Strategies to Reduce Hospital Readmissions

Efrén Manjarrez, M.D., SFHM, FACP

Associate Professor of Medicine

Division of Hospital Medicine

University of Miami Miller School of Medicine

emanjarrez@med.Miami.edu

UHealth University of Miami Health System | University of Miami Miller School of Medicine

Disclosures

Zero, zip, zilch, nada

Learning Objectives

- Identify Readmissions as a problem
- Identify your patient population at risk for readmissions
- Implement evidence-based strategies to reduce readmissions and track your data

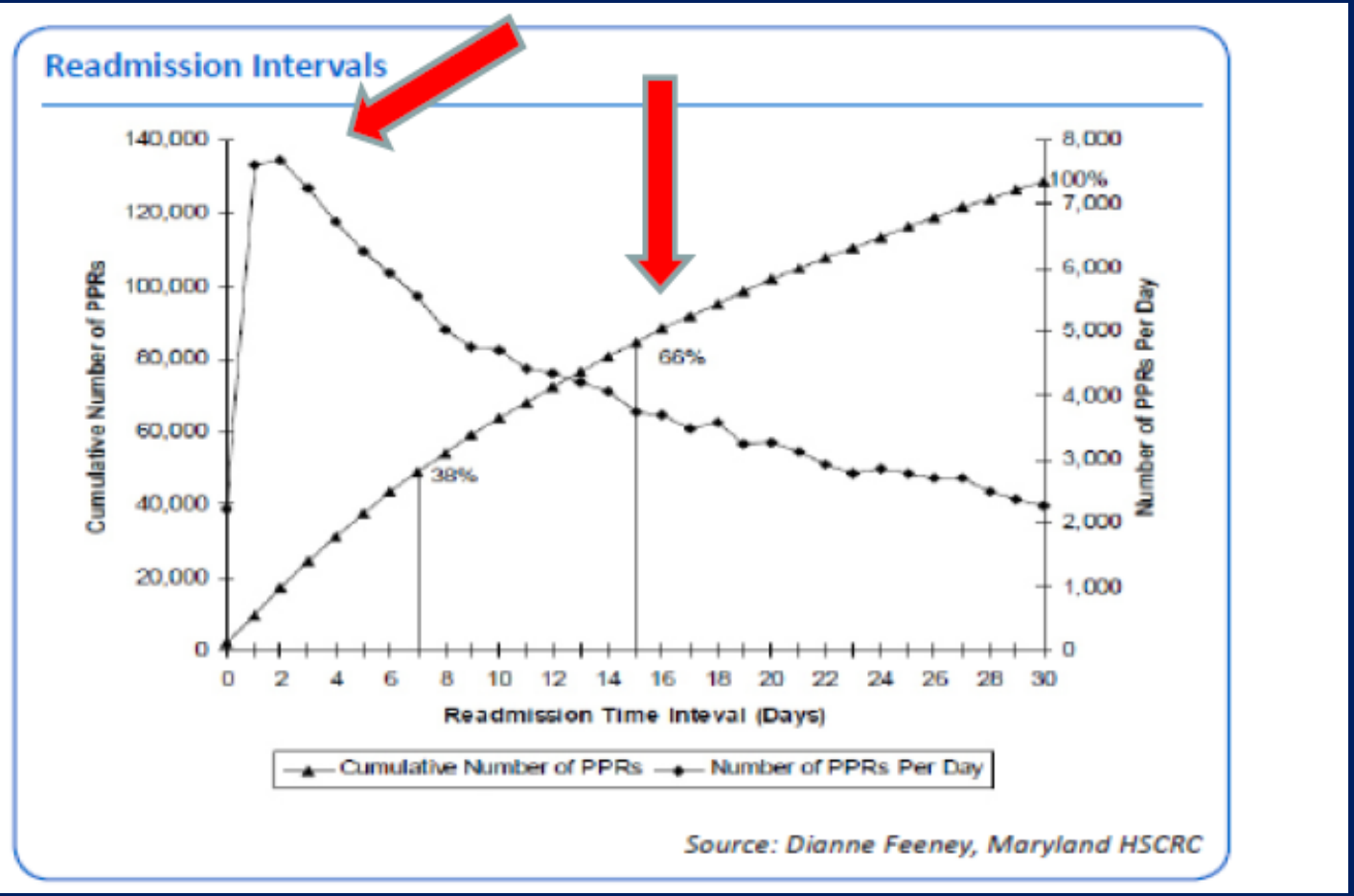
Agenda

- Scope of the Problem and Needs Assessment
- Who is at Risk?
  Risk Prediction Tools
- Single and Multiple Interventions to decrease readmissions
- Role of discharge summary and hospitalist to PCP communication
- Patient education and teach back
- Medication Discrepancies
- Gap/ Discharge clinics
- Drilling down and identifying your local patients at risk?

