

It makes a difference!

In this issue of *Wiener klinische Wochenschrift* Dr. Dünser and colleagues report about the differences in critical care practice between an industrialized (Austria) and a developing country (Mongolia) [1]. The Austrian and Swiss co-authors have been working in different developing countries in the field of anesthesia and intensive care medicine since many years [2, 3]. Their report evaluates differences in patient characteristics, ICU practice, and outcome between a Mongolian and an Austrian hospital of approximately the same size in 2007. While the numbers of patients admitted to the two ICUs were comparable, patients referred to the ICU in Mongolia had fewer chronic diseases with the exception of tuberculosis, had been less frequently medically examined ever before ICU admission, were more frequently admitted as emergency cases, were more severely sick at ICU admission but received fewer therapeutic interventions than patients referred to the Austrian ICU. Mortality in the Mongolian ICU was more than three times higher than the mortality in the Austrian ICU.

Why should such a study be published? Better education and training of nurses and doctors in and more resources allocated to hospitals and ICUs in developed countries should translate into a better outcome. With the figures the authors present, they do not only legitimate their commitment but also challenge the medical community of developed countries to engage in promotion of emergency and intensive care in countries like Mongolia.

But where are the real “differences in critical care practice” between Austria and Mongolia? In the study by Dünser and colleagues, a tertiary care Mongolian university hospital ICU was compared to an Austrian secondary care hospital ICU. The Mongolian ICU was located in one of twelve university teaching hospitals in Ulaanbaatar, a town with >1 Mio. inhabitants (40% of the Mongolian population) while the Austrian ICU is located in a hospital in a city with less than 20'000 residents. Accordingly, the difference in case mix between the two ICUs is not necessarily related exclusively to the degree of development of the two countries but may represent in part the difference between diseases and accidents in a large urban vs. a small rural population.

Was the performance of the Mongolian compared to the Austrian ICU really that much worse? Patients in the Mongolian ICU had a mortality of 19.7% vs. 6.2% in

the Austrian ICU. The predicted mortality in patients with SAPS II of 34 (Mongolian ICU patients) is 15.3% vs. 10.6% in patients with SAPS II of 30 (Austrian ICU). Interestingly, when SAPS II was corrected for age (27 in the Mongolian vs. 18 in the Austrian ICU), the relation between the expected mortality rates (7.9% vs. 2.9%) matched the relation of the observed mortalities between the two ICU quite well. Of note, life-sustaining therapy was less frequently withdrawn in the Mongolian ICU. This approach is likely to reduce the difference between ICU and hospital mortality, because it limits the number of patients discharged to the ward to die. In fact, some years ago, an Austrian multicenter study reported a hospital mortality of 16.8% with a SAPS of 33.1 [4] which is much higher than the Austrian ICU mortality and close to the Mongolian ICU mortality in the study by Dünser et al. In that respect, the resources invested in Mongolian vs. Austrian ICU patients as measured by TISS-28 (21 vs. 31) leaves room for optimizing cost efficiency in both countries.

While Dünser and colleagues report various aspects of critical care practice that can improve outcome, others have not been addressed. It has been demonstrated that changes in structural [5], organizational [6–10], and clinical processes [6, 8, 11, 12] can have profound effects on resource use and outcome. ICU characteristics found to be consistently associated with improved patient outcomes include, among others, the presence of specialist physicians dedicated to the ICU, development and implementation of evidence-based protocols and guidelines, a sufficient nurse-patient ratio, and decreased use of tests and evaluations that will not change clinical management [13]. As an example, when patients



Correspondence: Prof. Dr. Stephan Jakob, Universitätsklinik für Intensivmedizin, Universitätsspital, Inselspital Bern, CH-3010 Bern, Schweiz, E-mail: stephan.jakob@insel.ch

requiring mechanical ventilation are considered, an institutional approach to care which includes evidence-based clinical pathways, protocols for weaning and sedation use, and designation of people to manage and monitor such efforts – can result in improved outcomes, such as reduced duration of mechanical ventilation and reduced ICU and hospital length of stay and mortality rates, and in substantial cost savings [6]. While the effects of implementation of care bundles have generally been tested in ICU with less limitations of financial and human resources when compared to countries like Mongolia, there are no reasons why adapted care bundles – taking into account the limited resources – should not work in less developed countries. While the authors can be congratulated for the precise documentation of differences of various aspects of critical care between Mongolia and Austria, next steps should include the measurement of the effects of their interventions. Such efforts have the potential to enable health care providers, non-profit organizations and governments to concentrate on investments with a rational for real improvement of outcomes in their target health care institutions.

