

Primary Care Pharmacist Impact on Healthcare Utilization

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University of Houston Final Thesis Presentation



- Medicare Access and CHIP Reauthorization Act of 2015 (MACRA)
 - Streamlines quality programs under the new Merit Based Incentive Payments System (MIPS)
 - Bonus payments for participation in eligible alternative payment models (APMs)
- Pharmacists can play a role in improving quality metrics tied to reimbursement under MACRA

Medication Reconciliation

- Iowa Family Medicine Program

- Prospective, randomized controlled trial
- Goal: improve blood pressure control
- Pharmacist performed med reconciliation
- Intervention: 96% recommendations accepted

Endpoint	Intervention N=3	Control N=3	P-value
Patients with blood pressure control	64%	30%	<0.05
Mean blood pressure decrease	21/10 mmHg	7/5 mmHg	<0.05

Pharmacist Clinic Outcomes

- Veterans Health Affairs Primary Care Clinic
 - PGY2 ambulatory pharmacy resident performed services
 - Results:

- n = 24 patients

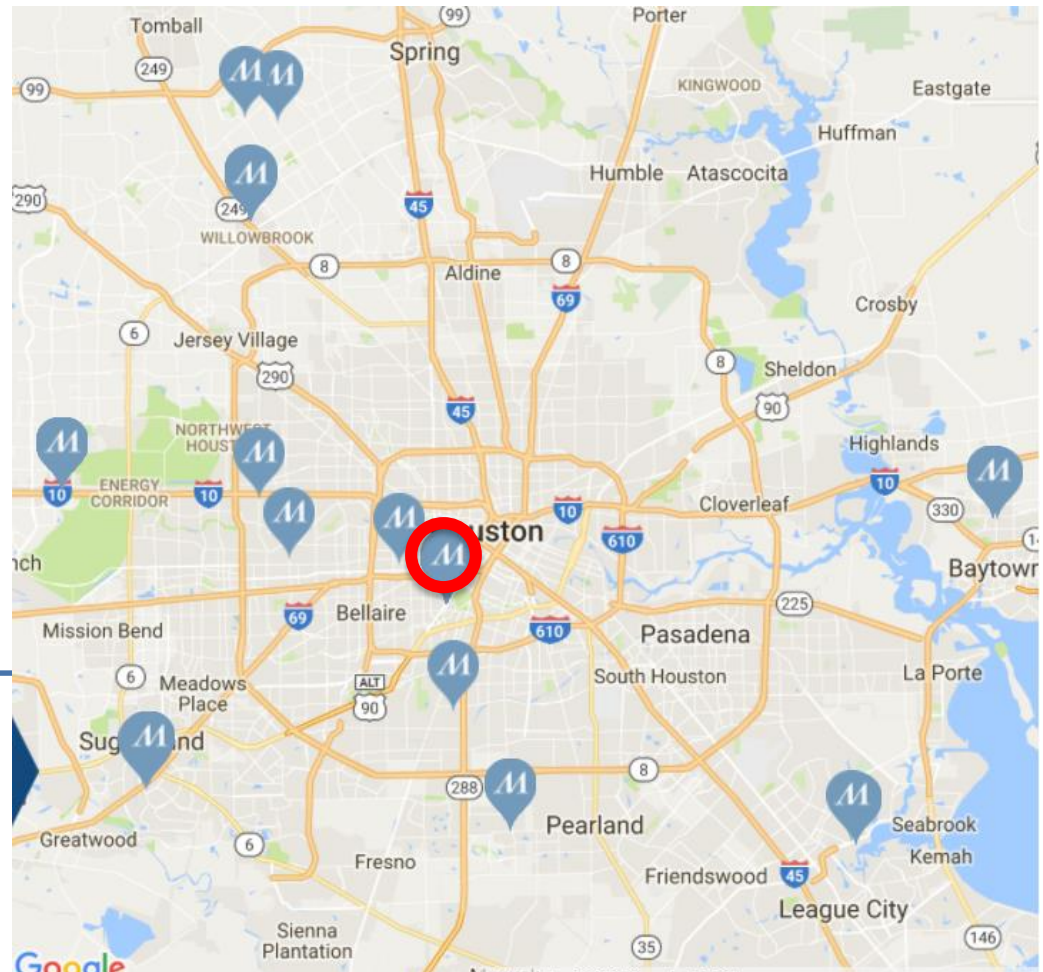
Outcome	Before	After	P-value
A1c	8%	7%	0.01
LDL	93 mg/dL	69 mg/dL	<0.01
SBP	131 mmHg	124 mmHg	0.03
DBP	72 mmHg	65 mmHg	<0.01
A1c <7%	17%	38%	0.06
LDL at goal	75%	96%	0.01
SBP at goal	46%	71%	0.01
DBP at goal	79%	92%	0.06

