

SLEEP

ABOUT SLEEP

Sleep clears the brain of waste.

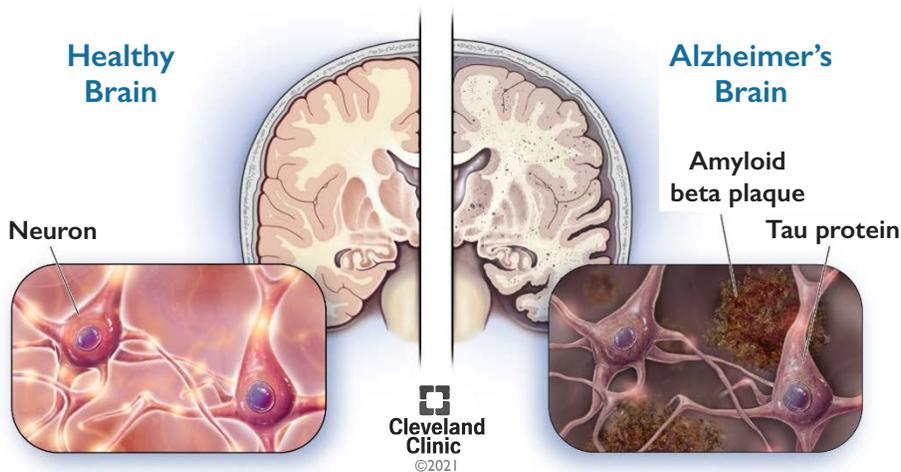
Amyloid beta is a protein that is produced during normal metabolic processes in the brain. It is a waste product that is removed by the glymphatic system, the brain's garbage disposal. During sleep, the glymphatic system washes the brain with cerebral spinal fluid (CSF). This rinse cycle, so to speak, clears away amyloid beta and other waste products from the brain.

In a healthy brain, amyloid beta is produced and removed at near-equal rates. If amyloid beta is produced too fast or removed too slowly, it will accumulate in the brain.

In Alzheimer's disease, amyloid beta clearance slows. It builds up in the brain and globs together into sticky plaques. The plaques cut off connections between brain cells and damage the brain. As more amyloid plaques accumulate, brain function gradually deteriorates.

The illustration below is a normal brain on the left and an Alzheimer's brain on the right. In the illustration on the right, note the amyloid beta plaques that form between neurons (brain cells) and the tau protein tangles that form inside the neurons.

Amyloid beta plaques and tau protein tangles are hallmark features of Alzheimer's disease.





SLEEP

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Sleep deprivation causes amyloid beta accumulation.

Sleep is so important for the removal of amyloid beta that even one night without sleep can cause it to increase in the brain.

In the following research study, 20 healthy participants between the ages of 22-72 had brain scans to determine the amount of amyloid beta that accumulated in the brain after a night without sleep compared to a night of rested sleep.

There was a 5% increase, on average, of amyloid beta after one night without sleep, regardless of the participants' age. This increase was not related to gender or ApoE4 status (genetic marker for Alzheimer's disease).

Amyloid beta was found to be clustered in the hippocampus and other areas of the brain. If amyloid beta continues to increase in the hippocampus, memory is typically affected.

Ehsan Shokri-Kojori, et al. β -Amyloid accumulation in the human brain after one night of sleep deprivation
Proceedings of the National Academy of Sciences Apr 2018, 115 (17) 4483-4488; DOI: 10.1073/pnas.1721694115

How much sleep do we need?

- Adults 18 to 64 need 7 to 9 hours of sleep per night
- Adults 65 and older need 7 to 8 hours per night

Is more sleep better?

In the Women's Health Initiative Memory Study, 7,444 women between the ages of 65-80 were evaluated for their risk of Mild Cognitive Impairment (MCI) and dementia based on how many hours of sleep they were getting.

Mild Cognitive Impairment (MCI) is the intermediate stage between normal aging and dementia when memory loss is noticeable and cognitive testing is abnormal.

