



NON-NUTRITIVE SUCKING TECHNIQUE IN NEONATES

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ABSTRACT

Non-nutritive sucking (NNS) is a safe and effective developmental care intervention commonly used for preterm infants with immature feeding abilities. Since sucking, swallowing, and breathing coordination is often underdeveloped in preterm neonates, they are at increased risk of feeding difficulties, aspiration, and delayed growth. NNS, performed using the mother's breast, pacifier, or gloved finger without milk transfer, helps improve oral motor development, feeding readiness, suck-swallow-breathing coordination, and physiological stability. Because immaturity of the lower esophageal sphincter increases the risk of regurgitation and aspiration, combining NNS with controlled feeding methods such as NG tube or paladai feeding ensures safe nutrition and feeding progression. Nurses play an important role in assessing feeding readiness, monitoring for complications, and educating caregivers. Evidence shows that NNS improves feeding efficiency, promotes weight gain, shortens hospital stay, and supports earlier transition to full oral feeding, making it a simple and cost-effective intervention for improving neonatal outcomes.

KEYWORDS : Non-nutritive sucking, preterm neonates, oral motor development, feeding readiness, nasogastric feeding, aspiration prevention, neonatal nursing.

INTRODUCTION

Neonatal feeding is a complex developmental process that involves the coordination of sucking, swallowing, and breathing. This coordination typically begins to mature around 32–34 weeks of gestation and is fully developed by 37 weeks. Preterm neonates often lack this coordination, which may result in feeding difficulties, prolonged hospital stay, and delayed growth.

IMPORTANCE OF ORAL MOTOR MATURATION

Oral motor development is essential for effective feeding and overall neurodevelopment. Proper maturation ensures safe swallowing, adequate nutrition, and prevention of aspiration. Early stimulation techniques, such as non-nutritive sucking, play a vital role in enhancing oral motor skills and improving the sucking reflex in preterm babies.

DEFINITION OF NON-NUTRITIVE SUCKING (NNS)

Non-nutritive sucking (NNS) is defined as sucking behavior that occurs without the delivery of nutrients, typically using a pacifier, gloved finger, or empty breast. Unlike nutritive sucking, NNS does not involve milk transfer but helps in the development of sucking patterns, oral motor coordination, and strengthening of the sucking reflex, especially in preterm infants.

PHYSIOLOGY OF SUCKING IN NEONATES

Sucking is a reflex action controlled by the central nervous system and involves multiple cranial nerves (V, VII, IX, X, XII). It consists of:

- Nutritive sucking: Slow, Rhythmic sucking with milk intake
- Non-nutritive sucking: Rapid, Repetitive sucking without milk flow

The coordination of suck-swallow-breathing is essential for safe feeding. In preterm neonates, this coordination is immature, increasing the risk of feeding difficulties and aspiration.

ADDITIONAL PHYSIOLOGICAL CONSIDERATION: ESOPHAGEAL SPHINCTER MATURITY

In preterm infants, the lower oesophageal sphincter (LES) is functionally immature. Due to this immaturity:

- The sphincter does not close effectively after feeding
- Milk can easily regurgitate back from the stomach into the oesophagus
- This regurgitated milk may enter the airway, increasing the risk of aspiration

This condition is commonly linked to gastroesophageal reflux in preterm neonates, and the lower oesophageal sphincter matures gradually over time.

- **Around 37–40 weeks of gestational age (term maturity)**
- Further LES strengthening occurs during the first 3–4 months after birth, and poor feeding coordination increases the risk of aspiration during direct breastfeeding in preterm infants.

CONCEPT AND MECHANISM OF NON-NUTRITIVE SUCKING

NNS stimulates oral sensory receptors and promotes rhythmic sucking patterns. The mechanism includes:

- Activation of neural pathways controlling the sucking reflex
- Enhancement of oral muscle strength and coordination
- Improvement and maturation of the sucking reflex in preterm infants
- Regulation of behavioral state and feeding readiness

Importantly, NNS helps infants practice sucking safely without the risk of milk aspiration, especially in those with immature swallowing and oesophageal control.

