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**

<table>
<thead>
<tr>
<th>Scoring system</th>
<th>Advantages</th>
<th>Disadvantages</th>
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| APACHE-IV      | • Coefficients regularly updated-  
• Provides algorithms for LOS prediction  
• Specific algorithm to predict mortality in CABB surgery patients  
• Less prone to be affected by the case-mix | • Developmental sample restricted to one country  
• More complex data collection  
• High abstraction burden  
• Proprietary scoring system |
| MPMo-III       | • Low abstraction burden  
• Less prone to inter-observer variability  
• By using less physiologic data, may be preferred when laboratory resources are constrained | • Developmental sample mostly restricted to one country  
• More susceptible to case-mix effects |
| SAPS 3         | • 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 | • Does not provide estimation for LOS  
• Some regional equations were developed using relatively low sample size |

**Publicly Reported Metrics**

**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.

**References**