Observing the approaches to weaning of the long-term ventilated patients

Kalliopi Kydonaki

ABSTRACT

Background: The weaning process from mechanical ventilation is a complicated issue for patients with respiratory failure who require long-term respiratory support. Although the application of weaning protocols reduces weaning time, and enhances patient outcome, little is known about the actual approaches that clinicians use for the weaning of these patients.

Aim: The purpose of this paper is to explore approaches to weaning of long-term ventilated patients in a Scottish Intensive Care Unit. The findings are part of a larger study on decision-making during the weaning of long-term ventilated patients.

Method: Data were collected through participant observation and follow-up interviews with the nursing staff. Twenty-four-hour chart and medical notes review and informal conversation with the bedside nurse were also used to collect information on the weaning process.

Findings: Nine patients were recruited to the study. Two patients were extubated and three patients were extubated but then required a tracheostomy. A further four patients had a tracheostomy performed. Thematic analysis of the data showed that weaning was individualized, and physician led, regardless of the existence of the weaning protocol. Six different weaning approaches were identified. Nurses followed a conservative approach to weaning in comparison to doctors who appeared more aggressive.

Conclusion: There are many varieties in the approaches clinicians use when weaning long-term ventilated patients, which acts on the continuity of their care. A shift of focus to identify ways of maintaining continuity of care and a combined ‘wake and wean’ approach needs to be considered.

Key words: Decision-making • Long-term ventilated patients • Mechanical ventilation • Weaning approaches

BACKGROUND

The process of weaning from mechanical ventilation is fundamental to the management of critically ill patients and their outcome. Delayed or unnecessarily prolonged weaning increases intensive care unit (ICU) length of stay, increases the cost of ICU care, decreases the availability of ICU beds and can adversely affect patient outcome (Walsh et al., 2004). The decisions made and the processes that underpin them are an integral part of nurses’ role because they determine the clinical outcomes associated with care and shape the health care experience for patients and professionals alike.

According to Mancebo (1998), weaning can be defined as ‘the process of becoming independent from the ventilator’ (National Health Service Modernisation Agency, 2003, p. 6). A number of studies have compared different methods for weaning from mechanical ventilation (Brochard et al., 1994; Esteban et al., 1995, 1997, 1999; Kollef et al., 1997; Ely et al., 2001; Meade et al., 2001) and randomized controlled trials have focused on identifying the indexes used for screening the patient’s readiness for weaning (Esteban et al., 1995; Esteban and Alia, 1998). Although weaning has been traditionally physician led based on clinical judgment and experience, large studies have concluded that the implementation of weaning protocols by nurses or respiratory therapists reduces weaning time (Kollef et al., 1997; Ely et al., 1999; Malerich et al., 2000; Crocker, 2002; Tonnelier et al., 2005), standardizes physicians’ behaviour and structures nurses’ input (Blackwood, 2000; Crocker, 2002; Blackwood and Wilson-Barnett, 2005, Blackwood et al., 2006). However, the argument that exists is whether the improved weaning times is a consequence of the protocol implementation or nurses’ input in decision-making (Price, 2001). Burns et al. (2000) and Gelsthorpe and Crocker (2004) suggest that regardless of the proliferation of weaning protocols, weaning still relies on clinical judgment.

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On the other side of the spectrum, the literature on clinical decision-making focuses on the description of cognitive processes that professionals use and on factors that affect decision-making (Manias and Street, 2000; Burman et al., 2002; Lauri and Salantera, 2002; Bucknall, 2003; Hicks et al., 2003; Thompson and Dowding, 2004; Croskerry and Norman, 2008; Croskerry, 2009). The use of protocols has been identified as a factor that influences and guides clinical decision-making but this is not in isolation from other factors such as experience, age, evidence-based practice, management structure, support and team work (Caputo and Mior, 1998). However, the published studies that investigate these factors generate conflicting and unclear conclusions, because they focus on nurses’ perceptions of their decision-making rather than their actual practice (Hicks et al., 2003; Hoffman et al., 2004). Moreover, they do not show the reality and complexity of decision-making in the weaning process and how this is interpreted in the strategies that clinicians use. The challenge is particularly relevant when the patient requires prolonged ventilatory support, and has underlying medical problems that complicate the weaning process. Therefore, perhaps it is timely to focus not just on the method of weaning but on how that method is applied.

