News Release

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Press conference time: May 17, 4:30 p.m. in the ATS Press Room (E-1)

Poster session time: 8:15- 10:45 a.m. May 19
Location: CC-Room 395-396 (Third Level), Morial Convention Center

ICU Infection Rates Not a Good Measure of Mortality Risk

ATS 2010, NEW ORLEANS— ICU-acquired infection rates are not an indication of patients' mortality risk, according to researchers the University of Pennsylvania, undermining a central tenet of many pay-for-performance initiatives.

Public reporting of quality data is increasingly common in health care. These "report cards" are designed to improve the quality of care by helping patients choose the best hospitals. Yet, they only work if they successfully identify high performers, and may be misleading if they steer patients toward poor performers.

The findings will be reported at the ATS*2010 International Conference in New Orleans.

To examine whether or not publicly-reported infection rates actually identify the best hospitals, Kate Courtright, M.D., resident physician at the University of Pennsylvania and colleagues looked at patients in Pennsylvania hospitals especially at risk for two types of infections: pneumonia and blood stream infections. They calculated hospital death rates accounting for differences in illness severity across 158 hospitals, which included nearly

19,000 admissions involving mechanical ventilation and over 16,000 ICU admissions involving central venous catheterization, and compared them to ICU-acquired infection rates obtained from a public state website. They then used rank correlation and linear regression to determine the relationship between infections and death.

"We found that ICU-acquired infection rates as reported on a state website did not correlate with death rates for at-risk patients." said Dr. Courtright, lead author of the abstract. "In fact, hospitals with lower rates of ICU-acquired infection did not also have lower death rates for at-risk patients." For example, the 43 hospitals that reported no cases of ICU-acquired pneumonia had an average death rate of 35.7 percent for patients receiving mechanical ventilation; hospitals with high infection rates (ranging from 1 to 8 cases per 1000 ventilator days) had an average death rate of 34.6 percent. These numbers were not statistically different.

Despite their limitations, Dr. Courtright noted, ICU-acquired infections rates are likely to continue to be a part of hospital report cards.

However, "both policy-makers and the public should recognize that these rates, at least as reported by hospitals, provide limited information about the quality of the hospital, and may misidentify high and low performers," she said. "More comprehensive report cards that report both complications like ICU-acquired infections and overall survival rates are needed to help patients make correct decisions. In the meantime, more care is needed to make sure that hospital report cards don't do more harm than good. This is especially important because under upcoming health care reform, infection rates are also to be used for hospital reimbursement—hospitals with high infection rates will not be reimbursed as well for their care. Such a strategy, known as 'pay-for-performance', may actually penalize good hospitals with low mortality rates."

Research on the efficacy of 'report cards' in predicting mortality rates must be expanded to other states or in a national study, said Dr. Courtright. Additionally, she said, infection rates as reported by the hospitals may be incorrect as they have an incentive to report low infection rates.

"Report cards only work if they successfully identify the best hospitals," concluded Dr. Courtright. "We were surprised to find that many hospitals with good report cards from an infection standpoint are not that good from a more important standpoint—patient survival. Additionally, many hospitals with high infection rates actually had very good survival rates. Using these report cards to choose a hospital may be misleading and potentially harmful."

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"Publicly Reported Infection Rates are Not Good Markets of Intensive Care Unit Quality" (Session D14, Wednesday, May 19, 8:15-10:45 a.m., CC-Room 395-396 (Third Level), Morial Convention Center; Abstract 920)

**Please note that numbers in this release may differ slightly from those in the abstract. Many of these investigations are ongoing; the release represents the most up-to-date data available at press time.*

Publicly Reported Infection Rates Are Not Good Markers Of Intensive Care Unit Quality