Major Themes

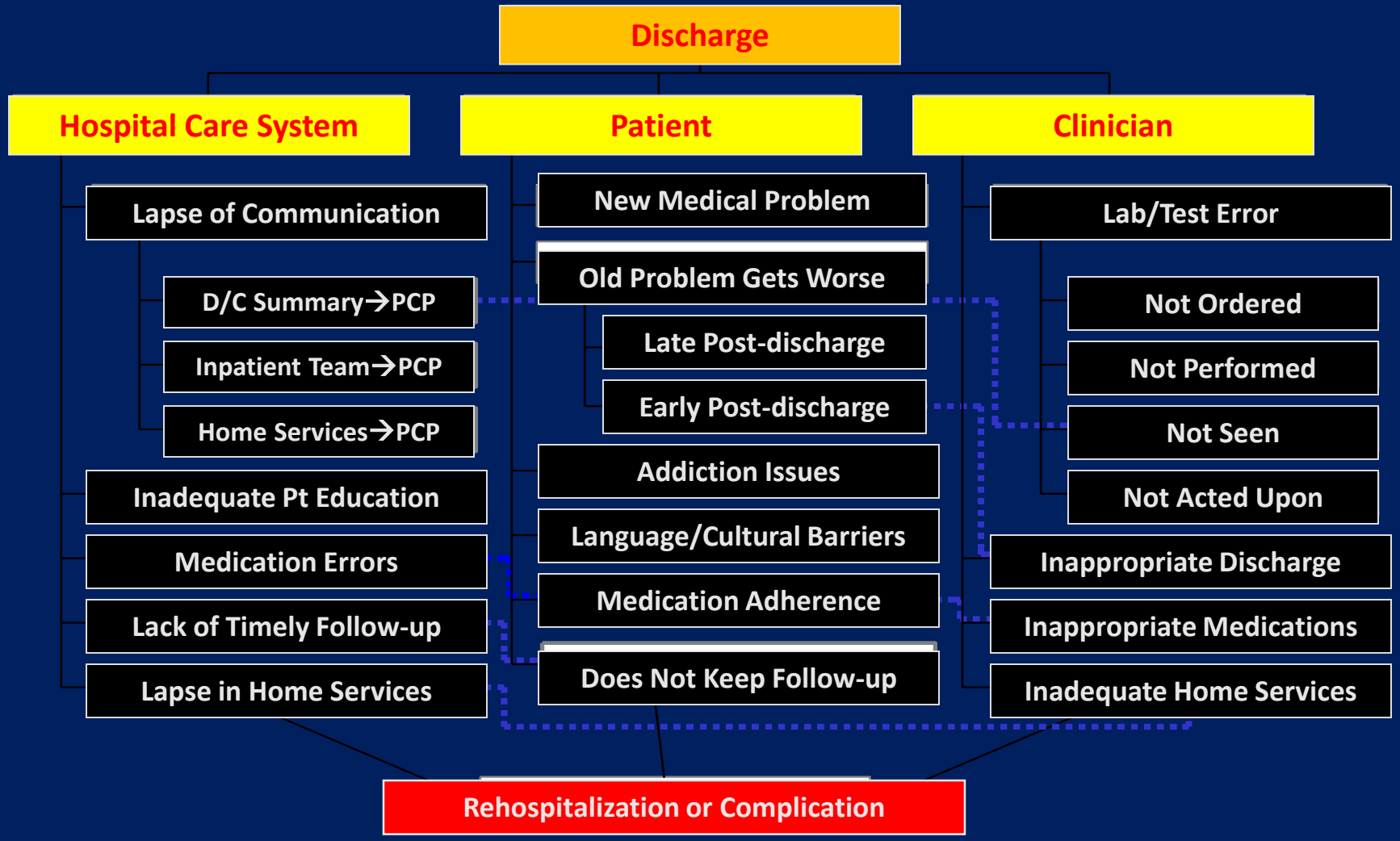
- Deficiencies in discharge planning result in adverse outcomes for patients.
- 30 day hospital readmission is strongly influenced by the care provided at the time of discharge
- CMS does not forgive anymore since 2012!

Institute for Healthcare Improvement (IHI)



Factors influencing re-hospitalization

Project RED
Boston
University



Who's at risk for 30 day readmissions?

Top 5 Diagnoses -Medical

- Heart Failure
- Pneumonia
- COPD
- Psychoses
- GI Disorders

Top 5 Diagnoses-Surgical

- Cardiac Stent Placement
- Major Hip or Knee Surgery
- Other Vascular Surgeries
- Major Bowel Surgery
- Other Hip or Femur Surgeries

Database review MEDPAR October 2003-December 2004 of > 11 M Medicare beneficiaries

Jencks SF N Engl J Med 2009 360:14, 1418-28.

Hard Clinical Outcomes

- Overall 30 day readmissions > 20% for medical conditions
- Overall 30 day readmissions was > 15% for surgical conditions
- Cost to Medicare > $17 B
- 30 day post discharge mortality 3%
- Authors found that 50.1% of patients who were readmitted < 30 days did not have a bill for outpatient follow-up at 30 days

Database review MEDPAR October 2003-December 2004 of > 11 M Medicare beneficiaries

Jencks SF N Engl J Med 2009 360:14, 1418-28.

Hmmmnnnn……

- How do these data compare with your institution? Surprised?
- Who keeps these data?
- Do you have a report card for MDs or provider groups?
- Do you communicate these data to MD’s or provider groups?

I don't know much about birds but I can easily identify the husband in this picture

Short Take: Physician Perspectives on Readmissions

- Cross sectional multi-centered study at 12 academic hospitals interviewed MDs involved in care of 993 patients readmitted < 30 days.
- PCPs=356, Admitting MDs=737, and Discharging MDs=675
- Cohort not very sick (Mean age 55, Cancer 17%, COPD=7%, Dialysis=13%, CHF=3%, Ischemic CVA=7%
- #1 reason cited was need for improved self management plan at discharge (52-55%)-no other factors received agreement
- Top 3 interventions suggested were: improved self management plan at discharge, greater engagement of home and community resources, and provision of resources to manage care at home and symptoms (47-60%)

Herzig J Gen Intern Med 2016: 31(11): 1287-93

HOSPITAL SCORE
Predicts Preventable Readmissions

Background: Tools are needed to identify potentially preventable readmissions to minimize financial penalties from CMS.

Research Question: Does the HOSPITAL score predict readmission for the four conditions of the Hospital Readmission Reduction Program (HRRP) which are: Acute MI, COPD, Pneumonia, and Heart Failure?

Methods: Retrospective Cohort N=9,081

All patients discharged with above 4 conditions at 6 academic medical centers calendar year 2011

