Sleep-wake Disorders Worksheet:

Neuro-developmental Disorders	Answer		Matching Options
Insomnia			A. A rare disorder marked by recurrent episodes of excessive sleep (up to 20 hours a day), altered behavior, and a reduced understanding of the world, typically interspersed with weeks or months of normal sleep, behavior, and mood.
Hypersomnia			B. A neurological disorder causing uncontrollable sleep attacks, sudden muscle weakness (cataplexy), sleep paralysis, hallucinations when falling asleep or waking, and disrupted nocturnal sleep.
Idiopathic Hypersomnia			C. A disorder characterized by repetitive episodes of breathing cessation during sleep due to upper airway obstruction (obstructive) or a lack of respiratory effort (central), often resulting in frequent awakenings and daytime sleepiness.
Kleine–Levin Syndrome			D. Excessive daytime sleepiness not due to disrupted sleep or circadian rhythm disorders, often resulting in long sleep episodes or significant distress, impairing social, occupational, or other important areas of functioning.
Insufficient Sleep Syndrome			E. A neurological disorder characterized by an irresistible urge to move the legs, typically accompanied by uncomfortable sensations, worsening during periods of inactivity and improving with movement.
Narcolepsy			F. An unknown cause, characterized by excessive daytime sleepiness, prolonged night-time sleep, difficulty waking up (sleep inertia), and unrefreshing naps.
Restless Legs Syndrome			G. A condition where individuals experience a loud, imaginary noise (like an explosion, gunshot, or thunderclap) just before falling asleep or upon waking, often accompanied by a sense of fear or distress but without pain.
Sleep Apnea			H. Sleepiness due to an individual's voluntary but inadequate allocation of time for sleep, leading to chronic sleep deprivation and associated symptoms when the individual does not meet their own sleep needs.
Night Terrors (Sleep Terrors)			I. Intense episodes of panic and fear during sleep, often paired with screaming, flailing, and no memory of the event upon awakening, primarily occurring in non-REM sleep stages.
Exploding Head Syndrome			J. Difficulty initiating or maintaining sleep, or waking up too early, occurring despite adequate opportunity for sleep. Chronic persists for at least three months, while short-term lasts less than three months.

Case Study Exercises

Case Study 1

A 28-year-old software engineer reports experiencing intense fear and panic during the night. These episodes occur without warning and involve screaming and kicking, though she has no recollection of these events the following morning. Her episodes often frighten family members, noting that she appears terrified. These episodes disrupt her sleep significantly, but she remains unaware and does not remember them upon waking. The impact on her daytime functioning is minimal, as she does not feel fatigued or sleepy.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 2

A 35-year-old librarian frequently complains about a severe lack of sleep due to an inability to fall asleep or stay asleep. Despite being in bed for 8 hours each night, he estimates only getting about 4-5 hours of actual sleep. He often lies awake worrying about work and personal issues, and this problem has persisted for nearly a year. He feels tired during the day and relies heavily on caffeine to stay alert. His mood has become irritable, and his performance at work is suffering.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 3

A 22-year-old university student describes falling asleep uncontrollably during lectures, despite getting full nights of sleep. She also experiences episodes where she suddenly feels weak and collapses when laughing or experiencing strong emotions. Occasionally, she has vivid dreams just as she is falling asleep. She's concerned because these symptoms are affecting her studies and social life, and she feels embarrassed by her unexpected sleep episodes and muscle weakness.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 4

A 40-year-old truck driver seeks help for persistent daytime fatigue and loud snoring noted by his partner. He wakes up frequently during the night gasping for air and feels like he cannot get enough rest. He often wakes up with a dry mouth and a headache. His partner is worried about the periods during the night when it seems like he stops breathing. The driver admits to sometimes feeling sleepy while driving, which frightens him, given his profession.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 5

A 30-year-old graphic designer experiences sudden loud noises in her head that wake her from sleep. These noises, like a bomb exploding or a clash of cymbals, are extremely distressing and occur without any external cause. She reports severe anxiety around bedtime, fearing when the next sound will occur. The noises happen sporadically, with several episodes in a month followed by periods of quiet. She has no pain, but the shock disrupts her sleep and leaves her anxious.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 6

A 47-year-old teacher mentions an irresistible urge to move her legs while resting in the evening, which disrupts her ability to relax or fall asleep. The sensations are described as crawling, itching, or throbbing in the legs, which temporarily improve with movement. She finds relief by walking or stretching, but these symptoms recur at night. Her sleep is severely fragmented, causing significant daytime fatigue and distress.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 7

A 19-year-old college student reports returning home for the summer and sleeping upwards of 14-18 hours a day. During these periods, he seems disoriented and irritable when awake and has little interest in social activities or eating. His parents observe that these episodes occur every few weeks and last for a few days before he suddenly returns to his normal schedule. His

academic performance is not affected outside of these episodes, but his parents are concerned about the recurrent nature of his excessive sleep.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 8

A 55-year-old journalist has been struggling with sleepiness during the day even after sleeping for 7 to 8 hours at night. He finds himself napping frequently, often feeling unrefreshed afterward. This excessive need for sleep is affecting his work, as he finds it hard to concentrate and complete tasks efficiently. He doesn't have any other significant health issues but mentions that waking up in the morning is particularly difficult, and he feels groggy for several hours.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 9

A 23-year-old receptionist mentions staying up late regularly to catch up on TV shows and social media, averaging about 4-5 hours of sleep on weekdays. She complains of constant tiredness and difficulty concentrating at work. She believes she can manage on this amount of sleep, but her fatigue suggests otherwise. On weekends, she tries to "catch up" on sleep by sleeping in, which further disrupts her sleep schedule.

