

Created by Catherine Siengskun, PT, PhD<sup>1</sup> and Kenneth L Miller, PT, DPT, GCS, CEEAA<sup>2,3</sup>

1. Associate Professor, Physical Therapy and Rehabilitation Science Department, Director of Sleep, Health and Wellness Lab, University of Kansas Medical Center
2. Adjunct Professor. Doctor of Physical Therapy Program, Touro College
3. Clinical Educator, Catholic Home Care

### Acknowledgments

**Home Health Section Practice Committee:**

Kenneth L Miller, PT, DPT, GCS, CEEAA, Chair

**Executive Committee:**

Dee Kornetti, PT, MA, President

Chris Chimentil, PT, MS Vice-President

Matt Janes, PT, DPT, MHS, OCS, Secretary

Phil Goldsmith, PT, DScPT, COS-C, Treasurer

Robin Childers, CAE, Executive Director

**Disclaimer:** This educational resource uses examples that are not meant to be absolute in determining medical necessity. Every patient is unique and scenarios used in this educational resource are merely examples to guide home health clinicians in practice. The entire assessment of a patient's unique and qualifying factors during a Start of Care (SOC) or evaluation visit must support medical necessity. This resource reflects regulations, evidence, and best practices at the time that it was created. Individual clinicians should always confirm current regulations, evidence, and best practices with the original sources of this information prior to applying recommendations made here.

## Table of Contents

*Click the topic for redirection to the appropriate page in the PDF.*

2	Acknowledgments
3	Introduction
5	Sleep Decision Tree
6	Medications that may impact sleep
7	Table 1. Medications Impacting Sleep Health
12	Methods to Promote Sleep Health
16	Resources & References

### Introduction

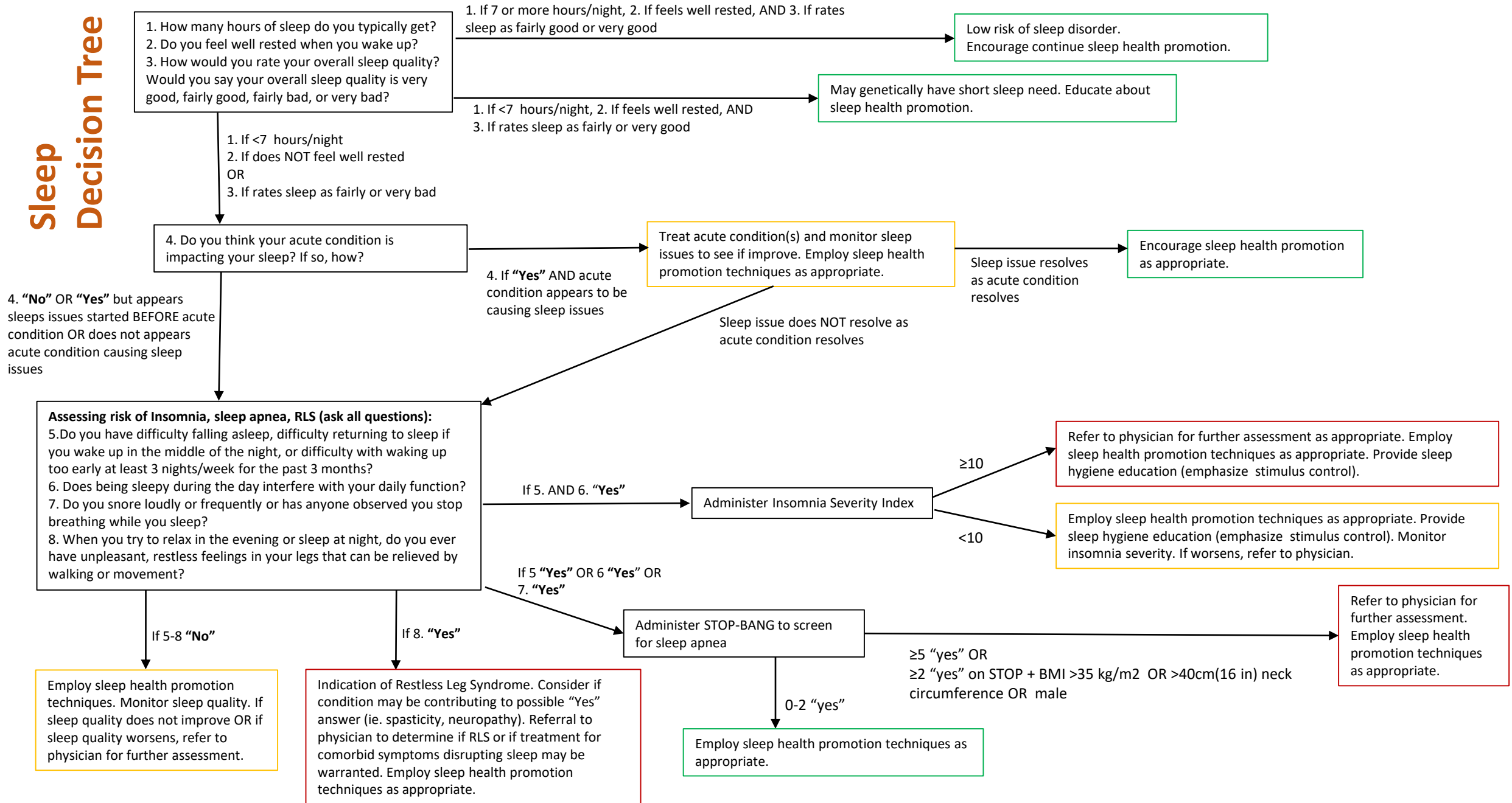
Nearly a third of all adults in the US experience disturbed sleep, and approximately 50% of older adults report difficulty sleeping. Insomnia, sleep apnea, and restless legs syndrome are the three most common sleep disorders in adults in the US. The prevalence of chronic sleep disturbances is likely underreported as 90% of sleep issues are undiagnosed, which provides an excellent rationale for why health care providers should regularly screen their clients for common sleep disorders, refer to the appropriate health care provider as indicated, and provide clients with methods to improve sleep health within their scope of practice.

