Pre-term babies to learn night from day

October 17 2016, by David Stacey

Researchers at The University of Western Australia aim to improve health outcomes for pre-term babies by restoring the infants' natural sleep-wake cycle. The cycle, commonly known as the circadian rhythm, is vital to healthy growth and development.

Dr Peter Mark, a reproductive biologist with UWA's School of Anatomy, Physiology and Human Biology, is leading a team to investigate whether the provision of regular light and dark periods can improve growth, enable earlier hospital discharge and enhance brain development in these newborns.

The researchers will use tiny blindfolds and earmuffs to simulate a night-time environment and infuse the infants with small doses of cortisol and

melatonin – hormones involved in regulating the circadian rhythm.

Dr Mark said although a baby's circadian rhythm only developed a few months after birth, it actually started while still in the womb with time-of-day information passing from mother to baby late in the third trimester of pregnancy.

"In pre-term babies however, exposure to these important maternal circadian signals is cut short by the delivery of the baby," he said.

"The babies' chances of establishing circadian rhythm are then further challenged by the continuous noise and bright lighting of the neonatal intensive care units into which they are invariably placed."

While circadian rhythm was regulated by cortisol and melatonin, levels of these fluctuated throughout the day and were influenced by changing patterns of sunlight and other environmental cues, he said.

Dr Mark said cortisol generally peaked in the morning preparing the body to wake while melatonin built up at night readying the body for sleep.

He said it was well documented that people with disrupted circadian rhythms were at increased risk of obesity, cancer and disease and that shift-working mothers delivered higher rates of small babies at full-term than their non-shiftworking counterparts.

"Ideally what we're hoping we can show is that through short-term restoration of the circadian rhythm straight after birth we can improve newborn growth and that this may later prove to be beneficial in the longer-term by reducing the risk of obesity and other diseases," he said.

Dr Mark's study is among 15 research projects that have been awarded

funding in the latest round of the Telethon-Perth Children's Hospital Research Fund.

The fund, now in its fourth year, is a joint collaboration between the Department of Health and Channel 7 Telethon Trust that funds research focusing on the health of children and adolescents.

Provided by University of Western Australia