



# **Weill Cornell Medicine**

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**Department of Medicine  
Quality Improvement  
& Patient Safety Committee**

## **Poster Session Abstracts**

**May 17<sup>th</sup>, 2017**

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## Limiting and Reducing Long-Term Dialysis Catheter Use

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**Background:** Long-term dialysis catheter (LTDC) use is associated with significant morbidity and mortality. Centers for Medicare and Medicaid Services established a goal of < 10% for LTDC use > 90 days.

**Objective:** To reduce the use of LTDC (>90 days) at Trude Weishaupt Memorial Dialysis Center.

**Methods:** Medical records of prevalent and incident patients during 2014 and 2015 were reviewed and dialysis access data was tabulated. An increasing trend of LTDC use (>90 days) was documented 6.0% rising to 10.7%. Using a QI approach we identified several root causes and in September 2015 implemented a plan to target the identified deficiencies. For incident dialysis patients: 1. Early surgeon referrals for vascular access creation in office patients with CKD 4-5 stages, 2. Initiate ongoing evaluation of access function in CKD 4-5 patients, and 3. Stress in-hospital vascular access creation for newly diagnosed end-stage renal disease patients pre-discharge. For prevalent dialysis population: 1. A physician team leader was identified to work with the access nurse manager to evaluate patients' access status and coordinate timely patient IR and surgical follow-up. 2. Physicians and nurses were re-educated on how to evaluate access function and advised to take a proactive role in access care. 3. The access nurse manager, staff nurses, and the physician team leader were to notify physicians on a weekly basis if their patients' have access problems. 4. Surgeons and interventional nephrologist/radiologist with best outcomes were identified to be used preferentially. 5. The interval between vascular access creation and the first fistulogram or maturation process advised to begin at 4 weeks.

### Results:

PERIOD	2014			2015			2016		
	Prevalent		Incident	Prevalent		Incident	Prevalent		Incident
	LTDC > 90 d	No AVF/AVG	No AVF/AVG	LTDC > 90 d	No AVF/AVG	No AVF/AVG	LTDC > 90 d	No AVF/AVG	No AVF/AVG
Jan-Mar	6.0%	8.0%	42%	8.3%	11.2%	46.2%	9.7%	12.3%	0%
Apr-Jun	5.0%	6.1%	7.7%	9.8%	11.2%	28.6%	10.4%	11.6%	18.2%
Jul-Sep	6.3%	6.3%	14.3%	10.7%	12.0%	25.0%	9.1%**	9.9%**	33.3%
Oct-Dec	8.7%	10.1%	30%	9.9%	12.0%	66.7%	7.8%**	10.8%**	38.5%

The implementation of new LTDC use reduction strategies led to a decline in LTDC use >90 days by 3<sup>rd</sup> quarter of 2016. Incident patients entering the unit without an AVF/AVG decreased from yearly average of 42% in 2015 to 22.5% in 2016.

**Conclusions:** Our findings highlight a multi-disciplinary quality improvement initiative that targeted open and timely communication between physicians, dialysis staff and patients, prompt access creation, prompt follow-up and access revision by IR and surgeons, making patient transportation available, and continuing education in successfully reducing LTDC use >90 days.



## Limiting and Reducing Long-Term Dialysis Catheter Use

Edwin C. Azarkian, MD; Sheng Kuo, MD; Josephine Kulogowski, RN; Farhanah Yousaf, MBBS; Joan Arslanian, NP; Marilyn Galler, MD

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### Problem Statement

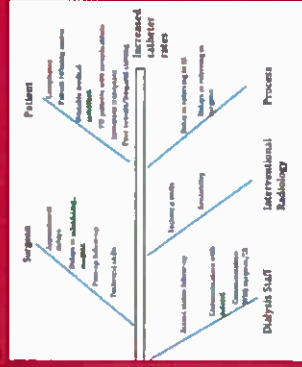
Long-term dialysis catheter (LTDC) use is associated with significant morbidity and mortality. Centers for Medicare and Medicaid Services established a goal of < 10% for LTDC use > 90 days. An increasing trend of LTDC use at Trude Weishaup Dialysis Center was noted (6.0% to 10.7%).

### Objective/Aim Statement

To reduce the use of LTDC (>90 days).

### Design/Methods

Medical records of prevalent and incident hemodialysis patients during 2014 and 2015 were reviewed and dialysis access data was tabulated. Using a QI approach we identified several root causes and implemented a plan to address the identified deficiencies in September 2015.



For incident dialysis patients: 1. Early surgeon referrals for vascular access creation in office patients with CKD 4-5 stages, 2. Initiate ongoing evaluation of access function in CKD 4-5 patients, and 3. Stress in-hospital vascular access creation for newly diagnosed end-stage renal disease patients pre-discharge.

For prevalent dialysis population: 1. A physician team leader was identified to work with the access nurse manager to evaluate patients' access status and coordinate timely patient, interventional nephrologists/radiologists (IR) and surgical follow-up. 2. Physicians and nurses were re-educated on how to evaluate access function and advised to take a proactive role in access care. 3. The access nurse manager, staff nurses, and the physician team leader were to notify physicians on a weekly basis if their patients' have access problems. 4. Surgeons and IRs with best outcomes were identified to be used preferentially. 5. The interval between vascular access creation and the first fistulogram or maturation process advised to begin at 4 weeks.

### Results



The implementation of new LTDC use reduction strategies led to a decline in LTDC use >90 days by 3<sup>rd</sup> quarter of 2016 (10.4% to 7.8%). Incident patients entering the unit without an arteriovenous fistula/graft (AVF/AVG) decreased from yearly average of 42% in 2015 to 22.5% in 2016.

### Conclusions/Lessons Learned

Our findings highlight a multi-disciplinary quality improvement initiative that targeted open and timely communication between physicians, dialysis staff and patients, prompt access creation, prompt follow-up and access revision by IRs and surgeons, making patient transportation available, and continuing education in successfully reducing LTDC use >90 days.

### Next Steps

- Continue staff education on catheter reduction strategies, current catheter rates and goals.
- Maintain communication between physicians, dialysis staff, and patients.
- Arrange educational sessions involving physicians, nursing staff, patients, and IRs on new access evaluation.
- Identify secondary AVF access opportunities.
- Implement revised AVF cannulation/catheter removal protocol.
- Continue monthly monitoring of numbers of catheters in incident and prevalent hemodialysis patients and reasons for continued catheter use.
- Continue to monitor the quality of access creation/intervention and timeliness of follow-up.

**Passport to good health: a multidisciplinary approach to improve medication adherence, self-efficacy and optimize transition of care in patients at high risk for readmission, a patient safety and quality improvement initiative.**

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**Statement of the Problem:**

Quality healthcare outcomes can be dependent on the patients' adherence to the recommended medication plan.<sup>1,2</sup> Recent studies show that medication adherence is a modifiable risk factor in predicting 30 day readmission<sup>3</sup>. Medication adherence is one of the key factors which links medical practice and patient outcomes, because non-adherence to medications can lead to increased health care costs, higher morbidity, adverse clinical outcomes and recurrent readmissions.<sup>1</sup> Adherence depends on many factors, including a patient's knowledge of the correct medication regimen and chronic disease self-efficacy<sup>4</sup>. Education about one's medication care plan and its use has been shown to help promote adherence and largely depends on the accuracy of the current medications list of the hospitalized patient using medication reconciliation<sup>5,6</sup>.

**Objective/Aim of the study:**

The chief aim of this study is to evaluate the effect of a pharmacy led medication education intervention on self-efficacy and adherence behavior in hospitalized patients, who are screened and deemed to be at high risk for readmissions, using a statistically validated Morisky adherence scale<sup>7</sup> and a Medication Understanding and Use Self-Efficacy scale survey and overall impact on readmission rates. Secondly, we aimed to quantify the number of medication discrepancies as a result of pharmacy's involvement in the medication reconciliation process

**Project Design/Methods:**

Medicaid insured patients were screened for eligibility based on comorbidities, number of medications or recent prior admission within 30 days of enrollment. The design was a prospective study. A process map was done to outline the multiple steps required for the project.

Using various PDSA cycles, the study was refined into fewer steps. We sought to systematize the medication reconciliation process and created a template to help educate the patient at the bedside using a personalized medication care plan. The medication education intervention was performed by pharmacy in collaboration with nursing. Patients' adherence and self efficacy levels were assessed and compared before the intervention and 14 days later. Patients received follow up phone calls within 3 days, 14 days and 30 days of being discharged. Readmission rates within 30 days were monitored.

**Passport to good health: a multidisciplinary approach to improve medication adherence, self-efficacy and optimize transition of care in patients at high risk for readmission, a patient safety and quality improvement initiative.**

Magalie Bruneus, MD<sup>1,2</sup>, Grace Shyh, PharmD<sup>3</sup>, Savira Kochhar, MS<sup>1</sup>, Yenni Ortega, BSN<sup>4</sup>, Ying Chan BSN<sup>4,5</sup>, Judith Kurtis, MSW<sup>5</sup> and Daniel Crossman, MD<sup>1,2</sup>

**References**

1. Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS. Impact of medication adherence on hospitalization risk and healthcare cost. *Med care* 43: 521-530
2. Leung CH., Chong C., Lim WK. Medical student-led patient education prior to hospital discharge improves 1-month adherence rates. *Intern Med J.* 2017 Mar;47(3):328-332.
3. Rosen OZ, Fridman R, Rosen BT, Shane R, Pevnick JM. Medication adherence as a predictor of 30-day hospital readmissions. *Patient Prefer Adherence.* 2017 Apr 20;11:801-810.
4. Cameron KA, Ross EL, Clayman ML, Bergeron AR, Federman AD, Bailey SC, Davis TC, Wolf MS. Measuring patients' self-efficacy in understanding and using prescription medication. *Patient Educ Couns.* 2010 Sep;80(3):372-6.
5. Atreja A, Bellam N, Levy SR. Strategies to enhance patient adherence: making it simple. *MedGenMed.* 2005 Mar 16;7(1):4.
6. Leguelinel-Blache G, Dubois F, Bouvet S, Roux-Marson C, Arnaud F, Castelli C, Ray V, Kinowski JM, Sotto A. Improving Patient's Primary Medication Adherence: The Value of Pharmaceutical Counseling. *Medicine (Baltimore).* 2015 Oct;94(41):e1805
7. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care.* 1986; 24:67-74.



A multidisciplinary approach to improve medication adherence and self-efficacy in patients at high risk for readmission, a patient safety and quality initiative

QIPS Poster Session 2017

Grace Shyh, Pharm.D., Savira Kochhar, M.S., Yenni Ortega B.S.N., Ying Chan R.N., Judith Kurtis, LCSW, Daniel Crossman, MD, Magalie Bruneus, MD | May 17th, 2017

Statement of the Problem:

Recent studies show that medication adherence is a modifiable risk factor in predicting 30 day readmission. Medication adherence is one of the most important factors which connects medical practice to patient outcomes...

Objective/Aim of the study:

The main objective of this study is to evaluate the effect of a pharmacy led medication education intervention on adherence and readmission rates in hospitalized patients...

Results:

A total of 24 Medicaid insured patients were consented and enrolled in the study. Of these enrollees, 78% had an education level of high school or less and greater than 50% did not have proficiency in English language.

There was an overall greater than 10% improvement in adherence as a result of the pharmacy education intervention during hospitalization as reflected in responses to a statistically validated adherence survey done 14 days after the education session...

Medication Use and Self Efficacy survey responses showed a sustained improvement in chronic disease self efficacy behavior after 14 days when compared to day of discharge since the initial education intervention.

The overall all-cause 30 day readmission rate of this enrolled group was 4% in contrast to a readmission rate of 7.2% in a matched-control group during the same time period.

Conclusion:

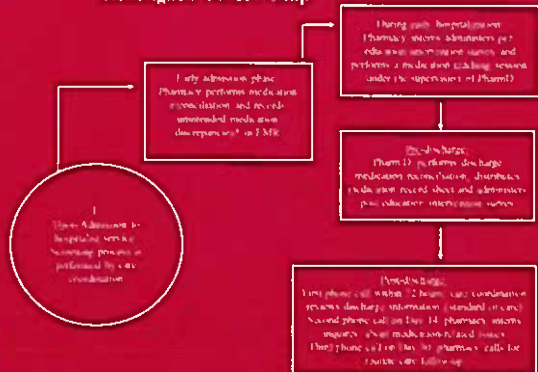
For selected patients at high risk for readmissions, with limited health literacy or a language barrier, a patient centered individualized pharmacy visit can be cost effective by improving self efficacy and adherence, as it contributes to an overall reduction in health care cost and unnecessary readmissions.

Our project has led to an enhancement in the quality of care provided to our patient and suggests that a pharmacy led education intervention can be added to the hospitalization process for selected patients.

In the future, using lessons learned during this study, we plan to expand the role of the pharmacy interns or pharmacy technicians under direct supervision of Pharm.D to provide personalized medication review care plan targeted towards high frequency health care utilizers and selected patients who are deemed to be at high risk for readmission.

Project Design and Methods

Redesigned Process Map



Medicaid insured patients were screened for eligibility based on algorithm derived partly from LACE criteria. This prospective study design consisted of an education intervention as described. Patients consented for follow up phone calls within 3, 14 and 30 days of being discharged.

Results

Table-1 Baseline Characteristics of enrolled Patients:

Table with 4 columns: Variable, Average, Number of comorbidities (+/- SD), and Percentage. Rows include Age, Sex, Race, Education, and Primary diagnosis.

Figure-1. Responses to Adherence questionnaire (% adherence)

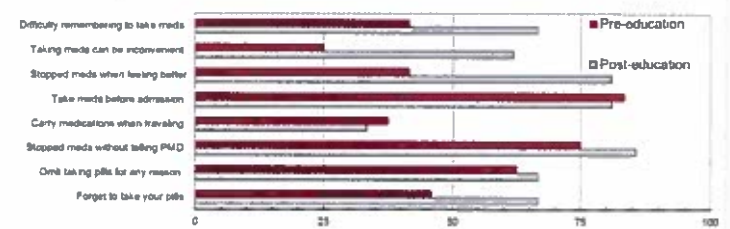


Figure-2. 30 day readmission rates in Medicaid Insured patients admitted to the Hospitalist Service at NYP-LMH

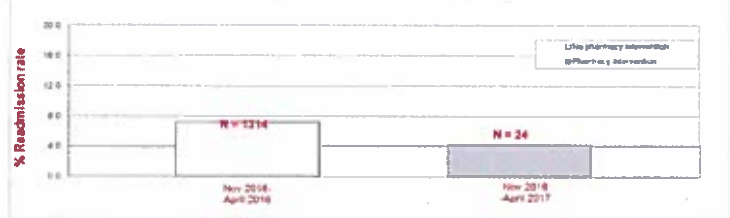


Table-2 Medication Use and Self Efficacy (MUSE) responses post-education discharge day and 14 days later:

Table with 3 columns: Question, Percent of positive responses (Day of discharge), and Percent of positive responses (14 days after discharge).

HCAHPS: Communication about Medicine

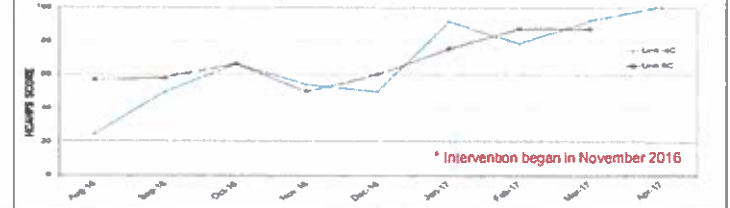


Table 3: What does interventions:

Table with 2 columns: Pharmacy led education of the inpatient and Significant pharmacy intervention reduction. Rows include Pre-education assessment, Medication Regimen Optimization, and Medication reconciliation.

## **Barriers to Post-Surgical Biologic Therapy in Crohn's Disease**

Shirley Cohen-Mekelburg M.D., Stephanie Gold M.D., Yechezkel Schneider M.D., Madison Dennis M.D., Clara Oromendia M.S., Fabrizio Michelassi M.D., Ellen Scherl M.D., Adam Steinlauf M.D.

