

SUCROSE: MANAGEMENT OF SHORT DURATION PROCEDURAL PAIN IN INFANTS

PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

NSW Ministry of Health Policy Directive

Neonates: Management of Procedure-Related Pain

http://www.health.nsw.gov.au/policies/pd/2006/pdf/PD2006_060.pdf

- The above linked document “Neonates: Management of Procedure-Related Pain” was developed by NSW Health in response to the availability of strong evidence that neonates do feel pain which can have both short and long term adverse effects.
- Despite this evidence there remains an evidence gap on the use of simple interventions such as breastfeeding, swaddling and sucrose during short duration painful procedures.
- Newborn infants admitted to hospital are subjected to numerous painful procedures that can be alleviated with these simple interventions. **Note:** The use of these interventions is not to be seen as a substitute for analgesia for *severe* or on-going pain and painful procedures.
- If the mother is present, breastfeeding should be promoted as the first line of use for short duration procedural pain.

Management of Short Duration Procedural Pain by using Sucrose

- The use of sucrose is **not** a substitute for comfort measures.
- Sucrose is available from the Pharmacy in 25% multi-use bottles [at SCH and CHW] or 24% single use vials [at CHW only].
- Evidence is not strong for the use of sucrose beyond the newborn period.
- Sucrose is a Nurse-initiated order. Sucrose **should not be used** if known fructose intolerance.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy Procedure and Guideline Committee	
Date Effective:	1 st December 2013	Review Period: 3 years
Team Leader:	Clinical Nurse Consultant	Area/Dept: Grace Centre for Newborn Care - CHW

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This Guideline may be varied, withdrawn or replaced at any time.

CHANGE SUMMARY

- At CHW - Sucrose concentration changed to 24% with the use of single use vials, but 25% sucrose is still available via the Pharmacy.
- Literature review and references updated.
- Other Sucrose guidelines at CHW & SCH [including the Nurse Initiated Medication document at CHW] have been rescinded and are replaced by this SCHN guideline. Sucrose Nurse Initiated Medication is covered in this document.

READ ACKNOWLEDGEMENT

- Nursing and Pharmacy staff who care for neonates and infants, are to read and acknowledge they understand the contents of this document. Sucrose is a Nurse Initiated order.
- Relevant Medical staff are to read this document.

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Prelude

Definition: The neonatal period is the first 28 completed days of life. Within the scope of this document infants up to the age of 3 months are included.

Authorised Prescribers

- Sucrose is a Nurse Initiated Medication and may be initiated and administered by nursing staff according to their Scope of Practice.
- Completion of a nurse initiated sucrose education package is required before being eligible to prescribe as a nurse initiated medication.
- An implementation strategy for nurse-initiated sucrose and a regular audit process are required to ensure compliance.
- The dose and *actual dose administered* is entered on the PRN section of the Medication Chart (including the maximum daily dose).
- All orders to include the maximum dose for each 24 hours.
- In the operating theatres, this procedure needs to be anaesthetist-initiated.

Availability

- Sucrose is available from the Pharmacy in:
 - 24% vials (1 or 2mL) [*at CHW only*] or
 - 25mL bottles of 25% solution [*at CHW and SCH*]. Once opened the multi-use bottle is assigned an arbitrary expiry period of one month.
- Sucrose 24% contains no preservative; Sucrose 25% contains preservative.

Specific Indications

Infant responses to short duration, single event painful procedures indicate that they experience considerable pain and this is often under-treated^{1,2}.

Small amounts of sweet solutions placed into the infant's mouth have been shown to reduce procedural pain³ and minimise crying following the procedure by mediating an increase in endogenous opioid⁴. Pain responses that have been shown to be reduced are crying time, heart rate and SpO₂ desaturation⁵. The oral administration of sucrose is a safe and effective form of analgesia for short duration procedures⁶ and may be given for repeated procedures^{6,7}.

Oral administration of sucrose is beneficial to decrease pain during minor procedures and to help reduce crying following the procedure. Potentially painful procedures include blood collection by a heel lance, venipuncture, inserting venous and arterial lines, inserting gastric feeding tubes, eye examinations, lumbar puncture, subcutaneous and intramuscular injection, chest drain removal, removal of adhesive tape and sutures⁸⁻¹². Refer to the [Appendix](#) for a complete list of potentially painful procedures.

There is insufficient evidence of the analgesic effects of sweet tasting solutions or substances during acute painful procedures in children over one month¹³ and over one year of age.¹⁴

Sucrose may be given repeatedly during the infant's hospitalisation however the number of doses need to be accurately recorded. Multiple doses of sucrose given over time have resulted in no increase in pain responses suggestive of a lack of evidence to support development of sucrose tolerance¹⁴. Further research is recommended on the long-term neurodevelopmental outcomes of infants who have received multiple doses during their hospital stay.³

Additional method for short duration Procedural pain relief

Infants who are able to suckle safely are placed on the breast to suck for two minutes prior to and if possible during a painful procedure such as a heel lance¹⁵.

