and effectiveness of private sleep medicine practice management.

10.6.6: Analyze the ethical and legal considerations in managing a private sleep medicine practice.

10.6.7: Prioritize patients to be seen in a busy lab by adapting an effective triage system.

10.6.8: Recognize the special needs of different populations in the sleep laboratory.

Synthesis (S)

10.6.9: Evaluate strategies for maintaining clinical excellence and patient satisfaction in a private practice setting.

10.6.10: Evaluate the importance of ongoing professional development and training for private practice success.

10.6.11: Create a business plan before starting a sleep lab depending on the specific health care system in their country.

10.6.12: Be familiar with requirements to establish a sleep lab, depending on their country's education facilities and existence of sleep medicine fellowship programs.

10.6.13: Identify the facilitators, barriers, and opportunities for establishing a pediatric sleep practice in low-resource settings.

CLO 7: Integrate AI and big data into sleep medicine.

Knowledge (K)

10.7.1: Recognize what raw signal data and sleep-related metrics are currently available to sleep researchers and potential ways to apply AI.

10.7.2: Describe common AI algorithms, their validation, and their interpretation in clinical settings.

10.7.3: Understand the state-of-the-art in using AI to inform sleep and circadian rhythms analysis.

10.7.4: Recognize the ethical and legal challenges of the integration of AI in sleep clinical practice and describe possible paths for overcoming them.

Application (A)

10.7.5: Discuss the challenges and opportunities in integrating AI and big data into sleep medicine practice.

10.7.6: Analyze the impact of big data on sleep medicine research and population health management.

10.7.7: Explore the role of AI in personalizing sleep disorder treatment plans.

Synthesis (S)

10.7.8: Evaluate the future directions of AI and big data in sleep medicine.

10.7.9: Appreciate how existing large auto-videosomnography datasets are being utilized to extract information on multidimensional constructs of sleep and family health, and how this new information can inform the development of future research.

10.7.10: Learn how physiological, mechanistic models can be combined with machine learning to improve the accuracy and utility of predictions.

10.7.11: Recognize how mathematical models of sleep and circadian rhythms may be used to personalize care and shift work management strategies.

CLO 8: Advance research and training programs in sleep medicine.

Knowledge (K)

10.8.1: Discuss the key components of effective sleep medicine education and training.

10.8.2: Analyze the role of accreditation and certification in ensuring the quality of sleep medicine education and training.

Application (A)

10.8.3: Discuss the importance of interdisciplinary collaboration.

10.8.4: Explore the impact of global partnerships.

10.8.5: Analyze the challenges and opportunities in expanding access to sleep medicine education and training.

Synthesis (S)

10.8.6: Evaluate strategies for fostering innovation and collaboration in sleep medicine research programs, including AI.

10.8.7: Discuss the importance of ethics in research and clinical practice, including AI.

10.8.8: Explore the impact of mentorship and leadership development.

10.8.9: Analyze the challenges and opportunities in securing funding for sleep medicine research programs.

PG 11: Foster professional development and practical training in sleep medicine.

CLO 1: Advance interdisciplinary collaboration in sleep medicine.

Knowledge (K)

11.1.1: Describe the importance of interdisciplinary collaboration in sleep medicine and its impact on patient outcomes.

11.1.2: Identify the roles and contributions of various healthcare professionals in a multidisciplinary sleep team.

11.1.3: Analyze the benefits and challenges of interdisciplinary training in enhancing team communication and patient care.

Application (A)

11.1.4: Evaluate strategies for effective interdisciplinary collaboration in clinical practice, research, and education.

11.1.5: Discuss the role of case discussions and grand rounds in fostering a collaborative approach to sleep disorder management.

11.1.6: Develop holistic treatment plans incorporating insights from interdisciplinary training.

Synthesis (S)

11.1.7: Assess the role of continuing education and professional development in strengthening interdisciplinary competencies in sleep medicine.

CLO 2: Address ethical and legal considerations in sleep medicine.

Knowledge (K)

11.2.1: Explain ethical principles in sleep medicine, including patient autonomy, beneficence, non-maleficence, and justice.