Outcomes: 30 day readmissions for the four conditions above

Burke Medical Care 2017; 55(3):285-290

HOSPITAL SCORE

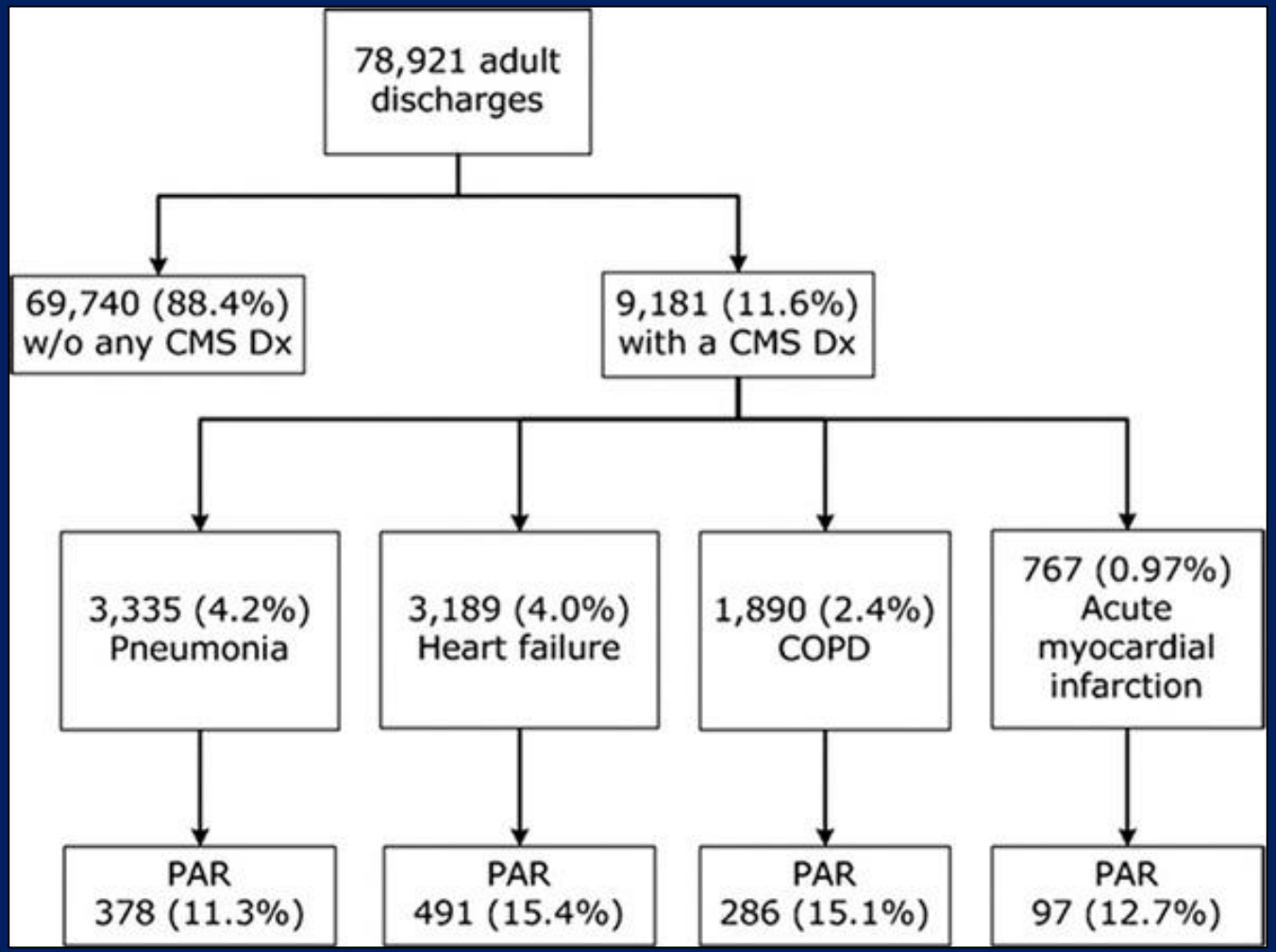
Characteristics	Value	Points
Low Hemoglobin level at discharge (< 12 g/dL)	Yes	1
Discharge from an Oncology service	Yes	2
Low Sodium level at discharge (< 135 mmol/L)	Yes	1
Procedure during hospital stay	Yes	1
Index admission Type: urgent or emergent	Yes	1
No. hospital Admissions in prior year	≤ 1	0
	2–5	2
	≥ 5	5
Index hospitalization Length of stay ≥ 5 d	Yes	2

The HOSPITAL score has 13 total points as scored above.

Bold indicates the letters associated with the HOSPITAL acronym from each characteristic.

Burke Medical Care 2017; 55(3):285-290

HOSPITAL SCORE Patient Population



Burke Medical Care 2017; 55(3):285-290

Characteristics	Potentially Preventable Readmission (N = 1252) (13.6%)	No Potentially Preventable Readmission (N = 7929) (86.4%)	P
Age [mean (SD)] (y)	65.4 (15.9)	65.9 (17.0)	0.21
Male (%)	51.4	47.5	0.01
Hospital diagnosis (%)			<0.01
Pneumonia	30.2	37.3	
Heart failure	39.2	34.0	
COPD	22.8	20.2	
Acute MI	7.8	8.5	
Low Hemoglobin level	66.5	58.1	<0.01
Discharge from Oncology service	3.8	2.2	<0.01
Low Sodium level	82.2	86.2	<0.01
Procedure during hospital stay	70.2	67.5	0.06
Urgent or emergent Index admission Type	87.9	85.9	0.06
No. Admissions in past year			<0.01
≤1	40.3	66.0	
2–5	41.2	29.7	
>5	18.5	4.4	
Index hospital LOS ≥5 d	49.8	42.5	<0.01
HOSPITAL score categories			<0.01
Low risk (≤4 points)	515 (41.1)	4922 (62.1)	
Intermediate risk (5–6 points)	347 (27.7)	2027 (25.6)	
High risk (≥7 points)	390 (31.2)	980 (12.4)	

Bold signifies letters comprising the HOSPITAL score and statistically significant *P*-values.
COPD indicates chronic obstructive pulmonary disease; HRRP, Hospital Readmissions Reduction Program; LOS, length of stay; MI, myocardial infarction.

Entire cohort
30 day
readmissions
13.6%

Burke Medical Care 2017; 55(3):285-290

Characteristics	Discharges (N)	30-Day Readmission Rate (%)	Brier Score	*c*-Statistic (95% CI)	Hosmer-Lemeshow (*P*)
All CMS diagnoses	9181	13.6	0.11	0.68 (0.66–0.70)	0.77
Pneumonia	3335	11.3	0.10	0.68 (0.65–0.71)	0.76
Heart failure	3189	15.4	0.12	0.68 (0.65–0.70)	0.17
Acute MI	767	12.7	0.11	0.67 (0.61–0.72)	0.16
COPD	1890	15.1	0.12	0.71 (0.67–0.74)	0.81

CI indicates confidence interval; CMS, Center of Medicare and Medicaid Services; COPD, chronic obstructive pulmonary disease; MI, myocardial infarction.

Potentially preventable

Characteristics	Discharges (N)	30-Day Readmission Rate (%)	Brier Score	*c*-Statistic (95% CI)	Hosmer-Lemeshow (*P*)
All CMS diagnoses	5087	13.2	0.11	0.66 (0.63–0.68)	0.27
Pneumonia	1717	11.8	0.10	0.64 (0.60–0.69)	0.27
Heart failure	1918	14.1	0.12	0.68 (0.64–0.71)	0.37
Acute MI	421	12.4	0.12	0.68 (0.61–0.76)	0.56
COPD	1031	14.1	0.10	0.67 (0.62–0.72)	0.71

CI indicates confidence interval; CMS, Center of Medicare and Medicaid Services; COPD, chronic obstructive pulmonary disease; MI, myocardial infarction.

Potentially preventable Age > 65

Characteristics	Discharges (N)	30-Day Readmission Rate (%)	Brier Score	*c*-Statistic (95% CI)	Hosmer-Lemeshow (*P*)
All CMS diagnoses	9181	16.3	0.13	0.68 (0.66–0.69)	0.41
Pneumonia	3335	13.8	0.13	0.68 (0.65–0.70)	0.49
Heart failure	3189	18.2	0.13	0.67 (0.65–0.70)	0.10
Acute MI	767	17.4	0.13	0.66 (0.61–0.71)	0.49
COPD	1890	16.6	0.13	0.70 (0.67–0.73)	0.84

CI indicates confidence interval; CMS, Center of Medicare and Medicaid Services; COPD, chronic obstructive pulmonary disease; MI, myocardial infarction.

