Clear to Feed: Effectiveness of First-Attempt Physiotherapist Suction in Children (<24 months)

Zubaidah Yusop (Physiotherapy Manager), Ana Atiqa Umaira Mohd Hamzah (Physiotherapist), Nur Izyan Osman (Physiotherapist), Noorazian Ibrahim (Physiotherapist), Noor Shazana Zainal (Physiotherapist), Rubne Thayanithi (Physiotherapist), Chandrasegar Gobi (Physiotherapist).

Columbia Asia Hospital-Setapak

ABSTRACT

Background: In infants and toddlers, feeding problems are frequently associated with retained airway secretions. Inadequate clearance can impair swallowing, raise aspiration risk, and extend hospital stay. Although suctioning is routine, little evidence exists on outcomes when performed by physiotherapists.

Aim: To evaluate physiotherapist led suction in improving feeding outcomes in children <24 months and identify factors contributing to failed first attempts, using a quality improvement framework.

Methods: A six-month project (January to June 2025) was conducted in the Pediatric Ward at Columbia Asia Hospital – Setapak. Children with secretion-related feeding difficulty were included. Suction was performed by physiotherapists using standard protocol and immediate feeding response was documented.

Results: Of 846 cases, 713 (84.3%) improved after the first attempt, while 133 (15.7%) required repeat suction. Monthly success varied between 92.5% (January) and 75.0% (June). Contributing factors included secretion viscosity, patient irritability, and inconsistent technique.

Conclusion: Physiotherapist-led suction was effective, surpassing the 80% target though sustained improvement requires standardized protocols and training.

CONTACT

Zubaidah Yusop
Columbia Asia Hospital-Setapak
zubaidah.yusop@columbiaasia.com
60341459999
https://www.columbiaasia.com/malaysia/hospitals/setapak/

INTRODUCTION

At Columbia Asia Hospital (CAH) – Setapak, feeding difficulties in children <24 months are often associated with **excessive airway secretions**. Clinical experience has shown that delayed clearance of these secretions can result in **feeding intolerance, aspiration events, and prolonged hospitalization**.

Globally, studies indicate that up to **30% of hospitalized children** experience feeding intolerance, and inadequate secretion clearance may increase healthcare costs by **20 to 30%**. Within this context, the effectiveness of **first-attempt suction performed by physiotherapists** has not been systematically measured. Although **nasal and oral suctioning** are standard procedures traditionally performed by nurses and physicians, physiotherapists are increasingly undertaking this role because of their expertise in airway clearance.

In pediatric patients, retained secretions whether due to **respiratory infections, excessive nasal/oral secretions, or partial airway obstruction** disrupt swallowing coordination and reduce oral intake, frequently contributing to **dehydration and extended hospital stays**.

AIM

To evaluate the effectiveness of physiotherapist led nasal and oral suction in improving feeding outcomes in children <24 months, and to identify contributory factors to potential failed first attempt suction.

SMART Goal: Achieve and sustain a ≥80% first attempt success rate in feeding improvement following suction from January to June 2025.

METHODS AND MATERIALS

A quality improvement study was conducted in the Pediatric Ward from January to June 2025. The project was embedded within a PDSA cycle, focusing on measuring and improving first attempt suction outcomes.

Population

- Inclusion criteria: Children aged <24 months admitted with feeding difficulties secondary to airway secretions.
- Exclusion criteria: Infant and toddler with congenital anomalies, neurological impairment, no feeding intolerance or those requiring ventilator support.
- Sample size: All eligible admissions over a 6-month baseline period were included.

Intervention

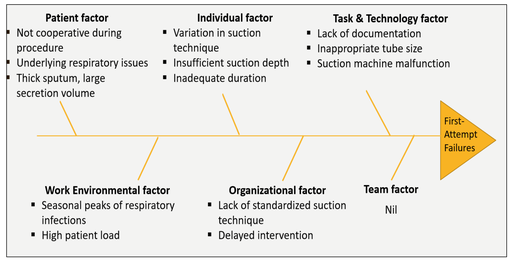
- Physiotherapist led suction using nasal/oral catheter.
- Standardization: Suction performed according to ward protocol (catheter size, suction pressure, depth and duration).

Data collection and analysis

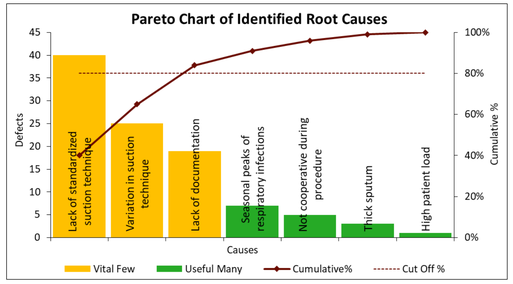
- Structured checklist on patient demographics, suction attempt, feeding response, and need for repeat suction.
- Data were prospectively entered into Microsoft Excel 2019 and analyze.

RESULTS

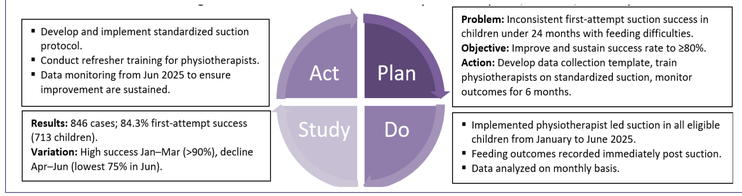
Root Cause Analysis (RCA) (Pre-implementation)



Pareto Chart (After multi voting)



PDSA Cycle



- Develop and implement standardized suction protocol.
- Conduct refresher training for physiotherapists.
- Data monitoring from Jun 2025 to ensure improvement are sustained.