Impact on Patient Care

- Systematic Review
 - Total of 63 studies
 - Studies of pharmacist-led chronic disease management
- Purpose: pharmacist management effects & harms
- Results: pharmacist-led management similar to usual care
 - Additional studies needed to determine if increased medication utilization and goal attainment improve clinical outcomes

- Houston Methodist has an opportunity to establish pharmacist involvement in primary care
- New MSSP Program and Primary Care expansion presents unique opportunities to expand pharmacist services

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Primary Care Pharmacist Impact on Healthcare Utilization

Methods

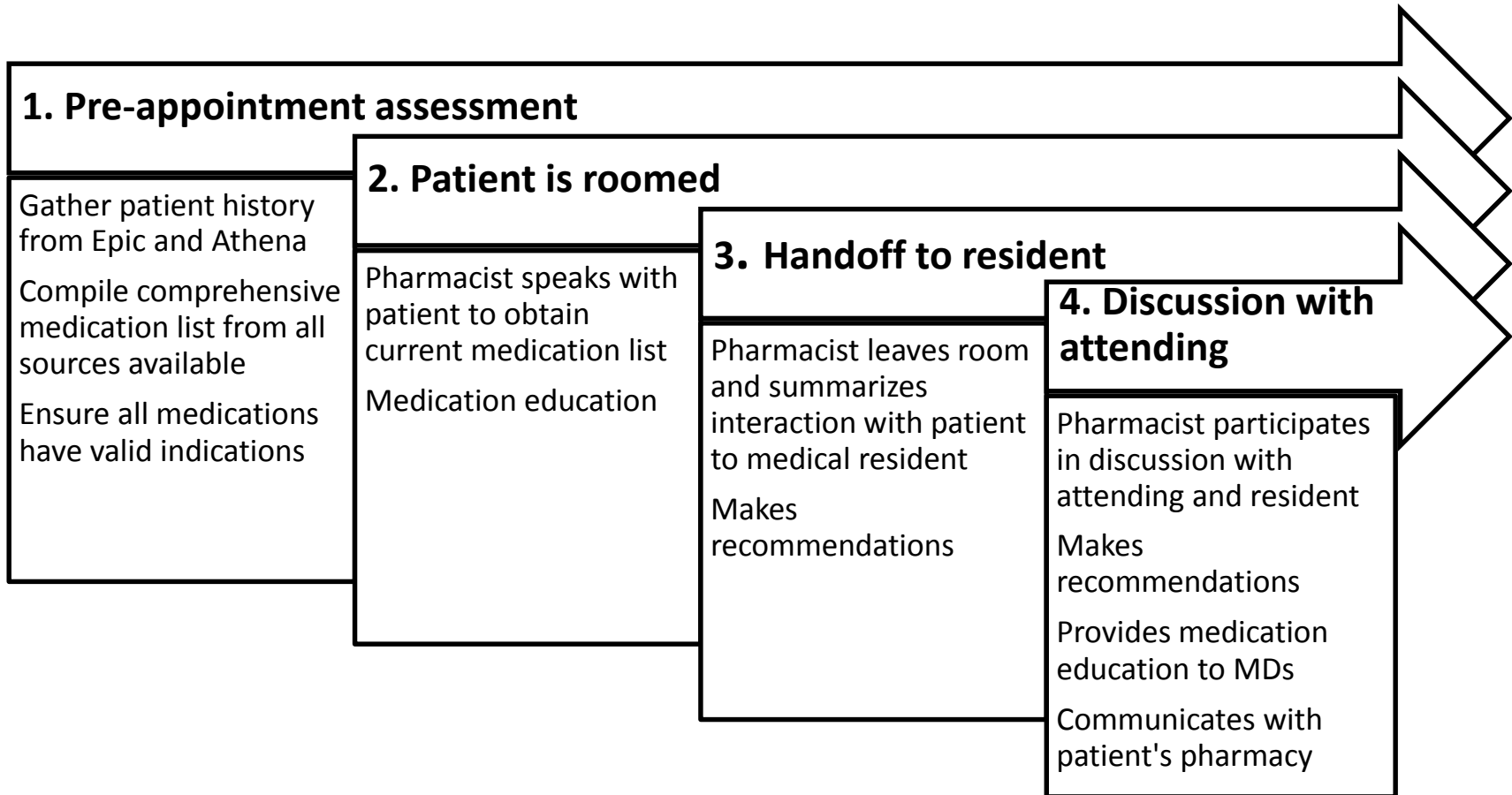
Pilot Overview

- Pharmacist located in Medical Resident Primary Care Clinic
- Pilot dates: October 2016 – March 2017
- Pharmacist staffing:
 - Monday-Friday 8am-5pm
 - Internal Medicine Clinical Pharmacist
 - PGY1 Pharmacy Practice Resident
 - PGY2 Internal Medicine Resident



Methods

Pharmacist Workflow



Study Objectives

1. Assess the need for clinical pharmacy services in a medical-resident ambulatory care clinic
2. Measure rate of pharmacist interventions accepted after incorporation of clinical pharmacy specialist
3. Assess patient 30-day healthcare utilization rate before and after incorporation of clinical pharmacy specialist

- Study populations:
 - Pre-pilot: June 1, 2016 – September, 30th 2016
 - Wash out: October 1, 2016- October 31st, 2016
 - Pilot: November 1, 2016- February 28th, 2017
