

Glucose infusions in Children

The table below provides the glucose infusion rates (GIR) in ml/kg/min at different fluid rates per 24 hours, and different dextrose solutions. In infants and children receiving just intravenous fluids, hypoglycaemia should be avoided by providing GIR of 4-6 mg/kg/min (areas shaded white in the table). Hyperglycaemia should also be avoided as outlined in the section below. Blood sugar outside the normal range despite appropriate glucose infusion rates is suggestive of abnormal glucose metabolism

Glucose Infusion Rate (GIR) (mg/kg/min)

		VOLUME OF IV FLUID per 24 HOURS						
		50mL/kg	60mL/kg	70mL/kg	75mL/kg	80mL/kg	90mL/kg	100mL/kg
DEXTROSE SOLUTION	D5	1.7	2.1	2.4	2.6	2.8	3.1	3.5
	D10	3.5	4.2	4.9	5.2	5.6	6.3	6.9
	D12.5	4.3	5.2	6.1	6.5	6.9	7.8	8.7
	D15	5.2	6.3	7.3	7.8	8.3	9.4	10.4
	D20	6.9	8.3	9.7	10.4	11.1	12.5	13.9
	D25	8.7	10.4	12.2	13	13.9	15.6	17.4

$$\text{GIR} = (\text{24-hour volume of IV fluid} \times \% \text{ dextrose}) \div (\text{weight in kg}) \div 1.44$$

Hypoglycaemia:

GIR of 4-6 mg/kg/min is typically needed to prevent hypoglycaemia in infants (GIR less than this rate is shaded in red in the table)

Emergency treatment of hypoglycaemia - 0.5g/kg Dextrose

- D50W 1 mL/kg (adolescents)
- D25W 2 mL/kg (infants/children)
- D10W 5 mL/Kg (neonate)

Dextrose Solutions:

Generally non-stock dextrose solutions should be made up by Pharmacy. However in an emergency, non-stock dextrose solutions can be made up in the following way:

Dextrose 12.5%: Add 6mL D50W to 94mL D10W (12.4%)

Dextrose 15%: Add 12mL D50W to 88mL D10W (14.8%)

Dextrose 20%: Add 25mL D50W to 75mL D10W (20%)

Hyperglycaemia

Higher GIRs are associated with hyperglycaemia, hepatic steatosis and cholestasis. Typically, GIR should not exceed:

- Under 1 year old: 11-13 mg/kg/min (area shaded in dark orange in the table)
- 1 – 10 years old: 8-10 mg/kg/min (area shaded in medium orange in the table)
- Over 10 years old: 5-6 mg/kg/min (area shaded in light orange in the table)