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Fulfilling the Promises of Health Information Technology: Are Metrics Measuring our Delivered Care?

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Background

- In the U.S., about 55,000 critically ill patients are cared for each day
- Hospital stays that involved ICU services are 2.5 times more costly than other hospital stays
- Between 2000 and 2005, annual critical care medicine costs increased from \$56.6 billion to \$81.7 billion, representing 13.4% of hospital costs, 4.1% of national health expenditures, and 0.66% of gross domestic product
- Cost savings of up to \$1 billion per quality life year gained can be attained with critical care management of severe sepsis, acute respiratory failure, and general critical care interventions.

Objectives

- Assess if quality metrics and measures accurately reflect the clinical care provided in the ICU
- Examine if publicly reported outcomes (metrics & measures) reflect the quality of care provided in the ICU

Predictive Scoring Systems

- Scores are measures of disease severity to predict likelihood of outcomes (e.g., APACHE-IV, MPM-III, SAPS3)
- Valuable for standardizing research and quality comparisons

Utilization of Predictive Scoring Systems

- Standardizing, stratifying and comparing severity adjustment
- Provide no assistance for patient management
- Validation – external
- Calibration – predictive agreement O/E over time
- Customization – across a population (region, size, type, performance quartile) – need similar baseline risk
- Discrimination – accuracy (alive or dead)
- Compare ourselves to others – good internal validity

Table 1. Advantages and Disadvantages of Common Predictive Scoring Systems

Scoring system	Advantages	Disadvantages
APACHE-IV	<ul style="list-style-type: none"> • Coefficients regularly updated- • Provides algorithms for LOS prediction • Specific algorithm to predict mortality in CABG surgery patients • Less prone to be affected by the case-mix 	<ul style="list-style-type: none"> • Developmental sample restricted to one country • More complex data collection • High abstraction burden • Proprietary scoring system
MPM ₀ -III	<ul style="list-style-type: none"> • Low abstraction burden • Less prone to inter-observer variability • By using less physiologic data, may be preferred when laboratory resources are constrained 	<ul style="list-style-type: none"> • Developmental sample mostly restricted to one country • More susceptible to case-mix effects
SAPS 3	<ul style="list-style-type: none"> • Lowest abstraction burden • Less prone to inter-observer variability • Customized equations to predict hospital mortality according to seven different geographic regions • Potential use for international benchmarking 	<ul style="list-style-type: none"> • Does not provide estimation for LOS • Some regional equations were developed using relatively low sample size

Figure 1. Tele-Critical Care Examples



Conclusions

“What gets measured gets managed.”

- Measurement combined with public reporting metrics can draw attention to particular areas of concern and stimulate improvement efforts
- Metrics are simplistic approximations of what clinicians and patients believe represents high quality of care
- Quality measurement enterprise operates separately from the workflows associated with delivering health care services

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Publicly Reported Metrics

