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Is Rescheduling Surgery a Viable Solution to Triage?

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Professor G. Van den Berghe, Dr J. Albers and Professor C.-F. Vahl present their opinions on whether rescheduling surgery is a viable solution to triage. Professor Jukka Takala's comment on these viewpoints follows, in which he explains the solutions practiced in his own ICU.

Dr Albers and Professor Vahl Rescheduling Planned Surgical Operations is not a Viable Solution to Clinical Triage

We first define the terms we use: "Rescheduling surgery" means the decision of the therapeutic team not to operate on a patient although a clear surgical indication exists. "Triage" in this context means the decision of the therapeutic team to discharge a patient from the ICU although no clear indication exists. The therapeutic team seems to be left alone within this bipolar arena. The above mentioned problem is one symptom of a medical environment characterized by restricted resources and a high number of emergency cases. In these circumstances the quality of team processes becomes increasingly important. In clinical reality however, separated fields of interest frequently exist between anaesthetists, intensivists, surgeons, and nurses. The subprocesses of care differ, and in extreme cases, are not linked in an optimal way.

The operation represents the centre of the surgical production line. Rescheduling cardiac surgery is equivalent to increasing the risk of a patient operated on at a later point in time. Achieving a fair balance between triage and rescheduling involves the whole team of the surgical production line. This includes surgeons performing less invasive procedures, anaesthetists using fast track anaesthesia wherever possible (Djaiani et al. 2001), ICU experts performing ICU triage, and trained outreach teams caring for ward patients.

The decision for discharge from the ICU with its consequences is highly dependent on who decides, and on the patient's status. When intensivists are involved in ICU discharge decision-making, the patient outcome is improved (Yoon et al. 2004). To evaluate outcome, the intensivist may rely on his/her own experience and on several sources of evidence. PredischARGE organ dysfunction score is a predictor for in-

hospital death after ICU discharge, as shown in a trial with nearly 3000 patients (Moreno et al. 2001). In a retrospective analysis of cardiac surgery patients readmitted to ICU, the factors non-elective surgery and higher required inspiratory oxygen upon discharge were the strongest predictors for readmission (Chung et al. 2002). In a large Canadian readmission study, cardiac surgery patients with preoperative renal failure or who required ventilation for more than 24 hours were at highest risk of ICU readmission (Bardell et al. 2003). Taken together, unstable vital signs are the most often reported reasons for readmission (Rosenberg and Watts 2000). Readmission to the ICU is associated with higher mortality. Based on this evidence, qualified intensivists should (1) decide on discharge (2) rate the severity of illness (3) identify individual risk factors (4) provide information to the ward personnel, and (5) provide assistance. This latter represents the most important point. It includes personal involvement and teaching, for example by providing FCCS courses.

The ICU of the Department of Cardiothoracic and Vascular Surgery of the University of Mainz is a ten-bed closed unit, headed by a full-time intensivist with qualifications in intensive care medicine and cardiac surgery. The therapeutic team further comprises a second fulltime intensivist, a junior assistant, highly trained nurses, and two physiotherapists. Our experience, education and training have led to our understanding that intensive care begins in the OR and continues even after discharge from ICU.

The interdisciplinary decision regarding rescheduling surgery versus patient triage remains a team challenge. In a well-trained therapeutic team, the decision will almost always be not to delay surgery.

Professor Van den Berghe Rescheduling Elective Surgery can be Limited by Using Appropriate Management Tools, but Remains Unavoidable Facing a Tight Budget for Intensive Care and Scarcity of ICU Nurses

A surgical ICU (SICU) hosting patients from an active elective cardiac surgery program as well as emergency admissions for trauma, solid organ transplantation and life-threatening complications after all types of surgery, requires a triage system. Obviously patients with lifethreatening disorders should receive immediate and optimal intensive care. To accommodate these new rescheduling elective (non-emergency) surgery patients presents a possible solution. Rescheduling elective surgery remains extremely unpleasant for the patient and his/her surgeon and also costly for the hospital. Although every attempt should be made to avoid rescheduling, it is not always realistically possible.

