Nurses’ Competencies in Caring for Mechanically Ventilated Patients, What does the Evidence Say?

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Dr. Noha El-Baz
The mechanically ventilated patient presents many challenges for the intensive care nurse. Nursing care and management of the critically ill mechanically ventilated patient is demanding and necessitates an expert understanding of technological issues underpinned with a patient focused approach.
- The care of mechanically ventilated patients is at the core of a nurse’s clinical practice.

- Despite the fact that Mechanical ventilation were introduced in the 1950’s, it has been a continuously challenging work to improve, update and excel.
The challenge is on two levels:

- The acquisition of highly technical skills and expert knowledge of invasive monitoring

- The implementation of interventions to care for mechanically ventilated patients
Nowadays the main aim is to use evidence based findings and integrate them into the care of mechanically ventilated patient.

Using evidence based nursing care is one of the basic competencies of the critical care nurses.
What is a nurse’s Competency?

The ability of a nurse to integrate the professional attributes required to perform in a given role, situation, or practice setting. Professional attributes include, but are not limited to knowledge, skill, judgment, attitudes, values, and beliefs.
Nursing care reflects an integration of knowledge, skills, experience, and attitudes needed to meet the needs of patients and their families. The Synergy Model has identified 8 nurse competencies, each one has additional dimensions based on level of nursing expertise.
Clinical Inquiry
Facilitation of learning
Response to diversity
Systematic thinking
Collaboration
Caring practices
Advocacy and moral agency
Clinical Judgment
AACN Nurses’ competencies
Domain of competency in ICU

Technology

Interpersonal

Critical thinking
Technology

- Cognitive skills
- Critical care knowledge
- Psychomotor skills
- Technical understanding
Interpersonal

✓ Communication
✓ Customer service
✓ Conflict management
✓ Collaboration
✓ Team skills
Critical thinking

✔ Problem solving
✔ Time management
✔ Priority setting
✔ Planning
✔ Change management
What does the latest evidence tell us?
Couchman et al. 2007, identified the core evidence-based collaborative principles which define the nursing management of mechanically ventilated patients.
Patient Safety

Equipment assessment

Stress, pain and sedation

Hygiene

Comfort

Position
To promote patient safety it is recommended to utilize the health assessment framework e.g. The emergency care cycle which facilitates a systematic and comprehensive approach to patient assessment:

- Primary survey
- Secondary survey
- Nurse / patient ratio 1:1 (AACN recommendation)
# Primary survey

<table>
<thead>
<tr>
<th>Assessment parameters</th>
<th>Relevant numerical data</th>
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<tbody>
<tr>
<td><strong>A</strong>: Airway Is the airway patent and secure?</td>
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<tr>
<td>- Listen to air movement</td>
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<tr>
<td>- Observe rise and fall of chest</td>
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<tr>
<td>- Check tube is secure and length is correct</td>
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<tr>
<td><strong>B</strong>: Breathing Is the patient breathing?</td>
<td>SpO2, tidal volume, respiratory rate</td>
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<tr>
<td>- Observe chest rise and fall</td>
<td></td>
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<tr>
<td>- Observe patient color</td>
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<tr>
<td><strong>C</strong>: Circulation Does the patient have adequate circulation? - Check for a pulse</td>
<td>Heart rate and rhythm, arterial blood pressure</td>
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<tr>
<td>- Assess strength of pulse</td>
<td></td>
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<tr>
<td>- Observe patient color</td>
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<tr>
<td><strong>D</strong>: Disability What is the patient’s level of consciousness?</td>
<td></td>
</tr>
<tr>
<td><strong>E</strong>: Exposure What is the patient’s surrounding environment? Is the patient’s dignity preserved?</td>
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## Secondary survey: system approach

<table>
<thead>
<tr>
<th>System</th>
<th>Assessment parameter</th>
</tr>
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</table>
| Neurological  | • Glasgow Coma Score  
• Ability to communicate  
• Sedation score  
• Degree of neuromuscular blockade                                               |
| Respiratory   | **Artificial airway.**  
• Tube placement  
• Tube security  
• Cuff status  

**Airway patency.**  
• Assessment of lung secretions (suctioning)  
• Adequacy of humidification  

**Breathing.**  
• Respiratory rate, volume and pressure  
• ABG analysis  
• Pulse oximetry  
• Capnometry |
| Cardiovascular          | • Heart rate and rhythm  
|                        | • Blood pressure         
|                        | • Central venous pressure 
|                        | • Peripheral perfusion   
|                        | • Chest X-ray interpretation  
|                        | • Measurement of cardiac output  
|                        | • Observe for signs of DVT  |

| Gastrointestinal       | • Abdominal discomfort/distension  
|                        | • Presence of bowel sounds       
|                        | • Amount and characteristics of gastric aspirates  
|                        | • Frequency of bowel movement    
|                        | • Physical strength and body weight  
|                        | • Serum phosphate level          
|                        | • Liver function tests           |
| Metabolic         | • Temperature
<table>
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<tr>
<th></th>
<th>• Blood glucose level</th>
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</table>
| Renal            | • Urine output
|                  | • Serum electrolytes, urea and creatinine levels |
| Skin integrity   | • Pressure ulcer risk
|                  | • Observe for presence of pressure ulcers |
Equipment and safety check

Essential equipment required at the bedside
• Self-inflating manual resuscitation bag with appropriately sized face mask
• High-flow suction unit and endotracheal suction catheters

Additional equipment readily accessible to the bedside
• Intubation equipment
• Oxygen—wall and portable supplies
• Battery operated suction unit
Equipment and safety check

