30-day readmission prevention program in heart failure patients (RAP-HF) in a community hospital: creating a task force to improve performance in achieving CMS target goals

Phyllis Macchio, Lorraine Farrell, Vikas Kumar, Wajiah Ilyas, Martin Barnes, Himani Patel, Andrew L. Silverman, Thuy Hong Le, Haseeb Siddique, Albert Raminfard, Michael Tofano, Jacob Sokol, Greg Haggerty, Alan Kaell, Shuaib Rabbani and Joan Faro

Mather Hospital Northwell Health, Port Jefferson, NY, USA

ABSTRACT
In 2012, Centers for Medicare and Medicaid Services (CMS) announced it would penalize any hospitals that had 30-day readmission rates for heart failure (HF) patients above 20%. Mather Hospital Northwell Health, a community teaching hospital, organized a proactive task force to meet these goals. We describe our hospital-wide Readmission Prevention in Heart Failure (RAP-HF) project. We focused on the following interventions: early identification of patients at risk for readmission, discipline-specific mitigation planning by the interdisciplinary rounding team, enhanced medication education for heart failure patients, education of family/caregivers on medication and heart failure symptoms, facilitation in scheduling of post-discharge follow up visits and hard-wired communication between hospital and post-discharge care providers. We saw a 25.53% decrease in 30-day readmission rates.

The Hospital Readmission Reduction Program (HRRP) began on 1 October 2012, as a Medicare value-based program to reduce payments to hospitals with excessive readmissions for certain diagnoses including HF. CMS defined readmission as any unplanned admission, irrespective of the primary diagnosis for readmission that was within 30 days of hospital discharge. Hospitals that had excess readmissions were penalized in the payment they received for these cases.

At Mather Hospital, a 248-bed community teaching hospital, we utilized existing resources and evidence-based methods to improve treatment of heart failure patients and decrease readmission rates. This paper describes the pertinent literature and our experience that focuses on tactics for reducing heart failure readmissions.

1. Background Rationale for the CMS HRRP
Heart failure (HF) is a widespread problem affecting approximately 5.7 million American adults. The prevalence of HF is expected to increase by 46% from 2012 to 2030. HF is a leading cause of hospitalization with almost 1 million patients discharged from a hospital with HF as a the primary diagnosis in 2010. In 2012, the total cost of treating HF was 30.7 USD billion. Medicare showed that the median risk-standardized 30-day readmission rate for HF to be 23% [1]. Of the HF patients hospitalized who have Medicare, 67.4% experienced readmission, and 35.8% died within 1 year of hospitalization. The risk for readmission is highest 3 days post-discharge, and the risk decreased by 50% only after 38 days post-discharge. HF patients also show an elevated risk of readmission for at least one-year post-discharge [2].

To address HF readmissions we utilized our available staffs’ multidisciplinary expertise and resources to facilitate the creation of our comprehensive quality improvement plan. The quality improvement project addressed concerns related to inpatient issues, discharge procedures, and communication efforts with patients, caregivers, and outpatient providers.

2. Methods
2.1. Pre-project QI
In anticipation of finalization of the HRRP CMS ruling, we participated in a QI project in 2012 with the New York State Partnership for Patients (NYSPFP) that aimed to reduce all causes of preventable 30-day readmissions by 20%. Our hospital identified patients with heart failure (HF) as having a high readmission rate (19.47% at the start of the project). The team proposed that many of the HF admissions were preventable with the use of the following interventions: early identification of patients at risk for readmission, discipline-specific mitigation planning by an interdisciplinary rounding team, enhanced medication education for HF patients (especially for new medications...
added during hospitalization), inclusion of family caregivers in medication and disease-specific education, facilitation of post-discharge follow up visit within 3 days post-discharge, and hard-wired communication between hospital and post-discharge care providers.

