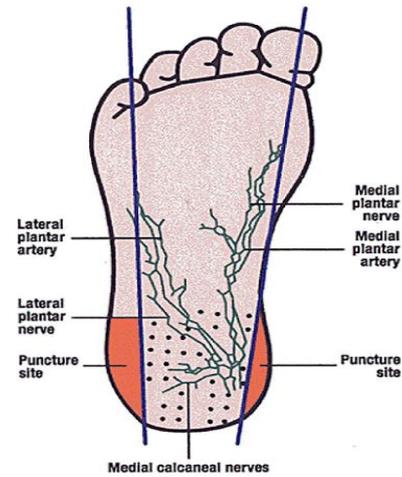


NEONATAL HYPOGLYCAEMIA

GRBS Check by capillary sample method (For Nursing):



Definition

Hypoglycaemia is defined physiologically as that blood glucose level at which cerebral energy needs fail to be met. However, there is no clear and satisfactory definition of hypoglycaemia based on plasma glucose levels alone, because of the complexities of metabolic and hormonal adaptation to birth, our limited understanding of neonatal cerebral defences in hypoglycaemia, and inadequate long-term data to fully assess the impact of hypoglycaemia on the developing brain.

It is prudent to prevent recurrent and persistent hypoglycaemia due to associations with seizures, poor visual motor, and executive function at 4–5 years of age. In healthy term neonates, there is a transient, physiological fall in the blood glucose concentration with a nadir at 60–90 minutes after birth, without any symptoms later rising to levels above 60 mg/dL by 4 hours.

Practical Note:

- **Breastfeeding must be initiated within the first 60 minutes**
- In Ward, if GRBS is **<45mg/dl**, immediately shift the baby to NICU for further management. If GRBS between **45-50mg/dl**, then give Glucose gel 40% (0.5ml/kg) followed by breastfeed (Or Formula feed) in babies with no symptoms of hypoglycaemia

symptoms (TFR 60ml/kg/day). The therapeutic goal for treatment of hypoglycaemia is **>50mg/dl** during initial 48 hours and **>60mg/dl** for babies older than 48 hours of age.

- **Blood glucose measured by strip (Point of care) is 15% lesser than plasma glucose.**
- **Treat all symptomatic hypoglycemia with IV Dextrose.**
- **Consider central line if IV Dextrose infusion concentration requirement >12.5%.**
- **Each time titrate by 2.5% dextrose concentration.**
- **Formula for calculating glucose infusion rate in mg/kg/min**

$$\text{Glucose infusion rate (mg/kg/min)} = \frac{\text{Dextrose concentration} \times \text{Vol. infused in ml/kg/day}}{144}$$

- **If any resistant or persistent hypoglycaemia please send blood investigations for Insulin, Cortisol, and Growth Hormone. For further evaluation contact metabolic team.**
- **For any neonate with hypoglycaemia, aim is to document 3 normal prefeed blood sugar levels.**
- **GRBS screening:** At high-risk neonates check initial 3 prefeed BSL at 2 -3hours interval (GRBS must check 2 times in SICU before shifting to ward for high-risk neonates born via LSCS.). If normal, then every 6 hourly for next 24 hours.

Hypoglycaemic symptoms: Tachypnoea, Tachycardia, Poor feeding, Pallor, Temperature instability, Lethargy, hypotonia, Apnea or irregular breathing efforts, Cyanosis and Seizures.

-For NICU babies receiving IV fluids, where the therapeutic goal is **>60mg/dl**.

Clinical setting	Intervention threshold	Therapeutic goal	Main therapeutic intervention
Well infant, not in 'at risk' group	Do not measure glucose unless hypothermic, feeding abnormally or becomes unwell		Feeding
'At risk' well infant screened for	<45mg/dl	>50mg/dl	Shift to NICU

hypoglycaemia <48hours of age (In ward)			
'At risk' well infant screened for hypoglycaemia <48hours of age (In ward)	45-50mg/dl	>50mg/dl	Glucose gel 40%(0.5ml/kg/dose) followed by feeding. - Recheck blood glucose after 30-60 minutes.
'At risk' well infant screened for hypoglycaemia >48hours of age (In ward)	<60mg/dl	>60mg/dl	Glucose gel 40%(0.5ml/kg/dose) followed by feeding. - Recheck GRBS after 30-60 minutes. -Shift to NICU If GRBS still <60mg/dl
Any infant with major illness or critically unwell (in NICU)	<60mg/dl	>60mg/dl	IV Dextrose infusion (Adjust the TFR or the concentration accordingly). -Recheck GRBS after 60-minutes.

In all above-mentioned scenarios, recheck prefeed GRBS until 3 normal levels.

