

Introduction

Insomnia is trouble falling asleep, staying asleep, waking up too early, or needing a medicine to sleep. Insomnia is not sleeping well.

- This guide covers the core features of CBTi. The information included are aspects of CBTi that have been shown by research to be helpful.
- It is designed to be used by anyone who needs help improving insomnia.
- Before starting CBTi it is best to consult with a healthcare provider who can provide an initial evaluation to make sure you have insomnia and not a different type of sleep disorder or a different medical or mental health condition. Your provider can also give you specific guidelines. For example, you may need to work through sleep restriction differently than described here if you have bipolar disorder, another sleep disorder besides insomnia, chronic pain, a seizure disorder or a general medical condition.
- It is also good to use this guide with the support of a healthcare provider.
- Finally, you should spend at least 6-8 weeks going through these topics repeatedly and using CBTi every day. You have probably had insomnia for a long time and it will require some time and effort to re-train your brain to be a good sleeper. It is possible. You can start by reading all the information or read one section each week. Once you finish going through it, restart at the beginning until you are skilled at CBTi. Six weeks is the usually the fastest you can really learn and apply CBTi but it may take longer. Stay with it! CBTi is powerful and helpful.

Cognitive behavioral therapy for insomnia (CBTi) is a treatment for insomnia. CBTi has been used as insomnia treatment for decades. There is evidence to support CBTi as a treatment for insomnia.

The American Academy of Sleep Medicine (AASM) provides guidance on treating insomnia. *Source: Morgenthaler T, Kramer M, Alessi C, et al. Practice parameters for the Psychological and Behavioral Treatment of Insomnia: an Update. An American Academy of Sleep Medicine Report. Sleep. 2006;29(11):1415-9.* The AASM defines a standard as something that is a generally accepted strategy which reflects a high degree of clinical certainty. The AASM defines a guideline as a strategy that reflects a moderate degree of clinical certainty.

- CBTi is successful for people with chronic insomnia. CBTi is successful for insomnia related to another problem. CBTi is successful in older adults and people who use sleeping pills. (AASM standard)
- Stimulus control therapy, relaxation training and cognitive behavioral therapy are successful treatments for insomnia. (AASM standard)
- Sleep restriction is helpful for insomnia. (AASM guideline)

The information provided on this website is my presentation of my research on CBTi. The original research articles are cited as “*Source:*”. It is updated over time as I re-review material or read new material. I also plan to add more information over time.

Record your sleep pattern before, during and after you work on CBTi.

Sleep Diary

Fill out before bed							
Date	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Naps							
Bedtime							
Fall asleep time							
Times awake overnight							
Wake up time							
Got out of bed time							
Total time asleep							
Total time in bed							
Calculated sleep efficiency							
Did you follow sleep stimulus control guidelines?							
Did you use relaxation if needed?							
POSITIVE sleep thought							

Cognitive behavioral therapy for insomnia (CBTi) is part cognitive and part behavioral. That is why it is called “cognitive behavioral”. Cognitive is what you think. Behavioral is what you do.

We will review cognitive topics and then behavioral topics. At the end of each topic there is a worksheet to strengthen your knowledge.

COGNITIVE Topics

- **Sleep and Insomnia Information**
- **Progressive Muscle Relaxation**
- **Sleep Related Thoughts**

BEHAVIORAL Topics

- **Stimulus Control**
- **Sleep Restriction**

COGNITIVE Topics:

- **Sleep and Insomnia Information**
- **Progressive Muscle Relaxation**
- **Sleep Related Thoughts**

Sleep and Insomnia Information Topic

- Sleep helps your memory.
- Sleep helps your brain function. Sleep helps you organize, make decisions, pay attention, use judgement, be motivated and control emotions.
- Sleep helps you have energy.

Sleep is driven by the circadian rhythm and periods of not sleeping. The circadian rhythm is the cycle of being awake during the daylight and ready for sleep at night. Periods of not sleeping causes sleepiness and drives the body to want to sleep again.

