

A needs assessment to determine the need for respiratory therapy in complex continuing care: A methods paper

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BACKGROUND: There is an emerging demand for complex continuing care for patients who are too ill to safely return home, but for whom hospitalization in an acute care environment is unnecessary or inappropriate. Despite the need and medical complexity of these patients, few respiratory therapists are practising in this environment, and little evidence exists to guide the implementation of respiratory therapy services in this setting.

OBJECTIVE: In response to a perceived need for greater respiratory services at Saint Vincent Hospital (Ottawa, Ontario), a needs assessment was undertaken to assess the prevalence of respiratory diseases and for increased respiratory therapist coverage at this complex continuing care hospital.

METHODS: An initial literature review was conducted to guide the assessment, and identified only one tool of relevance, which was obtained and formed the basis of the further development of tools for collecting data at the hospital level and on patient care units at the facility. This needs assessment tool was expanded to include priority areas of relevance that fall within the scope of practice of respiratory therapists, and was supplemented by the analysis of administrative databases and qualitative data gathered through unit walkthroughs and unstructured key informant interviews. A health systems framework was used to structure recommendations for the development of interventions and programs for this patient population.

RESULTS: The burden of respiratory disease was significant, and included a high prevalence of inhaled medication and oxygen use, and a significant workload that could be attributed to addressing the respiratory needs of patients.

CONCLUSION: A range of tools and methods are needed to conduct needs assessments for respiratory therapy in complex continuing care. Using multiple data sources, a significant burden of respiratory diseases was present at the Saint Vincent Hospital; further studies in other complex continuing care hospitals are needed to understand the significance of these findings among this patient population more generally.

Key Words: *Complex continuing care; Long-term care; Needs assessment; Respiratory therapy*

Changing population needs, disease trends, and increases in the complexity and the growing burden of chronic diseases present major challenges to clinicians, with evidence regarding the appropriate management of multimorbidity (defined generally as the concurrent presence of ≥ 2 chronic diseases in the same individual) lacking in both primary and hospital-based care (1,2) and growing questions of the appropriateness of applying clinical guidelines to their care (3). By 2036, Statistics Canada projects that seniors will represent 25% of the Canadian population, compared with 14% in 2009 (4) and, as the population ages, it is likely that demands for long-term care services

Une évaluation des besoins pour déterminer l'importance de l'inhalothérapie en soins continus complexes : un article sur les méthodes

HISTORIQUE : La demande de soins continus complexes auprès des patients trop malades pour rentrer chez eux en toute sécurité, mais pour qui l'hospitalisation en soins aigus est inutile ou inappropriée commence à émerger. Malgré les besoins et la complexité médicale de ces patients, peu d'inhalothérapeutes exercent dans ce contexte, et il existe peu de données pour orienter la mise en œuvre de services d'inhalothérapie dans ce milieu.

OBJECTIF : En réponse à l'impression qu'il fallait accroître les services respiratoires à l'Hôpital Saint-Vincent d'Ottawa, en Ontario, l'auteur a procédé à une évaluation des besoins pour examiner la prévalence de maladies respiratoires et l'augmentation nécessaire du nombre d'inhalothérapeutes dans cet hôpital de soins continus complexes.

MÉTHODOLOGIE : L'auteur a effectué une première analyse bibliographique pour orienter l'évaluation et n'a relevé qu'un outil pertinent, qu'il a utilisé pour préparer d'autres outils afin de colliger des données à l'hôpital et dans les unités de patients de l'établissement. Il en a élargi le champ d'application pour inclure les secteurs prioritaires dans la portée de pratique des inhalothérapeutes et l'a complété par l'analyse de bases de données administratives et de données qualitatives amassées lors de la revue des unités et d'entrevues non structurées avec des témoins privilégiés. Il s'est fié à un cadre du système de santé pour structurer ses recommandations sur l'élaboration d'interventions et de programmes à l'intention de cette population de patients.

RÉSULTATS : Le fardeau des maladies respiratoires était important et exigeait une forte prévalence de médicaments inhalés et d'oxygénothérapie, de même qu'une importante charge de travail pour répondre aux besoins respiratoires des patients.

