Critical neonatal hypoglycaemia in first 48 hours

Critical hypoglycaemia: BGL < 1.5 mmol/L, recurrent, prolonged or symptomatic

Validate* any BGL < 2.6 mmol/L

Urgent
- Do not delay treatment
- Urgent medical consultation
- Admit to neonatal unit–contact RSQ as required
- Validate* screening BGL
- Collect diagnostic samples
- If able, give glucose gel and feed while establishing other treatments

IV glucose therapy initiation
- Establish IV (PVL/UVC) access
- Commence 10% glucose IV infusion at 60 mL/kg/day
  - If symptomatic or BGL not improving, commence at 80 mL/kg/day
- Give 10% glucose 1 mL/kg IV bolus
  - May repeat 1 mL/kg if BGL remains low
  - Initial 2 mL/kg IV bolus may be indicated in some clinical circumstances
- If IV access delayed > 15 minutes give glucagon 200 microgram/kg IM or subcut
- Recheck BGL no later than 30 minutes after IV bolus

Glucagon
- If after 10% glucose IV bolus (as indicated) BGL not improved, or baby symptomatic, urgently give glucagon 200 microgram/kg IV/IM/subcut stat

Other treatment principles
- To achieve immediate increase in glucose delivery, increment IV glucose *rate* before glucose *concentration*
- Monitor risk of fluid overload
  - Fluids not exceeding 100 mL/kg/day on day 1
  - Monitor serum sodium
- Increase IV glucose concentration to 12% or step-wise to higher concentration
  - If concentration > 12% glucose give via UVC/CVL
- If GIR > 8 mg/kg/minute in 1st 24 hours or baby hyponatraemic consider glucagon infusion
- Feeds–continue if not contraindicated
- Medications - refer to NeoMedQ

Escalate and investigate
- If glucose > 7 mg/kg/minute
- Baby > 48 hours of age
- BGL refractory or requires medication to control

BGL monitoring
- 30 minutes after:
  - Start/change to IV glucose (concentration or rate)
  - Medication for hypoglycaemia
- Individualise at neonatologist discretion
  - Repeat hourly until BGL target reached
  - Then, 3–6 hourly before feeds

Weaning of treatments (in order)
- Gradually reduce IV therapy while establishing full enteral feeds
- When full feeds established, wean
  - Glucagon and then hydrocortisone

Glucose mg/kg/minute

	mL/kg/day			
%	60	80	100	120
10%	4.2	5.6	6.9	8.3
12%	5	6.7	8.3	10
14%	5.8	7.8	9.7	11.7
16%	6.7	8.9	11.1	13.3
18%	7.5	10	12.5	15
20%	8.3	11	13.9	16.7

Diagnostic samples
- Venous or arterial blood only
- During hypoglycaemic episode
- Before treatment

Blood gas including electrolytes, glucose, haemoglobin, haematocrit and lactate

Priority 1	Insulin Cortisol Acyl-carnitine profile
Priority 2	Growth hormone
Priority 3	Plasma amino acids Ammonium Pyruvate Beta Hydroxybutyrate

Urine (post hypoglycaemic episode) Metabolic screen

Ceasing BGL monitoring
(All BGL measurements in mmol/L)

If complex glycaemic support required, then at neonatologist discretion

Recommended criteria
- Baby is well and feeding effectively.
- Other treatments ceased
- BGL target achieved pre-feed (every 3-6 hours) for 24 hours after treatments ceased

BGL targets
- Within first 48 hours of life BGL ≥ 2.6
- 48–96 hours of life BGL ≥ 3.0
- > 96 hours of life BGL ≥ 3.5
- If known hypoglycaemic disorder BGL ≥ 4.0

* Validated BGL is obtained via:
- Enzymatic PoC device (e.g. iSTAT®, StatStrip®)
- Blood gas analyser (if short sample to analysis interval possible)
- Laboratory method in fluoride oxalate tube

BGL: blood glucose level, **CVL:** central venous line, **GIR:** glucose infusion rate, **IM:** intramuscular, **IV:** intravenous, **NNP:** neonatal nurse practitioner, **PoC:** point of care, **PVL:** peripheral venous line, **RSQ:** Retrieval Services Queensland, **subcut:** subcutaneous, **UVC:** umbilical venous catheter, **>** greater than, **<** less than, **≥** greater than or equal to

Queensland Clinical Guideline. Hypoglycaemia–newborn. Flowchart: F23.8-3-V10-R28

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