Sleep Stages:

- Non-REM Sleep: There are three categories of Non-REM sleep including N1, N2, N3. Non-REM sleep happens first when you go to sleep. N1 is the transition from being awake to falling asleep. If you wake up from N1 you may not realize you were asleep (but you were!). N3 sleep is deep sleep. N3 is the most difficult sleep stage to wake up from. If you wake out of N3 sleep you will feel groggy.
- REM Sleep: We dream during REM sleep. Our temperature goes up during REM sleep. REM sleep is the last part of the sleep cycle. When you wake up during or after REM sleep you will be somewhat groggy but less so than waking up from N3 sleep.

Sleep Cycles: One complete sleep cycle is going through Non-REM sleep and then REM sleep. One sleep cycle is 1.5 to 2 hours long. You have a few sleep cycles per night. It is normal to briefly wake up after a sleep cycle and then easily fall back to sleep.

Adults start with Non-REM sleep for 1 hour and then go to REM sleep for 30 to 60 minutes. Adults should try to sleep about 7 to 8 hours per night.

Sleep inertia is feeling groggy after waking up. It is the feeling that it is difficult to wake up and you want to fall back asleep. This is a normal transition from sleeping to being awake. Sleep inertia goes away with time, usually 20 to 40 minutes. It is normal to feel somewhat sleepy and groggy after first waking up. If your alarm goes off why you are in N3 deep sleep you may feel sleepier. If your alarm goes off after you finished REM sleep or you are in N1 sleep you may feel less groggy when you wake up. It is normal to feel somewhat groggy when you first wake up and each morning may vary somewhat.

What happens to your brain when you do not sleep well? Chronic sleep loss impacts the following parts of the brain the most.

1. Prefrontal Cortex. This is the area for complex thinking, organizing, decision making, attention, judgement and motivation.
2. Amygdala. This is the area for emotional control.
3. Striatum. This is the area for control of behavior.

When you lose sleep, it is difficult to get things done. When you lose sleep, you can feel irritable and frustrated. When you lose sleep, you can feel your emotions are more difficult to control. When you lose sleep, you can have worse memory, judgement,

motivation and balance in thinking.

Dr. Spielman talked about the steps involved that lead to insomnia in his 1986 paper. Insomnia happens because of three “p” words.

- **Predisposing**
- **Precipitating**
- **Perpetuating**

A person with insomnia is **predisposed** to get insomnia. This predisposition may be from genetics inherited from biological parents. This predisposition may be from life experiences that disrupted the circadian rhythm or ideal hormone levels. A person with insomnia likely had a **precipitating** event that caused the insomnia to start. This could be a positive or negative event. It could be related to personal health or life events. For example, pain from breaking a leg, being pregnant or the parent of a new baby, changing jobs, moving, hearing sad news or happy news can all change sleep for a short time. These can precipitate insomnia and make insomnia start happening. A person with chronic insomnia has **perpetuating** factors that prevent normal sleep from returning. Perpetuating factors may be napping during the day to catch up on sleep, spending too much time in bed while awake, going to bed or waking up at irregular times or starting to depend on using sleeping pills or substances.

Source: Spielman, A. Assessment of Insomnia. Clinical Psychology Review. 1986; volume 6:11-25.

Sleep Information WORKSHEET

What are three things that sleep helps us with?

What do you enjoy most about sleeping?

What is the stage of sleep that you may not realize you were even asleep?

What stage of sleep is deep sleep?

What stage of sleep is dream sleep?

What stage of sleep is the most difficult to wake up out of?

What is sleep inertia?

How does sleep inertia go away?

How long is the sleep cycle for an adult?

How long should most adults sleep each night

What do you struggle with the most when you have one night of bad sleep?

What do you struggle with the most when you have many nights of bad sleep?