- Quasi-experimental

- **Hospitalization:** Index admissions to a Houston Methodist System Hospital that is not on the same day of the clinic encounter or for a planned procedure within 30 days of the clinic encounter
- **Emergency department (ED) visit:** index visit to Houston Methodist ED within 30 days of the clinic encounter
- **Healthcare utilization:** admission and/or ED visit within 30 days of the clinic encounter
- **Uncontrolled hypertensive:** patient with a blood pressure value uncontrolled per JNC8 guidelines
- **Uncontrolled diabetic:** patient with an A₁c greater than 7%
- **Intervention:** A recommendation made by the pharmacists that resulted in an action or medication therapy modification affecting the patients plan of care

- Primary Outcome:
 - Comparison of percent of healthcare utilization at 30 days post clinic encounter
- Secondary Outcomes:
 - Comparison of hospitalizations and ED visits at 30 days post clinic encounter
 - Percent of uncontrolled hypertensive and diabetic patients who had an intervention performed during the clinic encounter
 - Rate and type of pharmacist interventions

- Primary Outcome:
 - Chi-square rate comparison of composite
 - Logistic regression of hospitalized patients
- Secondary Outcome(s):
 - Chi-square rate comparison for individual outcomes
 - Descriptive statistics analysis of interventions

Eligibility Criteria

- Inclusion:
 - All consecutive patients seen in the medical resident ambulatory clinic during the study periods

