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
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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

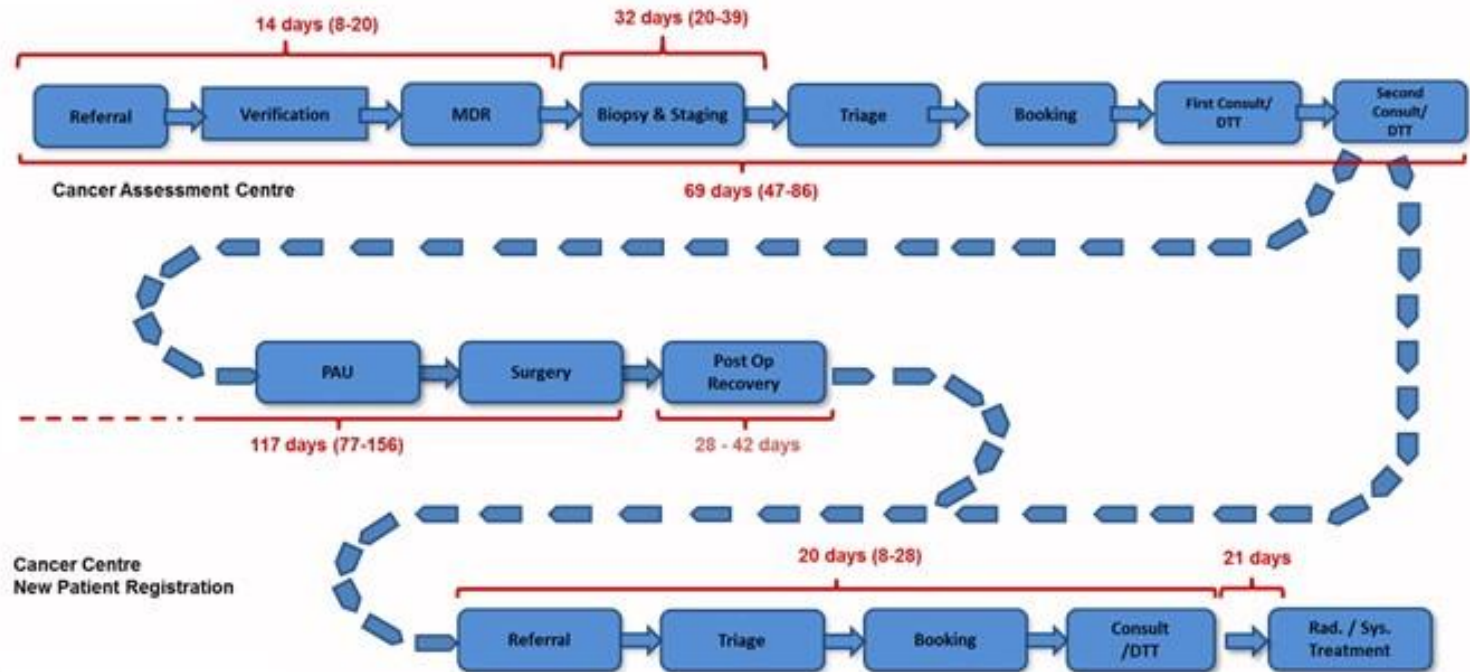Compassionate People. World-Class Care.   Des gens de compassion. Des soins de calibre mondial.

Disclosures:

1. No relevant financial disclosures
2. No discussion of off-label therapies or interventions
3. No TOH REB approval for quality improvement projects