All 30 day readmissions

Cohort C Stat 0.68 and Brier score 0.11 (lower is better)

Burke Medical Care 2017; 55(3):285-290

I WAS BORN TO BE WILD.....
BUT ONLY UNTIL ABOUT 9 PM OR SO!!

LACE Score Predicts Readmissions and Mortality

Background: Readmissions to hospital are common, costly and often preventable. An easy-to-use index to quantify risk of readmission or death after discharge from hospital would help clinicians identify patients who might benefit from more intensive post-discharge care.

Research Question: To derive and validate a clinically useful index to quantify the risk of early death or unplanned readmission among patients discharged from hospital to the community.

Validated with 1 M other discharges in Ontario

Methods: Prospective Cohort Study N=4,812 medical and surgical pts.

11 Hospitals 6 academic and 5 community Western Ontario, Canada
48 patient variables

Outcomes: Death and readmission at 30 days

Van Walraven CMAJ 2010; 182(6):551-57

Table 2

Final logistic regression model for risk of death or unplanned readmission within 30 days after discharge (derivation group only, *n = 2393*)

Variable	Odds ratio (95% CI)
Length of stay in days (logarithm)	1.47 (1.25–1.73)
Acute (emergent) admission	1.84 (1.29–2.63)
Comorbidity (Charlson comorbidity index score)	1.21 (1.10–1.33)
Visits to emergency department during previous 6 mo, (√)	1.56 (1.27–1.92)

Van Walraven CMAJ 2010; 182(6):551-57

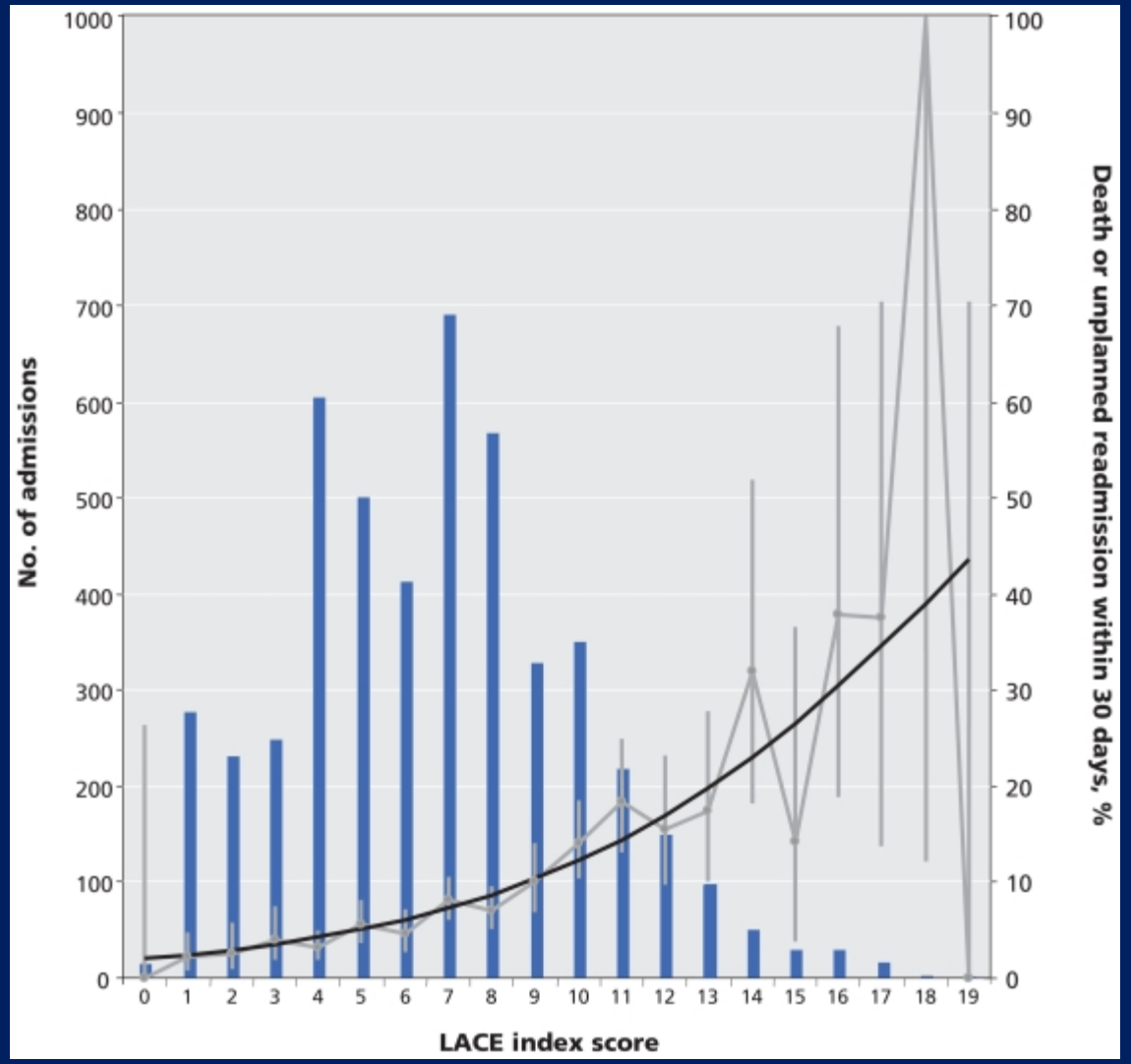
Table 3

LACE index for quantification of risk of death or unplanned readmission ≤ 30 days after discharge

Attribute	Value	Points[*]
Length of stay, d ("L")	< 1	0
	1	1
	2	2
	3	3
	4–6	4
	7–13	5
	≥ 14	7
Acute (emergent) admission ("A")	Yes	3
Comorbidity (Charlson comorbidity index score[†]) ("C")	0	0
	1	1
	2	2
	3	3
	≥ 4	5
Visits to emergency department during previous 6 mo ("E")	0	0
	1	1
	2	2
	3	3
	≥ 4	4

Van Walraven CMAJ 2010; 182(6):551-57

↑ LACE Score= ↑ Risk of Outcome



- Overall, 8% of cohort died or were readmitted ≤ 30 days after index admission
- LACE Score range (0- 19)

Van Walraven CMAJ 2010; 182(6):551-57

Project RED (Re-engineered Discharge)

- RCT of 11 interventions to decrease utilization after hospital discharge
- 749 patients
- Nurse discharge advocate and clinical pharmacist worked with the medical team
- Primary Outcomes: ER Visits and 30 day readmission (sum="Hospital Utilization")

Jack BW Ann Intern Med. 2009;150(3):178–187.