Here is what they found in the Women's Health Initiative Memory Study:

- **Six hours or less of sleep** was associated with a **36% increased risk of MCI and dementia**
- **Eight hours or more of sleep** was associated with a **35% increased risk of MCI and dementia**

Conclusion: The ideal amount of sleep for older adults is between 7 to 8 hours per night.

Chen JC, Espeland MA, Brunner RL, et al. Sleep duration, cognitive decline, and dementia risk in older women. *Alzheimers Dement.* 2016;12(1):21-33.
doi:10.1016/j.jalz.2015.03.004



SLEEP

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What if you can't sleep?

If you are not sleeping well, start with good sleep hygiene. Take the sleep hygiene tips on pages 12-14 seriously. You can also try the foods, herbs, and supplements listed below for sleep.

If you are still struggling, Cognitive Behavioral Therapy for Insomnia (CBT-I) can help.

Benzodiazepines are medications prescribed for sleep and anxiety. Examples include alprazolam (Xanax), temazepam (Restoril), clonazepam (Klonopin), lorazepam (Ativan), and zolpidem (Ambien). These sedatives disrupt normal sleep architecture by reducing deep sleep, the stage of sleep when amyloid beta and other waste products are removed from the brain.

Benzodiazepines can cause cognitive impairment. They are also highly addictive. These medications should only be used if needed and for a short period of time.

FOODS FOR SLEEP

Instead of a melatonin supplement, eat some pistachios.

Pistachios were found to contain the highest amount of melatonin of all the foods tested in the study listed below. Eat 5 to 7 pistachios before bed to get a physiological dose of melatonin. Check the ingredients on the bag of pistachios and make sure there is no added sugar or salt.

The following foods contain some melatonin and may be beneficial for sleep if consumed at dinner: **lentils, mushrooms, black rice, red rice, kidney beans, wheat, and oats.**

Meng X, Li Y, Li S, et al. Dietary Sources and Bioactivities of Melatonin. *Nutrients*. 2017;9(4):367. Published 2017 Apr 7. doi:10.3390/nu9040367

Tryptophan-rich foods and beverages that may improve sleep:

- Pumpkin seeds and squash seeds are the best sources of tryptophan
- Sesame seeds, sunflower seeds, flaxseeds, and chia seeds
- Soybeans
- Spirulina
- Milk

Antioxidant-rich foods and beverages that may improve sleep:

- Tart cherry juice
- Fresh tart cherries
- Fresh cranberries
- Kiwifruit

High-sodium foods disrupt sleep.

Consuming too much sodium in the evening, such as having pizza for dinner or snacking on chips or pretzels before bed, disrupts sleep by increasing blood pressure and causing fluid retention.



SLEEP

HERBS AND TEAS FOR SLEEP

The following herbs may help with insomnia:

- California poppy
- Catnip
- Chamomile
- Hops
- Kava
- Lavender
- Lemon balm
- Linden
- Oat flower
- Passionflower
- Valerian root

You can buy individual herbs and make your own herbal tea by following a recipe online, or purchase a tea with a blend of herbs such as those listed above.

Add a squeeze of fresh lemon to your tea for an antioxidant boost.

MEDITATIONS FOR SLEEP

Progressive Muscle Relaxation

1. Practice this meditation while lying comfortably on your back with your eyes closed.
2. Breathe in and tense each muscle group progressively from your feet to your face. Hold the tension for a few seconds. For example, inhale and tighten the muscles in your toes and feet. Try to keep the other muscles in your body relaxed. Focus on one area at a time.
3. Breathe out and abruptly release the tension so the muscles can fully relax.
4. Relax for 10 to 20 seconds before moving on to the next muscle group. Notice how relaxed the muscles feel after you release the tension.
5. Once you finish tightening and releasing the muscles in your face, tense all the muscles in your body and face for a few seconds. Then release the tension and revel in the sensation of being fully relaxed from head to toe.
6. Take some slow, deep cleansing breaths. It is easier to breathe when your muscles are relaxed, especially in your face and jaw.