The aim of this research was to understand and explore the actual practice of nurses during the weaning of long-term ventilated patients and to investigate the approaches that they used in adjusting the level of mechanical ventilatory support.

**METHODOLOGY**

To address this research question an ethnographic approach was adopted to allow the link between acquisition and use of information for clinicians’ practice to be explored (Parahoo, 2006) and to understand the meanings that individuals attached to their activities in a natural setting (Guba and Lincoln, 1995). Fieldwork was conducted in an 18-bedded adult ICU in a Scottish University Hospital. This unit receives surgical, and trauma patients, medical patients and post-liver transplant patients. The nurse to patient ratio is 1:1 for the ventilated patients and there is an already implemented weaning protocol in the unit.

Data were collected through participant observation, informal conversation with the bedside nurse, follow-up interviews, 24-h charts and medical notes review and collection of fieldnotes. Alterations of the ventilator parameters were gathered from the 24-h charts and recorded on the Adjustment of Ventilator Settings sheet (AVS) designed by the researcher for subsequent analysis. Follow-up interviews with the participating nurses were conducted at the end of each shift, or when the participants were available, lasted for 15–30 min and were recorded with a digital recorder. Nurses were asked to reflect on their decisions during the day regarding the patient’s weaning in order to find the meaning they attributed to their actions observed by the researcher (DeWalt and DeWalt, 2002). Interviews were verbally transcribed the same day. The researcher was a critical care nurse who had knowledge of the field. However, to reduce bias data collection took place in a setting that the researcher had not worked before.

**Ethical considerations**

Ethical approval was gained from the NHS Scotland A Research Ethics Committee and the hospital R & D Office, which approved the access to the setting and to the patient’s medical notes. Patient consent was not considered necessary because patients were not directly involved in the data collection. Patients’ privacy and confidentiality was respected, all data were anonymized and observation was discontinued if the nurse thought it predisposed patient’s condition. Written consent was obtained from participating nurses on the onset of the study, but at every new episode of observation, consent was refreshed verbally. No personal information was revealed during the transcription and analysis and all data were stored in the researcher’s personal computer in a locked file. In case of observing poor practice the researcher, who is a registered critical care nurse, behaved according to the regulations of the Code of Professional Practice to secure patient safety.

**Data collection**

**Participants**

Critical care nurses with a range of experience caring for long-term ventilated patients were invited to participate. Approximately 50 nurses were observed in routine weaning practice for 3–5 h each day on selected patient cases. The observation took place during the day shift between 8 a.m. and 8 p.m., because the unit’s practice was not to wean patients at night. The total time spent in the field was 4 months and formal documented time was 127 h.

**The patient**

Long-term ventilation was defined as a patient who has been ventilated for more than 4 days and had an unsuccessful trial of extubation within that period. Patients were identified from a computerized ICU database. Patients were selected for the study based on the inclusion criteria below:

- Adults aged > 18 years;
- Ventilated in the unit for more than 4 days;
• Admitted with Type I or Type II respiratory failure;
• Admitted with community acquired pneumonia; or/and
• Admitted with an exacerbation of chronic obstructive pulmonary disease.

Exclusion criteria were patients who had already been weaning when the observation period started, postoperative patients who were planned to be extubated in the morning, patients who were ventilated for less than 3 days, patients with a head injury, trauma patients and transplant patients. The sample aimed to describe the generic medical or surgical critical care patient with respiratory failure.