The standard of care at Mather Hospital for treating HF patients before this project was to provide them written instructions upon discharge that stated: ‘If you have heart failure, please weigh yourself daily and report a weight gain of 2 lbs. or more to your doctor.’ The discharging physician would instruct patients to follow up with an outpatient physician. No specific systematic instruction about what type of physician they should follow up with and what time frame they should have their follow up with the outpatient physician was provided. Mather Hospital did not have a system in place to provide systematic follow up calls to HF patients and no secure email portals existed for this purpose. Patients or caregivers were not provided any targeted medication education and these patients did not receive attention from a dedicated social worker. Caregivers were not provided any systematic support services such as support groups on what to expect when the patient was discharged and any information about their medication. This previous workflow was related to a readmission rate of 19.47%. We have limited metrics other than the overall readmission rate for this previous workflow/standard of care for treatment of HF patients admitted to Mather Hospital because we were not tracking this data previously.

2.2. RAP-HF Project design

The RAP-HF was a three-phase quality improvement initiative that utilized various methods of intervention at different levels of health care management (see procedures or interventions below), to successfully curtail heart failure readmissions for Mather Hospital Northwell Health. The initial goal was to reduce all-cause preventable 30-day readmissions for HF exacerbation by 20% in line with the aims of NYSPFP. Our quality initiative also fulfills the Institute for Healthcare Improvement (IHI) triple aim of improving population health, patient caregiver experience, and cost containment.

2.3. Participants

The patient population targeted by this quality improvement project were those admitted for treatment at Mather Hospital Northwell Health with a diagnosis of Congestive Heart Failure (CHF) Exacerbation including those with Heart Failure with Reduced Ejection Fraction and Heart Failure with Preserved Ejection Fraction. This patient population had an average age of 70 and 65% were covered by Medicare. They are primarily middle to upper-middle-class in socioeconomic status.

2.4. Setting

Mather Hospital Northwell Health is a 248-bed non-profit community teaching hospital located on the north shore of eastern Long Island. The hospital’s patient population is predominantly insured, with most having adequate access to health care and services. Mather Hospital serviced more than 12,000 inpatients annually at the time of this project.

2.5. Procedures

Mather Hospital Northwell Health established a Readmission Task Force dedicated to coordinating this quality improvement project. The task force selected the Telemetry Unit as the pilot unit for this project because many CHF readmissions are discharged and readmitted from this unit. The project was broken down into three phases, where specific interventions were used to address the issue of readmissions from this patient population.

2.5.1. Phase I (identification)

For the first phase, heart failure patients were identified as having a high readmission rate using the validated LACE index. LACE includes a point system adding the Length of current hospitalization stay (“L”), the level of Acuity of the admission (“A”), Comorbidities of patients (“C”), and Emergency department use by the patient in the 6-month period before the current admission (“E”) [3]. We also used a predictive analytics tool that the University of Pennsylvania employed, which describes the best predictor of readmissions to be prior inpatient activity over the last year [4]. Patients with a LACE score of ≥10 or a UPENN prediction showing high risk for admission were included in the second phase.

2.5.2. Phase II (in-hospital intervention)

For this phase, we implemented daily afternoon rounds of social work, hospital medicine, and nursing to identify next day discharges, and barriers to these discharges were identified and addressed. All participating disciplines were made accountable. Caregiver support groups were offered on a weekly basis to engage, prepare, and educate caregivers about the discharge. This consisted of reviewing medications, understanding disease management, and educating the caregiver about community resources.

2.5.3. Phase III (intervention prior to discharge)

A pharmacist, during one-to-one meetings, met with the patient and caregivers to review the medications at discharge or the day prior to discharge. A social worker
would administer the Hospital Anxiety and Depression Scale (HADS) at discharge and communicated the results to the team hospitalist, nurse, and aftercare providers. The hospital improved discharge instructions to address disease diagnosis and management in layman’s terms so as to be better understood by the patient and caregiver. The hospitalist or nurse would provide a warm handoff using direct discussion with the patient’s outpatient clinicians. In some cases, the next outpatient clinician was a nurse practitioner, physician assistant, or RN. The treatment team would provide the outpatient facility or clinician a more robust interdisciplinary packet of information, which would include consult notes, physician progress notes, social work assessment, and notes. A nurse practitioner would communicate directly with the patient’s cardiology office after discharge regarding a follow-up appointment. The nurse practitioner would also follow up with phone calls to the patient or caregiver at 1 day, 1 week, and 1 month after discharge. Secure email portals were utilized to provide communication about the patient to the community provider practice, skilled nursing facility, and for the patient. The readmission prevention coordinator would also conduct monthly outpatient support group meetings for HF patients and family members focusing on topics regarding disease management, symptom awareness, community resources, medication education, respiratory and nutritional management.

