



ALL INDIA INSTITUTE OF MEDICAL SCIENCES, RISHIKESH

Division of Sleep Medicine



Curriculum

Post-Doctoral Fellowship (Sleep Medicine) Degree



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CURRICULUM FOR POST DOCTORAL FELLOWSHIP IN SLEEP MEDICINE
TWO YEARS (FOUR SEMESTERS) COURSE

1. GOALS, OBJECTIVES AND COMPETENCIES:

1.1. Goals

The goal of Post Doctoral Fellowship in Sleep Medicine course is to produce a competent Sleep Physician who:

- 1.1.1. Recognizes the needs of patients having Sleep Disorders and carries out professional obligations in keeping with principles of discipline, prevailing guidelines and professional ethics.
- 1.1.2. Has acquired the competencies pertaining to Sleep Medicine (including knowledge, clinical skills and soft skills) that are required to practice in the community and at all levels of health care system.
- 1.1.3. Is aware of the contemporary advances and developments in medical sciences as related to Sleep Medicine.
- 1.1.4. Is able to apply principles of research methodology and evidence based medicine to clinical practice.
- 1.1.5. Has acquired skills in teaching and training of medical and paramedical professionals.
- 1.1.6. Is able to follow the principles of team approach in various capacities- as a member and as a leader.

1.2. Objectives

- 1.2.1. Able to recognize, diagnose and manage cases that belong to various sleep disorders
- 1.2.2. Identify situations calling for urgent or early intervention and refer at the optimum time to the appropriate centers / specialties, if required.
- 1.2.3. Perform various procedures related to Sleep Medicine (e.g.: Polysomnography, Actigraphy, Cognitive Behavior Therapy, Sleep EEG)
- 1.2.4. Provide adequate follow-up care to all patients
- 1.2.5. Plan and advice measures for the prevention and rehabilitation of patients belonging to the specialty
- 1.2.6. Counsel and guide (in a structured manner) patients and their caregivers regarding needs and implications of sleep disorders.
- 1.2.7. Able to discharge effectively the supervised clinical care to the patients and comply with the standard operating protocols of the department and institute
- 1.2.8. Discharge effectively medico-legal and ethical responsibilities and practice his specialty ethically
- 1.2.9. Effectively and coherently communicate with patients, care-givers, fellow professionals and scientific community as a member of multidisciplinary team



- 1.2.10. Organize and participate in relief measures during situations of mass disasters leading to behavioral sleep disorders
- 1.2.11. Should be effectively able to transfer conceptual and skills based knowledge related to the subject to the undergraduates, postgraduates and members of medical fraternity
- 1.2.12. Plan and perform clinical and medical audits
- 1.2.13. Demonstrate sufficient understanding of basic sciences related to the specialty
- 1.2.14. Demonstrate competence in basic concepts of research methodology and evidence-based medicine so as to interpret scientific data, conduct research and guide others
- 1.2.15. Able to represent department in various academic fora through presentations (paper/poster/symposium) and research publications

1.3. Competencies:

1.3.1. Theoretical knowledge:

- 1.3.1.1. Comprehensively understands the concepts of adult sleep disorders related to etiopathogenesis, symptomatology, diagnostic methods, investigations, management and prognostications
- 1.3.1.2. Comprehensively understands the sleep disorders from the perspectives of behavioral sciences, neuroscience, epidemiology, and genetics
- 1.3.1.3. Has adequate knowledge of other medical disorders including Psychiatric, Neurological, Pulmonary, Medical, Otorhinolaryngological, and Dental from the perspectives of Sleep Medicine
- 1.3.1.4. Able to coherently comprehend data gathered from laboratory investigations

1.3.2. Clinical Skills:

- 1.3.2.1. Gathering essential and accurate information about the patient
- 1.3.2.2. Providing transfer of care that ensures seamless transitions
- 1.3.2.3. Building up rapport and therapeutic alliance
- 1.3.2.4. Interviewing patients/families about particulars of the medical condition for which they seek care, with specific attention to medical, behavioral, psychosocial and environmental correlates of disease
- 1.3.2.5. Performing complete and accurate physical examinations
- 1.3.2.6. Making informed diagnostic and therapeutic decisions
- 1.3.2.7. Developing and carrying out management plans
- 1.3.2.8. Advising and performing all medical procedures
- 1.3.2.9. Providing effective health maintenance and anticipatory guidance
- 1.3.2.10. Providing long term continuous care to the patients and caregivers
- 1.3.2.11. Performing, scoring and interpreting data from Home Sleep Testing, In Lab Attended Polysomnography, Actigraphy and Sleep Diary
- 1.3.2.12. Performing manual titration of PAP devices
- 1.3.2.13. Performing various diagnostic methods using polysomnography
- 1.3.2.14. Using information technology to optimize patient care



1.3.3. Leadership Quality:

- 1.3.3.1. Able to lead the team consisting of colleagues, younger colleagues, paramedical staff, other mental health professionals and members from other medical disciplines in various settings
- 1.3.3.2. Able to effectively and coherently communicate with community, leaders, administrators and members of health care team using principles of evidence based medicine
- 1.3.3.3. Able to effectively participate and lead the team in various health care programs of national and international importance
- 1.3.3.4. Able to effectively organize and conduct scientific meetings and awareness programs

1.3.4. Administrative and managerial skills:

- 1.3.4.1. Able to manage and improve the routine work in the outpatient, in-patient settings of the department
- 1.3.4.2. Able to manage and maintain smooth flow of work in community, primary and secondary care setting settings to ensure optimal diagnosis and care to the patients



2. ORGANIZATION OF TEACHING AND TRAINING

Learning in postgraduate degree course shall essentially be autonomous and self-directed. However, to stimulate the learning process and guiding the student, various academic activities shall be periodically conducted in the department.