Problem:
Non-selective pattern of cardiac test referral in operable lung cancer patients.
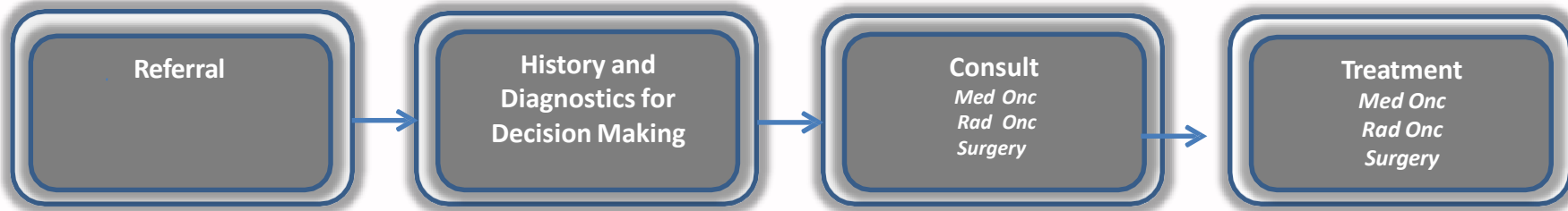
Solution:
Selective cardiac testing in operable lung cancer patients using valid tools to estimate operative risk and exercise capacity based on 2014 ACC guidelines for perioperative cardiac testing.
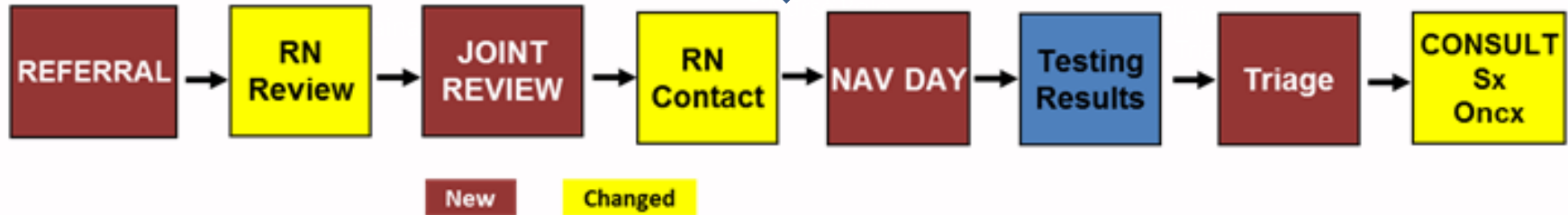
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Problem – poor patient flow, confusing patient processes, repetitive processes
Issue - workload inefficiencies, lack of coordinated patient support care
Solution - coordinate, standardize, streamline, engage, learn

| Referral | History and Diagnostics for Decision Making | Consult *Med Onc Rad Onc Surgery* | Treatment *Med Onc Rad Onc Surgery* |

Change Management, Communities of Practice (CoP)

CCO - Disease Pathway Management , INTEGRATE

REFERRAL → RN Review → JOINT REVIEW → RN Contact → NAV DAY → Testing Results → Triage → CONSULT Sx Oncx

New   Changed

1. Estimate Risk: RCRI

2. Estimate METs: DASI

Estimated perioperative risk of MACE based on combined clinical/surgical risk (Step 3)

Low risk (<1%) (Step 4)

Elevated risk (Step 5)

No further testing (Class III:NB)

Proceed to surgery

Moderate or greater (≥4 METs) functional capacity

Excellent (>10 METs)

No further testing (Class IIa)

Moderate/Good (≥4–10 METs)

No further testing (Class IIb)

Proceed to surgery

No or unknown

Poor OR unknown functional capacity (<4 METs): Will further testing impact decision making OR perioperative care? (Step 6)

Yes→ Pharmacologic stress testing (Class IIa)

If normal   If abnormal

Coronary revascularization according to existing CPGs (Class I)

No

Proceed to surgery according to GDMT OR alternate strategies (noninvasive treatment, palliation) (Step 7)

Fleisher et al; Circulation 2014; 130(24):e278-333

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1. Estimate Operative Risk: Revised Cardiac Risk Index

RCRI in non-cardiac surgery: Predicts CV events[1]

# Variables	RCRI	CV Event Rate
0	1	0.5 %
1	2	1 %
2	3	4 %
≥ 3	4	9 %

CARDIOPULMONARY ASSESSMENT

Ages Cancer Assessment Clinic
Thoracic Oncology

PART A. DECISION TOOL FOR PERSANTINE MYOVIEW

Revised Cardiac Risk Index Factors	Yes	No
Intrathoracic Surgery		
History of Heart Failure		
Creatinine greater than 170 mcmol/L		

Revised Cardiac Risk Index Factors	Yes	No
History of Coronary Disease		
Insulin for Diabetes		
History of Cerebrovascular Accident or Transient Ischemic Attack		

DUKE ACTIVITY STATUS INDEX (DASI) SCORE: _____   **METABOLOIC EQUIVALENTS (METS) =** _____

RECOMMEND Persantine Myoview if less than 5 METs AND sum of 2 or more Cardiac Risk Index Factors (YES answers)