Progressive Muscle Relaxation Topic

Having insomnia is stressful. It can cause negative thoughts about sleep. Having negative thoughts about sleep and makes it more difficult for insomnia to go away. What are your thoughts about sleep? Does thinking about sleep cause stress? Do you have negative thoughts about insomnia that quickly jump into your mind? Having negative thoughts about insomnia makes the problem worse. You have to push yourself to stop negative thoughts and start positive thinking. This can be very challenging.

Stress is linked to muscle tension. Progressive muscle relaxation is an exercise to calm the body and calm the mind. The goal of progressive muscle relaxation is to create a calm body and a calm mind. Progressive muscle relaxation helps you fall asleep. Progressive muscle relaxation was first proposed by Dr. Edmund Jacobson in 1908. Dr. Jacobson outlined the procedure for progressive muscle relaxation in his 1924 paper titled *The Technic of Progressive Relaxation*. Progress muscle relaxation is applied to many areas including sleep and insomnia.

Source: Jacobson E. The Technic of Progressive Relaxation. The Journal of Nervous and Mental Disease. 1924;60(6):568-578.

The steps for progressive muscle relaxation are:

1. Recognize the presence of muscular contraction even if it is very light.
2. Assess every muscle group of the body for tightness starting with the large muscle groups
3. Relax each muscle group. This can be done by first tightening the muscle group very tight and then letting go of 100% of the tension.
4. As a new muscle is relaxed, also relax all the other muscles that have been relaxed up to that point in the exercise.
5. Continue muscle group relaxation until full relaxation is achieved. This is

progressive muscle relaxation.

6. Once you learn full relaxation you may not need to proceed group by group and can go straight to full relaxation.

Learning the skills for progressive and full relaxation is challenging and important. Learning progressive muscle relaxation takes effort, time and practice.

One example of a progressive muscle relaxation order is below.

1. Right foot
2. Left foot + right foot
3. Right calf + left foot + right foot
4. Left calf + right calf + left foot + right foot
5. Right upper leg + left calf + right calf + left foot + right foot
6. Left upper leg + right upper leg + left calf + right calf + left foot + right foot
7. Hips + entire right leg + entire left leg + feet
8. Low back + hips + legs + feet
9. Mid back + low back + hips + legs + feet
10. Upper back + mid back + low back + hips + legs + feet
11. Shoulders + entire back + hips + legs + feet
12. Right hand + shoulders + back + hips + legs + feet
13. Left hand + right hand + shoulders + back + hips + legs + feet
14. Right arm + left hand + right hand + shoulders + back + hips + legs + feet
15. Left arm + right arm + hands + shoulders + back + hips + legs + feet
16. Chest + arms + hands + shoulders + back + hips + legs + feet
17. Neck (front and back) + entire upper body + entire lower body
18. Face (including the jaw to the forehead) + neck + upper body + lower body
19. Scalp + face + neck + upper body + lower body
20. Every muscle in the body at the same time

If you take 15 to 30 seconds to relax each muscle group the entire body relaxation will take 5 to 10 minutes.

You can first add tension. For example, wiggle the toes and then relax. Stretch the legs and then relax. Twist the back and then relax. Shrug the shoulders and then relax the shoulders. Bend the head in each direction and then relax the neck. Tighten the jaw and then relax. Wrinkle the forehead and then relax. Close the eyelids tight and then relax. Smile and then relax. Swallow and then relax. If you like you can play music during this time. You can place a warm compress on

the muscles you are working to relax. You can breathe deeply while relaxing. You can sense your muscles as becoming very heavy and sinking into the bed.

Progressive Relaxation WORKSHEET

What is the goal of progressive relaxation?

What are the steps for progressive muscle relaxation?

What does it take to learn how to be skilled at progressive muscle relaxation?

What is the order of muscles you would like to use in your progressive muscle relaxation?

Are you open to using progressive muscle relaxation?

What are your thoughts on using progressive muscle relaxation every night for 1 week, 2 weeks, 1 month?