Weaning process
The weaning process involved changes of ventilatory support, such as varying the mode of ventilation, altering pressure support (PS), positive end expiratory pressure (PEEP) and fraction of inspired oxygen (fio2) as determined by subjective (observation) and objective (blood gas results) assessment by the critical care nurses. The trajectory of mechanical ventilation of each selected patient was followed from a preweaning phase (when the patient was on a mandatory ventilation mode) until they were successfully extubated for more than 48 h or if they had a tracheostomy, until they were able to breathe spontaneously without any positive PS. Patients were monitored for reintubation and the use of non-invasive ventilatory support for up to 48 h after extubation. This period would be adequate to detect respiratory fatigue and the need for reintubation. Likewise, follow up of patients with a tracheostomy stopped 48 h after the discontinuation of any form of positive-pressure ventilation. Patients who were extubated but were reintubated within 48 h were considered as a recurrence of the same case and were still followed.

Pilot period
Pilot work was conducted during a 4-week period. The study design was piloted on three patient cases that did not form part of the main study.

Data analysis
Fieldnotes were analysed thematically with the use of the computerized software package for qualitative data NVivo, version 8. Data analysis began with the careful reading and rereading of the fieldnotes and interview transcripts in their entity until the researcher was able to identify behavioural concepts regarding the weaning process. Concepts were then analysed to explore their meaning and categorized into themes. The categories elicited from the data were constantly searched for commonalities and variations (Glaser and Strauss, 1967). From this process, three themes in relation to weaning strategies emerged: Wean as able, Weaning styles and Continuity of care.

To present the variation of the ventilatory parameters, the median values of fio2, PS and PEEP were calculated for each day of observation and overtime. Patient demographic data (diagnosis and reason for admission, sex, age, ventilation, preweaning and weaning times) were collected and expressed as proportions. Interval data were summarized as medians with interquartile range (IQR) because they were non-normally distributed. The ventilation time was the period from intubation until the patient was free of mechanical ventilation for more than 48 h. The start of the weaning or preweaning period was calculated as the time from intubation until the day that the ventilation was changed to a spontaneous assisted mode. The weaning time was the period from the first day that the patient was ventilated with a spontaneous mode until the patient was free from any type of positive-pressure ventilation.

FINDINGS
Patients’ demographic characteristics
During the 4-month observation period, 10 patients fulfilled the inclusion criteria and were included in the study; however, one patient was later excluded because she was transferred to another hospital before data collection was completed. Of the remaining nine patients, six were admitted with type I respiratory failure and three with type II respiratory failure. See Table 1 for diagnosis of these nine patients.

Seven patients were males and two females with a mean age of 58.3 years (SD, 10.20). The mean length of stay in ICU for the sample was 20.66 days (SD, 12.61; IQR, 22.5), and the mean ventilation time
was 17.88 days (SD, 11.49; IQR, 21). Preweaning and weaning times were 4.44 days (SD, 4.09; IQR, 7) and 13.22 days (SD, 9.12; IQR, 17), respectively. Seven patients received a tracheostomy on the 8th day after ventilation was commenced (Mean 7.88, SD 6.86). Two patients were successfully extubated, whereas a further two had a failed extubation and needed to have a tracheostomy performed to continue weaning. Finally, five patients had a tracheostomy without an attempt for extubation.

Weaning strategies
This is divided into three main themes: wean as able, weaning style and continuity of care.

Wean as able
The decision to move from a preweaning phase to a weaning phase was made by the medical staff either in the morning assessment of the patient or at the ward round. The doctors documented that decision as to ‘wean as able’ and they often gave parameters (desired level of PO\textsubscript{2} or PCO\textsubscript{2}) for the nurses to follow. Then, nursing staff decided on the manner and time to start reducing the ventilatory support.

‘... Quite often parameters are set by doctors, consultants, as to how low they would like, what are the parameters for ventilation... If a patient has difficulty oxygenating, the doctors might ask us to keep the PaO\textsubscript{2} above 9kpa, so that we can reduce pressure support or oxygen as we are able to. As long as it remains above the set parameter. They don’t guide us as to how much we can change the support or how much oxygen we will generally give the patient. That’s for us kind of, not to experiment but how we can change that random and move this way’ (Interview, RIN005).