A. Methods for the transfer of knowledge:

2.A.1 For imparting theoretical knowledge:

- 2A.1.1 **Seminars:** There is a one and half hour seminar weekly in which the Post-Doctoral Fellow (PDF) presents material on assigned topics in rotation. A topic is assigned to one PDF. The name of the PDF is notified well ahead of time and the PDF is expected to request one of the Consultants to chair their seminar preferably 2 months before the scheduled presentation. PDF is required to tell extempore and must not copy the material from the source. They should understand the concept and incorporate that in their presentation. Presenter must complete their presentation by half an hour leaving at least one hour for discussion in which all trainees are supposed to participate. The final seminar slides to be presented must be approved by the Faculty/Chairperson of the seminar. Generally, the topics covered are those that supplement the formal teaching program. The presentation of the seminar as well as the participation of other PDF in the seminar is subjected to evaluation, the marks of which are added to the scores of internal assessments. Evaluation is carried out by all faculty members present in the seminar.
- 2A.1.2 **Group discussions:** These are presentation by the faculty members/ senior residents on fortnightly basis. They choose a scientifically controversial topic of relevance and present the facts in front of the whole department. All members of the department participate in the activity and try to reach to some conclusion. This activity is aimed at improving the analytical thinking of post graduates.
- 2A.1.3 **Journal club:** An original article, meta-analysis or a systematic review related to discipline from the recent journals is chosen by the faculty member at least one month in advance and assigned to a PDF. PDF is expected to prepare the presentation based on the article which is then refined and improvised by the inputs from the faculty. Main focus for the journal club is critical analysis of methodology and analysis of data. Presentation is assessed by all concerned faculty members and marks are added to the formative assessment.



- 2A.14 **Didactic lectures:** Important topics will be covered in each semester in a series of lectures in each semester. These lectures will cover the topics defined for that semester. These lectures will be taken by a faculty.
- 2A.15 **Research Methodology:** PDF is expected to read and discuss research methodology in departmental forum. Topics will include introduction to research, hypothesis building, research methodology, biostatistics, and critically reading various articles e.g., original article, meta-analysis, randomized control trials and systematic reviews to name a few.
- 2A.16 **Dissertation discussion:** PDF will present their dissertation protocol before submission in front of the department. Inputs from all members are collected. This activity is aimed at improving the methodological strength of the proposal and to address ethical issues before it is submitted to the institutional ethics committee.
Thereafter, PDFs are expected to present the progress regarding their dissertation every 6 month in the department.
- 2A.17 **Guest lectures:** Time to time, department organizes guest lectures where faculty from other institutes is invited to share their knowledge. In addition, on monthly basis one faculty member from other departments of AIIMS, Rishikesh is also invited to discuss inter-disciplinary issues related to sleep and sleep disorders.
- 2A.18 **Teaching using Google Classroom, applications and other technologies:** Students are provided important learning material in the form of articles, videos, illustrations, presentations related to Sleep Medicine, Sleep Technology, Neuroscience and Research Methods on a periodic basis. Each activity is accompanied by short questions, points to be discussed. PDFs are given a deadline and they are expected to carry out these activities at their convenience. At the end of deadline, their responses are assessed and marked. Marks are added in the formative assessment.
- 2A.19 **Other activities organized by institute:** These include:
- 2.A.1.9.1 Clinical Grand Rounds
 - 2.A.1.9.2 Mortality meet
 - 2.A.1.9.3 Presentations from other departments
 - 2.A.1.9.4 Activities organized by the Department of Continuous Professional Development during induction program and thereafter
- 2A.1.10 **Activities outside institute:** PDFs are encouraged to attend conferences and workshops outside institute.
- 2A.1.11 **Webinars/ Virtual knowledge network/ Podcasts/ Telemedicine** broadcasted from and to other institutes of importance.



2.A.2 Methods of imparting clinical skills, conversion of theory in practice and documentation:

Skills related to use of various diagnostic and therapeutic procedures in Sleep Medicine will be imparted by

- 2A21 **OPD Teaching:** PDFs are posted in the OPD and they are expected to work up and present the case to the consultant to develop competencies mentioned in section 1.3.2. Case work up in OPD is brief and aimed at managing the high volume OPD setting, taking quick but rationale diagnostic and therapeutic decisions. All the cases are discussed with consultants and recorded in the Performa provided by the department. At the end of discussion, PDFs get the Performa signed by respective consultant. Students record all such cases in a log-book.
- 2A22 **IPD teaching:** PDFs are posted in the indoor ward on rotation basis. They work up the admitted cases in detail under the supervision. Different consultants see the case on rotation basis, as defined in the schedule of the department. Major focus is to assess the cases from various perspectives, stimulating focused reading related to the case, planning a wholesome management and learning competencies as mentioned in section 1.3.2. Students record all cases seen by them in a log book. Another focus of IPD work is proper documentation. During the rounds students are encouraged to search relevant literature and take decision (see 1.3.2.10).
- 2A23 **Comprehensive After Care:** Each candidate is expected to follow at least twenty cases suffering from different disorders longitudinally to learn about concepts of comprehensive after care. They are expected to maintain record that will get signed on each visit by a faculty. They will also maintain details of cases in their log book.
- 2A24 **Case Conference:** Interesting cases with diagnostic or therapeutic difficulties, important findings (clinical as well as investigational) are presented on weekly basis. PDFs work up the cases under supervision of faculty members. In addition to eliciting their findings in front of members of department, PDFs are encouraged to present their findings using recorded videos and captured images 1.3.2.10. After the presentation, assessment is done by all faculty members of the department which is added to their internal assessment.
- 2A25 **Demonstration / Hands on Training:** PDFs will be given hands on training in various procedures related to Sleep Medicine practice. It includes:
- 2.A.2.5.1 Use of sleep diary and actigraphy data to assess sleep
 - 2.A.2.5.2 Recording and analysis of Polysomnography data during diagnostic study
 - A. Adults
 - B. Pediatric
 - 2.A.2.5.3 Recording and analysis of Polysomnography data during diagnostic study with extended EEG montage