Indications for GRBS monitoring (3 Pre feed GRBS then q 6H up to 24H of age and 8H for next 24H)

1. Newly born who are well but identified as 'at risk

- Moderate and late preterm infants (32-37 weeks' gestation)
- Maternal diabetes /GDM
- Birth weight < 10th percentile for gestation (IUGR)
- Birth weight > 97th centile for gestation (LGA)
- Hypothermia (temperature < 36°C)

2. Other conditions:

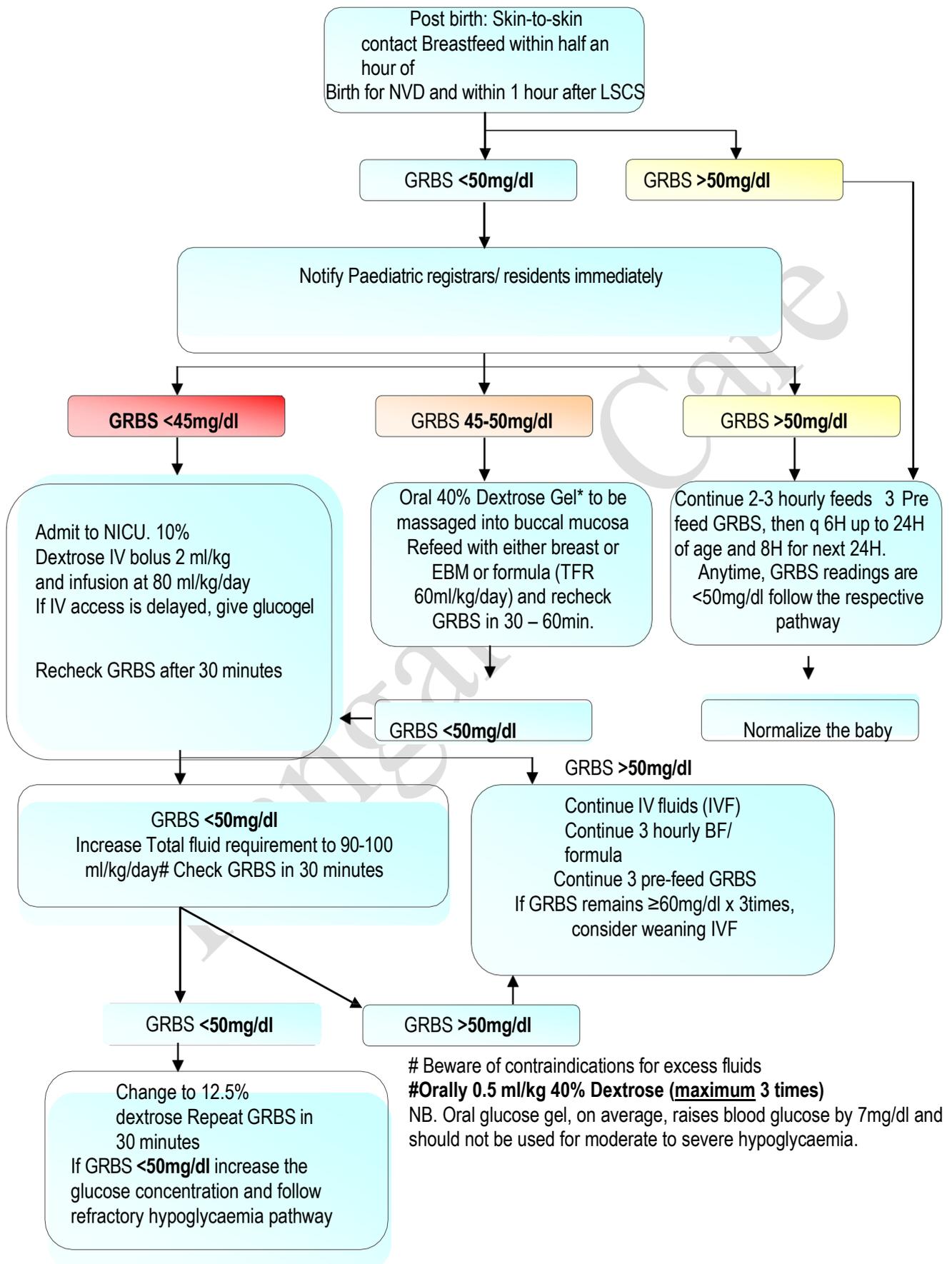
- Respiratory distress post elective caesarean birth at term with a low-level oxygen requirement ($FIO_2 < 30\%$) and suspected transient tachypnoea of the newborn
- Sepsis, Polycythaemia, perinatal asphyxia, inborn errors of metabolism (IEM), growth hormone (GH) and cortisol deficiency.
- Maternal treatment with drugs that interfere with glucose homeostasis, most importantly **beta-blockers and valproic acid.**

Symptomatic Hypoglycaemia (In Ward):