**Statement of the Problem:** A significant proportion of patients with Crohn's disease will develop complications requiring surgery. However, surgery is not a cure for Crohn's disease, and a majority will develop disease recurrence. Multiple studies have shown that infliximab and adalimumab can reduce rates of post-surgical recurrence, particularly with a preventative approach. Anecdotally, we see many Crohn's disease patients returning to care after surgical resections with recurrent symptoms which could have potentially been prevented with post-operative biologic therapy.

**Objective/Aims:** Our primary objective was to identify the percent of patients who received post-surgical prophylaxis within 4- and 8-weeks post-operatively. We secondary aimed to determine risk factors for delay in the initiation of post-operative biologic therapy in high-risk Crohn's disease patients in order to identify targets for future quality improvement initiatives.

**Project Design/Methods:** We performed a case-control study of Crohn's disease patients who underwent a bowel resection from 1/2013-3/2016 at NewYork Presbyterian Weill Cornell Medical Center. We excluded patients who lacked indications for post-operative prophylaxis and those with contraindications to biologic therapy. Two analyses were performed, defining delay based on either a 4-week or 8-week post-surgical cut-off. We explored a variety of characteristics of patients with and without delay both univariably (chi-square and Kruskal Wallis tests) and using multivariable logistic regression.

**Results:** 84 patients were included in our analysis of which 69.0% had a greater than 4-week delay and 60.0% a greater than 8-week delay in post-surgical biologic prophylaxis. Publicly insured patients had a 100% delay in post-surgical prophylaxis initiation ( $p=0.035$ ,  $p=0.003$  at 4- and 8-weeks, respectively) and those on a biologic pre-surgery were less likely to have a delay ( $p<0.001$ ). Patients followed at an inflammatory bowel disease center were less likely to have a greater than 8-week delay ( $p=0.042$ ). On multivariable logistic regression, pre-surgical biologic therapy remained a predictor of timely prophylaxis (OR 0.12; 95% CI 0.02-0.64), while follow-up at an IBD center trended towards significance (OR 0.34; 95% CI 0.11-1.06).

**Discussion:** To provide our Crohn's disease patients with the highest quality care, we must identify barriers to timely post-operative biologic therapy. We identified factors for delay, including insurance type and lack of pre-operative biologic therapy, which can help focus future improvement efforts. Additionally, based on our results, consultation with inflammatory bowel disease-specialized providers should be considered in peri-surgical care.





# Barriers to Post-Surgical Biologic Therapy in Crohn's Disease

**Weill Cornell Shirley Cohen-Mekelburg M.D., Stephanie Gold M.D., Yechezkel Schneider M.D., Madison Dennis M.D., Clara Oromendia M.S., Fabrizio Michelassi M.D., Ellen Scherl M.D., Adam Steinlauf M.D., Adam Steinlauf M.D., Clara Oromendia M.S., Fabrizio Michelassi M.D., Ellen Scherl M.D., Adam Steinlauf M.D.**

## Introduction:

- A significant proportion of patients with Crohn's disease will develop complications requiring surgery.
- However, surgery is not a cure for Crohn's disease, and a majority will develop disease recurrence.
- Multiple studies have shown that infliximab and adalimumab can reduce rates of post-surgical recurrence, particularly with a preventative approach.
- Anecdotally, we see many Crohn's disease patients returning to care after surgical resections with recurrent symptoms which could have potentially been prevented with post-operative biologic therapy.

## Methods:

- We performed a case-control study of Crohn's disease patients who underwent a bowel resection from 1/2013-3/2016 at a tertiary care center.
- We aimed to identify risk factors for delay in the initiation of post-operative biologic therapy in high-risk CD patients.
- Two analyses were performed, defining delay based on either a 4-week or 8-week post-surgical cut-off.
- We explored a variety of characteristics of patients with and without delay both univariably (chi-square and Kruskal Wallis tests) and using multivariable logistic regression.

Figure 1. Study Population

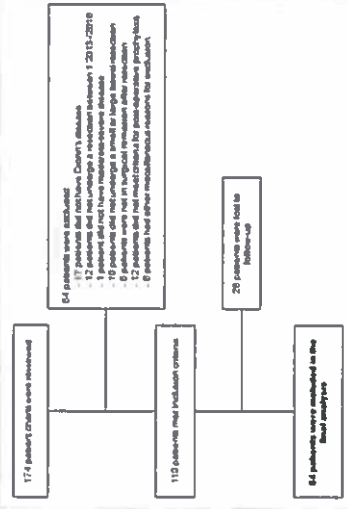


Table 1. Characteristics Associated with a Delay in Post-Surgical Biologic Therapy

Variable	Timely Post-Surgical Biologic Therapy	Delay in Post-Surgical Biologic Therapy	P-value	Timely Post-Surgical Biologic Therapy	Delay in Post-Surgical Biologic Therapy	P-value
Overall	36 (13.1%)	58 (69.4%)	0.384	34 (40.0%)	50 (60.0%)	0.262
Age	35.6 (23.2-49.0)	40 (27.2-53.3)		34.4 (23.2-48.1)	41.2 (27.2-56.4)	
Sex						
Female	23 (43.1%)	18 (52.9%)		18 (52.9%)	24 (48.0%)	
Male	13 (56.9%)	16 (47.1%)	0.026	16 (47.1%)	21 (52.0%)	0.204
Current residence						
Within City Vicinity of Treatment Facility	11 (42.3%)	41 (70.7%)		17 (50.0%)	35 (70.0%)	
Outside City Vicinity of Treatment Facility	15 (57.7%)	17 (29.3%)	0.009	17 (50.0%)	15 (30.0%)	0.020
Insurance status						
Medicare	0 (0.0%)	6 (13.8%)		0 (0.0%)	6 (16.0%)	
Medicaid	0 (0.0%)	5 (8.0%)		0 (0.0%)	5 (10.0%)	
Private	26 (100%)	44 (75.2%)	0.009	34 (100%)	36 (72.0%)	0.009
Uninsured	0 (0.0%)	1 (1.7%)		0 (0.0%)	1 (2.0%)	
Current IBD-specific medications						
Infliximab	9 (34.6%)	5 (8.6%)	0.026	10 (28.6%)	4 (8.0%)	0.018
Adalimumab	4 (15.4%)	10 (17.2%)	0.999	5 (14.3%)	9 (18.0%)	0.921
Certolizumab	4 (15.4%)	1 (1.7%)	0.03	5 (14.3%)	0 (0.0%)	0.009
Vedolizumab	0 (0.0%)	2 (3.4%)	0.071	5 (14.3%)	1 (2.0%)	0.038
None	0 (0.0%)	13 (22.4%)	0.007	2 (5.9%)	11 (22.0%)	0.008
Current IBD regimen						
Biologic alone	19 (73.1%)	19 (32.8%)	<0.001	24 (70.6%)	14 (28.0%)	<0.001
Combination biologic and thiopurine	2 (7.7%)	0 (0.0%)		2 (5.9%)	0 (0.0%)	
Combination biologic with methotrexate	1 (3.8%)	3 (5.3%)		1 (2.9%)	2 (4.0%)	
None	4 (15.4%)	37 (63.8%)		7 (20.0%)	34 (68.0%)	
Systemic Features						
Has a primary extra-intestinal	26 (100%)	55 (94.8%)	0.549	34 (100%)	47 (94.0%)	0.599
Has a gastroenterologist at our institution	20 (74.1%)	34 (59.3%)	0.429	27 (79.4%)	31 (62.0%)	0.146
Transition to our institution	3 (11.5%)	5 (8.6%)	0.162	4 (11.8%)	4 (8.0%)	0.195
Present follows in an IBD Center	20 (74.1%)	32 (55.2%)	0.008	26 (76.5%)	26 (52.0%)	0.042

Figure 2. Factors Associated with a Delay

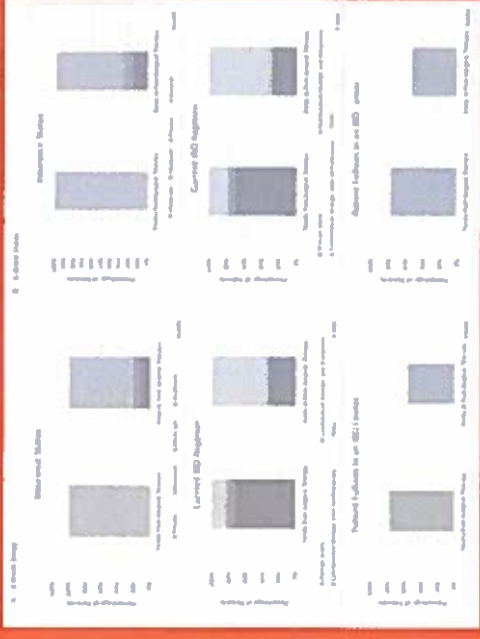


Figure 3. Predictors of Delay in Post-Surgical Biologic Prophylaxis

Variable	Univariable		Multivariable	
	OR (95% CI)	P-value	OR (95% CI)	P-value
IBD Disease	1.709 (0.592, 4.936)	0.321	1.648 (0.450, 5.433)	0.41
IBD Center	0.395 (0.132, 1.177)	0.095	0.476 (0.162, 1.596)	0.228
Pre-Surgical Biologic Therapy	0.1816 (0.037, 0.429)	<0.001	0.141 (0.042, 0.469)	0.002
8-Weeks				
IBD Disease	0.390 (0.100, 0.836)	0.022	0.347 (0.079, 0.818)	0.022
IBD Center	0.344 (0.123, 0.953)	0.042	0.341 (0.106, 1.104)	0.072
Pre-Surgical Biologic Therapy	0.196 (0.069, 0.594)	0.002	0.216 (0.071, 0.657)	0.007

## Discussion:

- To provide our Crohn's disease patients with the highest quality care, we must identify barriers to timely post-operative biologic therapy.
- Insurance status, pre-operative Crohn's disease therapy, and care at an inflammatory bowel disease center should be considered in targeting patients for future quality improvement efforts

## **Post-Operative Biologic Therapy for Crohn's Disease: Current Beliefs and Practice Amongst Providers**

Shirley Cohen-Mekelburg MD, Yechezkel Schneider MD, Russell Rosenblatt MD, Stephanie Gold MD, Fabrizio Michelassi MD, Ellen Scherl MD, Adam Steinlauf MD

**Statement of the Problem:** A substantial proportion of patients with Crohn's disease will develop complications requiring surgery. However, a majority will have disease recurrence, which may require repeat surgical procedures. With biologic therapies, post-operative Crohn's disease has changed dramatically. Studies have shown that post-operative prophylactic biologic therapy is effective in preventing recurrence of Crohn's disease in high-risk patients.

**Objective/Aims:** We aimed to determine the current opinion and state of practice among gastroenterologists with regards to post-operative biologic therapy for prevention of post-operative Crohn's disease recurrence to identify areas for future quality improvement efforts.

**Project Design/Methods:** We performed a cross-sectional study using a national survey of gastroenterologists and mid-level providers to determine the current beliefs, practice, and concerns regarding a prophylactic post-operative biologic strategy for the prevention of Crohn's disease recurrence. We also aimed to determine the differences between community and academic providers, as well as, inflammatory bowel disease specialists and non-inflammatory bowel disease specialized providers. Continuous variables were analyzed using Student's t-test or Wilcoxon Sum Rank test and categorical variables were analyzed using Fisher's exact or chi squared tests. All analyses were performed using R v3.3.2.

**Results:** 3,656 randomly selected providers were invited to participate via electronic mail, with a 2.74% response rate among 35 represented states. 66.7% were academic or academic-affiliated gastroenterology providers, and 33.3% were community gastroenterology providers. 49% considered themselves IBD specialists. IBD specialized providers were more likely to place their post-operative Crohn's disease patients on a post-operative biologic for prevention of disease recurrence ( $p=0.07$ ). IBD-specialized providers were also more comfortable prescribing biologics post-operatively for moderate-to-severe Crohn's disease ( $p<0.01$ ). When comparing academic versus community gastroenterologists, there was no difference in self-reported prescribing patterns with regards to post-operative biologic prophylaxis ( $p=0.14$ ). Further, both academic and community providers agreed that patients at high-risk for recurrence should be placed on a post-operative biologic to prevent recurrence ( $p=0.88$ ). However, community gastroenterologists were more comfortable prescribing biologics to Crohn's disease patients for post-operative prophylaxis ( $p<0.01$ ).

**Conclusions:** Recent guidelines recommend managing high-risk Crohn's disease patients using a prophylactic approach after surgical resection. However, the rates of post-surgical biologic prophylaxis are suboptimal. Understanding the current state of practice is essential prior to initiating quality improvement initiatives to increase rates of post-operative biologic therapy use for prevention of disease recurrence. Future initiatives may incorporate an education initiatives with a focus on efficacy and safety for both the IBD and non-IBD specialized audiences.



# Post-Operative Biologic Therapy for Crohn's Disease: Current Beliefs and Practice Amongst Providers

Shirley Cohen-Mekelburg MD, Yechezkel Schneider MD, Russell Rosenblatt MD, Stephanie Gold MD, Fabrizio Michelassi MD, Ellen Scherl MD, Adam Steinlauf MD

## Statement of the Problem:

- A substantial proportion of patients with Crohn's disease will develop complications requiring surgery.
- However, a majority will have disease recurrence, which may require repeat surgical procedures.
- Studies have shown that post-operative prophylactic biologic therapy is effective in preventing recurrence of Crohn's disease in high-risk patients.
- Recent guidelines recommend managing high-risk Crohn's disease patients using a prophylactic approach after surgical resection.

## Objectives/Aims:

- We aimed to determine the current opinion and state of practice among gastroenterologists with regards to post-operative biologic therapy for prevention of post-operative Crohn's disease recurrence to identify areas for future quality improvement efforts.

## Methods:

- We performed a cross-sectional study using a national survey of gastroenterologists and mid-level providers.

- Continuous variables were analyzed using Student's t-test or Wilcoxon Sum Rank test and categorical variables were analyzed using Fisher's exact or chi squared tests.

- All analyses were performed using R v3.3.2

Participant Variables	Total (n)
Type of Provider	100
Physician (MD/DO)	95 (95.0%)
Nurse Practitioner (NP)	2 (2.0%)
Physician Assistant (PA)	3 (3.0%)
Type of Practice (training 1)	
Academic (includes academic affiliates)	66 (66.7%)
Community	33 (33.3%)
Do you have interest in an infusion center or ambulatory surgical center	39 (39.0%)
Practice	
Teach	13 (13%)
Young adults	70 (70%)
Middle aged adults	87 (87%)
Geriatric	53 (53%)
Insurance accepted (multi-use)	
Uninsured	58 (60.0%)
Medicaid	86 (88.7%)
Medicare	86 (88.7%)
Private	93 (95.9%)
Would you consider yourself an IBD specialist	49 (49%)

## Results:

- 3,656 randomly selected providers were invited to participate via electronic mail, with a 2.74% response rate among 35 represented states.