CONCLUSION : Un éventail d'outils et de méthodes s'imposent pour effectuer une évaluation des besoins d'inhalothérapie en soins continus complexes. D'après de multiples sources de données, l'Hôpital Saint-Vincent présentait un fardeau important de maladies respiratoires. Des études plus approfondies dans d'autres hôpitaux de soins continus complexes devront être réalisées pour comprendre le sens plus général de ces observations au sein de cette population de patients.

will continue to grow, as will the prevalence of multimorbidity among the adult population in general (5,6).

A growing unmet need for long-term care and home care services is creating a backlog in acute care facilities, in which significant numbers of mostly elderly patients are waiting for placement in residential care (7). In the gap between acute care hospitals and community-based long-term care, there is an emerging demand for complex continuing care for patients who are too ill to safely return home, but for whom hospitalization in an acute care environment is unnecessary or inappropriate. These patients comprise a growing population who

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TABLE 1
Objectives of the assessment project

1. To review the current model of care, practices/standards in place for the care of patients with acute and chronic respiratory diseases at SVH;
2. To determine the prevalence of respiratory diseases among the inpatient population at SVH;
3. To identify best practices in the care of patients with complex acute and chronic respiratory diseases in CCCs in Ontario;
4. To make recommendations on the continuation, renewal and/or expansion of respiratory therapist services at SVH and the potential development of a respiratory therapy department within the hospital;
5. To identify and clarify improved service delivery and efficiency opportunities for the care of patients with respiratory diseases at SVH; and
6. To make recommendations on a direction forward for an enhanced model of care and service delivery for respiratory patients in the CCC program at SVH.

CCC Complex continuing care; SVH Saint Vincent Hospital, Ottawa, Ontario

often have multiple medical comorbidities and complex social situations that may operate synergistically to increase their health care needs (2,5). Comprehensively addressing the needs of this patient population necessitates the application of evidence-based practices in a manner that recognizes the individual needs and priorities of these patients (8).

Little research has been conducted to evaluate models of care that correspond with multimorbid patients' unique constellation of multi-dimensional problems, priorities and decision making (9). This population is frequently excluded from clinical research owing to the complex nature of their multimorbidity, and a major gap in knowledge exists for the development of care pathways for these patients as they transition across the continuum of care (10). From the perspective of patients with respiratory diseases, there have been few studies that specifically examine the needs of multimorbid patients with chronic respiratory diseases; however, there is evidence that patients with chronic obstructive pulmonary disease (COPD) often present with several other comorbidities, suggesting a need to ensure the application of integrated disease management approaches to their care (11,12).

Bruyère Continuing Care operates two hospitals outside of the acute care system, including Saint Vincent Hospital (SVH), a 336-bed complex continuing care hospital located in Ottawa, Ontario. This hospital includes a 10-bed neuromuscular ventilation unit for patients requiring chronic assisted ventilator care, and a substantial patient population with tracheostomies and other complex social and medical needs.

Respiratory therapy services are provided by a group of respiratory therapists who rotate through the hospital and provide the equivalent of one full-time position. One therapist is on site per day, five days per week, with the stated purpose of providing care for mechanically ventilated patients. The role of the respiratory therapists has expanded to include care for an increasingly large population of patients with tracheostomies, responding to consultations for patients with other respiratory conditions and responding to emergencies.

The growing role of the respiratory therapists at SVH led the senior management to request a review of the role of the service within the hospital, as well as an assessment of the overall provision of respiratory care, including policies and procedures, care pathways, and physical and human resources availability. There was a perception among clinical staff of a significant burden of respiratory diseases among the patient population. It was generally believed that an expanded role for respiratory therapists could improve the care of patients with respiratory diseases in terms of clinical outcomes and quality of life through the implementation of evidence-based practices and programs for common acute and chronic respiratory conditions. In September 2013, the Bruyère Research Institute – an independent research organization affiliated with Bruyère Continuing Care – was commissioned to conduct a needs assessment to guide the development of any respiratory programs that could be needed but were not

currently provided. The present article provides an overview of the methodologies used in conducting this review, which could be used as the basis for other clinical centres to perform similar reviews in a complex continuing care environment.

