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Radiology Posters - 2019

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Development and implementation of technology downtime simulations at Baystate Medical Center

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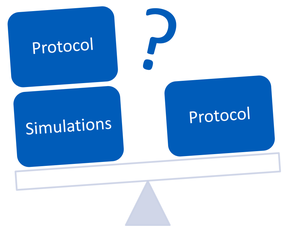
BACKGROUND

- Advancing hospital technology
- Improvements in safety and patient care
- Reliance on technology for daily workflow
- Technology
- Inconsistent response to downtime events
- Delays in care
- Increased dispensing errors

Research Question: Do mock simulation based trainings in addition to creation of new protocols increase the self-sufficiency of frontline pharmacy staff during downtime events more so than new protocols alone?



METHODS

A gap analysis was performed to identify areas with and without downtime protocols in place. BD Pyxis™ Logistics Carousel was identified as an area without comprehensive downtime standard operating procedures.

8 – Point Assessment

Describe
- Where to find resources, to help triage carousel down time problems.

Explain
- How to forward labels from this carousel printer A to carousel printer B or C.
- What order you would begin to manually enter a batch fill in the event of an extended time without the batch fill dropping?
- How many hours would you wait till manually entering the fill?

Identify
- Who to contact and in what order for a mechanical obstruction.
- Where the carousel drill, clamp, downtime binder and paper inventory are.
- Where replacement batteries are for the scanners, and explain how to reset them.
- Where the key is to open drill access panel.

Demonstrate
- How to open drill access panel, and explain how the drill is attached and functions.

METHODS

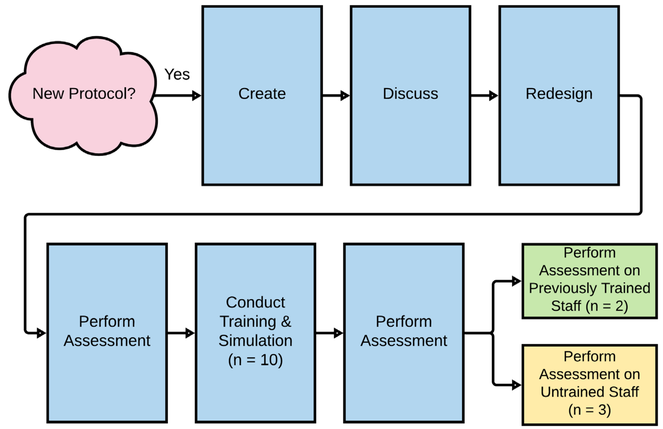


Figure 1: Flow diagram of methods

Technical Downtime
1. ADM : Carousel Interface
2. BD™ Logistics* Ordering Software Interface
3. Scanners
4. Printers
5. Batch fills not printing
6. Carousel PC error

Mechanical Downtime
1. Obstruction
2. Motor/Electric

Thirty Minute Simulation:
1. **Orient staff to the protocol**
2. **Simulate**
- Forwarding labels
- Running automated dispensing machine (ADM) inventory report
- Resetting scanners
- Opening carousel drill panel
- Attaching carousel drill
- Finding the emergency order

Figure 2: Areas of potential carousel downtime and format of simulation

RESULTS

Training	Score Before	Score After	Total Score
1	0	8	8
2	0	8	8
3	1	8	8
4	0	8	8
5	0	8	8
6	0	8	8
7	3	8	8
8	3	8	8
9	2	8	8
10	1	8	8
Average	1	8	8

Table 1: Scores before and after initial training

RESULTS

No Training	Score After	Total Score	Time (m)
1	4	8	20
2	6	8	12.5
3	7	8	13.5
Average:	5.67	8.00	15.33
% Successful:	70.83		
Training	**Score After**	**Total Score**	**Time (m)**
1	8	8	6
2	8	8	5.5
Average:	8	8	5.75
% Successful:	100		
% Increase in Score	**41.18**	**% Faster Response**	**66.67**

Table 2: Reassessment scores and analysis of training

DISCUSSION

Limitations
- Number of staff trained and assessed (small numbers for analysis)
- Training causes interruptions in workflow
- Difficulty in capturing entire staff

Future Implications
- Downtime protocols should be implemented for all complex technology.
- The initial mock simulation based training of these protocols should occur during pharmacist and pharmacy technician training/orientation.
- Periodic planned mock simulations should be planned and additional staff scheduled to prevent workflow interruptions should be provided to accommodate these trainings.

CONCLUSIONS

- **Simulated based training increases response rates and accuracy in response**
- **The results of this project could be extrapolated to other complex technology or operational systems**

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Development of a cost containment strategy for high-cost medications at a tertiary teaching hospital

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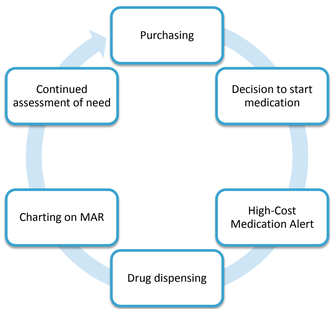
BACKGROUND

With the continued rise in pharmaceutical drug costs, stabilizing pharmacy spend with cost-containment initiatives remain a strategic focus.

- Pharmacy leaders are guiding collaborative efforts to buy, manage, and use medications as cost-effectively as possible[1]
- Clinical pharmacy services are able to provide an important foundation for a successful high-cost medication-utilization management program[2]
- Baystate Medical Center (BMC) participates in the 340B Program as well as group purchasing organizations (GPO)

Three of the top ten drug expenses at BMC are hemostatic agents

- Hemostatic agents available at BMC through a consignment program:
  - **Advate®** (recombinant factor VIII)
  - **Bebulin®** (3 factor prothrombin complex concentrate)
  - **Benefix®** (recombinant factor IX)
  - **FEIBA®** (activated prothrombin complex concentrate)
  - **Humate-P®** (vWF and factor VIII)
  - **Kcentra®** (4 factor prothrombin complex concentrate)
  - **NovoSeven®** (recombinant activated factor VII)
- Understanding the workflow of high cost medications, such as hemostatic agents, is important operationally and clinically:



OBJECTIVES

- Identify and address areas of improvement in the process of drug procurement through administration and charging for hemostatic agents

METHODS

- A gap analysis was created and performed to identify areas of sufficiency and areas of improvement for high-cost medications
- **Initial target medications:**

