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### The Future of Intensive Care Medicine: Facing a Physician Shortage

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ISICEM hosted an exchange of scientific innovations, both historical and futuristic. Predicted physician shortages need innovative solutions; some more traditional and some exploiting the most advanced technology available.

This year the International Symposium of Intensive Care and Emergency Medicine celebrated its 25th anniversary, providing a special opportunity to look back over the past 25 years of intensive care medicine and forward to the next 25 years. Intensive care medicine has seen many changes since its early development following the polio epidemic of the 1950s. Technological and clinical advances have changed the face of all aspects of patient care, including diagnosis, monitoring and patient management. Intensive care medicine has developed into a specialty in its own right, with trained 'intensivists' working with a unique set of skills to care for the critically ill patient.

But, what does the future hold? Undoubtedly as our understanding of disease process increases, we will add new therapeutic interventions to our armamentarium and improve outcomes for our patients. Genomic and proteomic techniques will help model critical illness and target therapies to groups of patients most likely to benefit. Improved monitoring systems and markers will provide ongoing information on the effectiveness of therapies, enabling therapeutic interventions to be titrated according to response. Better study and understanding of the importance of quality of life and the long-term effects of intensive care treatment will improve patient care. These and other exciting aspects of intensive care of the future were covered in several sessions.

However, while these provide interesting images of the future of intensive care medicine, there are considerable concerns about who will be around to deliver this care. This was a keen topic of discussion and debate during the Symposium this year. The need for intensive care will increase significantly as the population ages and people survive conditions that they would previously have succumbed to. The corresponding increase in ICU physicians, however, will be minor. The Committee on Manpower for Pulmonary and Critical Care Societies published a study in 2000 predicting that the demand for ICU services will increase by 66% by 2030 (Angus et al. 2000). Extrapolating current rates of supply of intensivists, the predicted shortfall in intensivist hours will be 35% in 2030.

Intensivists are essential to good ICU outcomes and their presence has been shown in numerous studies to reduce ICU mortality, shorten ICU stays and duration of mechanical ventilation and to reduce requests for arterial blood gases, etc. (Vincent 2000). Indeed, the Leapfrog Group, a US business consortium of more than 150 private and public health care sector purchasers, now requires hospitals within its health network to have board-certified critical care specialists available on and exclusive to their ICUs during daytime hours. At other times specialists should be able to return to the ICU, or arrange for an on-site physician to do so, within 5 minutes of being paged. This group estimates that applying such standards could save more than 54,000 lives in the US each year (<http://www.leapfroggroup.org/media/file/Leapfrog-Birkmeyer.pdf>). But again, how can we supply ICUs with all these dedicated staff, with a predicted shortfall already of 35%!

Several possible approaches were discussed during the Symposium. First, and perhaps the most simple, is that we need to make the specialty attractive so that young doctors will want to specialize in the field, and specialized doctors will want to stay. Second, with regionalization of intensive care services, as already achieved with neonatal ICUs, patients would be cared for in larger, but fewer units facilitating the provision of adequate intensivist cover. Third, telemedicine could be employed to ensure at least some form of intensivist cover for smaller ICUs lacking sufficient numbers of these specialists. Using such technology (figure 1), intensivists can perform virtual rounds as often as required on distant patients with access to current Patient data and monitoring systems.

Implementation of such a program has been shown to be associated with reduced ICU and hospital mortality, shortened ICU stays and improved financial performance (Breslow et al. 2004). While further study is needed to confirm these findings, being able to manage several ICUs from one place, using telemedicine and robots, could provide a way of limiting the impact of the huge gap between supply and demand that is forecast for intensive care medicine, and is already beginning to be felt. Health care managers and policy makers need to take steps now to increase the supply of physicians trained in intensive care medicine and to explore how best to employ those who are available.

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