As long as the investment of industrialized countries in the health care system of developing countries is heavily limited, it can be argued that the resources should be targeted at more basic aspects of health care such as for instance education, vaccination and treatment of endemic infectious diseases – especially in a country like Mongolia where basic facilities are lacking in many hospitals [14]. In fact, an important proportion of the patients in the Mongolian ICU in the study of Dünser and colleagues suffered from tuberculosis and/or had never been medically examined before ICU admission. Although the contribution of health resources to the health of a population as a whole in comparison to the role of socioeconomic resources has previously been considered rather small [15], the severity of disease of and the high costs invested in ICU patients also in developing countries, and especially the high mortality rates make ICU patients a very rational target for medical aid organizations. As the authors point out, developing countries face serious staff- and education-related problems, and major deficits of medical equipment, drugs, and disposals in their ICUs [16–19]. The investment of the authors in Mongolia is therefore more than welcome, and reports like the one by Dünser and colleagues remind us that it is possible for all of us to contribute to improvement of health care in developing countries!

Stephan Jakob

References

1. Dünser MW, Bataar O, Tsenddorj G, Lundeg G, Torgersen C, Romand JA, Hasibeder WR (2008) Differences in critical care practice between an industrialized and a developing country. *Wien Klin Wochenschr* 120: 600–607
2. Tschantz P (2001) Swiss Surgical Team. Instruction in surgery and anesthesia in Mongolia. *Rev Med Suisse Romande* 121: 383–384
3. Dünser M, Baelani I, Ganbold L (2006) The specialty of anesthesia outside Western medicine with special consideration of personal experience in the Democratic Republic of the Congo and Mongolia. *Anaesthesist* 55: 118–132
4. Metnitz PG, Vesely H, Valentin A, Popow C, Hiesmayr M, Lenz K, Krenn CG, Steltzer H (1999) Evaluation of an interdisciplinary data set for national intensive care unit assessment. *Crit Care Med* 27: 1486–1491
5. Flaatten H (2005) Effects of a major structural change to the intensive care unit on the quality and outcome after intensive care. *Qual Saf Health Care* 14: 270–272
6. Burns SM, Earven S, Fisher C, et al (2003) Implementation of an institutional program to improve clinical and financial outcomes of mechanically ventilated patients: one-year outcomes and lessons learned. *Crit Care Med* 31: 2752–2763
7. Carson SS, Stocking C, Podsadecki T, Christenson J, Pohlman A, MacRae S, Jordan J, Humphrey H, Siegler M, Hall J (1996) Effects of organizational change in the medical intensive care unit of a teaching hospital: a comparison of “open” and “closed” formats. *JAMA* 276: 322–328
8. Kern H, Kox WJ (1999) Impact of standard procedures and clinical standards on cost-effectiveness and intensive care unit performance in adult patients after cardiac surgery. *Intensive Care Med* 25: 1367–1373
9. Dimick JB, Pronovost PJ, Heitmiller RF, Lipsett PA (2001) Intensive care unit physician staffing is associated with decreased length of stay, hospital cost, and complications after esophageal resection. *Crit Care Med* 29: 753–758
10. Amaravadi RK, Dimick JB, Pronovost PJ, Lipsett PA (2000) ICU nurse-to-patient ratio is associated with complications and resource use after esophagectomy. *Intensive Care Med* 26: 1857–1862
11. Kollef MH, Levy NT, Ahrens TS, Schaiff R, Prentice D, Sherman G (1998) The use of continuous i.v. sedation is associated with prolongation of mechanical ventilation. *Chest* 114: 541–548
12. Kress JP, Pohlman AS, O'Connor MF, et al (2000) Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. *N Engl J Med* 342: 1471–1477
13. Randolph AG, Pronovost P (2002) Reorganizing the delivery of intensive care could improve efficiency and save lives. *J Eval Clin Pract* 8: 1–8
14. Kotilainen H (2001) Rehabilitation of the hospital infrastructure in a developing country. *World Hosp Health Serv* 37: 25–28
15. Kim K, Moody PM (1992) More resources better health? A cross-national perspective. *Soc Sci Med* 34: 837–842
16. Dünser MW, Baelani I, Ganbold L (2006) A review and analysis of intensive care medicine in the least developed countries. *Crit Care Med* 34: 1234–1242
17. Bhagwanjee S (2006) Critical care in Africa. *Crit Care Clin* 22: 433–438
18. Jochberger S, Ismailova F, Lederer W, Mayr VD, Luckner G, Wenzel V, Ulmer H, Hasibeder WR, Dünser MW (2008) Anesthesia and its allied disciplines in the developing world: A nationwide survey of the Republic of Zambia. *Anesth Analg* 106: 942–948
19. Hodges SC, Mijumbi C, Okello M, McCormick BA, Walker IA, Wilson IH (2007) Anaesthesia services in developing countries: defining the problems. *Anaesthesia* 62: 4–11