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An Overview of Respiratory Therapy and Respiratory Care at Saint-Vincent Hospital

A Bruyère Rapid Review

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Key messages

Three initiatives should be developed to improve the care of patients with respiratory disease:

- a program focused on the care of neuromuscular ventilation and tracheostomy patients modelled after programs at peer sites;
- a respiratory therapy consult service, staffed by a Certified Respiratory Educator respiratory therapist, which would provide respiratory care and implement the Ottawa Model for Smoking Cessation;
- a rapid response team including a respiratory therapist and nurse with acute/critical care experience.

Executive summary

As part of the process of continually improving the care provided to patients, and based on a high perceived burden of respiratory diseases among inpatients at Saint-Vincent Hospital (SVH), a review of respiratory therapy services was commissioned three years ago to assess current and anticipated needs and models of care.

On-site evaluation methods were utilized, most of which took place at SVH. Methods used included both quantitative and qualitative data collection and analyses designed to assess current practices in the hospital and identify existing and future needs. The author met with key informants within Bruyère, the Champlain LHIN, and at peer sites throughout the province.

This report provides an overview of respiratory therapy and respiratory care at SVH and makes recommendations for specific strategies to address current and future needs. The inpatient population at SVH was divided into three separate groups: (1) neuromuscular ventilated patients and patients with a tracheostomy; (2) patients with other chronic respiratory conditions; and (3) patients with acute respiratory conditions.

Three initiatives should be developed to improve the care of patients with respiratory disease:

- a program focused on the care of neuromuscular ventilation and tracheostomy patients modelled after programs at peer sites;
- a respiratory therapy consult service, staffed by a Certified Respiratory Educator respiratory therapist, which would provide respiratory care and implement the Ottawa Model for Smoking Cessation;
- a rapid response team including a respiratory therapist and nurse with acute/critical care experience.

The report explains how these initiatives could be implemented.

Based on this report, the smoking cessation program and several patient protocols have been developed and are currently in use. SVH professionals has also implemented strategies to improve care for ventilated patients.

Context

Bruyère Continuing Care (Bruyère) provides a wide range of vital programs and services. One of its sites, SVH, is a 336-bed complex continuing care (CCC) hospital located in Ottawa's downtown core. SVH provides care to a broad range of patients with complex medical and social needs through the services of an interprofessional care team. Saint-Vincent Hospital is the sole provider of Complex Continuing Care in the Ottawa region. The hospital includes a 10-bed neuromuscular ventilation unit for patients who require mechanical ventilation for all, or part, of a 24-hour period.

SVH's inpatient population is currently undergoing significant changes with the admission of more medically complex patients, many of whom are transitioning from acute care back to the community, and/or to long-term care facilities. In this atmosphere of change, the hospital needs to ensure that the care it provides continues to correspond with the needs of its patients. As part of the process of continually improving the care provided to patients, and based on a high perceived burden of respiratory diseases among inpatients at the hospital, a review of respiratory therapy services was commissioned to assess current and

Objectives

This report provides an overview of respiratory therapy and respiratory care at SVH and makes recommendations for specific strategies to address current and future needs.

For the purpose of this report, the inpatient population at SVH was divided into three

separate groups: (1) neuromuscular ventilated patients and patients with a tracheostomy; (2) patients with other chronic respiratory conditions; and (3) patients with acute respiratory conditions.

Methods

This project utilized on-site evaluation methods, most of which took place at SVH. Methods used included both quantitative and qualitative data collection and analyses designed to assess current practices in the hospital and identify existing and future needs. The author met with key informants within Bruyère, the Champlain LHIN, and at peer sites throughout the province.

Quantitative data collected and/or reviewed

To facilitate this investigation, a respiratory care needs assessment tool, based on a similar tool from the University Health Network in Toronto, was developed. This tool guided the collection of data on the prevalence of respiratory conditions among inpatients, equipment, and human resources available on each of the units.

The following information was collected:

- 911 call data from the Ottawa Paramedic Service for 2011, 2012, and 2013 YTD;
- SVH data collected by the Resident Assessment Instrument – Minimum Data Set (RAI-MDS);
- Radiography data for all inpatients at SVH for 2013;
- Numbers of patients with an active order for medications by inhalation from Bruyère’s pharmacy.

Qualitative research

The author met with key informants at Bruyère and with external stakeholders including community-based organizations and health partners at other health facilities within the LHIN.

On-site observations were conducted at peer CCC facilities in the Toronto region.

