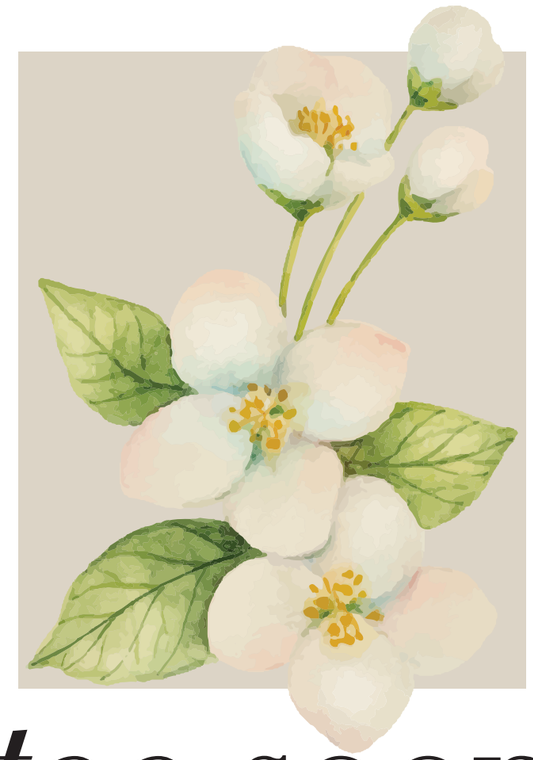

too soon

Even in a medically advanced country like Australia, one in 12 babies continue to be born prematurely – a rate that increases to around 1 in 8 for First Nations babies. *BAZAAR* meets the foundation striving for better outcomes for Australian families

words TESS DE VIVIE DE RÉGIE

They were both really healthy pregnancies – until one day, they just weren't," says Amy Hussey of her experiences with her daughter Molly (born at 28 weeks, weighing just 1030 grams) and son Oscar (also born at 28 weeks, weighing 1080 grams). "We had no early signs that our babies were in danger of being born so early."

Having already welcomed two children with her husband, former Australian Test cricketer Mike Hussey, birth complications were not on her radar. "I had had healthy pregnancies prior to my preterm babies and was not seen as 'at risk'," recalls Hussey. "I never thought it would happen to me. It is one of the hardest things you will go through and the challenges don't end when you take your baby home – often they are lifelong for that child and family."

Molly consequently spent 12 weeks in Perth's King Edward Memorial Hospital, being cared for in the preterm wards, and because of her early birth, now lives with cerebral palsy. "Oscar also spent 12 weeks in the hospital, had a lot of ups and downs in that time and suffered significant health challenges – [like] infections and brain bleeds. It was a daily struggle," says Hussey.

Mike and Amy are now ambassadors for the Women and Infants Research Foundation (WIRF), founded in 1975 and headquartered in Perth, whose mission is to improve the health outcomes of women and children in Australia and beyond.

The CSIRO estimates that more than 26,000 babies are born prematurely (defined as before 37 weeks' gestation) in Australia each year; globally, that figure reaches 15 million, according to the National Institutes of Health in the US. "There is a real association between resource availability and socioeconomic status, but at the same time, being in a high-resource environment doesn't guarantee you a low preterm birth rate," explains WIRF's chief scientist, perinatology researcher Professor Matt Kemp. According to the World Health Organization (WHO), preterm birth complications represent the leading cause of death globally in children under five years old, and those who survive, particularly babies born at the very earliest gestational age, have a higher chance of living with disability or developmental delays.

Image: Getty Images.

The causes of prematurity are manifold but remain somewhat opaque. "One of the best risk factors for whether you're going to have a pregnancy impacted by prematurity is whether you've had a previous preterm baby – and obviously, that's not a great marker if you're just getting started with a family," explains Kemp. "If you look at the epidemiology of a very early preterm baby [around 23 or 24 weeks] and compare that to [a] moderately or late preterm [baby], the risk factors and outcomes are different. You're dealing with this constellation of causes that have this common-looking [consequence] – which is baby comes early. Unpacking the nuance of these complex biological processes is difficult."

