

## Recharge Overview - Part III

### Complementary and Integrative Health Approaches

According to data from the 2007 National Health Interview Survey (NHIS), 45% of adults with insomnia symptoms had turned to complementary and integrative health (CIH) approaches in the past year.<sup>1</sup> The 2002 NHIS found that 65% of those using CIH for sleep had tried at least one herbal remedy.<sup>2</sup> Many patients do not disclose their use of complementary therapies, so clinicians ask their patients about them. Clinicians should also have sufficient knowledge to help guide patients<sup>3</sup>.

### Aromatherapy

Aromatherapy, the use of aromatic oils from plant compounds, has been studied as an insomnia intervention. It is low-risk and may improve sleep quality. In a single blinded, randomized crossover pilot study of 10 study participants with insomnia defined by a PSQI score of five or greater, either lavender oil or sweet almond oil (the control) was administered by a vaporizer during sleep. The results were confounded by some of the study participants turning off the vaporizer upon going to bed, but nonetheless, significant improvement in the primary outcome measure (PSQI) was seen in those who inhaled lavender oil.<sup>4</sup> In another study of patients hospitalized with ischemic heart disease, lavender oil aromatherapy was associated with statistically significant ( $p < .001$ ) improvements in self-rated sleep quality, as measured by a self-rating scale. In this study, a few drops of lavender oil were placed on a cotton ball on a bedside table about 20 centimeters from the sleeping study participant's head.<sup>5</sup>

### Dietary supplements: Nonherbal Compounds

Supplements that may be beneficial for sleep include minerals, vitamins, botanicals, and precursors of neurotransmitters thought to be involved in the regulation of sleep onset.

**Note:** Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

**Magnesium.** Magnesium is an essential element that is often deficient in the standard American diet. Supplementation is well tolerated as long as renal function is normal and excessive accumulation does not occur. Magnesium has multiple physiological effects including sedative, anticonvulsant, antihypertensive and muscle-relaxant properties. Magnesium also may enhance the production of melatonin by the pineal gland.<sup>6</sup> Magnesium supplements are available in multiple formulations that differ mainly in terms of their likelihood of causing loose stools. Amino acid chelates of magnesium (chelated magnesium) are less likely to cause diarrhea. A typical dose is 300 milligrams two times daily.

**Precautions:** The first toxic side effect of magnesium is diarrhea. If this occurs, reduce the dose.

**Vitamin B12.** Vitamin B12 is a cofactor in synthesis of multiple neurotransmitters, including dopamine, serotonin and melatonin. B12 deficiency can result in depression and other neuropsychiatric disturbances. B12 supplementation has been reported to improve insomnia in a variety of settings.<sup>6</sup> B12 deficiency can be diagnosed through direct measurement of serum levels. In the face of low normal serum levels, an elevated methylmalonic acid (MMA) level suggests biochemical insufficiency and can be used as a more sensitive test. Supplementation can be accomplished through oral or sublingual methylcobalamin tablets dosed at 1 milligram daily, although in severe deficiency a period of parenteral therapy with cyanocobalamin may be appropriate.

**Precautions:** B12 is adequately excreted in the urine and rarely causes side effects except in renal failure.

**L-Tryptophan.** L-Tryptophan is an essential amino acid found in foods rich in protein including eggs, dairy, chicken, fish, tofu, soy, and nuts. Some studies have shown that taking L-tryptophan as a supplement may lead to increased sleepiness and decreased sleep latency. The typical dose to assist with sleep is 1 gram taken 20 minutes before bedtime.<sup>7</sup>

**Precautions:** In 1989 a batch of contaminated L-Tryptophan caused eosinophilia myalgia syndrome. Since then, that has *not* been a concern with this supplement. The most common side effects include GI symptoms such as gas, reflux, nausea, and vomiting, as well as headaches or dizziness. There is also a potential risk for serotonin syndrome as L-Tryptophan increases serotonin levels in the brain. Consider using with caution when taking other medicines that increase serotonin levels.<sup>7</sup>

**Melatonin.** Melatonin is secreted by the pineal gland in response to declining light levels. Its release is suppressed by light. It acts as the principal circadian signal transducer. Exogenous melatonin has been used for insomnia with varying results. A systematic review and meta-analysis of melatonin looked at 19 studies involving 1683 study participants with “sleep disorders”. Melatonin treatment significantly reduced sleep onset latency by 7 minutes, increase prolonged subjective sleep time by 8 minutes, and modest improvements in sleep quality.<sup>8</sup> Melatonin is especially effective in the setting of delayed sleep phase syndrome.<sup>9</sup> A review and meta-analysis of five trials including 91 adults and four trials including 226 children found that melatonin treatment advanced mean endogenous melatonin onset by 1.18 hours (95% CI 0.89-1.48) and clock hour of sleep onset by 0.67 hours (95% CI 0.45-0.89).

