

Recommended Target Blood Sugar for Infants Who Require Neonatal Intensive Care

The S.T.A.B.L.E. Program defines hypoglycemia as “glucose delivery or availability which is inadequate to meet glucose demand”. The exact blood glucose value which defines hypoglycemia remains controversial.^{108,111} Furthermore, glucose values tolerated by individual infants may vary because of their individual diagnoses and medical problems. If an infant has a low blood or plasma glucose value, this does not imply that permanent neurologic damage will occur; however, it does mean that action should be taken to restore the blood sugar to a euglycemic, or normal blood glucose concentration.^{56,83}

There is controversy regarding what glucose value constitutes hypoglycemia. Furthermore, there is lack of definitive evidence regarding at which glucose values and under what conditions neurologic damage occurs. Therefore, to provide a safe and reasonable target for treatment, the S.T.A.B.L.E. Program recommends the following:

For sick infants who cannot be enterally fed, a glucose value (whether by bedside or laboratory method of analysis) of 50 mg/dL (2.8 mmol/L)^{40,58} is the value below which the S.T.A.B.L.E. Program recommends corrective intravenous therapy and on-going monitoring until the glucose is stabilized between 50 and 110 mg/dL (2.8 and 6.1 mmol/L).

The goal of therapy is to maintain the blood sugar between 50 and 110 mg/dL (2.8 and 6.1 mmol/L).^{83,97} Individual evaluation of the infant's age and cause of hypoglycemia must be considered in all cases. This recommendation is consistent with most current recommendations and published literature.

What's All the Phys About?

Are there alternative sources of fuel?

When infants are healthy, glucose is provided by carbohydrate intake in the form of breast milk or formula. When infants are sick and cannot feed, carbohydrates are supplied in the form of IV dextrose. When the blood sugar drops as a result of fasting or other factors such as increased glucose utilization, inadequate glycogen storage, or hyperinsulinemia, the term infant will compensate for the low blood sugar by using other substrates such as lactate

or ketone bodies as alternative fuels for brain energy.^{32,57,107,112,113} Preterm and SGA or intrauterine growth restricted (IUGR) infants are at a disadvantage however, because they lack the adipose (fat) tissue required for ketone production, or they are unable to mobilize free fatty acids from adipose tissue.^{40,57} In addition, preterm infants may not have matured enough to have the enzymes required for the breakdown of glycogen into glucose molecules, a process called glycogenolysis.^{32,57}