11.2.2: Identify legal considerations in sleep medicine practice, including confidentiality, informed consent, and duty to report.

Application (A)

11.2.3: Evaluate the ethical implications of emerging technologies and novel therapeutics in sleep medicine.

11.2.4: Discuss how ethical guidelines and legal regulations shape clinical practice, research, and professional conduct.

11.2.5: Explore legal responsibilities in ensuring patient safety, particularly in high-risk scenarios such as driving and occupational hazards.

Synthesis (S)

11.2.6: Assess ethical and legal challenges in managing conflicts of interest, industry relationships, and clinical trials.

11.2.7: Analyze case studies highlighting common ethical dilemmas in sleep medicine and propose solutions.

11.2.8: Evaluate the role of ethics committees and legal counsel in guiding complex decision-making.

11.2.9: Examine the importance of ethical training in the ongoing professional development of sleep medicine practitioners.

PG 12: Address global considerations in sleep health and medicine.

CLO 1: Evaluate cross-cultural perspectives on sleep health.

Knowledge (K)

12.1.1: Explore how cultural beliefs and practices influence sleep behaviors.

12.1.2: Discuss the impact of cultural norms on the treatment of sleep disorders.

12.1.3: Analyze the role of cultural competence in improving patient outcomes.

12.1.4: Recognize the socio-cultural and environmental factors that affect sleep health disparities.

Application (A)

12.1.5: Evaluate the challenges of conducting sleep research across different cultural contexts.

Synthesis (S)

12.1.6: Identify relevant cultural, social, and familial factors that can inform tailored sleep interventions for children and adolescents from marginalized groups.

12.1.7: Develop frameworks for implementing culturally adaptive interventions to address global sleep health disparities.

CLO 2: Promote diversity and inclusion in sleep medicine.

Knowledge (K)

12.2.1: Discuss the importance of promoting diversity and inclusion within the field of sleep medicine.

12.2.2: Define sleep health disparities across the globe with multi-level, multi-factorial determinants.

12.2.3: Recognize the specific sleep health disparities faced by disadvantaged and marginalized groups, including children.

Application (A)

12.2.4: Evaluate the role of culturally tailored interventions in addressing sleep disparities.

12.2.5: Discuss the challenges faced by underrepresented groups in accessing sleep healthcare and services.

12.2.6: Analyze the barriers faced by underrepresented groups in accessing sleep healthcare.

Synthesis (S)

12.2.7: Develop intervention models and policy recommendations to address sleep health disparities.

12.2.8: Assess the influence of implicit bias on sleep disorder diagnosis and treatment.

CLO 3: Examine the impact of modernization on sleep health.

Knowledge (K)

12.3.1: Describe the effects of urbanization, globalization, and technological advancements on sleep patterns and disorders.

12.3.2: Identify regional sleep duration trends and their implications for global health.

Application (A)

12.3.3: Assess how modern living conditions, including noise and light pollution, affect sleep health.

12.3.4: Analyze the impact of shift work and irregular schedules on sleep in industrialized societies.

Synthesis (S)

12.3.5: Develop public health strategies to mitigate the negative effects of modernization on sleep health.

CLO 4: Improve access to sleep healthcare globally.

Knowledge (K)

12.4.1: Discuss the barriers to accessing sleep healthcare in different populations, including socioeconomic, geographic, and cultural factors.

12.4.2: Discuss the role of global health organizations in sleep medicine initiatives.

12.4.3: Recognize the economic impact of untreated sleep disorders, particularly OSA.

12.4.4: Identify gaps and barriers in sleep duration data collection in different regions of the world.

Application (A)

12.4.5: Evaluate strategies to improve access to sleep healthcare, particularly in underserved communities.

12.4.6: Discuss the role of telemedicine and digital health technologies in closing healthcare gaps.

12.4.7: Examine the relationship between healthcare policy and access to sleep disorder diagnosis and treatment.

Synthesis (S)

12.4.8: Analyze the global challenges of providing equitable sleep healthcare in both urban and rural settings.

