

Proposed Tool for Lowering Readmission Rates

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Addressing Readmission Rates

Recognizing the importance of Readmission Rates

Impact on the hospital

What can be done about rates

Addressing Readmission Rates

Proposal: a new tool to predict readmissions

- The LACE score
- How it can help us
- What we need to move forward

We need to discuss readmissions

HOSPITAL READMISSION REDUCTION PROGRAM

- (HRRP)

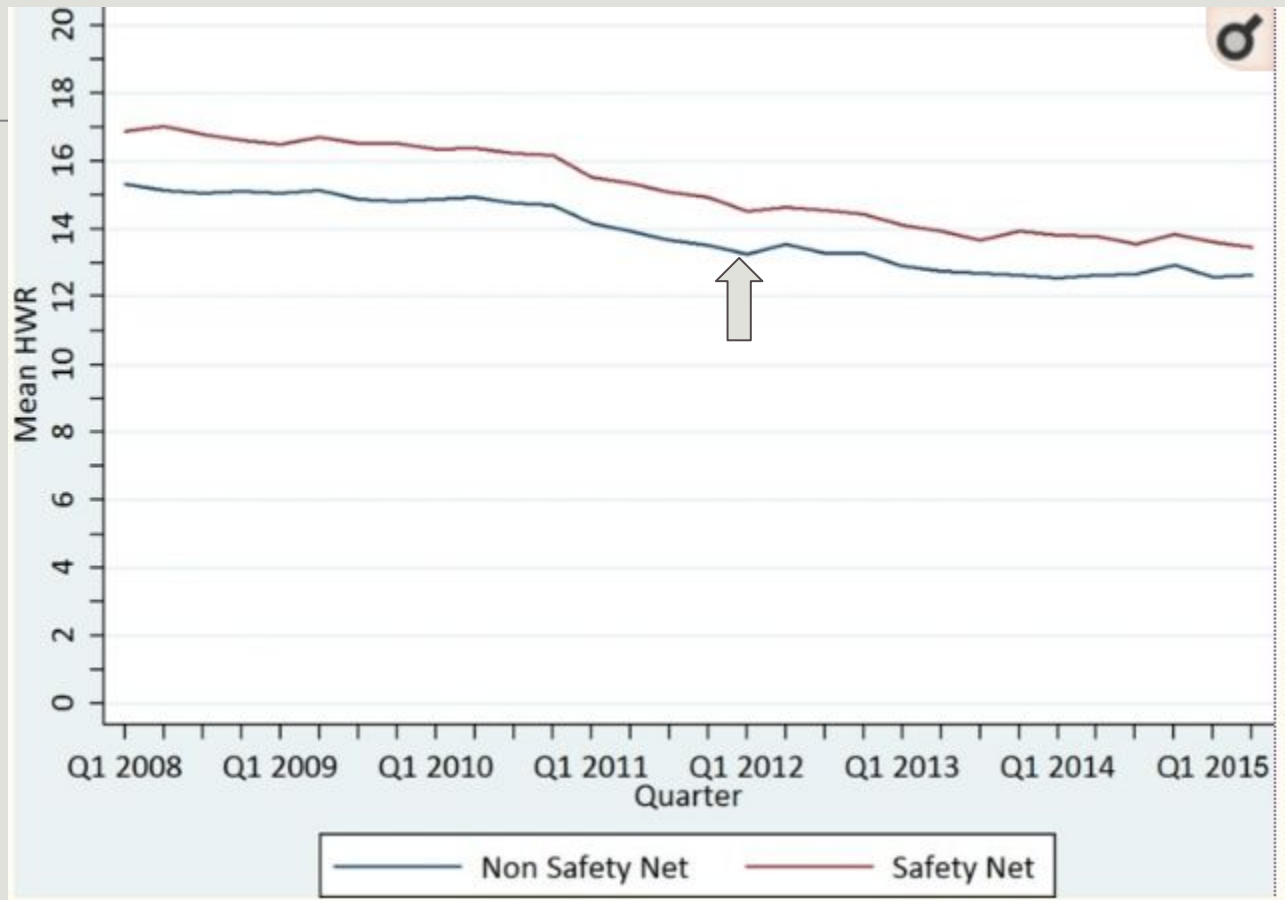
- 20% of Medicare patients readmitted within 30 days

- HRRP started penalties in 2012

McIlvennan CK, Eapen ZJ, Allen LA. Hospital readmissions reduction program. Circulation. 2015 May 19;131(20):1796-803.

Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. New England Journal of Medicine. 2009 Apr 2;360(14):1418-28.

<https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>



What happens if we do nothing

QUADRUPLE AIM

- Decreases patient satisfaction
- Decreases health of population
- Increases healthcare costs
- Decreases provider satisfaction

What can we do?

Focused-care-after-discharge

- resource-limited
- Which patients can benefit the most?

What could we do?

Predict those at risk for poor outcomes

Billings J, Dixon J, Mijanovich T, et al. Case finding for patients at risk of readmission to hospital: development of algorithm to identify high risk patients. *BMJ* 2006;333:327.

Bottle A, Aylin P, Majeed A. Identifying patients at high risk of emergency hospital admissions: a logistic regression analysis. *J R Soc Med* 2006;99:406-14

Predicting readmission risk with LACE

L = Length of Admission
A = Acuity of Admission
C = Comorbidities
E = Emergency Dept Use

- Goal: Predict patient's risk of readmission within 30 days (readmit30)
- Developed by Walraven et al. (*CMAJ* 2010)
- Widely adopted and customized
- We have developed the even simpler **LAE** model



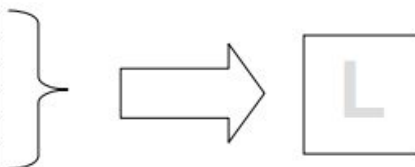
Model Development

- Data source: 34,532 patient records
- Method: LACE index scoring tool from Walraven et al., *CMAJ* 2010
- Tools: SQLite, R

Step 1. Length of Stay

Length of stay (including day of admission and discharge): _____ days

Length of stay (days)	Score (circle as appropriate)
1	1
2	2
3	3
4-6	4
7-13	5
14 or more	7



Discharge date - Admit date
for index admission

Step 2. Acuity of Admission

Was the patient admitted to hospital via the emergency department?
If yes, enter "3" in Box A, otherwise enter "0" in Box A



Admit source = Emergency Room

Step 4. Emergency department visits

How many times has the patient visited an emergency department in the six months prior to admission (not including the emergency department visit immediately preceding the current admission)? _____

Enter this number or 4 (whichever is smaller) in Box E



Number of encounters of type = 48
(Emergency Room)
in 6 months before Admit date

The Problem with “C”

- “C” is the most labor-intensive component of LACE
- Our pilot model used Dementia and Mild Liver Disease as two example comorbidities
- Issues:
 - Choosing only 2 comorbidities greatly limited the number of patients who had $C > 0$
 - Grouping ICD9 codes into value sets differs greatly based on method used
 - Many of the comorbidities are either interrelated or obvious

Can we leave out C?

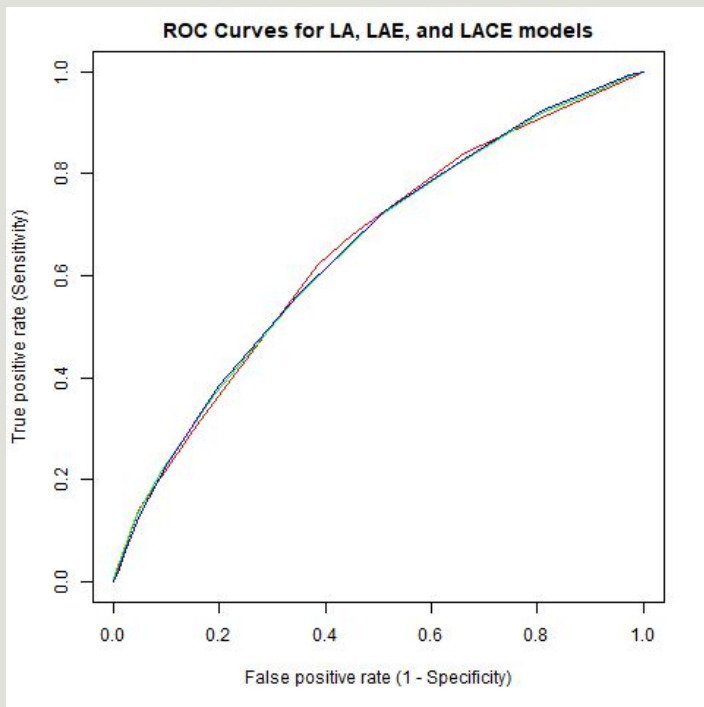
Condition (definitions and notes on reverse)	Score (circle as appropriate)
Previous myocardial infarction	+1
Cerebrovascular disease	+1
Peripheral vascular disease	+1
Diabetes without complications	+1
Congestive heart failure	+2
Diabetes with end organ damage	+2
Chronic pulmonary disease	+2
Mild liver disease	+2
Any tumor (including lymphoma or leukemia)	+2
Dementia	+3
Connective tissue disease	+3
AIDS	+4
Moderate or severe liver disease	+4
Metastatic solid tumor	+6
TOTAL	

