

# Loss of sleep during adolescence may be a diabetes danger

February 13 2016

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Credit: xiaphias/Wikipedia

How much slow-wave sleep a teenage boy gets may predict whether he is at risk for insulin resistance and other health issues, according to Jordan Gaines, a Penn State neuroscience researcher.

Boys who experience a greater decline in slow-wave sleep as adolescents have a significantly higher chance of developing insulin resistance than

those who more closely maintained their slow-wave sleep as they got older. These boys are then also at greater risk for developing type 2 diabetes, increased visceral fat and impaired attention.

Slow-wave sleep (SWS) is an important stage of sleep that is involved in memory consolidation and recovery after sleep deprivation, and is also associated with reduced cortisol and inflammation. While prior research has shown that SWS declines as a person gets older, there is little research looking at possible physical or neurocognitive consequences of the loss of SWS, Gaines explained today (Feb. 13) at the annual meeting of the American Association for the Advancement of Science.

"On a night following [sleep deprivation](#), we'll have significantly more slow-wave sleep to compensate for the loss," said Gaines, a doctoral candidate in neuroscience, College of Medicine. "We also know that we lose slow-wave sleep most rapidly during early adolescence. Given the restorative role of slow-wave sleep, we weren't surprised to find that metabolic and cognitive processes were affected during this developmental period."

Gaines analyzed results collected through the Penn State Child Cohort in order to study long-term effects of SWS loss from childhood to adolescence. The cohort included 700 children from the general central Pennsylvania population, ages 5 to 12. Eight years later, 421 participants were followed up during adolescence—53.9 percent were male.

Participants stayed overnight both at the beginning of the study and at the follow-up and had their sleep monitored for nine hours. At the follow-up appointment, participants' body fat and insulin resistance were measured, and they also underwent neurocognitive testing.

Gaines found that in boys, a greater loss of SWS between childhood and adolescence was significantly associated with insulin resistance, and this

loss was marginally associated with increased belly fat and impaired attention. However, Gaines did not find any associations between SWS and [insulin resistance](#), physical health or brain function in girls.

Importantly, the participants' [sleep duration](#) did not decline significantly with age, suggesting that the effects observed were due to a loss of this "deeper" stage of sleep, according to the researcher.

"More longitudinal studies are needed to replicate these findings, especially in other age groups," said Gaines. "Studies looking at the effects of experimentally enhanced slow-wave sleep are also necessary. In the meantime, we can use these findings as a springboard for future work on the sleep-health connection. The best thing we can do for ourselves today is keep a consistent sleep schedule, so as not to deprive ourselves of any more slow-wave [sleep](#) than we're already naturally losing with age."

Provided by Pennsylvania State University

Citation: Loss of sleep during adolescence may be a diabetes danger (2016, February 13)  
retrieved 19 April 2024 from  
<https://medicalxpress.com/news/2016-02-loss-adolescence-diabetes-danger.html>

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