

Push for full term

Western Australia is leading the charge in the prevention of preterm birth. ANGIE TOMLINSON reports.

WA has lowered its preterm birthrate and is now pushing the rest of the nation to do the same.

Babies born prematurely, particularly before 34 weeks' gestation, are at increased risk of serious complications involving the gut, lungs, heart and brain. They often have lifelong health problems associated with vision, hearing and mental capacity.

Five years ago the WA Preterm Birth Prevention Initiative began, encompassing a public health campaign called The Whole Nine Months, a dedicated preterm birth prevention clinic at King Edward Memorial Hospital and a Statewide outreach program for healthcare practitioners.

The Australian Preterm Birth Prevention Alliance is now rolling out The Whole Nine Months program Australia-wide.

"We are making the West Australian program national . . . it is a world's first and everyone is watching us," Professor John Newnham, obstetrician and chief scientific director at Women and Infants Research Foundation, says.

Together with decades of medical advancements, the State is on track to make further inroads to ensure the health of women and their babies.

Know your risk

The most important thing a woman can know is the length

DID YOU KNOW? Preterm birth is the single major cause of death and disability in children aged under five in the developed world. In Australia about 25,000 babies are born preterm each year.

of her cervix come mid pregnancy, says Professor Newnham. Of all the areas he has directed his considerable energy towards, ensuring every mid-pregnancy ultrasound in WA includes a cervix length measurement has been his priority.

A short cervix at 16-24 weeks is a predictor for preterm birth. Identifying this at the standard 19-week ultrasound means the mother can immediately start progesterone, a treatment that will take half of those at risk to full term.

While short cervical length is a well-known risk factor, Professor Newnham says no one had been able to implement the discovery across a population.

"We made sure every person that provided health care in WA, from Kununurra in the north to Albany in the south, understood that measurement needed to be done," Professor Newnham says.

"We hammered that really hard and it was completely successful."

Combined with the prevention clinic at King Edward and education of health professionals, the initiative produced fast results.

"After 18 months, the rate of preterm birth was lowered by almost 8 per cent; most of the reduction was seen in the late preterm birth group (greater than 34 weeks gestation), with a matching rise in deliveries after 39 weeks. The overall reduction equates to the prevention of almost 200 babies being born too early," says Professor Jeffrey Keelan, head of laboratories at UWA's division of obstetrics and gynaecology.

Despite these great inroads at KEMH and some other areas, Dr Newnham says there is plenty more to be done.

Every day counts

In the past full term was considered "around 37 weeks". Wrong, says Professor Newnham.

"There has been a progressive increase in deliveries down to 37, 36 weeks for non-medical reasons — FIFO workers, sick of being pregnant, doctor going on holidays — various reasons," Professor Newnham says.

"Across Australia and the developed world there was this increasing trend as people thought that 37 weeks was OK, and the reason they thought it

Risks for early delivery

Professor Jeffrey Keelan, head of laboratories at UWA's division of obstetrics and gynaecology, says some of the known modifiable and unalterable risk factors for preterm birth include:

- Low socioeconomic status
- Geographic isolation
- Mother's age (either young or old)
- Mother's ethnicity
- Reproductive history (including a family history of preterm birth)
- Prior cervical surgery or disease
- Mother's conditions (including diabetes, obesity, mental health diagnosis)
- Smoking in pregnancy
- Current or previous pregnancy complications
- Having a boy (boys have greater risk being born preterm than girls)

was the definition, inherited from 50-60 years ago, of term was 37 weeks. It was never right but it led us to think a baby is fully cooked at 37 weeks, but it is far from cooked at 37 weeks."

WA's Raine Study — one of the biggest successful prospective cohorts of pregnancy, childhood, adolescence and now early adulthood to be carried out anywhere in the world — highlights the dangers of a planned early birth.

"The study showed, to be born at 37 or even 38 weeks carries huge implications at school age in terms of learning ability and externalising behaviour. That

Leaders in Medical Imaging

This is a time when there's no question about the value of quality.

A name you can trust for pregnancy ultrasound scans in Western Australia



Artificial womb in gestation

Perth researchers' breakthrough could give hope to babies that are born as young as 21 weeks, writes ANGIE TOMLINSON

Looking to the future
Researchers at UWA and King Edward are a third of the way through a study to develop a low-cost test to identify women at risk of delivering a preterm baby.