**Table 1. Current beliefs among inflammatory bowel disease specialized and non-inflammatory bowel disease specialized providers, and among community and academic providers**

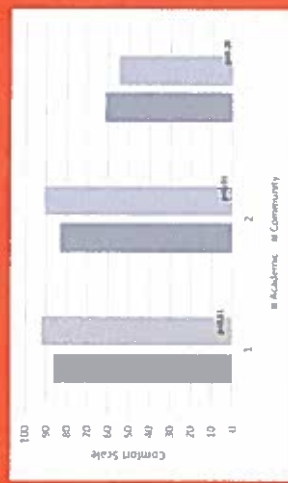
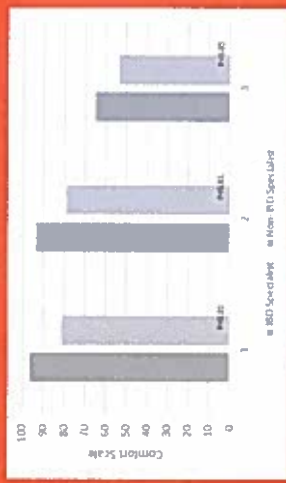
Question	Overall	IBD Specialist	Non-IBD Specialist	Academic	Community	P-value
Patients with moderate to severe Crohn's disease should be placed on post-operative biologic therapy to prevent post-operative disease recurrence?	100 (100.0)	49 (49.0)	51 (51.0)	66 (66.0)	33 (33.0)	0.88
When?	71 (71.0)	38 (77.6)	33 (64.7)	46 (69.7)	25 (75.8)	
How?	9 (9.0)	2 (4.1)	7 (13.7)	6 (9.1)	3 (9.1)	
How often?	20 (20.0)	9 (18.4)	11 (21.6)	14 (21.2)	5 (15.2)	
Patients with moderate to severe Crohn's disease and high risk features for recurrence (i.e. prior surgical resection) should be placed on post-operative biologic therapy to prevent post-operative disease recurrence?	91 (91.0)	44 (88.8)	47 (91.2)	41 (62.3)	33 (99.3)	0.60
When?	2 (2.0)	0 (0.0)	2 (4.1)	1 (1.5)	0 (0.0)	
How often?	3 (3.0)	0 (0.0)	3 (6.1)	3 (4.6)	0 (0.0)	

**Table 2. Current practice patterns among inflammatory bowel disease specialized and non-inflammatory bowel disease specialized providers, and among community and academic providers**

Question	Overall	IBD Specialist	Non-IBD Specialist	Academic	Community	P-value
What percentage of your moderate to severe Crohn's disease patients are currently on a biologic agent? (training 2)	100 (100.0)	47 (47.0)	53 (53.0)	66 (66.0)	33 (33.0)	0.21
<10	1 (1.0)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	
10-25	2 (2.0)	1 (2.1)	1 (1.9)	2 (3.0)	1 (3.0)	
25-50	21 (21.0)	12 (25.3)	9 (17.6)	15 (22.7)	6 (18.2)	
50-75	32 (32.0)	12 (25.3)	20 (39.6)	21 (31.8)	11 (33.0)	
>75	40 (40.0)	21 (44.7)	19 (37.2)	22 (33.4)	17 (51.5)	
What percentage of your post-surgical moderate to severe Crohn's disease patients are on a biologic to prevent disease recurrence? (training 2)	6 (6.0)	0 (0.0)	6 (11.7)	6 (9.1)	0 (0.0)	0.88
10-25	12 (12.0)	5 (10.4)	7 (13.7)	7 (10.6)	4 (12.1)	
25-50	16 (16.0)	9 (18.4)	7 (13.7)	10 (15.2)	6 (18.2)	
50-75	27 (27.0)	17 (35.3)	10 (19.2)	21 (31.8)	6 (18.2)	
>75	37 (37.0)	18 (37.7)	19 (37.2)	21 (31.8)	16 (48.5)	
Do you personally prescribe biologic post-operatively to your patients with moderate to severe Crohn's disease? (training 4)	81 (81.0)	41 (85.4)	40 (76.6)	55 (83.3)	27 (81.8)	0.72
How often?	18 (18.0)	7 (14.6)	11 (21.4)	10 (15.2)	8 (24.2)	

**Figure 1 & 2. Questions regarding provider comfort level:**

- 1) How comfortable are you in general with prescribing biologics for your patients with moderate to severe Crohn's disease?
- 2) How comfortable are you with prescribing biologics for your patients with Crohn's disease post-operatively?
- 3) In your patients with moderate to severe Crohn's disease for whom you are prescribing a post-operative biologic to prevent disease recurrence, how concerned are you about post-operative infections?



## Conclusions:

- The rates of post-surgical biologic prophylaxis are suboptimal.
- Understanding the current state of practice is essential prior to initiating quality improvement initiatives to increase rates of post-operative biologic therapy use for prevention of disease recurrence.
- Future initiatives may incorporate an education initiatives with a focus on efficacy and safety for both the IBD and non-IBD specialized audiences.

## A Risk Reduction Strategy to Lower Rates of Hypoglycemia by Determining Root Causes

Naina Sinha-Gregory<sup>1</sup>, Jane Jeffrie Seley<sup>2</sup>, Savira Kochhar<sup>1</sup>, Matt Fred<sup>2</sup>, Elizabeth Mauer<sup>1</sup>, Sona Shah<sup>1</sup>, Jenny Ukena<sup>1</sup>, Robert J. Kim<sup>1</sup>

<sup>1</sup>Weill Cornell Medicine, <sup>2</sup>New York Presbyterian Hospital/Cornell

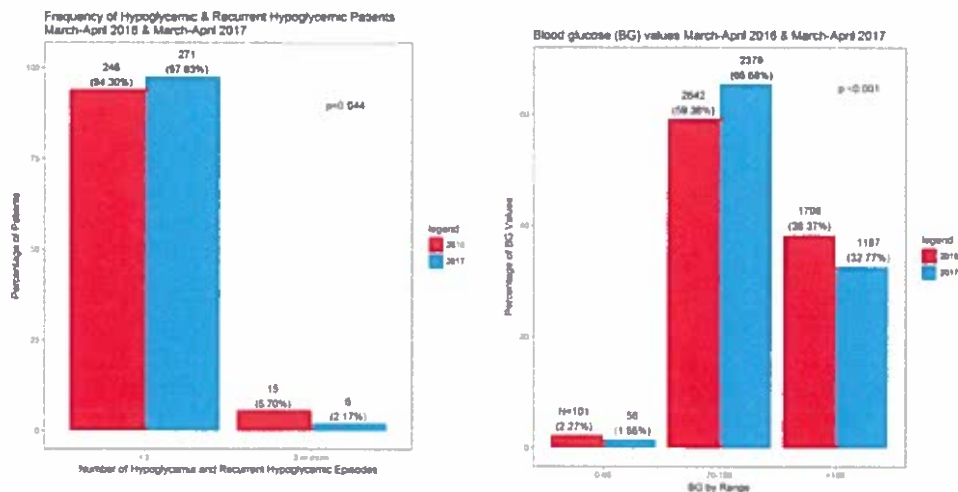
**Statement of the Problem:** Adverse Drug Events (ADEs) are the most common cause of inpatient complications and account for one-third of hospital acquired conditions. They are associated with an increase in both cost and length of stay. Insulin and anti-hyperglycemic agents make up 57% of ADEs. Of note, 50% of hypoglycemic events (BG<70 mg/dL) and up to 80% of severe hypoglycemic events (BG<40 mg/dL) are preventable. A prior hypoglycemic episode is the most powerful predictor for further hypoglycemic events during the same stay.

**Objective/Aim of the study:** The first project goal is to identify root causes of hypoglycemia on two medicine units, 5C and 5N. The second project goal is to use a targeted educational intervention to implement strategies to decrease rate of hypoglycemia.

**Project Design/Methods:** An RN survey was conducted to identify key risk factors for hypoglycemia on the study units. The survey data was used to create a hypoglycemia root cause survey tool in the electronic medical record. The RN completed the tool whenever a patient had a blood glucose value below 70 mg/dL. Once the top cause of hypoglycemia was identified, a targeted educational intervention for safe and effective use of insulin was launched for RNs and prescribers. This strategy was designed to empower the team to reduce the appropriate insulin dose as needed to prevent future hypoglycemia episodes.

**Results:** Blood Glucose (BG) data was compared from March & April in 2016 and 2017 on two medicine units. Rates of hypoglycemia (BG <70mg/dL) decreased from 2.3% to 1.5%; BG values in the target range (70-180mg/dL) increased from 59.4% to 65.7%; and hyperglycemia (BG >180mg/dL) decreased from 38.3% to 32.8%. In addition, the number of patients with recurrent hypoglycemia (3 or more episodes during the hospital stay) decreased from 5.7% to 2.2%.

**Conclusions:** The top two modifiable causes of hypoglycemia (nutrition and insulin) were identified by the RN survey and confirmed by chart review. A targeted educational intervention addressing safe and effective insulin dosing resulted in a significant decrease in hypoglycemia and recurrent hypoglycemia. Of note, the decrease in hypoglycemia was associated with an improvement in overall glycemic control. Ongoing nurse and prescriber education accompanied with discussions between RNs and prescribers to address each hypoglycemic event in real-time could continue to lower the rate of occurrence.



# A Risk Reduction Strategy to Lower Rates of Hypoglycemia by Determining Root Causes

Naina Sinha-Gregory<sup>1</sup>, Jane Jeffrie Selye<sup>2</sup>, Savira Kochhar<sup>1</sup>, Matt Fred<sup>2</sup>, Elizabeth Mauer<sup>1</sup>, Sona Shah<sup>1</sup>, Jenny Ukena<sup>1</sup>  
<sup>1</sup>Weill Cornell Medicine, <sup>2</sup>New York Presbyterian Hospital/Cornell

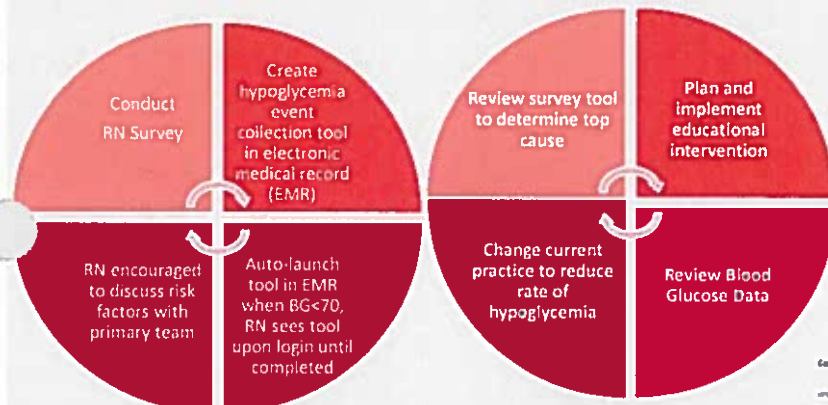
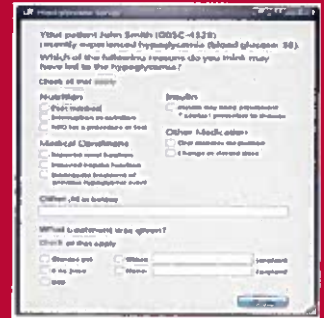
## Background:

Adverse Drug Events (ADEs) are the most common cause of inpatient complications and account for one-third of hospital acquired conditions. They are associated with an increase in cost and length of stay. Insulin and anti-hyperglycemic agents make up 57% of ADEs. Of note, 50% of hypoglycemic events (BG < 70 mg/dL) and up to 80% of severe hypoglycemic events (BG < 40 mg/dL) are preventable. A prior hypoglycemic episode is the most powerful predictor for further hypoglycemic events during the same stay.

## Project Goals & Aims:

- Identify root causes of hypoglycemia on two medicine units:
  - Conduct RN survey of risk factors
  - Create a hypoglycemia event collection tool in the electronic medical record (EMR)
  - Auto-launch tool in EMR when BG < 70, RN sees tool upon login until completed
  - RN encouraged to discuss risk factors with primary team
- Use targeted educational intervention to implement strategies to decrease rate of hypoglycemia
  - Review survey tool to determine top cause
  - Plan and implement educational intervention

## Electronic Medical Record Survey Tool



### PROJECT GOAL #1

- Identify root causes of hypoglycemia on two medicine units

### PROJECT GOAL #2

- Use targeted educational intervention to implement strategies to decrease rate of hypoglycemia

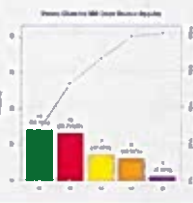
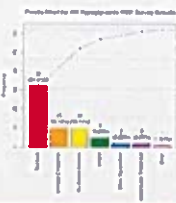
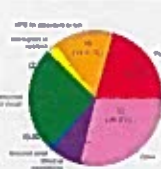
## Phase 1 Intervention: RN Survey

**Part 1:** What do you think are some reasons why patients may have an episode of hypoglycemia while in the hospital?

**Part 2:** Circle all of the reasons listed below that you think may contribute to hospital patients having an episode of hypoglycemia:

- Poor Nutrition (poor appetite, nausea or vomiting)
- NPO for a procedure or test
- Interruption in Nutrition (e.g. Tube feeds or TPN being held)
- Incorrect dose of Insulin:
  - Basal insulin (NPH, glargine)
  - Bolus (correction) or mealtime insulin (aspart)
- Failure to adequately treat prior hypoglycemia event
- Impaired renal and/or hepatic function

Causes of Hypoglycemia Identified in RN Survey



## Phase 2 Education Intervention

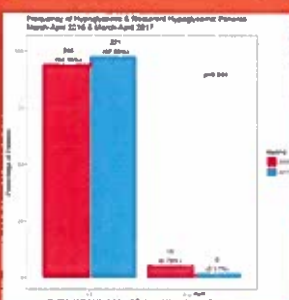
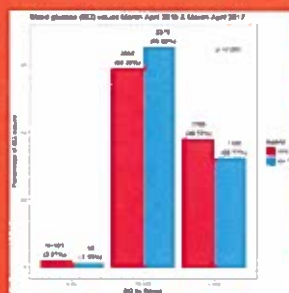
**Title:** Reducing Hypoglycemia by Targeting a Root Cause: *Too Much Basal Insulin*

**Target Audience:** RNs, PAs, Medicine Residents

**Description of Program:** Review of brief handout on insulin action and dose adjustment algorithm to titrate insulin based on glycemic patterns (8 slides, 10 minutes)

### Insulin Dose Adjustment Guidelines

NYP/WC Dose Adjustments Based on Blood Glucose	
BG (mg/dL)	Dose Adjustment
< 50	Decrease by 50%
50 – 69	Decrease by 20%
70 – 99	Decrease by 10%
100 – 180	No Changes
181 – 250	Increase by 10%
> 250	Increase by 20%



### Results:

- Blood Glucose (BG) Data was compared from March & April in 2016 and 2017 on 5C/5N
- Hypoglycemia (<70) decreased from 2.3% to 1.5%
- BG in Target (70-180) increased from 59.4% to 65.7%
- Hyperglycemia (>180) decreased from 38.3% to 32.8%
- Hypoglycemia & Recurrent Hypoglycemia were compared
- Number of patients with recurrent hypoglycemia (3 or more episodes during hospital stay) decreased from 5.7% to 2.2%

### Conclusions & Lessons Learned:

- The top two modifiable causes of hypoglycemia (Nutrition and Insulin) were identified by the RN survey and confirmed by chart review
- A targeted educational intervention addressing safe and effective insulin dosing resulted in a significant decrease in hypoglycemia and recurrent hypoglycemia
- Of note, the decrease in hypoglycemia was associated with an improvement in overall glycemic control

### Future Directions:

- Ongoing house-wide nursing & prescriber education to heighten awareness of root causes of hypoglycemia to inform & promote prevention strategies
- Stimulate discussion between RNs and prescribers to address each hypoglycemic event in real time
- Launch new educational intervention targeting interruptions in nutrition:
  - Second most common cause of hypoglycemia
  - Include recommendations for insulin adjustments in education plan

## **Communication of inpatient hyponatremia to outpatient providers is associated with fewer multiple readmissions**

Gordon J. Hildick-Smith, Vesh Srivatana, Kirsten Salline, and Jeffrey I. Silberzweig

**Statement of the Problem:** Despite the growing body of literature suggesting the important prognostic significance of hyponatremia, hyponatremia is commonly treated as a peripheral issue during inpatient admissions and may be poorly communicated to outpatient providers.

**Objective/Aim of the study:** We seek to quantify the degree to which hyponatremia occurring during inpatient admissions is reported to outpatient providers. Secondly we seek to evaluate factors associated with improved communication as well as potential associations between communication and standard outcome measures.

**Project Design/Methods:** With the approval of the Institutional Review Board, we designed a retrospective cohort study. We included patients who were admitted to the Weill Cornell Campus of the New York-Presbyterian Hospital in January 2014, had corrected serum sodium of less than 130 mEq/L, and survived the index hospitalization. The cohort was discovered using institutional laboratory database with the help of the TRAC team. Discharge summaries were manually reviewed for any mention of hyponatremia, and charts were reviewed for pertinent information. Statistical analysis was performed in conjunction with the Division of Biostatistics and Epidemiology at Weill Cornell. Continuous variables were analyzed with paired two sided t-test. Categorical variables were analyzed with a two sample test for equality of proportions with continuity correction using Chi-Square for the difference. Significance was determined to be at the 0.05 alpha level.

