

# Reducing Readmission: A Systems Analysis

Abigail Kroch, Epidemiology and Program Evaluation

Sara Levin, Internal Medicine

Natasha Pinto, Family Medicine



# Why Readmissions?

- ◆ Affordable Care Act emphasizes new delivery and reimbursement models that emphasize quality over quantity of care
- ◆ Unplanned readmission within 30 days of discharge established as a quality indicator for hospitals:
  - ◆ all cause readmissions (Medicare/CMS)
  - ◆ “ambulatory sensitive conditions” (Medicare/Medicaid/private payors)
- ◆ Preventable readmission can represent quality of care in BOTH the hospital and ambulatory care system
- ◆ Reducing Readmissions – Meets Triple Aim GOALS!!

# Why Readmissions? (questions & caveats)

- ◆ Is 30-day readmission rate an optimal quality indicator for a safety net population?
- ◆ In a safety net hospital, could high readmission rate indicate good access to hospital care and a lower mortality rate for the sickest and most vulnerable?
- ◆ Are the drivers of unplanned readmissions the same in all patient populations?
- ◆ Could the burden of mental illness, poor social support, poverty impact the unplanned readmissions?
- ◆ Readmission rates as a quality indicator may penalize systems that care for poor or vulnerable populations whose readmits are driven by factors unrelated to “medical care” interventions.

# Why Readmissions?

- 💧 If our population is different, how do our interventions and measures need to be different?
- 💧 Need to understand what our readmissions represent
- 💧 Improved discharge planning and care coordination IS a good goal

# Back At The IHI/CMS Ranch Medicare Populations

2005-2011:

- ◆ National attention to the high rates of preventable readmissions in the Medicare Populations
- ◆ Large databases (claims data) defining CHF as the primary diagnosis in all cause readmissions
- ◆ Development of coordinated care delivery models for how to reduce preventable readmissions gain national attention and are adopted as solutions in the quality improvement circles – focus on ambulatory sensitive conditions

# Reducing Readmissions: Single Diagnosis Focus

- ◆ Can we impact our readmission rate at CCRMC by focusing on an ambulatory sensitive condition?

# CCRMC Journey

## Reducing Readmissions

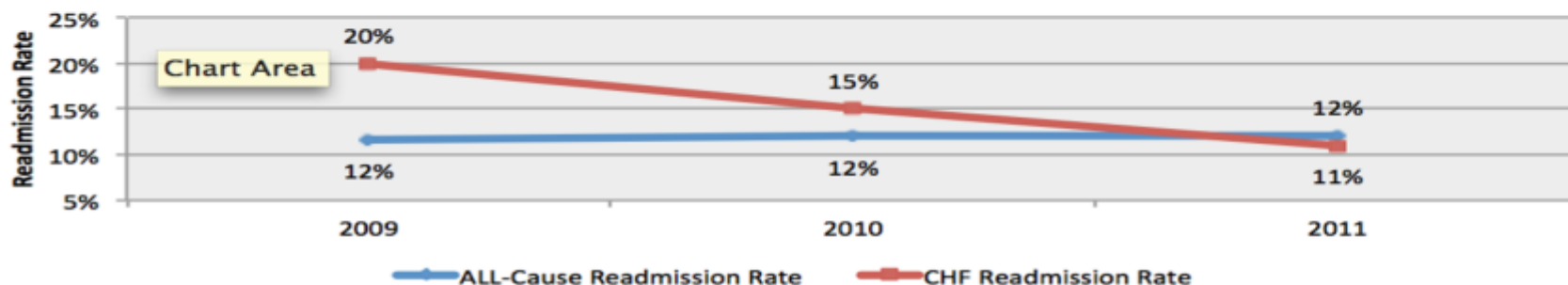
Primary Discharge Diagnosis	Baseline Admission Rate	Readmit Rate
Infections of skin and subcutaneous tissue	6%	6%
CHF	4%	14%
Pneumonia & Influenza	4%	8%
Other diseases of the Urinary system	4%	9%
Other diseases of the intestines and peritoneum	4%	13%
Symptoms respiratory system and other chest symptoms	4%	7%
Gallbladder	4%	3%
COPD	3%	11%
Psychoses	3%	7%
Diabetes Mellitus 1 & 2	3%	10%

- Top 10 diagnoses, CHF is #2!
- Disproportionate readmissions : 14%.
- Ambulatory sensitive condition.
- Reasonable conclusion: Let's focus on CHF to reduce readmissions



# Reducing Readmissions: Single Diagnosis Focus

**ALL-Cause Readmission Rate vs. CHF Readmission Rate  
By Year**



READMISSION RATES	2009	2010	2011
<b>All-Cause Readmission Rate</b>	12%	12%	12%
Numerator (ALL Readmissions)	614	597	567
Denominator (ALL Discharges)	5150	5013	4843
<b>CHF Readmission Rate</b>	20%	15%	11%
Numerator (ALL CHF Readmissions)	42	39	23
Denominator (ALL CHF Discharges)	213	261	212

💧 **Conclusion:** The CHF program was successful at reducing CHF readmissions but not at reducing the overall readmission rate. Why?