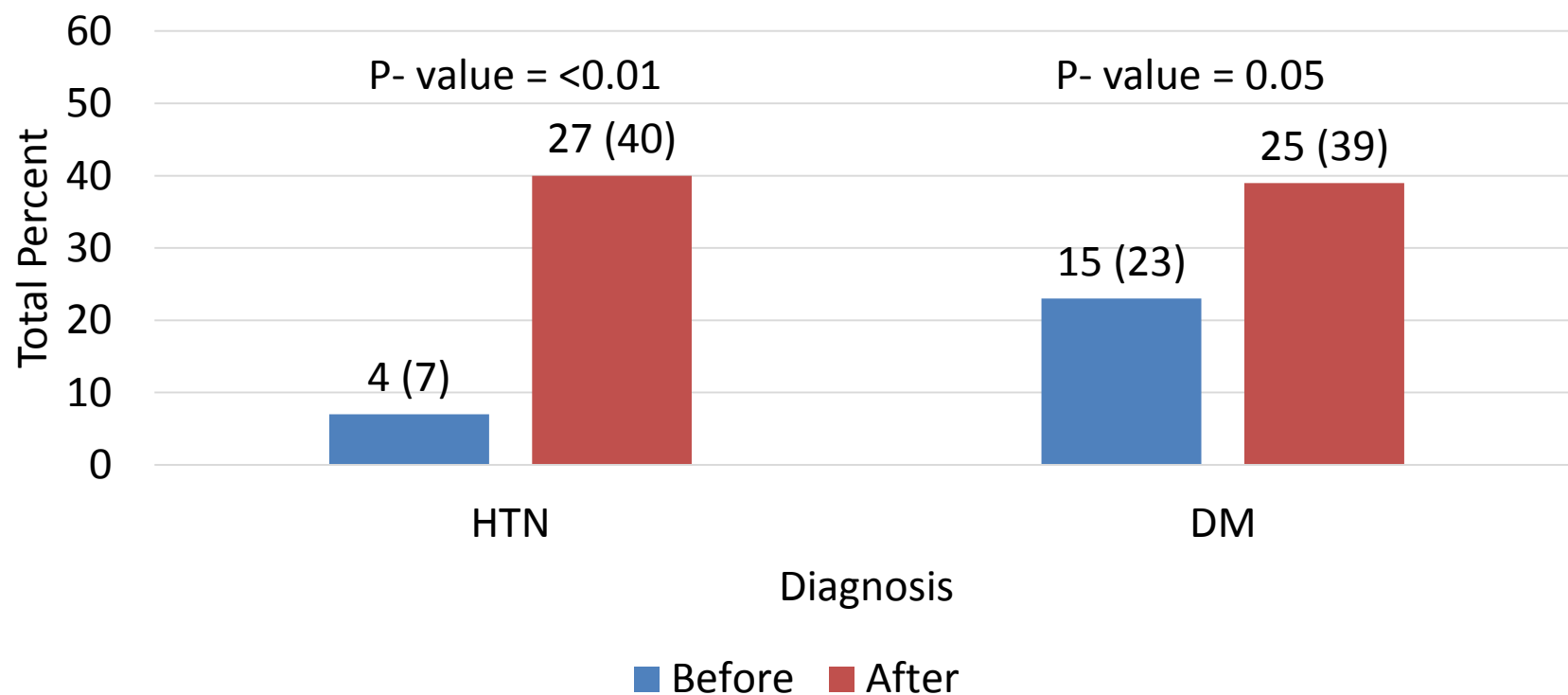
Baseline Characteristics

Variable	Pre-Pilot Population n=407	Pilot Population n=484	P-value
Age, mean $\pm$ SD	62 $\pm$ 16	63 $\pm$ 15	0.20
Caucasian (n,%)	219, 54 %	246, 51 %	0.65
Male (n,%)	168, 41 %	180, 37 %	0.21
Weight, mean $\pm$ SD	83 $\pm$ 21	83 $\pm$ 21	0.71
CKD (n,%)	16, 4 %	18, 4 %	0.87
DM (n,%)	89, 22 %	93, 19 %	0.33
HTN (n, %)	169, 42 %	169, 35 %	0.03
SBP, mean $\pm$ SD	136 $\pm$ 20	135 $\pm$ 19	0.61
DBP, mean $\pm$ SD	76 $\pm$ 13	77 $\pm$ 13	0.36
HgbA1C, mean $\pm$ SD	7.7 $\pm$ 2	7.7 $\pm$ 2	0.96

