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Baby health research, maternal-fetal medicine

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In partnership with Newborn Services at the Monash Medical Centre, the Ritchie Centre for Baby Health Research leads the way in researching heart, lung and brain dysfunction in newborn babies.

Babies born prematurely are often unable to breathe independently and require artificial ventilation. Long-term mechanical ventilation and the over or under inflation of the lungs is often associated with the development of Chronic Lung Disease. Available evidence suggests that lung injury may be lessened if ventilation of the lungs is managed within a “window” of safety.

Scientists are developing a novel device to translate acoustic variables into a measurement of gas volume in the lung, to prevent over or under inflation.

Mechanical ventilation in the newborn may also cause low blood pressure and poor oxygen supply to vital organs by constraining the actions of the heart.

The lungs can press on the heart and limit its movement – thereby limiting the amount of blood the heart can pump. Scientists are exploring a method that involves inserting a catheter into the baby's umbilical vein and continuously measuring the pressure transmitted from the ventilator to the heart to develop a normal range.

Humans spend one third of their lives asleep, and despite the significant problems associated with sleep disorders such as the cessation of breathing and stroke, little is known of how blood flow and metabolism of the brain is controlled during sleep.

The program also examines the effects on brain blood flow of cardio-respiratory changes that are known to occur when breathing stops whilst asleep.

Failure to arouse from sleep is believed to be a cause of Sudden Infant Death Syndrome, but no explanation for arousal failure has been found. Scientists are investigating the possibility that oxygen deficiency, which occurs during blockage of the upper airways, might lead to arousal failure.

Ritchie Centre Mission Statement:

To prevent death of babies and to improve their health through greater knowledge of their development.



The Ritchie Centre for Baby Health Research consists of laboratories recognised around the world for innovation and productivity in research. Housed within Monash Medical Centre, a world-renowned hospital of over 500 beds, including 14 Intensive care beds and 34 special care beds for sick newborn babies, the Ritchie Centre is ideally located for clinical research.



The Adamson Sleep Unit has a state-of-the-art polysomnography facility for clinical studies on infants and children with sleep-related problems, and research studies into problems such as SIDS.