Increasing Discharge Rates of Patients with Congestive Heart Failure Exacerbations from the Emergency Department

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Increasing Discharge Rates of Patients with Congestive Heart Failure Exacerbations from the Emergency Department

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Background

- CHF Statistics
  - 6.5 million Americans affected in 2014
  - 660,000 new cases annually
  - Exponential growth with age, affects 6-10% of people over 65 in developed countries
  - 509,000 ED visits in 2012
  - 4% die during hospitalization, 10% die within 30 days of hospitalization, 30% die within one year of hospitalization
  - 25% 30-day readmission rate
  - Most expensive DRG, averages $7,383 per admission vs $951 per outpatient treatment
- LVHN Statistics
  - ~94% admission rate in 2016, 5th percentile nationally for discharges
  - Average performance in readmissions at 20%
- Changes in US Healthcare System increasing urgency to control costs of CHF
  - New "values-based" payment models, moving away from "fee-for-service" models
  - Hospitals with high readmission rates penalized through reduced reimbursements
  - Some physicians view many ED admissions unnecessary
  - Recent research into risk stratification tools to aid in ED disposition decisions

Problem Statement

- Can a standardized, evidence-based care pathway emphasizing earlier treatment increase the percentage of patients who are appropriately discharged from the emergency department after presenting with an acute exacerbation of congestive heart failure?

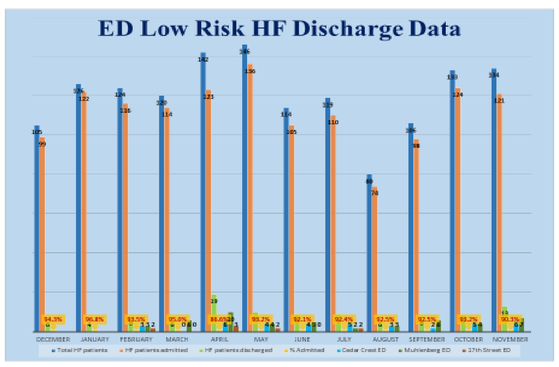
Methods

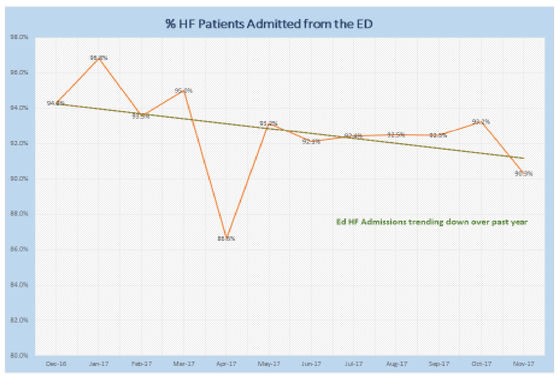
- Pathway from outside hospital, adapted to LVHN by ED site directors.
- Project deemed QI, IRB approval not needed.
- Pathway made available electronically via PolicyTech, appropriate staff made aware via email
- Implementation Efforts:
  - Nursing staff education by nursing leadership
  - Point of care reinforcement
    - In ED discussion with physicians
    - In ED distribution of educational materials
  - Creation of Epic Order Set
  - 2 Grand Rounds presentations to ED faculty and residents
  - Educational materials:
    - Synopsis paper summarizing pathway's importance
    - FAQ paper
    - Simplified version of pathway highlighting salient points
- Data obtained via Epic from all LVHN EDs
- Baseline inpatient conversion rate determined by Medicare Claims Data from 11/2015-12/2016
- Patients flagged using relevant ICD10 codes from 12/2016-11/2017
- Admissions and discharge rates tracked and summarized monthly
- Regression analysis performed in Microsoft Excel on admitted patients over time

Results

- Mean admission rate 92.7% vs baseline of 93.8%
- Monthly decrease in admissions of 0.27%
- R value of -0.353 and R^2 of 0.125

