

# Enteral Feeding in Critically Ill Patients on Mechanical Ventilation in Prone Positioning: A Quality Endeavor



Anna Lisa Ciarrocca<sup>1</sup>, Rachel Gergely, MS, RDN, LDN, CNSC<sup>2</sup>, Jennifer Stahl, MD<sup>3</sup>

<sup>1</sup>LINC Scholar, ECU Brody School of Medicine, Greenville, NC; <sup>2</sup>Department of Clinical Nutrition Services, Vidant Medical Center, Greenville, NC

<sup>3</sup>Division of Pulmonary and Critical Care and Department of Emergency Medicine, ECU Brody School of Medicine, Greenville, NC

## BACKGROUND

- Early enteral nutrition in critically ill patients is associated with improved patient outcomes and decreased hospital length of stay.<sup>1</sup>
- There has been growing evidence for tolerance of enteral nutrition in prone positioned mechanically ventilated patients in recent small-scale studies.<sup>2,3</sup>
- Research and quality improvement efforts within this domain are needed as the Covid-19 pandemic has led to an increase in the number of patients undergoing prone positioning.
- Before initiation of our project, there was not a formalized protocol in Vidant Medical Center's MICU resulting in inconsistent practices for the provision of enteral nutrition both during and after prone positioning to patients on mechanical ventilation.

## PROJECT AIM

**We aim to increase average patient enteral intake in prone positioning to 50% of recommended goal intake by December 2022.**

## PROJECT DESIGN/STRATEGY

**Location:** MICU at VMC

**Time Course:** Jan. 2021 – Dec. 2022

**Outcome Measures:**

- % of patients receiving enteral nutrition during prone events
- % of recommended goal intake being met through enteral nutrition received during prone events

**Balancing measures:**

- Gastric residual volume (GRV)
- Episodes of emesis

Data captured via manual chart review, de-identified, and stored in Redcap database.

## CHANGES MADE (PDSA CYCLES)

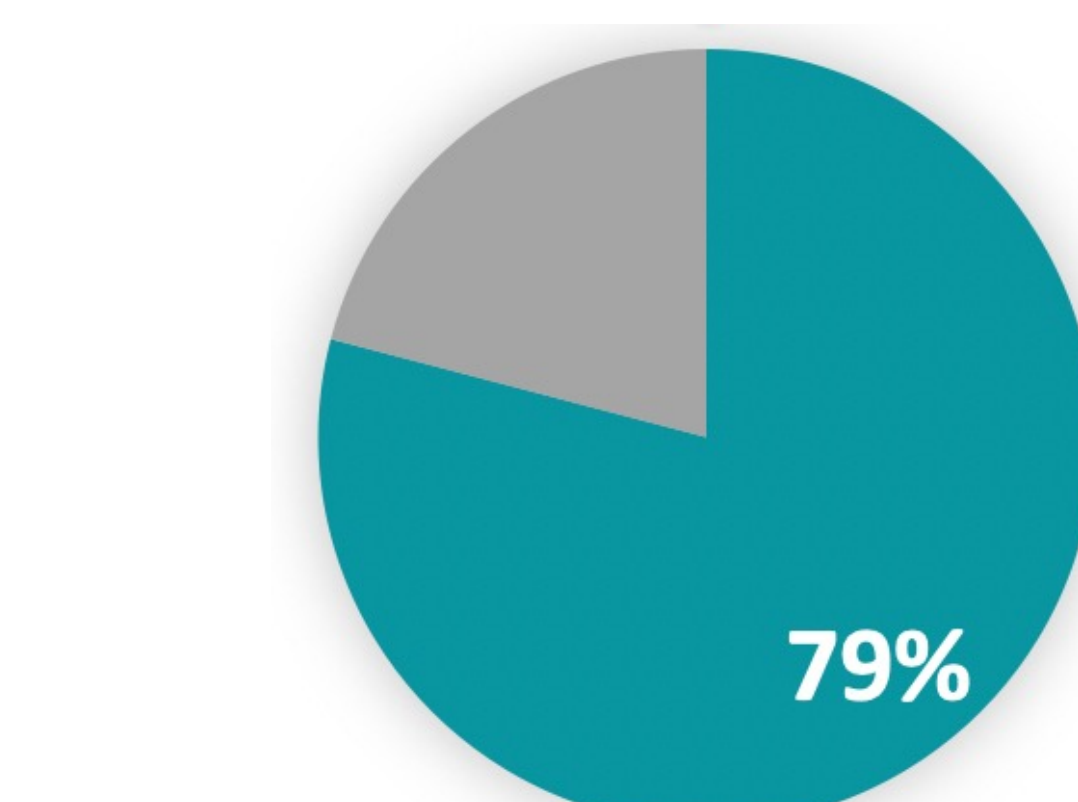
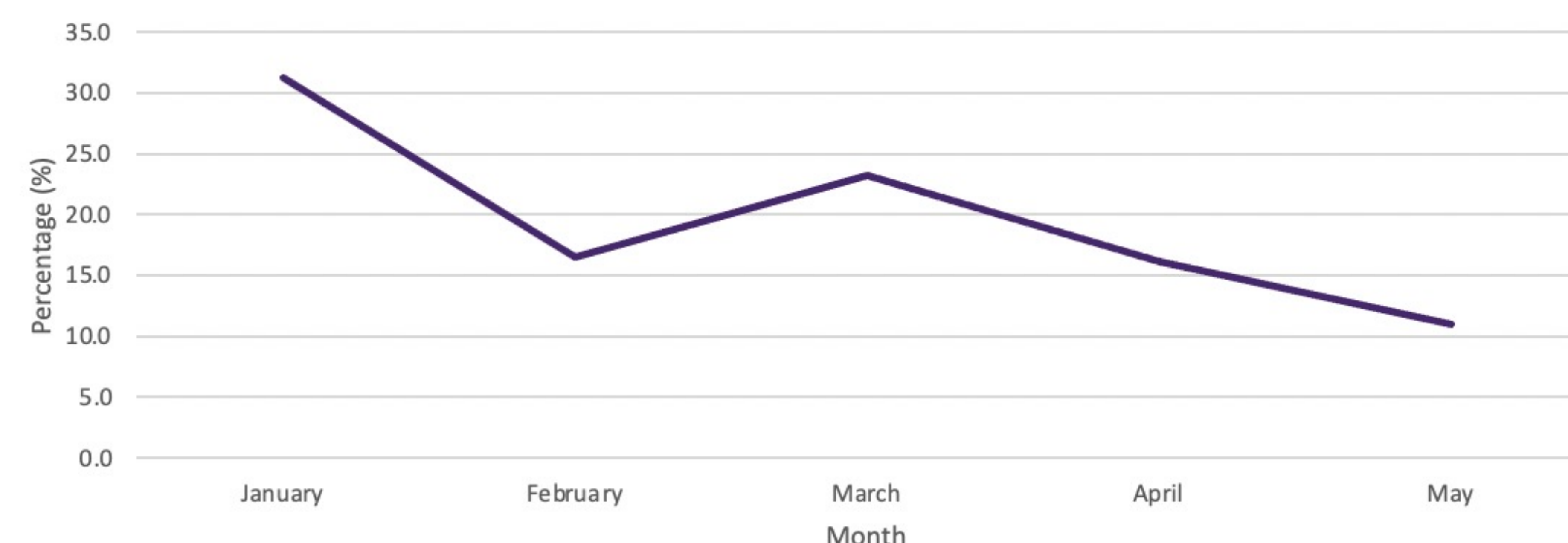
- 1/2021: Education efforts and distribution of protocol to MICU staff, dietitians, and pulmonary critical care fellows**
- 1/18/21-2/21/21: Implementation of protocol**
- 2/22/21-12/31/21: Optimization of nutrition**

