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Quality and Costs of Intensive Care – A Conflict?

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Summary

Professor Takala argues the case that optimization of the processes of intensive care may allow relevant cost control without putting the quality of care at risk.

Limited availability of resources and the need for cost containment have become part of daily life in all sectors of health care. In parallel, the awareness and expectations of quality of care have increased among patients and their families, the general public, governmental and other organizations responsible for resource allocation for health care.

Introduction

In critical care medicine, insufficient resources or inadequate resource allocation may become most apparent when a bed is unavailable for a patient at risk of dying due to acutely failing function of one or several of the vital organs. On the other hand, insufficient availability of professional health care personnel in an intensive care unit may worsen the quality of care, resulting in poorer patient outcomes and, ultimately, increased costs of care for surviving patients [1, 2]. Although an increase in personnel resources may improve the quality of patient care, the accompanying increase in salary costs and the possible increase in patient turnover may result in higher overall costs, despite improved outcome and the better cost efficiency per treated patient.

These are among the several seemingly contrasting issues that are common in debates on health care resources and quality of care. Since transparency in the cost components and their allocation within the hospital is often suboptimal and the underlying care processes interact in a complex way, the consequences of resource allocation in intensive care medicine need to be explored in much more detail. The link between available resources and quality of care is questionable and certainly not linear [2, 3, 4]. Optimization of the processes of intensive care may allow relevant cost control without putting the quality of care at risk.

Intensive Care as a Production Line

The need for intensive care services and the type of services provided depends very much on the characteristics of the specific hospital and the structure of the regional health care system. It is therefore useful to approach the needs for intensive care for a defined population by first looking at population-based numbers. These can then be better evaluated in the context of the structure of the health care system in question, and finally, the individual hospital and ICU.

All intensive care services can be divided into two main components:

1. Emergency admissions to intensive care due to acute, potentially reversible lifethreatening organ dysfunction, or a high risk thereof;

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2. Planned admissions to intensive care due to complex surgical or other interventional procedures which necessitate postoperative support or intensive monitoring of vital organ function due to organ function instability, or a high risk thereof.



The need for emergency admissions within a population should be relatively constant or change only slowly, provided that the criteria for patient selection are constant. These criteria are influenced by the cultural environment, among other factors, and may have a major impact on the use of resources; a fundamental question is to what extent resources will be allocated to patients whose chances of meaningful survival are considered small. Furthermore, intensive care resources can also be considered as wasted if they are used for patients with no or a very small risk of serious organ dysfunction or no need for therapeutic interventions.

Since the demand for intensive care services for emergency patients cannot be regulated, insufficient resources will cause a major organizational burden and high risk of poor quality and outcome: either acute care rationing or transfer of the unstable patients is needed.

Cancellation or postponement of planned admissions is one way to acutely regulate the resources available for intensive care. This option is frequently used, and can be a source of major frustration for the interventional specialties needing intensive care services. The need to cancel a planned surgery or other interventions due to a lack of intensive care beds can be regarded as an indicator of process quality and as a signal of either a resource imbalance or a problem in resource utilization. Since cancelling an elective operation disrupts a whole surgical production line, with several interlinked support processes (diagnostics, anaesthesia, etc.), it causes a disproportionate waste of resources and should be considered as an exceptional last measure.

In order to optimize the utilization of intensive care resources, the whole production line must be in balance. Patients in need of intensive care must be admitted without delay, and those who are no longer dependent on intensive care interventions must also be discharged without delay. Intensive care processes should be optimized and a high priority

placed on a v o i d i n g unnecessary prolongation of the patient's stay in the intensive care unit.



A d m i s s i o n delays are likely to cause increased morbidity and possibly mortality, and can therefore cause major increases in costs and poor quality of outcomes [5]. Reasons for admission delays include late detection of a problem and lack of intensive care beds. Major causes for discharge delay include a shortage of beds in the receiving unit and a lack of appropriate resources for taking care of the patient during the recovery phase. Since many patients discharged from intensive care have increased demands for nursing, monitoring, or both, the characteristics of the recipient ward may cause important discharge delays. High-dependency or intermediate care units or step-down beds within the intensive care unit can provide at least a partial solution for discharge delays.

Logistic and organizational issues and problems related directly to the care delivery process may cause prolongation of intensive care. Logistic issues in care delivery – especially the continuity of the care process 24 hrs a day, 7 days a week – can have a major impact simply due to faster decision making and intervention [1]. Some logistic issues are very simple: successful weaning from mechanical ventilation and removal of the artificial airway may have only a minor impact on one patient's stay in the intensive care unit, but have a major impact on the surgical team's planning by ensuring that a bed will be available for another patient following surgery.

Several organizational issues can have an impact on the quality of care. A full-time intensive care unit director, a closed unit where unit staff are responsible for patient care and admission/discharge decisions, and sufficient staff can all result in measurable improvements in the quality of care and resource utilization. Some of these organizational improvements may bring more direct costs initially; others can be obtained through reallocation of existing resources.



There are several examples of how improved quality of patient care can result in reduction of costs of care in a specific group of patients. Unfortunately, these studies rarely address the issue of overall costs of intensive care incurred in a particular hospital or intensive care department when these interventions are successfully applied. Nevertheless, these results are very important in demonstrating the potential synergy in improved quality and cost containment. Examples of such interventions include daily discontinuation of sedation [6], protocolized weaning from mechanical ventilation [7, 8], early goal-directed haemodynamic management of sepsis [9], and early use of activated protein C in sepsis [10]. Since intensive care is a package of therapies both from the medical and financial point of view, cost and quality assessments should in the future focus not only on specific therapeutic interventions in specific groups of patients, but also on the implications for the costs and outcomes of the whole intensive care package.

What is Characteristic to the Cost Structure of Intensive Care?

Intensive care is characterized by concentration of human and technological resources within a defined area within the hospital. Although access to advanced technology is prominent in the public's perception of an ICU, actually the high number of highly trained personnel per patient is the core factor that differentiates intensive care from all other areas of the health care system. Another essential feature is the ICU's dependence on a vast number of services from other production lines of the hospital, such as laboratories, radiology, consultant services from diverse medical specialties, material acquisition and supply, and pharmacy.

Accounting for all these costs is often difficult in the traditional hospital accounting and financial systems. Since up to around 40% of the total costs of intensive care are likely to stem from services provided by other hospital departments, the internal billing concept and its correspondence to true production costs has a major role in cost accounting [11]. Due to the problems related to internal billing, especially in systems where the internally produced services must be used, the use of units of services (e.g. specific laboratory tests) remains the best available surrogate for costs. The direct costs (salaries and other associated personnel costs, material costs, purchase of external services) cover the remaining 60% of the total costs.

Salaries and other associated personnel costs contribute to around 90% of the direct costs and 50% of the total costs of an ICU. The rest of the direct costs (material, etc.), therefore, comprise less than 10% of the total costs. These estimates can vary depending on whether medications and blood products are part of internal billing or direct costs. Nevertheless, it is clear that the largest cost drivers are personnel and indirect costs and not materials or devices.

So, how can an ICU director meet everincreasing expectations for quality and still satisfy demands for cost containment? Controlling the different subprocesses of intensive care delivery provides the best approach to containing costs and improving the quality of care. Process control facilitates appropriate personnel allocation, reduces the length of stay without adversely interfering with patient outcome, and will thereby have an indirect impact on overall costs. In a well-managed ICU there doesn't have to be a conflict between cost and quality.

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