Melatonin is well tolerated; complaints of headache, nausea, and drowsiness have been noted by small numbers of study participants. The American Academy of Sleep Medicine recommends that timed use of melatonin for delayed sleep-wake cycle disorder, which often is the case in the people suffering from jet lag.<sup>3</sup>

Melatonin should be taken about 45 minutes before bedtime. The typical dose is 1-3 milligram(s), taken orally. Lower doses, such as 0.3 milligrams, may be more effective than higher doses. Sublingual tablets avoid first-pass metabolism and may be more effective than oral dosing.<sup>10</sup>



**Precautions:** Short-term use of melatonin is generally well-tolerated. It can theoretically affect blood pressure as well as testosterone and estrogen levels. Long-term use may lead to increased risk of bone fractures, and thus it is likely best used in the short-term and on an as needed basis.<sup>10</sup>

## **Dietary Supplements: Herbal remedies**

Herbs can be of benefit in addressing sleep complaints and insomnia. In contrast to pharmaceutical hypnotics, herbal remedies are generally free of significant respiratory depressant effects and generally have favorable toxicological profiles. Herbs have a widespread tradition of use, but rigorous well-controlled studies are generally not available for most herbs used for insomnia and sleep disturbances.<sup>6 11</sup>

**Kava kava.** Kava is derived from the dried rhizomes of the shrub *Piper methysticum*, which is native to the South Pacific, where the endogenous population has used the herb medicinally for centuries. Clinically, it was initially described as having a calming and relaxant effect with no impairment of consciousness. In contrast to many herbs, the psychotropic effects of kava are well understood and are related to substances called kavapyrones or kavalactones.<sup>12</sup> Kavapyrones act centrally as skeletal muscle relaxants and anticonvulsants. Pharmacologically relevant actions include gamma-aminobutyric acid (GABA) channel modulation and weak direct GABA agonist activity. Although primarily used for anxiety, kava may be useful in treating anxiety-related insomnia.<sup>13</sup>

At this point, however, high quality randomized controlled trials have not yet been conducted to show a clear association between kava kava and sleep quality.<sup>14</sup> Potential benefits of kava in treating anxiety and depression must be evaluated in light of the risk of hepatic and neurological toxicity when used long term and in high doses. Because of reports of hepatic toxicity, kava has been withdrawn from the market in much of the world, although it continues to be available in the United States. Individuals who use kava should be monitored appropriately for hepatic toxicity via liver function testing.<sup>12</sup>

**Precautions:** High doses of kava for prolonged periods of time have been associated with hepatotoxicity and liver failure. For this reason, this supplement has been taken off the market in Switzerland, Germany and Canada. More common side effects are gastrointestinal-related. Extrapramidal side effects are also possible.

**Valerian.** Valerian is derived from the dried roots of *Valeriana officinalis*, a small flowering shrub native to northern Europe. It has long been used for insomnia. Valerian is the herbal sleep remedy for which the greatest evidence base exists.<sup>13</sup> Valerian is recognized as being indicated for the treatment of insomnia and restlessness by the German Commission E. Pharmacologically, it appears to increase the availability of GABA in the synaptic cleft. Clinically, it seems to work best after 2-4 weeks of nightly administration two hours before bed. Dosage can be in the form of a tea made from 2-3 grams of dried herb or as an ethanolic extract at doses of 600 milligrams. Safety appears to be good with only mild adverse effects such as headache or morning grogginess reported in small numbers.

A systematic review and meta-analysis of valerian for sleep analyzed the results of 16 placebo-controlled clinical trials involving 1,093 patients.<sup>15</sup> While methodological problems and

variability among the studies made comparison difficult, the available evidence suggests that valerian may improve sleep quality without producing side effects. Moreover, it may be uniquely suited for longer-term treatment of chronic insomnia. It may need to be taken for a few weeks before it takes effect.

