

# Good kidney health begins before birth

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Researchers have found that conditions in the womb can affect kidney development and have serious health implications for the child not only immediately after birth, but decades later.

In a paper published today in *The Lancet* an international team, including Monash University's Professor John Bertram and the University of Queensland's Professor Wendy Hoy, reviewed existing, peer-reviewed research on kidney health and developmental programming - the effects of the in utero environment on adult health.

The accumulated evidence linked [low birth weight](#) and prematurity - risk factors for [high blood pressure](#) and chronic kidney disease later in life - with low numbers of the kidney's filtration units or [nephrons](#).

In Australia, around 30 per cent of the [adult population](#) has high blood pressure and one in nine has at least one clinical symptom of [chronic kidney disease](#). The incidence of both diseases is significantly higher in Indigenous populations.

Professor Bertram, Head of the Department of Anatomy and Developmental Biology, has been researching nephrons for two decades.

"The kidney is particularly sensitive to life before birth because we stop making nephrons at 36 weeks gestation. So, for a baby born at term, the process of nephron formation is finished and it cannot be restarted," Professor Bertram said.

Humans are born with an average of one million nephrons and lose up to 6000 each year. However, Professor Bertram's research has shown there is a huge variance in nephron number - from just over 200,000 to around two million. Further, nephron number is positively related to [birth weight](#) - a low birth weight equates to low nephron number and larger babies have a higher nephron number.

Given that low birth weight occurs in 15 per cent of [live births](#) worldwide, the study has implications for maternal health and clinical screening processes.

"In terms of maternal health during pregnancy, things like a high fat diet, [alcohol consumption](#), various antibiotics and stress hormones have been shown to have a negative impact on foetal kidney development, although more research needs to be done," Professor Bertram said.

"Further, given the strong associations between birth weight, nephron number and disease later in life, and the fact that a baby's weight is routinely recorded in many countries, we suggest that birth weight should be a parameter that clinicians use to determine how often a patient is screened for kidney function or given a blood pressure test.

"Although a newborn may appear perfect, if their birth weight is low, there may be consequences 40 years down the line. We could be proactive about detecting these diseases in the early stages."

Provided by Monash University

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