

## Sleep Disorders and Insomnia: Classification and Overview of Management

Mohammed Esmail Qashqary<sup>1\*</sup>, Abdulmalek Rshood Al-Qwizani<sup>2</sup>, Ohoud Salman Alenazi<sup>3</sup>, Abdulhamid Ayman Kabli<sup>4</sup>, Njood Ahmed Al-Hrkan<sup>5</sup>, Khuloud Abdulrahman Almughazzawi<sup>6</sup>, Zeyad Nabil Sindi<sup>7</sup>, Tahani Saleh Alsaery<sup>8</sup>, Musab Marwan Alsharif<sup>9</sup>, Basema Muneer Alqatari<sup>10</sup> and Suad Ahmed Jumah<sup>11</sup>

<sup>1</sup>Assistant Professor in Family and Community Medicine Department, University of Jeddah, Jeddah, Saudi Arabia

<sup>2</sup>King Saud Medical City, Riyadh, Saudi Arabia

<sup>3</sup>South Faisaliah Dispensary, Arar, Saudi Arabia

<sup>4</sup>Medical University of Lublin, Poland

<sup>5</sup>Unaizah College of Medicine, Unaizah, Saudi Arabia

<sup>6</sup>Taibah University, Al Madinah, Saudi Arabia

<sup>7</sup>Security Forces Health Center, Bisha, Saudi Arabia

<sup>8</sup>King Fahad Armed Forces Hospital, Jeddah, Saudi Arabia

<sup>9</sup>King Abdulaziz University, Jeddah, Saudi Arabia

<sup>10</sup>Royal College of Surgeons, Ireland

<sup>11</sup>Yanbu Primary Health Care, Yanbu, Saudi Arabia

**\*Corresponding Author:** Mohammed Esmail Qashqary, Assistant Professor in Family and Community Medicine Department, University of Jeddah, Jeddah, Saudi Arabia.

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### Abstract

**Introduction:** Sleep is highly regulated physiologic drive, however, it is prone to many disorders. Classification of sleep disorders is essential to standardize definitions, promote differential diagnosis, and facilitates a systematic diagnostic approach. Insomnia is one of the most common complaint in adults.

**Aim of Work:** In this review, we will discuss the latest general classification of sleeping disorder with focusing in insomnia as a very common category and overviewing its management.

**Methodology:** A comprehensive and systematic search was conducted regarding Sleep disorders classification, Insomnia, acute and chronic insomnia management. PubMed and Google Scholar search engine were the mainly used database.

**Conclusion:** Insomnia is multifactorial in etiology whereby predisposing, precipitating, and perpetuating factors play a role. Cognitive behavior therapy for insomnia (CBT-I) is the preferred first-line for most patients with chronic insomnia. However, variable drug agents could be used in combination with CBT or as a second-line approach. There is no consensus on reliable predictor of adequacy of response for both CBT its medications. Some experts believe that optimal perception and behaviors are believed to be acceptable predictor for CBT-I intervention. After adequate response, the clinician goal is to maintain the response with attempts to tapering medication. This could be a difficult task and many patients may be reluctant with fear of insomnia recurrence.

**Keywords:** Sleep Disorders; Insomnia; CBT-I

### Introduction

Sleep is highly regulated physiologic drive in human being. In spite of that, people ability to fall and maintain adequate sleep pattern is prone to many disorders. Classification of sleep disorders is essential to standardize definitions, promote differential diagnosis, and facilitates a systematic diagnostic approach. The International Classification of Sleep Disorders (ICSD) is considered the most common reference in classification of sleep disorders. In their third edition (ICSD-3), sleeping disorder was classified to seven major categories [1].

In adults, insomnia is one of the most common problem that lead to seeking medical advice. The ability to fall and maintain sleep at the desired time without interruption could be fragile and is influenced by multiple factors. Addressing insomnia by medication only may partially solve the problem, hence, a stepwise approach that aims to eliminate or minimize contributing factors for insomnia is recommended. Successful management on insomnia could only be achieved by recognizing and addressing all contributing factors.

In this review, we will discuss the latest general classification of sleeping disorder with focusing in insomnia as a very common category and overviewing its management.