A. Adults

B. Pediatric

2.A.2.5.4 Conduction and analysis of data from Home Sleep Testing

2.A.2.5.5 Manual titration of PAP device (CPAP, Bi-Level PAP)

2.A.2.5.6 Conduction and interpretation of following tests using PSG:

A. Multiple Sleep Latency Test

B. Maintenance of Wakefulness Test

C. Suggested Immobilization Test

2.A.2.5.7 Cognitive Behavior Therapy for Insomnia

A log book shall be maintained for all the procedures.

2A26 Activities and training programs organized by the Department of Continuous Professional Development of AIIMS, Rishikesh time to time

2A27 Activities outside institute: PDFs are encouraged to attend workshops outside institute.

2.A.3 Methods for developing teaching skills:

2A31 Undergraduate bed side teaching: PDFs are involved in bedside teaching of undergraduate students during their ward postings. These are supervised by the faculty members. PDFs maintain a log-book of the classes that they had taken.

2A32 Postgraduate bed side teaching: PDFs are involved in bedside teaching of postgraduate students during postings in Sleep Laboratory. These are supervised by the faculty members. PDFs maintain a log-book of the classes that they had taken.

2.A.4 Methods for developing soft skills, managerial and leadership skills:

2A41 PDFs are made in-charge for the individual cases and various functional areas of the department. Feedback related to their soft skills are collected by staff members, colleagues, patients and their relatives. They are given feedback.

2A42 They are given responsibilities in various capacities during the activities organized by the department as mentioned in sections 1.3.3 and 1.3.4

2A43 Case conferences, seminars also work to improve the communication and oratory skills, which are the part of departmental teaching activity.

2.A.5 Exposure to private practice of Sleep Medicine:

During the training, students work in a protected environment and focus on the academic training. However, every-one of them may not choose or may not be able to pursue academic career. Considering this fact and looking at the dearth of Sleep Physicians in peripheral areas, it is important that students are exposed to concept of private practice as well. To make training comprehensive, private practitioners will be called periodically to share their experience with the students and guide them regarding how to establish private practice.

**2.A.6 Remedial Measures:**

Remedial measures on periodic basis shall be taken for the students who are not performing well in any of the areas. Data for this will be gathered from various assessment methods as mentioned in the curriculum.

B. Clinical Postings

2.B.1 OPD Posting in Sleep Medicine

2.B.2 IPD postings in Sleep Laboratory and ward having patients with Sleep Disorders

2.B.3 Following specialty rotations will be mandatory:

Department	Duration	Semester
Pulmonary Medicine	1 month	3
Neuroanatomy	07 days	3
Neurophysiology	07 days	3
ENT	14 days	3
Pediatrics	14 days	3
Neurology	1 month	4
Psychiatry	1 month	4

PDF will not be posted in the parent branch that he belongs to (Post graduate degree)

2.B.4 Expected outcomes from interdepartmental postings:

2.B.4.1 **Internal Medicine:**

2.B.4.1.1 Expected to learn at least following skills and gain knowledge regarding:

A. History taking in Pulmonary Medicine

B. General Physical and systemic examinations of patients with various medical conditions (like heart failure, COPD, cirrhosis)

2.B.4.1.2 Ability to synthesize information in a meaningful manner from 1 and 2

2.B.4.1.3 Recognize and provide primary care to patients with common medical conditions.

2.B.4.1.4 Able to interpret:

A. ECG

B. Hematological and biochemical investigations

C. Arterial Blood Gas Analysis

2.B.4.1.5 Learner will maintain a log book of cases seen and detailed report of at least three cases worked up each week of posting. These documents will be signed by consultant in concerned department and will be submitted to parent department on re-joining.

2.B.4.2 **Neuroanatomy:**

2.B.4.2.1 Learner is expected to learn neuroanatomy ranging



- from gross to cellular level
- 2.B.4.2.2 Should be able to recognize different structures of central and peripheral nervous system in soft tissue specimen/ picture/ diagram
- 2.B.4.2.3 Learner will maintain a log book of work done. These documents will be signed by consultant in concerned department and will be submitted to parent department on re-joining.
- 2.B.4.3 **Neurophysiology:**
- 2.B.4.3.1 Candidate must learn at least following:
Basic principles of Physiology of nervous system including synaptic transmission, nerve conduction, physiology of various neuronal structures
- 2.B.4.3.2 Must know principles of neuro-electrophysiology
- A. EEG
- B. EMG
- C. NCV
- D. Evoked potentials, especially those used in cognition
- 2.B.4.3.3 Must be able to recognize waveforms in EEG, both physiological and pathological
- 2.B.4.3.4 Must be able to recognize common patterns of EEG waveforms seen in epilepsy
- 2.B.4.3.5 Must be able to generate detailed and clinically meaningful report of EEG
- 2.B.4.3.6 Must know principles of quantitative EEG; interpretation of qEEG is desirable
- 2.B.4.3.7 Learner will maintain a log book of cases seen and detailed report of at least one EEG each day of posting. These documents will be signed by consultant in concerned department and will be submitted to parent department on re-joining.
- 2.B.4.4 **Neurology:**
During his posting learner is expected to learn at least following skills and gain knowledge regarding:
- 2.B.4.4.1 History taking in Neurology
- 2.B.4.4.2 Examination of Neurology patient
- 2.B.4.4.3 Ability to synthesize information in a meaningful manner from 1 and 2
- 2.B.4.4.4 Recognize and provide primary care to patients with:
- A. Stroke
- B. Movement disorders
- C. Myopathies
- D. Neuropathies