# Debunking Single Diagnosis Focused Analysis of Readmissions

- ◆ CHF readmission rate of 14%; 86% of patient with CHF will NOT readmit.
- ◆ Top 10 diagnoses still represent a tiny proportion of admissions (2-6% each)
- ◆ There are other single diagnoses that have a higher readmission rates—20-30%
- ◆ **Conclusion:**
  - ◆ No single medical diagnosis was the smoking gun.
  - ◆ Disease targeting is the most effective method of defining the population for intervention.

# Regroup at CCHS: Understanding the Safety-Net Readmit Population

- ◆ If single diagnoses are not the best way to define the population for intervention, then what is?
- ◆ Understanding the demographics of the safety-net population may help with the answer

# Taking a Closer Look: What Is Our Readmission Rate?

- ◆ For July 2008-June 2011
- ◆ Numerator is readmissions and denominator is all discharges, each readmission counts as additional index admission
- ◆ Include all cause medical, surgical, critical care, gynecology admissions; exclude psych, OB, duplications, AMAs, transfers, deaths
- ◆ Rate can be calculated by visit (16000) and by patient (11000)

# Readmission Rate CCRMC

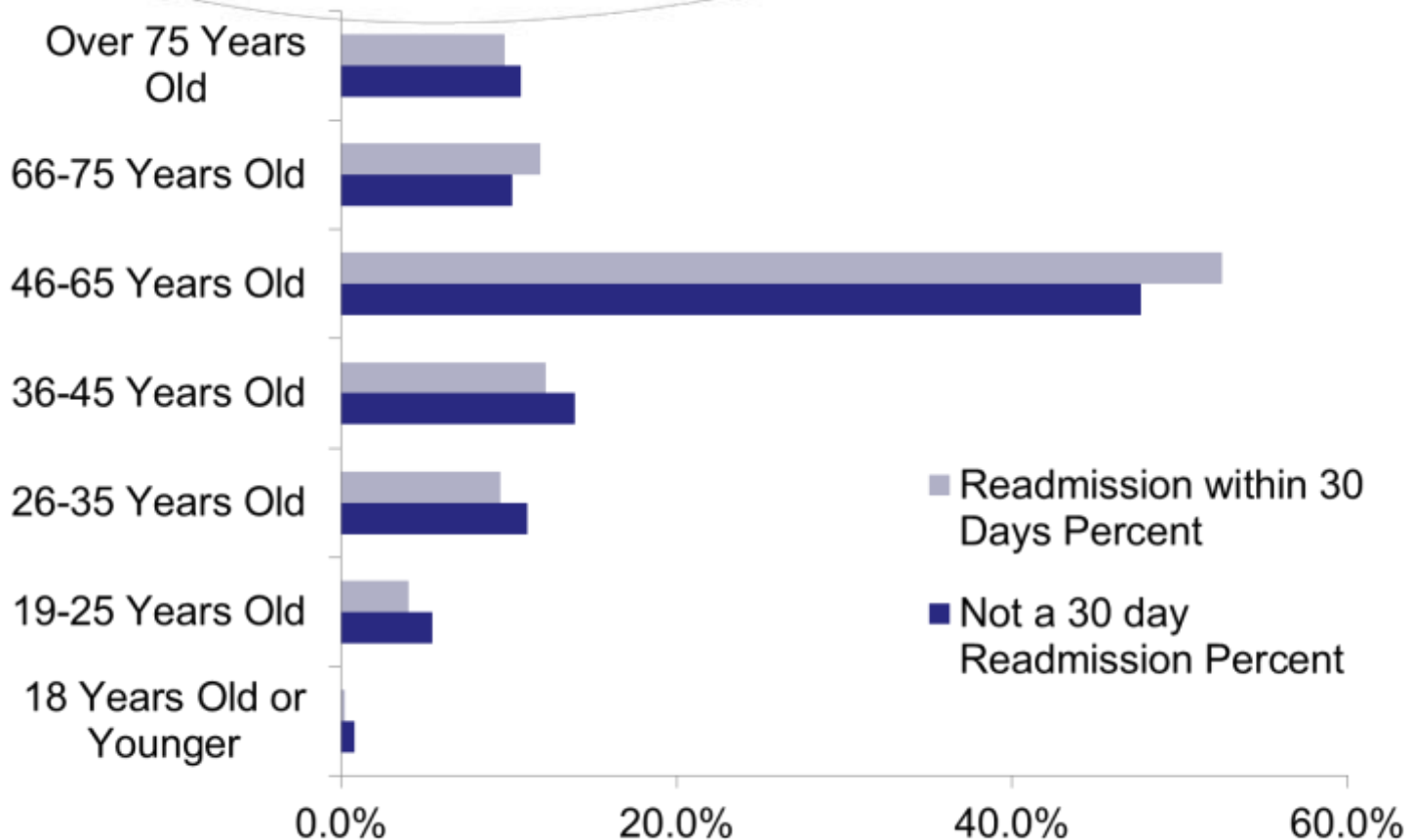
Baseline Readmits: Medical, Surgical, Critical Care,  
Gynecology