Prevalence of respiratory diseases in the patient population at SVH

Neuromuscular ventilation patients and patients with a tracheostomy

This is a well-defined patient population across SVH. The hospital is funded for 10 beds for ventilator patients, and these beds are frequently at capacity. At the time of the evaluation, there were 36 patients with tracheostomies, including nine ventilated patients, though this number fluctuates.

Patients with chronic respiratory conditions

Table 1 highlights the prevalence of respiratory conditions in patients outside of level 5 North/South, using different data sources. The unit walk-through and pharmacy data are from the same timeframe, and are, therefore, comparable; the RAI-MDS data are quarterly data, from July - September 2013, and thus are not representative of the same timeframe.

	RAI-MDS	Unit walk- through (n=261)	Pharmacy data (n=257)
Oxygen therapy	48 (21.3%)	41 (15%)	N/A
Respiratory condi-	N/A	60 (22.9%)	84 (32%)
CPAP/BPAP therapy	N/A	12 (4.5%)	N/A

Table 1. Prevalence point estimates of respiratory disease at SVH using three parameters and three estimates. Numbers in parenthesis represent percent of all patients. N/A = data

Patients with acute respiratory conditions

Acute respiratory conditions appear to be a major driver for transfers to acute care, again underlying the importance of recognizing respiratory conditions as a major disease at

SVH. Although acute respiratory conditions are common, it is not clear whether these transfers were precipitated by acute exacerbations of chronic illness as opposed to new onset acute illnesses.

Resp	Cardiac	Neuro	MS & GI	Return	Other	Total with-
66	30	55	49	26	96	296
22.3%	10.1%	18.6%	16.5%	8.8%	32.4%	

Table 2. Ambulance call data (n and %) 2011-2013. The percentages given are relative to the total number of transfers with non-urgent returns (such as for diagnostic testing or specialist appointments) removed (column "Total Without Returns").

Summary

Among the inpatient population (not including the ventilated patients), using the pharmacy data of patients receiving medications by inhalation, the best estimate of respiratory disease prevalence at SVH is approximately 32%. This is in line with other estimates of the prevalence of chronic obstructive pulmonary disease (COPD) derived from health administrative datasets in the province of Ontario, which have identified a COPD prevalence of 35% among residents of long-term care facilities. This estimate does not include patients who are only receiving oxygen therapy or

Continuous Positive Airway Pressure (CPAP) Therapy/ Bilevel Positive Airway Pressure (BPAP) therapy, nor does it provide an indication of any unmet need.

Workload attributable to respiratory conditions

Respiratory therapists are currently concentrated mostly on the 5th floor, where approximately 92% of their worked hours are spent. Even on these units, the nursing workload for respiratory-related procedures continues to be high, owing to the nature of

Service delivery

Meuromuscular ventilation patients and patients with a tracheostomy

There is a need for a revitalized approach to the management of chronically ventilated patients across the LHIN. A renewed program should focus on providing a transitional care environment to optimize the patients' health before their return to the community. This will require comprehensive and predictable strategies to address both their medical care and their social needs; such an approach would be best undertaken in collaboration with community-based partners (e.g. Champlain Community Care Access Centres (CCAC) and assisted living facilities). While the Ottawa Hospital offers similar supports for patients who can return home, these do not appear to exist for patients who lack social or financial supports and who require, or may benefit from, residential care rather than hospital-based care. Bruyère should determine whether it is within the organization's mandate to develop assisted living facilities in the community, among its network of continuing care facilities, or to explore other options for moving these patients back into the community. Bruyère already has experience with innovative assistive living facilities through its Bruyère Village.

Ottawa's ventilator patient population is notably different from that of other jurisdictions in Ontario. There is a large number of ventilated patients in the community who have avoided invasive ventilation through the use of innovative, non-invasive ventilation provided by The Ottawa Hospital Rehabilitation Centre's CANVent

program. The program currently follows approximately 200 patients, of whom approximately 40 are ventilated 24 hours per day. The majority of these patients are cared for in the community, often by their families, and only 5% are invasively ventilated via a tracheostomy.

Those patients who are non-invasively ventilated use mouthpiece delivery devices that allow them to trigger the ventilator with minimal effort, thereby avoiding, or delaying, a tracheostomy.