Role of Discharge Advocate

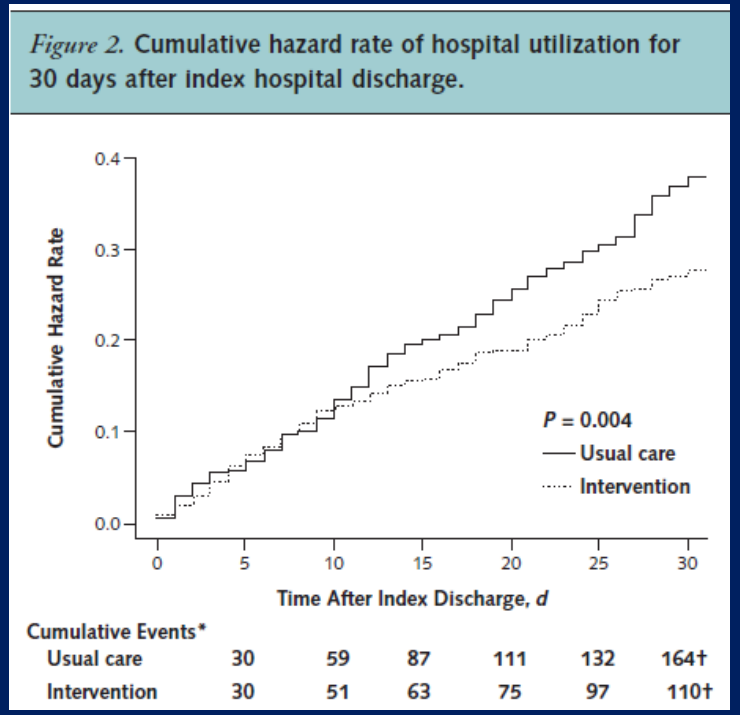
- Patient Education
- Make follow-up medical appointments
- Review pending tests and coordinate outpatient follow-up of results
- Organize home health services
- Medication Reconciliation
- Teach Back
- Reconcile Discharge Plan with Clinical Pathways
- Anticipatory Guidance
- Make sure expedited discharge summary arrives at PCP office
- Copy of written discharge plan to patient

***Hospital Pharmacist then calls patient
2-4 days later to reinforce the plan

Jack BW Ann Intern Med. 2009;150(3):178–187.

Results Project RED

Primary Outcome Variable (< 30 days) (visits/pt/mo.)	Usual Care	Intervention Group	P Value
# Patients	368	370	
Hospital utilization	166	116	0.009
ER Visits	90	61	0.014
Readmission	76	55	0.090



Jack BW Ann Intern Med. 2009;150(3):178–187.

Results Project RED

Secondary Outcomes	Usual care N=308	Intervention Group N=307	P Value
Able to identify discharge diagnosis	217	242	0.017
Able to identify PCP name	275	292	0.007
Visited PCP	135	190	<0.001
How well were your questions answered before you left the hospital?	108	129	0.002
How well did you understand your appointments after you left the hospital?	219	254	0.025
How well did you understand how to take medications after leaving the hospital?	233	264	0.049
How well did you understand your main problem or diagnosis when you left the hospital?	167	198	0.014
How prepared were you to leave the hospital?	163	197	0.013

Jack BW Ann Intern Med. 2009;150(3):178–187.

Discussion Project RED

- Saved $143K in readmission costs
- Decreased Hospital Utilization after index admission (more for those with higher utilization in 6 months prior to admission)
- Increased PCP follow-up and readiness for discharge

Jack BW Ann Intern Med. 2009;150(3):178–187.

Poor Handoff Communication at Hospital Discharge

Kripalani et al *JAMA 2007* Retrospective Analysis describes deficits in communication and information transfer at discharge:

- PCP notification of discharge (17-20%)
- PCP involvement in discharge plan (3%)
- Availability of discharge summary at first fu visit (12-34%) and at 4 weeks (51-77%)

Kripalani et al *JAMA 2007*

AND poor quality discharge summaries when available

Information deficits in discharge summary:

Diagnostic Test Results	33-63%
Treatment/ Hospital Course	7-22%
Discharge Medicines	2-40%
Test Results Pending at Discharge	33-63%
Patient/ Family Counseling	90-92%
Follow-Up Plans	2-43%

Kripalani et al *JAMA 2007*

My Take on Kripalani's Study

- Yeah, but Dr. Manjarrez, *we have EMR now* since the study was published in 2007!
- Q: Yes, but what if patient *does not* routinely receive care in your health system, is new to the area, or does not have a PCP?

A: Print discharge summary for patient and have patient act as a courier of their discharge summary- Patient Responsibility matters

- Discharge summary should communicate what is patient's functional ability at discharge AND HOW IT DIFFERS FROM PREADMISSION FUNCATIONAL CAPACITY
- Tell each outpatient provider what they are responsible for: Cardiology: FU INR on Warfarin 5 mg and PCP please FU BMP because Furosemide and Lisinopril doses were increased. At discharge Cr=1.0 and K=4.1.
- Name and cell number of inpatient MD!!

Does Patient Education Matter?

Performed RCT on 4 pillars of patient education

1. Assistance with medication self-management
2. Patient-centered personal health record owned and maintained by the patient to facilitate cross-site information transfer
3. Timely follow-up with PCP or specialist
4. “Red Flags” and how to respond

Coleman et al Arch Intern Med 2006

Multi-faceted Patient Education approach

Intervention included

1. a transitions coach
2. follow-up visits
3. phone calls

- Outcome: Non-elective 30, 90, 180 day readmission

Coleman et al Arch Intern Med 2006

Patient Education *works!*

Variable	Intervention Group N=379	Control Group N=371	Adjusted 2-sided P Value
Rehospitalization	**All Cause**		
30 days	**8.3**	**11.9**	***0.48****
90 days	**16.7**	**22.5**	***0.04****
180 days	**25.6**	**30.7**	**0.28**
Rehospitalization	**Same diagnosis as index admission**		
30 days	**2.8**	**4.6**	**0.18**
90 days	**5.3**	**9.8**	***0.04****
180 days	**8.6**	**13.9**	***0.046****

Coleman et al Arch Intern Med 2006

Limitations

- Must be English speaking, so unclear of efficacy in Limited English Proficiency patients
- Does not account for health care illiterate patients
- Excludes patients with diagnosis of dementia

Coleman et al Arch Intern Med 2006

English Limited-Proficiency Patients *<u>are also readmitted!</u>*

Medication Discrepancies after Hospital Discharge

- Prospective study looking at factors contributing to medication discrepancies after discharge
- N=375
- Geriatric Nurse Practitioner made home visits 24-72 hours after hospital discharge