METHODS

The present project was a quality improvement initiative and, therefore, research ethics review was not sought. The project was reviewed using the Alberta Research Ethics Community Consensus Initiative (ARECCI) Ethics Screening Tool, which ranked the project as a quality improvement initiative that was determined to be “somewhat more than minimal risk” with a score of 14 (13). As such, the project was discussed with the institution's research ethics board, and was determined to be a quality improvement initiative that did not require research ethics approval. Protection of privacy and patient confidentiality were addressed through institutional policies governing the handling of personal health information.

The specific objectives of the needs assessment are summarized in Table 1, and focus broadly on estimating the prevalence of respiratory conditions among the inpatient population at the hospital; assessing the availability and suitability of the resources to care for patients with respiratory diseases; and assessing and analyzing any gaps in the care of patients with respiratory diseases and to identify opportunities for enhancing this care. Achieving this required a systematic approach for conducting a situational analysis of the current model of respiratory care, focused not only on service provision but on all aspects of the essential elements of a well-functioning health system.

A methodological approach was developed to evaluate the availability of the resources necessary for delivering respiratory care, the role of different clinicians in providing this care, and any gaps that could be identified quantitatively or qualitatively. Recognizing that the integrated management of respiratory diseases includes a range of clinical, educational and social interventions provided by an inter-professional care team, the present assessment sought to explore these interventions and roles.

An initial literature review was conducted in August 2013 to locate existing methodologies, assessment tools or frameworks that could be used to guide the analysis and needs assessment in this setting. A search of the PubMed database using the MeSH terms “respiratory therapy” and “long term care” and of the CINAHL database using the terms “Respiratory Therapy Service” OR “Respiratory Therapy” AND “Nursing Home Patients” yielded no articles of relevance. A review of the abstracts from the Canadian Society of Respiratory Therapists' Annual Educational Conference located one abstract of a poster presentation on the conduct of a needs assessment in complex continuing care by respiratory therapists in the University Health Network (UHN) at the Bickle Centre in Toronto (Ontario), and the authors of the study were contacted and a copy of the needs assessment was obtained (14).

Needs assessment tool development

Owing to the lack of standardized needs assessments, it was determined that the best approach was to develop and pilot a needs assessment tool for collecting data during unit walkthroughs, and to supplement the tool's data with analyses from the hospital's administrative databases and qualitative data gathered through unit walkthroughs and unstructured key informant interviews. The Bruyère assessment tool was developed using many of the indicators and criteria from the UHN assessment as a framework, and expanded on this to include priority areas of relevance to Bruyère that fall within the scope of practice of respiratory therapists, as established in the 2011 National Competency Profile (15). The UHN tool was developed for a similarly complex, multimorbid patient population as Bruyère, but did not include patients receiving mechanical ventilation, and did not specifically query smoking cessation or chronic disease management criteria that were important to Bruyère's programs. Therefore, it was determined that some supplementation of the tool would be necessary to generate the most comprehensive analysis.

Two separate – but related – tools were developed: one for the collection of data at the hospital level; and the second for the collection of data during individual unit walkthroughs. The hospital assessment assessed the availability of hospital-wide policies and procedures and other resources that would be available institutionally, but not on individual units (such as a laboratory or radiography services). The assessment for the individual patient care units collected details on the number of patients and staff present, the availability of relevant resources (eg, piped-in oxygen, suction equipment, pulse oximeters, etc) and assessments of processes (such as the administration of medications or performing suctioning).

To address the need for an assessment of the ventilated patient population, indicators regarding the number of ventilated patients, and the availability of equipment and human resources were included. The SaferHealthcareNow! indicators for the prevention of ventilator-associated pneumonia were also included as part of the present needs assessment. Although these indicators were developed for ventilated patients in an intensive care unit with acute respiratory conditions, rather than chronically ventilated patients, they were included in the present assessment to determine their feasibility and appropriateness in this setting. The SaferHealthcareNow! indicators for rapid response teams for acute medical events were also included.

