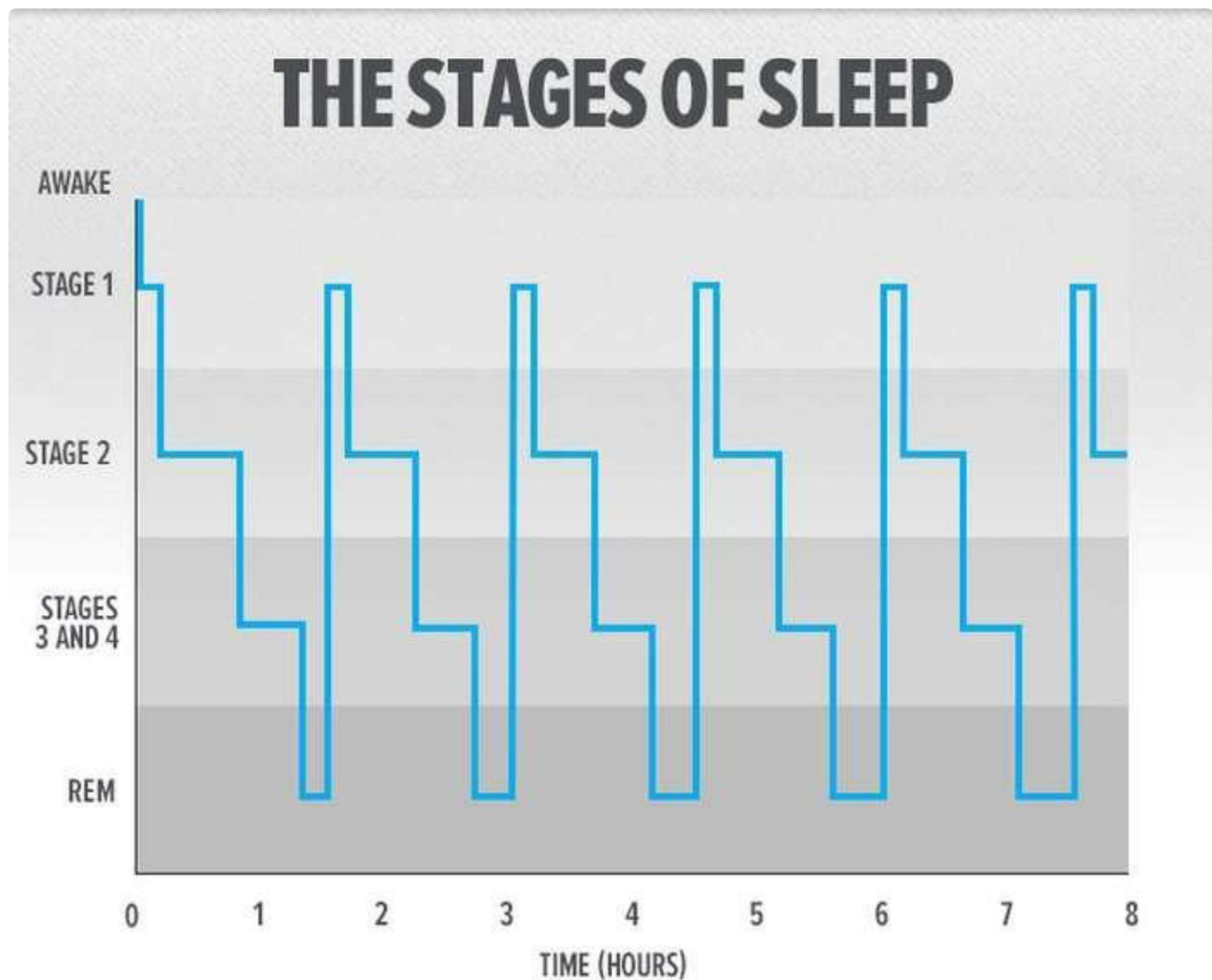


# THE IMPORTANCE OF SLEEP



**STAGE ONE:** Considered the transition stage between sleepfulness and wakefulness, stage one non-REM sleep is the shortest period (2-5%) of sleep in the sleep/wake cycle.

**STAGE TWO:** Considered the baseline of sleep, non-REM sleep stage two accounts for 45-60% of sleep.

**STAGES THREE & FOUR:** Termed delta sleep, non-REM sleep stages three and four account for up to 40% of sleep time. These are the deepest stages of sleep and the most restorative for the brain.

**REM:** The most active stage of sleep, REM accounts for 20-25% of a normal nights sleep. Breathing, heart rate and brain activity quicken during this stage.

Bodybuilders are constantly on the lookout for new and effective ways to build muscle using the latest supplements, a sophisticated training routine, or a new diet. Granted, all of these things are crucially important but what is possibly most important of all is sleep.

During sleep, growth hormone is produced and protein synthesis (provided protein is consumed prior to sleep) occurs. These are only two beneficial aspects of sleep. Energy consumption reduction and brain cell restoration are two other aspects equally important for bodybuilders.

Throughout this article I will explain the various stages of sleep and their implications for bodybuilders as well as the benefits that sleep has in terms of muscle recovery and growth.

## WHY DO WE SLEEP?

Sleep serves many vital functions. For bodybuilders the main functions are growth and mental alertness. Sleep provides these effects directly. Without adequate sleep, time in the gym could be, to a large degree, wasted. The following are important functions of sleep.