Coleman et al Arch Intern Med 2005

Error free medication reconciliation *improves outcomes!*

- Patients with no medication discrepancies had a 30-day rehospitalization rate of 6.1% versus 14.3 % for patients who experienced discrepancies (P=0.04)
- Assessments reveal 53 patients (14.1%) had at least 1 medication discrepancy.
- Patients who experienced medication discrepancies were receiving an average of 9 medications (4-18 meds; P<0.001)
- Unfilled prescriptions were 5%
- 33% unintentionally were not adherent to their meds

Coleman et al Arch Intern Med 2005

Categorization of Medication Discrepancies

Factor	Frequency, n (%)
Patient Related	
Did not fill prescription	6 (4.8)
Money/ financial barriers	7 (5.6)
Intentional non-adherence	6 (4.8)
Unintentional non-adherence	**42 (33.9)**
Health Care System Related	
Conflicting information from different sources	18 (14.5)
Discharge instructions incomplete, inaccurate, or illegible	20 (16.1)
Duplication	10 (8.1)

Just once I would like to read a medication label that says:

"May cause permanent weight loss, remove wrinkles and increase energy."

My Take: Hospitalist 7 on 7 off handoffs and therapeutic switch due to hospital formulary

Especially psychiatric medications!

Coleman et al Arch Intern Med 2005

Outpatient CHF Clinic Reduces 30 day Readmission Rates and Mortality

Background: CHF is leading cause of hospitalization and readmission over age 65, and prevalence is expected to increase.

Research Questions: What are the outpatient care processes and do these reduce 30 day all-cause readmission and inpatient mortality?

Methods: Retrospective analysis

N=415 adults enrolled in heart failure clinic in upstate New York

Outcomes:

Primary:30 day readmission, mortality

Secondary: Multiple

Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

Care processes in detail…

- Admitting MD contacts Heart Failure Clinic (HFC) RN-CCC , 48 hours of admission
- RN CCC (Clinical care coordinator) monitors EMR while patient is admitted with CHF
- RN CCC contacts patient ≤ 2 days of discharge to schedule FU at 7-14 days
- At clinic, patients Rx automated BP cuffs, weighing scales, and educated about self monitoring
- RN CCC calls patients Q week for first 60 days
- When patients fail to respond to treatment , goals of care, including palliation, are discussed

Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

Demographics

Characteristic	*n*	%
Gender		
Male	229	55.2
Female	186	44.8
Age in years (*M* and *SD*)	72.3	13.6
BMI (*M* and *SD*)	29.7	8.2
Race		
White	350	84.3
Black	53	12.8
Hispanic	8	1.9
Asian	2	0.5
Other (Native American, Alaskan, Caribbean)	2	0.5
History of smoking	244	58.8
Patients with systolic HF (ejection fraction ≤ 40%)	226	54.5
Ejection fraction in patients with systolic HF (%; *M* and *SD*)	26.4	8.0

Note. Age ranged from 24 to 96 years. BMI ranged from 15.0 to 64.6. Ejection fraction in patients with systolic HF ranged from 10% to 40%. BMI = body mass index; HF = heart failure.

Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

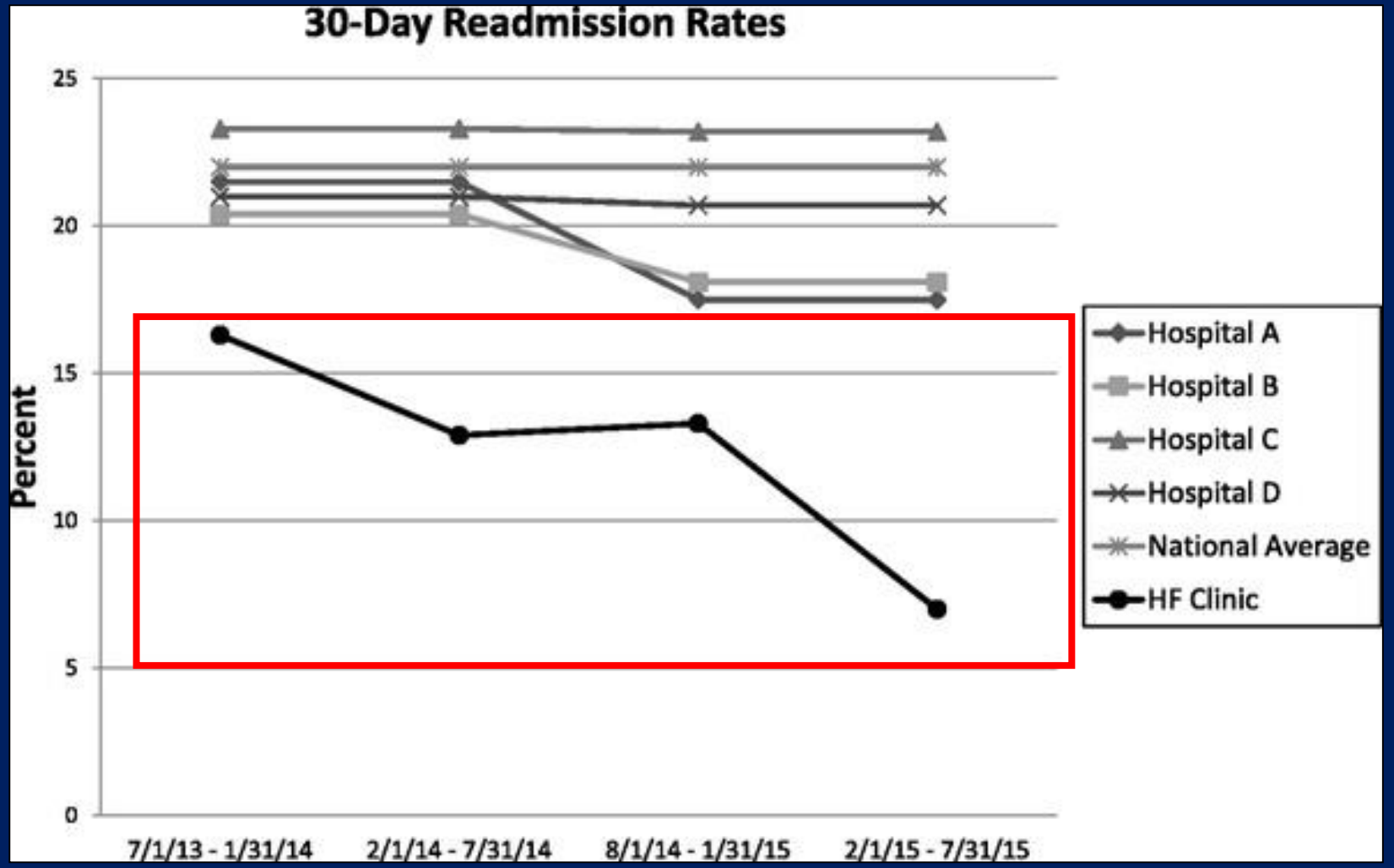
Clinical Processes at CHF Clinic

Clinic Service	*n*	%
Two-day call made	387	93.3
Diuretic changes at the initial visit	186	44.8
Increased	152	36.6
Decreased	22	5.3
Initiated	12	2.9
Self-monitoring education	324	78.1
	Mean	***SD***
Number of medication changes per patient	2.09	1.78
Number of calls made to patient in 60 days by RN-CCC	5.53	3.62
Number of days postdischarge seen for the initial visit in clinic	8.59	7.44

Note. RN-CCC = registered nurse clinical care coordinators.

Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

30 day Readmission Rates *Reduced!*



Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

Mortality

Characteristic	*n*	%
Total number of patients referred for palliative care (*N* = 415)	71	17.1
• Patients who died as an outpatient under palliative care (*N* = 71)	50	70.4
• Patients who died inpatient but were referred to palliative care (*N* = 71)	9	12.7
Total patient deaths that were referred to palliative care (*N* = 71)	59	83.1
Total patient deaths within 2 years (*N* = 415)	128	30.8
• % of total deaths in palliative care by total patient deaths within 2 years (*N* = 128)	59	46.1

Koser KD J Nurs Res. 2018 Dec; 26(6):393-98

Short Take: Role of Hospital Pharmacists in Readmissions Reduction

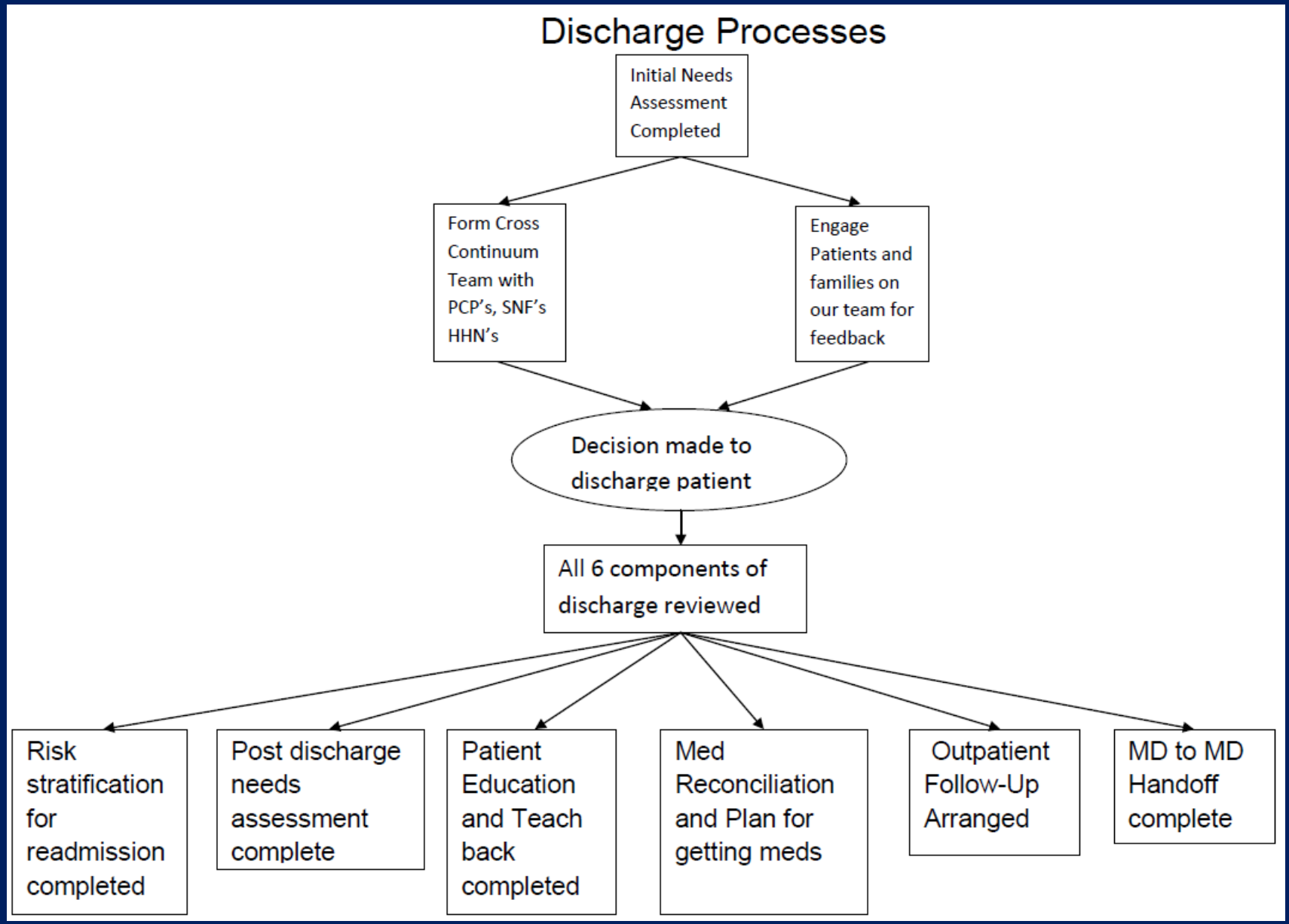
- Systematic Review of articles evaluating the effectiveness of interventions involving pharmacists to reduce hospital readmissions
- N=29 studies met criteria
- 55% of studies (N=16) showed a statistically significant reduction in readmissions from 3-30%
- Interventions deemed successful were patient education post discharge and medication reconciliation pre-discharge
- Authors concluded that the review highlights the role that pharmacists play either alone or as part of interdisciplinary teams

Bach QN Journal of Pharmacy Practice 2018: 1-8

IHI Suggested Approach to Readmissions…

- Needs Assessment: What are we doing wrong?
- Expanded Needs Assessment (IHI) (UHealth)
- Forming Cross Continuum Teams (IHI)
- Patient Education and Teach-Back
- Medication Reconciliation
- Pass the Baton… (Handoff to next provider)
- Arranging Outpatient Follow-up
- Engaging Patients and Families in Change

Discharge Processes



Needs Assessment…
What are we doing wrong?

Create a dashboard of the following:

- **Which floors or SNF's have highest readmission rates**
- **% of average daily census due to readmitted patients**
- **Days between dc and readmission**
- **fu scheduled %**
- **ER or UCC visits % and days since dc**
- **functional status- unclear**
- **Clear discharge plan?**
- **teach back %**
- ***document the reason for readmission! Social issues> medical reasons!**

Needs Assessment…
What are we doing wrong?