Select indicators from The Ottawa Model for Smoking Cessation (OMSC) were also included in the needs assessment to identify systematic practices for identifying smokers, and providing smoking cessation therapies and counselling to inpatients. The indicators included were taken from the OMSC Pre-Implementation Needs Assessment Form and integrated into the analysis.

Preliminary versions of the needs assessment tools were created using EpiInfo 7 (Centers for Disease Control and Prevention, Georgia, USA) and circulated among the two respiratory therapists providing clinical services at SVH at the time for their feedback, as well as among the senior leadership of the hospital. Minor changes to the data collection of human resources information were made, and a final version of the assessment tools was created in EpiInfo.

From October 22 to 25, 2013, unit walkthroughs were conducted at SVH and relevant data were collected using the needs assessment forms using a mobile version of EpiInfo 7. Data for the hospital assessment form were collected through interviews with the senior nursing leadership. Data regarding individual units were collected through interviews with the nurse managers for each unit and direct observation of the patient population and the resources available and in use to provide respiratory therapy. All data were collected by one investigator (JWN).

Other data sources

Data from the hospital's pharmacy order entry database were requested for the same time period as the unit walkthroughs, to identify the number of patients with an order for any medication by inhalation (excluding bland aerosols and nicotine replacement therapy). These were used to validate estimates of the prevalence of certain chronic respiratory conditions, as collected during the unit walkthroughs, and to identify any patients who may have been missed by this process.

Data were also requested from the hospital's Resident Assessment Index Minimum Dataset (RAI-MDS), which is required to be completed by all long-term care facilities in Canada. Because these data are collected on admission, following a change in status (eg, an increase in medical need) and every 90 days following either of these events, only quarterly data were available for comparison. Numbers of patients coded in the RAI-MDS as having undergone a tracheostomy, requiring oxygen therapy, as having emphysema/COPD and coded as having shortness of breath were requested for analysis and comparison.

Workload data were requested for all respiratory therapy interventions recorded in the hospital's workload measurement software. These interventions are self-reported by clinicians. All interventions from the respiratory therapy workload measurement tool were requested and analyzed for a period of one year, and all respiratory interventions performed by nursing staff were also requested for workload analysis.

To assess the frequency of acute events, ambulance call data were requested from the Ottawa Paramedic Service for a two-year period to determine the frequency of respiratory events in a historical cohort.

Other contextual factors were collected through a document review and through unstructured interviews with key informants during the unit walkthroughs, including issues related to service delivery, the health workforce, use and availability of information and evidence, medical products and devices, and financing and leadership/governance, each related to respiratory therapy specifically and the care of patients with respiratory diseases more generally (16).

Data analysis

All data collected through the needs assessment tools were initially analyzed using EpiInfo 7, and the raw data of interest were exported and analyzed using a spreadsheet (Excel, Microsoft Corporation, USA). Data from the other databases were also analyzed in Excel. Standard descriptive statistical analyses were performed on analyzable data. Qualitative data were used to inform the interpretation of quantitative data and to identify areas of concern, but were not systematically analyzed.

RESULTS

No single data source managed to comprehensively identify all patients with respiratory diseases. As such, the triangulation of findings through different data sources was essential for estimating prevalence and for validating the interpretation of the results.

Because of significant heterogeneity in the patient population and the organization of the care provided to them, the analysis was separated into three distinct patient populations: mechanically ventilated patients and patients with tracheostomies who are mostly cared for on one respiratory unit; patients with chronic respiratory diseases throughout the rest of the hospital; and patients with acute respiratory illnesses throughout the entire hospital. This disaggregation enabled an analysis unique to these patient populations, and the presentation of recommendations specific to these groups.