### Methodology

A comprehensive and systematic search was conducted regarding Sleep disorders classification, Insomnia, acute and chronic insomnia management. PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar search engine (<https://scholar.google.com>) were the mainly used database. All relevant available and accessible articles of all types were reviewed and included. The terms used in search were: sleep disorders, sleeplessness, insomnia, management, classification and medication.

### Classification of sleep disorder

In their third edition, the International Classification of Sleep Disorders (ICSD) has classified sleep disorders to seven major categories [1]. Until now, this classification is considered the most commonly used. Other classification of sleep disorder as that included in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) is greatly parallels to ICSD-3 classification system [2]. In ICSD-3 classification, there is more than 60 identified disorders of sleep in 7 major categories. Sleep disorder is similar to that of adults and there is no distinguish in ICSD-3 classification, an exception to that is classification of sleep-related breathing disorders where the classification was different between children and adults [3].

The first category of ICSD-3 is Insomnia. Insomnia was further classified to 3 main subtypes. These subtypes are short-term insomnia disorder and chronic insomnia disorder; when insomnia presentation does not fit the criteria of each type, the ICSD-3 classifies insomnia as other insomnia disorder. In previous edition, chronic insomnia was subclassified into primary and comorbid types, however, ICSD removed this sub-classification because it did not yield any diagnostic benefit.

Other major categories of sleep disorder include Sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm sleep-wake disorders, parasomnias, sleep-related movement disorders and other sleep disorders category.

### Initial assessment of insomnia

Insomnia is believed to have multifactorial origin, whereby predisposing, precipitating, and perpetuating factors play a role. Clinician should bear in mind all of these factors to develop best individualized management plan.

Social, medical, and psychiatric events that may have been related to etiology of insomnia should be considered for each patient. Common predisposing and precipitating factors include reactivity to sleep disturbance and medical and psychiatric conditions. Genetic factors may play a role as well [4,5]. Ignoring the presence of such factors may cause management failure. For example, if insomnia was

precipitated by pain, it is unlikely to adequately manage it without addressing pain itself. In addition, insomnia may be the presenting symptom of other sleep disorders such as obstructive sleep apnea or restless legs syndrome (RLS). Insomnia as a presenting symptom in these conditions is unlikely to resolve without addressing them. Similarly, psychiatric conditions and insomnia could be directly related; treatment directed to both disorders increases the possibility of maximum sustained response. Adults with a history of childhood trauma or a chaotic home environment at night could be at increased risk of insomnia. Considering this, these patients could be the best candidate for cognitive therapy.

Patient's awareness and adherence to healthy sleep habits are important to have an adequate sleep pattern and prevent insomnia. The physician's role is to ensure that the patient is well-aware of healthy sleep attitudes. Healthy sleep habits include avoiding alcohol and smoking at night, not going to bed hungry, regular sleeping schedule, and regular exercise at least 4 to 5 hours before bedtime among others.

Another important factor to be considered in the initial assessment is medications. Drugs used by the patient for other conditions may precipitate insomnia through central nervous system (CNS) stimulation or other effects. Stimulants, glucocorticoids, some antidepressants, diuretics, and opioids are incriminated to cause sleeplessness by different mechanisms.

Patient's behavioral and cognitive responses to insomnia may further disturb sleep and perpetuate insomnia. Wrong perception and unrealistic expectations of sleep in addition to poor sleep habits should be checked by the physician and adequately addressed. Hence, the physician should advise the patient to carefully fill out a sleep diary for two weeks at least. Such a diary should include bedtime and wake time in addition to time needed to fall asleep. Similarly, to other instinctive drives, such as bowel emptying, an attempt to sleep should be carried out when the person is feeling sleepy; the clinician should check this with his patient and encourage him to go to attempt sleep only if he is sleepy, similarly to bowel emptying. The physician also should question the patient about other behaviors such as napping during the day, night environment in the house, and the presence of anxiety caused by insomnia.

In the initial assessment of insomnia, polysomnography (PSG) plays a minor role in most cases. However, some cases may need assessment by polysomnography for thorough evaluation of insomnia. These cases include clinical suspicion for a sleep disorder that requires PSG to diagnose as sleep apnea (whether obstructive or central) and in case of chronic insomnia with no response to standard management.

### Management of acute insomnia

Acute or short-term insomnia is defined as insomnia for less than 1 month. This type of insomnia is the most commonly seen in medical practice. Short-term insomnia is usually caused by a stressful event that could be psychological or physiological. Patients with acute insomnia are usually able to identify the incriminated precipitant.