July 2008-June 2011

11.6% in prior analysis

10.9% in current analysis

# The Safety-Net Readmit Population: Younger



# The Safety-Net Readmit Population: Poorer

- ◆ ((Insert bar graph here on payor))
- ◆ Conclusion: A large percentage of the readmission population is Medical or Medi-Medi. They are a poorer population.



# The Safety-Net Readmit Population: Sicker

- ◆ ((Insert 4 number bar graph on prior LOS and then 4 number bar graph on readmission LOS))
- ◆ Conclusion: When the readmission population comes into the hospital they stay longer than others. They are likely a sicker population.

# The Safety-Net Readmit Population: Sicker

- ♦ ((insert figure here showing that 1 or more PQI have a higher readmission rate than 0, and 2 more more higher than 1)) – if not received from Abby – use 2010 slide w/ volume of comorbidities
- ♦ Conclusion: It is the VOLUME of comorbidities not the TYPE of comorbidity that may explain the disproportionate readmission rate.

# The Safety-Net Readmit Population: Smaller

- ◆ ((Insert long tail pictoral of the #visits correlated to the # of patients))
- ◆ Conclusion: The majority of patients do not readmit. The safety-net population has a small percent of patients that make up a disproportionate share of readmissions (2 or more).

# Conditions of Vulnerability

Two physicians and one epidemiologist asked:

- Can we explain the drivers of readmission rate in the safety-net population based on what we see day-to-day?
- And Hypothesized:
- We can define “conditions of vulnerability” that are driving the readmission rate on this population based on clusters of ICD-9 codes that communicate vulnerable states.

# Conditions of Vulnerability

- ◆ There are 5 “conditions of vulnerability” defined by a cluster of ICD-9 codes
  - ◆ End-of-life
  - ◆ Frailty
  - ◆ Substance Use
  - ◆ Mental Illness
  - ◆ Chronic Pain/Immobility

# Conditions of Vulnerability: End-of-Life

- ◆ ((Insert ICD-9 codes and % of patients with this condition))
- ◆ ((Insert bar graph on increased readmission with this condition))



# Conditions of Vulnerability: Frailty

- ◆ ((Insert ICD-9 codes and % of patients with this condition))
- ◆ ((Insert bar graphBar graph showing increased 30-day Readmission rate compared to patients without condition

# Conditions of Vulnerability: Substance Abuse

- ◆ ((Insert ICD-9 codes and % of patient with this condition))
- ◆ ((Insert bar graph))

# Conditions of Vulnerability: Mental Illness

- ◆ ((Insert ICD-9 codes with % patients with this condition))
- ◆ ((Insert bar graph))

# Conditions of Vulnerability: Chronic Pain/Immobility

- 💧 ((Insert ICD-9 codes and % patients with this condition))
- 💧 ((Insert bar graph))

# Conditions of Vulnerability

- ◆ ((Insert here the bar graph showing that if you add the conditions of vulnerability to the ambulatory sensitive conditions, it will better identify those at risk of readmission and in need of intensified post-discharge and intensified ambulatory care))
- ◆ This is basically slide 13 but with the addition of the conditions

# Conclusion

- ◆ These conditions were much more significant than any other single variable run in the data analysis!
- ◆ Defining the population can help define the intervention:
  - ◆ Ambulatory palliative care program
  - ◆ Behavioral Health Transitions Team and Ambulatory Care Behavioral Health Integration
  - ◆ High-utilizer program: Use conditions as predictive variables to identify smaller group of patients at high-risk for readmission and intensify their post-discharge contact and ambulatory care



# Conclusion

- ◆ Defining the population and the intervention leads to better defining quality measures
- ◆ Consider new measures: 0-7 day readmission rate for the hospital quality indicator, 7-14 day readmission rate for the ambulatory care quality indicator
- ◆ Consider follow-up data analysis to understand system utilization of the readmit population and if ER and ambulatory care interventions can help

# Conclusion

- ◆ Collaboration between clinicians, IT, Quality department and the Epidemiology department can help us with ALIGNMENT of our integrated system as we move towards a quality reimbursed environment
- ◆ A data infrastructure will aid in targeting interventions with the most value to the system