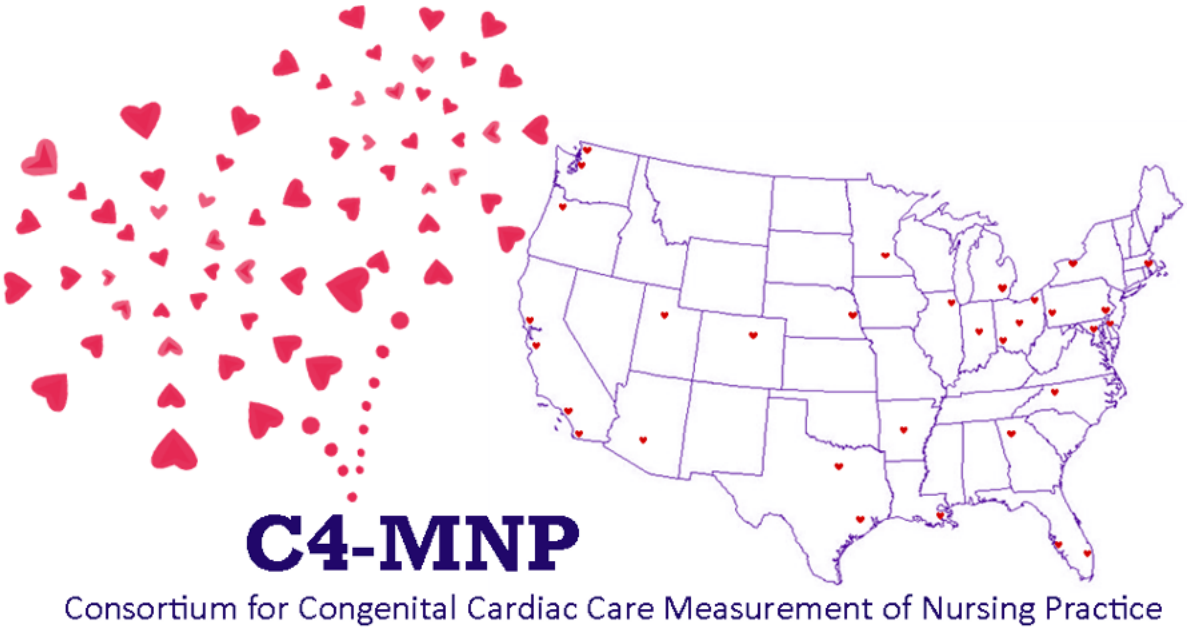
Consortium for Congenital Cardiac Care Measurement of Nursing Practice

Administration of Enteral Potassium Chloride

State of Practice Assessment Aggregate Result Report

December 10, 2019 – January 7, 2020



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Until every child is well™

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Dear Colleagues,

We are pleased to inform you that we have completed the analysis of surveys for the Consortium for Congenital Cardiac Care - Measurement of Nursing Practice (C4-MNP) state of practice assessment regarding the administration of Enteral Potassium Chloride.

The purpose of the C4-MNP state of practice assessment regarding administration of Enteral Potassium Chloride is to reevaluate current enteral potassium chloride administration processes especially for hospitalized neonatal and pediatric populations.

The survey questions were developed by Linda Kulik PhD, RN, CWON, CCRN of Boston Children's Hospital in collaboration with Anna Fisk PhD, RN, CCRN of Boston Children's Hospital.

The invitation to participate was sent to 40 C4-MNP centers and 25 completed the survey for a response rate of 63 percent. Below, please find the aggregate result report.

We would like to extend our heartfelt appreciation for your continued commitment to this collaborative as we work to improve outcomes for pediatric cardiovascular patients and their families.

Sincerely,

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Executive Summary

Survey Overview

The implementation of the new ENFit system and changes in the standard tubing connections for both enteral nutrition and medication delivery has led to a review of current enteral medication administration practices, specifically enteral potassium chloride supplementation. Hypokalemia can be associated with serious patient side effects, increasing the risk for potential co-morbidities or lead to cardiac arrhythmias and life-threatening events. Acutely, potassium supplementation often begins with intravenous administration and then may transition to enteral administration based on patient need.

There is limited evidence on the administration of enteral potassium chloride supplementation in pediatrics, specifically if potassium chloride is administered per post pyloric feeding tubes. The purpose of this project was to describe current nursing practice of enteral potassium chloride administration for hospitalized pediatric cardiovascular patients.

Key Findings

The response rate was 63% (25 out of 40 sites) with the majority (88%) described as a dedicated CICU.

