Mathematics simplifies sleep monitoring

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A UQ researcher has created a new way to measure breathing patterns in sleeping infants which may also work for adults.

The researcher, PhD student Philip Terrill, has created a mathematical formula that measures varying breathing patterns which indicate different sleep states such as active or quiet sleep.

Mr Terrill said a band, placed around the child's chest, recorded breathing rates which were then analysed using the new formula based on the maths of chaos theory.

It has been successfully tested on 30 children so far.

Current sleep monitoring involves an overnight stay in a hospital sleep lab with specialised equipment needing regular attention of a nurse, doctor or sleep technician.

Mr Terrill said he hoped his formula would form the basis of an automated sleep monitoring system that was cheaper and easier to use than current methods.

"In the future, diagnosing a sleep problem may be as simple as putting on a breathing monitor during a night's sleep at home, in your own bed," Mr Terrill said.

"This would mean that those children with sleep problems could be quickly diagnosed and treated appropriately."

Minor infant sleeping problems can result in daytime sleepiness and inattention with prolonged problems causing behavioural and learning difficulties.

Mr Terrill said clinical research showed that up to 20 percent of Australian children have symptoms of sleep problems and there were very few facilities available to investigate sleep problems in Queensland children.

He said previous work analysed sleep breathing patterns using conventional statistical methods but his work used techniques from a branch of mathematics called chaos theory.

The next step is to test his formula on teenagers and adults.

Source: UQ

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