1.0 Introduction
Many simple procedures commonly and frequently undertaken on neonatal units are painful for newborn babies.
- Both 24% Sucrose and Breast milk provide a quick and short term analgesic effect.
- The effect of sucrose appears to be enhanced by the use of a dummy.
- Sucrose should be used in conjunction with environmental and behavioural measures to relieve pain (eg: positioning, swaddling, containment holding).
- Sucrose is ineffective if given via the nasogastric or orogastric tube
- MEBM should be considered as an alternative when available

2.0 Indications for use
Sucrose, or Breastmilk should be given prior to these painful procedures:
- Heel prick blood sampling
- Cannulation (IV / IA / CVL)
- Oro / nasogastric tube insertion
- Intramuscular injection
- Urinary catheterisation
- Retinopathy examination
- Suturing
- Venepuncture
- Lumbar puncture
- Oropharyngea l/ nasopharyngeal suction
- Immunisation
- Suprapubic tap
- Ventricular tap
- Dressing change

3.0 Contraindications
Sucrose should not be used in:
- Infants less than 28 weeks gestation
- Infants at high risk of NEC
- Infants who are nil by mouth
- Infants who are sedated or on other pain medications
- Infants of diabetic mothers (until blood sugars have stabilised)
- Infants with known carbohydrate malabsorption or enzyme deficiency

Consider using MEBM for painful procedures instead of sucrose in the above situations.
4.0 Special precautions
Sucrose may not be as effective with: (but does not preclude its’ use)
- Infants of opiate dependent mothers
- Infants who have just been fed
- Infants exposed to chronic in-utero stress
- Infants older than 6 months

5.0 Oral Doses
- Solutions of 24% Sucrose should be used, several brands are commercially available - most are supplied in 12ml containers
- Sucrose should be given **two minutes before** the start of the procedure
- The dose may be repeated a further two times for lengthy procedures
- A **maximum of eight doses** of Sucrose may be given in one day

<table>
<thead>
<tr>
<th>Gestation</th>
<th>Dose of 24% sucrose</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 +0 – 30 +6 weeks</td>
<td>0.1ml (max 0.3 ml per procedure)</td>
</tr>
<tr>
<td>31 +0 weeks and over &amp; 1000-2000g</td>
<td>0.2 ml (max 0.6 ml. per procedure )</td>
</tr>
<tr>
<td>&gt;2000g</td>
<td>0.5ml.(max 1.5 ml per procedure )</td>
</tr>
</tbody>
</table>

- If several babies are having painful procedures at the same time the 12ml container can supply several babies with sucrose, provided the container does not come into contact with any individual baby, dummy or cot/incubator.

6.0 Procedure
- Wash hands and use alcohol gel as per unit policy
- Check sucrose prescription, as per unit policy
- Ascertain whether sucrose is to be given with a dummy
- Check 24% sucrose pack is undamaged and within shelf life.
- Draw up dose into a syringe
- Check patient identity as per unit protocol
- Ensure baby is awake to avoid risk of choking/aspiration
- Employ environmental and behavioural strategies to assist baby
  - Swaddling, containment holding, Kangaroo Care (skin-to-skin) or breastfeeding

**Give the dose... either:** drop the prescribed dose onto dummy and place in baby's mouth
**or:** give the prescribed dose onto the tongue or the buccal membrane

- **WAIT two minutes before** commencing the painful procedure.
- Continue environmental and behavioural strategies during the procedure
- Observe baby's cues and allow "time out" to recover if possible
- Record administration of sucrose on prescription chart
- Document administration in nursing notes
- Discard residual sucrose.
Flow Chart for Sucrose/ MEBM use during Painful Procedures

1. Painful procedure to be performed?
2. Employ behavioural & environmental strategies
3. Is sucrose/MEBM indicated?
4. Draw up prescribed dose of 24% sucrose
5. Administer sucrose to tip of tongue or buccal membrane
   - use dummy if parents agree
6. Wait two minutes before starting procedure
   - Continue using Behavioural and Environmental strategies to relieve pain
7. Sucrose dose may be given two further times during lengthy procedures
8. After the procedure, calm the baby and return to an appropriate position
9. Record administration of Sucrose
10. Discard residual Sucrose
   - if not used immediately for another baby

Breast milk may be used as an alternative to 24% Sucrose
7.0 Significant publications since last Guidelines (2008)

Holsti L and Grunau R  Considerations for Using Sucrose to Reduce Procedural Pain in Preterm Infants *Pediatrics* 2010; 125; 1042-1047 : originally published online Apr.19, 2009; DOI: 10.1542/peds.2009-2445


Both of these publications raised issues concerning the use of sucrose in preterm neonates. The following comments were made by Sunny Anand and Linda Franck in personal correspondence to Katie Thompson:-

*The review by Holsti & Grunau is an interesting analysis, but largely based on speculative relationships that have not been proven in the clinical setting. I don't think this will or should have much impact on the current clinical practices of using sucrose. The RCT by Celeste Johnston was very poorly designed and executed. One of the three collaborating centers had protocol violations in the majority of neonates enrolled in the study. What was labeled as “consistent use of sucrose” was really very inconsistent. Their subgroup analyses were not hypothesis-based (i.e. the RCT was not designed to answer the question of dose-related sucrose effects) and have been grossly over-interpreted.*

K.J.S. Anand, MBBS, D. Phil., FAAP, FCCM, FRCPCH.

*With regard to the new sucrose controversy, I share your concern! The review by Holsti & Grunau is full of assumptions and speculation. The study by Slater et al has some methodological issues and is only one small study – not an evidence base.*

Linda S. Franck, RN, PhD, FRCPCH, FAAN

A further comment on the Slater article was published in *The Lancet* January 2011.


8.0 Audit

Clinical audit should be carried out on a regular basis

<table>
<thead>
<tr>
<th>Standard</th>
<th>%</th>
<th>Clinical Exceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All babies receive adequate analgesia</td>
<td>100%</td>
<td>Emergency situations</td>
</tr>
</tbody>
</table>
9.0 References


Categories of Evidence

Category A
There is no evidence that sucrose has long-term negative effects

Category B
Sucrose is safe and effective for reducing procedural pain from single events. An optimal dose could not be identified due to inconsistency in effective sucrose dosage among studies. Further investigation on repeated administration of sucrose in neonates and the use of sucrose in combination with other non-pharmacological (e.g. behavioural, physical) and pharmacological interventions is needed. Sucrose use in extremely low birth-weight and unstable and/or ventilated neonates needs to be addressed.

If available, breastfeeding or breast milk should be used to alleviate procedural pain in neonates undergoing a single painful procedure compared to placebo, positioning or no intervention. Administration of glucose/sucrose had similar effectiveness as breastfeeding for reducing pain. The effectiveness of breast milk for repeated painful procedures is not established and further research is needed. These studies should include various control interventions including glucose/sucrose and should target preterm neonates.

Category D
Infants who received no more than 10 doses of sucrose over 24 hours were less at risk for poorer neurodevelopmental scores.