Feasibility & Initial Results of a Decision to Test Algorithm Using the Duke Activity Score Index in Operable Lung Cancer Patients

2018 ASNC Choosing Wisely Competition
Dr. CB Johnson, MD, FRCP
Cardiology Site Director,
The Ottawa Hospital, General Campus
Feasibility & Initial Results of a Decision to Test Algorithm Using the Duke Activity Score Index in Operable Lung Cancer Patients

**Team:**
Cardiology: Dr. CB Johnson, Dr. N Gauthier, Dr. A Law
Nuclear Medicine: Dr. E Leung
Thoracic Anesthesia: Dr. C Thompson, Dr. S Gagne, Dr. A Alhatmy
Thoracic Surgery: Dr. DE Maziak, Dr. A Seely
Respirology: Dr. N Voduc
Nav Day Nurse: J Smylie
Administrative Assistants: C Chenard, S Shin
Disclosures:

1. No relevant financial disclosures
2. No discussion of off-label therapies or interventions
3. No TOH REB approval for quality improvement projects
Before Cancer Transformation:
Median of **92 days** from Referral to First Treatment for Lung Cancer

Non-Selective Pattern of Cardiac Testing

Problem:
Non-selective pattern of cardiac test referral in operable lung cancer patients.

Solution:
Selective cardiac testing in operable lung cancer patients using valid tools to estimate operative risk and exercise capacity based on 2014 ACC guidelines for perioperative cardiac testing.
Lung Cancer Transformation

**Problem** – poor patient flow, confusing patient processes, repetitive processes

**Issue** - workload inefficiencies, lack of coordinated patient support care

**Solution** - coordinate, standardize, streamline, engage, learn

---

**Flowchart**

1. Referral
2. History and Diagnostics for Decision Making
3. Consult Med Onc, Rad Onc, Surgery
4. Treatment Med Onc, Rad Onc, Surgery

---

**Change Management, Communities of Practice (CoP)**

CCO - Disease Pathway Management, INTEGRATE

---

**Diagram**

- Referal
- RN Review
- Joint Review
- RN Contact
- NAV Day
- Testing Results
- Triage
- Consult Sx Oncx

New  Changed

---

1. Estimate Risk: RCRI

2. Estimate METs: DASI

Fleisher et al; Circulation 2014; 130(24):e278-333
1. Estimate Operative Risk: Revised Cardiac Risk Index

**RCRI in non-cardiac surgery: Predicts CV events**

<table>
<thead>
<tr>
<th># Variables</th>
<th>RCRI</th>
<th>CV Event Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>≥ 3</td>
<td>4</td>
<td>9%</td>
</tr>
</tbody>
</table>

![Cardiopulmonary Assessment](image)

**1. Lee et al; Circulation 1999;100(10)1043-1049**
1. Estimate Risk: RCRI

2. Estimate METs: DASI

Fleisher et al; Circulation 2014; 130(24):e278-333
DASI correlates with:
- VO$_2$ max (R=0.81, p<0.01) in CAD
- 6 min walk (R=0.53, p<0.01) in COPD

In women DASI predicts:
- prognosis (similar to TMT)
- inconclusive TMT (37% if < 4.7 METs)

In surgical patients DASI:
- predicts death & MI
- more reliable than subjective assessment for detecting < 4 METs

DASI / RCRI Decision For Cardiac Testing: Implementation

Implementation:
- Jan 1, 2017 – May 31, 2017

Launch:
- June 1, 2017

Pre-Implementation:
- June 1, 2015 - Jan 31, 2016

Post-Implementation:
- June 1, 2017 – Jan 31, 2018

First 8 Months Post-Implementation (June 1, 2017 – Jan 31, 2018)

- 1179 cases: joint review
- 496 / 1179 operable (42%)
- 373 / 496 (75%) attend Nav Day
- 336 / 373 (90%) complete DASI/RCRI decision to test
Results: DASI Estimated Functional Capacity

DASI Estimated METs For Operable Lung Cancer Patients (n=336)
June 1 2017 - Jan 31, 2018:

- 74.2% < 5 METs
- 25.8% 5-15 METs
<table>
<thead>
<tr>
<th></th>
<th>Pre-Implementation (June 2015 – Jan 2016)</th>
<th>Post-Implementation (June 2017 – Jan 2018)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nav Day Patients (n)</td>
<td>297</td>
<td>373</td>
<td></td>
</tr>
<tr>
<td>Echocardiograms (n)</td>
<td>43</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Echocardiograms / Nav Day Patients (%)</td>
<td>14.5%</td>
<td>14.2%</td>
<td>NS</td>
</tr>
<tr>
<td>Myocardial Perfusion Scans (n)</td>
<td>101</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Perfusion Scans / Nav Day Patients (%)</td>
<td>34.0%</td>
<td>10.2%</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>
Key Findings:

1. DASI / RCRI decision to test was feasible: completed in 90% of Nav Day patients
2. Most (74.2%) operable lung cancer patients have ≥ 5 METs estimated functional capacity
3. DASI / RCRI decision to test reduces referrals for myocardial perfusion scans by 70% with no change in referrals for echocardiograms
Future Research

1. **Link DASI / RCRI decision to test data to TOH thoracic surgery database:**
   1. Rates of mortality & myocardial infarction
   2. Appropriateness of perfusion scans & echos pre-and post decision to test
   3. DASI estimated METs & rates of death, MI, in-hospital complications
   4. Grant Application & REB submission

2. **Integrate DASI / RCRI decision to test with 2016 Canadian Cardiovascular Society Perioperative Guidelines**
   1. Single center pilot to measure resource utilization impact of CCS guidelines launches at the General Site of TOH in November, 2018
   2. Potential to apply DASI / RCRI decision to test to vascular surgery and renal transplant patients.
Choosing Wisely Objectives:

1. Enhance communication with referring physicians to increase appropriate referrals
2. Implement patient & test selection that reduces inappropriate testing in low risk patients
3. Implementation of quality improvement via appropriate test selection

https://www.asnc.org/choosingwisely
Feasibility & Initial Results of a Decision to Test Algorithm Using the Duke Activity Score Index in Operable Lung Cancer Patients

2018 ASNC Choosing Wisely Competition
Dr. CB Johnson, MD, FRCP
Cardiology Site Director,
The Ottawa Hospital, General Campus
Please rank this presenter based on the criteria noted:

1. Poor
2. Questionable
3. Average
4. Good
5. Excellent