AGE AND MORTALITY IN THE ICU: CAN WE HIT BELOW THE BENCHMARK?

Gerard Baltazar DO1,2, Ilene Staff PhD1, John Mah MD1,2, Robert Brautigam MD1,2, Kevin Keating MD1,2 and Karyn Butler MD1,2. Division of Surgical Critical Care

1Hartford Hospital & 2University of Connecticut

INTRODUCTION

Age is an independent risk factor for mortality in critically ill patients. It is unclear if advances in critical care have favorably impacted mortality in older patients. The APACHE II score was developed to prognostically stratify acutely ill patients and assist comparisons of the success of therapies. Increasing APACHE II scores have been shown to closely predict hospital mortality rates.

HYPOTHESIS

The purpose of this study was to determine the reliability of APACHE II scores for predicting mortality in critically ill surgical patients greater than or equal to 65 years of age.

METHODS

We retrospectively analyzed outcomes of consecutive admissions to three surgical ICUs (neuroscience, cardiothoracic and general surgery) at an 800 bed level 1, tertiary referral hospital from January through December 2011.

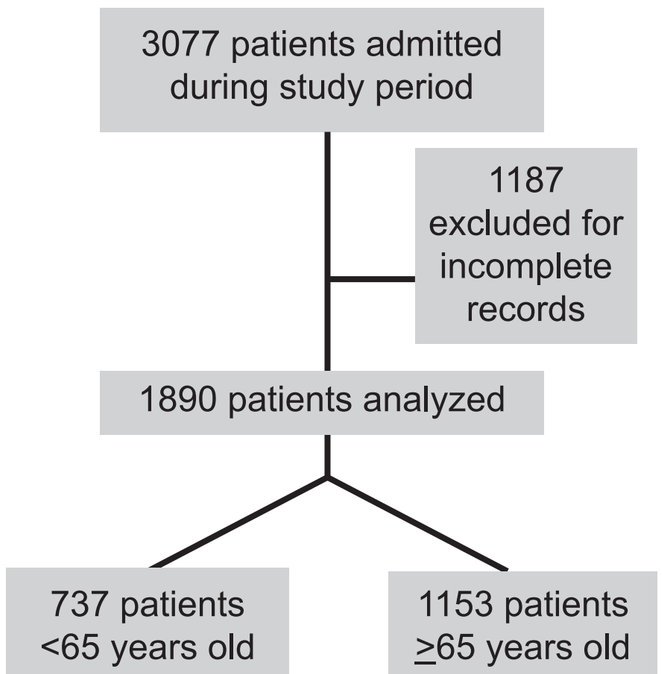

Figure 1. Consecutive patient enrollment from three surgical intensive care units.

Data collected from the surgical critical care database using ICUTracker™ included age, gender, ICU/hospital length of stay, mortality and severity of illness indicators (APACHE II score). Subgroup comparisons of mortality and severity of illness for each of the three surgical ICUs was also performed. Age was dichotomized at 65 years (younger < 65 years, older ≥ 65 years).

RESULTS

Table 1. Median hospital & ICU length of stay (LOS), mean APACHE II scores, and overall ICU mortality.

	Younger <65yo	*Older ≤65yo*	*p value*
Median ICU LOS in days (25%, 75%)	4.7 (2.8, 11.1)	2.8 (1.8, 5.0)	<0.001
Median Hospital LOS in days (25%, 75%)	12.1 (7.4, 28.6)	9.4 (5.9, 15/9)	<0.001
Mean APACHE II Score ± SD	18±8	20±7	<0.001
Overall ICU Mortality	9%	13%	<0.012

Figure 2. Mortality rates for younger (red) and older (blue) patients were not significantly different among patients in the cardiothoracic ICU.

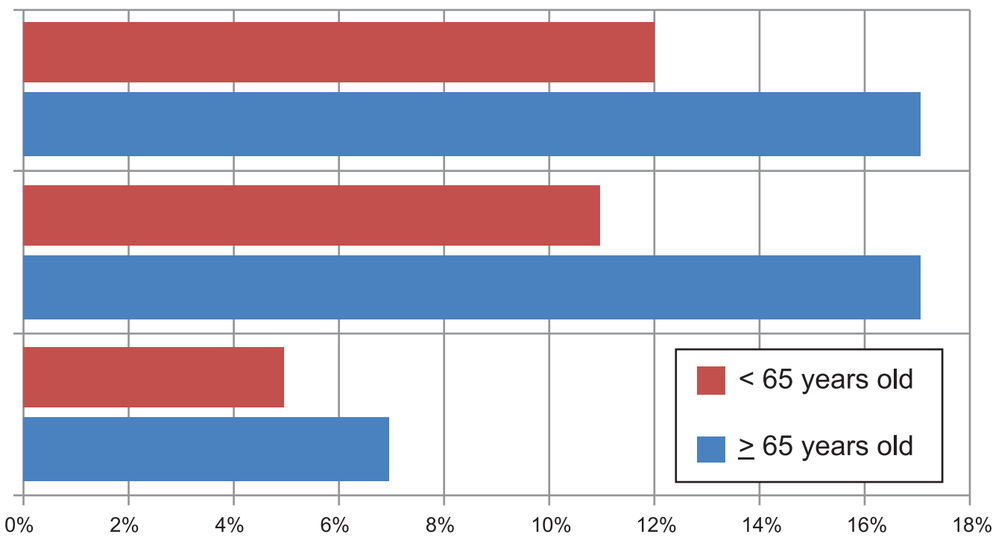

Table 2. Predicted & observed mortality rates at APACHE II breakpoints.

APACHE II (n = <65yo, ≥65yo)	*Predicted Mortality*	*Observed Mortality <65 years old*	*Observed Mortality ≥65 years old*	*p value**
0-14 (n=273, 257)	15%	2.2%	1.2%	<0.0001
15-19 (n=189, 311)	25%	6.9%	7.7%	<0.0001
20-24 (n=146, 262)	40%	13.0%	13.7%	<0.0001
25-29 (n=83, 193)	55%	24.1%	19.2%	<0.0001
30-34 (n=40, 83)	75%	15.0%	30.1%	<0.0001
≥35 (n=6, 47)	85%	66.7%	53.2%	<0.0001‡

**Comparing mortality rates for younger and older cohorts to mortality rate predicted by APACHE II.*
‡For APACHE II ≥35, p<0.0001 reflects only ≥65yo; p=0.209 for <65yo reflects the small sample size.

CONCLUSIONS

- **Expectedly, patients ≥65 years-old had higher APACHE II scores and increased overall mortality.**
- **In contrast to those from other surgical ICUs, older patients from the cardiothoracic ICU did not have higher mortality compared to younger patients.**
- **Independent of age, survival outcomes for critically ill surgical patients in our institution consistently outperformed benchmark predictions by APACHE II.**
- **Resource utilization for intensive care for elderly patients may be justified based on survival to discharge outcomes at our level 1, tertiary referral center.**