Adapted from: 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Non-Cardiac Surgery

PART B. DECISION TOOL FOR ECHOCARDIOGRAPHY

	Yes	No
DASI less than 5 METs		
Known Valvular Disease		
Pneumonectomy		

	Yes	No
Known Heart Failure		
Known Heart Murmur		

RECOMMEND Echocardiogram if none completed in last 12 months (with no change in symptoms) AND 1 or more YES answers above

Adapted from: 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Non-Cardiac Surgery
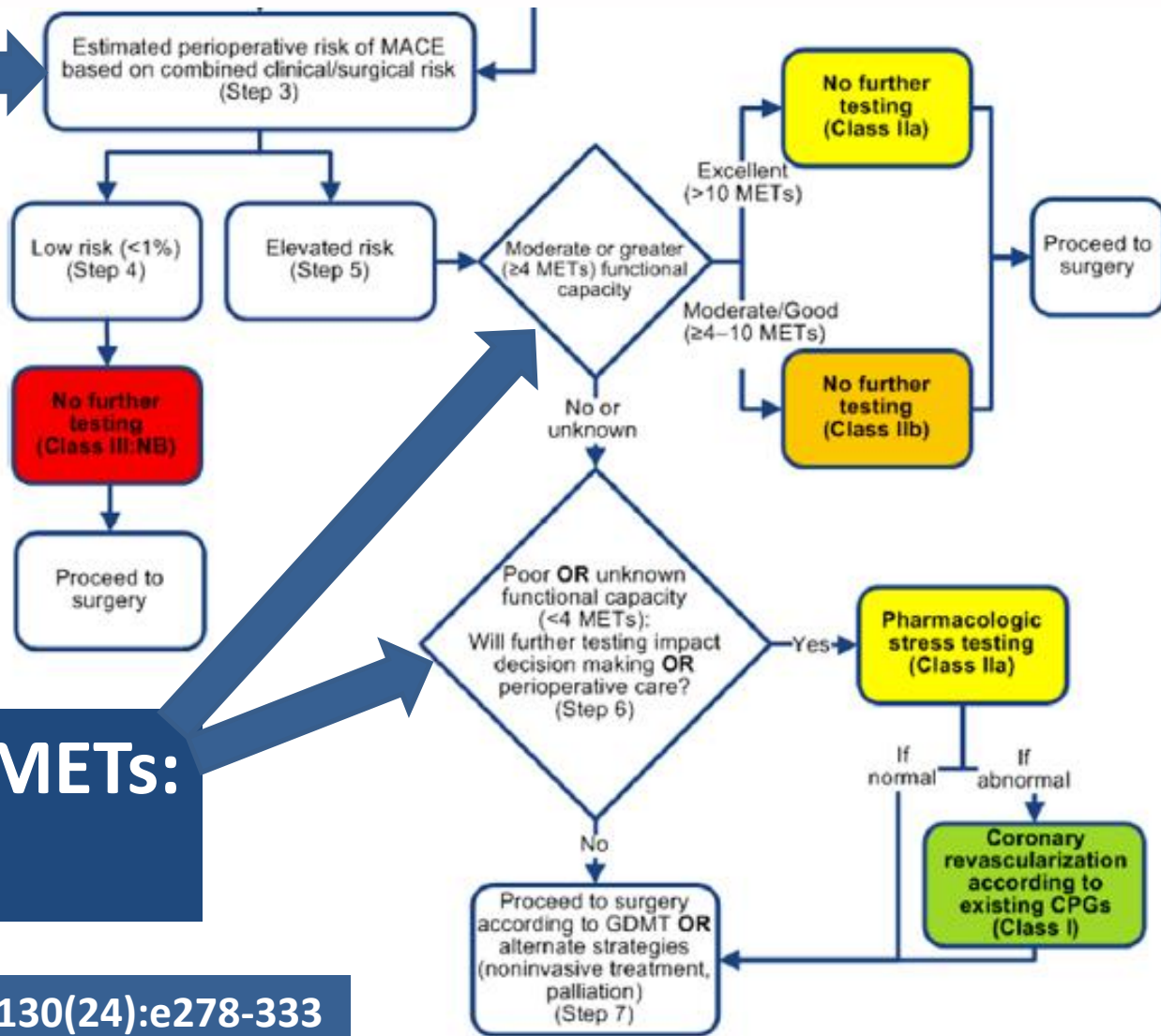
1. Lee et al; Circulation 1999;100(10)1043-1049