**Results:** Hyponatremia was reported to outpatient providers 37% of the time. Although there were no statistically significant demographic differences between groups, those with communication tended to be older (73 vs. 54;  $p=0.057$ ), female (68% vs. 47%;  $p=0.15$ ), Caucasian (52% vs. 31%;  $p=0.13$ ), and have shorter hospital stays (9.7 vs. 22.6 days;  $p=0.14$ ). Initial sodium levels were lower for patients with communicated hyponatremia compared with those with no mention of hyponatremia, (125.4 vs. 127.7 mEq/L;  $p<0.05$ ). Lower sodium on discharge was also associated with communication of hyponatremia (130.7 vs. 134.2 mEq/L;  $p<0.05$ ). Although, communication of hyponatremia was not associated with improved one year mortality, readmission rates, or readmissions associated with hyponatremia, it was associated with a 25% absolute reduction in rate of multiple-readmissions in the year following index admission ( $p=0.048$ ).

**Conclusions:** Despite its prognostic significance, our results suggest that inpatient hyponatremia is poorly communicated to outpatient providers. Improved communication was associated with severity of hyponatremia. As we continue to increase the study size, it is possible that certain demographic characteristics may be associated with improved communication. Additionally, with more power, there may be evidence associating hyponatremia with standard outcome measures. Our data indicate a significant association between communication and fewer multiple readmissions ( $p=0.048$ ). This is the first study to examine the degree of under-communication of hyponatremia in the context of transitions of care, and the first to relate communication of hyponatremia with important clinical outcome measures.



# COMMUNICATION OF INPATIENT HYPONATREMIA TO OUTPATIENT PROVIDERS IS ASSOCIATED WITH FEWER HOSPITAL READMISSIONS

Gordon J. Hildick-Smith,<sup>1</sup> Vesh Srivastana,<sup>2,3</sup> Kirsten Salline,<sup>1</sup> and Jeffrey I. Silberzweig<sup>2,3</sup>

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## Abstract:

**Problem Statement:** Despite the growing body of literature suggesting the important prognostic significance of hyponatremia, hyponatremia is commonly treated as a peripheral issue during inpatient admissions and may be poorly communicated to outpatient providers. We hypothesize that poor communication of inpatient hyponatremia is associated with worse outcomes.

**Aim of Study:** We seek to quantify the degree to which inpatient hyponatremia is reported to outpatient providers. Secondly, we seek to evaluate factors associated with improved communication as well as potential associations between communication and standard outcome measures.

**Methods:** We performed a retrospective cohort study examining patients admitted to the Weill Cornell Campus of the New York Presbyterian Hospital in 2014 with serum sodium level less than 130 mEq/L who survived the index hospitalization.

**Results:** Among our fifty-one cases, in only 19 (37%) was the episode of hyponatremia communicated to outpatient providers. Initial sodium levels were lower for patients with communicated hyponatremia compared with those with no mention of hyponatremia, (125.4 mEq/L vs. 127.7 mEq/L respectively, p<0.05). Lower sodium on discharge was associated with communication of hyponatremia (mean serum sodium of 130.7 mEq/L vs. 134.2 mEq/L). Although communication of hyponatremia was not associated with improved mortality, readmission rates, or hyponatremia-associated readmissions in the year following the index admission, communication was associated with a 25% absolute reduction in multiple readmissions (p=0.048).

**Conclusions:** Communication of hyponatremia to outpatient providers is infrequent and more common among severe cases. Additionally, communication is associated with a lower rate of multiple readmissions.

## Introduction:

- Hyponatremia is common in hospitalized patients, with prevalence of:
  - 30% as defined as Na < 136 mEq/L<sup>1</sup>
  - 1-2.5% as defined as Na < 130 mEq/L<sup>2</sup>
- A single episode of hyponatremia (serum Na < 135 mEq/L) is associated with increased mortality in:
  - Acute hospitalization: OR 1.47 (95% CI: 1.33-1.62)<sup>3</sup>
  - Following 1 year: HR 1.38 (95% CI: 1.32-1.46)<sup>4</sup>
  - Following 5 years: HR 1.25 (95% CI: 1.21-1.30)<sup>5</sup>
- Hyponatremia is also known to be associated with increased mortality in patients with congestive heart failure or cirrhosis.<sup>6,7</sup>
  - Serum sodium has been added as a factor in the MELD score for mortality prediction in end-stage liver disease (2016).
- Despite the growing body of literature suggesting the important prognostic significance of hyponatremia, hyponatremia is commonly treated as a peripheral issue and as a result may be poorly communicated to outpatient providers.

In this study we plan to analyze the frequency with which hyponatremia is communicated to outpatient providers, and we hope to identify factors associated with improved communication as well as the effect of communication on standard outcome measures.

## Methods:

- Our study was approved by the Institutional Review Board at Weill Cornell Medicine.
- Study design: retrospective cohort study
- Inclusion criteria:
  - Patients admitted to the Weill Cornell Campus of the New York Presbyterian Hospital in January 2014
  - Serum sodium level less than 130 mEq/L
  - Survived the index hospitalization
- Our cohort was discovered using institutional software to query all laboratory data for serum sodium measurements <130 mEq/L corrected for glucose level<sup>8</sup>
- Discharge summaries were manually reviewed for any mention of hyponatremia, and charts were reviewed for pertinent information.
- Statistical analysis was performed with assistance from the Division of Biostatistics and Epidemiology at Weill Cornell. Continuous variables were analyzed with paired two-sided t tests. Categorical variables were analyzed with a two sample test for equality of proportions with continuity correction using Chi-Square for the difference. Significance was determined to be at the 0.05 alpha level.

## Results:

Percent of cases with communication of hyponatremia

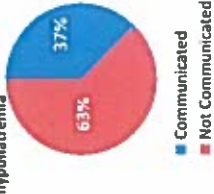
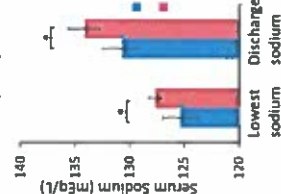


Table 1. Characteristics of study population

	Hyponatremia mentioned in the discharge summary		p-value
	Yes (n=19)	No (n=32)	
Age on admission—† (range)	73.7 (18-95)	59.8 (22-90)	p=0.057
Male sex—no. (%)	8 (42%)	20 (63%)	p=0.15
Race—no.			
Caucasian	10	10	p=0.13
All other	9	22	
Duration of admission—days (range)	9.7 (2-53)	22.6 (2-102)	p=0.14
Hypertension involved in index admission	5 (26%)	6 (19%)	p=0.53
Discharge appointment with Cornell affiliated physician	11 (58%)	24 (75%)	p=0.20

Figure 1. Only 37% of cases of hyponatremia were communicated to outpatient providers. While those with communication were slightly more likely to be older, female, Caucasian, and have shorter length of hospital stay, this difference was not statistically significant.

## Lower serum sodium is associated with increased frequency of communication



## Percent of readmissions among patient with communicated hyponatremia



## Percent of readmissions among patient no communication of hyponatremia



Figure 2. Both lower initial sodium and lower discharge sodium were associated with increased frequency of communication of hyponatremia. Error bars represent 95% CI (†p<0.05; p=0.006 and p=0.02, respectively).

Table 2. Communication of hyponatremia is associated with reduced multiple readmissions in the year following index admission

Hyponatremia communicated	Readmissions	Percent	p-value
Hyponatremia communicated	0	0%	
No communication of hyponatremia	8	25%	
Difference		25%	p=0.048

Figure 4. Communication of hyponatremia was associated with a 25% absolute reduction in multiple readmissions over the year following index admission (p=0.048).

## Conclusions:

- Our data suggest that inpatient hyponatremia is only communicated to outpatient providers about one third of the time
- There were no statistically significant differences between those with communicated or non-communicated hyponatremia, including sex, race, duration of admission, involvement of a nephrologist and those provided with intra-institutional follow-up. We saw a nonsignificant trend in those with communicated hyponatremia being older than those with non-communicated hyponatremia (p=0.057).
- Communication of hyponatremia was associated with both lower initial and discharge sodium levels.
- Although there was no statistically significant difference in overall readmission rate between study groups, patients with communicated hyponatremia had a 25% absolute reduction in multiple readmissions (p=0.048).

To our knowledge, this is the first study to examine the degree of under-communication of hyponatremia in the context of transitions of care. Additionally, we believe it to be the first to relate communication of hyponatremia with important clinical outcome measures.

## Next Steps:

- We plan to enroll more patients, and hope to have a study population of 100-150 patients.
- At the conclusion of the study, if data supports it, we would plan an educational program for inpatient and outpatient providers regarding the significance and communication of inpatient hyponatremia. We would then evaluate the impact of the program on standard outcome measures with an observational study.

## Acknowledgments:

We are grateful for the assistance of Stephen Marter, Adam Russman and Josekio Mistero, from the Weill Cornell TRAC team for developing our patient cohort by querying laboratory data for all patients admitted to the Weill Cornell Campus of New York Presbyterian Hospital. Additionally, we appreciate the assistance from Clara Dromenda and Paul Christos from the Division of Biostatistics and Epidemiology at Weill Cornell for their assistance in developing a statistical plan and with subsequent statistical analysis.

## References:

- Hoon EJ, Lindermans J, Zietse R. Development of severe hyponatremia in hospitalized patients: treatment-related risk factors and inadequate management. *Nephrol Dial Transplant*. 2006; 21(11):70-6.
- Anderson RU, Chung H-M, Kluge R, Schrier RW. Hyponatremia: a prospective analysis of its epidemiology and the pathogenesis of vasopressin. *Ann Intern Med*. 1985; 102(2):164-8.
- Wauker SS, Mount DB, Cushman GC. Mortality after hospitalization with mild, moderate, and severe hyponatremia. *Am J Med*. 2009; 122(9):857-65.
- Klein L, O'Connor CM, Lemberger JD, et al. Lower serum sodium is associated with increased short-term mortality in hospitalized patients with worsening heart failure: results from the outcomes of a prospective trial of intravenous milrinone for exacerbations of chronic heart failure (OPTIME-CHF) study. *Circulation*. 2005; 111(19):2454-60.
- Raf AE, Kremers WK, Chavez LL, Desvalh VI, Podesta LG, Villamil FG. Addition of serum sodium into the MELD score predicts waiting list mortality better than MELD alone. *Liver Transpl*. 2005; 11(3):336-43.
- Hiller TA, Abbott RD, Barrett EJ. Hyponatremia: evaluating the correction factor for hyperglycemia. *Am J Med*. 1999; 106(4):399-03.

## **Supplying the Quality Improvement and Patient Safety (QIPS) Pipeline: Introducing QIPS at the Medical Education Level**

Maurice D. Hinson MD, Khalil Anchouche, Karina Ruiz-Esteves, Elizabeth Park MD,  
Jamuna Krishnan MD MBA, Savira Kochhar MS, Jennifer Lee MD

### **Problem:**

As the landscape of healthcare policy and delivery continues to evolve, the need for professionals involved in quality improvement and patient safety (QIPS) becomes increasingly imperative. Several studies have demonstrated that physician involvement in quality improvement and patient safety improves patient outcomes. Despite representing roughly 70% of the primary healthcare providers in the U.S., only 1 in 3 physicians report engaging in quality improvement initiatives- with limitations in knowledge and skills in quality science noted as major barriers to involvement. Audet et. al (2005) proposed that introducing QIPS within the medical education curriculum may provide the foundation for introduce \_\_\_\_\_. This has been met with immense criticism given the voluminous content already contained within current medical education curricula. Here, we propose to use an alternative method to introduce QIPS to medical students.

### **Objective/Aim:**

- To introduce key concepts and practices of QIPS to medical students in an interactive and engaging manner
- To foster the professional development of medical students to become leaders in QIPS

### **Project Design/Methods:**

Collaborative, interdisciplinary effort involving persons of varying levels of training, including faculty, housestaff, and medical students targeting Weill Cornell Medical Students. An Institute for Healthcare Improvement (IHI) Open School chapter at NYP Weill Cornell was chartered, leading to the creation of a Medical Student-run, Resident/Faculty-supported social organization utilizing IHI networking and educational resources (WCM-IHI). WCM-IHI serves as an extracurricular student organization designed to introduce topics in QIPS.

### **Results:**

- Recognized organization under the Medical Student Executive Council (MSEC) of Weill Cornell Medical School comprised of MS1-4s
- Student Leadership comprised of two co-Presidents (Supported by several Medicine Residents and Faculty)
- Recipient of funding from MSEC and IHI
- Two successful events:
  - 1) Insulin Overdose- introduction to RCAs
  - 2) Mr. Potato Head- introduction to PDSA cycles

### **Conclusion:**

Medical Students demonstrate a genuine interest in QIPS when topics are introduced in an engaging and interactive manner. Additionally, the benefit of resident and faculty involvement in the group's activities allows for the development of relationships that facilitate continued mentorship; thus, providing a bridge for future physicians to engage in QI initiatives. The creation of WCM-IHI has unveiled a potential area to target as a means to increase physician involvement in QIPS.



# Supplying the Quality Improvement and Patient Safety (QIPS) Pipeline: Introducing QIPS at the Medical Education Level

**NewYork-Presbyterian**

The University Hospital of Columbia and Cornell

Maurice D. Hinson MD<sup>1</sup>, Khalil Anchouche<sup>2</sup>, Karina Ruiz-Esteves<sup>2</sup>, Elizabeth Park MD<sup>1</sup>,  
Jamuna Krishnan MD MBA<sup>1,2</sup>, Savira Kochhar MS<sup>1,2</sup>, Jennifer Lee MD<sup>1,2</sup>  
<sup>1</sup> New York-Presbyterian Weill Cornell, <sup>2</sup> Weill Cornell Medical College



**Weill Cornell  
Medicine**

## Introduction

- Physician involvement and leadership in Quality Improvement and Patient Safety (QIPS) improves patient outcomes [1,2]
- Physicians account for 74% of Primary Healthcare Providers in the U.S. [3], but only 34% of physicians report being directly involved in QIPS initiatives [2]
- Lack of knowledge and skills about improvement science is one of the key barriers to physician involvement in QIPS [4].
- Introducing QIPS in the medical education curriculum has been an area of interest; limited by current workload [2]
- Here we seek to explore an alternative method to introduce QIPS to medical students

## Methods

- Charter an Institute for Healthcare Improvement (IHI) Open School chapter at NYP Weill Cornell
- Create a Medical Student-run, Resident/Faculty-supported social organization utilizing IHI networking and educational resources (WCM-IHI)
- Recruit Residents of the Housestaff Quality Council to participate in WCM-IHI workshops/activities
- Involve medical students in ongoing QIPS initiatives at NYP Weill Cornell

## Aims

- To introduce key concepts and practices of QIPS to medical students in an interactive and engaging manner
- To foster the professional development of medical students to become leaders in QIPS



Weill Cornell Medical College

# Change the System



Achievement

## Empowerment



## Current Efforts

- An established extracurricular, social organization comprised of MSI-4s
- Student Leadership comprised of two co-Presidents (Supported by several Medicine Residents and Faculty)
- Recognized organization under the Medical Student Executive Council (MSEC) of Weill Cornell Medical School
- Recipient of funding from MSEC and IHI
- Two successful events:
  - 1) Insulin Overdose- introduction to RCAs
  - 2) Mr. Potato Head- introduction to PDSA cycles

## Future Direction

- Form a structured leadership board to lead WCM-IHI in the upcoming year
- Solicit additional funding for future events
- Explore ways to further publicize the organization to increase student involvement
- Explore IHI resources and opportunities to broaden WCM-IHI's scope
- Obtain feedback from medical students to tailor events to their interest and development

## Discussion

- Medical Students demonstrate a genuine interest in QIPS when introduced in an engaging manner
- The collaboration of a Medical Student, Resident, and faculty organization is a major selling point in generating student interest
- The creation of WCM-IHI has unveiled a potential area to target as a means to increase physician involvement in QIPS

## References

1. McFadden, K.L., G.N. Stack, and C.R. Gowen, 3rd, *Leadership, safety climate, and continuous quality improvement: impact on process quality and patient safety*. Health Care Manage Rev. 2015. 40(1): p. 24-34.
2. Audet AM, Doty MM, Shamasdin J, Schoenbaum SC. Measure, learn, and improve: Physicians' involvement in quality improvement. Health Affairs. 2005;24(3):843-853
3. Bureau of Labor Statistics, U.S. Department of Labor, *Occupation Outlook Handbook, 2016-17 Edition*, Physicians and Surgeons, nurse practitioners, Physician Assistant, on the Internet at <http://www.bls.gov/oooh/healthcare/physicians-and-surgeons.htm>, <http://www.bls.gov/oes/current/oes291171.htm>, <http://www.bls.gov/oooh/healthcare/physicians-assistants.htm>
4. Davies H., Powell A, Rushmer R. Healthcare professionals' views on clinician engagement in quality improvement. London: The Health Foundation; 2007

## **Making Care Better: A Study of LEAN Improvement in Action**

Calvin Hwang, MD MPH and Derrik Narayanajaya, MBBS MBA

**Objective/Aim of the study:** The goal of the project was to improve care coordination, improve patient safety and reduce the average inpatient length of stay (LOS).