Small amounts of mothers expressed breast milk (EBM) if available has been found to be effective for painful procedure management in newborns unable to suckle at the breast. A small amount of EBM is placed on the tongue prior to and during a painful procedure. The effectiveness of repeated doses over time has not been evaluated as yet¹⁵.

Use in specific circumstances

- The long term effects are unknown, therefore sucrose should be used with caution for infants hospitalised for a prolonged period of time, in particular infants of less than 32 weeks gestation and those at risk of necrotising enterocolitis¹⁶.
- Infants on nil by mouth may have sucrose or breast-milk administered by the buccal route. Check with neonatologist/paediatrician.
- Infants of methadone addicted mothers have altered endogenous opiate systems however oral sucrose has been found to be effective for procedural pain¹⁷.
- Use with caution for infants who are receiving concurrent opiates. These infants may not experience the same benefits due to altered endogenous opiate systems¹⁸.
- Infants excluded from receiving oral sucrose include those with carbohydrate metabolism disorders (such as fructose or sucrose intolerance), and disruption to the integrity of oral mucosa, due to diagnosed yeast infection, oral surgery/trauma and mucositis.
- Sucrose should be used only for management of short-lived acute pain. Due to the short acting analgesic effects of sucrose³, it is not effective and not recommended for use in situations of ongoing distress, irritability, hunger or chronic pain²².
- Small volumes of sucrose during painful procedures should not contribute to the risk of dental caries. However, health professionals caring for sick infants and their families, must be cognisant of the risk of over using sucrose, and ensure that oral sucrose is not promoted as an agent to be frequently used in the promotion of calming in crying infants, outside of the realm of procedural pain reduction¹⁶.
- There is negligible absorption of glucose through the oral mucosa, and substantial volumes of the solution needs to be swallowed in order for an increase in blood sugar level to occur¹⁹.

- Sucrose may be used for infants of diabetic mothers¹⁹, and infants who receive an opioid antagonist (Naloxone hydrochloride) as the analgesic effect of sucrose is not altered.
- Sucrose and breastfeeding is also recommended for procedural pain associated with eye examination¹¹ and immunisation^{8, 23}.

Other support offered during painful interventions

- There is evidence that different non-pharmacological interventions can be used with preterm infants, neonates, and older infants to significantly manage pain behaviours associated with acutely painful procedures²⁰.
- The most effective procedures were non-nutritive sucking, skin-to-skin holding (Kangaroo mother care) and swaddling²⁰. These measures are to be implemented as part of the management of procedural pain.
- If the mother is present and the infant is able to suck safely, consider placing the infant on the breast for sucking a small amount of breast milk during a painful procedure such as a heel lance¹⁵.
- Wrap the infant to help contain the infant and reduce the stress²¹.
- Provide information to the parents concerning the appropriate indications for oral sucrose administration with emphasis that it is for the exclusive use of single event short duration procedures. Parents are **not** to administer sucrose for comfort.
- The infant will still cry during the painful procedure; however the pain markers of crying time, elevated heart rate and reduction of SpO₂ will be minimised³.
- Other forms of analgesia should not be excluded.

Recommended Dosage

Neonates and Infants up to 3 months of age³: Concentration 24%, Dose per procedure 0.05 – 0.5mL, Maximum dose of 24 hours 5mL (approx. 10 doses).

Note: 0.05mL = one drop, 0.5mL = 10 drops

Store at room temperature.

In areas where 25% sucrose is only available, the same dosage as above should be applied.

How to administer Sucrose

- All doses are administered via the oral route as it is mediated via its gustatory effect (taste). No benefit has been demonstrated when administered via a gastric tube³.
- Two minutes prior to the painful procedure administer a small amount of the dose (about one drop) onto the infant's tongue using a vial, syringe or pacifier³. Ask staff to wait for 2 minutes prior to commencing the procedure.
- During the procedure if required repeat the dose (one drop) every two minutes up to the total maximum prescribed dose of 10 drops (0.5mL)³. Please note this is **NOT** the full vial.
- If breast feeding is not possible, offer a pacifier (with parental consent) during administration of sucrose to increase the analgesic effects.³
- The immediate effect of the sucrose may not be evident as the infant will still cry during the procedure. However, the duration of crying is likely to be reduced and the vital signs may be less affected.^{3,4}
- The administered dose of sucrose **must be documented on medication chart** and make a note in the progress notes with the purpose and the effect noted.

Precautions

- Recent oral surgery, trauma, yeast infection or mucositis.
- **Not to be used** as an infant comfort or settling practice.

Appendix: Potentially painful procedures in the newborn

Diagnostic	Therapeutic	Surgical
Arterial puncture	Bladder catheterization	Other surgical procedures, for example, peritoneal drain, cut-down
Heel lancing	Central line insertion/removal	
Lumbar puncture	Chest tube insertion/removal	
Retinopathy of prematurity examination	Chest physiotherapy	
Suprapubic bladder tap	Dressing change	
Venipuncture	Gavage tube insertion	
Eye examination	Intramuscular injection	
	Laser therapy for retinopathy, Peripheral venous catheterization & Mechanical ventilation	
	Postural drainage Removal of adhesive tape	
	Suture removal	
	Tracheal intubation/extubation Ventricular tap	

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