Sleep Related Thoughts

Working on sleep thoughts is unique for each person. It is important to consider what the specific use is for you. Conquering sleep related thoughts is important for success. Many people with insomnia have concerns on their minds. These may be realistic stress reactions to ongoing problems or exaggerated concerns or imagined crises. Some say the only concern or anxiety is whether or not they will fall asleep or not. This can quickly turn into a vicious cycle of concerns getting in the way of sleeping and then a reinforced belief that sleep will not happen. Anxiety and stress causes more insomnia which causes more stress which causes more insomnia which causes more stress which causes more insomnia and so forth.

It is important to put these thoughts out of the mind and try to turn a thinking mind to a calm mind when it is time to fall asleep. Most of the time the sleep environment is boring for the rest of the senses, no sounds, no lights, no movement and so all of the sudden it is easier to focus on what is going on in the mind and remain involved with the external world in that way. It is important to allow the mind to rest, shut down and drift into sleep. It would be harder to fall asleep in a place with flashing lights, colors, sirens, strong smells, movement. It would be easier to fall asleep in a place that is calm. It would be harder to fall asleep with a mind that is thinking, reviewing, deciding, planning. It would be easier to fall asleep with a mind that is calm. Are there things that cause your mind to be active instead of calm? Does seeing the

clock light and time activate you? Does checking your cell phone activate you? Can you change those? Do you have automatic thoughts that are negative about sleep? When you wake up in the middle of the night or early in the morning do you jump to a racing and negative mind? Can you keep your mind calm? Would it help to use progressive muscle relaxation to keep your mind calm? Would it help to say a prayer, song, saying or poem? Would it help think about something boring as a distraction? Would it help to think about the details of a calm place you visit or imagined?

Please think about ways your mind gets activated. Please think of ways you can prevent your mind from becoming over-active. Please think of ways you can calm your mind if it does become overly active. Someone who specializes in providing CBTi may be able to help you work through this complicated topic.

Source: Spielman A., Caruso L., Glovinsky P., A Behavioral Perspective on Insomnia Treatment. Sleep Disorders. 1987;10(4):541-553.

BEHAVIORAL Topics

- **Stimulus Control**
- **Sleep Restriction**

Stimulus Control

Stimulus control is when a specific stimulus, a thing or event, causes a predictable response.

Stimulus control is found commonly in daily life and each person has different things and events that cause a stimulus control connection with a predictable response.

Stimulus control can be connected to good and bad responses.

- Smelling coffee leads to feeling more awake.
- Sitting at a work desk causes attention and motivation to work.
- Sitting in a recliner chair causes relaxation.
- Seeing a lighter causes a craving for a cigarette.
- Hearing someone else open a drink or unwrap a candy causes a desire for a soda pop or candy bar.
- Hearing the music from the ice cream truck causes a craving for ice cream.
- Experiencing a pet peeve automatically makes us respond in a strong negative way.
- A baby is given a pacifier and automatically feels comforted.

- The environment of a party (the music, lights, crowd of people) causes the desire to smile, talk and dance.
- The environment of a library (quietness, rows of books, smell, lighting) causes people to want to whisper, be quiet and think of others.
- The environment of a kitchen (the smells, sounds, look) causes us to think about food.

Stimulus control is all around you. Stimulus control happens all through your day.
Stimulus control impacts wakefulness and sleep.

The sleep area should be a stimulus that causes the predictable response of being sleepy and falling asleep.

If you lay awake in bed for more than 20 minutes, you have lost this connection of the bed causing sleepiness and falling asleep. In fact, you may have created a new connection for the sleep area to be a stimulus that causes a feeling of being awake! The opposite of what a you want!

Stimulus control connections are created by positive and negative rewards and routine behavior. Stimulus control connections can be created and changed. Dr. Bootzin wrote a paper in 1972 on stimulus control treatment for insomnia. He applied the principles of stimulus control to sleep. He showed in this first research paper on stimulus control treatment for insomnia that someone with insomnia could use behavior to create a positive stimulus control connection between the bed and sleep and in that way, improve sleep. In this 1972 paper the person with insomnia improved from waking up five times per night to zero times per night after two weeks of treatment. After that, the person woke up about once per night and was able to fall asleep. You remember from the topic on sleep information that waking up briefly through the night and easily falling back asleep is normal because we go through sleep cycles.