**Project Design/Methods:** Project steering committee used LEAN methodology and team building tools to identify stakeholders and appropriate team members. A pilot unit (5 North) was identified based on greatest opportunity for improvement. Team members consisted of frontline patient care staff (physician assistants, nurses, case managers) and support staff (nutritionists, antibiotic stewards, patient flow staff).

Team members identified keys drivers and potential solution approaches through multiple PDCA cycles. The team implemented small tests of change, observed the results, and then refined solutions. Project leaders encouraged the frontline staff to actively problem solve.

**Results:** Staff on 5 North achieved a reduction in average LOS of 0.69 days for an estimated cost savings of \$332,024 for 2016. The CAUTI rate decreased from 0.13% in 2015 to 0% in 2016. In conjunction with efforts by the CLABSI committee, the CLABSI rate for 5 North decreased from 1.11% in the first half of 2016 to 0.09% in the latter half. This unit was honored as the Most Improved Unit within NYP Queens hospital.

**Conclusions:** Frontline staff engagement is vital to the success of sustainable quality improvement. Based on continuous feedback from the frontline staff, clinical leadership generated significant performance improvements including decreased LOS, elimination of CAUTIs, reduction in CLABSI, and cost savings through better coordination and use of existing resources. Some of the unit-generated solutions have led to hospital-wide initiatives, including use of standardized rounding on other units, use of checklists, protected clinical time for all frontline staff, improved handoff tab use within the CPOE (Allscripts), and conditional (next-day) discharge orders.

**Acknowledgements:** The authors would like to thank the numerous employees who contributed to this project including the entire 5 North nursing staff, physician assistants, case managers, Kwok Yim, Susan Denn, Sherley Louhis, Theresa Krockel, and Jacqueline Walton.

**Making Care Better: A Study of LEAN Improvement in Action**  
 NYP Quality Improvement and Patient Safety  
 Calvin Hwang, MD MPH and Derrick Narayanajaya, MBBS MBA

**Problem Statement**

In 2015, NYP Queens cohorted patients who were chronically ill, required prolonged weaning from mechanical ventilation, and needed sub-acute institutional care onto 5 North. Average length of stay (ALOS) exceeded expected length of stay (ELOS) by nearly 5 days. These patients also suffered a higher-than-expected rate of hospital-acquired conditions.

**Objective/Aim Statement**

The goal of the project was to improve care coordination, improve patient safety and reduce the ALOS.

**Design/Methods**

Project steering committee used LEAN methodology and team building tools to identify stakeholders and appropriate team members. A pilot unit (5 North) was identified based on greatest opportunity for improvement. Team members consisted of frontline patient care staff (physician assistants, nurses, case managers) and support staff (nutritionists, antibiotic stewards, patient flow staff).

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**Results**

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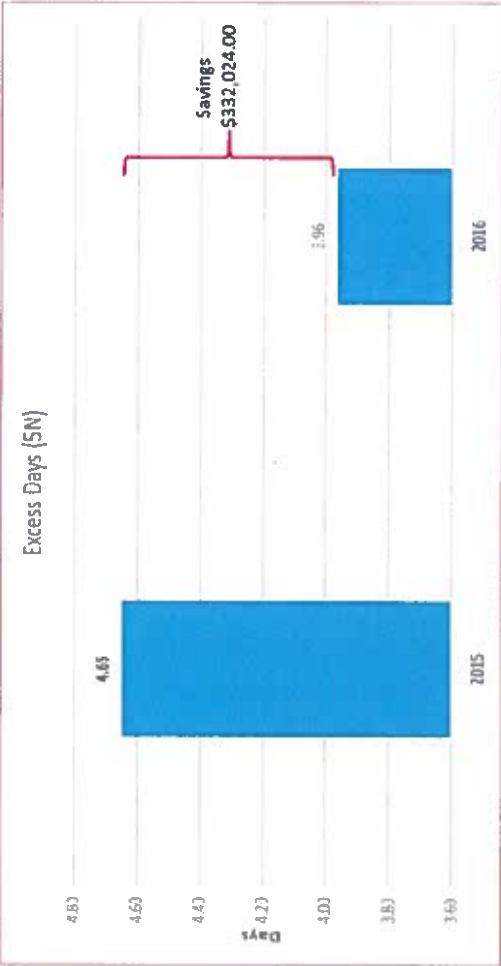
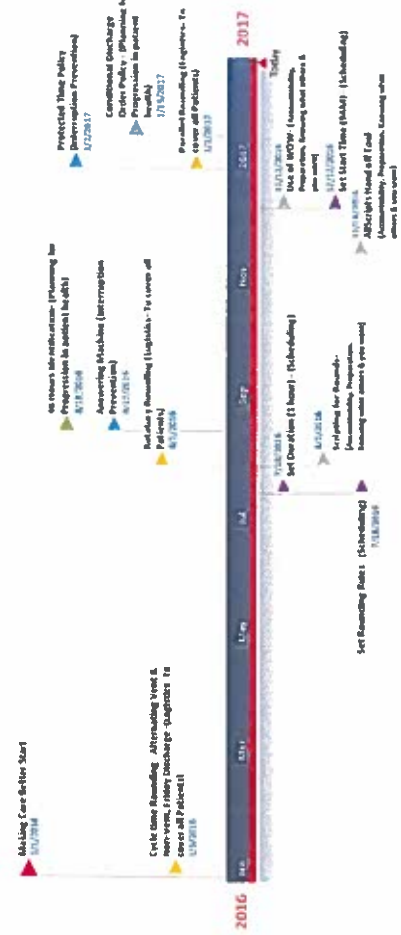
**Conclusions/Lessons Learned**

Frontline staff engagement is vital to the success of sustainable quality improvement. Based on continuous feedback from the frontline staff, clinical leadership generated significant performance improvements including decreased LOS, elimination of CAUTIs, reduction in CLABSI, and cost savings through better coordination and use of existing resources. Some of the unit-generated solutions have led to hospital-wide initiatives, including use of standardized rounding on other units, use of checklists, protected clinical time for all frontline staff, improved handoff tab use within the CPOE (Allscripts), and conditional (next-day) discharge orders.

**Next Steps**

Based on these successes, NYPQ decided to spread the model to other units. We are in the process of aligning frontline staff processes, standardizing work and training local leaders to support this initiative.

**Making Care Better – 5N**



## **Decreasing Time to Paracentesis in Hospitalized Cirrhotics with Ascites: A Quality Improvement Initiative**

Arun Jesudian, Luis Barraza, Peter Steel, Nicole Shen, Yechezkel Schneider, David Bodnar, Brenna Farmer, Jamuna Krishnan, Savira Kochhar, Rahul Sharma, Robert S. Brown, Jr., Jennifer I. Lee

**Statement of the Problem:** Spontaneous Bacterial Peritonitis (SBP) causes significant morbidity and mortality in hospitalized cirrhotics with ascites. Early paracentesis [ $\leq 12$  hours (h) from presentation] has been shown to decrease mortality and length of stay (LOS) in this population. However, paracentesis is often unnecessarily delayed or neglected in practice. Retrospective analysis of our center (2014-2015) revealed only 60% of these patients underwent diagnostic paracentesis, with 75% occurring after 12h.

**Objective/Aim:** The aim of this quality improvement initiative is to decrease the time to diagnostic paracentesis in hospitalized patients with cirrhosis and ascites.

**Project Design/Methods:** Patients with cirrhosis and ascites hospitalized over the initial 3-month period following intervention were identified. The protocol was a joint initiative between the hematology and emergency medicine (EM) services. The intervention phase included procedural training of providers in paracentesis and creation of criteria for which patients were at highest risk of SBP (bilirubin  $>3$ , abdominal distention/pain, signs of infection, altered mental status, creatinine  $>2$ ), whom EM providers were instructed to prioritize for early paracentesis. Remaining patients were verbally communicated to the admitting team as not yet having undergone paracentesis. Posters depicting the protocol were displayed in clinical provider areas. Patient charts were reviewed individually to confirm eligibility and record baseline characteristics, time of first physician encounter and paracentesis, type of provider performing paracentesis, ascites fluid results, and LOS. Descriptive statistics were calculated for baseline characteristics. Fisher's exact test and the chi-square tests were used to analyze categorical data.

**Results:** 60 patients with cirrhosis and ascites were admitted between 10/1/2016 and 3/31/2017. 50 (83%) of patients underwent diagnostic paracentesis, with 32 (64%) being performed  $\leq 12$ h from first physician contact. Between 1/1/2017 and 3/31/2017, 25/27 (92%) underwent paracentesis during admission with 18/25 (72%) occurring within 12h of presentation, improved from 60% and 25%, respectively ( $p < 0.001$ ). There were no statistically significant differences in the age, etiology of cirrhosis, MELD-Na, in-hospital mortality, or LOS between those who had early vs. late paracentesis. Patients were more likely to have a paracentesis early if performed by an EM provider ( $p < 0.001$ ).

**Conclusion:** A multidisciplinary quality improvement initiative significantly improved the proportion of hospitalized patients with cirrhosis and ascites undergoing both paracentesis during hospitalization and early paracentesis within 12h of presentation.



# Decreasing Time to Paracentesis in Hospitalized Cirrhotics with Ascites: A Quality Improvement Initiative

**Weill Cornell  
Medicine**

Arun Jesudian, Luis Barraza, Peter Steel, Nicole Shen, Yechezkel Schneider, David Bodnar,  
Brenna Farmer, Jamuna Krishnan, Savira Kochhar, Rahul Sharma, Robert S. Brown, Jr., Jennifer I. Lee  
Department of Medicine, Divisions of Gastroenterology and Hepatology, Emergency Medicine, and Hospital Medicine  
New York-Presbyterian / Weill Cornell Medicine (NYP / WCM)



## INTRODUCTION

- Spontaneous Bacterial Peritonitis (SBP) causes significant morbidity and mortality in hospitalized cirrhotics with ascites.
- Early paracentesis ( $\leq 12$  hours(h) from presentation) has been shown to decrease mortality and length of stay (LOS) in this population.
- Paracentesis is often unnecessarily delayed or neglected in practice.
- Retrospective analysis of our center (2014-2015) revealed only 60% of these patients underwent diagnostic paracentesis, with 75% occurring after 12h.

## PROJECT DESIGN/METHODS

- A joint initiative between hepatology, internal medicine (IM), and emergency medicine (EM) providers.
- The intervention phase (Figure 1):
  1. Educational training of EM and IM providers
  2. Creation of "BASIC" criteria to identify the patients at highest risk for SBP
- Patients meeting BASIC criteria were targeted by EM providers for early paracentesis.
- Patients not meeting BASIC criteria were verbally communicated to admitting team.
- Educational posters were displayed.
- Charts were reviewed individually.
- Baseline characteristics, time of first physician encounter and paracentesis, provider performing paracentesis, ascites fluid results, mortality, and LOS were recorded.
- Descriptive statistics, two-sample T-test and Fisher's exact test were performed.

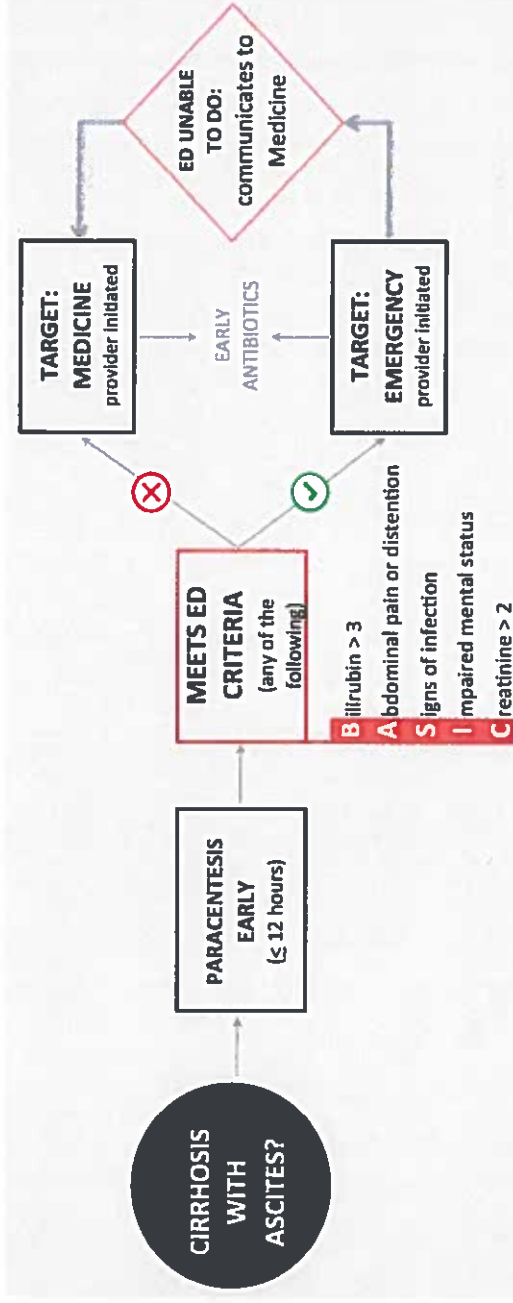


Figure 1. Project flowchart. Bilirubin >3, Abdominal pain or distention, Signs of infection/SIRS, Impaired mental status, Creatinine > 2 (BASIC) criteria were created to identify high risk patients.

## RESULTS

- 60 patients with cirrhosis and ascites were admitted between 10/1/2016 and 3/31/2017.
- 50/60 (83%) patients underwent diagnostic paracentesis during admission.
- 32/50 (64%) had paracentesis performed  $\leq 12$ h from first physician contact.
- From 1/1/2017-3/31/2017, 25/27 (92%) underwent paracentesis during admission with 18/27 (72%)  $\leq 12$ h, improved from 60% and 25%, respectively ( $p < .001$ )
- 2/50 (4%) of patients were diagnosed with SBP.
- There were no statistically significant differences in the age, etiology of cirrhosis, MELD-Na, in-hospital mortality, or LOS, between those who had early vs. late paracentesis.
- Patients were more likely to have a paracentesis early if performed by an EM provider ( $p < .001$ ).

## DISCUSSION

- Previous studies have demonstrated survival and LOS benefit in SBP when diagnostic paracentesis is performed within 12h of first physician contact.
- Diagnostic paracentesis should not be delayed or neglected, especially when SBP is suspected or when patients are at high risk for SBP.
- Development of BASIC criteria to identify patients at highest risk of SBP is an effective method to increase incidence of both overall and early diagnostic paracentesis.
- Small sample size and lower than expected incidence of SBP may explain the lack of improvement in mortality or LOS.

## CONCLUSIONS

- In this prospective quality improvement initiative, we significantly improved the proportion of hospitalized patients with cirrhosis and ascites undergoing both paracentesis during hospitalization and early paracentesis within 12h of presentation by forming a multidisciplinary EM-IM project team and developing the BASIC criteria.

## REFERENCES

1. Runyon BA. Hepatology 2013; 57: 1651-3
2. Kim JJ, et al. Ann J Gastroenterol 2014; 109: 1436-42

## Achieving Scholarship through Quality Improvement

Savira Kochhar, MS; Robert J. Kim, MD; Jennifer I. Lee; MD

**Problem:** There is a national expectation from oversight and governing organizations that providers of healthcare participate in reporting quality metrics that are publicly available and affect reimbursement. The Accreditation Council for Graduate Medical Education's Clinical Learning Environment Review program identifies five domains essential in the training of physicians in the current healthcare environment, two of which are quality and safety. This leads to a gap in mentorship as an increasing number of residents and students interested in pursuing quality improvement (QI) projects and research outnumbers the faculty proficient in QI methodology to lead that effort.