Safety checks

- All equipment is present, readily accessible and in full working order
- The ventilator is connected where possible to an uninterrupted power supply
- Intravenous infusions are being delivered according to a current order with the correct rate, composition, time of expiry, point of administration, etc.
- Patient equipment is functioning properly and safe alarm limits are set
- Monitoring devices are connected appropriately and safe alarm limits are set
| Positioning | Evidence supports recumbent positioning of ventilated patients with the head of the bed elevated from 30 – 45 degrees to prevent VAP. Prone positioning, and rotational therapy to improve ventilation perfusion mismatch (taking into consideration conditions like head injury or lung injury). Skeletal alignment, range of motion exercises, soft tissue and muscle, and normal anatomical flexion (further research is needed) |
| Hygiene | Eye care (polyethylene covers vs oitments and drops)  
Mouth care (Soft bristled toothbrushes / chlorhexidine every 2 - 4 hrs)  
Ice chips decrease bacterial growth  
Bathing, washing hair promotes comfort  
Washing the perineum twice a day to decrease urinary catheter infection (more research is needed.) |
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<th>Stressors</th>
<th>Communication difficulties, sleep deprivation, nightmares, isolation, loneliness, anxiety, more research is needed.</th>
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<tbody>
<tr>
<td>Pain</td>
<td>Pain assessment and evaluation</td>
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<tr>
<td></td>
<td>Pharmacological and non Pharmacological pain management</td>
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<tr>
<td>Sedation</td>
<td>Sedation assessment e.g. Ramsay scale, Ricker sedation- Agitation scale, and the Richmond Agitation sedation scale.</td>
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</table>
Delirium

Referred to as ICU psychosis or ICU syndrome. Can be identified by:
- the cognitive test of delirium (CTD)
- the confusion assessment method for ICU (CAM-ICU)
- the intensive care delirium screening checklist (ICDSC)

Now treated by haloperidol, and nursing role includes:
- orientation to time and place
- manipulation of environment e.g. lightening, noise.
- providing sensory aids e.g. glasses, hearing aids
- measures to provide the patient with a perception of control e.g. seeking their input regarding care.
As educators and researcher what should we look for and stress on in our students and interns???
### Competency statement: Provides nursing care for the patient requiring mechanical ventilation.

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1. Identifies the indications for mechanical ventilation.

2. Lists the steps in preparing for intubation:
   a. Notifies physician and respiratory therapist.
   b. Assembles the necessary equipment.

3. Determines the patient’s ventilator settings on a given ventilator and verifies the physician’s orders:
   a. FIO2, tidal volume, rate, and mode.
   b. Identifies additional settings according to patient orders.
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<td>4.</td>
<td>Describes the various modes of ventilation and their implication.</td>
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<tr>
<td>5.</td>
<td>Describes at least two complications associated with patient’s response to mechanical ventilation and their signs and symptoms.</td>
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<td>6.</td>
<td>Describe the causes of given ventilator alarms and nursing measures taken to trouble shoot given alarm.</td>
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<tr>
<td>7.</td>
<td>Describe some preventative measures taken aimed at prevention of ventilator-associated complications.</td>
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<td>8.</td>
<td>Given a nursing intervention in the care plan of the ventilated patient, be able to explain the rationale.</td>
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<td>9.</td>
<td>Verbalizes the standards of care according to care plan and documents pertinent information including the following: type of airway, position and size; type of ventilator and settings; breath sounds and pulmonary assessment; interprets ABG results; weaning attempts and patient tolerance.</td>
<td></td>
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Competency statement: Provides nursing care for the patient requiring mechanical ventilation.


11. Emergency equipment available in patient room: ambu bag, mask, appropriate size suction catheter and no outdated equipment.

Comments:........................................................................................................
Finally,

Being mechanically ventilated can be a terrifying experience. Although patient’s respiratory distress is relieved, intubation has deprived patient’s ability to move, clear secretions and communicate easily.

Critical care nurses must be sensitive to the physiological as well as psychological impact of MV & anticipate patient’s special needs.
Clinical reasoning, which includes clinical decision making, critical thinking, and a global grasp of the situation, coupled with nursing skills acquired through a process of integrating formal and informal experiential knowledge and evidence-based guidelines.
Advocacy & moral agency

Working on another’s behalf and representing the concerns of the patient, the patient’s family, and nursing staff; serving as a moral agent in identifying and helping to resolve ethical and clinical concerns within and outside the clinical setting.
Caring practices

Nursing activities that create a compassionate, supportive, and therapeutic environment for patients and staff, with the aim of promoting comfort and healing and preventing unnecessary suffering; includes, but is not limited to, vigilance, engagement, and responsiveness of caregivers, including family and health care personnel
Collaboration

Work with others in a way that promotes /encourages each person’s contributions toward achieving optimal/realistic goals for patients and their families; involves intra-disciplinary and interdisciplinary work with colleagues and community
Systematic thinking

Body of knowledge and tools that allow the nurse to manage whatever environmental and system resources exist for the patient, the patient’s family, and staff, within or across health care and non–health care systems
Response to diversity

The sensitivity to recognize, appreciate, and incorporate differences into the provision of care; differences may include, but are not limited to, cultural differences, spiritual beliefs, sex, race, ethnicity, lifestyle, socioeconomic status, age, and values.
Facilitation of learning

The ability to facilitate learning for patients and their families, nursing staff, other members of the health care team, and the community; includes both formal and informal facilitation of learning
Clinical inquiry

The ongoing process of questioning and evaluating practice and providing informed practice; creating practice changes through research utilization and experiential learning