Today, one of WIRF's principal research initiatives concerns antenatal steroid therapy, as respiratory complications tend to be a major concern with preterm babies. Mothers judged at risk of imminent preterm birth are frequently recommended an injection of synthetic steroid, usually either betamethasone or dexamethasone. "The drug crosses the placenta and activates a section of maturation pathways in the foetal lung, so that [baby's] lungs will function better than they otherwise would," Kemp says.

That said, steroids, he notes, are not innocuous drugs: "They are immunosuppressive, very potent and exert a range of effects, especially on rapidly developing growing cell systems." So WIRF have been working on a transdermal delivery system to address issues around the therapy's dosage, timing and frequency. "Essentially, it looks like a nicotine patch," says Kemp. "Instead of giving these big bolus injections, exposure is low and constant."

WIRF is likewise fine-tuning patient selection by studying molecular signals in the mother's blood to determine how mature the baby's lungs are. "The benefit from this [steroid] treatment is dependent on gestational age – for much older preterm babies, that benefit is much more marginal. If we can [determine] that, actually, this baby's got pretty mature lungs, you don't really need to bother. We want to target the treatments to those who need it." WIRF researchers published the first report of transdermal antenatal steroid delivery in medical journal *BMC Medicine* in August 2025. "[We] are continuing to work on this technology," shares Kemp. "It is fairly preliminary – although very promising – at this stage."

WIRF, in collaboration with Japan's Tohoku University, has been spearheading developments around artificial placenta life support systems, also known as EVE (meaning 'ex-vivo uterine environment') therapy, for extremely preterm babies. Instead of forcing ventilation, as is the case with traditional neonatal intensive care and which can be potentially damaging to underdeveloped lungs, the umbilical cord is connected to a gas exchange device and the foetus is delivered into an artificial uterus, to allow it to continue to grow in a protected environment. "It's quite a futuristic-sounding concept in a lot of ways, but the reality is that artificial placenta development work has been going on since the mid-to-late '50s," says Kemp.

A challenge that remains, Kemp continues, is that the baby's growth can be compromised in this environment. "We're trying to better understand what the signalling and communication interplay is between the mother's placenta and foetus normally and how that combines to drive a normal pattern of growth." Research is ongoing: "My view, based on the data available at present, is that we are some way away from seeing artificial placenta technology in clinical use."

> Preterm birth complications represent the leading cause of death globally in children under five years old

WIRF has also partnered with Lyfe Languages, a project that aims to overcome language and cultural barriers patients from First Nations and Culturally and Liguistically Diverse (CALD) backgrounds encounter in healthcare settings. Founded by clinical geneticist Professor Gareth Baynam, the Lyfe Languages app translates medical terminologies into various languages – it now covers 17. It's a critical technology, as Indigenous families experience almost double the rate of preterm birth than the Australian average. "We used it to translate preterm birth prevention and mental health terminologies," explains Deborah Attard Portughes, WIRF's chief executive officer; WIRF aspires to expand the platform to encompass pidgin English and animations to reach an even wider audience in future.

"Be well-informed and seek care early and consistently [as] timing changes outcomes and prevention is always better than cure," says Portughes of the takeaway message she wishes everyone took to heart. "Every family deserves access to knowledge and quality healthcare, no matter their income, background or circumstances."

"From a lab-nerd perspective, what I'd like to see five years from now is the ability to accurately, and in a personalised manner, assess the risk for adverse pregnancy outcomes right at the early stages of pregnancy – in the first trimester or perhaps even earlier," says Kemp.

Provided it progresses from the hypothetical to the tangible, WIRF's research could prove an inflection point for infant outcomes in Australia and around the world. "I don't want families to go through what we've been through," says Hussey. "We want a future where we can prevent this happening." HB