- **Interview patient and family members**
- **Why sick enough to return back?**
- **MD visit after dc?**
- **Difficulties scheduling/ getting to MD visits?**
- **How take meds?**
- **Meals since dc? (High salt, poor compliance)**
- **Action Item: Create interview tool**

Forming Cross Continuum Teams (IHI)

- Create partnerships with SNF/ LTAC/ Rehab
- Site visits to SNF/ LTAC/ Rehab facilities
- Watch an intake- med rec, RN and MD Handoffs?
- Have them visit us
- Frequent meetings

Patient Education and Teach-Back

- Identify “key learners” early in hospitalization
- Teach multiple times in during admission
- Standardize teach-back for all providers for all diseases across all facilities in non-threatening manner. Who teaches what? MD, RN’s
- “Sometimes I talk fast …Let me see how well I taught you”
- A) Diagnosis
- B) “Red flags”
- C) What to do about red flags

Reader-friendly Print Materials

- Consider use of terms e.g. ‘Heart Failure’ rather than ‘Congestive Heart Failure’ or ‘Chronic HF’
- Remove ranges
- Increase font size
- Two word explanations e.g. ‘water pill’ or ‘blood pressure pill’
- On all written materials, **match terminology** to what is taught or provided in classes

Reader-friendly Print Materials

- User-friendly written materials use:
  - Simple words (1-2 syllables)
  - Short sentences (4-6 words)
  - Short paragraphs (2-3 sentences)
  - No medical jargon
  - Headings and bullets
  - Highlighted or circled key information
  - Lots of white space
  - Use visual aids
  - Be careful with color

Institute for Healthcare Improvement

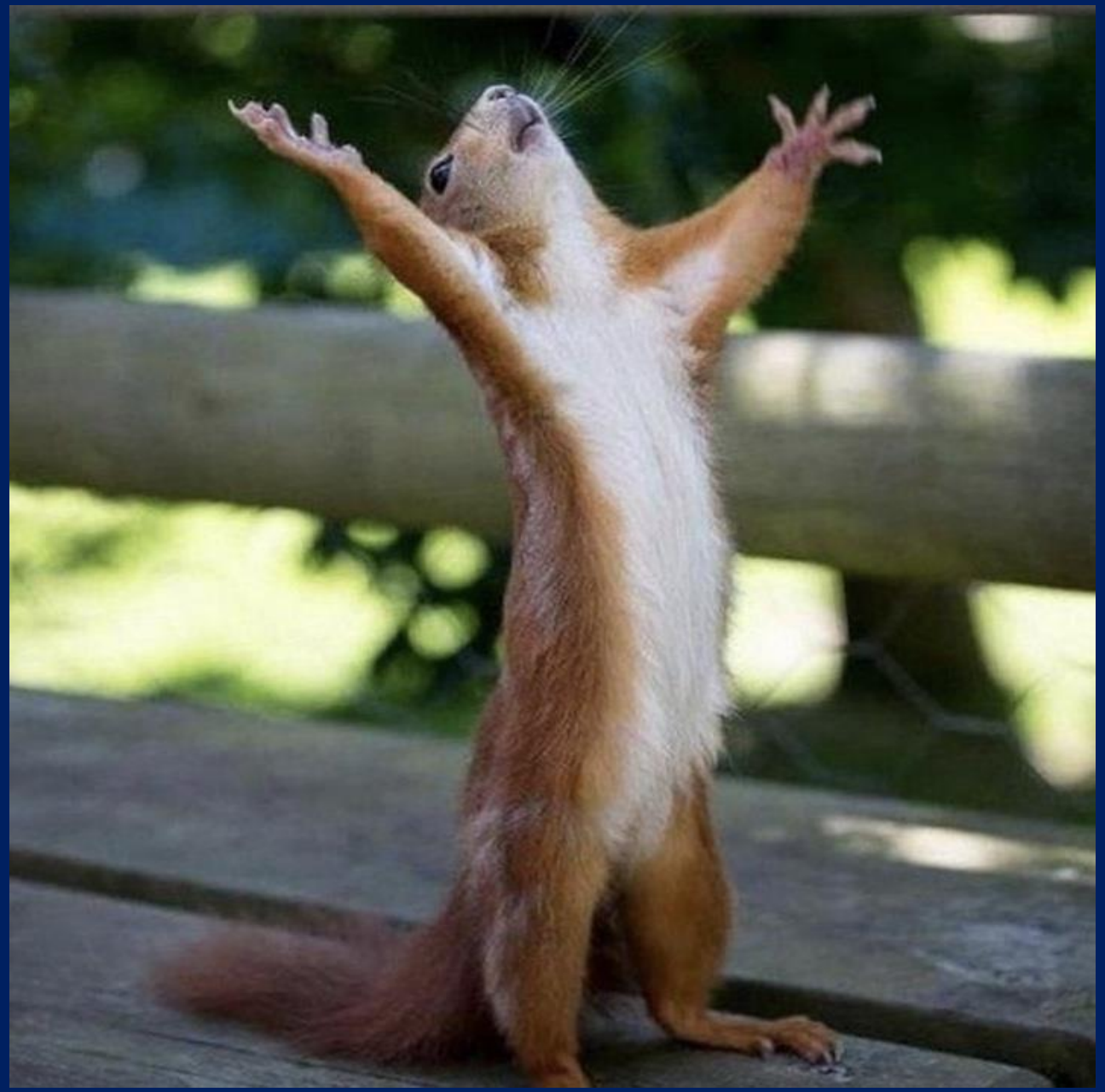
Does Telemedicine reduce readmissions?

- Systematic review of 12 studies using telemedicine to reduce CHF readmissions performed
- Six supported the intervention
- Six refuted the intervention
- Best studies refuted intervention:

  More Beta blockers, ACEI, and multi-centered
- Authors did not feel the intervention

  was ready for prime time

Garcia Clinical Medicine Insights: Cardiology 2019; 13:1-12



What Did We Cover?

- Who is at Risk?
  Risk Prediction Tools
- Single and Multiple Interventions to decrease readmissions
- A Framework to Identify your local patients at risk and a structure to implement your readmissions reduction program from IHI

Take Home Points

- CHF, COPD, Pneumonia are still most common medical reasons for readmissions
- Surgical causes of readmissions still there
- HOSPITAL and LACE Scores are two examples of validated risk prediction tools you may consider using
- Multiple strategies either alone or in combination, will reduce readmissions
- Project RED has all of the bells and whistles- 11 of them

Take Home Points

- Discharge handoff, Patient Education, eliminating medication discrepancies, and gap clinics are single interventions shown to reduce readmissions
- Telemedicine is not yet ready for prime time
- Partner with your SNF colleagues for smooth transitions of care
- Hospital pharmacists are also great
- IHI has a structured approach related to how to drill down in RCA fashion

Thank You!