Month		Admitted	Discharged	Total	Percentage
December	1	99	6	105	94.3
January	2	122	4	126	96.8
February	3	116	8	124	93.5
March	4	114	6	120	95
April	5	123	19	142	86.6
May	6	136	10	146	93.2
June	7	105	9	114	92.1
July	8	110	9	119	92.4
August	9	74	6	80	92.5
September	10	98	8	106	92.5
October	11	124	9	133	93.2
November	12	121	13	134	90.3



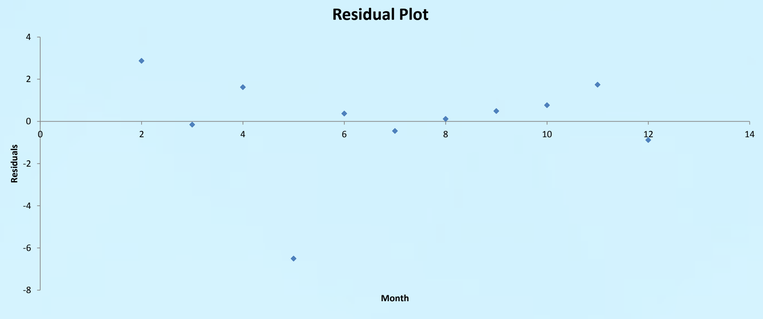


Regression Statistics	
Multiple R	0.353082368
R Square	0.124667159
Adjusted R Square	0.027407954
Standard Error	2.543313674
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	8.291272727	8.291272727	1.281803191	0.286825786
Residual	9	58.216	6.468444444		
Total	10	66.50727273			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	94.47636364	1.862642849	50.72167414	2.25904E-12	90.26277277	98.6899545	90.26277277	98.6899545
1	-0.274545455	0.242495444	-1.132167475	0.286825786	-0.82310826	0.274017351	-0.82310826	0.274017351



Discussion

- Regression analysis showed downward trend in admission rates; however, trend not attributable to time, i.e. pathway implementation. Project's problem statement remains unsolved.
- Project Limitations
  - Implementation taking place during transition period for LVHN's process for knowledge translation
  - Suspected provider noncompliance
- Future Implications
  - Continue with educational efforts, specifically focusing on literature justifying the pathway's discharge criteria
  - Focus on treatment time, specifically time to receiving diuretic
  - Currently devising individualized provider feedback mechanism: Epic Dashboard with admissions and discharge rates, revisit and readmission rates, and time to treatment statistics
  - Consider developing computerized decision aid.
- Project Relationship to SELECT Principles
  - Values-based Patient Centered Care
    - Reducing unnecessary hospitalizations, improving quality through standardization
  - Healthcare Systems
    - Interprofessional work needed to utilize the care pathway, including physicians, AHPs, nursing staff
    - Cost containment through decreasing unnecessary hospitalizations

Conclusions

- This project attempted to implement an evidence-based care pathway for acute exacerbations of CHF in the ED in hopes of increasing the percentage of patients discharged from the ED without inpatient hospitalization. This goal implies an improvement in the care of CHF exacerbations, a disease associated with a very high mortality rate and huge costs to the healthcare system, making this project largely significant. However, this goal remains unrealized as results of the project are inconclusive after analysis showed the decreasing admissions rate not attributable to time. As such, the project should continue, utilizing proven methods for prompting behavior change as well as other creative ways to make the pathway's adoption easier.