Humate P®

3

FEIBA®

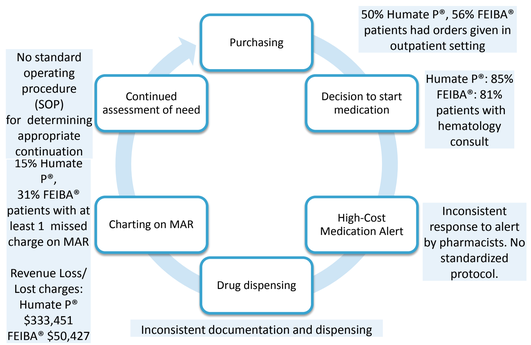
4

- **Date range:** Retrospective chart review of historical order data
  - Humate P®: Sep. 2016 - Oct. 2018
  - FEIBA®: Jun. 2016 - Jul. 2018
- **Data collected:**

Purchasing	• Least amount of drugs purchased from wholesale acquisition (WAC) account • Drugs purchased from 340B in 340B eligible patients
Stock/Storage	• Proper stock available on shelves • Expiration dating done correctly
Clinical Determination of Appropriate Use	• Restrictions/ criteria for initiation • Appropriate medication verification
Continual Monitoring of Appropriate Use	• Pharmacist aware of patients on the high-cost medications to determine if still meet criteria
Charging	• Charted on the medical administration record (MAR) • Amount of medications charged=amount of medications re-purchased

OUTCOMES

- **Gap analysis results:** Humate P® → n=20 patients
  FEIBA® → n=16 patients



- **Areas of improvement identified:**

1. Lack of awareness of predefined criteria related to ordering, verifying, and dispensing

- Standard operating procedure (SOP) created to address order entry, verification, and dispensing of hemostatic agents available on the BMC formulary
- SOP introduced to the pharmacy department through the Clinical Leadership Team
- SOP will be posted on the department's internal webpage
- An attestation form will be sent to all pharmacists

2. Lack of a standardized process for documenting hemostatic agents dispensed

- SOP includes:
- New dose-rounding policy: Doses may be rounded DOWN or UP to the next appropriate dose and/or vial size by the pharmacist as a protocol order if the dose is ≤ 10%
- Nearest nominal vial size
- Standardized proper documentation of hemostatic agents in the CPOE system (computerized physician order entry)

3. Unclear expectations for continued monitoring by clinical pharmacists

- High-Cost Medication Alert
- SOP describes expectations for clinical pharmacists to evaluate the need for continuation of the medication
- Ensure hematology consultation for continued use

4. Inaccurate medication charting, resulting in lost charges and increased risk for medication errors

- New real-time High-Cost Medication Hemostatic Agent Alert via email built for pharmacy purchasing team members
- Evaluation of proper documentation in the MAR

5. Decision between cost-containment strategies: Consignment vs 340B

- **Humate P® cost difference: $0.14/unit**
- $0.14/unit x 39,000 outpatient units = **$5,460** (Sep. 2016 - Oct. 2018)
- **FEIBA® cost difference: $0.65/unit**
- $0.65/unit x 29,500 outpatient units = **$19,195** (Jun. 2016 - Jul. 2018)

DISCUSSION

- Lost charges from high-cost medications, such as hemostatic agents, can be costly to the department and institution
- Lack of awareness of clear criteria for ordering, verifying and dispensing hemostatic agents increases risk for medication errors
- Cost-containment can be complex and requires high-level strategic planning and extensive collaboration
- Successful drug cost management requires systematic attention to and integration of both clinical and operational approaches
- Total financial opportunity over 2 years= **$408,533**
  - Cost savings using 340B: **$24,655**
  - Revenue gained from accurate charge capture: **$383,878**

FUTURE CONSIDERATIONS

- Repeat gap analysis for hemostatic agents in 6 months to assess compliance with SOP
- Consider implementing additional drugs into the high-cost medication SOP

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DISCLOSURE

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation

Evaluation of AUC-based Vancomycin Dosing Practices in Patients with Bloodstream Infections Caused by Methicillin-Resistant *Staphylococcus aureus*

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BACKGROUND

- Vancomycin is often considered the drug of choice for serious methicillin-resistant *Staphylococcus aureus* (MRSA) infections, including bacteremias.
- Area under the curve/minimum inhibitory concentration (AUC/MIC) ratio is the pharmacodynamic parameter best associated with vancomycin's effectiveness in treating such infections.
- Current guidelines advocate for an AUC/MIC target of at least 400 to achieve optimal bactericidal effect against *S. aureus*.
- High trough levels have been associated with an increased risk of nephrotoxicity.
- Recent literature suggests:
  - Single trough levels offer little prediction of the AUC.
  - The goal AUC/MIC of >400 can be achieved with trough levels much lower than the recommended 15-20 mg/L.
- At Baystate Medical Center (BMC), vancomycin AUC-based monitoring is performed for patients with identified MRSA bacteremia.
  - On initiation of therapy, empiric AUC calculations are performed using population-based kinetics.
  - Once the patient is at steady state, a peak and trough level are obtained and patient-specific AUC is calculated.

OBJECTIVES

Primary:
- Correlation between empiric AUC calculations and patient-specific AUCs

Secondary:
- Percent of patients who met the AUC goal of ≥400 mg/L•hr^{-1}
- Mean initial trough concentration in those that met goal versus those that did not

METHODS

- All adult patients with bloodstream infections caused by MRSA treated with AUC-based vancomycin regimens from Jan 2018 to Feb 2019 were reviewed.
- Exclusion criteria:
  - Pregnant
  - Receipt of renal-replacement therapy while on vancomycin
  - Lack of two steady-state vancomycin concentrations
- Institutional review board approval was granted prior to data collection.
- Empiric vancomycin AUC and pharmacokinetic data, as calculated via Vancomycin Initial Dosing Calculator on vancopk.com, were collected.
- Patient-specific AUC and pharmacokinetic data were calculated using the trapezoidal equation-based approach.
- Vancomycin MICs were assumed to be 1 mg/L.