12.4.9: Design scalable models for implementing global sleep health initiatives.

CLO 5: Examine traditional remedies and their integration into modern sleep medicine.

Knowledge (K)

12.5.1: Discuss the historical and cultural significance of traditional sleep remedies across different societies.

12.5.2: Identify the biological mechanisms underlying traditional sleep practices.

Application (A)

12.5.3: Analyze the potential benefits and risks of integrating traditional remedies into clinical sleep interventions.

Synthesis (S)

12.5.4: Develop ethical guidelines for integrating traditional remedies into clinical sleep medicine.

CLO 6: Analyze the systemic effects of inequity and inequality on sleep health.

Knowledge (K)

12.6.1: Describe how socioeconomic, racial, and geographic disparities impact global sleep health outcomes.

12.6.2: Recognize systemic barriers to equitable sleep healthcare access.

12.6.3: Discuss how historical inequities have shaped modern sleep health disparities.

Application (A)

12.6.4: Develop strategies to mitigate inequities through targeted policy interventions.

12.6.5: Assess community-based interventions designed to reduce sleep health disparities.

12.6.6: Explore collaborations with advocacy groups to address systemic inequities in sleep healthcare.

Synthesis (S)

12.6.7: Propose evidence-based solutions to mitigate the effects of inequity and inequality on sleep health.

12.6.8: Evaluate the effectiveness of current global initiatives aimed at addressing sleep health disparities.

12.6.9: Develop large-scale strategies to improve equitable access to sleep healthcare worldwide.

PG 13: Explore special topics in sleep medicine to address diverse challenges and opportunities in the field.

CLO 1: Address sleep disorders in special populations.

Knowledge (K)

13.1.1: Recognize how sleep in women differs from men, at all stages of life.

13.1.2: Describe sleep disturbances associated with common neurodegenerative disorders.

13.1.3: Outline a systematic approach to diagnosing and managing pediatric sleep disorders (medically and behaviorally based), including special considerations for ASD and ADHD.

13.1.4: Recognize the impact of hospitalization on sleep in children and families.

Application (A)

13.1.5: Evaluate treatment strategies for sleep disorders in special pediatric populations.

Synthesis (S)

13.1.6: Develop holistic management plans for sleep disorders in vulnerable populations.

CLO 2: Examine the relationship between sleep and neurological disorders.

Knowledge (K)

13.2.1: Discuss the bidirectional relationship between sleep and neurodegenerative diseases.

13.2.2: Recognize the role of circadian dysregulation in neurological diseases.

13.2.3: Understand how epilepsy and sleep interact.

13.2.4: Identify biomarkers of sleep microstructure in ADHD.

Application (A)

13.2.5: Apply knowledge of REM sleep behavior disorder (RBD) as a marker of neurodegenerative disease progression.

Synthesis (S)

13.2.6: Assess sleep-based interventions for managing neurological conditions.

13.2.7: Explore the relationship between sleep, demyelinating disorders, infectious conditions, and neglected tropical diseases such as malaria and trypanosomiasis.

13.2.8: Assess how spinal cord injuries and neuromuscular disorders affect sleep related breathing disorders.

CLO 3: Explore the intersection of sleep and psychiatry.

Knowledge (K)

13.3.1: Understand how sleep disturbances affect mental health and psychiatric disorders, including PTSD and suicide risk.

13.3.2: Summarize sleep-based interventions to improve psychiatric outcomes.

13.3.3: Describe the effectiveness of CBT-I in preventing PTSD-related insomnia.

Application (A)

13.3.4: Develop sleep-focused strategies to enhance psychiatric care.

Synthesis (S)

13.3.5: Evaluate emerging research on sleep disturbances as psychiatric risk factors.

CLO 4: Evaluate the relationship between sleep and cardiovascular health.

Knowledge (K)

13.4.1: Review the prevalence of OSA in cardiovascular diseases.

13.4.2: Evaluate the impact of sleep disorders, shift work, and circadian misalignment on cardiovascular risk.