3. Results

Readmission rates for the targeted patient group were reduced by 25% between the first quarter (Q1) of 2010 through the third quarter (Q3) of 2013. Readmission rates dropped from 19.47% (22 readmissions/113 discharges) in Q1 of 2010 to 14.44% (13 readmissions/90 discharges) in Q3 of 2013. This represents a 27% decrease in the 30-day admission rate. The linear trend over time shows a drop of 0.21% per quarter (Figure 1). Post-discharge follow-up care with primary physicians for HF patients in the study increased from 20% (62 patients said ‘yes’ to seeing their primary care provider) to 46% (61 patients said ‘yes’ to seeing their primary care provider) from 2010 to 2014 (Figure 2). Post-discharge follow-up care with a cardiologist for HF patients in our study increased 360% from 2010–2014, a change from 10% (32 patients said ‘yes’ to seeing their cardiologist) to 46% (61 patients said ‘yes’ to seeing their cardiologist) after discharge. Post-discharge follow-up visits decreased, cardiologist follow up visits increased. A limited number of HF patients were able to have access to our part-time pharmacist for medication review within 1 day of discharge. Of the 21 patients who had ability to access this limited resource, a 30-day readmission rate of 3/21 (14.29%) occurred (Figure 4).

4. Discussion

Heart failure is one of the leading causes of readmission among patients with Medicare. Among these readmissions, 53–62% of them are secondary to non-cardiovascular causes, and 17–35% are due to HF exacerbation [2]. We initiated this quality improvement project to systematically address issues that the literature had shown prior to 2012 was related to reductions in

Figure 1. The Heart failure 30-day readmission (to the same hospital) rate was 19.47% for Q1 2010 and dropped to 14.44% in Q3 2013, representing a 25.53% decrease. A linear trend over time shows a drop of 0.21% per quarter.
readmissions for HF patients. Because the literature had shown that no one intervention was predictive of lowering readmissions, our project looked to address how we treat and educate patients during their hospitalization, upon discharge, and post-discharge communication with outpatient providers, patients, and their caregivers with our available resources.

Our results showed that we were able to integrate this quality improvement project at little additional cost as the staff utilized were already employed by Mather Hospital. These interventions resulted in a 27% reduction over 3.5 years in the readmissions of HF patients. Our project also led to an increase in post-discharge follow up with the cardiologist of 360% [from 10% (in 2010) to 46% (in 2014)] revealing the success of this project. Our results were not skewed by lower readmission rates because of patient mortality. We were able to show that a teaching community hospital was able to engage in a comprehensive multidisciplinary effort to reduce HF readmissions.

5. Selected literature review of strategies to reduce HF readmission: the last 7 years

Since we began our project in 2012, over the last 7 years, published research has highlighted systemic strategies that health systems have used to reduce

Figure 2. Primary MD Follow Up: Prior to NP follow up phone calls to HF patients in 2010, the rate of HF patients following up with primary MD was 20% by 2014, the follow-up rate was 54% which represents a 170% increase in the follow-up rate.

Figure 3. Follow up with cardiologist. Prior to NP follow-up phone calls, the rate of HF patients following up with their primary cardiologist was 10% in 2010, and in 2014 it increased to 46%, which represents a 360% increase in the follow-up rate.
readmissions for HF. Studies investigated such factors as patient education, discharge planning, scheduling follow-up before discharge, communication with outpatient providers, medication reconciliation, and the use of follow-up phone calls. Findings reveal that no single intervention in isolation was associated with a reduction in readmissions. The more comprehensive interdisciplinary interventions demonstrate the most success [5,6]. Ziaian and colleagues found that specific strategies, including partnering with community physician and health systems, helped to reduce readmission rates.