More experienced nurses either would initiate weaning or would prompt the doctor to give a weaning plan after the morning assessment, whereas more junior nurses were reluctant to proceed with the weaning until a formal decision was made at the ward round.

‘... She (the nurse) explained that she would like to wait until the ward round before making a decision about the patient’s weaning, as she did not have any input from the doctor this morning’ (Fieldnotes from patient RIP009, Nurse RIN011).

The ‘wean as able’ did not provide the nurse with a definite plan for the day; it was interpreted differently and was attributed to the nurse’s skills, knowledge and experience in weaning. For some nurses, weaning meant a reduction of PS by 2 cm H\textsubscript{2}O for the day or a reduction of the fraction of oxygen by 10%. Nurses stated during informal interviews that they followed their clinical judgement when adjusting the ventilatory parameters and based their decisions on their observation and on blood gas analysis. This quite often resulted in great variations of the ventilatory support during the day or in total weaning inactivity.

Observation in practice and interview analysis revealed that changing the level of ventilatory support was variable and doctor dependent, despite the existence of a weaning protocol.

‘... I mean most weaning plans follow the same rough kind of thing, which would be, you know if you are really struggling then it would be a tracheostomy, and the tracheostomy would be there at least a day before we start weaning, and then it will be a case of weaning from ASB down to CPAP, from a CPAP onto a T-piece, and from a T-piece to an extubation. The T-piece phase might be like 2 hours and then back on the ventilator for 4 hours and then back on for the whole day, and that’s where all the variation kind of comes in. Some consultants will let the patient go on to ventilator for the night to rest the lungs, some consultants won’t and that’s when you end up with the patient struggling and struggling and then crash and then they are useless for another 24 hours. That’s because they are so exhausted. And that’s where all the argument tends to be. Yeah, I mean you can always sort of follow that broad kind of protocol but it is not written anywhere. I mean you wouldn’t be able to put your hands on it. But yeah, quite broad’ (Interview, RIN008).

Nurses agreed that the lack of a weaning plan resulted in inconsistency of decisions among nurses and doctors regarding the duration and frequency of spontaneous breathing trials (SBTs), the modes of ventilation for spontaneous breathing and the rest periods during the night. According to nurses, this irregularity had an impact on the patient’s weaning trajectory and response to changes of the ventilatory support.

Weaning style
Analysis of the fieldnotes and the AVS sheet revealed that clinicians followed six weaning strategies.

- Long periods of plateau PS;
- Gradual reduction of PS by 2–5 cm H\textsubscript{2}O during the day from the onset of weaning;

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Approaches to weaning ventilation

- Periods of rest with increased level of PS overnight;
- Aggressive SBTs;
- Long periods of SBTs and rest period on PS Ventilation (PSV) overnight;
- SBTs twice daily and rest periods on PSV in between.

Table 2 below summarizes the weaning strategies used in each patient case.

Disparity in the clinical practice patterns of weaning depended on the needs of the patient and it clearly illustrated that prolonged weaning is individualized. There were some similarities in the approaches followed by the clinicians. In most cases, weaning inactivity up to 14 days was observed at the onset of the weaning process followed by gradual reduction of the support level and trials of spontaneous breathing. SBTs did not follow a specific pattern and were alternating with periods of increased PS overnight. Aggressive reductions of support and insistent SBTs occurred in three cases and resulted in failed extubation and tracheostomy formation. This then led to prolonged and increased levels of ventilatory support.

Observation in practice revealed that nurses followed a conservative approach; they preferred to reduce the PS gradually in increments of 2–5 cm H₂O during the day and were inclined to increase the support without the doctor’s prompt when the patient showed signs of fatigue. However, they seemed reluctant to decrease the support without the doctor’s approval.

Nurses agreed that medical staff based their decisions on the information given by them, because they knew the patient better. However, they did not feel enough comfortable and empowered to lead the weaning process before discussing it at the ward round. This consequently resulted in delayed decisions about adjusting the ventilatory settings.