Proper sleep duration and quality is critical for proper functioning of the body. Chronic sleep disturbances can have detrimental effects including reduced physical and cognitive functioning, learning ability, and quality of life and increase pain sensitization, depression, anxiety, and risk for injury and falls. Furthermore, chronic sleep disturbances have been associated with an increased risk of obesity, diabetes, cardiovascular disease, Alzheimer's disease, and mortality. Improving sleep health provides an excellent opportunity for health care providers to impact their clients' health and wellbeing.

Many physical therapists agree that poor sleep quality is associated with impaired function. Many physical therapists report not having any education in their entry level training or following graduation related to assessing patient sleep. Physical therapists working in home care have a unique opportunity to address sleep disorders by assessing the very locations patients use for sleeping and providing non-pharmacological interventions where appropriate.

The purpose of this sleep kit is to provide resources for screening for sleep disorders and non-pharmacological interventions that physical therapists can provide in the home setting.

# Sleep Decision Tree



### Medications that May Impact Sleep

Many medications used to treat medical and psychiatric conditions also contribute to sleep disruptions, including  $\beta$ -blockers, bronchodilators, corticosteroids, decongestants and diuretics, as well as other cardiovascular, neurologic, psychiatric, and gastrointestinal medications. Medications used to treat depression, such as selective serotonin reuptake inhibitors (SSRIs) and serotonergic and noradrenergic reuptake inhibitors (SNRIs) may also cause or exacerbate insomnia. In addition to prescription medications, older adults often take over the counter preparations which can cause or exacerbate sleep disturbances. Examples include cough and “cold” medications, especially those containing pseudoephedrine or phenylpropanolamine, any caffeine-containing drugs (e.g. acetaminophen/aspirin/caffeine combinations), and drugs containing nicotine (e.g. nicotine gum or transdermal (patches)). Nicotine and caffeine may impair sleep as well.

Many medications are prescribed for the treatment of sleep disorders including: prescription meds, over-the-counter meds and supplements such as melatonin. Specific medication classes have been approved for use as sleep aids and others are used off label for sleep promotion due to known effects on sleep. Some of these medications are found on the Beers Criteria which is a list of medications that are potentially inappropriate for the older adult population.

