A. Specific Aims and Hypothesis

The Meds-to-Beds (M2B) program at Vanderbilt University Hospital was started in August 2015 to provide inpatients with bedside prescription delivery, financial assistance, proactive refill reminders, and bedside counseling by a pharmacist prior to discharge. To date, the program has served an estimated 16,000 patients. While the program is well-received by patients, we currently lack data on its clinical and financial outcomes, including its effect on decreasing 30-day unplanned readmission rates for patients who utilize M2B services.

Our hypothesis is that implementation of the M2B program at Vanderbilt University Hospital is associated with a decrease in 30-day unplanned hospital readmissions for patients who utilize these services. Specific outcomes of interest include M2B patients’ 30-day unplanned readmission rate, estimated dollars saved through avoiding preventable readmissions, and utilization of emergency department services by M2B patients.

Our primary objective is to demonstrate the M2B program’s clinical and financial impact on Vanderbilt University Hospital patients and for the institution. Other academic health-systems have implemented similar discharge prescription services, but there are few, if any, published studies in the literature that focus on the impact of bedside prescription delivery at hospital discharge with a patient population as large as Vanderbilt’s. We feel that this study would be well-received in a peer-reviewed journal to demonstrate the value of pharmacy services in the transitions-of-care process at hospital discharge.

B. Background and Significance

Hospitals across the United States are examining ways to improve patient outcomes after discharge by reducing preventable readmissions. Pharmacy departments can impact this outcome by focusing on the medication aspect of the transitions-of-care process as patients are discharged from the hospital. Medication misuse after discharge can occur when patients are unable to afford their medications, are unable to pick their medications up from the pharmacy after discharge, or do not understand how they should be taking their medication.

Comparable studies in the literature have focused on pharmacists’ roles in medication reconciliation, adherence, discharge counseling, and post-discharge follow-up. Implementing a pharmacy program to relabel inpatient inhalers for home use and provide discharge counseling to chronic obstructive pulmonary disease patients was associated with a significant decrease in all-cause 30-day and 60-day readmissions. Pharmacists who provided medication reconciliation, monitoring, and disease state management for patients seen for discharge follow-up at a primary care teaching clinic had a 9.2% 30-day readmission rate for their patients versus a 19.5% 30-day readmission rate for patients seen only by a physician. In an insurer’s program where patients received pharmacist-driven medication reconciliation, adherence education, and care coordination after discharge, participating patients had a 50% relative risk reduction for all-cause 30-day readmissions, and the program saved the insurer two dollars for each dollar spent.

C. Preliminary Studies/Progress Report

Preliminary operational data collected for the M2B program appears to show a decrease in 30-day unplanned readmissions rates between patients who utilized M2B services and those who did not.

D. Research Design and Methods

Patients older than eighteen years of age will be included in this retrospective study if they were discharged from a unit participating in the M2B program at Vanderbilt University Hospital between March 1, 2016, and August 31, 2016. Readmission and emergency department utilization data will be collected for these patients until September 30, 2016.

Patients discharged from a M2B unit during the study time frame who did not participate in the program will be used as the control group. Patients discharged from a M2B unit who participated in the M2B program during the study time frame are considered to have received the active intervention. Patients will be excluded if their discharge unit is not discernible.
Baseline information for the two groups will be collected, including age, sex, medical record number (for data linking purposes only), primary admitting and discharge diagnoses for the index hospitalization, primary admitting diagnosis for the first readmission, medical benefit payer, and pharmacy benefit manager.

The 30-day unplanned readmission rate will be calculated as the primary endpoint. Secondary endpoints include financial cost differences between the two groups (medications and estimated readmissions) along with 30-day emergency department utilization.

Data will be collected from VUMC clinical patient care and billing databases using the patient’s medical record number as the primary identifier. This data includes the index hospitalization length-of-stay and readmission length-of-stay, discharge unit, unique medication classes dispensed at discharge, total number of medications dispensed at discharge, time to first readmission from index hospitalization, reason for readmission (unplanned vs. planned), discharge medication cost, total inpatient discharges on M2B floors, time to first emergency department visit from index hospitalization, aggregate unit readmission rates, case-mix index for patients and units, number of emergency department visits within 30 days prior to index hospitalization, and number of hospitalizations within 30 days prior to index hospitalization.

This data will be obtained from individual databases based on the patient’s medical record number and compiled into a flat file database stored on a secure VUMC server with access limited to the primary investigator and faculty advisor. Once the data has been aggregated, the patients’ medical record numbers will be removed and replaced with generic identifiers to de-identify the data set.

Once approved by the Institutional Review Board in October 2016, we anticipate completing data collection by December 2016 and data analysis by March 2017. Presentation at the Southeastern Residency Conference is expected in April 2017 with a manuscript completion by June 2017.

E. Sample Size Justification and Statistical Analysis Plan
While the M2B program began in August 2015, it was not at a full level of operation until March 1, 2016. Thus, we plan to start data collection from the beginning of March in order to avoid any confounding variables that may have been present during the program’s initiation, including the installation of new pharmacist positions on the floors in November-December 2015. A six-month window is the best timeline that fits our project’s deadlines (data collection completed by December 2016) and that yields a viable sampling of patients. The inclusion of all patients discharged from the floors of interest during this time frame (an estimated 8,000 M2B patients and 8,000 controls) is necessary in order to gather a healthy amount of unplanned readmissions to examine (currently estimated at ~1,800 cases) and a large sample of control patients for comparison. Section D describes our data collection plan.

We are requesting assistance with the VICTR grant to aid with our statistical analysis plan. Due to the large number of patients and potential complexity with the data, our goal is to match cases to controls based on patients’ baseline characteristics to minimize the amount of bias in our results. Thus, we are specifically requesting assistance with the matching, analysis of variables (see section D), and manuscript composition. While we do not currently have a primary biostatistician, we do have a recommendation for a 90-hour voucher for the project from the biostatistics clinic we attended on August 29.

Literature cited