The physician should discuss the role of precipitating stressor and promote the ability to control it or at least accepting its importance to cause insomnia.

If there is severe distress that causes severe insomnia, short-term sedative medication should be considered. The aim of medical therapy is to reduce the resulting stress and to prevent the development of dysfunctional cognitive and behavioral responses. Such responses could increase the risk of developing chronic insomnia. A short- or intermediate-acting benzodiazepine receptor agonist for 2 - 4 weeks (e.g. estazolam or Lorazepam) nightly or by intermittent use is recommended as initial medication. Studies have shown the short-term use of these medications to be effective and well tolerated without excessive risk of next-day sedation [6,7].

Follow-up in two to four weeks is advised to evaluate the response to treatment and assess the presence of other causes of insomnia, current sleep-related symptoms, anxiety about sleep, and to reinforce good sleep habits. If there is no adequate response, cognitive behavioral therapy for insomnia (CBT-I) should be considered as the best approach encouraged.

### Approach to chronic insomnia

Chronic insomnia that persist despite appropriate addressing of precipitating and perpetuating factors is considered as chronic insomnia and is best managed by cognitive behavioral therapy (CBT) and pharmacotherapy. Whether to start with pharmacotherapy of CBT, experts suggest that CBT for insomnia (CBT-I) is the preferred first-line for most patients. However, as CBT-I may not be the best available option for some patients either due lack of therapists or to limitations of time. As an alternative, long-term use of medications is an acceptable option but require comprehended evaluation and regular follow up [7].

Many trials have examined the best initial management by comparing CBT-I, medications, and combination therapy. Cognitive behavior therapy for insomnia alone and CBT-I in combination with medications showed similar effect, however, both were superior to medication alone in short- and long term studies [8-11]. Relying of CBT-I alone with no medication carries the advantages of avoiding unnecessary side effects and interactions of drugs and provides patients with lifelong skills to deal with future insomnia [7,12,13]. Many Guidelines and societies recommend CBT-I as the best initial approach. Examples include the American Academy of Sleep Medicine [13], the British Association for Psychopharmacology [14], the American College of Physicians [12,15] and the European Sleep Research Society [16].

Clinician can choose to start with a combination approach when the clinical judgment is the need for rapid response. Such rapid response could be needed in case of excessive anxiety caused by insomnia which could interfere with the ability to follow restriction and stimulus control aspects of CBT-I). This approach is justified by the faster response with medications compared with CBT. The goal is achieving fast response then tapering the medication over 6 - 8 weeks.

No reliable predictor of adequacy of response has been agreed upon for both CBT it medications [17]. Developing optimal perception and behaviors is believed to be acceptable predictor for CBT-I intervention; however, negative thoughts and behaviors may develop in case of more severe sleep disturbance, disorganized lifestyle, or concomitant anxiety disorder. The presence of such factors may predict resistance. In one study, the researchers concluded association between higher level of distress at baseline or prolonged times to fall asleep and beneficial response to CBT-I, while shorter sleep time (< 6 hours) may predict poor response [18,19]. Similar controversy about predictor of response to medication is present. A meta-analysis of non-benzodiazepine benzodiazepine receptor agonists (BZRAs) has found that younger age and female sex were associated with greater improvements in sleep initiation time [20]. In addition, a history of no response to high doses hypnotics or paradoxical insomnia (inconsistency between subjective report and objective measure of total sleep time) are indicators of poor future response to medications.

### Cognitive behavioral therapy (CBT)

Cognitive behavioral therapy for insomnia (CBT-I) is the first line approach in adults with chronic insomnia [7,12,14,15] and there is a very good evidence about its effectiveness in patient with or without concomitant medical and psychiatric disorders [21-26].

This approach aims to address common thoughts and behaviors that incriminated to interfere with optimal sleep. It is traditionally delivered by therapist over 4 - 8 face-to-face sessions in private or groups setting. Remote delivery of CBT can also be effective. CBT-I include many components, behavioral components aim to encourage healthy behaviors. This include stimulus control to reduce anxiety caused by insomnia by leaving the bed once the anxiety occur and sleep restriction that means spending the same amount of time in bed as that of sleep time. These component of behavior is believed to be the most effective. Other components include encouraging patient to maintain sleeping schedule (sleep and wake) seven days per week, encouraging patient to sleep only when feeling sleepy, using the bed for sleep and sex only. In addition, sleep hygiene is also encouraged, this implies the avoidance of all substance that interfere with sleep, avoiding naps, and ensure a comfortable sleep environment. Sleep hygiene is believed to be less important and effective than other components of behavior.