RECOMMENDATIONS

Review the processes for inter-professional collaboration. There is a strong need to consolidate efforts to care for chronically ventilated patients in Ottawa and the Champlain LHIN. Although SVH currently has a relatively stable ventilated patient population, there are concerns that the need for this service will rise in the coming years, and it is likely that the burden will fall on SVH to care for these patients. Given this, Bruyère Continuing Care should organize and facilitate the development of a LHIN-wide strategy for the management of chronically ventilated patients in the region. Similar exercises have been carried out in other LHINs (Toronto Central, South West) and have resulted in comprehensive plans for the management of individuals with long-term ventilation needs. A strategy advisory group should ideally be led by Bruyère, which is well-situated to become the transitional care facility for these patients. The group should include partners from acute/critical care, rehabilitation, and the community and should

focus on the development of long-term strategies to avoid hospitalization when feasible, and to optimize those patients requiring hospitalization.

Patients with chronic respiratory conditions

The management of patients with chronic respiratory diseases in complex continuing care facilities is somewhat awkwardly split between the delivery of hospital-based and primary care models, and philosophies of care, neither of which may be wholly sufficient to address the needs of multimorbid, complex patients.

What is clear is that there appears to be a significant burden of respiratory disease among this patient population that requires a comprehensive approach for effective management. Guidelines exist for many common respiratory diseases – COPD, obstructive sleep apnea, etc. – but it is unclear how easily these can be transferred into the complex continuing care setting or how relevant they may be to a multimorbid patient population.

RECOMMENDATIONS

SVH requires a standardized, predictable approach to managing inpatients with respiratory conditions admitted to the hospital. Bruyère should support the development of a comprehensive inpatient respiratory program that implements best practice guidelines for respiratory conditions, as well as the Ottawa Model for Smoking Cessation.

Specifically:

1. A comprehensive respiratory program should be developed for implementation at SVH based on the best available clinical practice guidelines and evidence-based practice. This program should be implemented collaboratively by respiratory therapists, physicians, and nurses, and should focus both on ensuring that the best care is provided to patients admitted to the hospital, and on improving clinicians' knowledge of the management of respiratory conditions.
2. This program should focus on the development of care pathways for all patients admitted to the hospital with respiratory conditions. All patients with respiratory diseases, or risks for developing them (e.g. smoking history, elevated body mass index) should be identified on admission, and this should trigger entry into a care pathway. These care pathways should be guided by standardized order sets and medical directives allowing for timely, predictable, and evidence-based care to be administered by competent clinical staff upon admission to the hospital.
3. A respiratory therapy consult service should be developed to provide consultation to patients located on units

Acute respiratory events/Emergencies in the Hospital

SVH is neither affiliated with nor attached to an acute care hospital and, as such, does not have resources available to manage critically ill patients. In keeping with best practice, CCC hospitals should be capable of triaging patients requiring intermediate levels of care who could be treated without being transferred to acute care (e.g. uncomplicated pneumonia or urinary tract infections). Any programmatic interventions to improve the provision of acute care interventions must be integrated in a manner that is realistic and corresponds with the levels of care that SVH seeks to provide. There will inevitably be patients for whom treatment at SVH is no longer appropriate and who should be transferred to acute care (e.g. patients with myocardial infarction, or cerebrovascular accidents). However, there are other patients who could be cared for at SVH with slight escalations of care (e.g. parenteral antibiotics for pneumonia or urinary tract infections). An analysis of peer facilities suggests that the development of a rapid response team is a useful intervention, not only for providing acute interventions but also for familiarizing clinical staff with the signs of patient deterioration. Peer sites generally have access to this model, either as a result of being attached to an acute care hospital (Toronto East General Hospital), or, more relevant to SVH, by developing these resources in house (Westpark). The rapid response team model concept originates from acute care, and is often staffed by a respiratory therapist, a critical care nurse, and often (but not always)

a critical care physician or resident. The model is one of the Safer Healthcare Now! (SHN) interventions of the Canadian Patient Safety Institute for improving patient safety, mainly through the early detection of deterioration and the provision of critical care expertise at the bedside.^{1, 2} SHN describes this as “respond[ing] to a ‘spark’ before it becomes a ‘forest fire’.” This approach was developed for acute care settings, and SHN has not yet developed resources for applying it in CCCs such as SVH. Based on the experiences of Westpark, however, the rapid response team in the CCC context is feasible and practical. The model relies on the team’s expertise in critical care, and their ability to provide prompt evaluation, triage, and treatment for patients independent of the primary physicians who care for the patient. This may include the ability to order laboratory and imaging studies or medications, initiate appropriate therapies, transfer patients to higher levels of monitoring and care, and discuss end-of-life issues with patients and their families.³ The resultant goal of the team is to prevent cardiac arrests and other life-threatening events, reduce inappropriate or avoidable transfers to acute/ critical care, and to provide rapid consultation throughout the hospital.⁴ The success of the initiative relies not only on the interventions delivered by the team, but the overall improvement in the monitoring of patients for signs of deterioration by unit clinical staff, increasing the education of providers and establishing clear criteria for activating the team and seeking a consultation.