RESULTS

76 adult patients treated with vancomycin for MRSA bacteremia

↓

Patients Excluded:
- Pregnant: 3
- Received renal-replacement therapy: 9
- Did not have two levels collected: 22

↓

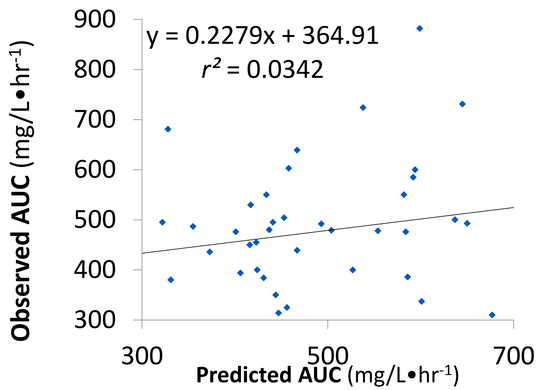
42 patients included for review

Demographics & Clinical Characteristics

	N (%)
Male	25 (59.5)
CKD*	5 (11.9)
Active IVDU**	20 (47.6)
Source of Infection:	
• Skin and soft tissue	11 (26.2)
• Endovascular	10 (23.8)
• Intravenous catheter	6 (14.3)
• Bone and joint	5 (11.9)
• Respiratory	2 (4.8)
• Other/unknown	8 (19)
	Mean (± SD)
Age (yr)	56 (± 20)
Height (cm)	171.5 (± 10.2)
Total body weight (kg)	76.2 (± 18.6)
Ideal body weight (kg)	65.6 (± 11.3)
Adjusted body weight (kg)	69.3 (± 12.2)
CrCl† (mL/min)	103 (± 54.4)
Total Daily Dose‡ (mg/kg)	29.1 (± 13.3)
	N (%)
Vancomycin-induced nephrotoxicity	7 (16.7)
14-day mortality	2 (4.8)
In-hospital mortality	3 (7.1)

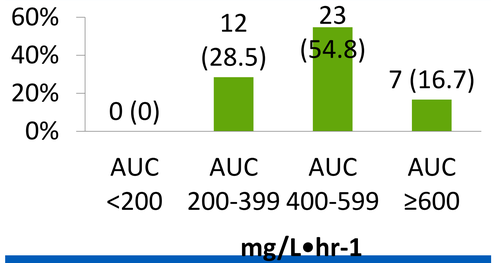
*CKD, chronic kidney disease; **IVDU, intravenous drug use; †CrCl, creatinine clearance (Cockcroft-Gault); ‡based on total body weight

Comparison of Population-Based vs. Calculated AUC



Significant difference in the mean initial trough concentration in patients who met the AUC goal vs. those who did not (13.8 mg/L ± 4.6 vs. 8.9 mg/L ± 2.4, p <0.001)

AUC Distribution following Empiric Calculations; N (%)



Patients who met AUC Goal Stratified by Initial Trough Concentration; N (%)

C_{min} <10 mg/L	5 (36)
C_{min} 10-14.9 mg/L	16 (84)
C_{min} 15-19.9 mg/L	7 (100)
C_{min} ≥20 mg/L	2 (100)

DISCUSSION

- Empiric AUC calculations through population-based kinetics did not produce a strong correlation to patient-specific AUCs.
- Regardless, following the AUC-based empiric dosing strategy, most patients met the AUC goal of ≥400 mg/L•hr^{-1}.
- These findings are consistent with prior data that suggest the AUC goal of ≥400 mg/L•hr^{-1} can be attained in most patients that achieve a vancomycin trough concentration of ≥10 mg/L.

Limitations	Future Directions
Small sample size, inability to assess patient outcomes	Continue to collect data to increase sample size
Data regarding the use of concomitant nephrotoxic agents and attainment of source control were not collected	Assess patient-specific factors that may account for differences in predicted vs. observed AUCs
MICs were assumed to be 1 mg/L	

References:

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Disclosures: Authors of this presentation have nothing to disclose.

Identifying discrepancies within the discharge summary in the Acute Care for the Elderly (ACE) Unit

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INTRODUCTION

It is estimated that approximately 29%[1] of American adults take five medications or more.

At our institution, a pharmacist has been incorporated into the Acute Care for the Elderly (ACE) Unit since July of 2018.

- ACE is an evidence-based model of care with the goal to minimize stress and prevent functional decline in older adults (≥ 65 years) during hospitalization.
- There is currently no standardized process for pharmacist-review of discharge medications at our institution, yet studies have demonstrated reduced errors when pharmacists are involved in the medication reconciliation process.[3]

OBJECTIVES

Primary Objective:
Identify the prevalence of medication discrepancies within discharge medication notes for patients located on the Acute Care for the Elderly Unit

Secondary Objective:

- Determine whether or not the implementation of a pilot project for pharmacist-led service is warranted to review medication lists prior to discharge
- Identify which patient populations may benefit from a pharmacist-led discharge service

METHODS

The physical discharge medication list was compared to the provider notes within the discharge summary to identify discrepancies.

Primary Outcome:	Number of discrepancies per patient
Secondary Outcomes:	• Therapeutic classes involved in discrepancies • Frequency of discrepancy types • Stratification of prevalence by subgroup: o Number of discharge medications o Medication reconciliation status o Chronological Age
Inclusion Criteria	Admitted to and discharged from the ACE unit
Exclusion Criteria	Chronological Age < 60 years

METHODS

Statistics:

Discrepancies Per Patient: # of discrepancies (total) / # of patients (total)

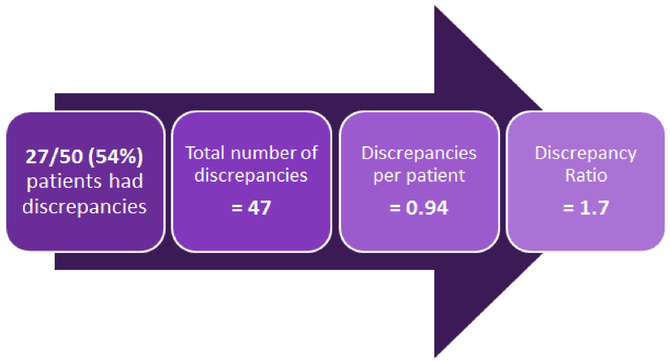
Discrepancies Incidence: # patients with discrepancies / # patients in group

Discrepancy Ratio: # discrepancies in group / # patients with discrepancies in group

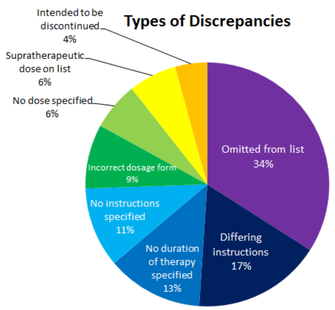
Data Collection Period: January 2019 to March 2019

RESULTS

Primary Outcome Results:



Secondary Outcome Results:



Top Therapeutic Classes Involved
Respiratory Tract Agents (15%)
Anti-infective Agents (13%)
Gastrointestinal Agents (11%)
Opioid Analgesics (9%)
Antidiabetic Agents (9%)
Antihypertensive Agents (9%)

RESULTS

Discharge Medication Reconciliation:

FUTURE DIRECTIONS

STEP 1: • This research has identified that our current discharge reconciliation process is insufficient at preventing discrepancies and potential medication errors

STEP 2: • Design and implement a pharmacy-led initiative to review medication lists prior to discharge within the ACE Unit

STEP 3: • Collect post-intervention data to assess impact and consider implementation on a larger scale.