Problem: Inconsistent first-attempt suction success in children under 24 months with feeding difficulties.
Objective: Improve and sustain success rate to ≥80%.
Action: Develop data collection template, train physiotherapists on standardized suction, monitor outcomes for 6 months.

Results: 846 cases; 84.3% first-attempt success (713 children).
Variation: High success Jan–Mar (>90%), decline Apr–Jun (lowest 75% in Jun).

- Implemented physiotherapist led suction in all eligible children from January to June 2025.
- Feeding outcomes recorded immediately post suction.
- Data analyzed on monthly basis.

Analysis

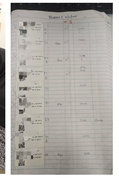
A total of 846 children <24 months with feeding difficulties underwent physiotherapist performed suctioning between January and June 2025.

- 713 children (84.3%) showed immediate feeding improvement after the first attempt.
- 133 children (15.7%) required more than one attempt.
- Monthly success rates ranged from 92.5% (January) to 75% (June).

Monthly analysis revealed consistently high effectiveness, with first-attempt success rates ranging from 75% in June to 92.5% in January 2025. Despite seasonal variations in feeding difficulties and secretion severity, physiotherapists consistently achieved over 80% success.



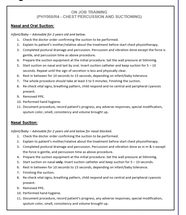
Standardized suction performed by physiotherapist



Feeding outcomes documented in a logbook



Feeding outcomes documented in Care21 (Electronic Medical Record)



On Job Training Chest Percussion and Suctioning

DISCUSSION

This study demonstrates that physiotherapist-performed suction at CAH Setapak achieved a high first-attempt success rate of 84.3%, exceeding the PDSA goal of 80%. More than 8 out of 10 children experienced immediate feeding improvement, confirming suction as an effective frontline intervention.

The monthly variability highlights areas for improvement with lowest success rate in June (75%) coincided with increased pediatric respiratory illnesses, suggesting an external seasonal factor. RCA revealed modifiable contributors such as inconsistent technique and lack of standardized suction protocols. From a quality improvement standpoint:

- **Strengths**: Large dataset, immediate clinical relevance for pediatric feeding care.
- **Limitations**: Single-center study, short duration, no comparison with suction performed by nurses/physicians.

GRAPHS AND TABLES

Table 1. Monthly Distribution of Suction and Success Rate

Month	Improved After 1st Attempt	Failures	Total Cases	Success Rate (%)
Jan-25	124	10	134	92.5%
Feb-25	66	9	75	88.0%
Mar-25	123	29	152	80.9%
Apr-25	140	25	165	84.8%
May-25	155	25	180	86.1%
Jun-25	105	35	140	75.0%
Total	**713**	**133**	**846**	**84.3%**

Figure 1: Number of Feeding Improvement After 1st Attempt Physiotherapist Performed Suction

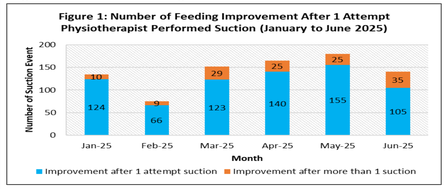


Figure 2: Percentage of Improvement

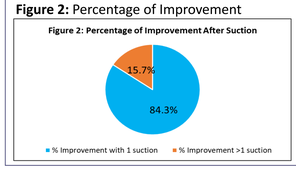
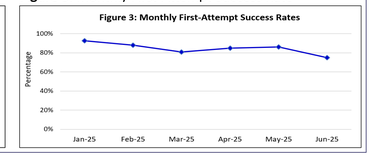


Figure 3: Monthly First-Attempt Success Rate



CONCLUSIONS

At CAH Setapak, physiotherapist led suction significantly improved feeding outcomes in children <24 months, with an **84.3% first-attempt success rate** across 846 cases.

By embedding the PDSA cycle and applying quality tools, this initiative provided a structured framework for identifying gaps and implementing improvements. Sustaining outcomes will require:

1. **Regular training to reinforce standard practices** among physiotherapist.
2. **Continuous monitoring** to sustain >90% success.
3. Expansion to include **comparative groups and long-term outcomes**.

REFERENCES

1. Atanelov.Z, Aina.T, Smith.T,Rebstock.S.E. Nasopharyngeal Airway. National Library of Medicine, January 30, 2024.
2. Boo.N.Y, Suhaida A.R, Rohana .J. Frequent nasopharyngeal suctioning as a risk factor associated with neonatal coagulase-negative staphylococcal colonization and sepsis. Singapore Med J. 2015 Mar,56(3):164–168.
3. Koheealleea.R , Kulnikb.S.T, Lewko.A. The use of nasopharyngeal and oropharyngeal suctioning in physiotherapy practice in the United Kingdom: a preliminary survey of current practice. St George's, University of London, Physiotherapy Volume 128, September 2025, 101779.
4. Schuh.S, MD1, Coates.A.L, Sweeney.J, RN, BScN2 et al. Nasal Suctioning Therapy Among Infants With Bronchiolitis Discharged Home From the Emergency Department. A Randomized Clinical Trial. JAMA Netwrok, October 19, 2023;6;(10):e2337810.
5. Joshi.K, Parihar.A.S, Singh.J. Effect of nasal suction on reliving feeding difficulty in children affected with bronchiolitis. Department of Pediatrics, Shyam Shah Medical College, Rewa, Madhya Pradesh, India,Int J Contemp Pediatr. 2020 Jan;7(1):168-172