

# Evaluation and Management of Sleep Disorders in the Hand Surgery Patient

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Despite posing a significant public health threat, sleep disorders remain poorly understood and often underdiagnosed and mismanaged. Although sleep disorders are seemingly unrelated, hand surgeons should be mindful of these because numerous conditions of the upper extremity have known associations with sleep disturbances that can adversely affect patient function and satisfaction. In addition, patients with sleep disorders are at significantly higher risk for severe, even life-threatening medical comorbidities, further amplifying the role of hand surgeons in the recognition of this condition. (*J Hand Surg Am. 2016;41(10):1019–1026. Copyright © 2016 by the American Society for Surgery of the Hand. All rights reserved.*)

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SLEEP DISORDERS ARE A MAJOR public health concern, affecting as many as 70 million adults in the United States alone, while accounting for billions of dollars in financial costs, disability, and even death.<sup>1–5</sup> Sleep disorders are also associated with a myriad of medical conditions including obesity, hypertension, diabetes, heart disease,<sup>6</sup> mood disorders, and overall higher mortality risk.<sup>6</sup>

Despite exorbitant socioeconomic and health costs, sleep disorders are often overlooked or improperly treated.<sup>7,8</sup> In the field of hand surgery, numerous conditions have known associations with sleep disorders, and sleep deprivation can adversely affect patient outcomes, function, and satisfaction. Thus, sleep disorders are important for hand surgeons to recognize and refer to appropriate providers. In addition, as

economic and policy-driven factors continue to incentivize hand surgery in the ambulatory setting, surgeons will increasingly be called upon to primarily manage intraoperative and postoperative pain regimens that are often tied closely with various sleep disorders. The purpose of this review is to provide an overview of sleep disorders that are most common in hand surgery, with a focus on the preoperative evaluation and perioperative management of these disorders.

## SLEEP DISORDERS IN HAND SURGERY

This discussion focuses primarily on 2 classes of disorders most relevant to hand surgery: (1) *dyssomnias*, which are disorders that produce excessive sleepiness or difficulty in initiating or maintaining sleep and (2) sleep disorders associated with other medical disorders.<sup>9</sup> A more inclusive outline of general sleep disorders is presented in [Figure 1](#).

### Intrinsic dyssomnias

Intrinsic dyssomnias either (1) originate or develop within the body or (2) arise from causes within the body.<sup>9</sup> This group includes psychological or medical disorders that *produce* a primary sleep disorder.

**Obstructive sleep apnea:** Perhaps the most widely recognized intrinsic dyssomnia in surgical patients is obstructive sleep apnea (OSA). Patients with OSA are

