Introduction

An evidence-based approach to medicine utilizes quality data from randomized, controlled, double-blinded studies. Residency education emphasizes competency-based experience that focuses on quality improvement linking best evidence to improving patient clinical outcomes. Value-based medicine’s intent is to influence the practice of medicine based upon tools that measure the objective value of health care interventions such as additional quality and/or length of life. Metrics used:

- Utility Analysis: Quality of life instrument that numerically quantifies best possible quality of life associated with a given health state. Utility value of 1=perfect health, value of 0=death
- Cost—Utility Analysis: An economic analytic tool that integrates the value of a treatment or intervention with the cost of the intervention as $/QALY, where $=dollars spent, QALY=quality adjusted life year. It is a measure of disease burden, involving the quality and quantity of years lived.
- Cost—Effective Analysis: An anti-rationing tool that sorts out interventions with substantial value vs. negligible or even harmful value.
- Overall Value-Based Medicine (VBM): Improves quality of healthcare & spends healthcare dollars more efficiently.

Using EBM: Terms & Concepts

Level Of Evidence:

- Level 1- Randomized clinical trials of high quality, multi-center, prospective, >80% follow-up
- Level 2- Randomized clinical trials, single-center, <80% follow-up, unblinded, wide confidence intervals
- Level 3- Non-randomized clinical trials, case-controlled, observational, or retrospective studies
- Level 4- Case series
- Level 5- Case report, expert opinion

Relative risk reduction-% difference in risk/outcomes between tx & control groups

Absolute risk reduction—Arithmetic difference in risk between tx & control groups

Use Absolute Risk Reduction (ARR) when possible in Cost-Utility Analysis of ED intervention or tx.

Number Needed to Treat (NNT) = 1/ARR or the # of pts with a disease needed to treat in order for 1 additional pt to benefit

Confidence Interval is a statistical range with a specific probability that a given parameter lies within that range. For example, a 95% confidence level denotes there is a 95% chance the sample’s mean will be in this interval, if the study is repeated on same population.

References


Use of VBM in Treating ED Pts 65+ Years of Age with Interventions Proven in Younger Pts

<table>
<thead>
<tr>
<th>STEMI</th>
<th>Ischemic Stroke</th>
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<tbody>
<tr>
<td>• Pts ≥75 with STEMI benefit from percutaneous coronary intervention (PCI).</td>
<td>• Lytic therapy for pts greater than 80 years?</td>
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<td>• No PCI or failed PCI in all age groups gives grave prognosis.</td>
<td>• Pts age ≥80 receiving lytics off label more frequently.</td>
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<td>• Age + multivessel disease are independent predictors of one year mortality post 30 day survival.</td>
<td>• Observational studies biased due to lack of randomization.</td>
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<td>• Radial artery PCI approach cause less bleeding complications.</td>
<td>• Significant ICH rate not worse in this population.</td>
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<td>• If PCI excessively delayed, thrombolytic should be used.</td>
<td>• Lytic therapy for pts ≥90 years old: &quot;most pts &gt; 90 years receiving TPA treatment had poor functional outcomes (MRS 4/5) or death. No improvement of outcome.&quot;</td>
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<tr>
<td>• &gt;85 underrepresented, but growing; no increase in survival rate with PCI to date.</td>
<td>Decision whether to initiate Hemodialysis</td>
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- Slowing decline of renal function best strategy. |
- Benefits of HD in older adults uncertain. |
- ECF pts’ 1 yr mortality rate after starting HD: Age >70= 35%; >80= 50%
- Uniform functional decline post starting HD
- Community living elders starting HD age 85: 47% dead at 2 years; 11% still living independently |
- HD may provide 3 mos. of stable function, but not restore function

AAA rupture & shock & attempted emergency surgical repair

- Suspected AAA leak or rapidly expanding aneurysm: Mortality=10-20 % |
- Ruptured AAA: Mortality=30-50%
- Elective AAA repair: Mortality=30-50%
- Age alone should not justify withholding emergency surgery
- Operative mortality age >80 vs younger pts (51% vs 48%) |

Note: Withholding surgery may be appropriate if pt has terminal illness or poor life quality

Hospice initiation in ED for terminal dementia pts

- Dementia is a terminal disease & ED discussion with the primary care physician regarding appropriate end of life care is key. |
- 6 mo. mortality rates with pneumonia, fever & eating problems. |
- Burdensome interventions 40.7% in last 3 months of life. |
- 71 % family members agree to palliative non-aggressive care at end of life, although when the pt is at the end of his/her life is a physician-directed conversation & often a process of realization for the pt & family that must be respected. |
- Starting the conversation is important.

Respiratory failure in pts in the ED with multiple co-morbidities & poor quality of life

- Decision not to intubate a pt with respiratory failure is difficult, if pt suddenly deteriorates & family unfamiliar with pt’s wishes. Discuss risks involved in weaning & overall morbidity, mortality & quality of life outcomes with intubation in frail or failing elderly with family members. |
- Other strategies, e.g., non-invasive mask ventilation (NIMV), may be successful. Pts with ARF treated with NIMV following DNI order have a satisfactory long-term survival. |
- Long term mortality rates 30.8% at 1 year, 46.2% at 3 years. |
- Brain Natriuretic Peptides in ED are valuable in diagnosis of CHF in pts presenting with dyspnea & atypical symptoms. Early CHF diagnosis ↓ time to d/c & total treatment cost.