NHMRC: IMPACT CASE STUDY

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Australian Government
National Health and Medical Research Council

NHMRC

Helping premature babies breathe

Each year, almost 1 in 10 babies are born prematurely in Australia. Babies born early face numerous health challenges, including needing help to breathe for weeks or months after birth. Supported by NHMRC grants, collaborating researchers from The Royal Women's Hospital, University of Melbourne, Monash University, Murdoch Children's Research Institute, and University of Tasmania implemented numerous programs aimed at improving the care of premature infants, leading to their improved long-term lung health.

Origin

Babies born prematurely have underdeveloped lungs with very little surfactant, a substance that is essential for lung inflation. As such, premature babies often have difficulties with breathing and require assistance.

Traditional interventions involved intubation and mechanical ventilation to deliver surfactant. This frequently damaged immature lungs and led to complications. Researchers began looking for an alternative to this invasive procedure.

Investment

Starting in 2000, NHMRC began funding researchers from The Royal Women's Hospital, University of Melbourne, Monash University, Murdoch Children's Research Institute, and University of Tasmania to study non-invasive breathing support for premature infants.

The collaborative group developed a research program with multiple research strategies to explore this topic, underpinned by the Monash University team's expertise in newborn physiology and models of prematurity.

Research

In 1999, one of the clinical program strategies led the research group to evaluate the safety and efficacy of continuous positive airway pressure (CPAP) as a non-invasive alternative treatment for premature infants with breathing issues.

Following the success of CPAP trials, the group explored nasal High Flow (nHF) technology in 2010 as a simpler alternative to CPAP. From 2011–2020, they developed and trialed their minimally-invasive surfactant therapy (MIST) technique for delivering surfactant in tandem with CPAP and nHF.

Translation

Trials demonstrated strong clinical evidence for CPAP and nHF as a safer non-invasive alternative to intubation, posing fewer risks and requiring less training to administer.

Further investigation by their SHINE trial showed that adding nHF to intubation procedures resulted in more stable blood oxygen levels, increasing its success rates and safety for babies.

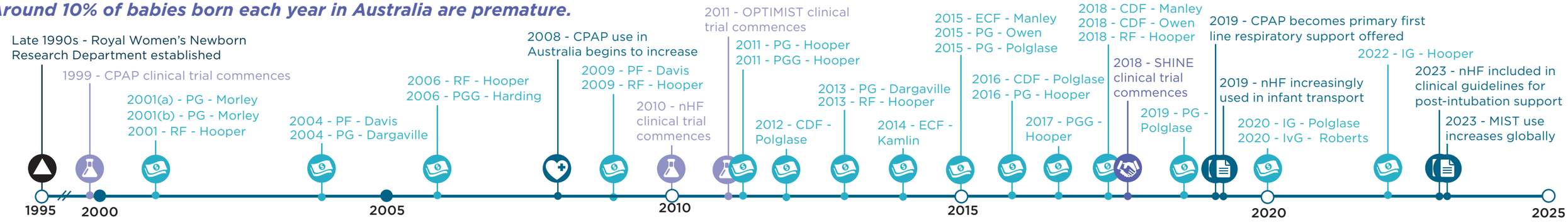
Infants who received MIST as newborns had lower rates of adverse respiratory outcomes during their first 2 years of life.

Impact

CPAP is now the first line of respiratory support provided for most premature babies in Australia and globally. Use of nHF treatments and MIST procedures also increased significantly in clinical settings.

Non-invasive treatments have improved newborn care and reduced the need to transfer premature infants to metropolitan neonatal intensive care units, decreasing burden on parents, the healthcare system, and saving approximately $1,700 AUD per child.

Around 10% of babies born each year in Australia are premature.



CDF: Career Development Fellowship | ECF: Early Career Fellowship | IG: Ideas Grant | IvG: Investigator Grant | PF: Practitioner Fellowship | PG: Project Grant | PGG: Program Grant | RF: Research Fellowship

Researchers

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