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Impact of antibiotic review during transition from hospital to community

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BACKGROUND

- Antimicrobial stewardship (AMS) programs have largely focused on inpatient care
- The transition from hospital to community may be another opportunity for AMS services when antibiotic regimens need to be completed in the outpatient setting
- According to the Center for Disease Control (CDC), about 30% of antibiotics prescribed in both inpatient and outpatient settings are unnecessary or prescribed incorrectly[1]
- Inappropriate antibiotic use leads to antimicrobial resistance, adverse drug effects, and increased costs
- Several retrospective studies that assessed antibiotic review on hospital discharge have shown that up to 70% of antibiotics are prescribed inappropriately[2]
- In an additional study, 70% of pharmacist recommendations were accepted, and prevented potential errors in 68% of patients[3]
- Common errors include duration, dose, and choice of antibiotics
- There is a need to extend AMS services beyond the inpatient setting to help bridge this gap in care

METHODS

- Single center, retrospective, quality improvement initiative
- Interventional group: January 2019 – February 2019
- Historical control: January 2018 – February 2018
- **Inclusion criteria:**
  - Patients at least 18 years of age
  - Admitted to general medicine floor
  - Plan for continuation of antibiotic after discharge

OBJECTIVE

- To evaluate the impact of antimicrobial stewardship review of antibiotic prescriptions upon transitions of care from hospital to community

INTERVENTION

AMS team to utilize discharge tracking board to identify patients potentially being discharged in the next 24-48 hours

The pharmacist will review the patients and assess for antimicrobials being prescribed at discharge

The pharmacist will make any interventions pertaining to the antibiotic when necessary (i.e., choice, dose, duration), prior to patient discharge

Primary Endpoint:

- Number of days of antibiotic therapy prescribed upon hospital

Secondary Endpoints:

- Number of interventions made
- Type of intervention made
- Intervention acceptance rate
- Any 30-day readmission

DEMOGRAPHICS

- Top 4 most frequent indications for antibiotics and top 4 most frequently prescribed outpatient antimicrobials

Type of Infection	Pre-intervention	Post-intervention
Influenza	36	25
Pneumonia	16	22
UTI	10	18
Bacteremia	11	13
Oseltamivir	36	25
Fluoroquinolones	18	18
Penicillins	15	22
Cephalosporins	15	7

	Pre-intervention Group (Jan-Feb 2018)	Post-intervention Group (Jan-Feb 2019)
Patients Discharged with Antibiotics, n	99	110
Sex, %	56.6% males	47.3% males
Age (Years) Median [IQR]	69 [54-78]	65.5 [54.3-77]
LOS (Days) Median [IQR]	4 [2-6] Range: 1-20	4 [2-6] Range: 1-30

PRIMARY ENDPOINT

2018 Days of Outpatient Therapy	2019 Days of Outpatient Therapy
Median: 4 IQR: 2-7 Range: 0.5-42	Median: 4 IQR: 3-7 Range: 0-43

	2018	2019
Total **Inpatient + Outpatient** DOT	Median: 9 IQR: 6.5-13	Median: 9 IQR: 6-14

SECONDARY ENDPOINTS

- 14 interventions were made on 11 patients
- Intervention acceptance rate: 71.4%
- 3 interventions were not accepted due to patient already being discharged

Type of Intervention	Frequency
Change in Duration	8 (25 total DOT avoided)
Change in Frequency	3
Antibiotics not Indicated/ Completed Therapy	2
De-escalation of Therapy	1

Disclosure: Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

	Any 30-day Re-admission Pre-intervention	Any 30-day Re-admission Post-intervention
Percentage of Patients	15% (n=15)	20% (n=22)
Infection-related Re-admission	26.7% (4/15)	59.1% (13/22)
Adverse Event-related Re-admission	1 severe diarrhea, *C. difficile* negative	1 patient possible allergic reaction to cephalexin

LIMITATIONS

- Single medical unit in single institution
- Sustainability
  - AMS pharmacists have many other tasks throughout the day
  - Time frame from discharge ordered to patient being discharged is variable
- Weekend and evening discharges
- Discharge unit open January and February

DISCUSSION

Clinical Impact:

- AMS pharmacists can have a positive impact on the transitions of care (TOC) process as seen by the 71.4% intervention acceptance rate

Future Directions:

- Continuation of AMS TOC interventions as time permits
  - Potential role for care team pharmacists outside of AMS team to have an impact in this initiative with appropriate training
- Develop better strategy to identify patients
- Continue to offer PGY2 ID TOC elective rotation

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Implementation of Pharmacist Driven Transitions of Care Services in the Emergency Department

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BACKGROUND

Based on studies looking at emergency department (ED) prescription noncompliance, the need for a transitions of care (TOC) pharmacist within this specialized area has been identified as a means to help address gaps in medication therapy and patient knowledge. The results are as follows:

- New medications are prescribed for 2 out of every 3 patients discharged from the ED.
- Up to 35% of patients are noncompliant with their ED discharge medications.
- Medication noncompliance has been shown to be the major contributing factor for as many as 22% of return ED visits.

OBJECTIVES

Primary Objective:

- Implement a standard process for transitions of care services, by a pharmacist, for patients who are discharged home

Secondary Objective:

- Track patient compliance to discharge prescriptions from the ED
- Assess the rate at which patients revisit fast track

METHODS

- The pharmacy resident, working as the TOC pharmacist, joined the fast track team consisting of doctors, midlevel practitioners, nurses, patient care technicians and scribes.
- The resident spent one day per week in fast track for 6 weeks; Monday was identified as the day with the highest patient census.