- Variation was reported in routine administration techniques of enteral potassium chloride. Other findings included:
    - 56% included a maximum limit per dose for enteral potassium supplementation; however, the limits varied.
    - 96% reported not making any changes in potassium chloride doses or change in administration technique based on whether the enteral route was gastric or post pyloric.
    - Multiple strategies were noted to manage patient GI discomfort or intolerance.
- Of the 25 respondents, 60% were either transitioning to the ENFit system or were already fully implemented.
    - Of those who were transitioning or already fully implemented ENFit system, 67% encountered barriers.
- Two sites (13%) reported the need to make nursing practice changes regarding the administration of enteral potassium chloride related to ENFit implementation.

Conclusions

Variability was reported regarding the administration of enteral potassium chloride supplementation in ICUs caring for pediatric cardiovascular patients. Some reports of administration techniques are not consistent with available best practice recommendations (1). Barriers were also reported for enteral medication administration related to ENFit implementation.

Next Steps

Recommendations are published by the American Society of Parenteral and Enteral Nutrition (2017) to inform and guide best practices to promote standardization of care to optimize enteral medication administration.

1. Boullata J., Carrera A., Harvey L., et al. (2017) ASPEN Safe Practices for Enteral Nutrition Therapy, J Parenter Enteral Nutr. 41(1):15-103

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Demographics

Question 1. Please describe your unit.

Respondents (N=25)	
Unit	**Frequency (%)**
PICU	3 (12.0)
CICU	22 (88.0)
Mixed Acuity or Acuity Adaptable	0 (0.0)
Acute Care or Step-Down	0 (0.0)

Question 2. Please select any of the following resources policy or guideline available to your nursing staff regarding enteral medication formulary potassium chloride supplements administration: (check all that apply)

Respondents (N=25)	
Resources	**Frequency (%)**
Policy or guideline	12 (48.0)
Medication formulary	20 (80.0)
Order set	10 (40.0)
Other	3 (12.0)
None	2 (8.0)

Of the 25 respondents, 2 reported "other" resources policy or available to nursing staff:

Resources
CICU Pharmacist
Dietician Guidance

Administration

Question 3. How do you routinely administer enteral potassium chloride per gastric enteral device including nasogastric (NG) feeding tubes and gastronomy tube (GT), for either bolus or contenuous feeds?

Respondents (N=25)	
Administration of KCl (NG/GT)	**Frequency (%)**
Bolus into device or device med port, flush	7 (28.0)
Slow manual push into device or device med port over designated amount of time associated with feeding	3 (12.0)
Administer by designated syringe pump overtime	4 (16.0)
Add into enteral feeding bag, associated with feeding	9 (36.0)
Other	2 (8.0)

Of those 25 respondents, 2 reported 'Other' routine administration of enteral potassium chloride per gastric enteral device (NG/GT):

Administration of KCl (NG/GT)
Both bolus into device and flush OR add into enteral feeding base based on patient, and nursing considerations
Recently we changed policy from using during pump mover an hour to administering via Bolus diluted 2:1

Question 4. How do you routinely administer enteral potassium chloride per post pyloric enteral devices including nasal jejunum (NJ) feeding tubes, gastro-jejunum tube (GJT)?

Respondents (N=25)	
Administration of KCl (NJ/GJT)	**Frequency (%)**
Bolus into device or device med port, flush	7 (28.0)
Slow manual push into device or device med port over designated amount of time associated with continuous feeds running	5 (20.0)
Administer by designated syringe pump overtime	3 (12.0)
Add into enteral feeding bag, associated with feeding	8 (32.0)
Other	2 (8.0)

Administration (continued)

Of those 25 respondents, 2 reported 'Other' routine administration of enteral potassium chloride per gastric enteral device (NJ/GJT):

Administration of KCl (NJ/GJT)
Bolus and diluted 2:1
Both bolus into device and flush OR add into enteral feeding base based on patient, and nursing considerations

Question 5. Do you have a maximum limit per dose for enteral potassium chloride administration?