## TREATMENT PROTOCOL

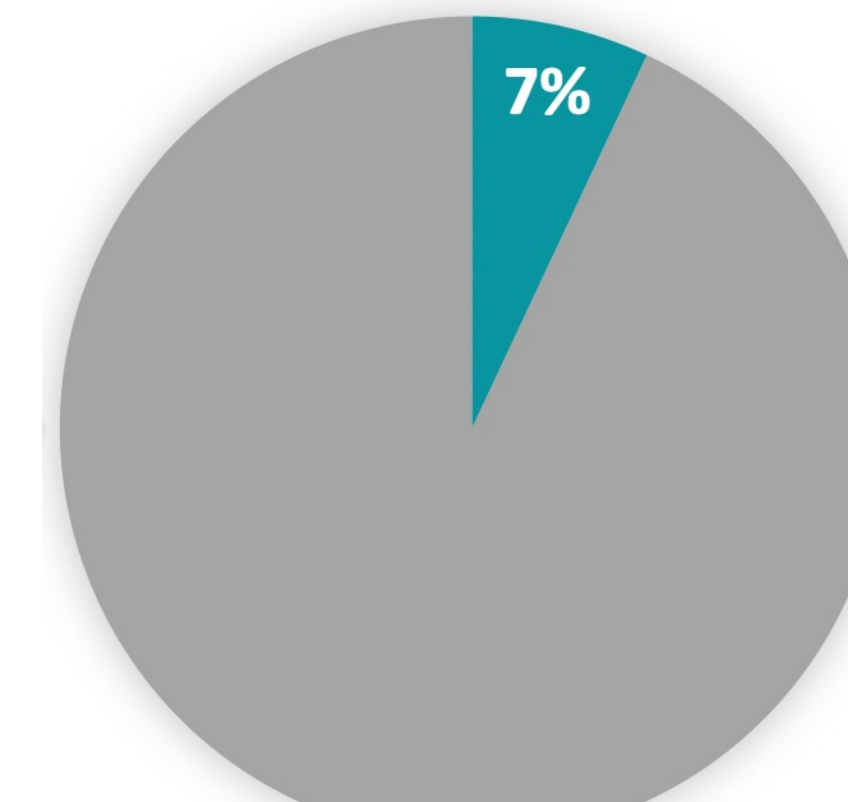
1. Screen patients for inclusion and exclusion criteria
2. Insert NG or OG tube if not already in place
3. Prior to position change enteral formula should be disconnected from NG/OG tube
4. Prone/supinate patient per nursing protocol
5. 10-25 degrees reverse Trendelenburg
6. Initiate or continue at previously tolerated rate of enteral feeding in patients on mechanical ventilation when undergoing prone positioning
7. Initiate or continue enteral feeding at minimum of 10 cc/hr titrating up to 80% of nutritional support as calculated for nutritional needs
8. If intolerance is suspected or observed then stop enteral feeds and proceed with GI physical exam