This is an example of which disorder: _____

What is your treatment plan: _____

Case Study 10

A 33-year-old accountant experiences episodes of excessive sleepiness every few months, sleeping up to 16 hours a day. Between these episodes, his sleep and waking hours are normal. During the sleepy phases, he withdraws from family and friends and loses interest in everyday activities. His family reports that his behavior also changes during these episodes, showing confusion and a lack of energy, which is not typical for him.

This is an example of which disorder: _____

What is your treatment plan: _____

Answers

Matching
J
D
F
A
H
B
E
C
I
G

Case Study 1: Night Terrors (Sleep Terrors)

The description of intense fear, panic, and physical activity during sleep, with no memory of the events upon waking, aligns with the characteristics of sleep terrors.

- **Pharmacological:** Medication is generally not the first line of treatment. Selective serotonin reuptake inhibitors (SSRIs) work by blocking the reuptake of serotonin in the central nervous system (CNS) neurons and may also slightly inhibit the reuptake of norepinephrine and dopamine. These medications are successfully used to manage panic attacks. Given the similarities in symptoms between nocturnal panic attacks and night terrors, SSRIs could potentially be effective in treating night terrors as well (for example, paroxetine [Paxil]). Tricyclic antidepressants can decrease deep Delta sleep and arousal between sleep stages. These medications can include imipramine (Tofranil) and amitriptyline. A long-acting benzodiazepine (like clonazepam [Klonopin]) may be used in severe cases.
- **Non-pharmacological:** Scheduled awakenings (waking the patient shortly before the typical time of a terror), reassurance, and improving sleep hygiene.

Case Study 2: Insomnia (including chronic insomnia and short-term insomnia)

The difficulty in initiating and maintaining sleep, significant distress and impact on daytime functioning, and duration of over a year match the definition of chronic insomnia.

- **Pharmacological:** Melatonin and antidepressants like trazodone (Desyrel), mirtazapine (Remeron), amitriptyline, and doxepin (Silenor). Anticholinergics are not typically a primary treatment for insomnia due to their potential side effects and risks, especially in older adults; they include diphenhydramine (Benadryl), doxylamine (Unisom), and hydroxyzine (Atarax, Vistaril). Short-term use of sleeping medications (like benzodiazepines or non-benzodiazepine hypnotics such as temazepam [Restoril], zolpidem [Ambien], eszopiclone [Lunesta], and ramelteon [Rozerem; non-scheduled option]), particularly for short-term insomnia.

- **Non-pharmacological:** Cognitive Behavioral Therapy for Insomnia (CBT-I), which includes techniques like stimulus control, sleep restriction, and relaxation training; maintaining a regular sleep schedule; and reducing caffeine and screen time before bed.

Case Study 3: Narcolepsy

Uncontrollable sleep attacks, sudden muscle weakness (cataplexy), and vivid dreams during sleep onset are hallmark symptoms of narcolepsy.

- **Pharmacological:** Central nervous system stimulants are commonly used to manage daytime sleepiness – medications such as modafinil (Provigil) or armodafinil (Nuvigil) are less likely to be habit-forming compared to traditional stimulants. Newer stimulant options include solriamfetol (Sunosi) and pitolisant (Wakix), with pitolisant also providing benefits for cataplexy. In some cases, methylphenidate (Ritalin, Concerta, and others) or amphetamines (Adderall, Dexedrine, and others) may be necessary. Although effective, these medications can lead to dependency and side effects such as increased heart rate and nervousness. To control symptoms like cataplexy, hallucinations, and sleep paralysis, serotonin and norepinephrine reuptake inhibitors (SNRIs) or SSRIs that suppress REM sleep may be used. Tricyclic antidepressants, such as protriptyline, imipramine (Tofranil), and clomipramine (Anafranil), are older options that treat cataplexy but may cause side effects including dry mouth and lightheadedness. Sodium oxybate (Xyrem) and oxybate salts (Xywav) effectively alleviate cataplexy and improve nighttime sleep, which is often disrupted in narcolepsy, and may also help reduce daytime sleepiness.
- **Non-pharmacological:** Scheduled naps throughout the day to control drowsiness, maintaining a regular sleep schedule. Education to avoid nicotine and alcohol use, especially at night. Patients should be taught to get regular exercise (moderate levels, at least four hours before bedtime).