‘... the medical staff, I think they rely more on the nurse feeding back to them to make their decision, whereas the nurses already have the information that they give in their brain before they are giving it. So, they are more in a position of power. Also, the doctors can look at the numbers that are on paper but they don’t know what has been happening in between every hour. So, I think, on that basis, I would say it is more nurse-led. But ideally it should be something that is discussed by everybody. But, if a ward round doesn’t happen before 11 o’clock in the morning, that’s five hours wasted of a shift waiting for the doctors to come and make a weaning plan. In practice then, you wait for the ward round to do it, in this unit’ (Interview, RIN007).

In comparison, doctors had different management approaches. In four patient cases, aggressive ventilatory changes decided by doctors resulted in prolonged

Table 2 Weaning strategies

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<th>Patient case</th>
<th>Weaning strategies</th>
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<td>RIP002</td>
<td>Plateau period on PSV (3 days)</td>
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<td></td>
<td>Gradual reduction of PS by 2–5 cm H₂O</td>
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<td>Long period of SBT</td>
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<td>Extubation</td>
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<td>RIP003</td>
<td>Plateau period of PSV (2 days)</td>
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<td>Extubation</td>
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<td>RIP004</td>
<td>Plateau period of PSV (14 days)</td>
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<td>Tracheostomy and gradual reduction of PS by 2–5 cm H₂O</td>
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<td>Plateau period of PSV (5 days)</td>
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<td>Gradual reduction of PS and rest period with increased PS</td>
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<td></td>
<td>Long period of SBT and rest periods on PSV overnight</td>
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<td>RIP005</td>
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<td>Aggressive SBT and extubation</td>
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<td>Reintubation and tracheostomy</td>
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<td>Long period of SBT</td>
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<td>RIP006</td>
<td>Aggressive SBT and extubation</td>
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<td>Plateau period of PSV (9 days)</td>
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<td>Mandatory ventilation (4 days)</td>
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<td>Plateau period of PSV (2 days)</td>
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<td>Gradual reduction of PS</td>
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<td>SBTs twice daily with rest periods on PSV in between</td>
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<td>Long periods of SBTs and rest periods overnight</td>
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<td>Long period of SBT</td>
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<td>RIP008</td>
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<td>RIP009</td>
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<td>Aggressive SBT twice</td>
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<td>Gradual reduction of PS by 2–5 cm H₂O</td>
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<td>Long period of SBT and rest periods on PSV overnight</td>
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<td>RIP010</td>
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PSV, pressure support ventilation; SBT, spontaneous breathing trial.
ventilatory support because of respiratory muscle fatigue.

Continuity of care

Nurses revealed during interviews that the flow of weaning process was influenced by their shift pattern, because they worked 12-h shifts resulting in fewer days worked per week. Nurses expressed the view that they could plan better the care of the patient during their 12-h shift because they could try different approaches to weaning. However, they tended to delay weaning until the afternoon because of other caring duties performed in the morning and because they did not always have a clear plan for weaning before the ward round. Observation also exposed that each day a different nurse looked after the selected patient, which resulted in inconsistency of the decisions made and compromised the continuity of care.

DISCUSSION

This ethnographic work offered a description of the weaning approaches that nurses used throughout the weaning trajectory of long-term ventilated patients and illustrated that there were many variances in the adjustments of the ventilatory support without following a standardized approach. Whilst uneven adjustments of the settings could be a result of the inherent complexity and unpredictability of managing the patients’ condition, one could argue that the lack of a weaning plan led to inconsistency in the decisions about the weaning strategies followed. The literature does not provide strong evidence to support the superiority of one strategy over the other. Twice-daily SBTs do not offer more advantage over a single SBT (Esteban et al., 1995; Ely et al., 1996; Kollef et al., 1997). In addition, a gradual lowering of the level of support was not found to be more beneficial than a stable unchanging level of support between SBTs to offer respiratory muscle unloading of the weaning patient (Vassilakopoulos et al., 1998). Both these strategies were observed in this study. MacIntyre (2009) recommends that patients who fail an SBT should have the cause of the failed SBT determined and that a stable, no fatiguing, comfortable form of ventilatory support should be used. However, he does not comment on the duration of that rest period. Therefore, the focus after a failed SBT should be on maintaining adequate muscle unloading, optimizing comfort and sedation needs and avoiding complications, rather than continuing with aggressive ventilatory support reductions. Further research is required to address whether gradual support reduction coupled with daily SBTs offer any advantage.