**Table 1. Medications Impacting Sleep Health**

Drug Class	Drug	Type of Sleep Disorder	Mechanism of Action	Possible Side Effects	2015 Beers Criteria
<b>Hypnotics: Benzodiazepines</b>					
Benzodiazepines	Examples: Clonazepam (Klonopin) Diazepam (Valium) Temazepam (Restoril) Estazolam Alprazolam (Xanax) Lorazepam (Ativan)	Short-term insomnia Parasomnias Bruxism (teeth grinding)	Generally, increases inhibitory effects of GABA; some bind receptors in the limbic system and reticular formation	Respiratory depression, ante grade amnesia, confusion, drowsiness, dizziness, increased saliva production, or change in sex drive/ability may occur.	Avoid
<b>Hypnotics: Non-Benzodiazepines</b>					
Sedative/Hypnotic	Zaleplon (Sonata)	Short-term insomnia – for trouble falling asleep	GABA-BZD receptor complex agonist	Dizziness, drowsiness, short-term memory loss, or lack of coordination may occur, especially during the first 2 hours after taking the medication. May cause withdrawal reactions, especially if it has been used regularly for a long time (more than a few weeks) or in high doses. In such cases, withdrawal symptoms (such as unusual depressed/anxious mood, stomach/muscle cramps, vomiting, sweating, shakiness, or seizures) may occur if stopped suddenly.	Avoid

Sedative/Hypnotic	Eszopiclone (Lunesta)	Short-term insomnia	Interacts with GABA receptor at binding domains	Dizziness, dry mouth, unpleasant taste, or difficulty with coordination may occur. Sleepiness during the day, “sleep-driving”, memory loss, mental/mood behavior changes, aggression, anxiety, agitation, hallucinations, thoughts of suicide.	Avoid
Sedative/Hypnotic/Insomnia	Ambien (zolpidem)	Insomnia – sleep initiation, Intermezzo	Selective antagonism of GABA receptor, decrease neuronal excitability	Idiosyncratic daytime sleepiness, antegrade amnesia	Avoid
Hypnotic - Orexin receptor antagonists	The only approved drug in this class is suvorexant (Belsomra).	Insomnia characterized by difficulties with sleep onset and/or sleep maintenance	Orexins are chemicals that are involved in regulating the sleep-wake cycle and play a role in keeping people awake.	Contraindication - Narcolepsy	Not Listed
Hypnotic - Melatonin receptor stimulator	Ramelteon (Rozerem)	Insomnia for difficulty falling asleep Facilitates sleep onset	Binds to melatonin receptors in the hypothalamus. It works by targeting the sleep-wake cycle, not by depressing the central nervous system.	Rozerem can be prescribed for long term use, and the drug has shown no evidence of abuse or dependence. Dizziness, fatigue, headache, lower risk of next day “hangover” symptoms.	Not Listed
<b>Sleep Aid</b>					
Melatonin	Melatonin	Insomnia- difficulty falling asleep or staying asleep	Naturally occurring hormone produced by the pineal gland. Regulates sleep cycle.	Abdominal cramps, decreased alertness, circadian rhythm disruption, daytime fatigue, depression, dizziness, drowsiness.	Not Listed



<b>Anticonvulsants</b>					
Anticonvulsant, Other	Carbamazepine (Tegretol - Carbatrol)	These drugs may be used to treat nocturnal eating syndrome, restless legs syndrome, periodic limb movement disorder, and insomnia related to bipolar disorder.	Each drug has individual effects. Tegretol stabilizes inactivated state of sodium channels making neurons less excitable.	Ataxia, dizziness, drowsiness, nausea, vomiting.	Not Listed
Anticonvulsant, Other	Valproate (Depakene, Depakote)	These drugs may be used to treat nocturnal eating syndrome, restless legs syndrome, periodic limb movement disorder, and insomnia related to bipolar disorder.	Depakote may increase levels of GABA in brain and mimic GABA at postsynaptic receptor sites and inhibit sodium and calcium channels.	Nausea, headache, asthenia, vomiting, somnolence, tremor, dizziness, abdominal pain, diplopia, anorexia.	Not listed
Gabapentenoids	Gabapentin (Neurontin) Gabapentin enacarbil (Horizant)	Insomnia	Neurontin: mechanism for analgesic and anticonvulsant activity unknown	Ataxia, dizziness, drowsiness, fatigue, somnolence.	Avoid
	Pregabalin (Lyrica)	Insomnia	Pregabalin: GABA analogue binds to calcium channel not sodium channels, opiate receptors, cyclooxygenase enzyme activity	Dizziness, somnolence, peripheral edema, ataxia, fatigue, xerostomia, weight gain, tremor, blurred vision, diplopia.	Not listed
<b>CNS Depressants</b>					
CNS Depressants	Sodium oxybate (Xyrem)	Control excessive daytime sleepiness and loss of muscle control in people with narcolepsy	Metabolite of GABA, GABA actions at noradrenergic and dopaminergic neurons and thalamocortical neurons	Seizures, respiratory depression, decreased level of consciousness, coma and death	Not listed