The cognitive component of CBT-I attempts to address patient's perception as anxious thoughts associated with insomnia and inappropriate expectations about sleep.

### Overview of pharmacotherapy

Sleep is physiologic drive and is regulated by many neurobiological systems and transmitters. Hence, different pharmacologic agents and classes could be used in managing insomnia. CNS functions is complex and some neurotransmitters are involved in more than biological function. Therefore, it is understandable that many of agents used for insomnia were basically developed for other purposes and have side effects on both sleep and non-sleep functions. Pharmacologic drugs used for insomnia is usually classified according to their mechanism of action or original indication. These agents include benzodiazepine receptor agonists whether benzodiazepines or non-benzodiazepine, sedating antidepressants, melatonin agonists, orexin receptor antagonists, and antipsychotics. It is estimated that 20 percent of American adults use prescribed and over-the counter medications for insomnia monthly [27].

There is no single best pharmacologic medication for all individuals with insomnia, the choice is usually individualized depending on multiple factors as age, comorbidities, type of insomnia, side effect profiles, cost, and clinician and patient preference.

### Follow-up and monitoring

Insomnia is a clinical diagnosis, and the response is usually judged by history and patient subjective report. Assessment of management response could be achieved by sleep diary as some patients may remember only the nights with poor sleeping. Another method for assessment is wearable devices that report sleep parameters; a method that is gaining popularity. However, the benefits is limited to compare sleep before and after treatment rather than absolute sleep metrics. The follow-up should start after the first month of management if continued treatment is planned. Further follow-up should be carried every six months at least.

If patient reported failure of management, clinician should check their expectations of sleep and sleep pattern especially in old age and in patient with comorbidities. Unrealistic expectation render all treatments to high possibility of failure. Physician should also examine sleep diaries carefully for timing of sleep and time in bed. This will yield the presence of any condition that interferes with sleep as excess time in bed and irregularity in bedtimes or wake times, or the fact that sleep is actually being improved.

Cognitive behavioral therapy for insomnia (CBT-I) requires solid changes in thoughts, commitment, perseverance. Patients' non-adherence and failure to response to CBT-I could be explained by these factors. In such cases, initiating medication is the best second-line. However, patients should be encouraged to maintain as many components of CBT-I as possible to remain able to control insomnia in the future.

If failure of management persist after initiating medication, the effort should be directed to assess possible explanations as lack of efficacy or emergent side effects of used agent. In the presence of any of these limitations, changing the dose, timing, or even the medication itself can be the best next step. Choosing medication with a different mechanism of action is often appropriate if changing in dose and time did not lead to desired effects.

After adequate response, the clinician goal is to maintain the response with attempts to tapering medication. This could be a difficult task and many patients may be reluctant with fear of insomnia recurrence. Such concerns could be relieved by discussion and explanation about the probability of successful discontinuation. Patient should be reassured that the majority of insomnia (about 75 percent) resolve before 1 year, a message that aids with patients' reassurance [28].

If the clinician suspects that concomitant comorbidity contributes to the insomnia and requires further expertise, referral for subspecialty is advised. Nevertheless, persistent non-response to treatments that are generally effective, is also indicative of referral.

### Conclusion

Sleep is highly regulated physiologic drive, however, it is prone to many disorders. Classification of sleep disorders is essential to standardize definitions, promote differential diagnosis, and facilitates a systematic diagnostic approach. Insomnia is one of the most common complaint in adults. Insomnia is multifactorial in etiology whereby predisposing, precipitating, and perpetuating factors play a role. Cognitive behavior therapy for insomnia (CBT-I) is the preferred first-line for most patients with chronic insomnia. However, variable drug agents could be used in combination with CBT or as a second-line approach. There is no consensus on reliable predictor of adequacy of response for both CBT or medications. Some experts believe that optimal perception and behaviors are believed to be acceptable predictor for CBT-I intervention. After adequate response, the clinician goal is to maintain the response with attempts to tapering medication. This could be a difficult task and many patients may be reluctant with fear of insomnia recurrence.

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