Improved hospital survival with higher oxygen saturation targeting

In 2005, clinicians worldwide aimed to give preterm babies on supplemental oxygen treatment sufficient to keep blood oxygen saturation between 85% and 95%, the range of accepted practice.

1. What was the aim of the BOOST II and other oxygen targeting studies?

Five oxygen targeting studies in babies born before 28 weeks gestation were begun in the US, Australia, New Zealand, UK and Canada in 2005-7. All five trials aimed to find out if targeting the higher (91-95%) or lower (85-89%) part of the normal range was better long term. The BOOST II studies were undertaken in Australia, New Zealand and the UK. The oxygen-calibration software was revised in 2009, halfway through the Australian and UK BOOST II trials and the Canadian trial.

2. What did we know about how much oxygen preterm babies need?

It was known that too much or too little oxygen for long periods might harm these babies’ eyes, lungs and brain, in or out of the studies. However, it was not known if 91-95% was too much or 85-89% was too little or if aiming for the higher or lower target would increase or decrease survival.

3. Why were the Australian and UK BOOST II studies stopped early?

In May 2010, the US trial reported a marginally statistically significant difference in hospital survival favouring the high target (P=0.04). That was unexpected. In December 2010, data from the Australian, New Zealand, UK and US trials showed that the 91-95% target increased 36 week survival in all 3,651 babies (P = 0.015) and in the 1,055 Australian and UK babies who had been managed with revised software (p < 0.001). Recruitment closed early in those two trials. The others had already finished.

4. What are the latest results in the BOOST II trials?

A total of 2,448 infants were recruited in the Australia, NZ and UK BOOST II studies. In the 1,187 infants managed with revised oximeter-calibration software, death before discharge from hospital was more common in the lower than in the higher target group (23.1% vs. 15.9%, P = 0.002). Using the revised software, for every 14 babies managed with the higher rather than the lower target group there was one extra survivor. In all 2,448 infants, the lower-target group had less retinopathy of prematurity needing treatment (10.6% vs. 13.5%, P = 0.045) and more necrotizing enterocolitis leading to surgery or death (10.4% vs. 8.0%, P = 0.04). There were no other significant differences in outcomes in the 2,448 babies overall.

5. What do the results mean for babies in the future?

Without these data, we still would not know if the higher or lower part of the normal saturation range was safer. Now, thanks to the many parents who took part, thousands more babies will survive worldwide every year.

6. Can these results explain why my baby died or had a bad outcome?

No. Among every 14 babies allocated the high rather than low target on revised software, there was only one extra survivor. So the difference in oxygen saturation target only explains part of the risks these tiny babies have. We will never be able to find out exactly why your baby had a particular outcome.

7. If my baby died or had a bad outcome, was I wrong to join the study?

No. Babies outside the study were at least as likely to have a bad outcome as those who took part. By joining the study, you have helped thousands of other parents whose babies will now survive.

8. Did twins and triplets receive the same allocation?

Not necessarily. Each twin or triplet was randomly allocated to the high or low target separately.

9. Can I find out if my baby or babies had the higher or lower target in BOOST II?

Yes. If you would like to know this, please contact boost2@ctc.usyd.edu.au. The BOOST II office will send you this information and the name of a consultant you can talk to at the hospital where your baby was enrolled.

10. Can I get in touch with other parents whose babies were in the BOOST II Study?

Yes. To make contact with other parents who were in BOOST II, please drop a line to Naomi Rohr at Miracle Babies Foundation www.facebook.com/MiracleBabiesFoundation or Email info@miraclebabies.org.au