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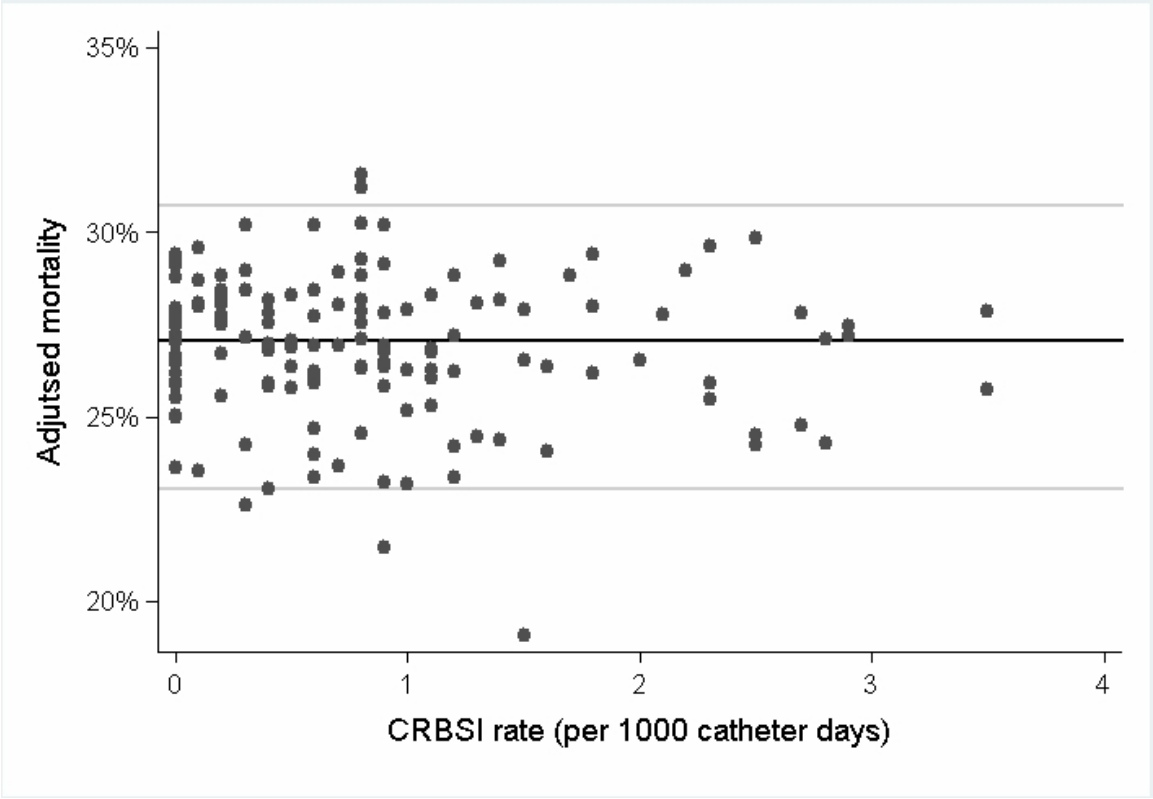
RATIONALE: ICU-acquired infection rates are increasingly used for public reporting and pay-for-performance initiatives, but may be misleading if they are not strongly tied to patient-centered outcomes. We examined the relationship between publicly reported ICU-acquired infection rates and risk-adjusted mortality for at-risk patients in a state-wide mandatory public reporting program.

METHODS: We linked 2006 Pennsylvania hospital discharge data to self-reported ventilator-associated pneumonia (VAP) and catheter-related blood stream infection (CRBSI) rates from Pennsylvania's hospital quality website. We determined hospital-specific risk-adjusted 30-day mortality rates for patients undergoing either invasive mechanical ventilation or central venous catheterization using hierarchical random-effects models, adjusting for patient characteristics and severity of illness. We then used rank correlations and linear regression to determine the relationship between incidence of infection and adjusted mortality for at risk patients.

RESULTS: In 158 Pennsylvania hospitals there were 18,544 ICU admissions involving mechanical ventilation and 16,285 admissions involving central venous catheterization. Mean risk-adjusted mortality was 35.1% for ventilated patients and 26.9% for catheterized patients, with wide variation in VAP and CRBSI rates. Reported infection incidence was not correlated with risk-adjusted mortality for either ventilated patients (rho=-0.11, p=0.19) or patients with central venous catheters (rho=-0.07, p=0.38). A sample Bland-Altman plot for CRSBI is shown in the Figure. In linear regression models adjusting for hospital size and academic status, higher VAP rates were not associated with higher risk-adjusted mortality for ventilated patients (change in mortality for each one unit increase in VAP incidence = -0.2%, 95% CI: -0.98 – 0.58, p=0.61), nor were higher CRBSI rates associated with higher risk-adjusted mortality for catheterized patients (change in mortality for each one unit increase in CRBSI incidence = -0.13%, 95% CI -0.45 – 0.19, p=0.41).

CONCLUSION: We found no correlation between self-reported incidence of VAP or CRBSI and risk-adjusted mortality for at-risk patients. Publicly reporting ICU-acquired infection rates may fail to guide the public towards the hospitals with best overall performance, and reimbursement policies based on infection rates may actually penalize high performers.

Figure. CRBSI and risk-adjusted mortality in patients with central venous catheters.


35%
30%
25%
20%
Adjutsed mortality
0
1
2
3
4
CRBSI rate (per 1000 catheter days)