Risk Stratification for TAVR

*Is my patient too sick, old or frail?*

Karen Alexander MD, FACC
Professor of Medicine, Cardiology
Duke University Medical Center, Durham NC
Patient Selection and Evaluation:

Too sick, old or frail for what......

- Relieve Aortic Stenosis
- Feel Better (Improve QoL)
- Live Longer (Longer ≠ Forever)
US Life Expectancy: CDC Life Tables-2009

Average Years of Life Remaining

9.1
4.7
2.3


http://eprognosis.ucsf.edu/ (Lee index, iFlacker index, Palliative Performance Scale, Walter Index, Gagne Index)

REF: www.cdc.gov/nchs/fastats/lifexpec.htm (accessed Dec 2015),
AS – Natural History from Cohort B

US population (age 85) – Life Years Remaining ~ 6 to 7

1-2 years

4-5 years

REF: Kapadia, Lancet 2015:385:2485-91
Patient Selection - Competing Risks for Mortality

- High STS Risk Score (STS PROM >15%)
- Cardiac Morbidity
  - Severe MR, HF, Myocardial fibrosis
  - Low flow gradient <20mmHg, SVI <36ml/m2)
- Non-CV Comorbidity burden (multimorbidity)
  - Severe lung disease (COPD, 02, PASP >60mmHg)
  - CKD stage IV-V
  - Liver disease or active malignancy
- Frailty, Disability, Cognitive function
  - Gait speed <0.5m/sec, Disability (>1 ADLs), MMSE <27
Frailty and TAVR Outcomes

- **PARTNER Sub-study: (3 sites; N=244, age 85)**
  - 45% frail (composite albumin, handgrip strength, gait speed, and Katz ADL)
  - Frail mortality 32.7% at 1 year vs. 15.9%, p=0.004.
  - Poor outcome (death, KCCQ<60 or ↓ 10), Frail 50.0% vs. 31.5%, p=0.02.

- **Canadian Registry: (N=339 non-operable high risk, age 81)**
  - 25% frail (clinical scale)
  - Frail mortality 55% at 42±15 mo - Adj. HR = 1.41 (1.02–1.96)
  - Cause of death: 58% non-cardiac, 23% cardiac, 17% unknown

- **Swiss Registry (N=100, age 83.7yr )**
  - 49% Frailty Scale >3 (and 32% MMSE<27)
  - Cognitive impairment – Adj HR Mortality 4.12 (1.48 – 11.5)
  - Frailty – Adj HR Mortality 4.48 (1.48 – 13.4)

- **ACC/STS TVTR: Gait Speed (N=8,039, age 84, Gait = 0.64m/sec)**
  - Slowest <0.5 m/sec have 35% higher adj. 30 day mortality
  - 11% increase mortality for each 0.2 m/s decrease in gait speed

REF: Green Am J Cardiol 2015;116:264-269; Rodes-Cabau JACC 2012; 60: 1864-75; Stortecky S, JACC Interventions 2012;5:489-96; Alfredsson, Under Review
ADLs - Onset (Hierarchy) of Disability

Longitudinal Study of Aging (N=5,151 Community-dwelling ≥ 70 yrs)

<table>
<thead>
<tr>
<th>ADL</th>
<th>Median Age (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>83.9</td>
</tr>
<tr>
<td>Bathing</td>
<td>86.9</td>
</tr>
<tr>
<td>Transferring</td>
<td>89.7</td>
</tr>
<tr>
<td>Dressing</td>
<td>91.8</td>
</tr>
<tr>
<td>Toileting</td>
<td>92.7</td>
</tr>
<tr>
<td>Feeding</td>
<td>99.6</td>
</tr>
</tbody>
</table>

Mortality Benefit w/ TAVR by STS Score

5 year Partner B – Cause of Death mostly Non-Cardiovascular

REF: Kapadia, Lancet 2015:385:2485-91
Mortality Benefit of TAVR by CKD Stage

- N=2,075 European TAVR Pts - CKD Stage 4 or 5 = 12%

REF: Allende, EHJ 2014
Symptom Benefit - Moderate to Severe COPD

PARNTER Trial Poor mobility and O2 dependent = Lack of Benefit

REF: Dvir, J Am Coll Cardiol 2014;63:269–79)
Mortality Benefit – Partner Cohort B with Moderate to Severe Lung Dz

Lag time to death (%)

REF: Dvir, J Am Coll Cardiol 2014;63:269–79)
Goals of Care with AS – Alleviate Suffering
Patient Selection for TAVR

- Benefit
  - TAVR Benefit and Competing risk
  - Patient Goals and Priorities
  - Patient expectations
  - Agreement between stakeholders

+ Competing Risk

Care Plan
(with or without TAVR)

Lindman, JACC Intervention 2014:7; 707-716.