Inclusion Criteria

- Patients seen in fast track and pharmacist consulted for TOC services
- English and non-English speaking patients

Exclusion Criteria

- Patients seen in fast track **without** TOC pharmacist intervention
- Patients seen outside of fast track

METHODS

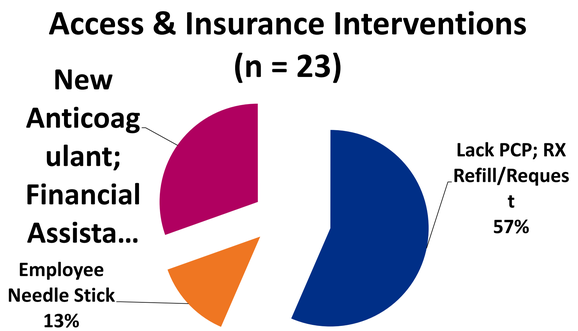
Pharmacist Interventions

Access & Insurance	• Lack of PCP; RX refill/request • Employee needle stick • New anticoagulant; financial assistance
Education & Counseling	• Device training • Disease state counseling • Adherence counseling
Pharmacist Clinical Interventions	• Medication selection • Prescription directions; drug-drug interactions • Therapy appropriateness

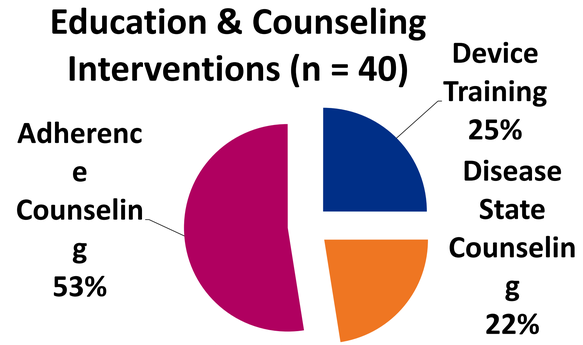
RESULTS

- The TOC pharmacist spent a total of **37 hours** in fast track
- During this time, **138 patients** were seen by the fast track team
- **55 patients (40%)** out of these total patients received an intervention by the TOC pharmacist

Access & Insurance	n = 23 (44%)
Education & Counseling	n = 40 (77%)
Pharmacists Clinical Interventions	n = 46 (90%)
Medication Reconciliation	n = 55 (100%)



RESULTS



Fast track prescriptions (n = 55)

- Baystate Pharmacy compliance: 100% (n = 26)
- Outside pharmacy compliance: 76% (n = 22)
- Overall compliance: 87% (n = 48)

30-Day fast track revisit rate = 18% (n = 10)

- Return for prescription refill = 2 patients

DISCUSSION

Addition of the TOC pharmacy resident to the patient care team within the fast track area of the ED lead to:

- Increased access to care
- Increased medication compliance
- Decreased fast track revisits

Limitations	Future Implications
High patient turnover	Application of TOC services in the ED
Single pharmacist operation	Expand TOC services in fast track
Medical team rotation	Retail ED dispensing pharmacy
Sustainability of TOC services	Mandated d/c prescription review

DISCLOSURES

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have direct or indirect interest in the subject matter of this presentation.

Pharmacist-driven Implementation of Guidelines for Management of Pain, Sedation, and Delirium in a Medical Intensive Care Unit

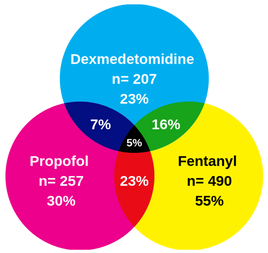
Mehrnaz Sadrolashrafi, PharmD; Hannah Spinner, PharmD, BCCCP; Adam Pesaturo, PharmD, BCPS, BCCCP

Baystate Medical Center

Baystate Medical Center

INTRODUCTION

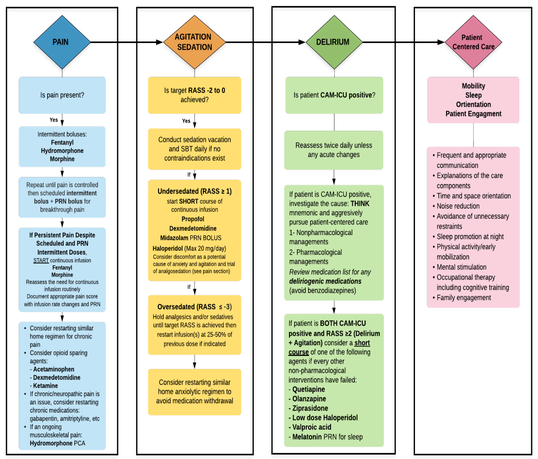
- Pain, agitation, and delirium (PAD) stewardship could be considered a coordinated program aimed at promoting evidence-based prescribing of opioids and sedatives
- Critical care pharmacists in a stewardship-type role can optimize an appropriate level of sedation and pain control in critically ill patients
- Retrospective evaluation of patients admitted to MICU from February 2018 to June 2018 (n=879)



METHODS

Primary Endpoint: to study the impact of the pharmacist's intervention on DOT/1000 Patient Days and unique administration of opioids and sedatives in mechanically intubated patients

- Development of an institutional practice guidelines in line with SCCM PADIS guidelines



RESULTS

Characteristics	Pre intervention (n=217)	Post intervention (n=66)
Age, yr, mean ± SD	62 ± 15	64 ± 15
Male n (%)	112 (52)	41 (62)
Race n (%)		
Black	24 (11)	6 (9)
Hispanic	14 (6)	7 (11)
White	162 (75)	49 (74)
Not specified/Disclosed	17 (8)	4 (6)
Indication for mechanical ventilation, n (%)		
Alcohol/drug overdose	19 (9)	5 (7)
Cardiac Arrest/PEA	23 (11)	9 (13)
CHF/pulmonary edema	10 (5)	3 (4)
COPD/asthma	11 (5)	5 (7)
Gastrointestinal bleed	9 (4)	4 (6)
Pneumonia and/or ARDS	47 (22)	13 (19)
Seizure	15 (7)	3 (4)
Trauma	1 (<1)	2 (3)
Other	82 (38)	25 (36)

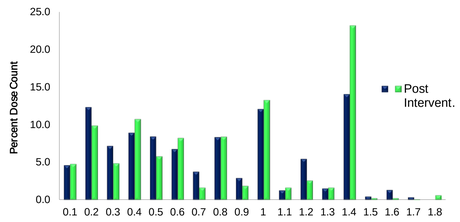
	Pre intervention (n=217)	Post intervention (n=66)
Length of mechanical intubation, hr, median, (IQR)	36 (12-113)	43 (23-104)
Length of ICU stay, hr, median, (IQR)	64 (30 – 136)	81 (47 – 131)

	Pre intervention (n=217)	Post intervention (n=66)
Patients with recorded CAM-ICU positive n (%)	114/217 (53)	38/66 (58)

	Pre intervention (n=217)	Post intervention (n=66)
Haloperidol n (%)	11 (5)	3 (5)
Quetiapine n (%)	21 (10)	5 (2)
Olanzapine n (%)	2 (0.9)	1 (2)