Case Study 4: Sleep Apnea

Frequent awakenings, loud snoring, gasping for air, and excessive daytime sleepiness are classic indicators of sleep apnea.

- **Pharmacological**: No medications have been explicitly developed to enhance motor function, coordination, or related issues. Modafinil (Provigil) has received approval from the Food and Drug Administration (FDA) for treating patients who continue to experience daytime sleepiness despite optimal use of continuous positive airway pressure (CPAP). In 2019, the FDA approved solriamfetol, a dopamine/norepinephrine reuptake inhibitor (DNRI) designed to enhance wakefulness in patients suffering from excessive daytime sleepiness associated with obstructive sleep apnea (OSA). Propranolol and other beta-blockers have been utilized to manage severe essential tremors, which can accompany coordination difficulties in children but should only be prescribed in extreme

cases. Medications are generally used to address associated conditions, such as attention deficit hyperactivity disorder (ADHD).
- **Nonpharmacological**: Occupational therapy, physiotherapy, task-oriented motor training, and adaptations for learning environments.

Case Study 5: Exploding Head Syndrome

Hearing sudden loud noises (like explosions) that are not real, especially around sleep transitions, fits the description of exploding head syndrome.

- **Pharmacological:** There is limited evidence for specific medications, but clomipramine (Anafranil) or calcium channel blockers have sometimes been used.
- **Non-pharmacological:** Reassurance and education about the disorder's benign nature may help reduce occurrences. Stress management and relaxation techniques may also help.

Case Study 6: Restless Legs Syndrome

The irresistible urge to move the legs due to uncomfortable sensations, improvement with movement, and disrupted sleep are symptoms characteristic of restless legs syndrome.

- **Pharmacological:** The FDA has approved dopamine agonists like rotigotine (Neupro), pramipexole (Mirapex ER), and ropinirole for the treatment of moderate to severe Restless Legs Syndrome (RLS). For those with occasional RLS symptoms, carbidopa-levodopa (Duopa, Rytary, among others) may be prescribed for use as needed, although daily or near-daily use is not recommended. Additionally, medicines such as gabapentin (Neurontin, Gralise), gabapentin enacarbil (Horizant), and pregabalin (Lyrica) are effective for some individuals with RLS. Opioids, which are primarily reserved for treating severe symptoms, include tramadol (ConZip, Qdolo), codeine, oxycodone (Oxycontin, Roxicodone, and others), and hydrocodone (Hysingla ER). These are used cautiously due to the potential for addiction, especially at high dosages. Iron supplementation may be helpful in patients with iron deficiency.
- **Non-pharmacological:** Regular exercise, avoidance of caffeine, alcohol, and tobacco; establishing good sleep practices, and leg massages or warm baths before bed.

Case Study 7: Kleine–Levin Syndrome (KLS)

Periodic episodes of excessive sleep, disorientation upon awakening, and altered behavior during episodes are symptoms of Kleine-Levin Syndrome.

- **Pharmacological:** Stimulants (to combat hypersomnia during episodes) and mood stabilizers or antipsychotics may be used based on symptomatic presentation.

- **Non-pharmacological:** Supportive care during episodes, maintaining a safe environment, and ensuring the patient consumes adequate food and fluids.

Case Study 8: Idiopathic Hypersomnia

Persistent excessive daytime sleepiness despite adequate or prolonged night-time sleep and difficulty waking fully (sleep inertia) are symptoms of idiopathic hypersomnia.

- **Pharmacological:** Stimulant medications such as modafinil (Provigil, Alertec) may be prescribed to assist with daytime wakefulness. Modafinil can cause side effects, including headaches, dry mouth, nausea, diarrhea, decreased appetite, and weight loss. Other recommendations include sodium oxybate (Xyrem), clarithromycin (Biaxin XL, Klaricid), and methylphenidate (Quillivant XR, Daytrana, QuilliChew ER). The FDA recently approved a lower-sodium formulation of oxybate (Xywav) for treating idiopathic hypersomnia in adults.
- **Non-pharmacological:** Regular exercise, maintaining a consistent sleep schedule, strategic napping.

Case Study 9: Insufficient Sleep Syndrome

Chronic sleep deprivation due to voluntarily not allocating enough time for sleep and trying to "catch up" on sleep during weekends, describes insufficient sleep syndrome.

- **Pharmacological:** Generally, it is not applicable unless another underlying sleep disorder is identified that may benefit from treatment.
- **Non-pharmacological:** Education about sleep needs and importance, behavioral changes to extend sleep duration (like setting a consistent bedtime, reducing evening engagements).

Case Study 10: Hypersomnia

Periodic episodes of excessive daytime sleepiness and prolonged sleep durations, interspersed with normal sleep patterns, match the symptoms of hypersomnia.

- **Pharmacological:** Similar to mediations listed for Idiopathic Hypersomnia.
- **Non-pharmacological:** Maintain a regular sleep schedule, avoid alcohol and medications that can cause drowsiness, and schedule naps to manage daytime sleepiness.