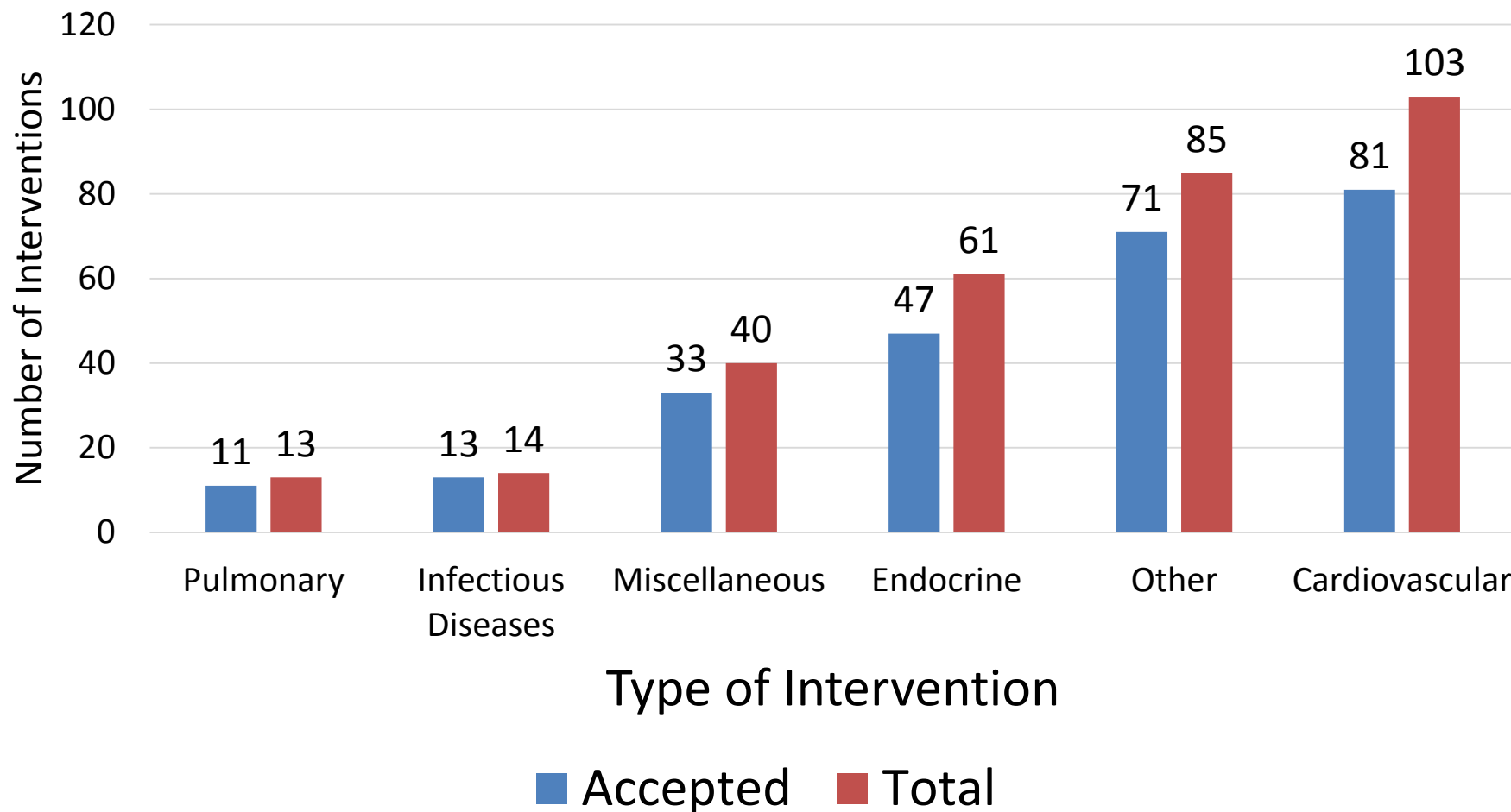
Key: SBP: Systolic Blood Pressure, DBP: Diastolic Blood Pressure, HTN: Hypertension, CKD: Chronic Kidney Disease, DM: Diabetes Mellitus