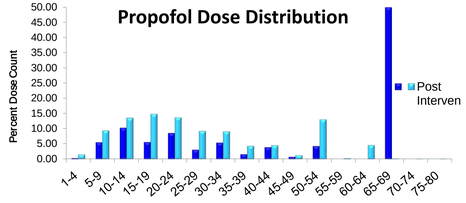
Pharmacist Intervention (n = 83)	n (%)
Discontinue opioid continuous infusion	16 (20)
Decrease infusion rate of opioid	1 (1)
Add intermittent opioid bolus	22 (27)
Add as needed adjunct non-opioid agent for pain	8 (10)
Start continuous infusion of opioid	9 (11)
Discontinue sedative agent	10 (12)
Decrease infusion rate of sedative	5 (6)
Add sedative agent	3 (4)
New initiation/dose titration of typical/atypical antipsychotic	4 (5)
Discontinue antipsychotic	4 (5)

Dexmedetomidine Dose Distribution



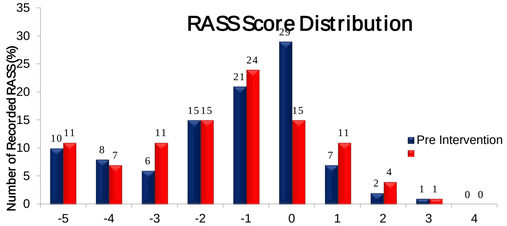
Dose	Pre intervention	Post intervention
Dexmedetomidine (mcg/kg/hr), Mean ±SD, Median	0.75 ± 0.4 0.7	0.84 ± 0.5 0.8

Propofol Dose Distribution

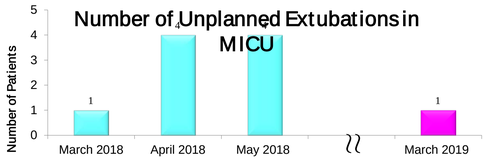


Dose	Pre intervention	Post intervention
Propofol (mcg/kg/min) Mean ±SD, Median	25 ± 16 20	22 ± 13 0.8

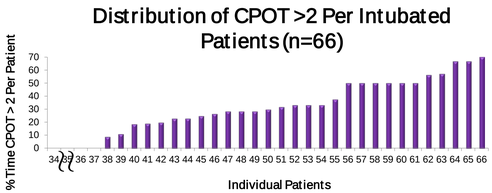
RASS Score Distribution



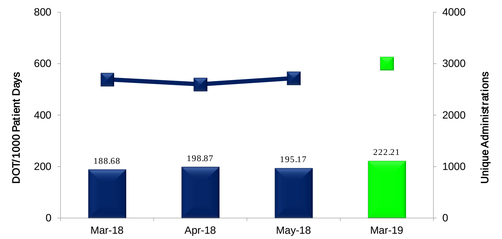
Number of Unplanned Extubations in MICU



Distribution of CPOT >2 Per Intubated Patients (n=66)

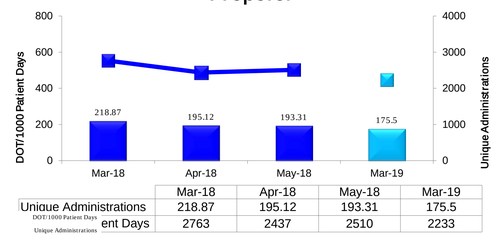


Dexmedetomidine



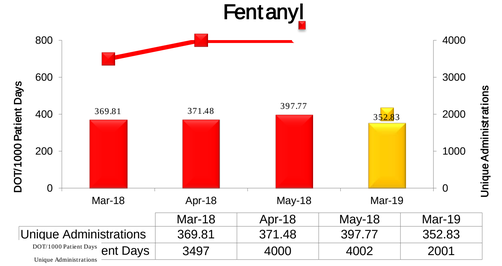
	Mar-18	Apr-18	May-18	Mar-19
Unique Administrations	188.68	198.87	195.17	222.21
DOT/1000 Patient Days' ent Days	2696	2599	2718	3008

Propofol



	Mar-18	Apr-18	May-18	Mar-19
Unique Administrations	218.87	195.12	193.31	175.5
DOT/1000 Patient Days' ent Days	2763	2437	2510	2233

Fentanyl



	Mar-18	Apr-18	May-18	Mar-19
Unique Administrations	369.81	371.48	397.77	352.83
DOT/1000 Patient Days' ent Days	3497	4000	4002	2001

DISCUSSION

- Daily interventions by a critical care pharmacy resident who implemented the institutional PADIS guideline led to a 50% reduction in the number of unique doses of fentanyl administered over the duration of this study

Future Directions

- Complete the second phase of the study until May 2019 and conduct the secondary data analysis
- Addition of the management of PADIS to an onboarding training for all incoming PGY1 and PGY2 residents in order to offer this service 7 days a week
- Expand this practice guideline to other ICUs within the institution (surgical, neuro, cardiac)

Pharmacists Defining High-Risk Opioid Use Patient Populations at Baystate Medical Center

Catherine Chatowsky, PharmD; Melanie Conboy, PharmD;
Evan Horton PharmD, BCPPS; Shawn Roggie, PharmD, MBA

Baystate Health

MCPHS UNIVERSITY

BACKGROUND

- **2016: MA ↑ Drug Overdose Death Rate**
  - Driven by heroin and synthetic opioids
  - Deaths: 23.5 per 100,000 population
  - 2017: 24.5 per 100,000 (4.3% change)
- **BMC Pharmacy New FTE Approved**
  - Pain Management Pharmacist
  - Anticipated to start September 2019
- **CDC Guidelines: Prescribing Opioids for Chronic Pain**
  - Clinicians should avoid increasing dosage, or carefully justify a decision to titrate dosage, to ≥90 Morphine Milligram Equivalents (MME/day)
  - High Risk: May increase risk for overdose

OBJECTIVES

1. Define BMC's High-Risk Opioid-Using Patient Population:
2. BMC IRB Approval to Develop a Data Extraction Tool
3. Identify areas for BMC Pharmacy Pain Management Interventions

PATIENT SELECTION

50 Adult Inpatients

Eligibility:
- Adult inpatients administered opioids ≥ 90 MME/day

Exclusion Criteria:
- PCA pumps or continuous infusions
- ED or any ICU patients per day
- Cancer diagnosis
- Comfort Measures Only (CMO) Status

