

# Body's clock may lead to increased risk for fainting during the nighttime

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Fainting, or syncope, is quite common. About 50% of people will experience fainting at some point during their lifetime. The most common type of fainting is vasovagal syncope (VVS) that is caused by a sudden drop in blood pressure resulting in reduced blood flow to the brain. VVS can occur in healthy people due to inappropriate cardiovascular responses to certain behavioral or emotional triggers such as fear, needle prick or even standing up.

VVS has a daily pattern with more occurrences during the morning. This daily pattern is possibly due to the daily distribution of behavioral and emotional stimuli or perhaps due to influences from the internal circadian system, or 'body clock'. In a new study, researchers at Brigham and Women's Hospital (BWH) provide strong evidence that the circadian system may contribute to the daily pattern of VVS via its influences on physiological responses to changes in body posture. These findings are published on March 8, 2011 in the journal *Circulation*.

Lead study author Kun Hu, PhD, of the Division of Sleep Medicine at BWH said that "the susceptibility to VVS is probably present in all healthy humans. Fainting can cause an individual to fall which can result in severe trauma, including skull and limb bone fractures. Recurrent VVS can also affect quality of life due to reduced activities and social adjustment. Understanding the causes of VVS is important for diagnosis, prevention and treatment of people with a history of recurrent VVS".

In this study, repeated tilt-table tests were used to determine the

susceptibility to VVS across the day and night in twelve healthy participants who stayed in a controlled laboratory environment for almost 2 weeks. To measure the influence of the [internal body clock](#) on VVS while controlling for other factors including the sleep/wake cycle, meals and the environment, the researchers scheduled all behaviors of participants while they lived on a recurring 20-hour "day" (with 6.7 hours scheduled for sleep and 13.3 hours for wake). The study was performed in dim light so that the internal body clock still oscillated with an approximate 24-hour period. Core body temperature was measured throughout to indicate the times of the internal body clock. To stop the participants from actually fainting, signs of imminent VVS (presyncope) were closely monitored and tilt-table tests were immediately aborted whenever there were notable symptoms of nausea, dry mouth, dizziness, or low blood pressure or rapidly falling blood pressure.

The researchers found that the vulnerability to presyncope has a strong connection to the internal body clock, with susceptibility nine times higher at the circadian times between 10:30 PM and 10:30 AM compared to between 10:30 AM through 10:30 PM. The highest risk for presyncope occurred at the circadian time corresponding to 4:30 AM. "This vulnerable period may have relevance to individuals who remain awake or wake up frequently during the night, such as shift workers, parents feeding their infants and elderly people with increased nocturia or insomnia. These people may be at higher risk for syncope due to their postural changes during the night" said one of the investigators, Dr. Steven Shea of the Division of Sleep Medicine at BWH.

In addition, this study highlights the importance of performing tilt-table tests at similar circadian times when comparing responses of different individuals or the same person before and after treatments for syncope. The results also suggest that a higher sensitivity may be achieved by performing tilt-table testing during early morning hours or the night.

Provided by Brigham and Women's Hospital

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