A significant burden of respiratory disease was identified among the hospital's inpatients at the time of the assessment. Thirty-two percent (n=84) of all inpatients outside of the respiratory unit were prescribed at least one medication by inhalation, while RAI-MDS data for the same period identified only five (1.3%) patients coded with asthma and 17 (4.4%) patients with COPD for the yearly quarter of interest. The most recent historical quarterly data available at the time from 225 RAI-MDS assessments identified 48 (21.3%) patients who required oxygen either continuously or intermittently; a manual tally of oxygen use during the unit walkthroughs identified 41 (15%) patients of a total of 261 currently using oxygen on the units assessed. Twelve (4.5%) patients were prescribed either continuous positive pressure airway or bilevel positive airway pressure devices. The hospital provides care to 10 chronically ventilated patients and, at the time of the assessment, provided care to 36 patients with tracheostomies.

The ambulance call data provided some insight into the numbers of ambulance calls related to acute respiratory events (66 between 2011 and 2013, comprising 22.3% of all ambulance calls to the hospital, excluding nonurgent calls); however, attempts to validate these findings among key informants suggested that these figures were likely incomplete or inaccurate.

Workload data revealed that approximately 92% of all respiratory therapy work occurred on the respiratory units where all of the ventilated patients and most of the tracheostomy patients are cared for. Despite the presence of respiratory therapists during weekdays, a significant amount of nursing time was involved in caring for these patients, with 23.88% of nursing workload on these units comprised of respiratory-related procedures such as suctioning, administering oxygen therapy or performing tracheostomy care. Respiratory therapy procedures outside of this unit comprised a small number of diagnostic tests and some consultations for medically complex patients.

Only one hospital policy related to the management of respiratory patients (for oxygen administration) was located because much of this care was physician directed.

DISCUSSION

Despite the growing need for long-term care, the role of the respiratory therapist in this setting remains underdeveloped, with only a small number of respiratory therapists practicing in this area (17). For this reason, there is currently little guidance regarding the essential competencies or groups of services that are necessary for successfully implementing a respiratory therapy role into these environments.

Several key themes emerged from the needs assessment. First, the prevalence of respiratory conditions (both acute and chronic) was generally high among residents of long-term care facilities, and the complex continuing care hospital examined in the present needs assessment, specifically. Second, despite the high prevalence of respiratory conditions in this patient population, little research has been conducted to identify and evaluate effective interventions for the management of respiratory diseases in this setting. Third, the availability and quality of data regarding the complex continuing care patient population is minimal across the health system, which is a significant limitation for understanding the population's health. Finally, the role of respiratory therapists in addressing each of these themes remains to be firmly established.

Burden of respiratory disease

The present needs assessment identified a substantial burden of respiratory disease among the inpatient population of one complex continuing care hospital. Although approximately one-third of the inpatients could reasonably be presumed to have been receiving treatment for a respiratory disease, virtually none were admitted for primary respiratory conditions. Rather, most were admitted for other conditions requiring continuing care, and respiratory diseases were a comorbidity. It should be noted, however, that although the burden of respiratory diseases appears to be high, the data for which this finding has been made were not robust, and showed sufficient variation among different data sources to warrant further investigation and questioning.

Existing databases may be of use in estimating this prevalence, including the use of the RAI-MDS, which collects information regarding COPD and other respiratory diseases, and whose comorbidity classifications have been validated in this context (18,19); however, a significant gap was noted between data in the RAI-MDS and pharmacy data at our facility. Administrative health databases in Ontario have also been used to identify cohorts of patients with COPD and to describe their rates of mortality and health services utilization (20,21); however, the RAI-MDS and the administrative databases have never been cross-validated for identifying COPD patients. There is a further need to correlate these prevalence data with important outcomes, such as mortality and health services utilization, and to identify predictors of these outcomes such as socioeconomic status, place of residence and access to health services, which are important determinants of respiratory health (22).

It is clear that additional clarification will be necessary to better understand the respiratory patient population in complex continuing care, including the development of more standardized measures and approaches. Of the 32% of patients prescribed some medication by inhalation, consultation with clinicians revealed that it was generally believed that the majority of these patients were likely to have been diagnosed with COPD; however, firm estimates were not possible with the data available. Previous research has estimated the prevalence of COPD among residents of long-term care to be 35% in Ontario, making this estimate plausible (23).