SLEEP

MEDITATIONS FOR SLEEP

Body Scan

1. Practice this meditation while lying comfortably on your back with your eyes closed.
 2. Take some deep, cleansing breaths to start.
 3. You will progressively scan each part of your body from your feet to your head.
 4. Focus on one body part at a time. Start with your feet. Notice any sensations in your feet. Is there pain, tingling, numbness, a warm or cold sensation, tension, pressure, or tightness in your feet? Bring your awareness to these sensations and try to just observe them without judgment or emotion.
 5. Next, imagine your breath entering your feet on the inhale and exiting your feet on the exhale. Breathe into any sensations you may notice. Imagine any uncomfortable sensations leaving your body with each exhale.
 6. Move on to the next body part when you are ready. You will finish at the top of your head.
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RELAXATION TOOLS FOR SLEEP

Mindful Moments app by Cleveland Clinic Wellness

Download this free app on your smartphone or tablet for guided meditations that can help with sleep including Body Scan and Mindful Breath–Night.

Insight Timer App

Download this free app on your smartphone or tablet for a wealth of relaxation resources. In the sleep section you can find sleep meditations, bedtime tales, and sleep music. The music section contains different genres of calming music including binaural beats (see description below) and nature sounds. In the search box on the home page, type “progressive muscle relaxation” and select one of the options to be guided through a relaxation exercise.

Acupressure Mat

Acupressure mats contain thousands of tiny acupoints that stimulate the body’s pressure points on your back, neck, or feet. Use the mat to release tension, promote relaxation, and improve sleep. You can use the mat in different ways: lie on it, roll it up and rest your head on it, or gently rest your feet on it. Acupressure mats are available online.

Binaural Beats

Listening to binaural beats using headphones or earbuds can promote relaxation and sleep. You can hear binaural beats on the Insight Timer app, Binaural app, or on YouTube.com. Learn about the benefits of binaural beats for sleep in the following online articles:

“Can binaural beats help you fall asleep?” by Tom Ryan. June 22, 2021. SleepFoundation.org

“What health benefits are binaural beats claimed to have?” by Jacquelyn Cafasso. Sept 18, 2018. Healthline.com



SLEEP

SLEEP HYGIENE: THE KEY TO A GOOD NIGHT'S REST

Bedtime Routine

1. Create a sleep-wake schedule of 7 to 9 hours per night. Use an alarm to wake around the same time each day. Keep this routine as consistent as possible 7 days per week.
2. Use soft lighting at night. Avoid fluorescent lights. Listen to soothing music.
3. Stop mentally challenging tasks an hour before bedtime to calm your mind.
4. Avoid thinking of worries or upsetting things. Avoid discussing emotional issues right before bed. Instead, focus on the positives of the day or what you are grateful for.
5. Practice meditation or deep breathing before bed.
6. If you can't fall asleep within 30 minutes, go to another room and read a book, write in a journal, take a bath with Epsom salts, meditate, color in a coloring book, or do some yoga until you feel sleepy.

Electronics and Sleep

1. 30 to 60 minutes before bedtime, turn off electronic devices (e.g., computer, smartphone, tablet, television). The blue light emitted from electronic screens disrupts melatonin production in the brain and can cause nighttime awakenings and poor quality sleep.
2. Dock your devices outside the bedroom, or if you must have them in the bedroom, turn on Do Not Disturb or Airplane Mode.
3. Consider moving your TV out of the bedroom for better quality sleep.