- E. Epilepsy
- 2.B.4.4.5 Able to work up epilepsy and recognize EEG waveform in epilepsy
- 2.B.4.4.6 Learn Lumber Puncture taking all aseptic precautions
- 2.B.4.4.7 Learner will maintain a log book of cases seen and detailed report of at least three cases per week of posting. These documents will be signed by consultant in concerned department and will be submitted to parent department on re-joining.
- 2.B.4.5 **Psychiatry:**
 - During his posting learner is expected to learn at least following skills and gain knowledge regarding:
 - 2.B.6.5.1 Various Psychiatric disorders and their association with sleep disorders e.g.,
 - A. Anxiety disorders
 - B. Depressive Disorders
 - C. Substance Use Disorders
 - D. Psychotic Disorders
 - E. ADHD
 - F. Autistic Spectrum Disorders
 - G. Other Neurodevelopmental disorders
 - H. Dementia
 - 2.B.6.5.2 Should maintain a log book of cases seen and detailed report of at least one case each day of posting.



SYLLABUS FOR PDF (Sleep Medicine)

3. Semester wise division of topics:

Considering the examination process as mentioned in section 7, syllabus is divided in four semesters. At the end of each semester, examination will be held from the syllabus mentioned for respective semester.

3.1. Syllabus common for all semesters:

3.1.1. Review Articles/ Meta-analysis published in following journals during the semester

- 3.1.1.1. Sleep
- 3.1.1.2. Sleep Medicine
- 3.1.1.3. Journal of Clinical Sleep Medicine
- 3.1.1.4. Sleep and Breath
- 3.1.1.5. Sleep Medicine Clinics
- 3.1.1.6. Sleep and Vigilance
- 3.1.1.7. Journal of Sleep Research
- 3.1.1.8. Sleep and Biological Rhythms
- 3.1.1.9. Sleep Related Articles from:
 - 3.1.1.9.1. Thorax
 - 3.1.1.9.2. Physiological Reviews
 - 3.1.1.9.3. Nature

3.1.2. All Academic activities as mentioned in sections 2.1.1 and 2.1.2 during the semester

3.2. Semester wise division of syllabus:

Syllabus include following topics and their extensions. PDF is encouraged to read relevant literature from the reading material suggested in the Reading list (Section 10).

3.2.1. First Semester:

- 3.2.1.1. Instrumentation and Methodology
 - 1. Polysomnography and Beyond
 - 2. Sleep Stage Scoring
 - 3. Central Nervous System Arousals & Cyclic Alternating Patterns
 - 4. Neurologic Monitoring Techniques
 - 5. Monitoring Techniques for Evaluating Suspected Sleep-Related Breathing Disorders
 - 6. Home Sleep Testing
 - 7. Cardiopulmonary Coupling Sleep Spectrograms
 - 8. Pulse Wave Analysis During Sleep
 - 9. Recording and Scoring Sleep-Related Movements
 - 10. Evaluating Sleepiness
 - 11. Chronobiologic Monitoring Techniques
 - 12. Actigraphy
- 3.2.1.2 Normal Sleep and Its Variance
 - 1. History of Sleep Physiology and Medicine



2. Normal Human Sleep: An Overview
 3. Normal Aging
 4. Daytime Sleepiness and Alertness
 5. Sleep Deprivation
 6. Genetics of Normal Human Sleep
- 3.2.1.3 Sleep Mechanisms and Phylogeny
1. Neural Control of Sleep in Mammals
 2. Rapid Eye Movement Sleep
 3. Novel Techniques for identifying Sleep Mechanisms and Disorders
 4. Sleep in Animals: A State of Adaptive Inactivity
- 3.2.1.4 Physiology in Sleep
1. Relevance of Sleep Physiology for Sleep Medicine Clinicians
 2. What Brain Imaging Reveals about Sleep Generation and Maintenance?
 3. Cardiovascular Physiology and Coupling with Respiration: Central and Autonomic Regulation
 4. Cardiovascular Physiology: Autonomic Control in Health and in Sleep Disorders
 5. Respiratory Physiology: Central Neural Control of Respiratory Neurons and Motoneurons during Sleep
 6. Respiratory Physiology: Understanding the Control of Ventilation
 7. Physiology of Upper and Lower Airways
 8. Respiratory Physiology: Sleep at High Altitudes
 9. Sleep and Host Defence
 10. Endocrine Physiology in Relation to Sleep and Sleep Disturbances
 11. Thermoregulation in Sleep and Hibernation
 12. Memory Processing in Relation to Sleep
 13. Sensory and Motor Processing During Sleep and Wakefulness
 14. Opiate Action on Sleep and Breathing
 15. Pathophysiology of Sleep-wake Disturbances After Traumatic Brain Injury
- 3.2.1.5 Chronobiology
1. Introduction: Master Circadian Clock and Master Circadian Rhythm
 2. Anatomy of the Mammalian Circadian System
 3. Physiology of the Mammalian Circadian System
 4. Human Circadian Timing System and Sleep-Wake Regulation
 5. Sleep Homeostasis and Models of Sleep Regulation
 6. Circadian Rhythms in Sleepiness, Alertness, and Performance
 7. Central and Peripheral Circadian Clocks
 8. Circadian Dysregulation and Mental and Physical Health
 9. Circadian Disorders of the Sleep-Wake Cycle
- 3.2.1.6 Pharmacology
1. Hypnotic Medications: Mechanisms of Action and Pharmacologic Effects
 2. Clinical Pharmacology of Other Drugs Used as Hypnotics
 3. Wake-Promoting Medications: Basic Mechanisms and Pharmacology
 4. Wake-Promoting Medications: Efficacy and Adverse Effects
 5. Drugs That Disturb Sleep and Wakefulness
 6. Effects of Hypnotic Drugs on Driving Performance
- 3.2.1.7 Impact, Presentation, and Diagnosis