Evidence-based practices

Programmatically, there is a need to identify effective interventions for the management of patients with acute and chronic respiratory diseases in long-term care. This patient population is both complex and

heterogeneous, encompassing patients with needs that are resource intensive (such as chronically ventilated patients) to patients whose care needs may be more minimal. Applying evidence-based interventions to this patient population will likely necessitate the adaptation of existing evidence to a new context, for which there may be several barriers (24). Further research is required to understand the existence and quality of the evidence for respiratory therapy in complex continuing care, and to identify gaps in the research that ought to be addressed to ensure high-quality patient care. Presently, it appears that few studies have specifically been conducted in this care environment with this patient population. The absence of contextually appropriate evidence leads to a gap in clear guidance on the development of interventions and the composition of the care teams required to effectively manage respiratory diseases in this setting.

Several promising practices likely exist from acute, primary and home care settings for managing respiratory conditions in the complex continuing care setting, including evidence-based best practices for both acute and chronic respiratory diseases (25-27). However, the application of single-disease guidelines to multimorbid patients is controversial and requires further exploration (28). Addressing this evidence gap will require further research and evaluation of existing initiatives involving unique interventions and care teams, including of the role of respiratory therapists in this setting.

Needs assessment design

Several questions in the Bruyère assessment tool referred to quantitative data that ultimately were not part of the final analysis, such as the number of staff present during various shifts. These data formed a component of the contextual analysis, enabling a more refined understanding of the potential systems-level stressors that exist on units and at the bedside, and the role that respiratory therapists can play in delivering patient care through the identification of gaps in coverage.

The assessment included several metrics for standards of care from the acute care environment (eg, indicators for both ventilator-associated pneumonia and for rapid response teams) that, although relevant, did not specifically apply in the context of complex continuing care and likely require adaptation to this care environment despite their relevance. The development of key performance indicators to accompany the expansion of respiratory therapy in the long-term care and complex continuing care environment may be an area for future research that would drive innovation and improvements in clinical practice.

Role of respiratory therapists

There is growing concern in Canada for the future need for long-term care and complex continuing care beds as the population ages (29). Access to these services is currently poor, with many seniors waiting to be discharged from acute care to long-term care after their acute needs have been met (30).

Addressing the complex medical needs of subacute hospitalized patients necessitates ensuring that comprehensive respiratory services are available for the management of acute and chronic respiratory conditions, both of which appear to be prevalent and important predictors of health outcomes in this population (23,31). Respiratory therapists bring a unique skill set to the long-term care environment, with expertise in respiratory disease management, critical care, airway management and basic therapeutics, among others. Existing evidence demonstrates that in the acute care setting, respiratory therapist-driven care for asthma and COPD reduces health care costs and adverse events, while increasing adherence to appropriate therapies (32,33). Similar results have been shown with respiratory therapy consult services for non-intensive care unit patients and ventilator weaning (34,35). Research is needed to evaluate whether similar effects can be demonstrated in the complex continuing care patient population.

CONCLUSION

The results of the present assessment should be leveraged in two significant ways: first, to improve the availability of information and data

on the prevalence of respiratory diseases and the availability of respiratory services in complex continuing care settings; and second, to serve as a starting point for improving the care of patients with respiratory diseases in complex continuing care.

In response to the results of the present needs assessment, the development of inpatient programs are underway to increase the coverage of respiratory therapy services, specifically with regard to the implementation of smoking cessation and COPD programs. Future work is planned to examine the role of respiratory therapists in the ventilator and tracheostomy care programs.

Given the high prevalence of respiratory diseases among patients in the complex continuing care hospital evaluated specifically, and

long-term care facilities generally, there is a need to better understand the burden and impact of these diseases on patient outcomes and health services utilization, and to implement integrated disease management programs in response. Evidence exists to support the role of respiratory therapists as central to these initiatives; the logical next step is to extrapolate the evidence base derived from other settings to the long-term care environment and to carefully evaluate its impact.

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