Prolonged Mechanical Ventilation in the US

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Introduction

Advances in life-prolonging and life-saving interventions over the last 30 years have lead to a rapidly growing subgroup of patients who aren't liberated from mechanical ventilation as quickly as expected. These patients often are referred to as ventilator-dependent individuals who are receiving prolonged mechanical ventilation (PMV).

The plight of these patients is often very difficult as there are limited resources and a lack of access to post acute continued care. Acute care hospitals struggle with placement in post acute care venues. Published studies have proven that with extended time some 50-60% of these ventilated patients can still be liberated from mechanical ventilation. In areas without subacute venues and continued weaning capabilities these patients are simply discharged home to live out there lives on the ventilator.

What is PMV?

The Centers for Medicare & Medicaid Services defines PMV as at least six hours per day of mechanical ventilation for 21 consecutive days.

Mechanical ventilation in short-term acute care hospital intensive care units generally have an average LOS of about 8-10 days. However those who fail to wean have an average acute care LOS of around 30 days. Following the acute care stay patients who remain on mechanical ventilation will begin the often difficult journey through the various sites of care available to them in hopes of eventual liberation from the ventilator.

The sites of care, involve transfers to either Long Term Acute Care Hospitals (LTAC) with an average LOS of somewhere around 30 days or to Skilled Nursing Facilities with subacute capabilities. Additionally some patients will then transition to home where they are cared for by family with often limited professional support.

How Many Patients Require PMV?

Studies have demonstrated that approximately 20 percent of patients supported with mechanical ventilation won't wean successfully in the acute care setting.

Based on this published data and information from MedPar database (made up of only Medicare beneficiaries) for 2001 the estimated population is between 47,000 and 65,000 patients requiring PMV.

Pediatric patients, home care patients, Medicaid patients and privately insured patients remain a poorly studied group, and there are no known systematic estimates of the size of these patient populations. Therefore, a reasonable estimate of the annual incidence of PMV is perhaps 50,000 to 70,000.

Patient Settings

The vast majority of patients receiving PMV are cared for in traditional ICUs of acute care hospitals. Many of them are in the ICU solely due to the presence of the ventilator. A portion of these patients are stable compared to the traditional ICU patient and don't require the minute-to-minute or hour-to-hour assessment and interventions typical of an ICU. This in turn consumes vast ICU resources and results in a high cost of care. Acute care hospitals are already financially burdened and this issue certainly has a negative impact on the hospitals bottom line.

Beginning in the mid-1980s, long-term acute care (LTAC) hospitals have developed as acute care level hospitals focusing on the patient requiring a prolonged hospital stay (greater than 25 days on average). Many of these patients require prolonged mechanical ventilation. By almost any definition, patients undergoing mechanical ventilation in LTAC hospitals are PMV patients. As a result of extremely rapid growth and spending in this segment of health care the Medicare Payment Advisory Commission (MedPAC advises congress and CMS on Medicare payment issues) and CMS have begun to impose new regulations on the LTACs in an effort to address the rapid growth. LTACs like the acute care counterparts are not able to keep patients whose prolonged ventilator use becomes more chronic in nature. They too must find acceptable discharge plans for those patients.

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A small number of skilled nursing facilities (SNF) have developed specialized units suitable for PMV patients. Reimbursement changes in Medicare in 1998 seriously limited the financial feasibility of these units for elderly patients. Additionally the state to state variation in Medicaid reimbursement is an issue in the SNF setting. This core reimbursement is more likely the reason for poor access across the country. A stable ventilated patient that requires long-term weaning is very well suited for these SNF subacute centers.

Lastly, home ventilation remains an option for the stable nonweanable patient who has a very dedicated caretaker team. Home ventilation is a very difficult task for families. Unfortunately these patients frequently rebound to acute care resulting in a high cost of care overall.

High Costs

PMV is associated with some of the highest costs in medical care. Depending on the care setting and the patient's co-morbidities, a daily cost of $600 in the SNF to several thousand dollars per day in acute care is typical. The care of ventilator patients accounts for approximately 37% of all ICU cases and utilizes vast resources through clinical care needs and from the standpoint of case management resources.

Medicare pays about $98,000 per admission for each of the roughly 65,000 PMV patients. Costs to acute care hospitals for PMV patients almost always are paid through the high cost outlier payment policy (more than the standard DRG payments) and materially exceed the Medicare payment. This amounts to a daily equivalent of 1500 to 2000 per patient day.

SNF ventilator care is a fraction of the cost of acute care. This will range from 900 per day in some states to 500 in others. Unfortunately all states do not have a Medicaid funded chronic ventilator program. So patients who reside there have little to no access for care. They are forced to move to other states who do offer such services. Usually they are far from their families in strange surroundings with little hope of returning home.

Clinical Outcomes

A growing consensus is that successful weaning in the PMV setting might best be defined as freedom from mechanical ventilation for seven days.

As a poorly studied group, PMV patient outcomes aren't well-described. Depending on the patient population and definition of PMV hospital survival for adult PMV patients in acute care hospitals range from 39 percent to 75 percent.

Weaning success is approximately 50 percent, influenced by both patient selection criteria and the quality of the weaning program. Acute care ICUs typically define a successful wean at 48 to 72 hours post extubation.

Weaning success rates for subacute centers has been documented at somewhere between 30% and 60%. Some facilities depending on screening criteria are reporting as high as 75%. This is accomplished at a fraction of the cost of acute care.

What We Have Done

Following drastic reimbursement changes in 1998 nearly all SNFs in the US closed their subacute programs creating a huge void in post acute placement options.

At the request of many acute care contacts we revisited the issue of long term ventilator care in the SNF arena. In early 2001 in partnership with an SNF we opened our first ventilator rehabilitation and weaning unit. It quickly became clear that we could wean many of the cases and return them to home, ventilator free. This dramatically reduced the cost of care for these patients.

Since then we have opened several more centers all of similar size and utilizing a consistent model. Our goal was to create centers of excellence for this population of difficult to wean patients. Additionally we wanted to build a model that would set the standards of ventilator care delivery. We also created a resource website ventweaning.com to help families and clinicians better understand the role of the ventilator.

In 2008 we joined the Linde Group in a global initiative to provide state-of- the art complex ventilator care across the world. Our ventilator program is called REMEO (Latin for "I return Home"), our growth is fueled by success in the liberation of mechanically ventilated patients and our ability to design programs in various reimbursement models. For those who cannot wean we provide an enhanced quality of life and excellence in daily care.

Conclusion

PMV is a large and growing clinical, financial and psychosocial problem. PMV involves 50,000 to 70,000 patients per year at an annual cost of $6 billion to $7 billion to Medicare alone.

A number of sites are suitable for patients with PMV depending on their clinical stability, weanability and intensity of required services. SNF ventilator rehabilitation can be very successful and cost effective.

State controlled Medicaid funding is the core issue in access to SNF based ventilator care. With improved coverage access would be available for the vast majority of these patients.

A national coverage policy for patients requiring PMV as well as national standards of care should be developed for this rapidly growing population of patients.