1. Approach to the Patient with Disordered Sleep
2. Cardinal Manifestations of Sleep Disorders
3. Physical Examination in Sleep Medicine
4. Use of Clinical Tools and Tests in Sleep Medicine
5. Classification of Sleep Disorders
6. Epidemiology of Sleep Medicine
7. Sleep Medicine, Public Policy, and Public Health
8. Sleep and Athletic Performance

3.2.2 Second Semester

3.2.2.1 Sleep Breathing Disorders

1. Sleep Related Breathing Disorders: Classification
2. Sleep Breathing Disorders: Clinical Overview
3. Central Sleep Apnea: Definitions, and Pathophysiology, Genetics, and Epidemiology
4. Central Sleep Apnea: Diagnosis and Management
5. Anatomy and Physiology of Upper Airway Obstruction
6. Snoring and Pathologic Upper Airway Resistance Syndromes
7. Obstructive Sleep Apnea: Phenotypes and Genetics
8. Obstructive Sleep Apnea: Clinical Features, Evaluation, and Principles of Management
9. Positive Airway Pressure Treatment for Obstructive Sleep Apnea
10. Medical and Device Treatment for Obstructive Sleep Apnea: Alternative, Adjunctive, and Complementary Therapies
11. Obstructive Sleep Apnea and the Central Nervous System: Neural Adaptive Processes, Cognition and Performance
12. Obstructive Sleep Apnea and Metabolic Disorders
13. Overlap Syndromes of Sleep and Breathing Disorders
14. Obesity Hypoventilation Syndrome
15. Obstructive Sleep Apnea, Obesity, and Bariatric Surgery
16. Sleep and Breathing at High Altitude

3.2.2.3 Insomnia

1. Insomnia: Recent Developments and Future Directions
2. Insomnia: Epidemiology and Risk Factors
3. Etiology and Pathophysiology of Insomnia
4. Insomnia Diagnosis Assessment, and Evaluation
5. Insomnia and Health
6. Cognitive Behavioral Therapies for Insomnia I: Approaches and Efficacy
7. Psychological and Behavioral Treatments for Insomnia II: Implementation and Specific Population
8. Pharmacologic Treatment of Insomnia: Benzodiazepine Receptor Agonists
9. Pharmacologic Treatment of Insomnia: Other Medication

3.2.2.3 Psychobiology and Dreaming

1. Introduction
2. Why We Dream
3. Dream Content: Quantitative Findings
4. Brain Correlates of Successful Dream Recall



5. Neurobiology of Dreaming
6. Lucid Dreaming
7. Nightmares and Nightmare Function
8. Incorporation of waking Experiences into Dreams
9. Dreams and Nightmares in Posttraumatic Stress Disorder
10. Emotion, Motivation, and Reward in Relation to Dreaming

3.2.2.4 Neurological Disorders

1. Narcolepsy: Genetic, Immunology, and Pathophysiology
2. Narcolepsy: Diagnosis and Management
3. Idiopathic Hypersomnia
4. Parkinsonism
5. Sleep and Stroke
6. Sleep and Neuromuscular Diseases
7. Restless Legs Syndrome and Periodic Limb Movements During Sleep
8. Alzheimer's Disease and Other Dementias
9. Epilepsy, Sleep, and Sleep Disorders
10. Other Neurological Disorders
11. Sleep Disorders after Traumatic Brain Injury
12. Kleine-Levin Syndrome

3.2.2.5 Psychiatric Disorders

1. Anxiety Disorders and Posttraumatic Stress Disorder
2. Unipolar Major Depression
3. Bipolar Disorder
4. Schizophrenia
5. Medication and Substance Abuse
6. Sleep Disturbances in Attention-Deficit/Hyperactivity Disorder

3.2.3 Third Semester

3.2.3.1 Dentistry and Otolaryngology in Sleep Medicine

1. Role of Dentistry and Otolaryngology in Sleep Medicine
2. Oropharyngeal Growth & Skeletal Malformations
3. Sleep Bruxism: Definition, Prevalence, Classification, Aetiology, and Consequences
4. Sleep Bruxism: Diagnostic Considerations
5. Orofacial Pain and Temporomandibular Disorders in Relation to Sleep-Disordered Breathing and Sleep Bruxism
6. Oral Appliances for the Treatment of Obstructive Sleep Apnoea-Hypopnea Syndrome and for Concomitant Sleep Bruxism
7. Anaesthesia in Upper Airway Surgery for Obstructive Sleep Apnoea
8. Upper Airway Surgery to Treat Obstructive sleep-Disordered Breathing Pharmacotherapy, Complementary

3.2.3.2 Sleep in older adults

1. Psychiatric and Medical Comorbidities, and Effects of Medications in Older Adults
2. Obstructive Sleep Apnea in Older Adults
3. Insomnia in Older Adults
4. Circadian Rhythms in Older Adults

3.2.3.3 Sleep in Women

1. Sex Differences and Menstrual-Related Changes in Sleep and Circadian Rhythms
2. Sleep and Sleep Disorders Associated with Pregnancy