Respondents (N=25)	
Maximum Limit	**Frequency (%)**
No	11 (44.0)
Yes	14 (56.0)

Of thos 25 respodents, 14 responded 'Yes', the maximum limit is:

Maximum Limit
0.5 mEq/kg/dose no more than 4x day
1 mEq/kg/dose
1 mEq/kg
2 mEq/kg/dose
20 mEq/dose
2 mEq/kg/day
2 mEq/kg/dose
2 mg/kg and/or 40 mEq; adults up to 60 mEq
40 mEq
Order set
Per MD order/Pharmacy recommendations
Typically 1 mEq/kg, but will occasionally give above with close monitoring on rare patients
Varies, single dose 2 mEq/kg; usual max single dose 20 mEq but may go higher per Attending and patient need
Wt </= 30 kg: 0.1-2 mEq/kg/dose, not to exceed 40 mEq; max 6 mEq/kg/day; 1-3 doses/day; hard stop 2 mEq/kg/dose. Wt > 30 kg: 10-40 mEq/dose; max 200 mEq/day; 1-2 doses/day; hard stop 60 mEq/dose

Administration (continued)

Question 6. Do you make any potassium chloride medication dose changes related to enteral administration site if given gastric (NG feeding tube, GT) versus post pyloric (NJ/GJ)?

Respondents (N=25)	
Medication Dose Changes	**Frequency (%)**
No	25 (100.0)
Yes	0 (0.0)

Question 7. Do you make any potassium chloride medication administration changes related to enteral administration site if given gastric (NG feeding tube, GT) versus post pyloric (NJ/GJ)?

Respondents (N=25)	
Medication Administration Changes	**Frequency (%)**
No	24 (96.0)
Yes	1 (4.0)

Of those 25 respondents, 1 responded "Yes", the medication administration changes are:

Medication Administration Changes
Slower bolus injection, not push

Question 8. Do you make any changes related to enteral potassium choride administration if the patient has signs of GI discomfort or intolerance (e.x. vomiting, gagging, loose stools, pain) or arrhythmia? (select all that apply)

Respondents (N=24)	
Changes to administration	**Frequency (%)**
Administer dose slower	9 (37.5)
Give smaller doses more frequently	10 (41.7)
Change to IV administration	11 (45.8)
Administer by designated syringe pump over time	3 (12.5)
Add into feedings for further dilution	9 (37.5)
Other	5 (20.8)

Administration (continued)

Of those responding 'Other,' the changes to administration are:

Changes to administration
Further dilution
Dilute (not into feedings)
If they cannot tolerate feeds, we'll transition our patients to IV fluids and add potassium there
More dilution with water and administer slowly

ENFit System

Question 9. Are you currently transitioning to or already using the ENFit enteral system?

Respondents (N=25)	
Transitioning or Using ENFit	**Frequency (%)**
Yes	15 (60.0)
No	6 (24.0)
Unsure	4 (16.0)

Question 10. What components are you currently using? (check all that apply)

Respondents (N=15)	
Components	**Frequency (%)**
Enteral only syringe pumps	3 (20.0)
Enteral only medication syringes with new enteral only locking connection	5 (33.3)
ENFit syringe pump tubing with new enteral only locking connection	2 (13.3)
Large volume feeding pump with bag, ENFit compatible	8 (53.3)
Neomed orange colored tubing and orange feeding syringes	5 (33.3)
We are fully implemented including enteral only syringe pumps, enteral only large volume pumps, enteral tubing with enteral only locking connection and enteral only medication syringes	7 (46.7)

Question 11. Did you experience any barriers in administering enteral medications that you had to overcome in order to implement ENFit?

Respondents (N=21)	
Barriers	**Frequency (%)**
Yes	10 (47.6)
No	11 (52.4)

ENFit System (continued)

Question 12. Please check any of the following potential barriers you had to overcome in order to implement ENFit system? (check all that apply)

Respondents (N=10)	
Potential Barriers	**Frequency (%)**
Need for adapters to use with oral medication syringes	5 (50.0)
Supply issues, back-orders of enteral formula syringes or tubing	4 (40.0)
Nursing practice changes needed to administer enteral medications	4 (40.0)
Supply issues, back-orders of enteral medication syringes	5 (50.0)
None	0 (0.0)
Other	1 (10.0)

Of those responding 'Other,' the potential barriers are:

Potential Barriers
Equipment poor quality, lots of leaking

Question 13. Do you anticipate or plan to make any practice changes regarding administration of enteral potassium chloride or any other enteral medication related to the implementation of the ENFit system?

Respondents (N=15)	
Practice Changes	**Frequency (%)**
Yes	2 (13.3)
No	9 (60.0)
Not Sure	4 (26.7)

ENFit System (continued)

Of those 15 respondents, 2 reported 'Yes,' the practice changes are:

Practice Changes
Education
Need to change from routine administration of enteral potassium chloride by designated syringe pump over time related to current oral syringe and new enteral pump incompatibility

Question 14. Any additional comments?

Comments
Discussing conversion to ENFit, but have not implemented, yet
Moving to complete ENFit system is a challenge where pharmacy has automated medication filling to normal oral syringes. Changing completely into ENFit is increasing pharmacy labor.