

There is no such thing as a normal preterm baby

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More than eight percent of Australian babies are born preterm (*i.e.* before 37 completed weeks of gestation), equating to over 25,000 preterm babies annually. Although they represent fewer than 10% of all births in Australia, preterm babies account for more than two-thirds of those admitted to neonatal intensive care units. These disproportionately high rates of admission for neonatal intensive care reflect the considerable risk of morbidity and mortality associated with preterm birth.

The vulnerability of preterm babies extends further than the immediate neonatal period. People born preterm have higher-than-normal rates of a variety of illnesses throughout childhood and well into their adult lives. The trajectory of life-long compromised health for the majority of people born preterm does not result simply from their early births. The myriad antecedents of preterm birth, including pathological conditions and aspects of clinical care, have profound effects on fetal development. The unusual circumstances that lead to preterm delivery rarely result in the birth of a normal baby.

Classification of preterm births by phenotype (“the biochemical and physical characteristics of the mother, fetus, and/or placenta that lead to, and/or are present at the time of, delivery”) reveals that the vast majority of pregnancies that end in preterm birth have one or more of the following characteristics: infection/inflammation; decidual haemorrhage; maternal stress; cervical insufficiency; uterine distension; placental dysfunction; preterm premature rupture of membranes; maternal comorbidities; family history. For each of these phenotypes, there are clinical and/or experimental data showing clear effects on fetal development and postnatal outcomes.

Our experiments, focussed on the effects on fetal lung development of intrauterine infection/inflammation, have demonstrated the physiological correlates of altered risk of respiratory disease in preterm babies, and identified the underlying developmental mechanisms. We hope this work will help to inform to better management of preterm babies and, thus, improved long-term outcomes.

Tailoring clinical management of preterm babies according to their developmental peculiarities, rather than taking a generic approach to their care, might improve the life-long health of these vulnerable individuals.