3. Sleep-Disordered Breathing in Pregnancy
4. Postpartum Period and Early Motherhood
5. Sleep and Menopause
- 3.2.3.4 Other Medical disorders
 1. Sleep and Fatigue in Cancer Patients
 2. Fibromyalgia and Chronic Fatigue Syndromes
 3. Endocrine Disorders
 4. Pain and Sleep
 5. Sleep and Chronic Kidney Disease
 6. Sleep in Critically Ill Patients
- 3.2.3.5 Sleep and cardiovascular disorders
 1. Sleep and Cardiovascular Disease: Present and Future
 2. Sleep-Related Cardiac Risk
 3. Cardiac Arrhythmogenesis during Sleep: Mechanisms, Diagnosis, and Therapy
 4. Cardiovascular Effects of Sleep-Related Breathing Disorders
 5. Systemic and Pulmonary Hypertension in Obstructive Sleep Apnea
 6. Coronary Artery Disease and Obstructive Sleep Apnea
 7. Heart Failure
- 3.2.3.6 Parasomnia
 1. Parasomnias: Overview and Approach
 2. Non-Rapid Eye Movement Parasomnias: Clinical Spectrum, Diagnostic Features, and Management
 3. Rapid Eye Movement Sleep Parasomnias
 4. Nightmares and Dream Disturbances
 5. Other Parasomnias
 6. Sleep-Related Movement Disorders and Their Unique Motor Manifestations

3.2.4 **Fourth Semester**

- 3.2.4.1 Genetics and Genomic Basis of Sleep
 1. Introduction: Genetics and Genomics of Sleep
 2. Genetics and Genomics of Circadian Clocks
 3. Genetics and Genomic Basis of Sleep in Simple Model Organisms
 4. Genetics and Genomic Basis of Sleep in Rodents
 5. Genetics and Genomic Basis of Sleep in Healthy Humans
 6. Genetics and Genomic Basis of Sleep Disorders in Humans
- 3.2.4.2 Legal Topics in Sleep Medicine
 1. Sleep Forensics: Criminal Culpability for Sleep-Related Violence
 2. Legal Obligations of Persons Who Have Sleep Disorders or Who Treat or Hire Them
 3. Legal Aspects of Fatigue-and Safety-Sensitive Professions
 4. Sleep Medicine Clinical Practice and Compliance - United States
 5. Sleep Medicine Clinical Practice and Compliance – Europe
- 3.2.4.3 Occupational Sleep Medicine
 1. Introduction
 2. Performance Deficits During Sleep Loss and Their Operational Consequences
 3. Sleep and Performance Prediction Modelling
 4. Fatigue Risk Management Systems



5. Drowsiness in Transportation Workers
 6. Shift Work, Shift-Work Disorder, and Jet Lag
 7. Sleep Problems in First Responders and in Deployed Military Personnel
 8. Sleep, Occupational stress, and Burnout
 9. Optimizing Shift Scheduling
 10. Obstructive Sleep Apnea in the Workplace
- 3.2.4.4 Paediatric Sleep Medicine
1. Polysomnography in children
 2. Physiological variation in sleep
 3. Sleep and colic
 4. Enuresis and OSA
 5. Treatment of OSA in children



Dissertation

4. Following the current recommendations of Academic Council of All India Institute of Medical Sciences, Rishikesh

4.1. Guides/ Co-Guides:

- 4.1.1. It is mandatory that every student pursuing PDF degree in Sleep Medicine to write a dissertation under the guidance of the postgraduate teacher (guide) and a Co-guide. Number of co-guides can be increased, if necessary.
- 4.1.2. The basic aim of carrying out dissertation writing is to train a postgraduate in research methods and techniques.
- 4.1.3. A Guide shall be appointed from the concerned departments and the co-guide can be either from the department or from other disciplines related to the dissertation topic.
- 4.1.4. Before the submission of the dissertation protocol to the Dean of the Institute it will be presented to the department faculty and peers.

4.2. Protocol of dissertation:

It consists of:

- 4.2.1. Introduction
- 4.2.2. Brief review of literature: Must include gaps in existing literature, Need for the study and clear hypothesis
- 4.2.3. Aims and objectives
- 4.2.4. Material and methods: Including calculation of sample size
- 4.2.5. Statistical Analysis
- 4.2.6. Bibliography
- 4.2.7. Annexures: Including Informed consent form, Patient Information Sheet, Case Record Form, Scales/ Questionnaires as applicable

4.3. The Final dissertation:

Dissertation should consist of:

- 4.3.1. Introduction
- 4.3.2. Literature Review including gaps in existing literature, Need for the study and clear hypothesis
- 4.3.3. Aims and objective
- 4.3.4. Material and methods
- 4.3.5. Observations and results
- 4.3.6. Discussion
- 4.3.7. Limitations
- 4.3.8. Conclusion
- 4.3.9. Summary
- 4.3.10. Future directions
- 4.3.11. Bibliography
- 4.3.12. Annexures



4.3.13.

Master Chart

4.4. Evaluation of dissertation:**4.4.1. Periodic evaluation:**

Progress meetings for the dissertation shall be conducted at the end of each semester. Meetings shall be incorporated in the departmental academic activity. After completion, dissertation will be sent for review to external examiners as per policy of AIIMS, Rishikesh.