## RESULTS/OUTCOMES

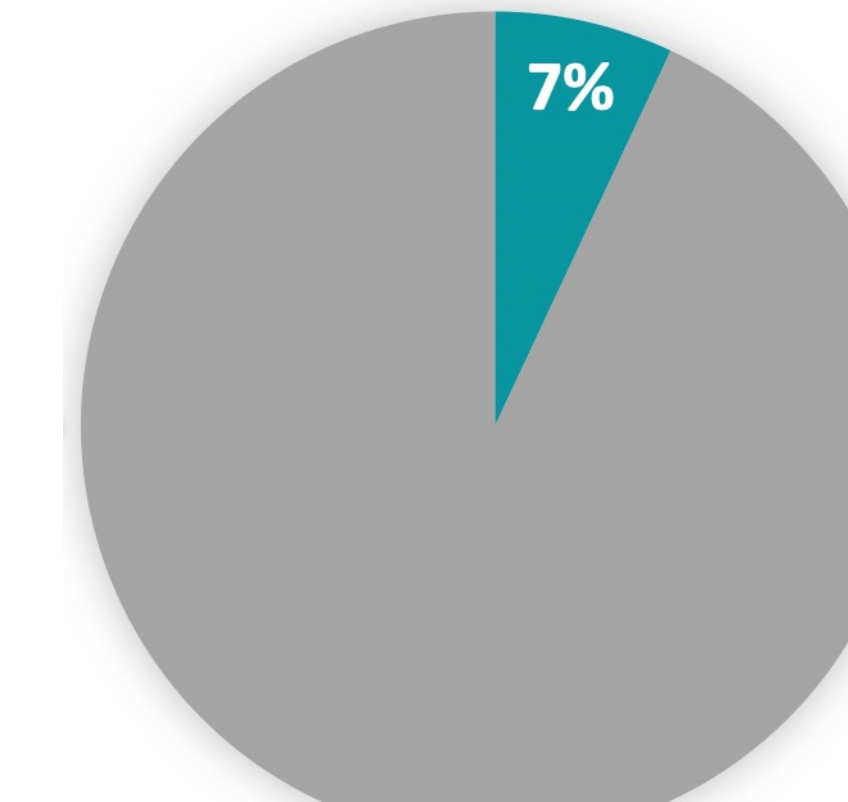
Average Percentage of Recommended Goal Intake in Prone Positioning (2021)



Patients Receiving Enteral Nutrition While Prone



% Patients with GRV > 500ml



% Patients with Episode of Emesis

## LESSONS LEARNED

- Enteral nutrition in mechanically ventilated patients undergoing prone positioning appears to be well tolerated with only 7% of patients experiencing GRV >500mL or emesis during a prone event.
- Optimization of nutrition is limited by critical status of patients in the MICU and provider's clinical decision to place NPO order.
- Challenge of implementing new protocol that differs from previous practice within MICU.

## NEXT STEPS

- Continue to encourage optimization of nutrition in MICU patients through use of protocol and additional PDSA cycles
- Assess limitations to implementation of protocol in critically ill patients under NPO status
- Continue data collection efforts to further assess outcomes from implementation of protocol and tolerance of enteral feeds

## REFERENCES

1. Taylor B, McClave S, Martindale R, et al. Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: society of critical care medicine (SCCM) and American society for parenteral and enteral nutrition (A.S.P.E.N.). *Critical Care Medicine* 2016; 44: 390-438.
2. Saez de la Fuente I, Saez de la Fuente J, Quintana Estelles MD, et al. Enteral nutrition in patients receiving mechanical ventilation in a prone position. *Journal of Parenteral and Enteral Nutrition* 2016; 40: 250-255.
3. Savio R, Parasuraman R, Lovesly D, et al. Feasibility, tolerance and effectiveness of enteral feeding in critically ill patients in prone position. *Journal of the Intensive Care Society* 2020.

## ACKNOWLEDGEMENTS

The authors of this study would like to thank the LINC Scholars program as well as VMC MICU leaders, dietitians, nurses, and providers for your engagement and help with implementation of our protocol.

Anna Lisa Ciarrocca  
Health System Transformation and Leadership Distinction Track  
Brody School of Medicine at East Carolina University  
Greenville, North Carolina 27834  
910.318.0969  
ciarrocca14@students.ecu.edu