If the TOTAL score is between 0 and 3 enter the score into Box C.
If the score is 4 or higher, enter 5 into Box C

C

Evaluating LA vs. LAE vs. LACE

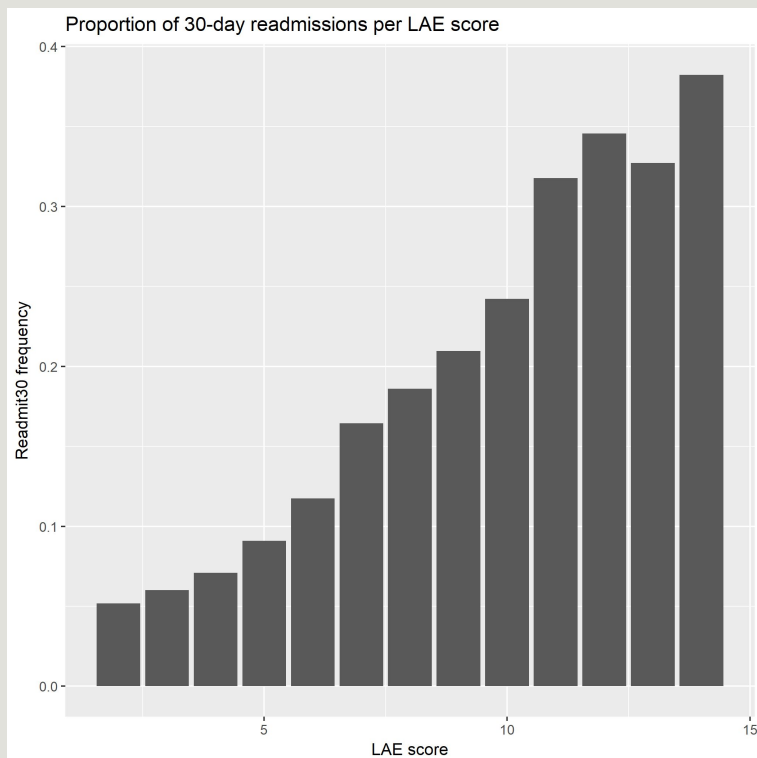
- Methods: logistic regression, confusion matrix, area under ROC curve



	LA_model <dbl>	LAE_model <dbl>	LACE_model <dbl>
Accuracy	0.7550313	0.8010558	0.834873
AUC	0.6481320	0.6471652	0.648487

Conclusion: C could be left out, but more research is needed

L + A + E = LAE score



0 - 6 = LOW (47%)

7-10 = MEDIUM (47%)

11+ = HIGH (5%)

How can we use LAE?

A tool with many uses

- Discharge Planning Team
- Hospitalist-to-Primary physician
- Other departments:
- Social work, finance/budgeting, quality assurance
- Research (more on that later)

Return on Investment

- Time to value – 1-2 years

Return on investment

- Learning where to improve
- Sustaining use
- The Nerd (NRD)

<https://www.ahrq.gov/news/blog/ahrqviews/112015.html>

Sponsor Actions

How can **you** help?

- Review forthcoming budget and work plan for development, implementation, user training, and long-term maintenance of the LAE tool
- Facilitate assembling the project team, including you (sponsor), analysts, and representatives from stakeholder/user groups
- Participate regularly in planning meetings
- Champion this cause to hospital administration and other groups

Goal: Lower hospital readmission rates by rolling out the LACE tool to the entire institution