Insomnia: Prevalence, Burden, and Consequences

By CHARLES M. MORIN, PhD

Insomnia is a significant and costly public health problem. It is among the most frequent complaints in primary-care medicine. Persistent insomnia represents an important health burden for the individual and for society at large, as evidenced by its adverse impact on quality of life, occupational functioning, and psychological and mental health. Despite its negative consequences, insomnia often remains unrecognized and untreated due to important barriers to assessment and management. This issue of Insomnia Rounds summarizes the most current evidence on the nature of insomnia, its prevalence, burden and consequences on the Canadian population, and addresses key issues related to assessment and diagnosis of insomnia.

Manifestations of Insomnia – How to Recognize and Diagnose

Insomnia is characterized by dissatisfaction about sleep quality or duration. Subjective complaints include difficulty falling asleep at bedtime, waking up at night and having difficulty going back to sleep, waking up too early in the morning with an inability to return to sleep, or a complaint of non-restorative sleep. These nocturnal symptoms routinely lead to daytime fatigue, decreased energy, problems with cognitive functions (attention, memory), and mood disturbances (dysphoria, irritability), which can produce significant distress and functional impairments at home, work or in social endeavors.1,2 Daytime impairment is often the main reason individuals with insomnia seek treatment.

Presentation

Insomnia symptoms are not mutually exclusive; for example, a person may present with sleep onset as well as maintenance difficulties. In a recent Canadian survey, the combination of at least 2 symptoms (usually trouble falling and staying asleep) was the most common presentation (47%), followed by 28% who reported initial insomnia, 15% middle-of-the-night insomnia, and 10% early morning awakenings. Nonrestorative sleep or poor sleep quality was reported by more than two-thirds (37%) of respondents, and the majority (71%) reported another concomitant insomnia symptom. The type of problems may also change over time. Difficulties falling asleep are more common early on in the course of insomnia, while problems maintaining sleep or mixed onset and maintenance insomnia become more prevalent with persistent insomnia.

Comorbidity with other medical or psychiatric disorders

Insomnia may present as a disorder on its own but more frequently it presents in association with another medical or psychiatric disorder. Psychiatric comorbidity is particularly high with anxiety, mood, and substance abuse disorders.3,4 In the 2002...
United States National Health Interview Survey, individuals with insomnia were more than 5 times as likely to present with anxiety or depression than individuals without insomnia. There is also evidence of high rates of comorbidity between insomnia and medical conditions such as pain, hypertension and congestive heart failure, diabetes, and obesity.

The next edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) is likely to move away from the distinction between primary and secondary insomnia, partly because it is often difficult to determine which condition is the cause and which is the consequence, and this relationship may also change over time. For instance, although insomnia can be a symptom of another medical (pain) or psychiatric (depression) disorder, its persistent form can also lead to major depression and even exacerbate pain-related conditions. Proposed new DSM-5 criteria for insomnia can be viewed at the American Psychiatric Association website.

**Sleep history**

The diagnosis of insomnia is based on clinical symptoms, and a detailed sleep history is necessary to reach an accurate diagnosis. Because of the heterogeneity of insomnia complaints and its multiple origins, the assessment should cover the following:

- the nature of the sleep complaint, its onset and circumstances, duration, severity, and course
- the patient’s sleep-wake schedule, pre-bedtime routines, daytime functions
- medical and psychiatric contributing factors
- other sleep-related symptoms
- alleviating and exacerbating factors, medication and substance use, and current and past treatments

**Sleep diary**

The sleep diary is a useful tool to complement baseline clinical evaluation and to monitor treatment progress. A typical diary (Table 1) includes entries for bedtime, arising time, and estimates of time to fall asleep, number and duration of awakenings, sleep time, and sleep quality. The patient should complete this diary on a daily basis, typically upon arising in the morning, before and during the course of treatment.

**Insomnia Severity Index**

The Insomnia Severity Index is another useful tool that patients can fill out as part of their initial evaluation and to document treatment outcome (Table 2). In-laboratory polysomnography is not indicated for the routine evaluation of insomnia; its main indication is for patients with excessive daytime sleepiness or with symptoms of other disorders such as sleep apnea or periodic limb movements.

**Prevalence – Who Gets Insomnia?**

Insomnia is among the most prevalent complaints brought to the attention of primary-care physicians. Approximately 20% of patients in primary-care medicine report significant sleep disturbances. Insomnia affects all segments of the population, including children and the elderly. While precise estimates vary as a function of definitions and methodology, approximately 40% of adults (≥18 years of age) report at least 1 symptom of insomnia 3 times per week, 20% are dissatisfied with their sleep, and about 10%-13% meet criteria for an insomnia disorder (Figure 1).