While advanced QI training courses exist, few exist within academic institutions. Programs led by independent agencies often are cost prohibitive and require travel and time away from clinical practice. Quality University-Department of Medicine (QUDOM) was designed to provide advanced QI methodology training to core junior faculty committed to becoming vital leaders and mentors in quality and patient safety (QPS).

**Objective/Aim of the study:** To train junior faculty within the Department of Medicine at the assistant professor level in rigorous QI methodology to improve the delivery of high impact, high value care to our patients while achieving academic scholarship through mentorship and publications.

**Project Design/Methods:** In 2015, QUDOM, a twelve month course including twice-a-month direct mentorship sessions and quarterly workshops, was designed to assist "fellows" through the processes of project design, development, testing, evaluation and implementation. All fellows were provided with ten percent support effort to complete the project. Workshops were focused on knowledge and QI skill development with interactive sessions to evaluate the application of these skills to their projects.

A knowledge assessment tool developed by the Institute for Healthcare Improvement was used before and at the end of the fellowship to capture self-reported improvement across 32 fundamental QI skills and tools. All responses were anonymous. Separate evaluations were completed at the end of each workshop and at the end of the fellowship to assess course content and relevance. Adjustments were made throughout the 12 months based on real-time feedback from the fellows.

Outcome Measures	Process Measures
<ul style="list-style-type: none"><li>• Increase in self-assessment of improvement in knowledge of QI skills and methodology</li></ul>	<ul style="list-style-type: none"><li>• Attendance and participation of 4 workshops</li></ul>
<ul style="list-style-type: none"><li>• Completion of one process intervention project that is relevant to the division and in alignment with WCM or NYP quality goals</li></ul>	<ul style="list-style-type: none"><li>• Completion of all program work and materials</li></ul>
<ul style="list-style-type: none"><li>• Mentorship</li></ul>	<ul style="list-style-type: none"><li>• Application of QI tools and methodology to project</li></ul>
<ul style="list-style-type: none"><li>• Completion of manuscript by end of academic year</li></ul>	

# Achieving Scholarship through Quality Improvement

Savira Kochhar, MS; Robert J. Kim, MD; Jennifer I. Lee, MD

## Introduction

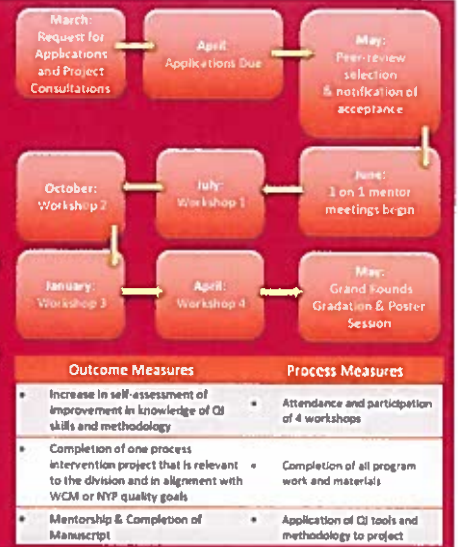
- National expectation that providers participate in reporting quality metrics
- ACGME's Clinical Learning Environment Review program identifies 5 domains essential in training physicians, 2 of which are quality and safety with faculty engagement in quality improvement (QI) and safety initiatives and mentoring
- Gap in mentorship as increased number of residents and students interested in pursuing QI projects and research outgrows the faculty proficient in QI methodology
- Quality University Department of Medicine (QUDOM) designed to provide QI methodology training to core junior faculty committed to becoming vital leaders and mentors in Quality and Patient Safety (QPS)

## Objective of the Program

- To train junior faculty within the DOM at the assistant professor level in rigorous QI methodology over one academic year to improve the delivery of high impact, high value care to our patients while achieving academic scholarship through mentorship and publications

## Program Design & Methods

- In 2015, QUDOM was designed as a 12 month course including twice a month direct mentorship sessions and quarterly workshops
- Lead fellows through processes of project design, development, testing, evaluation, and implementation
  - Fellows were provided 10% support effort to complete the project
  - Workshops focused on knowledge and QI skill development
    - Interactive sessions to evaluate the application of QI skills to their projects
    - Evaluations completed at the end of each workshop to allow for adjustments as needed
- A knowledge assessment tool, developed by the Institute for Healthcare Improvement was used before and at the end of the fellowship



Outcome Measures	Process Measures
<ul style="list-style-type: none"> <li>Increase in self-assessment of improvement in knowledge of QI skills and methodology</li> <li>Completion of one process intervention project that is relevant to the division and in alignment with WCM or NYP quality goals</li> <li>Mentorship &amp; Completion of Manuscript</li> </ul>	<ul style="list-style-type: none"> <li>Attendance and participation of 4 workshops</li> <li>Completion of all program work and materials</li> <li>Application of QI tools and methodology to project</li> </ul>

Improvement Skills, Metrics or Tools

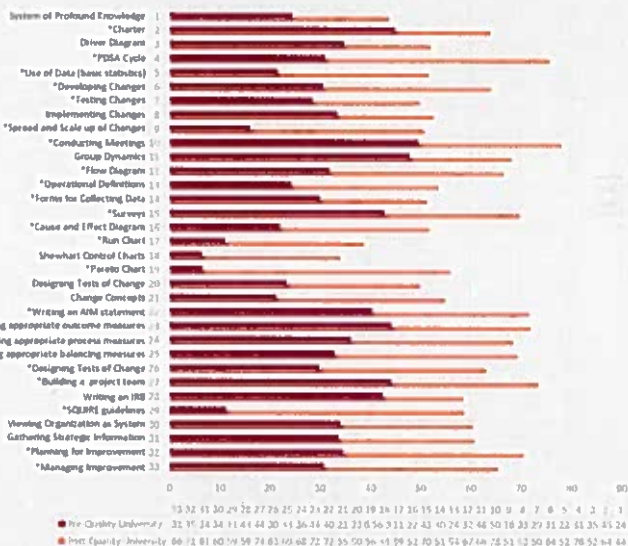
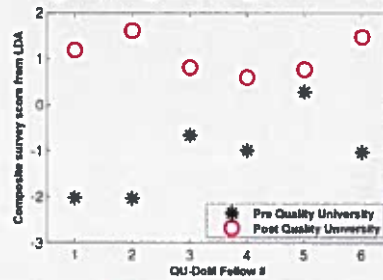


Figure 1: Absolute Change in Learning

\* p-value < .05, showing statistical significance when performing a paired t-test in pre vs post absolute change

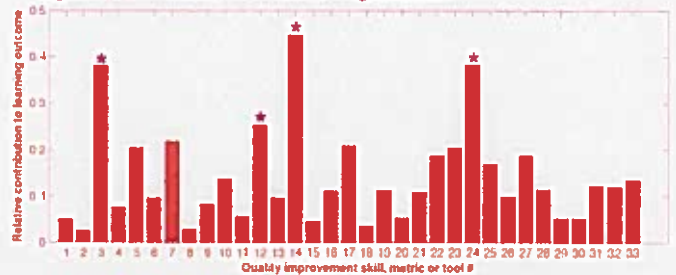
Figure 2: Composite survey score from LDA



## Linear Discriminant Analysis:

- Shows a statistically significant difference between pre and post self-knowledge assessment
- Composite measure of the 33 categories was taken for each of the 6 Fellows
- A paired t-test on the pre and post composite scores indicated a significant enhancement in learning with a p value of less than 0.01, illustrating a 99% confidence in the learning improvement. (Figure 2)

Figure 3: Relative contribution to learning outcomes



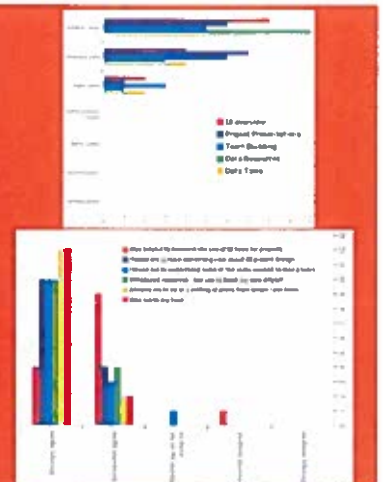
Categories 3, 12, 14, and 24 had the most contribution to an individual's learning

## Results

- Six faculty fellows were selected through peer review to participate in QUDOM in the academic year of 2016-17, none of whom reported previous formal QI training or completion of a QI project prior to the course
- Pre- and Post-QUDOM survey responses showed 23 out of 33 categories with statistically significant improvement (p < 0.05) (Figure 1)
- Post-QUDOM, the average composite score was 59.6 compared to Pre-QUDOM score of 30.2, indicating that participants have working knowledge of application of fundamental QI skills and tools (Figure 2)
- A linear discriminant analysis (LDA) was performed on the 33 items allowing the computation of the relative contributions of each of the items to the learning outcome (Figure 3)
- A paired t-test on the pre and post composite scores indicated a significant enhancement in learning with a p value of less than 0.01, illustrating a 99% confidence in the learning improvement. (Figure 2)
- All fellows have been able to successfully complete their project, will continue to mentor learners in QI, and are on course for completion of their project manuscript by the end of June 2017

## Conclusions & Next Steps

Through QUDOM, six junior faculty members demonstrated significant knowledge improvement and application of advanced QI methodology to scholarly projects through training in a formal structured fellowship program over the academic year. All fellows have contributed to building our mentorship base and have demonstrated academic achievement through healthcare systems improvement. Moving forward, we hope to offer this opportunity to include faculty from other departments to allow for interdepartmental collaboration and to fill the gaps that exist in leadership and academic opportunities for scholarship through QI across the college.



## **Does A Bedside Handoff Tool Increase Patient Satisfaction?**

Katharine Leary BSN, RN, PCCN  
New York-Presbyterian

**Statement of the Problem:** This poster explores the connection between bedside nurse handoff and patient satisfaction, to see if consistent use of a bedside handoff tool tailored for 5W leads to increased patient satisfaction to be noted in the units HCAHP scores. A review of Evidence-Based Practice suggests that bedside handoff increases patient involvement and satisfaction,<sup>1</sup> and encourages patients to be actively involved in their care.<sup>2</sup> Bedside nursing handoff at shift change helps to promote patient safety and is part of the Joint Commission's 2009 National Patient Safety Goals.<sup>3</sup>

**Objective/Aim of the study:** For patients on 5W, does the implementation of a new bedside handoff tool by nurses, compared to bedside handoff without the tool, result in improved patient satisfaction?

**Project Design/Methods:** The policy for bedside shift report, PROC 136- NURSE BEDSIDE SHIFT REPORT, was implemented across NYP in 2016, in accordance with Joint Commission National Patient Safety Goals. In July of 2016, the 5 West Unit council noted that 5 West, a 28-bed Adult Medical/Surgical Stepdown Unit, was struggling with consistent practice of bedside shift report. In an effort to increase the compliance with hospital policy, the Unit Council created a paper tool to assist nurses with bedside handoff and improve communication between nurses at shift change. The Unit Council also led huddles to in-service nurses on the use of the handoff tool and best practice for bedside handoff. Following the implementation of the handoff tool in August 2016, shift report was consistently taking place at patient bedside.

**Results:** In the months following the implementation of the bedside handoff tool, 5 West had a 20 percent average improvement of HCAHP scores in relation to Nurse Communication and Rate NYP as "Best Hospital Possible."

**Conclusions:** This increase in HCAHP scores suggests that patients perceive better communication with nurses when shift report is conducted at the bedside. Findings also suggest a possible correlation between nurse communication and patients' perception of quality of care.



AMAZING THINGS ARE HAPPENING HERE

# Does A Bedside Nurse Handoff Tool Increase Patient Satisfaction?

5 West

Katharine Leary BSN, RN, PCCN

NewYork-Presbyterian  
Department of Nursing

## Background

- This project was focused on 5 West, a 28-bed Adult Medical/Surgical Stepdown Unit
- NYP implemented the PROC 136-NURSE BEDSIDE SHIFT REPORT policy in February 2016. Halfway through the year the Unit Council found that RNs were having continued challenges with the bedside shift report process.
- The Unit Council created a bedside handoff tool to assist nurses in bedside handoff, in an effort to increase nursing communication.

## Purpose

For patients on 5W, does the implementation of a new bedside handoff tool by nurses, compared to bedside handoff without the tool, result in improved patient satisfaction?

## Inclusion Criteria

- Bedside shift report was given for all patients on 5 West twice a day

## Methods

### Review of Evidence-Based Practice Research

- Bedside shift report increases patient involvement and satisfaction.<sup>(1)</sup>
- Bedside handoff encourages patients to be involved actively in their care.<sup>(2)</sup>
- Bedside nursing handoff at shift change helps to promote patient safety and is part of the Joint Commission's 2009 National Patient Safety Goals.<sup>(3)</sup>

### Copy of 5 West Handoff Tool

Date:	Room:	Code Status:	Tube:
PN Name:	Admit:	Code Status:	Fall Risk/Bed Alarm
Diag #	Team:	Code Status:	Fall Risk/Bed Alarm
Allergies:	Contact:	Code Status:	Fall Risk/Bed Alarm
Admitting Diagnosis:	Code Status:	Code Status:	Fall Risk/Bed Alarm
PHN:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Active Problems:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Pending Test/Procedures:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Pending Labs:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Medications to Start:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Wound Care:	Code Status:	Code Status:	Fall Risk/Bed Alarm
IV Access:	Code Status:	Code Status:	Fall Risk/Bed Alarm
CHG Bath:	Code Status:	Code Status:	Fall Risk/Bed Alarm
IF PICC or Central Line is Dressing Change due)	Code Status:	Code Status:	Fall Risk/Bed Alarm
Supplemental O2:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Foley:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Diets Received:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Drugs/T Labs:	Code Status:	Code Status:	Fall Risk/Bed Alarm
IV Flow:	Code Status:	Code Status:	Fall Risk/Bed Alarm
IV gtt:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Dear Nurse (Who Follows in Care /Alone)	Code Status:	Code Status:	Fall Risk/Bed Alarm
Relevant I/O:	Code Status:	Code Status:	Fall Risk/Bed Alarm
Safety Check	Code Status:	Code Status:	Fall Risk/Bed Alarm
Arms Bag	Code Status:	Code Status:	Fall Risk/Bed Alarm
Bedside Sign-up	Code Status:	Code Status:	Fall Risk/Bed Alarm

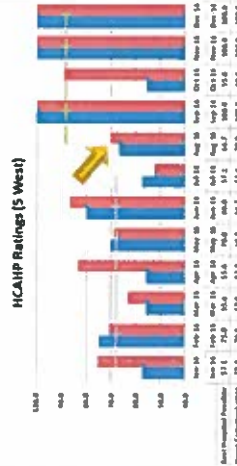
## Results

### Pre-Intervention

- Hospital-wide implementation of bedside shift report as standard practice.
- All nurses received e-learning on bedside shift report and expectations.

### Interventions: Began August 2016

- Unit Council lead huddles with RNs to orient nurses to the bedside handoff tool and to explain the procedure for conducting bedside shift report.



### Post-Intervention

- 5 West HCAHP scores for Nursing Communication and Rate as "Best Hospital Possible" improved after the implementation of bedside handoff tool by an average of 20 %.

## Discussion

- Increased HCAHP scores suggest patient's perceive better communication with nurses when shift report is done at the bedside
- Findings also suggest a link may exist between communication with nurses and patients' perception of quality of care

## Next Steps

- Present findings to other units at NYP
- Continue to perform shift report at the bedside for all patients on 5 West
- Incorporate feedback from discharge phone calls and HCAHP to improve bedside handoff

## References

- (1) McMurray A, et al. Patients' perspectives of bedside nursing handover. *Coh-Legian*. 2011;18(1):19-26.
- (2) Maxson PM, et al. Bedside nurse-to-nurse handoff promotes patient safety. *MedSurg Nurs*. 2012; 21(3):140-144.
- (3) Wakefield S, et al. Making the Transition to Nursing Bedside Shift Reports. *The Joint Commission Journal on Quality and Patient Safety*. 2012; 38(6): 243-253.