What is more, this study demonstrated that continuity of care during the weaning process was compromised by doctors’ aggressive approach when adjusting the ventilatory parameters, which when unsuccessful resulted in prolonged ventilatory support. Failed SBTs are often because of persistent respiratory system mechanical abnormalities that are unlikely to reverse rapidly and they often result in respiratory fatigue (Jubran and Tobin, 1997; Capdevila et al., 1998; Vassilakopoulos et al., 1998). This should be taken into account when aggressive approaches to ventilatory adjustments are chosen.

Moreover, nurses’ interpretation of the ‘wean as able’ approach did not provide a systematic approach to the management of ventilation. Studies until now have shown that protocolized weaning can improve the outcome of weaning patients because it offers a more standardized conduct (Krishnan et al., 2004; Blackwood et al., 2009). However, one could argue that protocols can impede the clinical judgment, because they over simplify weaning and concentrate on physiological responses of the patients without considering the heterogeneity of these patients (Blackwood et al., 2005). Weaning is more complicated than just following an algorithm; therefore, long-term ventilated patients would benefit from an individualized dynamic weaning plan that would incorporate nurses’ expertise.

Weaning protocols are available to assist less experienced staff in their decision-making, whilst junior nurses are allocated to the weaning patients. In this study, the nurse allocation system and shift patterns were inhibiting factors in knowing the patient and maintaining a continuity of the weaning process, which was also acknowledged in a recent study by Crocker and Scholes (2009). Senior nurses and critical care managers should consider the skill mix when allocating nurses to the patients to preserve continuity of care and to allow junior nurses learn from experts, if they are to develop skills in weaning the patient (Logan and Jenny, 1997). Further research is required in investigating ways to maintain and enhance the continuity of care for the complex long-term ventilated patients.

Limitations

This study was conducted in one critical care unit and, therefore, the findings cannot be generalized. However, it can influence further research on the impact of the critical care culture on patients’ weaning. One of the limitations of the study was that the researcher as a critical care professional could have biased and limited the objective analysis of the findings (Parahoo, 2006). Although the Hawthorne effect is an obvious drawback (Munhall, 2003), the outcome of the
The pilot study revealed that nurses felt comfortable with the researcher and did not change their behaviour.

CONCLUSION
This study showed that there was lack of a systematic approach to weaning, because of the different interpretations of weaning strategies by the clinicians and of the alternating shift pattern and nurse to patient allocation, which compromised the continuity of care that long-term ventilated patients require. Weaning should be based on a methodical cooperation between doctors and nurses to maintain consistency in decision-making and avoid behaviours that can result in the patient’s deterioration. Nurses are knowledgeable clinicians who spend hours by the bedside and are in the position to know the patient’s weaning behaviour. Increasing their autonomy with the appropriate support, and guidance by the medical and senior nursing staff and by adequate education would increase their confidence in decision-making during the weaning process and therefore, facilitate the patient’s sooner discontinuation from the ventilatory support. Moreover, developing a flexible ‘wake and wean’ tool would offer a standardized approach to the management of weaning patients.

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WHAT IS KNOWN ABOUT THIS TOPIC
- Protocol-based weaning from ventilation has been shown to reduce weaning time.
- There is little research on the weaning strategies that clinicians use in reality.

WHAT THIS PAPER ADDS
- Six different approaches to weaning were identified.
- The shift pattern and nurse allocation system have an effect on maintaining continuity of care of long-term ventilated patients.
- A collaborative systematic approach will allow maintenance of continuity of care with an effect on the weaning process.

REFERENCES

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