

Nocturnal penile tumescence (NPT)

"Morning wood" is a slang term referring to a person having an erect penis when they wake up in the morning. The medical term is Nocturnal penile tumescence (NPT). It is a perfectly normal and healthy phenomena and is not a result of sexual arousal or having a dream relating to sex.

The term "morning wood" can be misleading as penises can become erect and then flaccid again several times in the course of one night. One is just more likely to notice it on waking up.

Research suggests that morning penile erections are involuntary and can affect everyone. Women experience clitoral erections during sleep too.

In fact, regular episodes of NPT are a sign that the nerves and blood supply to the penis are healthy. According to The NHS a healthy man has up to five erections during the night, with each one lasting 25-35 minutes.

A healthy man should expect to get hard three to five times per night. If this isn't happening, it could be a sign of nerve malfunction, arterial disease, hypertension, diabetes, low testosterone, or depression and anxiety. - Adam Ramin, M.D., urologist and medical director of Urology Cancer Specialists in Los Angeles, California

Cause

Nocturnal penile erections occur during Rapid Eye Movement (REM) sleep (the phase during which we dream). They occur when certain areas of the brain are activated. This includes areas in the brain responsible for stimulating the parasympathetic nerves ("rest and digest" nerves), suppressing the sympathetic nerves ("flight and fight" nerves) and dampening areas producing serotonin (the mood hormone). The sacral nerve, part of the parasympathetic nervous system, controls erections.

The two leading theories behind why men experience NPT both center around hormone levels and increased blood flow:

- Scientists believe that norepinephrine production slows down during REM sleep. This is the chemical primarily responsible for keeping the penis relaxed. Basically, the part of the brain that maintains norepinephrine levels gets turned down during REM sleep. This lets the testosterone-related excitatory mechanisms takeover, leading to an erection.
- Another theory is that the body produces more nitric oxide during REM sleep. Nitric oxide is responsible for making the blood vessels of the penis relax, allowing all the extra blood needed to cause an erection to enter the penis.

Reasons for the loss of NPT

Young boys may experience NPT as young as 6 to 8 years old. NPT may also occur in men in their 60s and 70s. It will become less frequent as ED issues begin to occur, and those issues become more frequent with age. This change should happen gradually, as hormone levels shift. Anyone who notices a sudden drop in the number of their NPT episodes should speak with a doctor to rule out any potential health issues.

Both high cholesterol and high blood pressure can damage blood vessels, causing them to lose their elasticity making it harder for the vessels to expand, hence constricting the blood flow into the penis.

Research also suggests that a person's quality of sleep can affect the frequency of NPT. If a person is not getting good sleep and entering the REM cycle, they may not experience nocturnal erections.

- A study of 61 men with obstructive sleep apnea and ED found that getting better quality sleep resulted in more frequent NPT.

A study found that sex less than once a week significantly increases the risk of erectile dysfunction. And compared to sex once a week, sex at least three times a week significantly decreases risk of erectile dysfunction.

- "Regular sexual activity preserves potency in a similar fashion as physical exercise maintains functional capacity," conclude Juha Koskimaki, MD, PhD, and colleagues at the University of Tampere, Finland.

Certain medications, such as antidepressants, can make it more difficult for a person to get or maintain an erection. They may also cause a decrease or put a sudden stop in NPT. Some of these medications include:

- high blood pressure medications
- muscle relaxers
- hormonal medications
- seizure medications
- antidepressants
- histamine H2 agonists (which can help treat some types of ulcers)
- chemotherapy drugs
- medications to treat heart arrhythmias
- diuretics

Loss of NPT can be a useful marker of common diseases affecting erectile function.

“If I could only ask a man one question to assess his health, it would be, ‘Do you wake up with an erection?’” – Dr. Steven Lamm, Medical Director of NYU Men’s Health Center
The blood vessels of the penis are small compared to other areas of the body. That means other underlying conditions can show up first as ED.

Erectile dysfunction could indicate **high cholesterol levels, stress, type 2 diabetes (or prediabetes), hypertension, depression, sleep disorders, heart disease, hormone issues, side effects of medication, consequences of poor lifestyle choices, or emotional issues.**

According to Dr. Michael P. O’Leary, MD, MPH, Harvard Medical School, erections **“serve as a barometer for overall health,”** and that **erectile dysfunction can be an early warning sign of trouble in the heart or elsewhere.**

- ***A study found that men who have less than one morning erection per week are 2.5 times more likely to get erectile dysfunction as are men who have two or three morning erections per week.*** But having a morning erection every day did not lower a man's risk of erectile dysfunction.

Scientists believe that Atherosclerosis starts with damage to the endothelium, a layer of cells lining the arteries. To get erect, the penis must become engorged with blood; and for that to happen, the endothelium must relax, allowing the arteries to widen and let blood flow into the penis.

