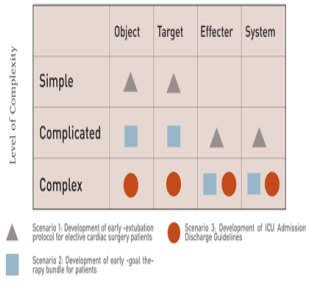
ICU MANAGEMENT & PRACTICE

ICU Volume 8 - Issue 3 - Autumn 2008 - Matrix

Efficient ICU Management: A Framework to Implement Evidence Based Organisation of Care

Figure 1: Evaluation of Barriers to Translate Knowledge at the ICU Bedside



Authors

Rebecca Anas, *B.Sc, MBA*
Project Manager
Strategic Decisions, Critical Care Department
anasr@smh.toronto.on.ca

Fabrice Brunet, *MD, FRCPC*
Professor of Medicine,University of Toronto
Chief, Critical Care Department
Li Ka Shing Knowledge Institute
brunetf@smh.toronto.on.ca

David Klein *MD FRCP(C) MBA*
Assistant Professor of Medicine
University of Toronto
Staff Physician, Critical Care Department
kleind@smh.toronto.on.ca

Richard Bowry, *MB BS FRCA*
Medical Director
CVICU

Chris Hayes, *MD, FRCPC*
Medical Director,Patient Safety & Quality

Orla Smith, *RN, MN*
Research Manager,Critical Care
St. Michael's Hospital
Toronto, Canada

Implementing evidence is the basis for improving organisation of care in the intensive care unit. As this can be a challenging task due to human and system barriers, we propose an innovative framework to facilitate knowledge translation at the bedside.

Background

The mission of an Intensive Care Unit (ICU) may vary according to the type of unit, hospital and healthcare system involved (Walter et al. 2008). However, the universal objectives for all ICUs remain the same and are as follows:

- To provide compassionate and evidence-based care for critically ill patients and families,
- To optimise resource allocation and utilisation,
- To coordinate care and provide critical care services to hospital stakeholders, like the emergency room (ER), surgical and medical services,
- To provide regional critical care support for specialised services, like trauma or burns and
- To create, develop and translate knowledge, if the ICU belongs to an academic hospital.

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The Challenge of the ICU Environment

Despite the wealth of evidence-based practice and the drive to improve organisation of care, failure to successfully implement protocols and guidelines in the ICU environment is frequently reported (Blackwood 2003; Ferrer et al. 2008; Ibrahim and Kollef 2001; Trujillo et al. 2008; Walter et al. 2008). This can be attributed to the high level of complexity of the patients and illnesses, as well as the model of care delivery, requiring highly trained caregivers to interact in a multifaceted way (Simpson and Doig 2007). The purpose of this article is to describe a framework we designed to better identify potential barriers to change and to develop targeted action plans.

Methods

We propose a methodology to effectively implement protocols, guidelines or other kinds of change strategies within the ICU environment.

For this purpose, we first identified that the failure to execute can be due to four categories of barriers found within the ICU setting [Fig1]:

- Complexity of information contained within protocols and guidelines that are often difficult to interpret in the local ICU environment and can contradict each other (Walter et al. 2008; Morris 2004; Morris 2003). In this paper, we will label this barrier as the “object”.
- Complexity and heterogeneity of ICU patients that often limit the translation of direct evidence from randomised controlled trials. Indeed, many of these randomised clinical trials exclude a large portion of severely ill and complex patients (Hammond 2001). We will label this barrier as the “target”.
- Complexity of change for the individual practitioner (-s) or healthcare team (-s), that will be the person (-s) required to implement this new evidence at the bedside. Cultural, interpersonal, and other change barriers fall into this category (Walter et al. 2008; Sinuff et al. 2007). We will label this barrier as the “effecter”.
- Complexity of the model of healthcare delivery in which the new evidence will be implemented. Variance in complexity will be observed, dependent on the level of formal organisation of the health system (MacKenzie et al. 2006). We will label this barrier as the “system”.
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Each of these types of barriers has already been reported in the literature (Simpson and Doig 2008). However, a systematic framework that defines how one could tangibly overcome these obstacles in an articulated manner has not been described, as yet

. Second, the level of complexity of each of the four barriers is assessed and then categorized using a semi-quantitative tool developed by Westley and Zimmerman (Westley et al. 2007; Zimmerman et al. 1998). This tool permits the level of complexity to be evaluated as “simple”, “complicated” or “complex”.

