Using Frailty Measurement to Assist With Patient Assessment and Discharge Planning in Patients Undergoing Transcatheter Aortic Valve Implant – Results of a Pilot Project

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Alignment

SFH Strategy
• Organizational support
• Processes of care
• Unique needs of patients / families / caregivers

RNOC Direction
• Collaboration, consensus building
• Client-centred care model
• Integration of rehab services
TAVI

What is a TAVI?

How does it work?

Acute RCA Occlusion

RCA After Rerupfusion
Our TAVI Patients

- Age: 84.6 (range 66 - 95)
- Evaluated as too high risk for conventional surgery
- Multiple co-morbidities
- Complex health history
- Symptomatic
  - Dyspnea, pre-syncope, fatigue
  - +/- some cognitive impairment

Most TAVI patients have some degree of frailty…

- Aortic stenosis is the most frequent acquired valvular heart disease in the industrialized world
- Incidence increases with age
- Once symptoms appear, untreated AS is usually fatal within 18 mths – 3 yrs
Frailty: A Multidimensional Syndrome

- Nutrition (↓Protein)
  - Poor dentition
  - Illness
  - Depression
- Declining metabolism
  - Loss of lean body mass
- Low Energy/Physical Activity
  - ↓Physical activity
  - ↓strength
  - ↓balance
- Immobilization
- Molecular and cellular damage
  - Immune dysregulation
    - ↓ability to respond to stressors
  - Neuro-Endocrine dysregulation
    - ↓regulation of critical homeostatic functions
- Illness
  - Chronic Inflammation
    - Loss of ability to modulate inflammatory proteins
  - Catabolic state
    - ↓Insulin sensitivity

Cognitive Decline

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What does frailty look like?

- Unintentional weight loss
  - 10 pounds or more in past year
- Muscle loss and weakness
  - Fatigue, decreased activity
- Decreased ADL’s; IADL’s

How is frailty assessed?

- Clinical phenotype
  - Slow gait speed, weak hand grip
- Deficit accumulation
  - Incremental effect of co-morbidities
- Clinical judgement
  - Hx and Px filtered through practitioner experience/insight
Evidence Review:
Frailty as an Outcome Predictor

Cardiac surgery
Afilalo et al (2012)
- Prior to cardiac surgery, patients ≥ 70 yrs completed a variety of frailty assessments
- Major outcome: composite of postoperative mortality or major morbidity
- The mean frailty measurements were higher in patients who experienced a major morbidity or mortality

Non-ST-Segment Elevation Myocardial Infarction
Ekerstat et al (2011)
- Patients ≥ 75 yrs diagnosed with NSTEMI had prospective frailty measurement
- Major outcome: composite of death, re-infarction, re-hospitalization, bleeding, stroke/TIA, dialysis
- Frailty score was found to be independently associated with risk for major composite outcome

TAVI
Stortecky et al (2012)
- Patients ≥ 70 yrs with severe AS referred for TAVI were prospectively administered a multi-dimensional geriatric assessment and assigned a frailty index score
- Major outcome: all cause mortality or major adverse cardiovascular and cerebral events post-TAVI
- Frailty index showed an association with major outcome at 30 days and 1 year post-TAVI
Frailty Pilot Project

If frailty predicts outcomes,

1. Is it feasible to include a frailty measurement scale in patients booked for elective TAVI?

2. Does the integration of a frailty measurement scale help to identify those who may require targeted, early interventions?

Pilot Quality Improvement Project

- Elective TAVI patients
- Frailty assessment scale
- Identify frail patients pre-TAVI and target interventions
- Follow post-TAVI outcomes
The TAVI Patient Experience

Dx of critical, symptomatic AS
Not a surgical candidate
Eligible for TAVI
Waiting for TAVI...

Opportunity for patient assessment and tailored pre-TAVI interventions

2 – 6 weeks
3 – 4 weeks
1 – 4 months
**Methodology**

**The CSHA Frailty Scale**

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**Full functional assessment**

**CSHA Clinical Frailty Score**

**CSHA ≥ 4: Tailored Education/Support**
- Family/ Caregiver assessment
- Pre-admission discharge planning
- Early referrals initiated
- Fluid balance; daily weights
- Falls risk, other symptom review

**CSHA<4 Standard Waitlist Mgmt/Care***
- Communication with patient and family
- Discharge options discussed
- Accessible as needed for questions concerns

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**The CSHA clinical Frailty Scale**

1. Very Fit - robust, active, energetic, well motivated and fit; these people commonly exercise regularly and are in the most fit group for their age.

2. Well - without active disease, but less fit than people in category 1.

3. Well, with treated comorbid disease - disease symptoms are well controlled compared with those in category 4.

4. Apparently vulnerable - although not frankly dependent, these people commonly complain of being "slowed up" or have disease symptoms.

5. Mildly frail - with limited dependence on others for instrumental activities of daily living.

6. Moderately frail - help is needed with both instrumental and non-instrumental activities of daily living.

7. Severely frail - completely dependent on others for the activities of daily living.

8. Terminally ill.

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*Regional Cardiac Care Coordinator Role (www.ccn.on.ca)
Frail Patients Pre-TAVI: Targeted Interventions

Family engagement and collaboration

- Assistance in exploring appropriate convalescent/geriatric care options; geriatric referral
- Education, managing expectations (LOS, delirium, potential outcomes/complications)
- Optimized scheduling to family availability; caregiver strain

Early community referrals

- Social work
- Tele-home monitoring for fluid balance/optimization
- Community pharmacist for problems related to medication

Associated symptom management

- Symptom progression, early admission for HF management
## Post TAVI Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Score &lt; 4</th>
<th>Score ≥ 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-operative complication*</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Mean ICU LOS (Days)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Mean hours of ventilation</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td>Number requiring CRRT (Acute kidney injury)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Number requiring re-intubation (Resp. failure)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Number requiring enteral nutrition (N/G feeds)</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Overall LOS (Days)</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Overall mortality (median f/u 22.2 months)</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
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* Cardiac arrest; conversion to SAVR; embolism; LV wall perforation; cardiac tamponade
What did we learn; What did we do about it

Vulnerable/Frail patients experience higher degree of morbidity and mortality.

There are significant opportunities *pre-admission* to engage with frail patients and their families to manage expectations and tailor care and support.

Family/caregivers assume the bulk of pre-TAVI planning and post-discharge management – need to have access *and* be involved throughout the process.

**Heart Team**
- Geriatrician at TAVI meetings
- International Frailty Study

**Pre-TAVI**
- Frailty assessment, cognitive screen
- Discussion of options with patients and family members
- Access/ education/ support

**In-hospital**
- TAVI Pathway; social work, physio (early mobilization), dietitian
- Firm discharge plan/support

**Post-Discharge**
- A number to call
Questions

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