Source: Bootzin R.R., Stimulus control treatment for Insomnia. Proceedings, 80th Annual Convention, APA (1972) 395–396.

The rules Dr. Bootzin used are:

1. Lie down intending to go to sleep ONLY when you are sleepy.
2. Do NOT read or watch television in the bedroom.
3. If you find yourself unable to fall asleep GET UP and go into another room. Stay up as long as you wish and then return to the bedroom to sleep.
4. If you still cannot fall asleep, repeat Step 3. Do this as often as is necessary throughout the night.

It can be stressful to get out of bed when you want to be sleeping but the goal is to work hard for a few weeks to months and change your brain connections to be a good sleeper for years. If you are not falling asleep within 20 minutes or you cannot fall back asleep within 20 minutes after waking up in the middle of the night you need to get out of bed. You have to make a strong connection that the sleeping area is only for sleeping. Don't let your brain connect your sleeping area with being awake!

Sleep Stimulus Control WORKSHEET:

What is stimulus control?

What is an example of a stimulus control in your everyday life?

Do you have a strong association with your sleeping area and being sleepy and falling Asleep right away?

Are you open to trying sleep stimulus control?

What are the steps of sleep stimulus control that Dr. Bootzin designed?

Sleep Restriction

Sleep restriction is another behavior to help improve insomnia. Like stimulus control it can be scary but short-term sacrifice leads to long-term benefits.

Sleep restriction was described in 1983 in a research paper by Dr. Spielman, Dr. Saskin and Dr. Thorpy. In this paper, they showed that sleep restriction improved sleep efficiency from 68.9% to 88.3% and the total sleep time improved. This means that before treatment on average the sleepers were only sleeping about 70% of the total time they were lying in bed. After treatment on average the sleepers were sleeping about 90% of the total time they were lying in bed. They improved efficiency by 20% and slept more total time each night.

Source: Spielman AJ, Saskin P, Thorpy MJ. Sleep Restriction: A New Treatment of Insomnia. Sleep Res 1983; 12: 286.

Sleep restriction is important to efficient sleep so that you are asleep more of the time that you are in bed. Using sleep restriction helps you fall asleep faster and be awake less through the night. It seems odd that forcing yourself to sleep LESS for a period of time helps you sleep MORE in the long run but it really works! Doing sleep restriction

for a few weeks helps you sleep better for months and years if you keep up the rest of the good sleep behaviors and thoughts.

****Important:** Do not restrict your total sleep time to less than 5 hours. If you have any mental or medical health conditions talk to your healthcare provider about guidelines that may be specific to you. Sleep restriction may not be healthy if you have bipolar disorder, another sleep disorder, a seizure disorder, chronic pain or other health conditions or risk factors.

First, we will learn about sleep efficiency and then apply that to sleep restriction to improve sleep.

What is sleep efficiency? Sleep efficiency is the time you are asleep compared to the amount of time you are in bed. You can calculate this as a percentage by dividing the time you are asleep by the time you are in bed and then multiplying that by 200.

$\text{Time Asleep} / \text{Time in Bed} \times 100 = \% \text{ Sleep Efficiency}$

We will use the same example throughout this explanation on sleep efficiency and sleep restriction. Example:

Bedtime: 10 pm

Fall Asleep Time: 11 pm (it took 1 hour to fall asleep)

Awake: 2 am to 3 am (1 hour of being awake in the middle of the night)

Wake Up: 7 am (1 hour of lying awake in bed after waking up)

Out of Bed: 8 am

It took 1 hour to fall asleep, 1 hour of being awake in the middle of the night and 1 hour of being awake in the morning before getting out of bed. This is 3 hours of being in bed but not asleep and 7 hours of actually being asleep. The time asleep is 7 hours. The total time in bed is 10 hours.