METHODS

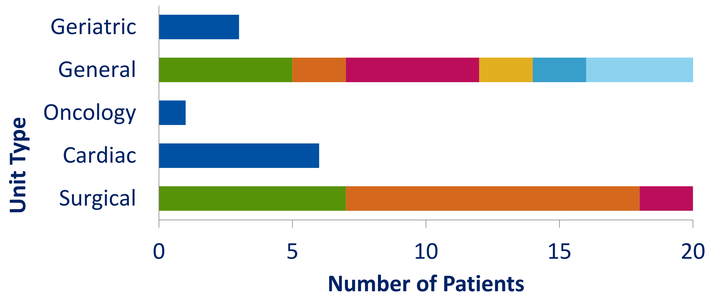
- **Identify 50 high-risk opioid using patients using data extraction tool**
  - Check tool daily for eligible patients
  - Check eMAR to determine administration of ≥ 90 MME/Day
  - Recheck patients the next day
- **Retrospective Chart Review: 50 Patients ≥ 90 MME/Day**
  - Baseline Characteristics (age, sex)
  - Prior opioid use + selected medications
  - Diagnosis or history of substance abuse
  - Pain + primary discharge diagnosis
  - MME/Day: first 24 hrs, admission high, discharge
  - Inpatient selected medications
  - Naloxone orders: inpatient + discharge

Rules for Data Extraction Tool

Drug	Oral (mg/day)	IV (mg/day)
Morphine	≥90	≥30
Hydromorphone	≥22.5	≥4.5
Hydrocodone	≥90	
Oxycodone	≥60	
Codeine	≥600	
Fentanyl transdermal	≥50 mcg/hr*	

RESULTS

Admission: Hospital Location



Pre-Admission Prescription History

For ≥ 3 Months	Number of patients (%)
Opioid	18 (36)
In the Past 3 Months	**Number of patients (%)**
Benzodiazepine	9 (18)
Gabapentin or Pregabalin	12 (24)
Muscle Relaxant	6 (12)
In the Past 1 Year	**Number of patients (%)**
Naloxone	0 (0)

Opioid Use

	Median (MME/Day)	Minimum (MME/Day)	Maximum (MME/Day)
First 24 Hours	120	0	960
Highest 24 Hours	178	95	960
Discharge Prescription	96	0	663

66% of Patients had Discharge Prescription(s) ≥ 90 MME/Day
8% of Patients Discharged without Opioid Prescription(s)

Medications Administered with Opioids

	Number of Patients (%)	Outpatient Prescription (%)
Benzodiazepine	20 (40)	9 (18)
Gabapentinoids	16 (32)	12 (24)
Muscle Relaxants	7 (14)	6 (12)

Discharge Naloxone Prescription

DISCUSSION

- Identifying high-risk opioid users is difficult with the current electronic system and data extraction tool. This tool will need to be adapted and refined in the near future.
- An essential responsibility of the new pain management pharmacist will be to identify high-risk opioid using patients during periods of transitions of care to enhance pain care plans.

Limitations	Future Directions
Data extraction tool cannot detect drug administrations or MME/Day	Build a BMC Opioid Calculator: MME/Day
No BMC Opioid Calculator: MME/Day	Add a rule for opioid-use + benzodiazepines
May not be capturing all patients on the eMAR. ▪ Operating rooms use different eMAR.	Focus on surgical inpatient floors ▪ Evaluate surgical power-plans that allow for high MME/Day
Identification of opioid dependence is dependent on medical coding	Increase awareness and access to naloxone at discharge

References: 1.) MMWR Morb Mortal Wkly Rep. 2018;67:349–358. 2.) MMWR Morb Mortal Wkly Rep. 2019;67:1419–1427. 3.) MMWR Recomm Rep. 2016;65:1–49.
Disclosures: Authors of this presentation have nothing to disclose.

Pharmacy Services at Baystate High Street Health Center

Melanie Conboy, PharmD, Geena Eglin, PharmD, Jennifer Glisson, PharmD,
Carmen Lariviere, RPh, Kevin Miler, RPh, Eunice Lopez, CPhT

Baystate Health

UMASS MEDICAL SCHOOL

BACKGROUND

According to the Association of American Medical College, there is expected to be a physician shortage 121,300 physicians by 2030 in the US. Coupled with the current nursing shortage, it is becoming increasingly difficult for Primary Care to manage patients disease states effectively and provide access to care in a timely manner. About 157 million Americans (48% of the total U.S. population) live with a chronic condition. We established a clinical pharmacy presence within Baystate High Street Health Center – Adult Medicine (BHSHC-AM) to accommodate medication related needs of both patients and providers. The Pharmacy Consult Clinic is available 3 days per week and assists in bridging the provider shortage gap. By providing patients with access to our Pharmacy Consult Clinic, we have been able to show great benefits while obtaining positive outcomes of chronic disease states.

METHODS

Inclusion Criteria

Patients referred to Pharmacy Consult Clinic or consults during provider visit

Exclusion Criteria

Patients seen outside the Pharmacy Consult Clinic operation hours

Chronic Disease Education

- **Diabetes:** Insulin teaching, glucometer training, complications, and interpretation of glucose readings/A1C
- **Hypertension:** complications, diet and exercise
- **Asthma:** inhaler/spacer training, monitor use of rescue inhaler, warning signs and avoidance of triggers

PHARMACIST INTERVENTIONS

Addition of therapy	• Identify gaps of therapy
Discontinuation of therapy	• Identify inappropriate medications or medications no longer needed
Dose change or change of medication	• Optimize therapy by decreasing pill burden with combination medications, determine appropriateness of dosage forms • Identify suboptimal or supratherapeutic dosing
Chronic disease education	• Diabetes, Hypertension, Asthma
Recommend laboratory testing	• Recommend labs based on medication guidelines (A1C, liver function tests, lipid panel, TSH, etc.)
Nutrition education	• Demonstration of proper portion sizes and carbohydrate counting
Referred to provider	• Identify patients that need to be seen in clinic for an urgent visit
Smoking cessation education	• Assess readiness to quit, treatment options and continued support
Obtain prescription refills	• Refill prescriptions per clinic protocol and obtain refills from provider
Medication Reconciliation	• Obtain patient history, identify duplicate prescriptions, determine adherence, and update CIS medication lists

BASELINE CHARACTERISTICS

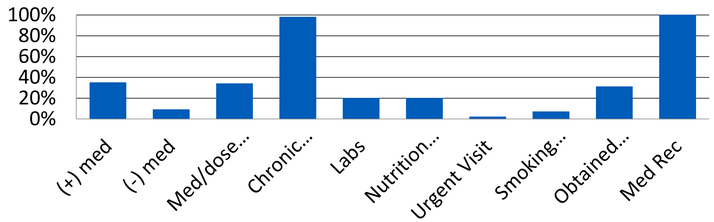
n = 75	
Age, mean years ± SD	61.6 ± 13.7
Sex	
Male	33 (44)
Female	42 (56)
A1C	
< 7.0	27 (36)
7.0 – 9.9	27 (36)
≥ 10	21 (28)

RESULTS

The chart shows the percentage that each intervention is performed during a pharmacy consult visit. Along with addressing interventions we are able perform a complete medication reconciliation at all visits. The medication list in CIS is updated every time.