**Precautions:** Prolonged use of valerian can result in a benzodiazepine-like tolerance, which requires a slow taper when discontinuing. It is best not to use valerian and benzodiazepines in combination. Common side effects include headache and gastrointestinal intolerance.

**Chamomile.** Chamomile is derived from a member of the Aster family, *Matricaria recutita*, and it is one of the most commonly utilized herbal remedies in the United States. It is usually taken as a tea and is thought to be beneficial for indigestion and nervousness. It may be helpful with insomnia. A randomized controlled trial of chamomile in generalized anxiety disorder (GAD) suggested that it might be effective in treatment of mild to moderate GAD.<sup>16</sup> Chamomile occupies a place in English and United States herbal practice similar to that occupied by valerian in German practice. It is quite safe but can cause allergic reactions in people with allergies to other members of the Aster family, such as ragweed.

**Precautions:** The main side effect of chamomile is that it can trigger allergic reactions in some individuals.

**Herbal Teas.** Herbal teas are traditionally taken in the evening one to three hours prior to sleep. Widely available examples include “Sleepy Time,” a mixture of chamomile, spearmint and lemongrass and “Organic Bedtime Tea,” a combination of valerian, chamomile and passionflower, with licorice, cardamom and cinnamon added as flavorings. As with all teas, a single bag is usually steeped in a cup of hot water until the tea is brewed to taste.

## Whole Medical Systems+

**Traditional Chinese medicine (TCM).** Acupuncture is the most familiar component of TCM in the West. However, it is important to recognize that as a whole medical system, acupuncture is but one component in an approach that is inherently focused on lifestyle-based wellness and prevention practices. The theoretical basis for acupuncture is based on the concept of qi, a life force that is conceptualized to flow in channels or meridians in the body. The flow of qi in these meridians can be affected by insertion of fine needles at certain points on the body, thus helping correct imbalances that are postulated to result in physical or psychological symptoms. This conceptualization also includes neurohumoral mechanisms more consistent with current Western physiological models.

Acupuncture is widely utilized to support healthy sleep. In a systematic review of 46 randomized trials involving 3,811 study participants, acupuncture was shown to be safe and effective in the treatment of insomnia.<sup>17</sup> A Cochrane review of acupuncture for insomnia analyzed 33 trials with 2,293 participants<sup>18</sup>. Although acupuncture was associated with improvement in sleep measures, effect sizes were small, and the studies had methodological problems that limited their ability to draw reliable conclusions. Most recently, a systematic review assessing acupuncture’s association with sleep quality analyzed 30 studies involving a total of 2,363 participants. Results showed that acupuncture improved Pittsburgh Sleep Quality Index scores significantly more than placebo/sham as well as pharmacotherapy.<sup>19</sup> Refer to



[Passport to Whole Health](#) Chapter 18, “Whole Medical Systems,” for more about TCM and acupuncture.

**Homeopathy.** Homeopathy is often used to treat insomnia. Homeopathic preparations are widely available over the counter, and homeopathic physicians often treat insomnia. According to a systematic review of homeopathy for insomnia published in 2010,<sup>20</sup> four RCTs comparing homeopathic medications to placebo have been published. All involved small numbers of patients, had high withdrawal rates, and were statistically underpowered. Nonetheless, a trend toward benefit was demonstrated. No RCTs of treatment by a homeopathic physician have been reported, but observational studies suggest a benefit. Refer to [Passport to Whole Health](#) Chapter 18, “Whole Medical Systems,” for more about Homeopathy.

## Pharmacotherapy

In 2016, the American College of Physicians published a review of the literature related to pharmacological approaches to insomnia. The review, funded by the US Department of Health and Human Service’s Agency for Healthcare Research and Quality, included 35 randomized controlled trials. Findings pointed to low-to-moderate strength evidence that eszopiclone, zolpidem, and suvorexant improved short-term sleep outcomes compared to placebo. Evidence for other commonly used prescription medicines including benzodiazepines, melatonin agonists, and anti-depressants was insufficient or low strength.<sup>21</sup> Other evidence does suggest that low dose trazodone may also be effective for both primary and secondary insomnia.<sup>22</sup>