Research suggests that it's during REM (Rapid Eye Movement: explained later) sleep that the body is able to: restore organs, bones, and tissue; replenish immune cells; and circulate human growth hormone. Sleep has a profound effect on muscle growth and physical well-being.

## DURING SLEEP ENERGY CONSUMPTION IS LOWERED

Lowered energy consumption is a biological mechanism for resource conservation. We would need many meals per day (rather than the normal 4-6 for bodybuilders) if we did not get enough sleep.

With bodybuilders, the name of the game is increased size, so energy conservation out of the

## THE REPAIRING OF MUSCLE AND OTHER TISSUES, AND REPLACEMENT OF AGING OR DEAD CELLS

Sleeping for 8-10 hours per night is similar to fasting and this is catabolic to muscle growth. However, eating just prior to sleeping, can help to reverse this process and increase protein synthesis. Protein synthesis does occur under conditions of sleep but it occurs in the gastrointestinal tract, not the muscles. Muscle is actually broken down under these conditions to provide our stomach with amino acids during this time of starvation. Eating before bed is crucial in offsetting this. Some reports suggest waking up in the middle of the night to eat (nocturnal eating).

gym is paramount. Several meals throughout the day also assists growth, and sleep helps to ensure that food is used to replace energy and rebuild muscle (pre-sleep meals and nocturnal eating help to intensify this effect).

## SLEEP TO RECHARGE THE BRAIN

Adenosine (a neurotransmitter that produces ATP, the energy-storage molecule that powers most of the biochemical reactions inside cells) is used as a signal to tell the brain that it needs to rest. Rising and declining concentrations of adenosine suggest that the brain is actually resting during sleep given that adenosine secretion reflects brain activity.

During sleep, levels of adenosine decline. Blocking adenosine in the brain has been shown to increase alertness, so this suggests that during sleep the brain is recharging. During the day heightened levels of adenosine, particularly toward the end of the day, suggest that the brain is getting tired.

Resting the brain has obvious implications for bodybuilders given that mental alertness is desired during the day, especially during training. Motivation levels are highest when mental alertness is highest. Studies suggest that it is during REM sleep that proper functioning of the brain and alertness is assisted.



## THE STAGES OF SLEEP AND THE SLEEP/WAKE CYCLE

The brain follows cycles during sleep, which last between 90 and 100 minutes each. The two different types of sleep are REM and non-REM sleep. A sleep cycle begins with 4 stages of non-REM sleep before they reverse and REM sleep commences. Most people experience around 5 of these cycles per night.

Knowing about sleep's stages are important for bodybuilders as the stages typically follow a set

pattern and to adequately recover (get a good night of sleep, and grow) one's brain must experience all of these stages.

A lack of REM and stage three and four sleep is particularly problematic because it is during these periods that the body and brain are complete rest (stages three and four) and memory consolidation occurs (REM). During stages three and four the body and brain are completely at rest due to the slowing of brain activity that occurs.

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**REM:** The most active stage of sleep, REM accounts for 20-25% of a normal nights sleep. Breathing, heart rate and brain activity quicken during this stage.

Due to the neurotransmitter acetylcholine's activation in the pons, which in turn activates the medulla, during REM sleep, the body becomes paralysed. This is because the medulla inhibits motor neurons and gives rise to atonia (complete immobility). Newborn babies undergo about 50% of REM sleep per night. This level decreases as one ages, until, by adulthood, REM will account for 20-25% of sleep per night. The phenomenal growth that occurs as the baby makes the transition to childhood, then to adulthood, suggests that REM is beneficial for growth. Sleep research is not conclusive on this point but many bodybuilders will attest to the benefits of a complete night of uninterrupted sleep (8-10 hours).

## GETTING ADEQUATE SLEEP

Often it is hard to get a good night of sleep. Even when we do fall asleep the quality of the sleep may

not be sufficient. The following ways can assist in getting that good night sleep and subsequently the benefits thereof.

1. Never Oversleep: Oversleeping may set the bodies clock to a different cycle. This will make trying to fall asleep much harder.
2. Take A Warm Bath: A warm bath will sooth and relax. However, a shower will have the opposite effect so these should be avoided.
3. Exercise: Exercising, particularly aerobic, during the day will sufficiently tire one out and sleep will come faster at night. Intense training sessions during the late evening will have the opposite effect.
4. Avoid Alcohol, Caffeine, and Tyrosine-Rich Foods At Night: Caffeine causes hyperactivity and wakefulness. Tyrosine-rich foods are brain stimulating and may keep one awake. Alcohol significantly disrupts sleep by interfering with the stages of sleep.
5. Avoid Sleeping Pills: These may work temporarily but in the long term will cause disturbed sleep patterns.
6. Correct Sleeping Environment: Keep your room reasonably cool (about 60 degrees). Humidity may cause disrupted sleep. A fan running or soft background music may help to relax and encourage sleep.
7. Make evenings relaxed, not stressful affairs.
8. No screens in bed. This may also increase alertness.

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## REFERENCES

1. Colgan, M. (1993). Optimum Sports Nutrition. Advanced Research Press. USA.
2. Morin MD, Charles M. (1996). Relief from Insomnia: Getting the Sleep of Your Dreams. New York: Doubleday Main-street Books.
3. Broughton, Roger, Robert Olgivie (1992). Sleep, arousal and Performance. Birkhauser.
4. Hobson, J. Allan. (1995). Sleep. W.H. Freeman & Co. New York.