Costing ICU Care: a Bottom-up Approach

A study from Greece that analysed variable ICU costs found that medicines, and antibiotics in particular, accounted for more than half of the cost of the patient's stay. Other significant costs were blood products, cardiovascular drugs, biochemistry and arterial blood gases. The variable cost per ICU day was €573.18 (median 422.40), lower than observed in other studies. However, there is scope for protocols to reduce items which have disproportionately high costs, say the researchers.

Dimitra Karabatsou, from the University ICU, Ag. Anargiroi General Hospital in Greece, and colleagues conducted an observational bottom-up cost analysis of ICU patients who were admitted during 2011 in a Greek general seven-bed ICU and stayed for at least 24 hours. The study is in press in Intensive and Critical Care Nursing .

138 patients were included in the study; just under half were surgical patients, just over half were non-surgical patients. Using the bottom-up method, the researchers added the costs of all materials used for each patient in the categories of medication, lab tests and consumables. Any drugs given to patients were recorded per amount. Costs were determined from the 2011 hospital-specific cost catalogue. The cost of materials for complex interventions, such as catheter insertion, was calculated in advance of the observation period. Lab and imaging tests were costed according to the national Ministry of Health price list.

Overall ICU mortality was 18.84%. The researchers found that non-survivors had higher total and partial costs compared to survivors, and that costs decreased sharply only after the first month in hospital. Variable costs were influenced by the medical cause of admission, APACHE severity score illness and increased length of stay, mechanical ventilation and dialysis. Factors that affected the total cost of treatment were length of stay, admission diagnosis,severity of illness and the need for mechanical ventilation and continuous haemodialysis.

Cost studies may not be comparable due to difference in methodology, patients and clinical practice. However, the researchers note the lower costs of Greek ICUs, which may be due to lower prices in Greece and the ongoing economic crisis. On the other hand, the high cost for antibiotics is due to high incidence of multi-resistant gram-negative bacteria. They note that the almost 90% of patients needing mechanical ventilation reflects the shortage of ICU beds and absence of intermediate care units in Greece, thus limiting the entry of less seriously ill patients in the ICU.

Recommendations

As health systems look to save costs, the researchers recommend the bottom-up approach as more informative in terms of unit costs, although it is labour and time-intensive to collect. It allows analysis of individual patient costs with respect to their treatment, severity of illness and outcome.

As blood products had a high cost, the researchers recommend strict adherence to transfusion guidelines. The cardiovascular drug esmolol had the highest cost (7.49% of the total variable cost), but its use is justified, they write. Of concern was the 8.37% of costs due to arterial blood gases' measurement, and protocols may help control these costs.

They conclude, "In the midst of a national economic recession and a global economic stagnation it is necessary to look for ways of cost reduction by adopting specific protocols and reducing the ICU length of stay with-out at the same time compromising in anyway the quality of care."

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