

# State of knowledge on organizational models for intensive care units

English summary

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The complete version of this guidance (in French) is available on the website of INESSS in the Publications section.

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# SUMMARY

## Background

Each year, in Quebec, thousands of people are admitted to intensive care units (ICU), following a severe traumatic injury or because of a life-threatening condition. Admissions in Canadian ICUs are increasing faster than hospital admissions. An aging population and an increasing prevalence of chronic diseases contribute to this growing use of ICUs. In addition, evolution of healthcare and technologies allows more patients to survive their injury or condition. However, many resources are solicited to provide services during and after an ICU stay.

Despite the fact that many guidelines on the organization of intensive care services have been published in the last few years, the provision of care to critically ill patients is not standardized and varies between countries, even between provinces or regions. Moreover, organizational models seem to rely very little on evidenced-based data. As demand increases, optimizing structure and processes of care could help delivering effective and efficient care, in a timely manner, while improving quality of care and ensuring the sustainability of critical care services.

## Objective

The objective of this report is to synthesize knowledge on optimal organizational features of critical care services and their potential impact on patient outcomes. Based on the Donabedian model, structural components and processes sustaining timely access of care and optimizing health outcomes for patients will be presented in this document.

## Methods

A rapid review of the literature published from January 2010 to March 2017 was conducted. Common databases were searched to retrieve relevant studies. Major topics were identified: critical care capacity, medical and administrative management, medical care models, composition and characteristics of the clinical team, material and technological resources, admission, discharge and other processes. For each of these topics, systematic reviews that were judged of satisfactory quality generally provided the basis for selecting other relevant studies. An Internet search for recent guidelines (from 2000 to 2017) focusing on critical care organization was performed. Finally, a brief environmental scan on the critical care organizational models found across Canada and around the world was conducted. Data from national and provincial critical care and healthcare organizations' websites as well as the grey literature was gathered. Various aspects of the organization of critical care services were targeted, including levels of care and clinical information systems. Examples of healthcare organizational models showing substantial impacts on patient outcomes were also sought. Of note, the present work did not include on-site assessment and consulting.

## **Main findings and conclusion**

Assessing the impact of organizational features regarding critical care is not a simple task, given the heterogeneity of healthcare structures and settings. Moreover, guidelines do recommend the implementation of a number of structural features and processes, but these recommendations are often based on expert consensus, and only occasionally supported by a more or less elaborated literature review. From the present work, it is however possible to identify some features or practices reaching consensus.

Beyond the identification of relatively well-defined levels of care, there seems to be an agreement on an optimal ICU organizational model based on the level of responsibility devolved to intensivists regarding the care of admitted patients: the « closed » model. However, a 24/7 intensivist staffing does not seem essential, even though some guidelines underline the importance of making arrangements to ensure a critical care coverage without significant gaps.

Notwithstanding the published guidelines, the evidence is scarce regarding the required specialized training for intensive care doctors and education of nurses. Nor is there a clear consensus on intensivist or nurse to patients ratios; for the latter, however, guidelines tend to concur. As well, it seems that an agreement has not been reached on the optimal composition of the critical care team, even though guidelines promote the implementation of such a team.

Regarding material and technological resources, some guidelines suggest the implementation of telemedicine systems, limited data linking those systems to potential beneficial outcomes for patients. Such systems could also increase the accessibility to critical care in areas where resources are limited.

The use of clear processes and criteria for admission and discharge of patients is recommended by some, the literature offering mixed results on possible negative impacts of delays or overnight transfers on patient outcomes. The implementation of rapid response systems could however support admission and discharge processes.

The impact on mortality and length of stay of daily multidisciplinary rounds and strategies aiming to improve communication with patients and their relatives as well as their involvement in care, is not clear, but still, the use of such processes is recommended by some critical care organizations. Lastly, strategies to improve quality of care probably have a greater impact on patient outcomes if they are multifaceted and tailored to settings; the implementation of such strategies is recommended by several organizations.

Despite limited data, this report outlines variations between the current organization of critical care services in Quebec and best practices for diverse structural features and processes. Integrating some of the structural attributes and processes highlighted in this report, in a structured model for organizing critical care, can ensure conformity and allow the assessment of care quality, hence potentially improving patient outcomes. Some jurisdictions and areas of care have already undertaken such tried and tested exercises.

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