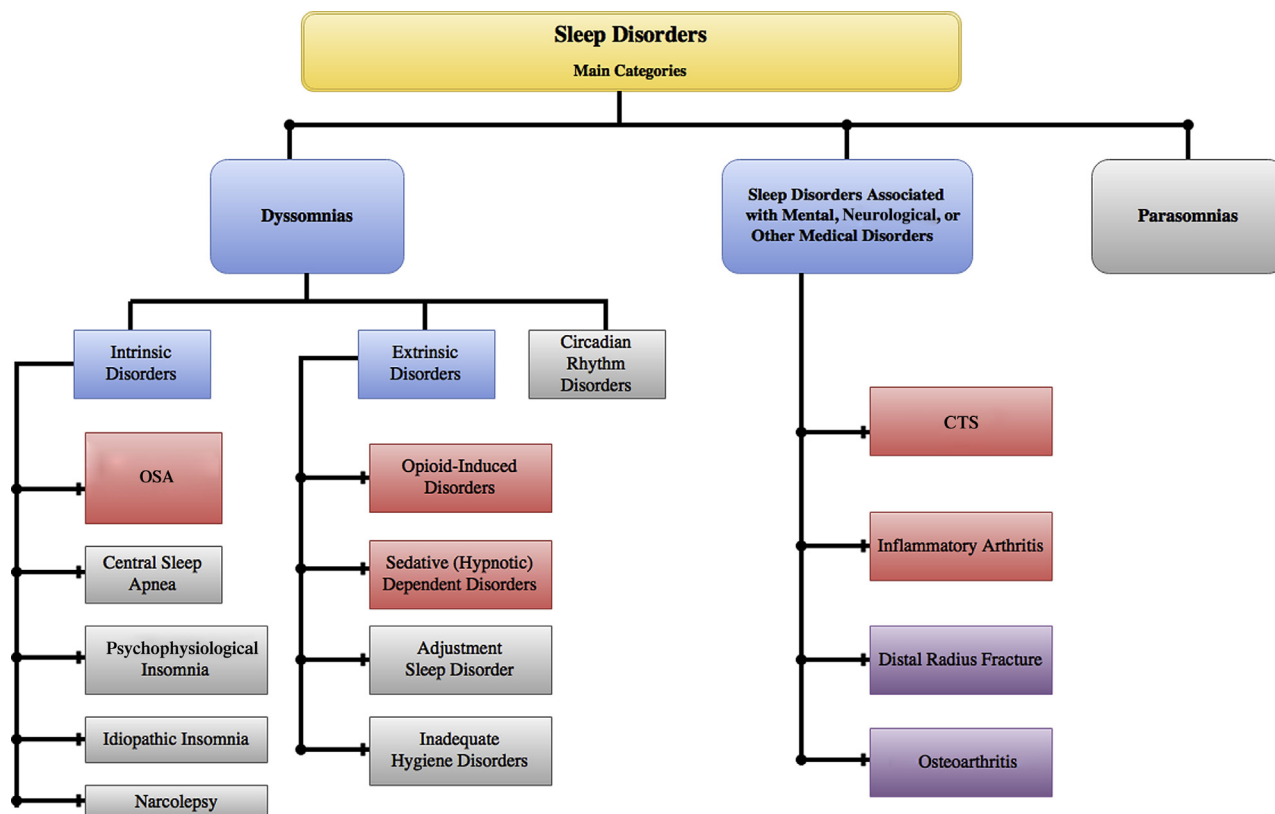
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**FIGURE 1:** Flow chart outlines the key types of sleep disorders relative to hand surgery in the context of a broader overview of all sleep disorder categories. The first level represents the 3 main categories of sleep disorders. Note that boxes in gray are not relevant to this discussion, those in red highlight the key types of sleep disorders known to be related to hand surgery patients, and those in purple represent conditions that are likely to be associated with sleep disorders based on current evidence. CTS, carpal tunnel syndrome; OSA, obstructive sleep apnea.

at a significantly higher risk for adverse events in the perioperative period than non-OSA patients; optimal management should entail communication between the anesthesiologist and the hand surgeon prior to the date of surgery. Among the first considerations for discussion should be regarding the physical setting of surgery. With surgery being increasingly performed on an outpatient basis, the suitability of OSA patients as candidates for ambulatory surgery has been debated.<sup>10–13</sup> Whereas this decision may ultimately be determined by the comfort levels of the surgeon and anesthesiologist, newer evidence suggests that even moderate-to-severe OSA patients may be appropriate for ambulatory surgery when the proper precautions are taken.<sup>10,14</sup> However, even in experienced hands, precautionary measures should be in place that include means for efficient transfer should a patient require a higher level of care or inpatient admission.<sup>15</sup>

For patients with a known history of OSA, the optimal management approach should address all stages of care including the intraoperative, immediate postoperative, and subacute postoperative (postdischarge home) periods. During surgery, a primary concern is

airway management owing to the OSA patient's inherent decreased ability to protect her or his own airway.<sup>16,17</sup> Because of these risks, local and regional anesthesia are almost always favored over general anesthesia because these techniques will obviate the need for airway manipulation as well as the use of muscle relaxants, hypnotic-sedatives, and opioids, which can all worsen airway obstruction. As a secondary benefit, these techniques provide postoperative analgesia and may attenuate the postoperative opioid requirement.

If a broader or more proximal field of coverage (such as the elbow) is desired, our preferred method of regional anesthesia in OSA patients is the infraclavicular or axillary approach to the brachial plexus.<sup>18</sup> Although its likelihood of success is somewhat diminished in obese patients,<sup>19</sup> newer techniques including ultrasound guidance continue to make this a favorable option.<sup>20</sup> More distal nerve blocks may be used to augment the effects of an infraclavicular block<sup>21</sup> or as the primary means of anaesthesia<sup>22</sup> and have even been reported to provide superior patient satisfaction to brachial plexus blocks by obviating the

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