Sleep medications may be useful for transient and short-term insomnia and may be helpful in preventing them from progressing into chronic insomnia. However, sleep medications have only modest effects compared to placebo.<sup>23</sup> When conventional zolpidem (Ambien) 10 milligrams and 4 doses of eszopiclone (Lunesta) were compared to placebo, only higher doses of eszopiclone (2.5 and 3 milligrams) led to statistically significant improvements in sleep. The magnitude of the difference, while statistically significant, was small. For example, for eszopiclone at a 3 milligrams dose, the difference was only about 7 minutes, and this was the largest difference for all the sleep medications and doses tested. The primary outcome measure, latency (time) to persistent sleep (LPS) improved with both eszopiclone 3 milligrams and zolpidem compared to placebo. However, it only reduced LPS by 15.9 minutes. Side effects were more pronounced in the higher dose eszopiclone and zolpidem treatment compared to placebo.<sup>23</sup> In fact, over 50% of the benefit of sleep medications is likely to be attributable to the placebo effect.<sup>24</sup>

The literature also points to several significant concerns about initiating pharmacotherapy related to medication side effects. The American College of Physicians review referenced above reported that potential harms of these medications can include: confusion, dizziness, memory loss, morning sedation, falls, fractures, and motor vehicle accidents. These medications are also associated with increased all-cause mortality. In addition, these pharmaceuticals often lead to tolerance and dependence.<sup>21</sup> These concerns are particular germane to the elderly population.<sup>25</sup> Other increased risks associated with these medicines include behavioral parasomnias (sleep walking, sleep-related eating, etc.), worsening of untreated sleep apnea, and interactions with alcohol. All of these side effects must be considered in the risk–benefit analysis. A meta-analysis of sedative-hypnotic use in older people found the number needed to treat was 13 while the number needed to harm was 6.<sup>24</sup>

## Back to Our Patient Carl

After meeting with his clinical care team, Carl came up with several specific changes that have had significant benefits regarding his sleep and overall well-being. First, he has reduced his caffeine intake by gradually switching to decaffeinated coffee. Second, he and his wife agreed to redo their bedroom. They gave the TV in the bedroom to a local homeless shelter and bought a new mattress and good-quality cotton linens. They ripped up the old wall-to-wall carpet and discovered beautiful oak floors beneath, which Carl was able to restore easily. They try to leave the bedroom window open a little for fresh air.

Carl decreased his television watching in the evening and has been able to avoid napping after dinner. Instead of spending time on the computer doing social media, he does his community activism in person. He used his woodworking skills to build raised beds for a community garden.

For a time, Carl had trouble doing without his sleeping medication, but then he found that an herbal combination containing valerian and other botanicals was a good substitute. He has cut out beer except when he bowls with his new friends in the bowling league he and his wife just joined. He limits himself to just one or two drinks.

Even if he has an occasional bad night, he gets up at 6:30 a.m. each morning and goes for a walk-jog. He has lost 15 pounds and feels “10 years younger.” His wife wants to take some yoga classes at the local YMCA, and he thinks he may tag along. He is planning to run in a charity fun run in the spring. He adds, “Although I am sleeping a lot better, it is about so much more than sleep. With these changes I feel like I am more in control of my health. In a real way, I feel like I have my life back.”

## Integrative Health Tools

- [Botanical Medicines to Support Healthy Sleep and Rest](#)

## Resources

- [The National Sleep Foundation](#) website
- Information about [iRest® Yoga Nidra](#)
- [The Natural Medicines Comprehensive Database](#).
  - A tremendous resource for information on herbs and supplements. Mobile apps are also available. A subscription fee may be required.
- [Online MBSR courses](#) through the Oasis Institute at the University of Massachusetts School of Medicine
- [Guided Imagery programing](#)
- [Guided Imagery programing](#), which can be streamed for free!
- University of Wisconsin [Mindfulness Program guided practices](#) including body scan, breath awareness, yoga, tai chi, and practices for children

## Publications

- **Insomnia** by Rubin Naiman, PhD. In: Rakel D, ed. *Integrative Medicine, 4th ed.* Philadelphia, PA: Elsevier Saunders; 2018:74-85. Excellent review of an integrative approach to insomnia.



- **Healthy at Home: Get Well and Stay Well Without Prescriptions** by Tieraona Low Dog, M.D. Washington D.C.: National Geographic Society, 2014. Chapter 4 “Calming the Nerves, Strengthening the Nervous System” offers the perspective of a master herbalist on insomnia and related topics.

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