Objective

More than 30,000 infants are born premature in Australia each year, which greatly increases the infant's risk of death or ongoing disability that can adversely affect the infant for the rest of its life. Premature infants have a high risk of developing respiratory problems after birth because their lungs are very immature. Thus, most premature infants require respiratory support after birth and while life-saving, it can cause lung and brain injury, causing life-long disability. **We need to identify better respiratory support strategies that do not injure the lung.** The objective of this project is to understand the fluid mechanics in various respiratory support to identify why they fail and help to design the next generation of infant respiratory support techniques.

Project Details

Infant respiratory support delivers pressure & flow to the baby's respiratory system. A variety of different methods and techniques that are used in clinic. However, there is limited consensus as to the optimal method and why they may fail to deliver the support required. Deep knowledge of the fluid mechanics within these systems is required to understand the limitations & mechanisms of how these respiratory support mechanisms work. This project is part of a collaboration with researchers at the Hudson Institute of Medical research. It will involve CFD modelling of airflow in respiratory support systems and/or the neonate upper airways to compliment in-clinic and Synchrotron imaging experiments.

Prerequisites

Completion at least one unit related to Computational Fluid Dynamics (eg. MEC4447, MEC3451, MEC2456, MAE5406) or equivalent skills in CFD packages and CAD. An interest in biomedical device design and fluid mechanics essential.

Additional Information

Students should only apply if they are interested in continuing the project further through a Final Year Project or possible post-graduate degree. Contact supervisor for additional project details.