CARING FOR PATIENTS AFTER MECHANICAL VENTILATION

PART 2: NURSING CARE TO PREVENT COMPLICATIONS

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This article, the second in a two-part series, outlines the importance of providing high-quality nursing care and careful monitoring when patients are discontinued from artificial mechanical ventilation. The range of physical and psychological effects they may experience is discussed, and the role of the nurse in patient monitoring and care during this period is outlined.

The first article in this series (Gallimore, 2007) provided important background information on the various physical and psychological effects that patients may experience when they are removed from mechanical ventilation. This article discusses the care they may require.

Nurses have a vital role in the transitional stage when a patient is removed from a ventilator; they must monitor the patient, looking for any changes in physical condition, and support them psychologically through what is often a very difficult period.

When patients have been removed from a ventilator they are at risk of a number of potential complications, of which nurses need to be aware (Table 1). If these complications are identified at an early stage they can be corrected before they have serious effects on the patient’s condition. A delay in recognising them could result in the patient needing to be put back on artificial ventilation. Deteriorations in respiratory and cardiac function are early indicators that a patient is not able to breathe adequately without the aid of a ventilator. Once these systems have stabilised there are a number of longer-term problems of which nurses should be aware.

CARE AFTER VENTILATION

Respiratory effects
When removed from ventilation patients should be given humidified oxygen at a level decided by a qualified health professional. One of the first indications that a patient is unable to manage without a ventilator is the development of a rapid, shallow breathing pattern (Goldstone, 2002). This means it is vital to measure the respiratory rate frequently. A sustained rate of more than 35 breaths per minute is an indication that the patient is unable to tolerate being taken off the ventilator (Morton et al, 2004).

Other aspects of respiratory function should also be monitored. This includes constant measurement of pulse oximetry, which should remain above 90%, and frequent assessment of arterial blood gases. The blood gas results should be similar to the patient’s baseline results and, specifically, a rise in pCO2 is an early indication of deterioration (Adam and Osborne, 2005). The frequency of recording arterial blood gases will depend on the patient’s condition, which will take 20–30 minutes to respond to changes in treatment.

Cardiac effects
Problems with the cardiovascular system are common following withdrawal of mechanical ventilation. Patients therefore need continuous monitoring of their cardiac rate and rhythm, and blood pressure. The heart rate should not vary above or below 20% of the patient’s normal baseline value. The systolic blood pressure should be below 180mmHg and above 90mmHg (Morton et al, 2004).

An increase in cardiac arrhythmias is also an indication that a patient is not able to manage without support from a ventilator.

Other body systems
One of the early signs that a patient is not able to tolerate being taken off a ventilator is a change in mental function, which indicates that insufficient oxygen is reaching the brain. This results in mood changes including extreme anxiety and agitation, both of which are often accompanied by excessive sweating. The level of consciousness is also important and should be measured using a locally accepted assessment tool such as the Glasgow Coma Score. The patient should always be

LEARNING OBJECTIVES

Understand the importance of holistic nursing care of a patient who has recently discontinued artificial mechanical ventilation
Know the full range of physical effects and possible complications after stopping ventilation
Know the full range of psychological effects patients may suffer
Understand the importance of involving patients’ families as soon as possible when they are removed from ventilation

TABLE 1. COMPLICATIONS FOLLOWING DISCONTINUATION OF VENTILATION

<table>
<thead>
<tr>
<th>Complication</th>
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<tbody>
<tr>
<td>Respiratory failure</td>
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<tr>
<td>Heart failure</td>
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<tr>
<td>Haemodynamic instability</td>
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<tr>
<td>Increased carbon dioxide production</td>
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<tr>
<td>Electrolyte/fluid imbalance</td>
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<tr>
<td>Pain</td>
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<tr>
<td>Sepsis</td>
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<tr>
<td>Extreme malnutrition</td>
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<tr>
<td>Untreated/unresolved respiratory problems</td>
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<tr>
<td>Excessive sedation</td>
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<tr>
<td>Neurological factors, such as reduced consciousness levels</td>
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CLINICAL KNOWLEDGE

KEYWORDS POST-VENTILATION CARE | ARTIFICIAL VENTILATION | VENTILATION WEANING
alert and able to respond to commands (Woodrow, 2006).

It is important to maintain the patient’s fluid balance, so fluid intake should be recorded and urine output measured hourly. A nutritional assessment should be carried out, as malnutrition has been identified as a cause of failure to stay off ventilation (MacIntyre, 2002). If necessary, a nutrition nurse specialist or dietitian should be asked to assess the patient and recommend a nutritional programme.

The patient’s temperature should be frequently monitored as pyrexia could signal the return of previous infection, if that was the reason for the initial ventilation.

Adequate pain control has been identified as important in ensuring problem-free removal from a ventilator (Morton et al, 2004). If patients experience any pain, for example following surgery or trauma, it is likely to impair their ability to breathe adequately and may affect their blood gases. Pain assessments should be performed frequently and adequate analgesia provided as required by the patient. The level of sedation should also be closely monitored as too high a level could reduce breathing.

Psychological effects
As mentioned in part one of this article (Gallimore, 2007), a number of psychological effects have been identified that affect patients when they come off ventilation. Of those professionals involved in the care of these patients, nurses are best placed to identify and alleviate these problems.

If patients complain that they have strange memories of the time they were ventilated they should be reassured that these are a common response to critical illness and its subsequent treatment (Löf et al, 2006). They are not an indication that patients have developed a neurological disorder or that their condition is deteriorating. Memories from ventilation can be extremely persistent and patients should be offered appropriate long-term psychological support if they need it, according to local availability. Some hospitals are able to provide critical care outpatient clinics and patients should be encouraged to attend if one is available.

Patients who have been on ventilation for extended periods often talk about how important the support of family members and friends was when they were removed from the ventilator (Arslanian-Engoren and Scott, 2003). As such it is important that these people are involved as soon as possible when the patient has been removed from the ventilator.

Most patients find the removal of artificial breathing support stressful and say that the presence of competent, knowledgeable nurses and doctors helped them in the process. Good communication is vital to reduce stress and anxiety. This includes explaining the various assessments that are performed and what they mean for the progress of the patient’s condition. Having care provided by nursing staff whom the patient recognises, knows and trusts can be helpful, in addition to involving relatives (Mårtensson and Fridlund, 2002).

The time immediately after removal from mechanical ventilation can be extremely stressful for patients and their families. Patients are almost certain to face physical and psychological problems in this transitional period; if these are not managed they may develop breathing problems and need to be put back on the ventilator.

CONCLUSION
Nurses are the health professionals with the greatest amount of contact with patients after they have been removed from ventilation so their role of monitoring and assessment can be an important factor in the ultimate outcome. An understanding of problems these patients may experience is essential to enable nurses to manage this difficult time effectively. They must be aware of their responsibilities in caring for the physical and psychological aspects of this process, and communicating successfully with patients and their families to minimise the stress and anxiety experienced.

GUIDED LEARNING

1. Explain the nursing role in the care of a patient immediately after artificial mechanical ventilation
2. Outline the range of possible physical complications following removal from mechanical ventilation
3. Explain the common psychological effects patients experience following discontinuation
4. List some actions nurses can take to counteract the psychological problems patients experience after stopping mechanical ventilation

REFERENCES


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