We then assess and categorise each scenario using a matrix approach [Fig1]. Each barrier is listed and in terms of one of the three levels of complexity. When this level has been determined, an action plan can be developed to deal with the most complex barriers and assign resources accordingly.

Lastly, the action plan is then targeted to simplify the obstacles through communication, education and management techniques, while using a problem-solving approach. The goal of this methodology is to achieve successful knowledge translation of evidencebased care at the bedside using a project management methodology.

Results

We will describe three scenarios to illustrate this concept

Scenario 1: Implementation of an Evidencebased Early Extubation Protocol in the Cardiac Surgery ICU for Elective Cardiac Surgery Patients.

During this process, few communication efforts were needed for the “object” and the “target” factors since the protocol and patient population were “simple” and well defined and similar to that reported in the literature (Flynn et al. 2004). However, more time and focus was required for the “effecter” and “system”, which were assessed as “complicated” due to the number and the diversity of players involving the ICU, Operating Room and Ward teams. The objective of reducing delay in extubation by 2.5 hours was successfully achieved within three months, using a virtual electronic community tool to improve stakeholder communication, reduce the risk of inter-professional conflict, facilitate buy-in and realise synergies amongst the teams.

Scenario 2: Development and Implementation of a Sepsis Bundle in the Medical Surgical ICU and ER.

This action plan required significant efforts with the “object”, “target” and “effecter”. Actions included simplification of the sepsis bundle (described in the surviving sepsis campaign guidelines, Dellinger et al. 2008; Dellinger et al. 2004) by the inter-professional steering committee, in order to adapt the intervention to the local environment. A refinement in the local definition of the target patient population focused directly on those patients who would significantly benefit from the use of the bundle. In addition, a clear definition of the role for each of the different individuals and teams was required. Lastly, an inter-professional training and communication program was created to improve continuity of care between the teams from the ER and ICU. Improvements in clinical uptake of the bundle occurred over time but were slow to build, as reported in other studies (Trzeciak et al. 2006; Ferrer et al. 2008).

Scenario 3: Development and Implementation of Admission and Discharge Guidelines for ICU Patients.

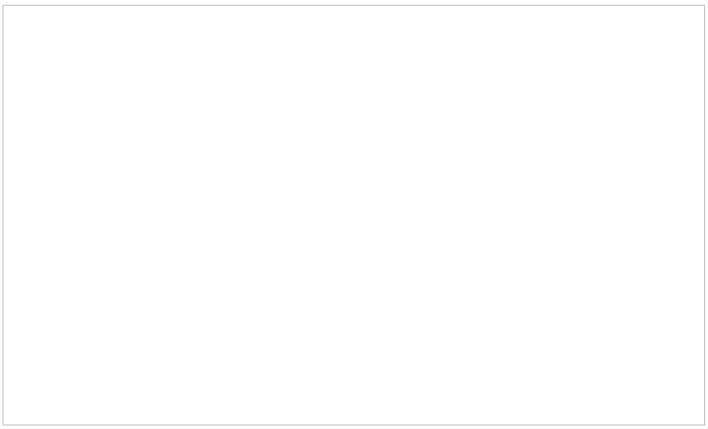
Development and implementation of a standardised guideline to identify those patients most likely to benefit from ICU care is still challenging (Walter et al. 2008). System level challenges often compete with individual patient needs and decisions must be made quickly, often with limited information available. In our institution, after a two-year timeframe, the utilisation of ICU guidelines is still very low due to the complexity of all four types of barriers involved. Practical utility of the guidelines was difficult to define and a streamlined process was not possible with the multitude of care providers involved and the uniqueness of each patient. Lastly, the lack of coordination of the health system for patients moving into and out of the ICU contributed to the inconsistency in use of these guidelines to date. Nevertheless, efforts to improve efficiency of organisation in this area utilising our framework are ongoing.

Conclusions

When implementing evidence at the bedside, our framework can help to optimise the organisation of care in the ICU. The methodology allows for the assessment of the complexity of the task, the detection of major obstacles and can guide the team's action plan. We recommend use of the tool prospectively to plan for implementing new protocols and guidelines. In addition, the tool can be used retrospectively, to detect the root cause of failure and at the same time, allow for alternative solutions. It can also facilitate organisational projects such as patient flow management, academic program development, teamwork training and response to disasters and pandemics.

Note of Appreciation

We would like to extend our thanks to the work of Dr. Brenda Zimmerman, Associate Professor, Schulich School of Business at York University in Toronto, Canada.



Published on : Thu, 15 Aug 2013