The rapid response team model can only function effectively when the resources are routinely available, team members are well trained and experienced and provided with the necessary tools and policies to function effectively.

RECOMMENDATIONS

SVH should develop a rapid response team similar to what has been developed at Westpark Hospital, providing 24-hour coverage and response to acute medical events in the hospital. Implementing this model should include:

1. The development of an education package for clinical staff related to the signs of deterioration, risks of adverse events, and other relevant clinical features for activating the rapid response team. These can be adopted from The Ottawa Hospital's model, to provide greater consistency among the local hospitals.
2. The development of a rapid response team capable of implementing clinical interventions (diagnostic, therapeutic, transfer) 24 hours per day at SVH, including the development of relevant care pathways, standardized order sets, and medical directives.
3. Conducting training and certification for rapid response team members in areas such as the medical directives, advanced cardiac life support (ACLS), and other relevant skills. Resources are likely available to support the development of this program through The Ottawa Hospital's critical care program.
4. An exploration of the feasibility of implementing a higher-acuity patient unit

at SVH to provide enhanced, short-term monitoring of patients with acute medical conditions. Consolidating the care of these patients would allow for the pooling of resources, and may alleviate concerns of increased workload for high-need patients by unit nursing staff.

5. The development of an interprofessional Code Blue Committee, to review the implementation of this program, and the regular reporting of the interventions provided by this team will be needed to monitor the effectiveness of acute events within the hospital.

Medical technologies

There is a need to consider how best to maintain the existing non-invasive ventilation equipment and supplies, such as nocturnal CPAP/BPAP machines, and the required disposable equipment owned by both the hospital and by patients. Many patients have their own machines and are using them while in hospital; the cost of maintaining this personal property is not provided for in current budgets, even though some patients are hospitalized for prolonged periods of time. Several components require routine maintenance or replacement, such as face masks, chinstraps, and tubing; this cost is currently covered through ad hoc funding mechanisms (often through individual unit funding) or by the patients themselves. It appears sensible for the hospital to provide this equipment through a centralized funding mechanism, as pragmatic evidence suggests that, even though it is requested patients provide this equipment themselves,

the hospital is providing replacements, despite there being no specific budget for this. Centralization would allow for the standardization of equipment purchases and maintenance, which might address current confusion due in part to the variety of devices used in the hospital. With the development of more comprehensive respiratory programs, it is conceivable that there will be additional one-time capital equipment costs for items such as new spirometers, overnight pulse oximeters, and/ or CPAP/BPAP devices to enable the optimization of treatment. At present, these are not being specifically requested, though the development of more comprehensive programs will undoubtedly require additional equipment.

Impact

Impact on the patient experience

- Increasing the capabilities of clinical staff to address acute needs will result in better clinical care and improved patient outcomes. It will also decrease the number of avoidable patient transfers to acute care.
- Increasing the number of full-time equivalent respiratory therapists resolves the delay in admission of patients with tracheostomies when respiratory therapist coverage is not presently available and also provides an additional safety mechanism for responding to emergencies through expanded coverage.
- Improved respiratory coverage provided by the rapid response team leads to more consistent care.

Impact on costs

- Development of a respiratory therapy consult service has been shown to reduce costs and improve quality.
- Development of a robust, interprofessional program that focuses on caring for neuromuscular ventilated patients in the community will result in significant savings and improved quality of care.
- There are potential revenue gains if transfers to acute care can be avoided

and managed at SVH by providing care to moderately more complex patients.

Impact on the quality of care

- Implementation of OMSC would fulfill the obligations to the LHIN and improve care of the patient population at SVH.
- Implementation of care pathways will improve quality and consistency of patient care.
- Familiarizing clinical staff with signs of patient deterioration in conjunction with the deployment of a rapid response team will improve quality of care through the early recognition of potentially critical events.

Demography and a role for Bruyère

Several community-based ventilated patients are being cared for by parents who are now reaching the age of 60 or 70 years, and they warn that it is likely they will not be able to care for them over the coming decade. There is likely to be an enhanced need for services for invasively and non-invasively ventilated patients in the coming years, yet few resources are currently available in the

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