Improving Nutrition in Mechanically Ventilated and/or BiPAP Patients in the ICU: A Nurse-Driven Protocol Initiative

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PROBLEM STATEMENT

•More than 50% of ICU patients are malnourished on admission, with albumin levels < 2.2

•ICU patients have a higher risk for malnutrition due to reduced mobility, catabolic changes, and reduced food intake

•Patients requiring mechanical ventilation (MV) and/or BIPAP support are deprived of nutrition due to dyspnea and hypoxia, leading to a prolonged state of starvation

•In the ICU, 70% of patients receive a dietician consult > 48 hours after admission with an average of four days without nutrition

PROJECT PURPOSE

Purpose: Improve nutrition for ICU patients on MV and/or BiPAP

Aim: Early identification, initiation time of enteral nutrition (EN), albumin levels, ICU LOS, vent days on MV and/or BIPAP

Clinical Question: Will the implementation of an ICU Nutrition Bundle Protocol improve the nutritional status in MV and/or BiPAP patients in the ICU within 90 days of implementation when compared to current practice?

MODEL & NURSING THEORY

•**FADE model**: Focus, Analyze, Develop, Evaluate

-Improving the current process through the implementation of the ICU Nutrition Bundle protocol

•**Diffusion of Innovation theory**:

-Influencing the ICU staff and providers' desire to change their current practice by confirming improved nutritional outcomes through utilization of the ICU Nutritional Bundle protocol

METHODS

Subjects (Participants)

• Adult ICU patients
• Ages 45-85
• Requiring MV and/or BiPAP

Setting

• Community hospital
• 36-bed ICU

Instruments & Tools

• ICU Nutrition Bundle protocol: 3 parts

1. ICU order-set on admission
   - Required completion of NRS, obtain baseline albumin level, weight, BMI and automatic Dietician consult
2. Nutritional algorithm
3. Nutritional risk screening (NRS) tool
   - Score > 3 identifies a high nutritional risk and results in physician notification

✓ Validated tool used to identify nutritional risk

Score		Score	
Absent: 0	Normal nutritional status	Absent: 0	Normal nutritional requirements
Mild: 1	Wt loss >5 % in 3 mths or food intake below 50 – 75% of normal requirement in preceeding week.	Mild: 1	Hip fracture, Chronic patients, in particular with acute com-plications cirrhosis, COPD*, Chronic haemodialysis, diabetes, oncology
Moderate: 2	Wt loss >5 % in 2 mths or BMI 18.5 – 20.5 + impaired general condition or food intake 25 – 60 % of normal requirement in preceding week.	Moderate: 2	Major abdominal surgery, Stroke, Severe pneumonia, hepatologic malignancy
Severe: 3	Wt loss >5 % in 1 mths (>15 % in 3 mths) or BMI <18.5 + impaired general condition or food intake 0 – 25 % of normal requirement in preceding week.	Severe: 3	Head injury, Bone marrow transplantation, Intensive care patients (APACHE >10)

Score (nutritional status) ☐ + score (disease severity) ☐ = Total score: ☐

Adjustment for age: if ≥ 70 years: add 1 to total score above

➔ Age-adjusted total score ☐

INTERVENTION & DATA COLLECTION

✧ *Patient specific data = MV and/or BiPAP, albumin levels, EN initiation time, caloric intake*

Pre-intervention: 100 ICU patients

- Obtain nutrition-specific data
- Develop ICU Nutrition Bundle protocol
- Staff education & training on protocol

Implementation: 100 ICU patients

- Random selection
- 90 day implementation

Post-intervention: 100 ICU patients

- Obtain nutrition-specific data
- Compare pre & post outcomes
- Analyze data

Results

- Development of the ICU admission order-set and the Nutritional algorithm

NRS score < 3

- Re-screen in 7 days

NRS score 3-4: HIGH risk

- Inform Intensivist of High Nutritional Risk
- Repeat albumin levels every 48 hours
- Re-screen patient every 48 hours

NRS score > 4: SEVERE risk

- Inform Intensivist of Severe Nutritional Risk
- Obtain order for EN tube placement
- Initiate EN within 12 hours
- Repeat albumin levels every 48 hours
- Re-screen patient every 48 hours

DISCUSSION

- Early identification and utilization of the NRS provides an easy-to-use algorithm to aid in appropriate nutrition interventions
- The ICU Nutrition Bundle protocol serves as a guideline to improve the quality of care provided in the ICU
- Improves patient outcomes as evidenced by increased albumin levels, EN initiation times with 12-24 hours of admission and daily caloric intake documentation
- Early consultation to Dietician, as improving nutrition requires a team
- A plan for implementation of the nutrition admission order-set has been devised and is ready to replicate, when possible

LIMITATIONS

- COVID restrictions

IMPLICATIONS FOR ADVANCE PRACTICE NURSING

- ICU Nutrition Bundle protocol identifies nutritional risks on admission
- Provides patient-specific nutrition plan
- Promotes higher quality of care provided as it is a team-based approach
- Improves patient outcomes

SUSTAINABILITY

- The protocol developed for this QI project is an easy process to follow on admission and should be part of the admission screening
- Promotes a more cohesive care team
- Adds convenience by combining three orders into one
- Order-set can be added to any electronic charting system

References

Improved outcomes of mechanically ventilated and/or BiPAP patients through the use of an ICU nutrition bundle protocol.

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