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## **Hepatitis C Antibody Screening in an Academic Center: Assessing Barriers and opportunities for Improvement via an HCV Management Specialist**

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### **Statement of Problem:**

Chronic hepatitis C virus (HCV) is a significant cause of morbidity and mortality worldwide. An estimated 3.2 million individuals in the US remain infected, and up to 50% of those infected are unaware they harbor the virus. As of January 1, 2014, New York State issued an unfunded mandate for providers to offer HCV antibody screening to all patients born between 1945 and 1965 in inpatient and outpatient settings and at a minimum follow-up diagnostic testing and care. Screening for the HCV antibody (anti-HCV), however, does not ensure follow up diagnostic testing or linkage to outpatient care.

**Objective/Aim of the study:** We first aim to assess the practice of inpatient HCV screening at our teaching medical center and identify barriers to care. We then aim to link those HCV seropositive patients with pathways to care via an HCV Management Specialist.

**Project Design/Methods:** We first retrospectively collected data from September 2014 to September 2016 in all patients born between 1945 and 1965 admitted to an inpatient medicine service with positive HCV antibody. Linkage to outpatient care was defined as a having a scheduled visit with a gastroenterologist following discharge. Based on linkage to care, we pursued root-cause analysis for individuals with anti-HCV not scheduled for follow up. Beginning in January 2017, we then prospectively collected data on seropositive patients. These patients were contacted by a designated HCV Management Specialist, provided their test results, and given information for a pathway to care with a Hepatology specialist.

**Results:** Between September 2014 and September 2016, a total of 1,128 individuals admitted to the inpatient service were screened for HCV, of which 9.6% tested positive for anti-HCV. 52% (56/108) were newly diagnosed positive anti-HCV, of which 21% were not tested with HCV RNA PCR test. Following discharge, only 18% of the newly seropositive patients followed up with a gastroenterologist. Age, male gender, and Hispanic ethnicity were not associated with a lower rate of linkage to outpatient care. The rate of outpatient follow-up was significantly lower for patients with primary Medicaid insurance than those with other [private or Medicare] insurance (9% versus 32%,  $P = 0.04$ ). Between January and April 2017, 202 additional seropositive patients were identified. Of these patients, 41 (20.3%) lacked confirmatory PCR testing. Within this cohort, our HCV Management Specialist successfully contacted 31 patients (76%), to relay test results and arrange outpatient follow up.

**Conclusions:** Effective HCV screening and linkage to care remains a challenge. Root cause analysis suggests Medicaid insurance, indicative of a patient's low socioeconomic status, is a risk factor for failed linkage to care. Linkage to outpatient follow up, however, is enhanced by the assistance of an HCV Management Specialist.

## Introduction

- Chronic hepatitis C virus (HCV) is a significant cause of morbidity and mortality worldwide.
- An estimated 3.2 million individuals in the US remain infected, of which 50% are unaware.
- As of January 1, 2014, New York State mandated providers offer HCV antibody screening to all patients born between 1945 and 1965 in inpatient and outpatient settings, as well as follow-up testing and care. Few studies have critically evaluated their efficacy.

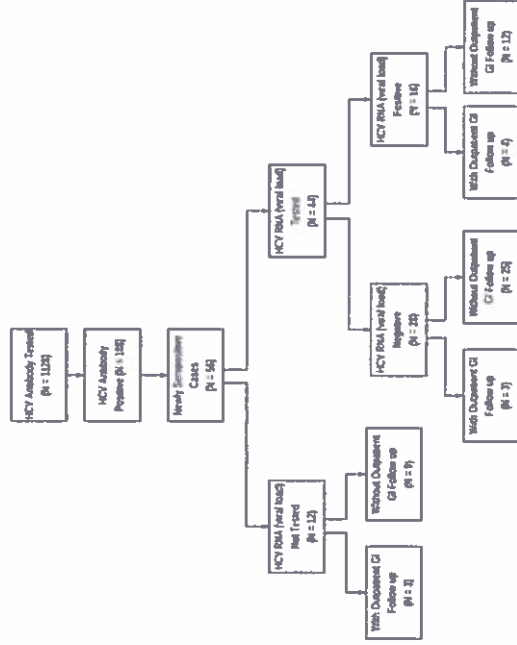
## Objectives

The aim of this study was to assess inpatient HCV screening at our teaching medical center, identify barriers to care, and link those HCV seropositive patients with pathways to care via an HCV Management Specialist.

## Methods

- From September 2014 to September 2016, all patients born between 1945 and 1965, admitted to an inpatient medicine service and with positive HCV antibody were retrospectively evaluated for demographic, clinical, and outpatient follow-up data.
- Linkage to outpatient care was defined as having a scheduled visit with a gastroenterologist following discharge.
- Prospective data on admitted seropositive patients identified between September 2016 and April 2017 was subsequently collected.
- Seropositive patients without outpatient follow up were contacted by a designated HCV Management Specialist, provided their test results and information for a pathway to care with a Hepatology specialist.

**Figure 1: Flow Diagram of Inpatient HCV Screening and Linkage to Care**



- 1,128 individuals admitted to the inpatient service, between September 2014 to September 2016, were screened for HCV, of which 9.6% tested positive for anti-HCV.
- 52% were newly diagnosed, of which 21% were not tested with HCV RNA polymerase chain reaction (PCR).
- 18% of the newly seropositive patients followed up with a gastroenterologist.

**Table 1: Demographic Data for Newly Seropositive Patients**

	Newly Seropositive Patients (N = 56)
Gender	
Male	35
Female	21
Mean Age (years) (SD)	61 (± 6)
Labatory Findings	
Creatinine	1.6 mg/dL (± 2.0)
Platelet Count	222 x 10 <sup>3</sup> /µL (± 97.8)
Int'l Normalized Ratio (INR)	1.2 (± 0.3)
Albumin	3.3 g/dL (± 0.7)
Bilirubin Total	1.0 mg/dL (± 1.2)
Aspartate (AST) Follow up	58.2 U/L (± 101.5)
Alanine (ALT) Follow up	60.3 U/L (± 125.4)
Alkaline Phosphatase (ALP) Follow up	101.3 U/L (± 62.7)
APRI Score	
Mean	1.1
Standard Deviation	± 2.5
Primary Insurance Type	
Medicaid	34 (60.7%)
Medicare	9 (16.1%)
Private	13 (23.2%)
Outpatient Follow Up at Discharge	
Yes	10
No	46

**Table 2: Risk Factors for Inadequate Linkage to Care**

Risk Factor	With Outpatient Follow Up (N = 210)	Without Outpatient Follow Up (N = 46)	P-Value
Age (mean)	60.9 (± 5.7)	61.7 (± 6.1)	0.71
Male	7 (70%)	28 (61%)	0.73
AST to Platelet Ratio Index (APRI)	1.33 (± 2.7)	1.09 (± 2.5)	0.69
Hispanic	0 (0%)	5 (10.9%)	0.57
Medicaid	3 (20%)	31 (67.4%)	0.04

- Age (P = 0.71), male gender (P = 0.73), APRI score (P = 0.69) and Hispanic ethnicity (P = 0.57) were not associated with a lower rate of linkage to outpatient care.
- Rate of outpatient follow-up was significantly lower for patients with Medicaid (N = 10, 30%) than those with other (private or Medicare) insurance (N = 46, 67.4%) (P = 0.04).

**Figure 2: Linkage to Care via an HCV Management Specialist**



- Between September 2016 and April 2017, 202 seropositive patients were identified, and 20.3% lacked additional diagnostic testing or follow up.
- HCV Management Specialist successfully contacted 31 patients (76%), to relay test results and arrange outpatient follow up.

## Conclusions

- Effective HCV screening and linkage to care remains a challenge.
- Medicaid insurance, indicative of a patient's low socioeconomic status, is a risk factor for failed linkage to care.
- Linkage to follow up is enhanced by an HCV Management Specialist.

## A Novel Antimicrobial Stewardship Program-Guided Procalcitonin Initiative for Diagnosis of Bacterial Pneumonia

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**Statement of the Problem:** Making an accurate diagnosis of bacterial pneumonia in the Emergency Department (ED) can be challenging resulting in inappropriate antibiotic use adversely impacting patient care and safety. Procalcitonin (PCT), a serum biomarker has a good positive predictive value (PPV) for bacterial lower respiratory tract infections.

**Objective/Aim of the study:** Evaluate the impact of using PCT in an antimicrobial stewardship program (ASP)-driven algorithm to manage patients with presumed pneumonia.

**Project Design/Methods:** Initial PCT use was restricted to ED for hemodynamically stable patients with presumed pneumonia. Subsequent PCT levels were ordered by ASP team members at 8 to 12-hours followed by repeat tests on days 3, 5 and 7 to guide duration of antibiotic use and interpreted as per existing guidelines. Beginning December 2016, aggressive education was provided by ASP to ED staff, followed by implementation of algorithm in January 2017. PCT use was analyzed in real-time from January to March 2017. Outcomes included hospital admission, days of antibiotics, length of stay, incorrect pneumonia admitting diagnosis and 30-day pneumonia readmission.

**Results:** A total of 82 patients were evaluated with median age 82 years, 40% male, and 90% from home. Groups were well matched with the exception of higher baseline temperatures (37.9°C vs. 36.9°C, p=0.009) and leukocytosis (11.3 K/ $\mu$ L vs. 8.1 K/ $\mu$ , p=0.014) seen in patients with positive PCT levels<sup>1</sup>. Table 1 depicts PCT<sub>peak</sub> levels and outcomes. Negative PCT was associated with reduced antibiotic initiation and total duration. Although not statistically significant, patients with negative PCT levels had reduced hospital admissions and length of stay. There were no reported adverse events or differences in 30-day pneumonia re-admissions. Both positive and negative predictive values were good for PCT use. The impact on antibiotic resistance remains to be determined.

**Conclusions:** Implementation of a PCT algorithm through ASP is a novel and efficacious addition to improving diagnostic yield and targeting appropriate therapy.

Table 1. Primary and Secondary Outcomes

	Initial Procalcitonin (PCT) Level (mcg/L)		
	Negative PCT <sup>1</sup> (n = 56)	Positive PCT <sup>1</sup> (n = 26)	p-value <sup>2</sup>
Hospital Admission	45 (80)	25 (96)	0.092
Peak Procalcitonin on Admission	0.11 (0.06,0.15)	0.66 (0.38,1.67)	< 0.0001
Antibiotics Initiated	40 (71)	25 (96)	0.009
Total Antibiotic Duration, days	3.5 (1,6)	7 (5,8)	0.0001
Total Antibiotic Duration $\leq$ 48 hours	26 (46)	3 (12)	0.003
Length of stay, days	5 (4,7)	7 (4,10)	0.068
Incorrect Pneumonia Admitting Diagnosis <sup>3</sup>	12 (27)	2 (8)	-. <sup>5</sup>
Pneumonia Re-admission, 30 day <sup>4</sup>	1 (4)	0 (0)	-. <sup>5</sup>

Categorical values are presented as n (%), continuous values as median (interquartile range)

<sup>1</sup> Negative PCT-  $\leq$  0.24  $\mu$ g/L. suggests non-bacterial process discouraging antibiotic use, Positive PCT-  $\geq$  0.25  $\mu$ g/L. suggests bacterial process encouraging antibiotic use

<sup>2</sup> Categorical values using Pearson Chi-square and Fisher's Exact test, continuous values using Wilcoxon rank-sum test (STATA®)

<sup>3</sup> Total no. of patients admitted with pneumonia and discharged with alternative diagnosis (Negative PCT n=45, Positive PCT n=25)

<sup>4</sup> Includes all evaluable patients re-admitted with pneumonia within 30 days of hospital discharge (Negative PCT n=28, Positive PCT n=21)

<sup>5</sup> Descriptive analyses

George D. Rodriguez, PharmD, Roman Yashayev PA-C, Bella Yushuvayev PA-C, Demetra Tsapepas, PharmD BCPS, Anna Kula PA-C, Naihwan Warren PA-C, Caroline A. Keane RN, MSN ANP, Jonathan Siegal MD, Manish Sharma DO, MBA, Sorana Segal-Maurer MD | 17 May 2017

**Problem Statement**

Making an accurate diagnosis of bacterial pneumonia in the Emergency Department (ED) can be challenging, resulting in inappropriate antibiotic use adversely impacting patient care and safety. Procalcitonin (PCT), a serum biomarker, has a good positive predictive value (PPV) for bacterial, lower respiratory tract infections.

**Objective/Aim Statement**

Evaluate the impact of using PCT in an antimicrobial stewardship program (ASP)-driven algorithm to manage patients with presumed pneumonia.

**Design/Methods**

Initial PCT use was restricted to the ED for hemodynamically stable patients with presumed pneumonia. Subsequent PCT levels were ordered by ASP team members at 8 to 12-hours followed by repeat tests on days 3, 5 and 7 to guide duration of antibiotic use and interpreted as per existing guidelines (see Figure 1). Beginning December 2016, aggressive education was provided by ASP to ED staff, followed by implementation of algorithm in January 2017. PCT use was analyzed in real-time from January to March 2017. Outcomes included hospital admission, days of antibiotics, length of stay, incorrect pneumonia admitting diagnosis and 30-day pneumonia readmission.

Figure 1. Procalcitonin Algorithm

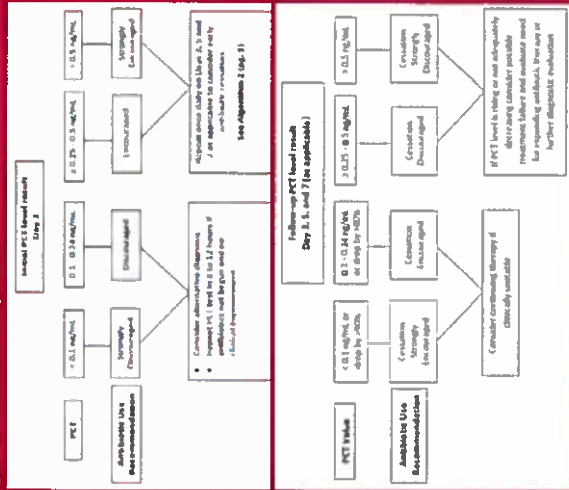


Table 1. Baseline Demographics

	Initial Procalcitonin (PCT) Level (ng/ml)	p-value
Age, years	81 (65.86)	0.5
Sex, male	19 (34)	0.087
Place of origin		
Home	51 (91)	0.704
Nursing/Group Home	5 (9)	-
Congestive Heart Failure	16 (29)	0.601
COPD	14 (25)	0.243
Pneumonia (previous 90 days <sup>†</sup> )	13 (23)	0.989
Temperature (C) on Admission	36.9 (36.3, 37.3)	0.0009
WBC on Admission	8.1 (6.1, 11.2)	0.014
Influenza Positive on Admission	6 (11)	0.061
Positive Respiratory Specimen	4 (7)	0.778

Categorical values are presented as n (%), continuous values as median (interquartile range). <sup>†</sup> Per New York-Presbyterian Queens documentation.

Figure 2.

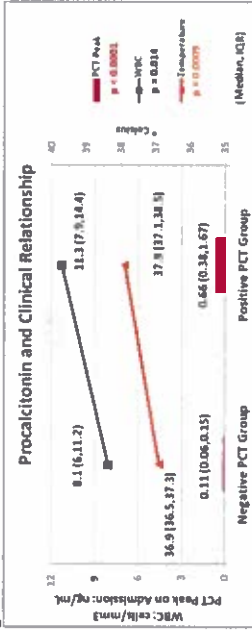


Figure 3.



Figure 4.



**Results**

A total of 82 patients were evaluated (Negative PCT=56, Positive PCT=26). Groups were similar with the exception of higher baseline temperatures and leukocytosis seen in patients with positive PCT levels (Table 1). Table 2 depicts peak PCT levels on admission. Negative PCT was associated with reduced antibiotic initiation and total duration (Figures 2-4). Although not statistically significant, patients with negative PCT levels had reduced hospital admissions and length of stay. There were no reported adverse events or differences in 30-day pneumonia re-admissions (Table 2). Both positive and negative predictive values were good for PCT use. The impact on antibiotic resistance remains to be determined.