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2. Estimate METs: Duke Activity Score Index: DASI

DASI correlates with:

-VO$_2$ max (R=0.81, p<0.01) in CAD[1]

-6 min walk (R=0.53, p<0.01) in COPD[2]

In women DASI predicts:

-prognosis (similar to TMT)[3]

-inconclusive TMT (37% if < 4.7 METs)[3]

In surgical patients DASI:

-predicts death & MI[4]

-more reliable than subjective assessment for detecting < 4 METs[4]

1. Hlatky et al Am J Cardiol 1989; 64:651-654
2. Carter R et al J Cardiopulm Rehabil Prev 2002;22:298-308
3. Shaw LJ et al J Am Coll Cardiol 2006;47:36S-43S
4. Wijeysundera et al Lancet 2018;391:2631-40

Instructions: Please circle "yes" to the following questions only if you can easily do the physical activity.

Can you:		Circle	
1.	Take care of yourself, that is, eat, dress, bathe or use the toilet?	Yes	No
2.	Walk indoors, such as around your house?	Yes	No
3.	Walk a block or two on level ground?	Yes	No
4.	Climb a flight of stairs or walk up a hill?	Yes	No
5.	Run a short distance?	Yes	No
6.	Do light work around the house like dusting or washing dishes?	Yes	No
7.	Do moderate work around the house like vacuuming, sweeping floors or carrying groceries?	Yes	No
8.	Do heavy work around the house like scrubbing floors or lifting or moving heavy furniture?	Yes	No
9.	Do yard work like raking leaves, weeding or pushing a power mower?	Yes	No
10.	Have sexual relations?	Yes	No
11.	Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis or throwing a football?	Yes	No
12.	Participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?	Yes	No

Completed by: ☐ Patient ☐ Support/Family ☐ RN

Printed Name | Signature | Date (yyyy/mm/dd) | Time

Duke Activity Status Index (DASI) = _____	Metabolic Equivalence = _____
DASI = the sum of weights for "yes" replies. (online calculator at www.iheartmyheart.com)	Metabolic Equivalence = $\frac{0.43 \times DASI + 9.6}{3.5}$
Signature:	

CLN 129 (REV 01/2016)   CHART   Français au verso

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%)
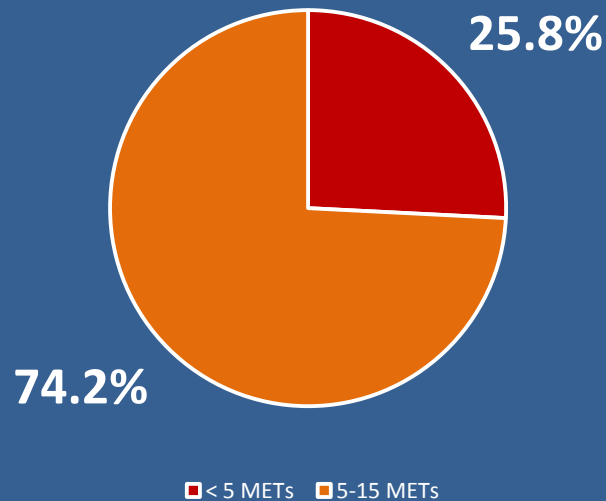
⬇

373 / 496 (75%) attend Nav Day

⬇

336 / 373 (90%) complete DASI/RCRI decision to test

Rates of Referral for Cardiac Testing Pre & Post Decision to Test Implementation

	Pre-Implementation (June 2015 – Jan 2016)	Post-Implementation (June 2017 – Jan 2018)	P-value
Nav Day Patients (n)	297	373	
Echocardiograms (n)	43	53	
Echocardiograms / Nav Day Patients (%)	14.5%	14.2%	NS
Myocardial Perfusion Scans (n)	101	38	
Perfusion Scans / Nav Day Patients (%)	34.0%	10.2%	< 0.05

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

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Please rank this presenter based on the criteria noted:

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

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