

# Brain research reveals possible causes of sudden infant death syndrome

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New research published today in *The Journal of Physiology* sheds light on areas of the brain thought to be the root cause of Sudden Infant Death Syndrome (SIDS) – the poorly understood condition also known as 'cot death'.

The research looks at specific areas of the brain and how they communicate to control [breathing](#). It builds on previous studies that suspected abnormalities in the brain may be responsible for SIDS. It is hoped this research may vastly improve understanding of the condition.

The team from Macquarie University in Sydney have identified two areas of the brain that work together to control breathing and swallowing to enable breathing without choking – they hope that by understanding how these areas should work, they can identify what may be going wrong in SIDS babies.

Professor Paul Pilowsky, lead author of the paper, commented: "Until now, the centres in the brain that coordinate breathing and swallowing were poorly understood, but our research has finally teased apart the two mechanisms in the brain, demonstrating how they work together in the presence of an irritant.

"If irritants such as food or water 'go down the wrong way' and enter the airway, a powerful protective response is initiated in the brain to stop breathing and prevent foreign matter entering the lungs. Abnormalities in this reflex may underlie a number of life threatening conditions,

including SIDS."

This protective reflex brings the vocal chords together and initiates coughing and swallowing. It is vital to everyone, but babies in particular as they have a tendency to regurgitate liquids after feeding and saliva tends to pool in their throats. It is also risky – without breathing, blood oxygen levels can drop to dangerously low levels, heart rate slows and blood is re-routed to the brain, depriving and potentially damaging other organs.

"The closing of the airway in adults is only a small compromise as breathing is only stopped temporarily. But for babies the response has more radical implications, particularly if breathing stops for a long time, as they can't take in oxygen or get rid of carbon dioxide.

"The timing of breathing and swallowing is exquisitely coordinated. We suspect that coordination of the two may be going awry in SIDS, but to be sure of this, we need to know how the brain organises this response in the first place," added Prof. Pilowsky.

To understand how the central nervous system controls breathing and swallowing, the team recreated the brain and body's response to a throat irritant using electrical stimulation of the nerve (the superior laryngeal nerve) which normally carries information from the larynx (or voicebox) to the brain, to initiate the reflex response.

By artificially generating a response and measuring the neurotransmitters that indicate how the different regions of the brain are talking to one another, the team hopes to have a better understanding of what is going on in the [brain](#) to disrupt the reflex and cause breathing to stop for long periods.

"The next step is to work out why these regions 'decide' whether

breathing should be stopped. The eventual hope is to have the ability to manipulate these two systems separately to prevent the excessively long breathing arrest that may cause SIDS," concluded Professor Pilowsky.

Provided by Wiley

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