<b>Antidepressants</b>					
Antidepressants (non SSRI, non-Tricyclic)	Trazodone (Desyrel)	Treats sleeplessness and anxiety	Inhibits neuronal uptake of serotonin, histamine and alpha1- adrenergic receptor antagonist	Dizziness, dry mouth, headache, suicide	Not listed
	Mirtazapine (Remeron)	Insomnia	Stimulates norepinephrine and serotonin release, potent antagonist of serotonin and histamine receptors.	Somnolence, weight gain	Not listed
Tricyclic Antidepressant	Doxepin (Silenor)	Approved for use in people who have trouble staying asleep.	Silenor may help with sleep maintenance by blocking histamine receptors.	Do not take this drug unless you are able to get a full seven or eight hours of sleep. May result in morning drowsiness (increasing risk of falling)  Anticholinergic, extrapyramidal symptoms	Not listed
<b>Over-the-Counter Sleep Aids:</b>					
Antihistamines	Diphenhydramine (Benadryl) Tylenol PM Advil PM	Insomnia	Histamine receptor antagonist, anticholinergic effects.	They generally work well but can cause some drowsiness the next day. Confusion, falls, delirium	Avoid
<b>Anti-Parkinsonian</b>					
Dopamine replacement/Agonists	carbidopa/levodopa (Sinemet,) bromocriptine (Parlodel), ropinirole (Requip) rotigotine (Neupro), and pramipexole (Mirapex)	Restless Leg Syndrome/Periodic Limb Movement Disorder	Increases effect of dopaminergic neurons	Extrapyramidal symptoms	Not listed

<b>Anti-Narcoleptic</b>					
Stimulants	Modafinil (Provigil) Methylphenidate (Ritalin)	Used to improve daytime wakefulness in those who are shift workers or suffer from narcolepsy or sleep apnea	Unknown, may increase dopamine levels by binding to the dopamine transporter and inhibiting dopamine reuptake	Headache, nervousness, syncope, decreased appetite	Not listed

### Methods to Promote Sleep Health

There are several non-pharmacological interventions that can be utilized by health care providers to reduce sleep disturbances and improve sleep quality. Some of the interventions may be appropriate to provide or consider providing to all patients, with modifications to individualize the intervention as needed.

### Consider for All Patients

#### Education

1. Attempt to *reassure sleep disruptions may occur immediately following the onset or exacerbation* of the client's condition.
  - Pain, stress, and anxiety due to the onset or exacerbation of the client's condition can also contribute to sleep disturbances.
  - Discuss with your client that sleep is important for healing and recovery, so their body may need more rest and sleep following onset or exacerbation of their condition.
  - However, it is important to maintain good sleep hygiene as much as possible or return to good sleep hygiene as quickly as possible to reduce risk of developing or perpetuating sleep disturbances.
2. Attempt to *reassure a bad night of sleep may happen from time to time*, but to maintain good sleep hygiene. If excessive daytime sleepiness is a safety concern, take a nap, but limit the duration and return to good sleep hygiene practices as soon as possible.
3. *Education regarding good sleep hygiene.* Sleep hygiene refers to the behaviors and environment that promote optimal sleep. The home health provider has an excellent opportunity to observe the sleeping environment and make recommendations to enhance the home sleeping environment (such as use of light-blocking curtains, set up of bedroom, noise reduction techniques, etc).
  - The depth and breadth of sleep hygiene education that should be provided will depend on the client's knowledge of good sleep hygiene, how much they practice good sleep hygiene techniques, their risk for sleep comorbid sleep disorders, and their overall sleep quality.
    - i. For those who report good sleep quality: Review sleep hygiene techniques and encourage them to continue.
    - ii. For those who report poor sleep quality due to poor sleep hygiene practices: Educate on sleep hygiene techniques including rationale for each component. Modify to individualize for each patient (see examples provided below). May need coaching for behavior change and implementation of good sleep hygiene.
  - Two of the most important sleep hygiene techniques are: 1. to maintain a regular sleep schedule (go to bed and wake up at the same time each day) and 2. stimulus control (associating the bed with quality sleep).
    - i. For stimulus control: educate clients that the bedroom is for sleep and sex only, and all other activities should be conducted outside the bed and preferably the bedroom. This allows the brain to associate

the bedroom with good consolidated sleep. The client should be instructed that rest that does not involve intention to sleep should be done outside of the bed and bedroom.

