

ICU use associated with more invasive procedures, higher costs

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A study of four common medical conditions suggests hospitals that used intensive care units (ICUs) more frequently were more likely to perform invasive procedures and have higher costs while showing no improvement in mortality, according to an article published online by *JAMA Internal Medicine*.

The potential clinical implications of overusing ICU care, along with its high costs, have made improving the value of ICU care an imperative for the U.S. health care system. However, variability exists in ICU utilization among hospitals because of a lack of clear-cut guidelines for ICU admission and differences in hospital resources, policies and culture.

Dong W. Chang, M.D., M.S., of the Los Angeles Biomedical Research Institute, Harbor-UCLA Medical Center, Torrance, Calif., and Martin F. Shapiro, M.D., Ph.D., of the University of California, Los Angeles, analyzed ICU utilization for four common medical conditions: diabetic ketoacidosis (DKA), pulmonary embolism (PE), congestive heart failure (CHF) and upper gastrointestinal bleeding (UGIB).

The study included data for 156,842 hospitalizations at 94 hospitals for those four conditions in Washington state and Maryland from 2010 to 2012, accounting for 4.7 percent of total hospitalizations at these hospitals. The authors examined ICU utilization rates, hospital mortality, use of invasive procedures and hospital costs.

The authors report ICU admission rates ranged from 16.3 percent to 81.2 percent for DKA, 5 percent to 44.2 percent for PE, 11.5 percent to 51.2 percent for UGIB, and 3.9 percent to 48.8 percent for CHF.

Smaller hospitals with fewer beds more frequently had higher ICU utilization, as did teaching hospitals, according to the results.

While ICU utilization was not associated with significant differences in hospital mortality, it was associated with more invasive procedures and higher costs, the study reports. For example, rates of [invasive procedures](#) in all four conditions were greater in higher ICU utilization hospitals. Also, hospitalization costs among lower and higher ICU hospitals were \$7,141 and \$8,204 for DKA, \$10,660 and \$11,117 for PE, \$10,164 and \$10,851 for UGIB and \$10,175 and \$13,587 for CHF, according to the results.

The authors note study limitations related to the data, including a lack of detail to fully account for medical complexity.

"In summary, hospitals that utilized ICU care more frequently for DKA, PE, UGIB and CHF were more likely to perform invasive studies and have higher [hospital](#) costs with no improvement in mortality compared with lower ICU utilization institutions. These findings suggest that optimizing ICU utilization may improve quality and value of ICU care but accomplishing that will require institutional assessments of factors that lead clinicians to admit patients to the ICU for cases in which that level of care may not be necessary," the study concludes.

"These common illnesses may be classified as 'in-between' conditions if they are not presenting at extreme levels of severity. ... In conclusion, patients with in-between conditions may appear to be in between to some but not to all hospitals. Chang and Shapiro have well described the high and low ICU utilizing scenarios; now it is up to hospitals and

clinical decision makers to reflect on their care pathways, triage decision processes, patient safety, care effectiveness and costs, whether on the wards or in their ICUs. Hopefully, further studies will clarify the characteristics of ICU triage and care pathways to favorably affect patient outcomes and resource use in the ICU," writes Neil A. Halpern, M.D., M.C.C.M., of Memorial Sloan Kettering Cancer Center, New York.

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