Needs Assessment

Percent of Uncontrolled Patients with an Encounter Intervention

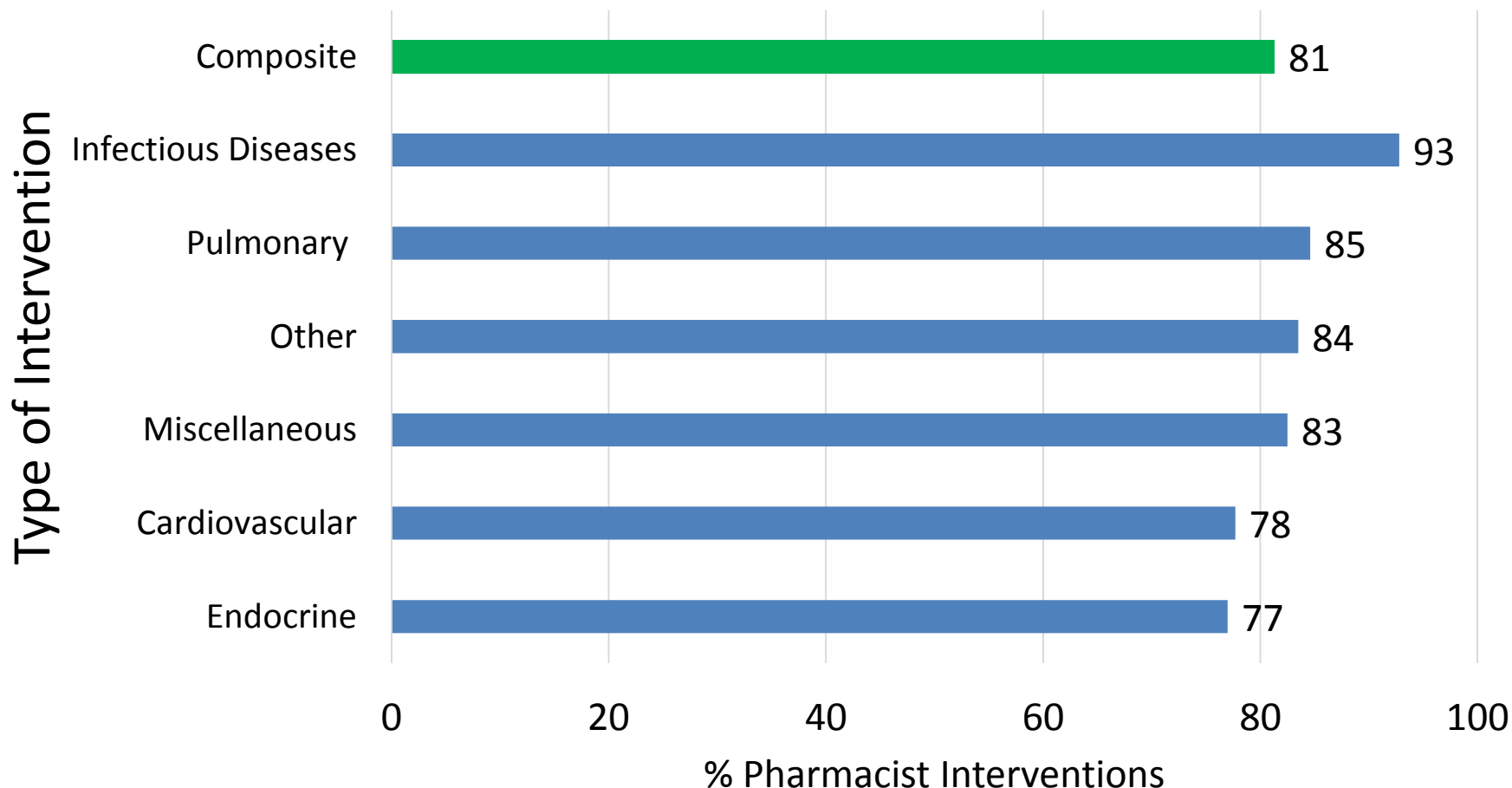


Pharmacist Interventions by Type



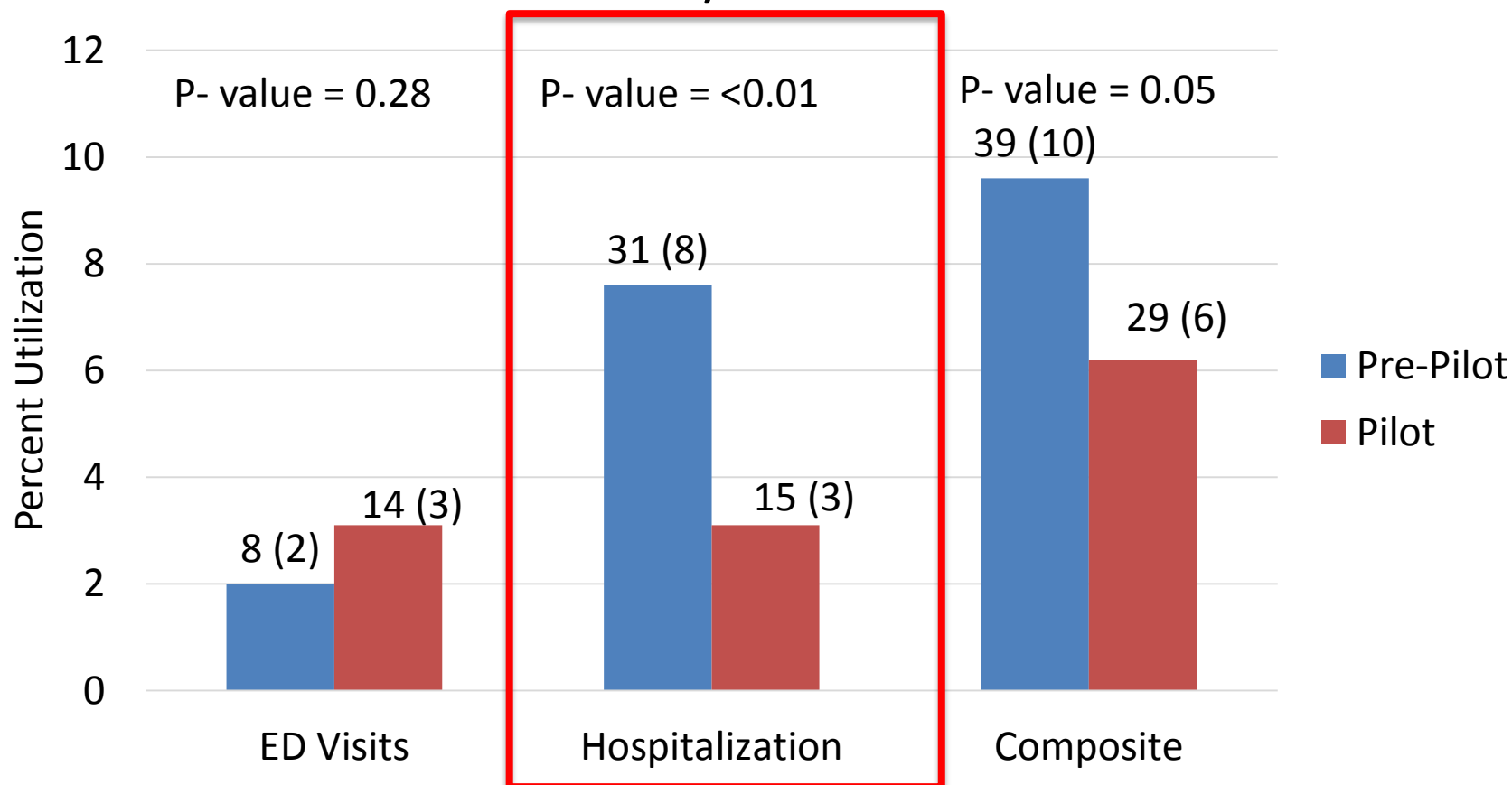
Pharmacist Interventions

% Pharmacist Interventions Accepted by Type



Healthcare Utilization

Utilization at 30 Days Post Clinic Encounter



Hospitalized Patients

Logistic Regression

Variable	Odds Ratio	95% Confidence Interval	Chi-Square P-Value
Pilot	0.38	0.19 – 0.73	<0.01
Age	1.02	0.99 – 1.05	0.08
Female	0.84	0.45 – 1.56	0.58
White vs. Other	1.64	0.36 – 7.43	0.52
Black vs. Other	0.83	0.17 – 4.00	0.82
Hypertension Diagnosis	0.78	0.40 – 1.55	0.47
Diabetes Diagnosis	1.83	0.88 – 3.80	0.10
Chronic Kidney Disease Diagnosis	1.21	0.39 – 3.77	0.74
Uninsured	1.99	1.03 – 3.88	0.04
Medications	1.04	1.01 – 1.07	0.02

Hosmer-Lemeshow Test: 0.46 c-statistic: 0.75

- Providers less inclined to manage chronic diseases
 - Clinic functions as a minor emergency center
 - Management referral to specialist
- Multiple patients scheduled at the same time
- Pharmacist coverage provided by core group of clinical pharmacy staff
- Variables not considered: previous readmissions, severity of disease states, health literacy, adherence