One study of 377 patients admitted for HF, acute coronary syndrome, or pneumonia [7] found that most HF patients were not aware of medication changes at discharge and 63.1% had no understanding of all intended medication changes at discharge. Nearly 25% of medication changes were attributed to suspected provider errors secondary to inadequate medication reconciliation Salim Al-Damluji et al. [8] found that better quality discharge summaries were associated with a lower risk of HF patients’ readmissions. Specifically, they found summaries that were transmitted to an outpatient provider were associated with lower odds of readmission after adjusting for hospital and patient characteristics (OR: 0.53, p =.02). Discharges that were of higher quality discharge summaries (including recommended aspects from the Transitions of Care Consensus Conference; OR: 0.67, p = 0.03) were also associated with lower readmission rates. Another study found that readmissions were also found to be reduced by 56.2% as a result of providing comprehensive education to the patient and family, reviewing medication, and intensive follow-up [9]. Formal education and support through nurse teaching shortly after discharge and followed by one-year monitoring had a 39% relative risk reduction for readmissions [10]. A meta-analysis conducted by Phillips et al. [11] looking at interventions for older HF patients found comprehensive discharge planning with ongoing post-discharge support reduced readmissions as well as improved outcomes (i.e., lower all-cause mortality, greater percentage improvement in quality of life scores with no added costs).

6. Conclusion

One of the significant barriers to reducing hospital costs and the overall healthcare cost burden is high readmission rates. HF has been a significant contributor to readmission rates in hospitals due to symptom exacerbation and disease progression. Our project implemented an HF Task Force who evaluated each HF patient and utilized simple, yet impactful strategies to reduce readmissions. Our Task Force found that patient education and medication review by a pharmacist right before discharge significantly reduced HF readmissions. We also found that a post-discharge follow-up within 3 days with a cardiologist subsequently led to a significant drop in readmission rates. As a quality improvement project at Mather Hospital Northwell Health, our successful performance improvement strategy cannot be extrapolated to other clinical settings, even those that appear similar to ours.

Disclosure statement

No potential conflict of interest was reported by the authors.
References

[1] Go AS, Mozaffarian D, Roger VL, et al. Executive summary: heart disease and stroke statistics—2014 update: A report from the American Heart Association. Circulation. 2014;129(3):399–410.

[2] Dharmarajan K, Hsieh AF, Kulkarni VT, et al. Trajectories of risk after hospitalization for heart failure, acute myocardial infarction, or pneumonia: retrospective cohort study. BMJ. 2015;350:h411.

[3] van Walraven C, Dhalla IA, Bell C, et al. Derivation and validation of an index to predict early death or unplanned readmission after discharge from hospital to the community. CMAJ. 2010;182(6):551–557.

[4] Penn study shows automated prediction alert helps identify patients at risk for 30-day readmissions. 2013, November. Retrieved from https://www.pennmedicine.org/news/news-releases/2013/november/penn-study-shows-automated-pre

[5] Hansen LO, Young RS, Hinami K, et al. Interventions to reduce 30-day rehospitalization: A systematic review. Ann of Intern Med. 2011;155(8):520–528.

[6] Bradley EH, Curry L, Horwitz LI, et al. Hospital strategies associated with 30-day readmission rates for patients with heart failure. Circulation Cardiovasc Qual Outcomes. 2013;6(4):444–450.

[7] Ziaeian B, Araujo KL, Van Ness PH, et al. Medication reconciliation accuracy and patient understanding of intended medication changes on hospital discharge. J Gen Intern Med. 2012;27(11):1513–1520.

[8] Salim Al-Damluji M, Dzara K, Hodshon B, et al. Association of discharge summary quality with readmission risk for patients hospitalized with heart failure exacerbation. Circulation Cardiovasc Qual Outcomes. 2015;8(1):109–111.

[9] Rich MW, Beckham V, Wittenberg C, et al. A multidisciplinary invention to prevent the readmission of elderly patients with congestive heart failure. N Engl J Med. 1995;333(18):1190–1195.

[10] Krumholz HM, Amatruda J, Smith GL, et al. Randomized trial of an education and support intervention to prevent readmissions of patients with heart failure. J Am Coll Cardiol. 2002;39(1):83–89.

[11] Phillips CO, Wright SM, Kern DE, et al. Comprehensive discharge planning with post-discharge support for older patients with congestive heart failure: A meta-analysis. J Am Med Assoc. 2004;291(11):1358–1367.