Application (A)

13.4.3: Analyze the interaction between circadian rhythms, obesity, and cardiovascular health.

Synthesis (S)

13.4.4: Assess the pathophysiology of vascular dysfunction in sleep apnea.

Core Learning Outcome 5: Address internal medicine and general pulmonary disorders related to sleep.

Knowledge (K)

13.5.1: Recognize the impact of sleep health on systemic diseases, including diabetes and metabolic conditions.

13.5.2: Evaluate surgical and non-surgical approaches to pediatric and adult OSA.

Application (A)

13.5.3: Assess the effectiveness of sleep interventions in managing pulmonary and metabolic disorders.

Synthesis (S)

13.5.4: Develop integrative approaches to treating sleep-related internal medicine disorders.

CLO 6: Investigate environmental, disaster, and socioeconomic factors affecting sleep health.

Knowledge (K)

13.6.1: Understand how environmental factors, including light exposure and work conditions, impact sleep health.

13.6.2: Recognize the effects of natural disasters and pandemics on sleep patterns.

Application (A)

13.6.3: Develop interventions to mitigate sleep disturbances in operational and emergency settings.

Synthesis (S)

13.6.4: Evaluate public health strategies for improving sleep health in vulnerable communities.

CLO 7: Explore sleep health in extreme conditions.

Knowledge (K)

13.7.1: Identify sleep hazards in extreme conditions.

Application (A)

13.7.2: Implement strategies to maintain sleep health in wilderness and high-risk work environments.

Synthesis (S)

13.7.3: Assess resilience-based sleep interventions for extreme conditions.

CLO 8: Examine the impact of hormonal changes and pregnancy on sleep health.

Knowledge (K)

13.8.1: Recognize the impact of hormonal changes (menarche, pregnancy, menopause) on sleep health.

13.8.2: Identify sleep disorders specific to pregnancy and postpartum periods.

13.8.3: Identify circadian misalignment related to hormonal shifts in women.

Application (A)

13.8.4: Develop interventions for sleep disruptions caused by hormonal shifts.

Synthesis (S)

13.8.5: Evaluate sleep management strategies tailored to reproductive health.

CLO 9: Investigate the role of dentistry in sleep medicine.

Knowledge (K)

13.9.1: Screen OSA with clinical and imaging tools in adult and pediatric populations.

13.9.2: Understand oral appliance therapy, indications, and efficacy.

13.9.3: Recognize the importance of follow-up and side effect management in OSA patients.

Application

13.9.4: Promote multidisciplinary collaboration between dentists and sleep physicians.

13.9.5: Understand how palatal expansion treats pediatric SDB.

Synthesis

13.9.6: Apply dental insights into oro-dental sleep conditions to OSA management.

CLO 10: Evaluate the surgical approaches to sleep disorders.

Knowledge (K)

13.10.1: Understand modern surgical techniques for treating sleep apnea.

Application (A)

13.10.2: Assess the role of DISE in guiding sleep surgery decisions.

Synthesis (S)

13.10.3: Evaluate surgical treatment pathways involving dental and sleep specialists.

CLO 11: Investigate the role of dreams in sleep health and research.

Knowledge (K)

13.11.1: Understand the function of dreams in emotional regulation and mental health.

Application (A)

13.11.2: Integrate dream content analysis into sleep studies.

Synthesis (S)

13.11.3: Assess the significance of lucid dreaming research in clinical practice.

CLO 12: Explore the intersection of sleep and forensics.

Knowledge (K)

13.12.1: Examine the influence of sleep disturbances on forensic psychiatry and crime.

Application (A)

13.12.2: Analyze the role of circadian rhythms in criminal behavior and forensic analysis.

Synthesis (S)

13.12.3: Assess forensic applications of sleep medicine research.

CLO 13: Examine the contribution of animal studies to sleep medicine.

Knowledge (K)

13.13.1: Explain how animal research informs human sleep medicine.

Application (A)

13.13.2: Assess environmental influences on sleep across species.

Synthesis (S)

13.13.3: Evaluate the translational value of animal studies in sleep research.