By providing this teaching and education, our results demonstrated that we were successfully able to decrease each patient A1C by an average of 0.81% after just one pharmacy consult visit.

Interventions

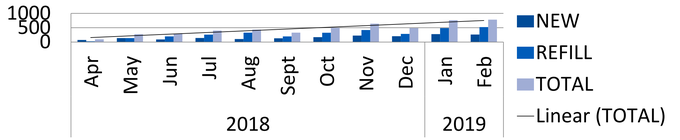


ENHANCED PHARMACY SERVICES

Free prescription delivery service began in April 2018. The number of prescriptions delivered continues to grow.

To date, over 4000 prescriptions have been delivered and patient and provider satisfaction has been enhanced. Due to this, prescription volume has increased in the pharmacy by 25%.

Prescriptions Delivered



DISCLOSURES

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Transitions of Care: Longitudinal Pharmacy Resident Learning Experience

Melanie Conboy PharmD[1]; Geena Eglin, PharmD[1]; Jennifer Glisson, PharmD[1]; Jared Ostroff, PharmD, BCACP[1,2], BCGP

1. Baystate Medical Center; 2. Western New England University CoPHS – Springfield, Massachusetts

BACKGROUND

- The transitions of care (TOC) pharmacy learning experience was newly re-designed to have the pharmacy resident complete patient centered teaching and education surrounding the medication-use process .
- Pharmacy involvement throughout TOC helps to improve patient outcomes, reduce readmissions, and benefit patients' quality of life.

LEARNING OBJECTIVES

- Complete admission and discharge medication reconciliations
- Provide resources for patients to obtain prescribed medication therapy
- Work to resolve medication access issues prior to hospital discharge
- Identify language & literacy barriers and provide counseling for patients
- Follow up with patients in their assigned outpatient clinics

METHODS

Inclusion Criteria

- Admitted patients: 2 weeks prior to running the MIDAS report
- Brightwood Health Center (BWHC) or High Street Health Center (HSHC) patients
- Patients still admitted to the hospital; plans for discharge home

Exclusion Criteria

- Patients with planned discharge to a rehabilitation facility
- Patients already discharged from the hospital

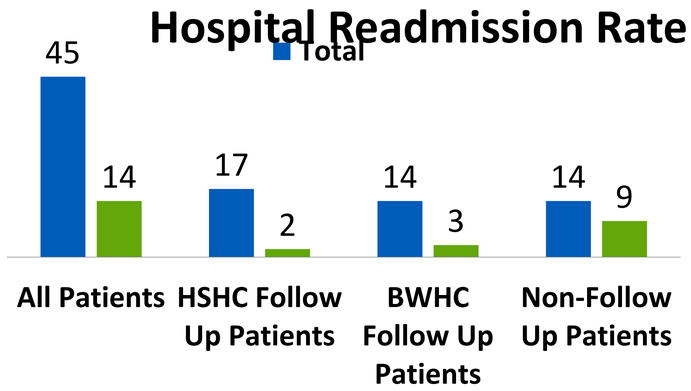
RESULTS

Baseline Characteristics (n = 45)	
Average Age (±SD)	57.3 ± 16.3
Male	22 (48.8)
Average # of Home Medications	14.9
Average # of Incorrect Medications*	5.79

*Medications incorrect from home list; needed to be changed

RESULTS

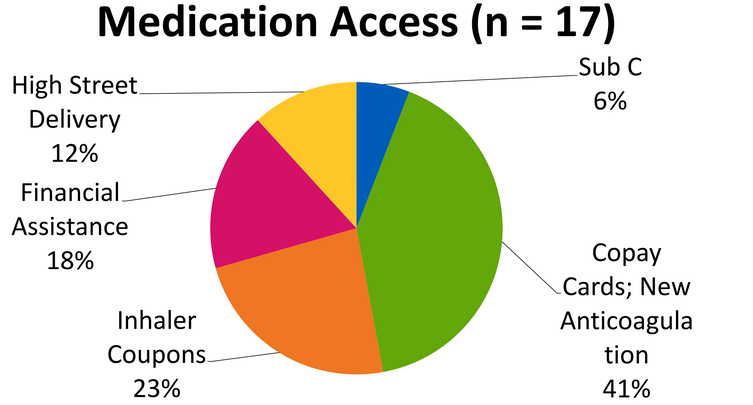
Total Population	n = 45
Medication Access	n = 17 (38%)
Counseling & Education	n = 41 (91%)
Clinical Pharmacists Interventions	n = 26 (58%)
Medication Reconciliation	n = 45 (100%)

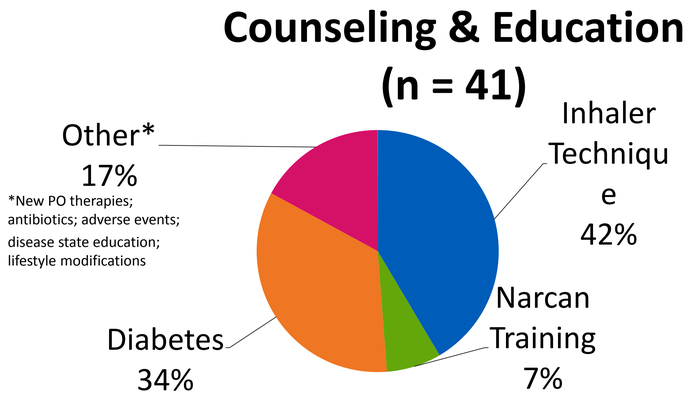


Hospital Readmission Rate

Patients were followed 30 days past their hospital discharge date to evaluate the efficacy of post discharge pharmacy follow up.

- HSHC follow up patients = 11.7%
- BWHC follow up patients = 21.4%
- Patients with no clinic follow up = 64.2%





DISCUSSION

The TOC pharmacy resident plays a vital role in patient centered care & has led to improved outcomes such as:

- Increased access to follow up care post hospital discharge
- Increased medication adherence
- Decreased hospital readmission rates

Financial Impact	Future Directions
Cost avoidance for medical readmission (~ $ 1,020.00/pt.)	TOC services to all units
Cost avoidance for cardiac readmission (~ $ 2,087.00/pt.)	FTE approval for TOC Pharmacists
TOC Pharmacist follow up = billable clinical services	Code 99495 & Code 99496 utilization