4.4.2 Final evaluation:

The dissertation, when submitted is sent out to external expert reviewers for their comments/approval. The review by experts comprises of a semi-structured format as described hereunder:

- i. General overview
- ii. Novelty of the research work
- iii. New skill sets learnt by trainee
- iv. Critical / analytical thinking demonstrated
- v. Adequacy of trainee's contribution
- vi. Specific comments
- vii. Introduction & review of literature
- viii. Specific aims and hypotheses
- ix. Study method
- x. Statistical analyses and results
- xi. Discussion & conclusions
- xii. Bibliography
- xiii. Overall comments
- xiv. Recommendation Modify/Accept/Reject

Note: Each of the general and specific comments are rated on a scale of 1 to 4; where 1=not satisfactory, 2=satisfactory, 3=good, 4=exceptional



5. LOG BOOK

- 5.1. PDF shall maintain a record log book of the work carried out by them during the period of training.
- 5.2. The log book has to be maintained as recommended by the department, checked, and assessed periodically and signed by the senior resident weekly and consultant fortnightly and, checked and signed by the HOD at the end of every month.
- 5.3. Scanned copy of the log book will be kept in the departmental record for future purposes.

6. Poster/Research Presentation and Publication:

During the training period PDF has:

- 6.1. To present at least one poster presentation in a National conference.
- 6.2. To read at least one paper in a National conference.
- 6.3. To submit at least two research papers, which should be published/accepted for publication/sent for publication during the period of his postgraduate studies in National/ international indexed journal.
- 6.4. Data should have been collected during the training period



ASSESSMENT

7. Scheme of Assessment:

During the course, both formative and summative assessment shall be done.

7.1 Formative assessment:

- 7.1.1 It will be based on day to day observations by the faculty members related to parameters mentioned in sections 1.3.1, 1.3.2 and 2.A.1 and 2.A.2.
- 7.1.2 Performa for the assessment are attached with the curriculum
- 7.1.3 It will be done by each faculty member independently at the end of every month
- 7.1.4 Students will also be given relevant topics for discussion by each faculty member in sequential manner on weekly basis. Students are expected to read the material and participate in discussion. They will be assessed using the content of their submission.

7.2 Periodic assessment:

- 7.2.1 **Monthly Assessment:** Informal assessment shall be done at the end of each month by each consultant. Assessment criteria will cover all objectives as mentioned in section 1.2.
- 7.2.2 **Semester Assessment**
 - 7.2.2.1 During first 3 semesters examination will be held at the end of last month of semester.
 - 7.2.2.2 Syllabus will include topics mentioned in sections 3.1 and 3.2.
 - 7.2.2.3 Examination shall consist of theory and practical cum viva-voce, 100 marks each.
 - 7.2.2.4 Theory examination shall consist of structured short answer questions aimed at assessment of assimilation of subject's knowledge and Multiple-choice questions. It will be aimed to assess objectives mentioned in section 1.3.1.
 - 7.2.2.4.1 70% weightage of theory will be given to Structured short answers questions and remaining 30% to multiple choice questions.
 - 7.2.2.5 Practical examination will be conducted that will consist of case-presentations and OSCE/OSPE. It will be aimed at assessment of skills mentioned in section 1.3.2.
 - 7.2.2.5.1 One long case and at least one short case shall be given. It will weigh 50% of the total marks for practical examination.
 - 7.2.2.5.2 Remaining 50% weightage shall be given to OSCE/OSPE relevant to the syllabus of the semester.
- 7.2.3 Second to fourth semesters will include syllabus from previous and current semester in a ratio of 30-50% content from previous semesters. This will ensure assimilation of knowledge and continued learning.



- 724 Critical and constructive feedback will be provided after each examination.

7.3 Pre-Professional Examination*:

This assessment will be carried out to prepare the student for appearing in final examination.

- 731 It will include syllabus from all semesters.
- 732 Examination shall consist of theory and practical cum viva-voce, 400 marks for theory and 400 for practical.
- 733 Theory examination shall consist of two papers (100 marks each).
- 733.1 Theory examination will consist of structured short answer questions aimed at assessment of assimilation of subject's knowledge (critical analysis) and Multiple-choice questions. It will be aimed to assess objectives mentioned in section 1.3.1.
- 733.2 70% weightage of theory will be given to Structured short answers questions aimed at assessment of critical and analytical thinking and remaining 30% to multiple choice questions.
- 734 Practical examination will be conducted that will consist of case-presentations and OSCE/OSPE. It will be aimed at assessment of skills mentioned in section 1.3.2.
- 734.1 One long case (100 marks) and three short cases (30+30+40 marks each) shall be given
- 734.2 Remaining 50% weightage shall be given to OSCE/OSPE relevant to the syllabus.
- 734.3 Some stations of OSCE/OSPE shall be directed towards examining soft skills/ attitude/ communication skills/ professional conduct. Examples include how to deal the situation when patients start following you on social media; patient presenting you with some gift etc.
- *The structure of pre-professional examination may be modified and finalized subsequent to approval of structure for final examination by academic council.*

7.4 Final Professional Examination*:

This assessment will be carried out to evaluate objectives and competencies mentioned in sections 1.2 and 1.3.

- 741 It will include syllabus from all semesters.



- 742 Examination shall consist of theory and practical cum viva-voce, 400 marks for theory and 400 for practical.
- 743 Evaluation panel will consist of two internal examiners and two external examiners. Selection of internal and external examiners will be done following the prevailing policies of the institute.
- 744 Theory examination shall consist of two papers (100 marks each).
- 74.4.1 Theory examination will consist of structured short answer questions aimed at assessment of assimilation of subject's knowledge (critical analysis) and Multiple-choice questions. It will be aimed to assess objectives mentioned in section 1.3.1.
- 74.4.2 70% weightage of theory will be given to Structured short answers questions aimed at assessment of critical and analytical thinking and remaining 30% to multiple choice questions.
- 745 Practical examination will be conducted that will consist of case-presentations and OSCE/OSPE. It will be aimed at assessment of skills mentioned in section 1.3.2.
- 74.5.1 One long case and three short cases (30+30+40 marks) shall be given
- 74.5.2 Remaining 50% weightage shall be given to OSCE/OSPE relevant to the syllabus.
- 74.5.3 Some stations of OSCE/OSPE shall be directed towards examining soft skills/ attitude/ communication skills/ professional conduct. Examples include how to deal the situation when patients start following you on social media; patient presenting you with some gift etc.