REFERENCES

1. Benjamin EJ, Blaha MJ, Chiuve SE, et al. Heart disease and stroke statistics—2017 update; a report from the American Heart Association [published online ahead of print January 25, 2017].
2. Abraham WT, Fonarow GC, Albert NM, et al. Predictors of in-hospital mortality in patients hospitalized for heart failure: insights from the Organized Program to Initiate Lifesaving Treatment In Hospitalized Patients with Heart Failure (OPTIMIZE-HF). J Am Coll Cardiol.2008; 52(5):347-356.
3. Loehr LR, Rosamond WD, Chang PP, Folsom AR, Chambless LE. Heart failure incidence and survival (from the Atherosclerosis Risk in Communities study). Am J Cardiol. 2008; 101(7):10161022.
4. Chang PP, Chambless LE, Shahar E, et al. Incidence and survival of hospitalized acute decompensated heart failure in four US communities (from the Atherosclerosis Risk in Communities Study). Am J Cardiol. 2014; 113(3):504-510.
5. Bradley EH, Curry L, Horwitz LI, et al. Hospital strategies associated with 30-day readmission rates for patients with heart failure. Circ Cardiovasc Qual Outcomes. 2013; 6(4):444-450.
6. Lee DS, Austin PC, Rouleau JL, Liu PP, Naimark D, Tu JV. Predicting mortality among patients hospitalized for heart failure: derivation and validation of a clinical model. JAMA. 2003; 290(19):2581-2587.
7. Heidenreich PA, Albert NM, Allen LA, et al. Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. Circ Heart Fail. 2013; 6(3):606619.
8. Centers for Medicare and Medicaid Services. 42 CFR Parts 412, 413, 413, et al. Medicare Program; Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals and Long-Term Care Hospital Prospective Payment Systems and Fiscal Year 2013 Rates. In Centers for Medicare and Medicaid Services, ed. Vol CMS-1588-F: Department of Health and Human Services; 2012:494
9. Centers for Medicare and Medicaid Services. Readmissions reduction program. 2014; CMS Policy Document. Available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html.
10. Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation. 3; 128(16):e240-e327.
11. What is "quality improvement" and how can it transform healthcare? Paul B Batalden and Frank Davidoff, Qual Saf Health Care. 2007 Feb; 16(1): 2–3.
12. Brophy JM, Deslauriers G, Boucher B, Rouleau JL. The hospital course and short term prognosis of patients presenting to the emergency department with decompensated congestive heart failure. Can J Cardiol 1993; 9:219–24
13. Pang PS, Jesse R, Collins SP, Maisel A. Patients with acute heart failure in the emergency department: do they all need to be admitted? J Card Fail 2012; 18:900–3.
14. Collins SP, Pang PS, Fonarow GC, Yancy CW, Bonow RO, Gheorghiade M. Is hospital admission for heart failure really necessary? The role of the emergency department and observation unit in preventing hospitalization and rehospitalization. J Am Coll Cardiol 2013; 61:121–6.
15. Schrager J, Wheatley M, Georgiopoulou V, et al. Favorable bed utilization and readmission rates for emergency department observation unit heart failure patients. Acad Emerg Med 2013; 20:554–61.
16. Stiell I.G., et al. *A risk scoring system to identify emergency department patients with heart failure at high risk for serious adverse events.* Academic Emergency Medicine, 2013. 20(1):p17-26.
17. Collins, S.P. et al. *Identification of Emergency Department Patients with Acute Heart Failure at Low Risk for 30-Day Adverse Events: The STRATIFY Decision Tool.* JACC: Heart Failure, 2015. Vol 3, No 10.p213-279.
18. Matsue, Y., et al. *Time-to-Furosemide Treatment and Mortality in Patients Hospitalized with Acute Heart Failure.* JACC, 2017. Vol 60, No 25
19. Cabana M.D., et al. *Why Don't Physicians Follow Clinical Practice Guidelines? A Framework for Improvement.* JAMA, 1999; 282(15):1458-1465.
20. Johnson M.J., May, C.R. *Promoting Professional Behavior Change in Healthcare: What Interventions Work and Why? A theory-led Overview of Systematic Reviews.* BMJ Open 2015; 5:e008592.
21. Grimshaw J.M., et al. *Knowledge Translation of Research Findings.* Implementation Science, 2012; 7:50

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