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The Effect of a New Primary Physician Notification System On The Rate of Unnecessary Heart failure Admissions

A. Study Purpose and Rationale:

Background:

Healthcare spending is a major contributor to America's overall long-term debt. According to World Bank estimates, health care spending accounted for 17.9% of the United States' GDP in 2013[1]. Among other OECD countries, the United States was number one in spending[2]. Due to the intricacy of the United States health care system and the complex nature of medicine, a multi-faceted approach and equally complex attempt to control costs was endeavored through the Affordable Care Act (ACA). In the ACA a number of measures focused on decreasing waste and inefficiency were proposed. One such measure was decreasing unnecessary acute care hospitalizations and transitioning towards a more community-centered model for medical treatment[3]. Hospitals are one of the most expensive settings for health care delivery, on average costing $1600 to $2000 per day and consuming $ 850 billion of the $2.7 trillion spent annually on health care[4]. Thus, there is a clear incentive to decrease readmissions (admissions within 30 days of discharge) as well as unnecessary admissions (admissions that could have been avoided by being managed in an outpatient setting. This definition may also include readmissions). Currently, Medicare is no longer paying for and may even fine hospitals for "unnecessary readmissions" for 3 of the most costly conditions with the highest readmission rates: heart failure, heart attack and pneumonia and the list will continue to grow[3].

Since Columbia NY-Presbyterian is one of the top Cardiology institutions in the country and serves a diverse as well as underserved community, there are a significant number of heart failure (HF) admissions per year as well as a high readmission rate (it has been found that hospitals that provide care to underserved communities often have higher readmission rates) [5]. A number of hospital programs have been implemented over the past several years to decrease unnecessary admissions such as: discharge clinics, one-on-one HF education sessions and community outreach programs, however, the readmission rate remains high[56]. Thus although the recent new hospital program initiatives are a step in the right direction, more can be done to reduce unnecessary admissions.

Purpose:

A new quality improvement (QI) initiative to alert primary physicians of when their patients are admitted to the ED is currently being implemented and is projected to take full effect in several weeks. This project has the potential to significantly improve continuity of care (integration of health care services and health care coordination) by improving the transmission of patient information between health care providers in the outpatient and inpatient settings and could potentially have positive secondary effects such minimizing "unnecessary" admission, decreasing hospital length of stay (LOS) and improving patient's overall satisfaction.

B. Study Design and Statistical Analysis:

This study will be a one-center (CUMC) quality improvement (QI) pre-post staggered intervention comparison group design. The pre-intervention group will be comprised of HF patients with primary physicians at CUMC who are admitted to the ED before the implementation of the notification system. The post-intervention group will be comprised of HF patients with CUMC primary physicians admitted to the ED after initiation of the notification system.

Extrapolating the national average HF admission LOS of 5 days to CUMC, with an estimated STD of approximately 1/10 of a day, an unnecessary admission will be defined as LOS ≤ 2 days. Using this definition makes the assumption based on average length of stay, that patients hospitalized 2 days or fewer, were hospitalized unnecessarily and likely could have been managed as outpatients.

Data on unnecessary heart failure admissions prior to implementation of the intervention will be collected from January 1st 2013 to January 1st 2014 and will function as the control. Data from March 1st 2014 to March 1st 2015 will be collected and analyzed and will function as the post-intervention group (March 1st as the start date allows time for the notification system to be fully established and for physicians to become acclimated to the new system).

Subgroup analysis of readmissions rates before and after the implementation of the intervention will also be performed.

Study Population:
All patients admitted to CUMC for heart failure exacerbation between January 1st 2013 -March 1st 1015.

Inclusion/exclusion Criteria:
Inclusion: Patients must have an index admission for a principal diagnosis of heart failure (ICD9).
Exclusion: CCU admissions, transplanted patients or those on the transplant list as well as patients with assist devices such as LVADs. Such conditions would be

excluded given the severity of their condition and their frequent need for hospitalization given the tenuous nature of their HF and risk of rejection for transplant patients.

Study Outcomes:

The primary outcome will be the difference in the rate of unnecessary HF admissions (defined as hospitalizations with LOS ≤ 2 days) between the 2 study groups. A secondary outcome will be a comparison of LOS between the 2 study groups excluding admissions ≤ 2days.

Statistical analysis:
For statistical analysis, heart failure admissions and LOS data for those admissions will be analyzed using Stata 12.0. The unpaired chi square test will be used to statistically analyze the rate of unnecessary admissions before and after the intervention. To study the secondary outcome of LOS >2 days, a t-test would be used to compare the two study groups. $P < 0.05$ will be used to indicate statistical significance. Under the assumption that on average there are 1000 HF admissions per year, and that about 10% of them have LOS ≤ 2 days, using the chi-square test, at 80% power, the study would be able to detect an effect size of 4 percentage points (from 10% to 6%).

The unit of analysis is heart failure admissions. The study is powered to detect a 40% difference in unnecessary heart failure admission rates between the two groups.

For the secondary outcome measure of LOS between the pre-post intervention groups (excluding LOS ≤ 2 days), this study is powered to detect an effect size of 1/5 of a day.

C-F:Study Procedure, Drugs, Medical Devices and Questionnaires:
No study procedures, drugs, medical devices or questionnaires will be used in this study.

G: Study Subjects:
Human subjects will not be directly involved in this study. Pertinent information such as LOS will be extracted from the IT clinical database and analyzed.

H: Subject Recruitment:
No human subjects are directly involved in the study

I Confidentiality of data:
All data extracted from the IT clinical database will be de-identified.

J. Potential Conflict of Interest:
None

K. Location of study:
This study will be a collaborative effort between the departments of Cardiology and Bioinformatics

L. Potential Risks:
There are no potential risks to patients since they are not directly involved in the study and since no identifying information will be utilized. No physical interventions will be performed nor will drugs be utilized.

M. Potential Benefits:
Patients could benefit from this study if it is found that the notification of PMDs decreases cost by preventing unnecessary admissions. This would be beneficial to patients since they would avoid unnecessary wait times and perhaps redundant/unnecessary testing. The study may also improve continuity of care by facilitating communication among health care providers and improve patient satisfaction.

N. Alternative Therapies
As it is now, PMDs will receive a secure health message as a notification. An alternative is a text page, which may would likely prove to be more effective.

O. Compensation of Subjects:
none

P. Cost to subjects
none

References:

1. data.worldbank.org . The World Bank. Health Expenditure, total % of GDP.
2. OECD Health Data 2013. How Does the Unites States Compare. www.oecd.org
3. Medicare Hospital Readmissions Reduction Program. Health Affairs Nov2013
4. Hospitals Seek to Avoid Penalties by Minimizing Readmissions. Susan Prank . USNEWs.health.usnews.com
5. 364 Hospitals Have High Rates of Overall Readmissions, New Medicare Data Show. Jordan Rau. Kaiser Health News. Jan.2014
6. Hospital Programs Aim to Reduce Re-admission. Barron.B, Lee. J NYP.org/new/programs.June 2011.