Improving Nutrition for Mechanically Ventilated Patients

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10:45 AM
Why is nutrition significant for ventilator dependent patients?
The Research…

Many studies show that ICU patients receive inadequate nutrition.

Research also suggests that...

Significantly more ventilated patients received less than required energy and protein.

Why is this important?

Impaired nutrition is linked to physiological stress, impaired immune response, poor tissue healing and increased hospital acquired infection.

ZERO TOLERANCE TO HOSPITAL ACQUIRED INFECTIONS
ZERO TOLERANCE TO HOSPITAL ACQUIRED INFECTIONS
ZERO TOLERANCE TO HOSPITAL ACQUIRED INFECTIONS
It’s also linked to:

Impaired ventilatory drive, and weakened respiratory muscles.

This leads to prolonged dependence on ventilators.

(Dark & Pingleton, 1993)
All this leads to.....

Increased length of stay

Increased hospital costs

(Artinian & DiGiovine, 2006; Marik & Zaloga, 2001).
So....

Providing proper nutritional care for ventilator-dependent, critically ill patients can:

• Improve outcomes
• Reduce complications,
• Decrease length of stay
• Decrease hospital costs.

(Mackenzie, Zygun, Whitmore, Doig and Hameed (2005), Strack van Schijndel, Weijs, Koopmans, Sauerwein, Beishuizen and Girbes, 2009).
And most important…

Studies have shown that improved nutrition decreases patient mortality!!

(Artinian & DiGiovine, 2006; Marik & Zaloga, 2001).
So, that means that means…

Improved nutrition saves lives!!

What about early nutrition?

Early feeding significantly reduces ICU and hospital mortality in ventilated patients.

(Artinian, Krayem, and DiGiovine, 2006)
What about the Use of Protocols or Standardized Orders?

Studies suggested that the use of a feeding protocol improved nutrition to ventilated patients and increased patient outcomes.

(Mackenzie, Zygun, Whitmore, Doig and Hameed (2005), Strack van Schijndel, Weijs, Koopmans, Sauerwein, Beishuizen and Girbes, 2009).
The EBP Project

• Collect data on current practice.
• Develop an evidence-based enteral nutrition feeding protocol for ventilator dependent patients.
• Implement the protocol and collect new data.
• Compare pre-implementation data to post-implementation data.
• Analyze results and make recommendations for practice.
**PICO Question**

**Population:** Newly intubated, mechanically ventilated patients over the age of 18 years

**Intervention:** Utilization of an evidence-based enteral nutrition protocol

**Comparison:** Usual patient care management

**Outcomes:** Improvement in nutrition as indicated by an increase in the percentage of patients receiving EN within 24-48 hours and an increase in the percentage of patients who received at least 60% of their prescribed calories (EN received ÷ EN ordered)
We start with a model: The Iowa Model

- Based on research findings, evidence-based practice guidelines are developed using available evidence.
- Recommended practice is then compared with current practice.
- Decision is made whether current practice should be changed.
- If change warranted, changes are implemented using process of planned change.
  - Practice pilot
  - Guidelines revised based on pilot
  - Outcome data collected
- Adopt for practice if sufficient research is gleaned to form basis for change.
It is important that...

• The protocol be implemented uniformly

• Data collection is accurate and thorough

• Institutional Review Board (IRB) approval granted

• Patient confidentiality maintained
## Enteral Nutrition Initiative For Ventilator Dependent Patients

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubated</td>
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<tr>
<td>Nutrition Trigger Entered</td>
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<tr>
<td>Nutrition Evaluation Completed</td>
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<tr>
<td>Tube Feed Ordered</td>
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<td>TF Started</td>
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<tr>
<td>Extubated</td>
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**Total days intubated** __________  **Total days in unit** __________
## Data Collection Form

<table>
<thead>
<tr>
<th>Date</th>
<th>Rate</th>
<th>Total Ordered</th>
<th>Total Received</th>
<th>Type of Supplement</th>
<th># of hours held</th>
<th>Why held?</th>
<th>% goal met</th>
<th>Weight</th>
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The Protocol

• Consult MD & Dietician to initiate EN within 24-48 hours. Verify orders.
• Obtain baseline weight and weigh daily.
• Insert Nasogastric/Orogastric feeding tube. Check placement with XR
• Elevate and maintain head of bed to 45 degrees.
• Initiate EN at 25ml/hr and advance as per orders to goal rate.
• Verify tube placement by:
  [ ] Withdraw gastric contents prior to each medication administration
  [ ] Withdraw gastric contents every 8 hours for continuous use
• Assess for clinical signs of intolerance at least 4 hours after initial feeding and at least every 8 hours thereafter. Stop feeding and reevaluate if the following are present:
  [ ] Abdominal cramping, distention and rigidity
  [ ] Vomiting/aspiration
  [ ] Diarrhea/constipation
  [ ] Gastric residual volume (GRV) > 250cc
    ( ) GRV < 250ml - replace, continue feeding and recheck in 8 hours
    ( ) GRV > 250ml - replace 300 ml of aspirate, irrigate the tube and hold feeding for 2 hours, then recheck
• Intervene on risk factors that may delay gastric emptying:
  [ ] Maintain tight glycemic control [ ] Assess electrolyte abnormalities
  [ ] Minimize use of narcotics and sedation
• For patients with persistent inability to tolerate feeding, notify and consult with MD. Consider use of prokinetics.
The Results
<table>
<thead>
<tr>
<th>Demographics</th>
<th>Pre-intervention Data</th>
<th>Post-intervention Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33 patients</td>
<td>18 patients</td>
</tr>
<tr>
<td></td>
<td>ages 30-88 years</td>
<td>Ages 37-86 years</td>
</tr>
<tr>
<td></td>
<td>58% female</td>
<td>56% female</td>
</tr>
</tbody>
</table>
## Outcomes - Early Feeding

Timing from Patient Intubation to Start of Nutrition (Table 1)

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Nutrition started Within 24-48 hours</th>
<th>Nutrition started After 48 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n) %</td>
<td>(n) %</td>
</tr>
<tr>
<td>Pre-Intervention</td>
<td>(18) 54.5%</td>
<td>(15) 45.5%</td>
</tr>
<tr>
<td>Post-Intervention</td>
<td>(15) 83.3%</td>
<td>(3) 16.6%</td>
</tr>
</tbody>
</table>
### Outcomes - Feeding Goal

Percentage of Patients receiving 60% of Prescribed Enteral Feeding Goal (Table 2)

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Received 60% of Goal (n) %</th>
<th>Received less than 60% of goal (n) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Intervention</td>
<td>(18) 63.6%</td>
<td>(15) 36.3%</td>
</tr>
<tr>
<td>Post-Intervention</td>
<td>(15) 77.8%</td>
<td>(3) 12.0%</td>
</tr>
</tbody>
</table>
Evaluation

This EBP project has increased positive patient outcomes.

Use of an enteral nutrition protocol resulted in

- **Earlier Feedings**
- **More complete feedings**

The protocol has now been accepted for permanent use by the medical center and will contain automatic triggers for the ordering of referrals, laboratory tests and medical orders.
THANK YOU!!