"Arteries that lead to the penis are smaller than the arteries that lead to the brain or the heart," says Ira Sharlip, MD, a urologist at the University of California, San Francisco. **Hardening of the arteries begins to affect those small arteries long before any change is noticeable in the larger arteries.**

- A study published in the journal *Mayo Clinic Proceedings* in 2009, showed that ED may predict future heart disease. The 1,400 men who took part in that study had never been diagnosed with heart disease. But over the next decade, men with ED were 80% more

likely to develop heart disease than men without ED -- regardless of smoking, high blood pressure, diabetes, and weight.

- Men in their 40s who had ED had the most dramatic increase in heart disease risk. They were more than twice as likely to develop heart disease as men of the same age without ED.
- Another study, published in *The Journal of the American Medical Association* found that men with ED were 45% more likely to develop heart disease over a five-year period. That's about the same increase in risk that has been linked to smoking or high cholesterol, the researchers noted.
- A study published in the journal *European Urology* showed that men with moderate-to-severe ED were 65% more likely to develop heart disease over a 10-year period compared with men who didn't have ED.

Doctors believe that if ED is diagnosed early, some men could prevent heart disease by making lifestyle changes, such as quitting smoking, eating a healthier diet, and exercising.

Erectile dysfunction has also emerged as a potential marker for metabolic alterations including **diabetes mellitus and metabolic syndrome, eventually presenting as the initial manifestation of a dysmetabolic condition in young patients.**

- In diabetics, the lack of morning erections may be associated with erectile dysfunction due to poor nerve or blood supply to the penis. In this case, there's a poor response to the messages sent from the brain during sleep which generate nocturnal erections.
- Research has demonstrated **a significant association of erectile dysfunction with several conditions including vascular, respiratory, gastrointestinal disorders, and endocrine with chronic-sustained inflammation** representing the common pathophysiological link between erectile dysfunction and comorbidities.
- Longitudinal studies demonstrated **a higher risk of overall mortality in patients complaining of erectile dysfunction, even irrespective of cardiovascular risk.**

According to Tobias Köhler, M.D., M.P.H., the absence of morning wood could even cause the muscles in the penis to become too contracted, which over time could cause the length of the penis to shorten.

NPT can help doctors identify whether the problem is Physical or Psychological

If a person has NPT but cannot get or maintain an erection during sexual activity, doctors can rule out issues such as insufficient blood flow or nerve responses in the penis. If this is the case, ED may be a psychological issue, and a health professional can treat it accordingly.

- “Consistently having erections while you sleep indicates healthy blood flow to your penis, which also is necessary for getting hard when you’re turned on,” explains Tobias Köhler MD, an associate professor and residency program director of the urology division at Southern Illinois University’s School of Medicine. “A healthy man should expect to get hard three to five times per night. ***So if you experience erection problems when you’re trying to get busy — but you get them overnight or when you wake up in the morning — that points more to a psychological cause of erectile dysfunction, like performance anxiety or depression. But if you haven’t been experiencing erections at night either, that signals that blood flow to your penis may be an issue.*** This is a common characteristic of underlying conditions like heart disease, blocked blood vessels, high cholesterol or high blood pressure.”

Home test

At home, one can test if for NPT by securing a small roll of postage stamps or a thin plastic ring around a flaccid penis to see if the erections that normally occur at night are able to bust apart the restriction. If the stamp/ring remains in place, the erections either didn't occur or were not sufficiently vigorous.

When to see a doctor

- If a person notices a sudden reduction in the frequency of NPT or stops experiencing it all together.
- If a person has recently started a new medication and notices changes in the frequency of NPT, they may wish to speak with their doctor. Sometimes, the doctor can prescribe a different medication to help address this side effect.
- NPT or erections in general are painful.
- Seek emergency medical help for an erection that does not go away after 4 hours. If this occurs, it can cause tissue damage in the penis and problems with sexual function.

Conclusion

Considering the amount of data demonstrating a strong correlation between several life-risky comorbidities and erectile dysfunction, a careful and comprehensive general health assessment of patients complaining of erectile dysfunction should be carried out, regardless of patient's age.

ED can be an early warning sign—a “check engine light”—for the body. Paying more attention to the strength and frequency of one’s morning wood could lead to life-saving preventative treatment.

The identification of erectile dysfunction as an early sign of a major comorbidity would allow the implementation of therapeutic measures aimed at improving the overall health status and life expectancy across the entire aging process.

Maintaining a healthy lifestyle is important in avoiding and even reversing erectile dysfunction, so it’s important to remember to eat healthily, maintain a healthy weight, exercise and avoid smoking and alcohol.

Source:

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