Insomnia is more prevalent among women, middle-aged and older adults, and individuals with poor self-rated physical or psychological mental health. Difficulties initiating sleep are more common among young adults, and problems maintaining sleep become more frequent among middle-aged and older adults. The incidence of insomnia is also higher among first-degree family members than in the general population; the mother was the most frequently affected. It is unclear whether this familial link is inherited through a genetic predisposition, learned by observations of parental models, or simply a byproduct of another psychopathology.

Insomnia can be a situational, recurrent, or persistent problem. Even with chronic insomnia there is variability across nights, with a good night’s sleep interspersed between several poor ones. Acute insomnia is usually triggered by stressful life events or changes in

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**Table 1.** Sleep Diary

<table>
<thead>
<tr>
<th>Time</th>
<th>Event/Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedtime</td>
<td>22:30</td>
</tr>
<tr>
<td>Arising Time</td>
<td>06:45</td>
</tr>
<tr>
<td>Sleep Quality</td>
<td>7/10</td>
</tr>
</tbody>
</table>

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**Figure 1.** Canadian Statistics on Insomnia

- With Insomnia Symptoms: 79.7% (74.2%)
- Without Insomnia Symptoms: 19.8% (16%)
sleep schedules and usually remits once the precipitating event has subsided. It can also follow an intermittent course, with recurrent episodes of sleep difficulties closely associated with stressful events. However, for some individuals, perhaps those more vulnerable to insomnia, sleep difficulties persist after the initial cause has disappeared. Longitudinal studies reveal that nearly 70% of individuals with insomnia at baseline present with persistent insomnia a year later, and 50% continue reporting insomnia up to 3 years later.

Thus, clinicians should attend to insomnia complaints and not presume that a situational problem will necessarily subside with time.

**Burden and Consequences – What is the Cost of Insomnia?**

The impact of persistent insomnia should not be underestimated. Significant adverse effects on the individual as well as on society have been documented in several domains:

- **Psychosocial:** reduced quality of life and increased risks of depression
- **Occupational:** reduced productivity and increased disability
- **Economic:** higher healthcare utilisation
- **Public safety:** increased risks of accidents due to impaired vigilance

**Reduced quality of life and psychosocial functioning**

Persons with insomnia experience more subjective impairments of waking behaviours and psychosocial functioning, relative to those without insomnia. These include problems with attention and memory, mood disturbances, lower ratings of enjoyment of interpersonal relationships, and more days where they are unable to work or carry out normal role-related activities.

Insomnia is associated with impaired cognitive skills, including attention, memory, and vigilance, all of which may contribute to significant functional impairments at work, at home, or while driving a motor vehicle. In a Canadian study by Daley et al., individuals with an insomnia disorder reported more frequent absences from work (4.4 days annually specifically due to insomnia) and greater reduction of productivity relative to good sleepers. Higher rates of accidents among individuals with insomnia have also been linked to impaired vigilance caused by a cumulative sleep loss. Although absenteeism and accidents cannot always be
linked exclusively to sleep difficulties (comorbid disorders can also contribute to these problems), they represent one of the main determinants of help-seeking among individuals with insomnia. 11

**Increased risk of psychiatric disorders**

Evidence from longitudinal studies indicates that insomnia is an important risk factor for new-onset psychiatric disorders, most notably major depression, anxiety, and substance abuse disorders. 21,22 Individuals with insomnia were nearly 4 times more likely to develop new-onset major depression over the next 3.5 years relative to individuals without insomnia at baseline; risks to develop anxiety and substance abuse disorders were twice and 7 times higher, respectively. 21 A systematic review of 21 longitudinal studies found that non-depressed people with insomnia had a 2-fold risk to develop depression, compared to people with no sleep difficulties. 22

Insomnia and fatigue are the 2 most common residual symptoms in patients treated for depression, 23 and such residual symptoms may increase the risk of relapse for future depressive episodes. Recent clinical trials of comorbid insomnia and major depression have shown that augmentation therapy targeting insomnia symptoms specifically enhanced outcome relative to treatment focusing on depression only. 24,25 While the evidence is not as strong for medical as for psychiatric morbidity, at

