

'Normal' sleep is still a problem for children with sleep disorder

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Credit: xiaphias/Wikipedia

University of Adelaide researchers have discovered key signs that children experiencing sleep difficulties continue to suffer health problems even during periods of so-called "normal" sleep.

The same research has helped to show that surgical removal of adenoids and tonsils is effective at reversing these problems among [children](#), and

may lead to improvements in brain development and behaviour.

Researchers in the University's School of Electrical and Electronic Engineering have analysed data collected in [sleep](#) studies from children who have been diagnosed with "sleep-disordered breathing", or [sleep apnoea](#). This condition is linked with poor development of the brain, cognitive and behavioural issues among children.

Information gathered in the sleep studies – such as brain, muscle, breathing and heart activity – is used by sleep technicians to determine whether children have had an adverse event during the night, or if their sleep has been considered 'normal'.

"For the first time, our research has uncovered key indicators that show children with sleep-disordered breathing, or sleep apnoea, may be experiencing problems even during periods of so-called 'normal' sleep," says research leader Associate Professor Mathias Baumert from the School of Electrical and Electronic Engineering.

The research, conducted by PhD student Sarah Immanuel, discovered that even during "normal" sleep, children who have sleep apnoea take longer to inhale and exhale than a healthy child.

"This shows that a breathing abnormality persists throughout all periods of sleep. Such a deficit in breathing may have implications for [brain development](#)," Ms Immanuel says.

She also discovered that the signals sent from the heart to the brain – which occurs every time the heart beats, known as a 'heartbeat evoked potential' – appear to be abnormal in these children.

"The presence of a reduced heartbeat evoked potential provides a novel marker that the internal processing of information from the body to the

[brain](#) is dysfunctional in these children," Ms Immanuel says.

Her research showed that the indicators improved after surgery. "All of these issues were reversed in children who received surgery to remove their adenoids and tonsils," she says.

Associate Professor Baumert says: "One of the main concerns for parents is that they often don't know if this surgery will be beneficial for their child. A more comprehensive analysis of sleep, using our novel markers, may help in the decision-making process."

Provided by University of Adelaide

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