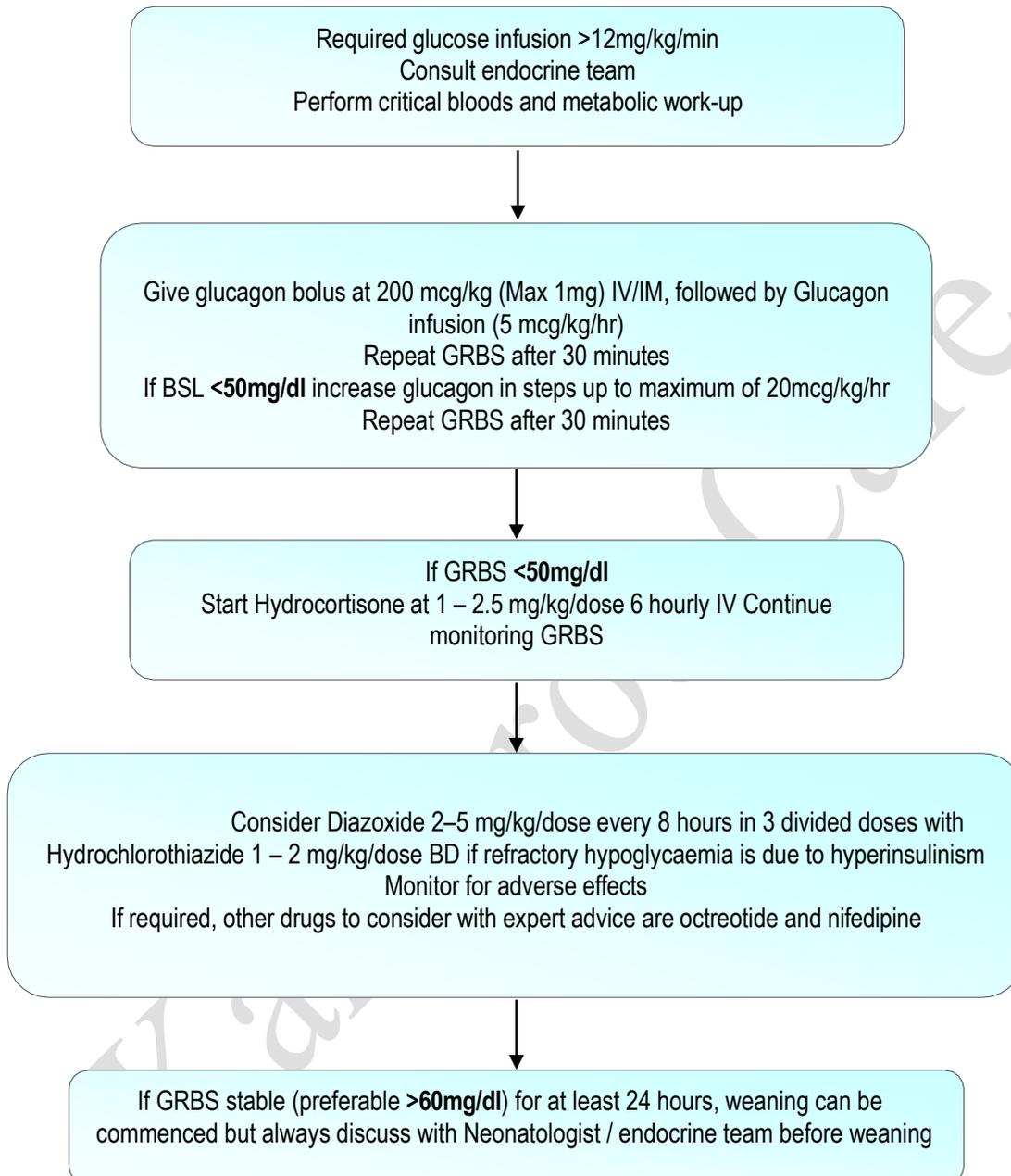
- Shift to NICU immediately. Administer 40% dextrose gel if oral solution is allowed.
- **Insert IV cannula ASAP**, give 10% Dextrose IV bolus at 2ml/kg and commence IV Dextrose infusion at age-appropriate fluid rate and concentration. Repeat GRBS after 30 minutes.

***Symptomatic hypoglycaemia:** Defined as symptoms including irritability, tremors, exaggerated Moro reflex, high-pitch cry, seizures, lethargy, floppiness cyanosis, apnoea and poor feeding with a corresponding GRBS of **<50mg/dl.**

Asymptomatic neonates at risk of Hypoglycaemia



Refractory Hypoglycaemia: It is defined as Hypoglycemia requiring infusions of a large amount of glucose (>12 mg/kg/min) to maintain normoglycemia.



REF: NNF, www.sahealth.sa.gov.au

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