<table>
<thead>
<tr>
<th>Subject ID:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>For each question below, please circle the number corresponding most accurately to your sleep patterns in the LAST MONTH. For the first three questions, please rate the SEVERITY of your sleep difficulties. 1. Difficulty falling asleep:</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2. Difficulty staying asleep:</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3. Problem waking up too early in the morning:</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4. How SATISFIED/dissatisfied are you with your current sleep pattern?</td>
<td></td>
</tr>
<tr>
<td>Very Satisfied</td>
<td>Satisfied</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g., daytime fatigue, ability to function at work/daily chores, concentration, memory, mood).</td>
<td></td>
</tr>
<tr>
<td>Not at all Interfering</td>
<td>A Little Interfering</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6. How NOTICABLE to others do you think your sleeping problem is in terms of impairing the quality of your life?</td>
<td></td>
</tr>
<tr>
<td>Not at all Noticeable</td>
<td>A little Noticeable</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7. How WORRIED/distressed are you about your current sleep problem?</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>A Little</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Guidelines for Scoring/Interpretation:**

Add scores for all seven items = __________ (Total score ranges from 0-28)

0-7 = No clinically significant insomnia; 8-14 = Subthreshold insomnia; 15-21 = Clinical insomnia (moderate severity); 22-28 = Clinical insomnia (severe)

least 2 longitudinal studies have shown that chronic insomnia increases the long-term risk of cardiovascular morbidity.

Economic burden

Chronic insomnia carries significant economic burden for the health-care system and for society at large. A longitudinal study conducted with 6599 working persons (40-45 years old) in Norway19 found that insomnia was a strong predictor of permanent work disability (odds ratio = 4.56), even after controlling for baseline exposure to disability and sick leave, sleep duration, as well as for other possible confounders.

A recent study by Daley et al16 estimated the total annual cost of insomnia in the province of Quebec alone to be $6.6 billion. This total included direct costs associated with healthcare consultations and products used to promote sleep (prescribed and over-the-counter medications and alcohol), as well as indirect costs resulting from loss of resources (absenteeism and reduced productivity) associated with insomnia. The average annual per-person costs (direct and indirect costs combined) were $5010 for individuals with an insomnia disorder and $1431 for those with subsyndromal insomnia, relative to $424 for good sleepers. The burden of illness in terms of adverse impacts on resources lost (indirect costs) was 10-fold higher than the direct costs spent for treating insomnia (ie, healthcare consultations, medications, etc; Figure 2). Thus, huge sums of money are spent annually to promote sleep, but much more is lost for untreated insomnia.

Table 3 outlines the characteristics and health-related burdens of individuals with insomnia.

Conclusion

Insomnia is a significant and prevalent public health problem. It may present as an independent disorder, but more often it is comorbid with another medical or psychiatric disorder. It is often a persistent condition that can lead to negative long-term outcomes both for mental and physical health. It is therefore important to recognize and treat sleep/insomnia complaints early on so as to reduce psychosocial and health morbidity.

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References


ABSTRACT OF INTEREST

The consensus sleep diary: standardizing prospective sleep self-monitoring.

Carney CE, Buysse DJ, Ancoli-Israel S, Edinger JD, Krystal AD, Lichstein KL, Morin CM.

STUDY OBJECTIVES: To present an expert consensus, standardized, patient-informed sleep diary.

METHODS AND RESULTS: Sleep diaries from the original expert panel of 25 attendees of the Pittsburgh Assessment Conference(1) were collected and reviewed. A smaller subset of experts formed a committee and reviewed the compiled diaries. Items deemed essential were included in a Core sleep diary, and those deemed optional were retained for an expanded diary. Secondly, optional items would be available in other versions. A draft of the Core and optional versions along with a feedback questionnaire were sent to members of the Pittsburgh Assessment Conference. The feedback from the group was integrated and the diary drafts were subjected to 6 focus groups composed of good sleepers, people with insomnia, and people with sleep apnea. The data were summarized into themes and changes to the drafts were made in response to the focus groups. The resultant draft was evaluated by another focus group and subjected to lexile analyses. The lexile analyses suggested that the Core diary instructions are at a sixth-grade reading level and the Core diary was written at a third-grade reading level.

CONCLUSIONS: The Consensus Sleep Diary was the result of collaborations with insomnia experts and potential users. The adoption of a standard sleep diary for insomnia will facilitate comparisons across studies and advance the field. The proposed diary is intended as a living document which still needs to be tested, refined, and validated.


UPCOMING CONFERENCES

June 9 – 13, 2012
SLEEP 2012: 26th Annual Meeting of the Associated Professional Sleep Societies, LLC
Boston, Massachusetts
CONTACT: Website: http://www.sleepmeeting.org
Telephone: (630) 737-9700
Fax: (630) 737-9789

September 4 – 8, 2012
21st Congress of the European Sleep Research Society
Paris, France
CONTACT: Website: http://www.congres.ch/essr2012
Telephone: +41 61 686 77 77
Fax: +41 61 686 77 88

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