

Preterm Labour & Birth

Professor Shaun Brennecke
Director of Department of Maternal Fetal
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“75 percent of all neonatal mortality is due to preterm birth.”



Transcribed directly from MOGCAST Episode 11. Listen here:

<https://open.spotify.com/show/6dtXQ6jLjAlI7lHtP71cYe?si=7671224caacc4f4a>

“This mini episode is brought to you by Professor Shaun Brennecke, the Director of the Department of Maternal Fetal Medicine at the Royal Women's Hospital and Professor with the University of Melbourne.

The title of this mini podcast is Preterm Birth.

Preterm birth is defined as delivery between 20 weeks gestation and 36 weeks completed weeks gestation. On a worldwide basis, 15 million babies are born preterm each year. One million of these babies do not survive their first month because of complications of prematurity. And 75 percent of all neonatal mortality is due to preterm birth.

Here in Australia, 25-30,000 preterm births occur each year. And while that accounts for only somewhat less than 10 or so percent of births, 85 percent of perinatal deaths unassociated with fetal anomalies occur in this group.

It is expensive to look after premature babies, particularly if they require neonatal intensive care unit attention. And the cost of looking after premature babies amounts to \$700 million in annual health care costs. And as well, of course, there are the social and emotional costs for caring for these premature babies that are felt by the clinicians looking after the babies and the parents and other family members of these babies.

The outcomes of preterm birth in Australia today can be summarized in these statistics from the Royal Women's Hospital Neonatal Intensive Care Unit. And you can see that at the very early periviable stages of preterm birth around 23 and 24 weeks gestation, there is a high perinatal mortality rate and in those babies that survive there is a significant disability rate, which often affects the neurological system, so that cerebral palsy, for example, is an unfortunate outcome of such a premature birth in surviving babies.

But as the weeks of gestation progress towards the third trimester, you can see that there is a significant improvement in perinatal mortality and also survival with severe disability.

So that by the time the third trimester is reached, the outcome for prematurely born babies is quite good and often comparable to babies born at term.

The causes of preterm birth are spontaneous preterm labour in the majority of cases, but also preterm prelabour rupture of membranes is a significant contributor as a cause of preterm birth. Multiple pregnancy, particularly twins and triplets, are often born before 37 weeks gestation, either spontaneously or for reasons of medical complications developing and the iatrogenic preterm birth can sometimes be required for preeclampsia, fetal growth restriction and cases of antepartum haemorrhage. There is a small but important group of preterm birth cases that arise from cervical insufficiency. Such cases are often at the very early stages of gestation at 23, 24 weeks in cases of cervical insufficiency.

The typical presentations of preterm labour are preterm uterine contractions, which can often be difficult to distinguish, in their early stages at least, from the normal Braxton Hicks contractions, which are benign and frequently occur in preterm labour towards the latter half of pregnancy, particularly in multiparous women.

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Preterm prelabour rupture of membranes is another common presentation for preterm labour, and the appearance of a cervical mucus plug show can sometimes be a warning that preterm labour is pending, particularly in cases of cervical insufficiency. If a woman does present with contractions preterm, that might be a forewarning of the onset of preterm labour or an actual preterm labour.

One way of helping to distinguish between physiological Braxton Hicks and actual preterm labour contractions is to undertake a quantitative cervical vaginal fetal fibronectin test. And you can see from this table that the higher the level of fetal fibronectin found at such a test, the more likely it is that the woman concerned will go on to deliver preterm.

In such cases where early preterm labour is diagnosed, it can be helpful to use tocolytic drugs to help stall or delay the progress of the preterm labour. In particular, calcium channel blockers such as nifedipine have been found to be the most useful drugs in this context. In so far as, in comparison with placebo, no treatment, and compared with other tocolytics, drugs like nifedipine have been shown to be relatively safe and relatively effective at delaying delivery sufficiently to allow optimal preparation of the fetus for preterm birth.

That preparation of the fetus for preterm birth should involve delivery in a suitably equipped perinatal facility, in particular a maternity hospital with a neonatal intensive care unit, particularly for the most premature deliveries. Also, preparing the fetus ideally will involve the administration to the mother of antenatal corticosteroids to allow fetal lung surfactant production to minimize neonatal respiratory distress, and these corticosteroid treatments are best administered to the mother ideally, 24 to 48 hours before delivery. The beneficial effect of antenatal corticosteroids persists for 7 to 10 days, and the maximal benefit is usually obtained if given to cases of preterm labour up to 32 to 34 weeks gestation.

As well, for the very early preterm labour cases with delivery likely up to about 30 weeks gestation there is randomized controlled trial evidence that administering intravenous magnesium sulfate to the mother within 24 hours of delivery provides significant neonatal neuroprotection and minimizes the eventual development of cerebral palsy in these babies.

So the benefits of tocolytic therapy for cases of preterm labour amount to the short term at least inhibition of labour, to ensure the mother can be transferred to suitably equipped perinatal facilities before the baby is born, because babies born in-house have better outcomes than babies born outside of suitably equipped perinatal facilities.

The transfer of such babies from outlying hospitals does involve risks, in particular the ability to keep the baby warm, and to ensure good glucose levels in the baby and good oxygenation, through breathing in the neonatal period. All these issues are best dealt with in-house rather than in an ambulance on the way to a suitably equipped perinatal facility from a distant and regional maternity hospital, for example.

The administration of tocolytic therapy can also allow, as I mentioned, corticosteroids and magnesium sulfate to be given in certain situations.

Finally, I'd like to draw your attention to a rare but important situation that can present with spontaneous

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preterm labour. In this scenario, the woman has intact membranes, but she is febrile, and there is no obvious sign of infection.

In such an eventuality, the woman should be considered to be infected with *Listeria monocytogenes* until proven otherwise. And be offered immediate treatment with intravenous penicillin, pending confirmation of listeriosis, which can take 24 to 48 hours to occur, because in the meantime, untreated listeria has a predilection for infecting the unborn baby often with potentially fatal consequences for the baby. So immediate treatment with intravenous penicillin can be life saving for the fetus.

Thank you, and that completes this mini podcast.”