ICU MANAGEMENT & PRACTICE

ICU Volume 5 - Issue 1 - Spring 2005 - Points of View

Allocation of ICU Resources: First Come First Serve vs. Service When Needed

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In response to the preceding comments by Professor Van den Berghe, Dr Albers and Professor Vahl, Professor Takala discusses their viewpoints and explains the solutions practiced in his own ICU.

Intensive care services within a general hospital system serving a population base must fulfil dual needs: those for emergency admissions from the referral population and the hospital itself, and those needed for planned (elective) surgical and other interventions. The actual organisation of intensive care services for the population in question should be taken into consideration, when allocation of resources is discussed: who are the service providers for intensive care – one vs several hospitals, ICUs within the hospitals, specialties providing ICU services, and the collaboration between the service providers. The number of elective ICU admissions and the necessary resources can be planned, and should be clearly linked to the strategy of the hospital system: if the number of elective operations done is consistent with the strategy of the hospital, then the corresponding amount of resources for postoperative intensive care should be available for these operations. This, as self-evident as it may sound, would logically have the consequence that rescheduling elective surgery due to lack of ICU-resources should never happen. This idealistic-sounding concept is complicated in reality by several factors.

First, in contrast to elective admissions with relatively predictable lengths of stay, the need for emergency admissions has a relatively large day-to-day variability and highly variable length of ICU stay.

Second, financial and personnel availability constraints make it unreasonable to always have resources available for the maximum demand. Therefore, a strategy for responding to the inevitable fluctuation in the need for ICU services, largely caused by emergencies, must be available. In this issue of ICU Management two different views are presented on using the rescheduling of elective surgery as a triage tool for intensive care services availability. These views clearly demonstrate some of the key issues in resource allocation, while the consequences of both strategies for the whole patient care process and resource allocation within the hospital or hospital system receives only limited consideration.

A carefully planned elective surgical production line produces a foreseeable demand for intensive care resources. Also with this scenario, inevitable fluctuation in length of stays will cause day-to-day and week-toweek variation in the demand. Either the ICU must have sufficient capacity to meet the peak demand, or there must be flexibility in the production line to shift the available production resources to surgery not requiring intensive care during times when the ICU capacity is exhausted. Prof. Van den Berghe considers such high ICU capacity as too expensive for the hospital and recommends rescheduling of elective surgery as the optional tool for resource management. Dr. Albers and Prof. Vahl argue that rescheduling increases the risk for the patient and that optimizing patient management and

discharge decisions including extending care support to wards, helps to avoid rescheduling. Although not explicitly expressed, I assume that Dr. Albers and Prof. Vahl have adjusted their ICU-capacity to meet, at least in part, the “average” extra needs due to fluctuation in both the elective and emergency intensive care. Prof. Van den Berghe, on the other hand, argues that the ICU capacity must be occupied up to 100 %, and buffer zones created elsewhere in the hospital, providing mechanical ventilation in the recovery room and emergency care area, and that additionally, elective surgery is cancelled. In her hospital this results in less than 10 % of elective cardiac surgery being rescheduled, and 12 % of emergency admissions being delayed due to ICU bed shortage.

Let us consider both scenarios. Dr. Albers and Prof. Vahl run a small, specialized, closed ICU, which facilitates controlling the elective patient flow through their unit. At the same time, unexpected prolongation of ICU-stay in individual patients or a peak in emergency admissions makes

such a unit vulnerable to fluctuations, unless the overall capacity is very generous (some “excess” of resources, as suggested by Prof. Van den Berghe) or patients can be discharged to other ICUs (to put it provocatively, outsourcing the problem). Small may be beautiful but vulnerable!

Prof. Van den Berghe runs a large multidisciplinary surgical ICU. Such a large unit profits from the fact that random fluctuations in a larger patient mix from different surgical specialties, including emergencies, tend to cancel each other out, and a larger personnel can be more efficiently allocated in treating patients with different severities of illness. Instead of having the probably somewhat smaller “excess” capacity necessary to cover the fluctuations in the large unit, Prof. Van den Berghe and colleagues choose to (put provocatively, once again) outsource the “excess” capacity into emergency and recovery rooms, and in addition, to cancel elective surgery, when necessary.

Is an empty ICU bed really a financial problem? In a larger scale, I doubt it. Filling ICU beds in order to maximize charges may be attractive in some financing concepts, but it certainly increases health care costs. Flexibility of personnel allocation in work schedules is still possible despite the current tight work-time regulations. A higher number of beds is not expensive; the number of personnel needed to run them is. It is questionable, whether reducing ICU staff at the cost of increasing staff and resources elsewhere, e.g. in the emergency and recovery areas for treatment of similar intensity, is likely to save costs or guarantee professional quality of care. In addition, operation room activities typically need more personnel per patient than the ICU. Unless the whole surgical team can be effectively put in to alternative production during the lack of ICU beds at very short notice, this may indeed represent the most expensive alternative.

In my ICU, rescheduling elective surgery is considered to be a quality deviation, reflecting system failure. Our 30-bed multidisciplinary (all specialties except major burns) ICU is the only ICU for adult patients in the 950-bed university hospital. Over 3000 patients are treated annually and over 1900 are mechanically ventilated. 40% of patients are admitted after elective surgery. In the last 5 years, rescheduling of elective surgery due to lack of ICU beds has practically disappeared. Less than 0.5% (i.e. clearly less than 10 cases) of elective surgery needs to be rescheduled, and emergency capacity without delay is sufficient for our referral area.

This is a result of process- and resource optimization throughout the patient care process:

• the length of stay has been substantially reduced;

• flexibility in personnel allocation has been introduced;

• in addition to the central, closed, multidisciplinary ICU, sufficient intermediate care capacity has been created in the most relevant ICU customer clinics (representing a cost effective alternative);

• and a close collaboration between the ICU and the intermediate care units, including support and consultations from the ICU, has been established.

I believe that the efforts of Dr. Albers and Prof. Vahl and Prof. Van den Berge, as well as our own efforts, all have the same principal goal: providing high-quality intensive care in a cost-effective and resource-conscious way for all patients who need it. However, I am also convinced that the health care providing industry still has a lot to learn about optimizing our core production process – producing health for the patients.

Published on : Thu, 15 Aug 2013