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FILE: ▪ Sleep Disorders

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RE: Review of Sleep Disorders and Natural Approaches to Treatment

Meletis CD, Zabriskie N. Natural approaches for optimal sleep. *Altern Complement Ther*. Aug. 2008;14(4):181-188.

Healthy sleep alternates between slow-wave, or non-rapid eye movement (REM) sleep, comprising about 75% of total sleep, and REM sleep, representing about 25%. REM sleep occurs briefly about every 90 minutes during sleep, with increased brain activity, dreaming, reduced muscle tone, variable heart and respiration rates, and REMs. Within non-REM sleep, four stages show progressive brain wave changes. Light sleep begins with alpha waves in stage 1, replaced with bursts of alpha-wave "sleep spindles" as sleep continues, then theta waves in stages 2 and 3, as deep sleep begins. In stages 3 and 4, delta waves begin to predominate, followed by beta waves in REM. Sleep is controlled by homeostatic and circadian processes that increase melatonin, decrease cortisol, and reduce core temperature. The hypothalamic-pituitary-adrenal (HPA) axis plays an important role, with over-expression of cortisol brought about by stress perhaps a common risk factor in sleep disorders (SD), anxiety, and depression. Sleep deficits cause neurobehavioral changes, accumulating over days of partial sleep loss.

Insomnia, the most common SD, can include difficulty getting to sleep or staying asleep, waking too early, or non-restorative sleep. Insomnia can produce daytime sleepiness and impairment. Accidents involving people with insomnia are a significant public health risk. Insomniacs are more likely to develop mood disorders and substance abuse. It is believed that 10-15% of adults have chronic insomnia with another 25-35% experiencing occasional insomnia. Women and the elderly are more likely to have insomnia. Rates are higher in widowed, divorced, or separated people; those who are less educated; have lower income; are unemployed; work nights or shifts; or have poor evening routines. In one study, over 40% of insomniacs had chronic pain. There is a strong association between insomnia and depression. Lifestyle factors such as cigarette smoking, especially at bedtime; alcohol; caffeine; naps; time in bed; and sleeping-in can contribute to insomnia. Benzodiazepine-receptor agonists and non-benzodiazepine hypnotics are used for insomnia, reducing sleep latency, but also decreasing REM and deep non-REM sleep. Behavioral therapy has been found just as effective for acute insomnia, and more effective for chronic. Restless leg syndrome (RLS), a neurological condition that compels leg movement at rest, is most prevalent in pregnancy, end-stage renal disease, iron-deficiency anemia, and attention deficit hyperactivity disorder (ADHD), and is familial in up to two-thirds of those affected. Conventional treatment uses dopamine agonists and, possibly, anticonvulsants and opioids. Sleep-disordered breathing, including snoring, upper-airway

resistance syndrome, and sleep apnea, is another type of SD. Half of patients with sleep-disordered breathing also have insomnia. Sleep apnea, with periods of breathing cessation and of reduced breathing, increases morbidity and mortality. High body mass index and large neck circumference increase risk, with obesity the strongest predictor. Obstructive sleep apnea is an independent risk factor for systemic hypertension, cardiovascular disease, stroke, and abnormal glucose metabolism. Therapy requires a nighttime continuous positive airway pressure device, or a dental appliance. Lifestyle changes, especially weight loss, sleeping on one's side, and avoiding alcohol and sedatives can significantly reduce severity of sleep apnea.

Many natural and herbal products may improve sleep. Human production of melatonin decreases with age. Supplementation significantly improved sleep quality, morning alertness, sleep-onset latency, and quality of life in insomniacs over 55; improved sleep in children with ADHD; and in insomnia associated with schizophrenia. In patients with SDs and mood disorders, both the amino acid L-tryptophan and its metabolite 5-hydroxytryptophan improved sleep. In one study, best effects were in patients with mild insomnia and normal patients with longer-than-usual sleep latency. Unlike benzodiazepine, L-tryptophan doesn't alter sleep stages or brain activity, impair performance, or raise waking thresholds. Gamma-aminobutyric acid (GABA), the main inhibitory neurotransmitter of the central nervous system, favors sleep, with electroencephalograms suggesting it induces relaxation and reduces anxiety. L-theanine, an amino acid in green tea (*Camellia sinensis*), increases brain serotonin, dopamine, and GABA. Vitamin B12 may normalize the sleep-wake cycle. Persons with RLS have benefited from iron and folic acid supplementation. One study found reduced RLS symptoms after oral magnesium therapy. Botanicals that improve sleep include valerian (*Valeriana officinalis*), sometimes used with hops (*Humulus lupulus*); lemon balm (*Melissa officinalis*); and passionflower (*Passiflora incarnata*). In one study, sleep improvement with valerian was most notable among smokers, frequently poor sleepers, and those who usually took a long time to fall asleep. Terpenes in lemon balm's essential oils are thought to act on neurotransmitters such as GABA in the brain, with a calming effect. In one study, combining valerian and lemon balm produced improvements in amount and quality of sleep. Passionflower was formerly an over-the-counter (OTC) sleep aid in the US, and although few studies have examined it in SDs, one double-blind randomized trial found it comparable to the benzodiazepine oxazepam in treating anxiety, with slower onset of action but significantly less job performance impairment.

— Mariann Garner-Wizard

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