- If not able to fall sleep within 15-20 minutes OR if start to feel anxious about not being able to fall sleep, leave the bedroom and return only when sleepy enough to fall asleep. However, consider safety when providing this recommendation and modify as needed.
- ii. Stimulus control is an important technique for treating insomnia, and it is possible education about this technique prior to the development of insomnia may help reduce the risk of developing insomnia. Research is needed to verify this contention.
- Sleep hygiene techniques should be individualized for the person.
  - i. Example 1: if there are safety concerns about encouraging the client to get out of bed during the night due to inability to sleep, then the recommendation to do so should be modified. Rather than getting out of bed, relaxation techniques (such as diaphragmatic breathing, progressive muscle relaxation, and mindfulness) should be considered instead.
  - ii. Example 2: the person may need to temporarily extend their normal sleep schedule or take a nap following an injury or exacerbation of their condition to promote healing and recovery. Encourage the client to limit the extension to what is needed to feel rested and resume good sleep hygiene as soon as able.
  - iii. Example 3: sleep is typically recommended to occur in a bedroom in a bed. However, due to the client's condition or preference or home environment, the sleeping location may be elsewhere (for example, in the living room in a recliner). If that is the case, attempt to make the sleeping location as conducive for sleeping as possible.
  - iv. Example 4: if nocturia (frequent nighttime urination) is disrupting sleep, discuss limiting fluids in evening and avoiding caffeine/alcohol if appropriate. May focus on relaxation techniques to aid return to sleep. Consider referral to physician for evaluation and if medication type and timing could be contributing.

### *Positioning and mobility*

1. Home health care providers should observe the position the client typically sleeps in.
  - Education regarding comfortable sleeping positions or positioning using pillows, towels or other devices might be necessary.
  - If sleeping in side-lying position, consider placing a pillow between the knees for optimal positioning of the pelvis and lumbar spine. Consider using a towel roll to support the cervical spine.

- If sleeping supine, consider placing a pillow under the knee for positioning of the lumbar spine. If individual is at risk for obstructive sleep apnea, sleeping supine is not recommended.
  - Sleeping in a prone position is typically not recommended due to stress on the cervical spine.
  - If a painful condition is impacting the client's typical sleeping position, the health care provider may need to consider alternative positioning options.
2. Home health care providers should observe the client get in and out of bed (or sleeping location) to consider if addressing the functional limitations that may be impacting bed mobility is needed.
- A person may change positions several times throughout the night without waking up, but if bed mobility is limited, changing positions may be more difficult which may wake up the person and be more disruptive of sleep.
3. *Nocturia* (the need to urinate at nighttime) is a common issue which can disrupt sleep. Addressing functional limitations that may impact mobility to get to and from the bathroom or bedside commode should be considered.
- Better mobility would presumably lead to less time and effort required to complete bathroom activities, which may minimize wakefulness and improve the likelihood of quickly and easily falling back to sleep upon getting back into bed.
  - An assessment of fall risk while getting up to go to the bathroom at night should also be considered and modifications made as needed.

### Consider Appropriateness for Each Patient

#### *Relaxation techniques*

There are numerous relaxation techniques that can be used. Which technique(s) is chosen will depend on the clinician's knowledge of how to use and teach the skill as well as which technique(s) works best for the patient.

- Relaxation techniques can be incorporated into the bedtime routine to prepare for sleep and can be used to hasten return to sleep if wake up during the night.
- Two relaxation techniques that are fairly easy to teach and learn and are often used in physical therapy practice are *progressive muscle relaxation* (PMR) and *diaphragmatic breathing*. These two techniques are also easily done in a supine position, but can be done in any position if needed. PMR can be modified to perform only the relaxation portion while eliminating the contraction portion.
- Other techniques include autogenic training, imagery training, mindfulness, meditation, and meditative movement (yoga, qi gong, and tai chi).
- Key: consider which technique(s) your patient is interested in trying, the appropriateness of the technique for the patient, which technique(s) is actually relaxing for the patient, and if the patient will be able to consistently perform the technique(s). Also, practice while awake outside of the bedroom first so become proficient before trying to utilize at night when trying to fall asleep or return to sleep.
- Some patients will be interested in learning several techniques so they have options at their disposal, while others may need encouragement to try one of the techniques.

- Be aware that some patients may experience increased anxiety with relaxation techniques. This usually occurs in individuals with a history of panic disorders or high anxiety. If your client experiences increased anxiety, then consider trying another relaxation technique (they may not have heightened anxiety with each of the techniques).

### *Exercise*

Exercise has numerous health benefits and has been shown to increase the length and quality of sleep as well as reduce the use of sleep aid medication.