INDICATIONS FOR NON-NUTRITIVE SUCKING

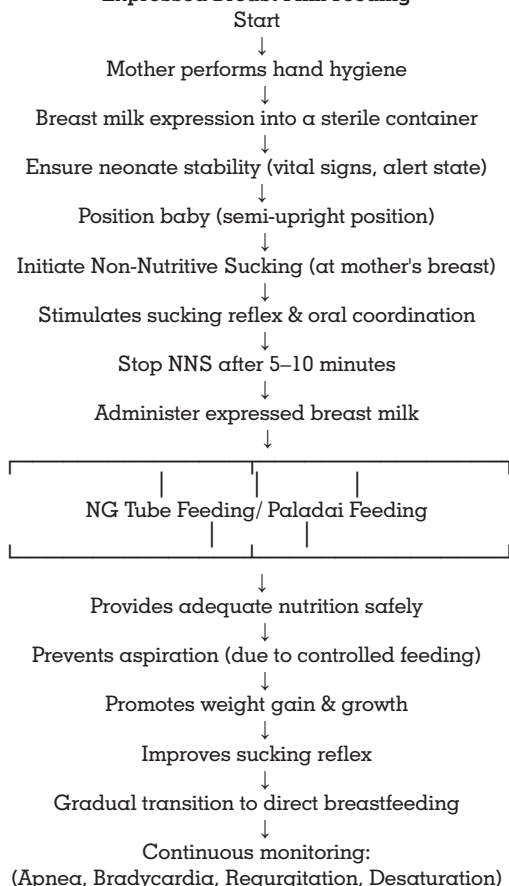
- Preterm neonates with an immature sucking reflex
- Infants with poor suck-swallow coordination
- Neonates at risk of aspiration
- Infants on tube feeding
- Neurologically immature neonates
- NICU-admitted babies

CLINICAL TECHNIQUE AND PROCEDURE**1. Preparation:**

- Perform hand hygiene

- Use sterile equipment
- Ensure neonatal stability

Flowchart: Combined Non-Nutritive Sucking with Expressed Breast Milk Feeding



NON-NUTRITIVE SUCKING (NNS) TECHNIQUE

A supportive oral stimulation technique for preterm and medically unstable neonates



BENEFITS OF NON-NUTRITIVE SUCKING

- Improves sucking reflex in preterm babies
- Enhances oral motor development
- Improves coordination of suck-swallow-breathing
- Reduces risk of aspiration
- Promotes weight gain
- Facilitates safe feeding transition
- Reduces hospital stay

EVIDENCE FROM RESEARCH STUDIES

- Studies show improved sucking reflex and feeding efficiency in preterm infants receiving NNS
- Evidence indicates reduced aspiration risk when feeding is combined with NNS techniques
- Research supports earlier transition to full oral feeding
- Demonstrates improved physiological stability and growth

ROLE OF NURSES IN IMPLEMENTATION

- Assess sucking reflex and aspiration risk
- Monitor signs of regurgitation due to immature LES
- Guide mothers in proper feeding techniques
- Ensure safe administration of expressed breast milk
- Educate parents about feeding safety and reflux risk
- Maintain aseptic practices

CHALLENGES IN CLINICAL PRACTICE

- Limited awareness of reflux-related risks
- Lack of standardized feeding protocols
- Difficulty in assessing feeding readiness
- Parental anxiety regarding feeding methods

SAFETY CONSIDERATIONS AND CONTRAINDICATIONS

Safety:

- Monitor for regurgitation and aspiration signs
- Maintain proper positioning (semi-upright)
- Avoid overfeeding
- Use controlled feeding methods

Contraindications:

- Severe respiratory distress
- Unstable neonates
- Congenital anomalies (e.g., cleft palate)
- Severe gastroesophageal reflux complications

CASE SCENARIO 1

In 2025, a 32-week preterm low-birth-weight neonate in a tertiary care NICU experienced poor sucking reflex and breastfeeding difficulties. Non-Nutritive Sucking (NNS) was introduced before feeds, followed by expressed breast milk through a nasogastric tube. After two weeks, the infant showed improved sucking coordination, better feeding tolerance, gradual weight gain, and successfully transitioned to direct breastfeeding.

CASE SCENARIO 2

In 2024, a 30-week preterm neonate with respiratory distress syndrome in a tertiary care NICU received ventilatory support and tube feeding. Non-Nutritive Sucking (NNS) was introduced before feeds due to delayed oral feeding readiness, followed by expressed breast milk via NG tube. Over three weeks, the infant demonstrated improved oral-motor skills, better physiological stability, reduced feeding intolerance, and successfully transitioned to full breastfeeding with a shorter hospital stay.

CONCLUSION

Non-nutritive sucking is a safe and effective method that improves oral motor development and sucking reflex in preterm neonates. As preterm infants have immature swallowing and a high risk of regurgitation and aspiration, combining NNS with controlled feeding methods such as NG tube or paladai feeding helps prevent aspiration, promote weight gain, and support safe progression of feeding. Proper nursing care and monitoring further improve neonatal outcomes.

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