The study will recruit more than 6000 women from King Edward and St John of God hospital, Subiaco.

"We know that bacterial infections of the womb are a major cause of early birth but until now we haven't been able to identify women at risk with any degree of accuracy, so antibiotic treatment hasn't been particularly successful or widely adopted," Professor Jeffrey Keelan says.

"The new test enables us to identify women at risk early in pregnancy, allowing timely treatment with antibiotics and probiotics to remove the bacteria, restore a healthy vaginal microbiome and enable the pregnancy to continue until full term."

He says the combined test and treatment program could reduce the preterm birthrate in Australia up to 30 per cent.

The role of fish oil in reducing rates of preterm births is also being investigated by researchers, says Professor Keelan.

He says the dose, duration and indications for the therapy are still not clear.

Work is also being conducted by Australian and Canadian researchers on a new drug which can block inflammation, prevent preterm birth and spare the foetus from the harmful effects of inflammation in utero, says Professor Keelan.

The project is under way in four centres, including Perth.

last little bit of pregnancy is terribly important for brain development," Professor Newnham says.

Professor Keelan explains that every week in the womb counts as it allows the foetal organs to mature and develop ready for life outside.

He says babies born less than 28 weeks' gestation have up to a 50 per cent chance of major morbidity but this falls to less than 10 per cent at 32 weeks and 2 per cent at 36 weeks.

Neonatal deaths have declined by around a third over the past decade in Australia thanks to neonatal intensive care unit practices and improved management of sick newborns.

WA's medical fraternity states no pregnancy is to be ended until about 39 weeks without a medical reason.

The beginnings of what has the potential to be a medical miracle lies in the paddocks surrounding the tiny town of Darkan in Western Australia's Wheatbelt region.

A futuristic artificial womb is being developed by researchers at the Women and Infants Research Foundation in Subiaco. Earlier this year, the team announced a major advancement and world-first — the ability of an artificial placenta-based life support platform to maintain extremely preterm lamb fetuses; equivalent to a 24-week human fetus.

While previous research had demonstrated the technology's feasibility in late preterm fetuses, no one had done it in extremely preterm fetuses.

"For several decades, there has been little improvement in outcomes of extremely preterm infants born at the border of viability (21-24 weeks gestation)," WIRF Perinatal Research Laboratories head Matt Kemp says.

But then the researchers were able to show the technology was able to support extremely preterm lambs in a stable, growth-normal state for five days, demonstrating the technology's potential clinical application for preterm infants born at the border of viability.

The research brings together researchers from Perth's Women and Infants Research Foundation, The University of Western Australia and Japan's Tohoku University Hospital and biomedical technology company Nipro Corporation, along with the buy-in of the WA Department of Health.

"We start off down in the Wheatbelt around Darkan, Collie, where we work with some fantastic agricultural and livestock consultants to get our animals for our study," Associate Professor Kemp says.

"We then come up to the city and do the work here, then the data we are generating and a few other bits and pieces go up to Kyoto and Osaka and then up to the US and Europe to some of our other partners we are working with. It is a fantastic international collaboration."



"The goal is to offer a bridge between a natural womb and the outside world to give babies more time for their fragile lungs to mature."

While babies born from 25 weeks onwards show great improvements in their short and long-term outcomes, those born between 21-24 weeks "haven't seen those sorts of improvements", says Associate Professor Kemp. The idea of the artificial womb is to bridge the three to four-week gap to allow a baby to become strong enough and viable to be transitioned to existing technology.

"The goal is to offer a bridge between a natural womb and the outside world to give babies born at the earliest gestational ages more time for their fragile lungs to mature," he says.

And why lambs?

"It's not just because there are lots of sheep kicking around here in Western Australia," laughs Professor Kemp. "A lot of the work that has been done in the obstetrics space for a very long time has been done on sheep."

He says much of what we know about fetal physiology as well as common interventions, like antenatal steroids, was first developed in sheep.

"With additional refinement, what today might be considered as futuristic technology might soon not be so futuristic and might be standard of care."

Associate Professor Matt Kemp is leading research on an artificial womb. Picture: Iain Gillespie



Pictures: Getty Images