Our 56 bed, tertiary/quaternary referral SICU serving a large 1900 bed hospital functions within a system of multidisciplinary, combined elective/emergency admissions and works with a nurse to patient ratio of 1:2 and a virtual 100% occupancy. We adopted this approach due to the strength and high quality of multidisciplinary intensive care and in view of the scarcity of well-trained ICU nurses/physicians and the high staffing costs. Empty ICU beds reflect huge financial losses for the hospital. The 100% occupancy is only an option when a limited number of "buffer-beds", equipped and staffed for mechanically ventilated patients, are available in the post-operative recovery room and the emergency department, for exceptional patient overflow.

Our ICU admits +/- 2200 ventilated patients per year, of which 60% are from the elective paediatric (complex congenital cardiomyopathies) and adult (combined valve/coronary procedures for patients with high eurocores, corrections of congenital anomalies in adults and transplant procedures) cardiac surgery program. We have a 2.3% re-admission rate for emergencies due to complications after this, initially elective, phase. This group of patients occupies < 40% of the ICU beds because the risk of prolonged intensive care stay is much lower than for emergency admissions. In order to comply with the sometimes opposing goals of serving elective and emergency admissions, we designed a pragmatic management tool for optimal triage. Although not evidence-based, the instrument appears to optimise our cost-effective, high-quality service to critically ill patients. We set a certain number of ICU beds as a "virtual slot" for the cardiac surgery program and we evaluate the validity of this "slot" on a daily, weekly, monthly and yearly basis. This is necessary to quickly detect external factors forcing us to revise the size of the slot. Examples of such external factors are the evolution towards more non-invasive procedures performed by cardiologists and flow-through problems on the normal wards. Likewise, we critically evaluate the implications of setting this "slot" on the quality of care and flow-through of patients admitted for complications after other types of surgery. Detecting problems quickly allows these to be resolved before they generate substantial impact. We allow temporary over- and under-use of the elective "slot", with a monitoring and correction system applicable to both parties' planning. Hereby, an overall fixed number of beds for patients in the elective program can be guaranteed.

A key to success in this system is a relatively constant number of elective patients being presented from the inflow-side, per day and per week. Primarily, this implies a regular and even planning by surgeons and anaesthesiologists

in the operating room (OR). Simultaneous absence of all members of the surgical team for a scientific meeting, for example, inevitably evokes a temporarily reduced number of scheduled patients, which – in a 100% occupancy system – results in a progressive occupancy of the elective beds by other emergency admissions. As these patients require a longer ICU stay, it takes several weeks to "free" the "slot" again for the elective program. Another, less avoidable reason for reduced availability of beds for the elective cardiac surgery program is a sudden increase in the number of patients receiving solid organ transplantation, a program that does not tolerate organ refusal for ethical reasons.

A key to limit unnecessary waiting for a "go" for the OR staff and for patients on the wards, is to guarantee a stable minimum number of elective surgery admissions per day. Setting this number realistically requires a detailed analysis of the bed-occupancy of the ICU. With this number of guaranteed admissions, the morning shift in the OR can always start work without delay, which allows a cost-effective management of nursing time in the OR. During the course of the morning, the decision on the additional number of elective patients that can be admitted to the ICU that day is communicated to the OR staff.

This strategy, even within a virtually fixed slot, limits rescheduling of elective surgery to the minimum. Nevertheless, rescheduling remains the unavoidable price to pay for a 100% occupancy in ICU. In our system, on a yearly basis, the "virtual slot" is occupied exactly as planned. For more than 2/3 of the year, a full or more than full occupation of the elective surgery slot is achieved; in 108 days of 2004, the slot was not fully occupied. For 3 out of 4 of such occasions, this was due to an unexpected lower inflow from the elective cardiac surgery program. For only 1 out

of 4 times, overcrowding of the ICU by other emergencies was the reason, which resulted in a global need for rescheduling less than 1 out of 10 patients planned for elective cardiac surgery. Of all the emergency admissions in 2004, 12% of the requests needed to be delayed due to lack of ICU bed availability. The latter problem was fully balanced against the number of patients who were ready for ICU discharge, but did not have a bed available on the regular ward.

We consider this an acceptable compromise for a high quality, cost-effective and ethical ICU management, although optimisation of outflow to regular wards has potential for further improvement. Any system that does not allow rescheduling of elective surgery will either require an excess of ICU beds and nursing staff and therefore be less cost-effective, or will compromise the quality of patient care.

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