- Exercise is generally recommended to be completed in the morning or afternoon to reduce the risk of the increased in body temperature interfering with falling asleep. However, the 2013 Sleep in America poll found no differences in sleep outcomes between those who exercised close to bedtime compared to those who exercised earlier in the day. Therefore, the recommendation is “exercise is good, regardless of time of day”
- Do take into account each person’s ability and tolerance to exercise in general and consider how that exercise may impact sleep for that individual.

### Resources (including sleep hygiene education information):

1. "Sleep Health Promotion: Practical Information for Physical Therapists" by Siengsukon, Al-dughmi, and Stevens (2017) published in *Physical Therapy*
2. National Sleep Foundation <https://sleepfoundation.org/>
3. American Sleep Association <https://www.sleepassociation.org/>
4. American Academy of Sleep Medicine <http://sleepeducation.org/>
5. Centers for Disease Control and Prevention <https://www.cdc.gov/sleep/index.html>

### References

1. Siengsukon CF, Al-Dughmi M, Sharma NK. A survey of physical therapists' perception and attitude about sleep. *J Allied Health*. 2015;44(1):41-50.
2. Siengsukon CF, Al-dughmi M, Stevens S. Sleep Health Promotion: Practical Information for Physical Therapist Practice. *Physical Therapy*. 97(8): 826-836
3. Colten HR, Altevogt BM; Committee on Sleep Medicine and Research. *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*. Washington, DC: National Academies Press; 2006.
4. Crowley K. Sleep and sleep disorders in older adults. *Neuropsychol Rev*. 2011;21(1):41-53.
5. Foundation NS. *Sleep in America Poll: Adults Sleep Habits and Styles*. 2005; [https://sleepfoundation.org/sites/default/files/2005\\_summary\\_of\\_findings.pdf](https://sleepfoundation.org/sites/default/files/2005_summary_of_findings.pdf).
6. Centers for Disease Control and Prevention. *Insufficient sleep is a public health problem*. <http://www.cdc.gov/features/dssleep/>. Accessed 1/29/16.
7. National Sleep Foundation. *Sleep in America poll: adults' sleep habits and styles*. Available at: [https://sleepfoundation.org/sites/default/files/2005\\_summary\\_of\\_findings.pdf](https://sleepfoundation.org/sites/default/files/2005_summary_of_findings.pdf). Published March 2005. Accessed May 12, 2017.
8. National Sleep Foundation. *Sleep in America poll: exercise and sleep*. Available at: <https://sleepfoundation.org/sites/default/files/RPT336%20Summary%20of%20Findings%202%2020%202013.pdf>. Published February 20, 2013. Accessed May 12, 2017.
9. Morin CM, Belleville G, Bélanger L, Ivers H. The Insomnia Severity Index: Psychometric Indicators to Detect Insomnia Cases and Evaluate Treatment Response. *Sleep*. 2011;34(5):601-608.
10. Nagappa M, Liao P, Wong J, et al. Validation of the stop-bang questionnaire as a screening tool for obstructive sleep apnea among different populations: A systematic review and meta-Analysis. *PLoS One*. 2015;10(12).
11. Perlis, ML, Jungquist, C, Smith, MT, Posner, D. *Cognitive Behavioral Treatment of Insomnia: A session-by-session guide*. 2008. Springer: New York, NY.
12. Bloom HG, Ahmed I, Alessi CA, et al. NIH Public Access. *J Am Geriatr Soc*. 2009;57(5):761-789.
13. *Sleeping Pills (Prescription Drugs) for Sleep Problems*. 2005:53.
14. *Medications for Sleep Disorders Learn more about Sleep Disorders*. :56.
15. Cr A, Fda T. *Common Sleeping Pills: Ambien, Lunesta, Rozerem, and More*. 2007:16-17. Available at: <http://www.webmd.com/sleep-disorders/insomnia-medications>. Accessed October 12, 2017.



16. Pagel JF, Parnes BL. Medications for the Treatment of Sleep Disorders: An Overview. *Prim Care Companion J Clin Psychiatry*. 2001;3(3):118-125.
17. Pagel JF. Drug-Induced Hypersomnolence. *Sleep Med Clin*. 2017;12(3):383-393.
18. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc*. 2015;63(11):2227-2246.
19. Insomnia Severity Index: Bastien CH, Vallieres A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med*. 2001;2:297-307.
20. Stop-Bang: Chung F, Yegneswaran B, Liao P, et al. STOP questionnaire: a tool to screen patients for obstructive sleep apnea. *Anesthesiology*. 2008;108:812-821.