- Healthcare utilization outside of health system unavailable

Conclusion

- Hospitalizations had a statistically significant decrease after incorporation of pharmacy services
- Uncontrolled hypertensive patients seen during the pilot period had higher rates of interventions during the clinic encounter
- Over 80% of pharmacist interventions were accepted

Recommendations

- Use pilot model and results to incorporate pharmacy services into primary care clinics
- Leverage technology to generate pre-encounter and during encounter alerts for clinic pharmacists
- Think big! Pharmacists can also play a role in specialty clinics

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Length of Stay

Population	Mean length of stay, days (mean $\pm$ SD)	Quartile 1	Quartile 2 (Median)	Quartile 3	Range	P-value
Pre-pilot population	3.71 $\pm$ 2.69	1	3	6	7	0.72
Pilot population	4.07 $\pm$ 3.75	1	3	6	11	

Admission Reason

Pre-pilot reasons for admission

Shortness of breath

Hyperglycemia

Pleural effusion

Constipation

Parotid mass

Diarrhea

Cellulitis

Pancreatitis

Liver abscess

GI hemorrhage

Dehydration

Chest pain

Dyspnea

Altered mental status

Wound infection

Other

Pilot reasons for admission

Dehydration

Sinusitis

Acute kidney injury

Urinary tract infection

Abdominal aneurysm

Avascular necrosis of the hip bone

Osteoarthritis

Deep vein thrombosis

Dehydration

Wound infection

Chest pain

Abdominal pain

Healthcare Utilization

Type	Before n (%)	After n (%)	P value
Composite	39 (9.6)	29 (6.1)	0.05
ED Visit	8 (2)	14 (3.1)	0.28
Admission	31 (7.6)	15 (3.1)	<0.01

Outcomes

Pharmacist Interventions

	Intervention	Total (n)	Accepted (n,%)
Cardio	Hypertension Medication Optimization	62	49, 79%
	Dyslipidemia Medication Optimization	23	19, 82.6
	Coronary Artery Disease Medication Optimization	11	7, 63.6
	Anticoagulant Optimization	7	6, 85.7
Endocrine	Diabetes Mellitus Medication Optimization	61	47, 77
Miscellaneous	Lab Monitoring Recommendation	40	33, 82.5
	Over the Counter Medication Recommendation		
	Alternate Therapy Recommendation		
	Immunization Recommendation		
	Alternate Dose Recommendation		
	Medication Discontinuation Recommendation		
Infectious Diseases	Antibiotic Optimization	14	13, 92.8
Pulmonary	Asthma/COPD Medication Optimization	13	11, 84.6
	Total	231	186, 80.9%