The sleep efficiency calculation is:

$7 \text{ hours Time Asleep} / 10 \text{ hours Time In Bed} \times 100 = 70\% \text{ Sleep Efficiency}$

(7 divided by 10, then multiplied by 100, equals 70%)

The sleep efficiency can be calculated for each night over the last 5 nights, added together and then divided by 5 to get the average sleep efficiency for 5 nights. NOW ... what should you do about that number? The guidelines for this sleep restriction are from a 1987 paper on treatment of insomnia by the Dr. Spielman, Lauren Caruso, M.S. and Dr. Glovinsky. The goal is to get sleep efficiency greater than 85% to

90% or higher. If your sleep efficiency is greater than 85% on average for two weeks then you do not need to do sleep restriction.

1. Step 1: Collect information about your personal sleep by recording a sleep diary for two weeks. Calculate the sleep efficiency and total time asleep each night.
Example: In this example it is the same every night - 70% sleep efficiency and 7 hours asleep each night.
2. Step 2: Set a personal wake-up time based on the needed time to get up for the day. **The wake-up time should stay the same every day.**
Example: 8 am wake up time each day
3. Step 3: Take an average of the total time in bed from the collected sleep diary information.
Example: Sleep efficiency 70%, 7 hours asleep each night
4. Step 4: RESTRICT the time in bed to the average time actually asleep. Count back from the set wake-up time to figure out the new bedtime.
Example: Wake up time set at 8 am. Restricted to 7 hours in bed each night. Counting back from 8 am that means the new bedtime is 1 am.
5. Step 5: Continue to record sleep diaries. Stay with the restricted time until the sleep efficiency is 90% or greater.
6. Step 6: Once the sleep efficiency is 90% or greater increase the time in bed by 15 minutes by setting the bedtime 15 minutes earlier.
Example: New bedtime 12:45 am instead of 1 am
7. Step 7: Do not change the new sleep schedule for 5 days. If the sleep efficiency continues to be 90% or greater add back 15 minutes every 5 days until the sleep efficiency drops lower than 90%.
8. Step 8: If sleep efficiency is between 85% and 90% do not change the sleep time, total time in bed.
9. Step 9: If sleep efficiency drops below 85% on average for the last 5 days then decrease the total time in bed by 15 minutes.

Source: Spielman A., Caruso L., Glovinsky P., A Behavioral Perspective on Insomnia Treatment. Sleep Disorders. 1987;10(4):541-553.

After weeks of this hard work you will have efficient sleep AND a set wake up time and set bed time. It is important to keep a set wake up time. This work also helped you experiment and find out what is the best total sleep time for you each night. Maybe you found out that you are well rested and have good sleep efficiency at 7 hours per night and you should not be in bed longer than that each night. Maybe you found out that you continued to have high sleep efficiency until you reached 9 hours of sleep each night and you need to plan for 9 hours of time in bed and asleep each night.

Sleep Restriction WORKSHEET:

What has your sleep efficiency been for the past two weeks?

What is the concept of how sleep restriction works?

Do you need to restrict your sleep to improve your sleep efficiency?

Do you have any health conditions that would limit how you use sleep restriction?

What is a good time to set as your wake-up time?

How many hours should you restrict your sleep to?

This has been a review of the key features of CBTi. Three cognitive features including information, progressive relaxation and thoughts. Two behavioral features including sleep stimulus control and sleep restriction.

***Special note. This is a general outline of CBTi and an overview of the main features. There are many more specialized and specific treatments that are part of CBTi that may be right for you. If you are still having trouble with insomnia please find a CBTi specialist that can work with you and provide personal coaching to improve your sleep. If this application of CBTi is not enough you may have great benefit from working with a CBTi specialist.**

Stay tuned for added information with time.

There may be addition of:

- more cognitive and behavioral features
- information on sleep hygiene
- a review of research on CBTi being tested in large studies and special circumstances and populations
- other resources of CBTi
- other information

I may also continue to change the wording so the information is as simple and easy to read as possible.