

# Continuous glucose monitoring in extremely preterm infants in intensive care: the REACT RCT and pilot study of 'closed-loop' technology

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## Plain English summary

The REACT RCT and pilot study of 'closed-loop' technology

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## Plain English summary

**B**oth high and low blood sugar (glucose) levels are common in preterm babies and have been linked to worse health outcomes. Managing the extremes of glucose levels is difficult as it requires frequent invasive blood sampling. In addition, every baby responds differently to treatments. In children with diabetes, who have similar difficulties, a continuous glucose monitor can be used to better target glucose levels. Continuous glucose monitoring requires a small sensor to be inserted under the skin; this can be left in place for up to a week. The REAL-time Continuous glucose monitoring in neonatal intensive care project aimed to assess whether or not continuous glucose monitoring is helpful for the management of preterm babies in intensive care. There were three parts to the project, each with protocols and patient information sheets developed with support from parents:

1. a feasibility study to guide the design of a randomised clinical trial
2. a randomised clinical trial
3. a pilot study, combining continuous glucose monitoring with computer advice (i.e. the 'closed-loop study').

The randomised clinical trial recruited 182 babies within 24 hours of their birth. A continuous glucose monitor was inserted in all babies, but doctors used the results to support sugar control in only half of the babies. The other half received standard care (continuous glucose monitor data were collected, but were not made available to the clinical team).

The study was positive in that continuous glucose monitoring helped to target sugar levels without increasing the risk of low blood sugar levels. The clinical team and parents felt that the continuous glucose monitor improved the care of babies. In health economic calculations from birth to 36 weeks' corrected gestational age, continuous glucose monitoring was, on average, less costly and more effective than standard care. The closed-loop study showed that the use of a computer, combined with continuous glucose monitoring, can further increase the time within the target sugar levels. Further studies are required to determine the ideal target for sugar levels in these babies and the impact on long-term health. A continuous glucose monitor provides the technology to support such studies.



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