**The structure of professional examination may be modified and finalized subsequent to approval of structure for final examination by academic council.*



8. Eligibility Criteria to appear for the PDF Examination*:

8.1. Attendance

The candidate must have attendance as per rules laid down by the academic council.

8.2. Learning of skills:

- 8.2.1. At least 200 PSG scored independently with 80% agreement with Expert scoring
- 8.2.2. Out of 200 PSGs, 100 should be titration studies done independently to the level of Good to Optimal level
- 8.2.3. Conducting and Reporting at least 10 cases of MSLT/MWT
- 8.2.4. Conducting and Reporting at least 10 cases of Suggested Immobilization Test
- 8.2.5. At least 30 cases of Cognitive Behavior Therapy for insomnia completed and recorded

8.3. Poster, Paper, Research Presentation and Publication:

- 8.3.1. To present one poster presentation National/International Conference.
- 8.3.2. To read one paper at a National/International conference.
- 8.3.3. To submit at least two research papers, which should be published/accepted for publication/sent for publication during the period of his postgraduate studies in National/ international indexed journal.
- 8.3.4. Data should have been collected during the training period

8.4. Semester Examinations:

- 8.4.1. The candidate must secure at least an average of 50% marks in the best of 2 out of 3 semester examinations separately in theory as well as practical.
- 8.4.2. In the pre-professional examination, the candidate must secure at least 50% marks separately in theory as well as practical.

8.5. Formative assessment:

- 8.5.1. The candidate must secure at least 50% marks in the formative assessment.

8.6. Dissertation acceptance

- 8.6.1. To appear in examination, submission of dissertation is required.
- 8.6.2. The dissertation has to be accepted by external reviewers, before awarding the degree.

8.7. Recommendation from the Department

Department will provide in writing a certificate of good standing of the candidate for being eligible to appear in the professional examination.

**May be modified and finalized subsequent to approval by academic council.*



9. Criteria for passing PDF examination*:

- 9.1. Candidate has to secure at least 50% marks individually in theory and practical during final assessment.
- 9.2. In the final assessment formative assessment will have 20% weightage, 20% weightage shall be given to monthly assessment, 20% to semester and 40% to the final examination.
- 9.3. Marks of formative assessment for Seminars and Journal Club shall be included in Theory in proportion to marks obtained (percentage).
- 9.4. Marks of Case presentations and monthly assessment shall be included in practical in proportion to marks obtained (percentage).
- 9.5. Marks obtained in theory and practical during semester examinations shall be included in theory and practical, respectively.



Assessment Method		Marks Obtained/ Total	Percentage (Out of 100)	Weightage to final marks	Marks to be added to final marks (Multiply Total by weightage)	Marks out of 100
Theory						
Formative						
	Seminars			20%		
	Journal Club					
	E-Classroom					
Total						
Periodic						
	Semester 1			20%		
	Semester 2					
	Semester 3					
	Semester 4					
Total						
Pre-Professional						
	Paper 1			20%		
	Paper 2					
	Paper 3					
	Paper 4					
Total						
Professional						
	Paper 1			40%		
	Paper 2					
	Paper 3					
	Paper 4					
Total						
Grand Total Theory						

Practical**Formative**

	Case Conference			20%		
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Monthly

	Monthly Assessment			20%		
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Periodic

	Semester 1			20%			
	Semester 2						
	Semester 3						
	Pre Prof						

Total

				40%		
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Grand Total Practical

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10. Suggested Reading List*

1. International Classification of Sleep Disorders. **3rd** ed. Darien, IL : American Academy of Sleep Medicine ; 2014 .
2. Principles and Practice of Sleep Medicine. Meir Kryger, Thomas Roth, William Dement. (Eds) 6th Edition. Elsevier; 2017: Chicago
3. Principles and Practice of Pediatric Sleep Medicine. Stephen Sheldon, Richard Ferber, Meir Kryger David Goza. (Eds) 2 Edition. Elsevier; 2014: Chicago
4. Berry R, Albertario C, Harding S, for the American Academy of Sleep Medicine. The AASM Manual for the Scoring of Sleep and Associated Events: Rules, Terminology and Technical Specifications. Darien, IL: 2018
5. Gupta R, Pandi-Perumal SR, BaHammam A. Clinical Atlas of Polysomnography. Apple Academic Press. 1st Ed. New Jersey, USA. 2018
6. Chakroverty S, Thomas RJ. Atlas of Sleep Medicine. Elsevier. 2nd Ed. Philadelphia, PA. 2014
7. Edinger JD, Carney CE., Treatments that work. Overcoming insomnia: A cognitive-behavioral therapy approach, therapist guide. Oxford University Press. 2nd Ed. 2015

Guidelines:

1. Guidelines from World Sleep Society
2. Guidelines from American Academy of Sleep Medicine
3. Guidelines from European Sleep Society

Journals:

1. Sleep
2. Sleep Medicine
3. Journal of Clinical Sleep Medicine
4. Sleep and Breath
5. North American Clinics of Sleep Medicine
6. Sleep and Vigilance
7. Journal of Sleep Research
8. Sleep and Biological Rhythms

Suggested reading list may be modified from time to time. Please use the latest edition of the book available in the market.

Dr. H N Mallick

Dr. Abhishek Goyal

Dr. Ravi Gupta

Dr. Niraj Kumar

Dr. Ashi Chugh

Dr. Lokesh Kumar Saini