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# Feasibility of Risk-Based Scoring for Initiating Oral Feeds in Infants with Congenital Heart Disease on High-Flow Nasal Cannula

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## Purpose

### Background

- Oral feeding difficulties are prevalent in infants with congenital heart disease
- Delayed initiation of oral feeding post-surgery has been associated with increased need for tube feeding at discharge
- Oral feeding on high-flow nasal cannula (HFNC) is considered safe in healthy infants with bronchiolitis, but these data are not directly applicable to infants with congenital heart disease due to higher feeding and aspiration risks

### Objective

- The aim of this quality improvement project was to develop and assess a risk-based scoring tool for initiating oral feeds in infants  $\leq 6$  months old admitted to the Congenital Heart Center (CHC), with the goal of increasing rates of oral feeding at hospital discharge
- The primary objective was to demonstrate feasibility of the scoring tool and to monitor for adverse events after implementation

## Project Design

### Risk-based scoring tool design

- After reviewing established institutional practices, a multidisciplinary feeding team composed of cardiac intensivists, acute care cardiologists, nurse practitioners, speech/language pathologists, occupational therapists, and dietitians adapted a risk assessment tool originally developed by Seattle Children's Hospital
- Based on the total score, feeding recommendations are as follows:

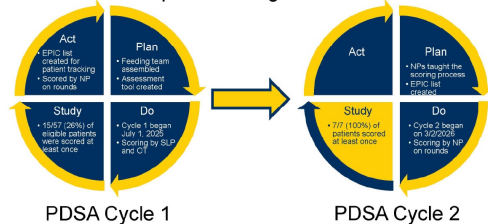
Score 0 – 4: full oral feeds

Score 5 – 7: limited PO trials of 10 mL TID

Score 8 – 10: pacifier dips/oral stimulation

### Plan-Do-Study-Act (PDSA) cycles

- All infants  $\leq 6$  months old admitted to the Congenital Heart Center who required HFNC for  $\geq 12$  hours and survived to hospital discharge were included



|                                                     | 2                                                                                                                  | 1                                             | 0                                       |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------|
| HFNC Flow by Weight (L)                             |                                                                                                                    |                                               |                                         |
| 1.5 – 2.49 kg                                       | >2                                                                                                                 | ---                                           | 2                                       |
| 2.5 – 2.9 kg                                        | >3                                                                                                                 | 3                                             | 2                                       |
| 3.0 – 3.9 kg                                        | $\geq 4$                                                                                                           | 3                                             | 2                                       |
| 4.0 – 4.9 kg                                        | >5                                                                                                                 | 4-5                                           | $\leq 3$                                |
| 5.0 – 5.9 kg                                        | >6                                                                                                                 | 5-6                                           | $\leq 4$                                |
| 6.0 – 6.9 kg                                        | >8                                                                                                                 | 6-8                                           | $\leq 5$                                |
| 7.0 – 7.9 kg                                        | >9                                                                                                                 | 7-9                                           | $\leq 6$                                |
| Current cardiac physiology / extracardiac diagnoses | Genetic syndrome (i.e., trisomy 21, Turner's syndrome, DiGeorge syndrome) OR Cardiac – single ventricle physiology | Cardiac – cyanotic                            | Cardiac – acyanotic                     |
| Oral feeding experience / gestational age           | None to partial oral (<1 mo) OR Born <34 wks                                                                       | <1 mo or partial oral >1 mo OR Born 34-37 wks | Full oral feeding >1 mo OR Born >37 wks |
| Respiratory course / status                         | History of ECMO, significant time on vent OR Marked respiratory distress                                           | Moderate respiratory distress                 | Normal respiratory effort               |
| Aspiration risk                                     | High risk or known aspirator OR High risk for VFMI (arch repair, transplant)                                       | Moderate aspiration risk                      | Respiratory status is only risk factor  |

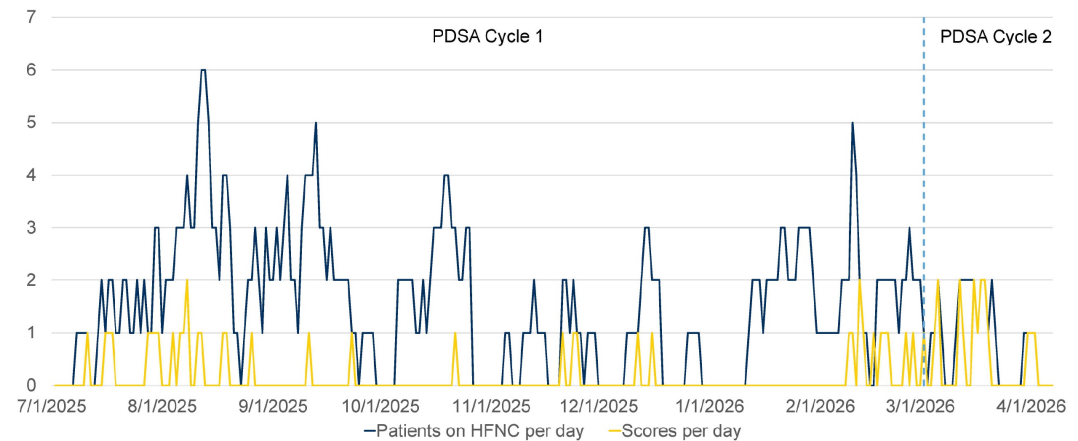
## Results and Conclusion

### PDSA cycle 1

- Between 7/1/2025 and 3/1/2026, there were 57 eligible infants admitted to the CHC
- Median duration of HFNC support was 3 days (IQR 1 – 5 days) with a median hospital length of stay of 21 days (IQR 15 – 32 days)
- 15 patients (26%) were scored at least once during their hospitalization using the HFNC risk assessment tool
- Scored patients spent a longer median time on HFNC (4 days, IQR 3 – 9.5 days) compared to unscored patients (2 days, IQR 1 – 4.75 days)
- One documented aspiration event occurred in a scored patient though the event occurred after the patient had weaned to room air

### PDSA cycle 2

- Between 3/2/2026 and 4/5/2026, there were 7 eligible infants admitted to the CHC
- Median duration of HFNC support was 4 days (IQR 2 – 5 days) with a median hospital length of stay of 27 days (IQR 23 – 34 days)
- All 7 patients (100%) were scored at least once during their hospitalization using the HFNC risk assessment tool
- In PDSA cycle 2, there were 19 scores per 26 patient HFNC days (73%) compared to 29 scores per 237 patient HFNC days (12%) in PDSA cycle 1
- No documented safety events have occurred in PDSA cycle 2



### Conclusions

- The HFNC Risk Assessment tool enabled a standardized, risk-based approach to initiating oral feeds in infants with congenital heart disease on HFNC
- Scoring rates were suboptimal in PDSA cycle 1 when scoring was done by team members who do not see patients daily
- Because daily scoring is necessary due to patients' fluctuating respiratory statuses, a second PDSA cycle began in March 2026 with scoring responsibility transferred to nurse practitioners which resulted in improved rates of scoring for patients on HFNC