Bedroom Environment

1. Make sure your bedroom is well-ventilated. Use a fan or open the window.
2. Sleep in a cool room. The ideal temperature for sleeping is between 60°F to 70°F.
3. Sleep in a completely dark room. Any amount of light, even coming from the tiny indicator lights on electronic devices, can disrupt sleep. Move electronic devices out of the bedroom or cover the light with a towel so your bedroom is completely dark.
4. Use an eye mask if your bedroom is not dark enough.
5. Minimize noise with earplugs, if needed.
6. If you prefer some noise while sleeping, listen to sleep-enhancing sounds such as white noise, pink noise, calming music, nature sounds, or binaural beats.
7. Use your bed for sleep and intimacy only. Avoid doing work in bed or in the bedroom.
8. Consider having pets sleep outside your bedroom if they disrupt your sleep.

Naps

1. If you need a nap, take it before 3 pm and limit to 30 minutes. Set an alarm. Sleeping longer than 30 minutes and napping later in the day can affect your sleep that night.



SLEEP

SLEEP HYGIENE: THE KEY TO A GOOD NIGHT'S REST

Alcohol

1. Alcohol is a depressant and might help you fall asleep, but can cause nighttime awakenings and sleep disturbances.
2. One glass of wine with dinner should not interfere with sleep. However, if sleep continues to be a problem, eliminate alcohol for two weeks to see if sleep improves.
3. Drink a glass of water with dinner to stay hydrated, especially if you are drinking alcohol. Dehydration can affect sleep.
4. Avoid alcohol 2 hours before bedtime.

Food and Beverages

1. Finish dinner within 2 to 3 hours of bedtime and avoid snacking after dinner. Limit beverages to water or non-caffeinated herbal tea in the evening. If you're hungry, eat a small amount of the foods listed on page 4 for sleep.
2. Consuming high-sodium foods in the evening can cause sleep disturbances by increasing blood pressure and causing fluid retention. Also, eating a heavy meal at night can affect sleep. For a good night's rest, eat a light supper that is low in sodium.
3. Stop caffeine (e.g., coffee, soda, caffeinated tea, chocolate, and some over-the-counter medicines) at least 4 hours before bedtime. If you are a slow metabolizer of caffeine, stop all caffeine by noon. To find out if caffeine affects your sleep, avoid all sources of caffeine for 1 to 2 weeks to see if you sleep better. If you have symptoms of caffeine withdrawal, drink a lot of water and take acetaminophen or ibuprofen for headaches. Caffeine withdrawal symptoms will pass in a few days.

Physical Activity

1. Regular physical activity improves sleep quality and lowers cortisol, the stress hormone, which will lead to better sleep.
2. Exercise during the day or early evening. High-intensity exercise closer to bedtime is stimulating and can make it difficult to fall asleep.
3. Do some yoga poses or stretching before bed to promote restful sleep. Search for restorative yoga videos on www.YouTube.com.

Awakening During the Night

1. Avoid turning on the lights during the night. Use a night light to get to the bathroom.
2. Avoid looking at the clock. Checking the time can trigger anxiety if you need to be up at a certain time. It also stimulates thinking and can keep you awake.
3. Avoid thinking about your to do list and the day ahead, or events and conversations that happened in the past. Instead, focus on getting comfortable in bed. Breathe slowly and deeply. Use the relaxation tools for sleep listed on page 6.
4. If it feels like you've been awake longer than 30 minutes, get up and go to another room. Do something relaxing until you feel drowsy, then go back to bed.
5. Avoid watching TV or using your smartphone or computer while awake.



SLEEP

THREE GOOD THINGS

At the end of your day, just before bed, write down three good things that happened that day such as an event, conversation, discovery, or accomplishment. What made the experience enjoyable? Name the emotions you felt such as joy, relief, peace, connected, uplifted, energized, or excited.

Consider using a gratitude journal. When you've had a difficult day or are feeling down, look back on your journal entries to gain a better perspective on life.

By focusing on the positives of each day and the goodness of life, research has shown a regular gratitude practice has many health benefits including:

- Improved outlook
- Increased happiness
- Less anxiety and depression
- Less ruminating on life stressors
- Better sleep and less fatigue
- Stronger immune function
- Lower blood pressure