Table 2. Secondary Outcomes

	Initial Procalcitonin (PCT) Level (mcg/L)	p-value
Admitted	45 (80)	0.092
Number of antibiotic continuations <sup>1</sup>	30 (54)	-
Reason for antibiotic continuation		
Clinically warrants antibiotic therapy <sup>2</sup>	7 (23)	-
Non-compliant / delay in DC <sup>3</sup>	13 (43)	-
Continue azithromycin for atypical coverage /anti-inflammatory property	3 (10)	-
ID decision to continue	5 (17)	-
Pulmonary decision to continue	2 (7)	-
Length of stay, days	5 (4, 7)	7 (4, 10)
No. of correct diagnosis <sup>4</sup>	28 (62)	21 (92)
No. of avoided pneumonia diagnosis <sup>5</sup>	12 (27)	2 (8)

Categorical values are presented as n (%), continuous values as median (interquartile range). <sup>1</sup> Antibiotics continued despite initial PCT negative by definition. <sup>2</sup> Based on primary team clinical judgment. <sup>3</sup> Recommendations not followed / team to discuss with primary attending leading to delay. <sup>4</sup> Defined as discharge diagnosis matching admission diagnosis per number of patients admitted. <sup>5</sup> Potential cases which may be incorrectly coded on discharge.

**Conclusions/Lessons Learned**

Implementation of a PCT algorithm through ASP is a novel and efficacious addition to improving diagnostic yield and targeting appropriate therapy.

**Next Steps**

- Phase II: Expand use to intensive care units to guide providers with duration of antibiotic therapy
- Phase III: Expand use to general floors for HAP/VAP to guide providers with duration of antibiotic therapy

1. Siegel J, Cohen D, Keane M, et al. Impact of Procalcitonin on Antibiotic Use in Hospitalized Patients with Bacterial Pneumonia. *Clinical Infectious Diseases*. 2017; 64(10):1303-1310.   
 2. Rodriguez G, et al. Procalcitonin-guided antibiotic therapy in bacterial pneumonia: a systematic review and meta-analysis. *Journal of Antimicrobial Chemotherapy*. 2016; 61(10):1973-1981.   
 3. Keane M, et al. Procalcitonin-guided antibiotic therapy in bacterial pneumonia: a systematic review and meta-analysis. *Journal of Antimicrobial Chemotherapy*. 2016; 61(10):1973-1981.   
 4. Keane M, et al. Procalcitonin-guided antibiotic therapy in bacterial pneumonia: a systematic review and meta-analysis. *Journal of Antimicrobial Chemotherapy*. 2016; 61(10):1973-1981.   
 5. Keane M, et al. Procalcitonin-guided antibiotic therapy in bacterial pneumonia: a systematic review and meta-analysis. *Journal of Antimicrobial Chemotherapy*. 2016; 61(10):1973-1981.

**“Behavioral Challenges: Innovation and Safety in Medical Nursing” QIP Poster Session Abstract 2017**

Nadine Rosenthal, DNP, RN, CCRN, NEA-BC, Asmin Brown DNP, RN, Natalie Mohammed, MA, BS, RN, NEA-BC, Kristen Magnuski, MSN, RN-BC, Lorelle Wuerz MSN, BS, RN, VA-BC

Hospitals can be dangerous places. Although statistics concerning the violence by patients directed to nursing are difficult to obtain, there has been a steady increase in the amount of behavioral patients being admitted to hospital medical floors. Comorbidity is considered an expectation and not an exception. Patients are increasingly presenting to acute care hospitals in crisis because there are fewer community based programs or available psychiatric inpatient beds. Patients with behavioral issues come in many forms. Patients can be diagnosed or undiagnosed with a psychiatric disorder, have substance abuse or simply behave badly.

There are safety risks that come with having behavioral patients in a non-psychiatric medical floor. Behavioral patients are often loud and disruptive. Use of additional resources such as nursing attendants for constant observation and considerable security resources get allocated to this population, which increases cost of care as well as length of stay. In addition, patient and staff engagement scores are affected as non behavioral patients are disrupted and fearful by having a roommate who is loud and potentially visibly violent and staff is frazzled by this population. Staffs are fearful for their own safety as this population often lashes out verbally or physically and staffs are not confident in their skills to care for them having never received formal or ongoing training for patients with mental health disorders.

In 2016 The New York Times and The Wall Street Journal both published articles regarding recent violent crimes to health care workers and the need to have mental health support on Medical wards. Integration of services is key. Focus is on maximizing safety and improving the health care experience.

Several hospitals in the nation have begun to integrate services. Some have had their psychiatric physicians and mental health teams round on medical floors and provide consultative services. Other hospitals created new combined units dedicated to the high medical acuity and behavioral health population. However, these interventions are only the tip of the iceberg. The former only provides intermittent support and the latter has significant financial impact and can be limited based on infrastructure and space needs. A new and fresh approach is needed.

In September 2014 there was an increase of violent patient attacks on nursing in the Medicine Service line of a large academic teaching center in the North East. After a collaborative discussion with senior leadership in nursing, operations and behavioral health, in June 2015 a total of 5.2 FTEs were granted to hire Mental Health Workers and to imbed them into one of the medical floors to provide 24/7 support for the staff and patient population.

Preliminary results in the first year (2016) of implementation as each of the mental health workers were on boarded include a significant impact in one to one utilization and improvement in patient experience scores; 50 percent reduction in one to one observations, greater than 25 point score increase in communication with nursing, greater than 30 point increase in responsiveness of hospital staff and greater than 20 point increase in care transitions.

# Behavioral Challenges: Innovation and Safety in Medical Nursing

Nadine Rosenthal, DNP, RN, CCRN, NEA-BC, Asmin Brown DNP, RN, Natalie Mohammed, MA, BS, RN, NEA-BC, Kristen Magnuski, MSN, RN-BC, Lorelle Wuerz MSN, BS, RN, VA-BC

## Current State

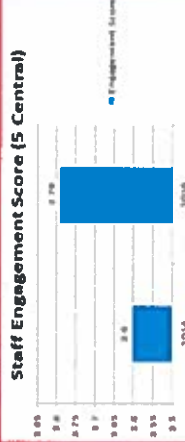
- NY Times (2016) and The Wall Street Journal published articles regarding recent violent crimes to healthcare workers and the need for mental health workers support on medical wards
- Former first lady Michelle Obama spoke out about mental health stating "Our mental health seriously affects our physical health..." (Each Mind Matters, 2015)
- Hospitals are seeing a steady increase in behavioral health patients in the past 20 years (Briefings on Hospital Safety, 2016)

## Background

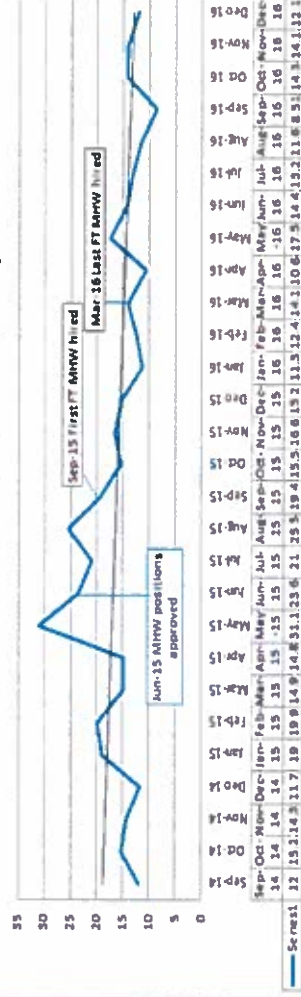
- Increase of patient behaviors escalating into violent verbal and physical attacks on nursing in medicine service line
- Patients too medically ill to be admitted to psychiatric unit and too psychiatrically challenged to be on a medicine unit
- An increase in 1:1's, multiple security calls and decreased patient satisfaction resulted
- Staffs on medicine units request additional education and resources

## Goals

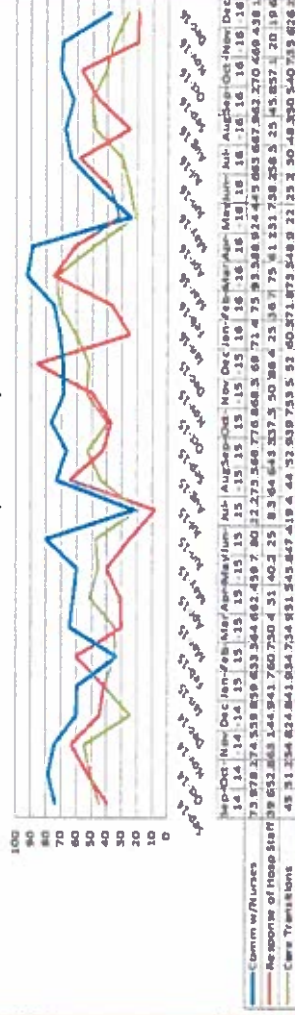
- Reduce overall 1:1 observations
- Improve patient experience
- Improve staff sense of safety and security



## Constant Observations (1:1) 5 Central NYP/WC



## HCAHPS (5 Central)



## Discussion and Conclusions

- Took several months to onboard the right MHW candidates
- Staff engagement scores increased from 2014 to 2016 from 3.6 to 3.79
- Staff verbally state their feelings of support
- Decrease in 1:1s FTEs in 2016 (↓ 48.3% from 115.06 to 77.6)
- HCAHPS continue to fluctuate (multi-factorial)
- Due to success of program the MHW team now consults with other medicine units

## Interventions

- Director of Nursing (DON) for Medicine collaborated with Chief Nursing Officer (CNO), other senior leaders and staff to discuss the current state and solutions
- An innovative and unique approach was approved to add 5.2 FTE's of Mental Health Workers (MHW) to the Medicine Units most affected
- Implemented hourly rounding with security, weekly debriefings with crisis prevention, and mandatory crisis prevention intervention training for all staffs

## Role of the Mental Health Worker (MHW)

- Patient observations and rounding on patients
- Providing physical, emotional and social-behavioral support
- Offering structure and recreational activities to promote mental health
- Collaboration with nursing and medicine teams to meet individualized mental health needs of patients
- Effectively intervene with any mental health needs for patients

References: Each Mind Matters. (2015). First lady Michelle Obama speaks about mental health. Retrieved from: <http://www.eachmindmatters.org/movement/moment/first-lady-michelle-obama-speaks-about-mental-health/>; Funderburk, J., et al. (2012). Integrating Behavioral Health services into A University Health Center: Patient and Provider Satisfaction. American Psychological Association, 30(2), 130-140; Pestka, E., et al. (2012). Enhancing Safety in Behavioral Emergency Situations. MedSurg Nursing, 12(6), 335-341; Rape, C., et al. (2015). Managing Patients with Behavioral Health Problems in Acute Care. Journal of Nursing Administration, 45(1), 7-10; Rutledge, Dana., et al. (2012). Hospital Staff Nurse Perceptions of Competency to Care for Patients with Psychiatric or Behavioral Health Concerns. Journal for Nurses in Professional Development, 29(5), 265-282; Safety by design: Behavioral Health patients. (2016). Briefings on Hospital Safety, 24(6), 1-6. 1; Zauske, P., et al. (2012). Registered Nurses' and Behavioral Health Associates' Response to Violent Inpatient Interactions on Behavioral Health Units. Journal of the American Psychiatric Nurses Association, 18(2), 112-128.

## **What to expect that you're not expecting: Video education to improve self-efficacy around discharge medication barriers**

Sanjai Sinha, MD

### **Statement of the Problem:**

Large academic medical centers, like NYP carry higher than average readmission rates and suffer great penalties from payers as a result. The literature suggests that one factor driving readmissions is patients' difficulty anticipating challenges with discharge medication adherence after they leave the hospital. Improving self-efficacy in developing plans to address medication barriers before a patient is discharged could lead to better overall comprehension of and adherence to discharge medications and ultimately lower readmission rates.

### **Objective/Aim of the study**

The objective of this initiative is to develop, test, and implement a standardized, video-based educational tool to deliver education on discharge medication adherence challenges, with the aim of improving self-efficacy by 10% after completing the video education.

### **Project Design/Methods:**

Design: Single-arm intervention feasibility study

Population: General Medicine Inpatients at NYP-WCMC, disposition planned for home

Intervention: 5 brief videos on different medication adherence challenges

Survey tool: Self-efficacy questions for each video pre and post video, using 5-point likert scale adapted from MUSE (Cameron et al, 2010) The five confidence questions with response ranges from 1-5, will be added together to form a composite confidence score with a range from 5-25 for every study participant.

Primary Outcome: Change in median composite self-efficacy score of 5 questions

Feasibility Measures: Knowledge retention, time taken to complete intervention, Patient satisfaction with videos, nursing feedback.

### **Results:**

The median composite self-efficacy score increased by 2 points, or 8%, from 21.5 to 23.5 ( $p=0.046$ ) from the pre- to the post-intervention stage. Knowledge retention assessed by multiple choice questions in the post-intervention period was high with 95% getting 4 or 5 of the 5 questions correct. Average time taken to complete the videos was 14.4 minutes. 90% of patients found the intervention helpful. The majority of nurses interviewed (16/20) reported that discharge education, planning and communication were improved by the video education and that this intervention would not add to time spent doing discharge planning.

### **Conclusions:**

Video education improves self-efficacy involving discharge medication challenges that lead to patient harm and readmission. Patients and nurses report satisfaction with the education. This video discharge education is feasible because it is a standardized tool which requires little extra time, can be incorporated into nursing workflow, and is inexpensive while being scalable.





# What to Expect That You're Not Expecting: Video Education to Improve Patient Confidence Around Discharge Medication Barriers

Sanjai Sinha, MD, John Dillon, BS, Alexi Archambault, MPH, Savira Kochhar, MS

## Problem Statement

- The discharge process consists of providing patients with verbal and written instructions, however many patients **do not fully understand or recall** the information provided at discharge leading to **poor discharge planning**.
- Data from recent studies highlights that patients frequently feel unprepared for post-discharge challenges often leading to **preventable readmissions**.
- One domain of unanticipated challenges is **medication adherence barriers**. As a response to the difficulty with written discharge instructions, and the advent of bedside tablets, some have used **videos to offer instructions and education around discharge**.

## Objective

- To develop, test, and implement a **standardized video educational tool** on discharge medication challenges to **improve confidence and knowledge** in dealing with these barriers.

## Aim Statement

- To achieve a **10% increase in patient self-efficacy** in managing medication discharge barriers after completing video education.
- To assess post-education **knowledge retention**.
- To measure **the rate and cause of hospital revisits** in patients who completed video education.
- To assess **feasibility**.

## Design/Methods

- Single-arm intervention feasibility study in 40 patients recruited from general medicine service (5C and 5N) planned for discharge home over 3 months.
- Intervention:** 5 videos, 60-90 seconds each, 1 knowledge question per video
- Pre- and Post-confidence levels assessed on a 5-point Likert scale adapted from the Medication Understanding and Use Self-Efficacy Scale (MUSE) developed by Cameron, et al.
- Self-efficacy evaluated as a composite score (range 5-25), which consists of the five confidence questions added together
- Nonparametric Mann-Whitney U tests utilized to measure the statistical difference between pre-intervention and post-intervention scores

## Results

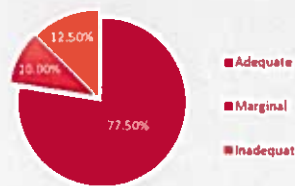
### Demographics

Total N	40
Age, mean	52
Gender, (%)	
Female	63
Race/ Ethnicity, (%)	
White	43
Asian/ South Asian	5
African American	23
Hispanic/ Latino	13
Other	13
Declined	5
Readmission at time of intervention, (%)	13
Readmission 7 days after intervention discharge, (%)	10

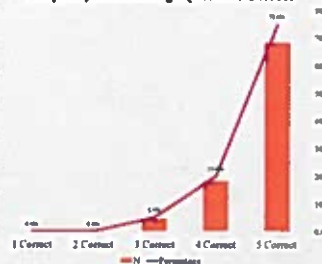
### Self-efficacy Questions:

- When you go to the hospital, doctors often change your medications. How confident are you that you will **know which medications to take after you leave the hospital?**
- How confident are you that you will **know what to do if you are confused about your medications after you leave the hospital?**
- How confident are you that you will **know how to take your medications the correct way after you leave the hospital?**
- When you leave the hospital, you will probably have to go to the pharmacy to pick up your medications. How confident are you that you **know what to do if there is a problem with filling your medications/prescriptions?**
- How confident are you that you will **be able to pick up the medications from the pharmacy after you leave the hospital?**

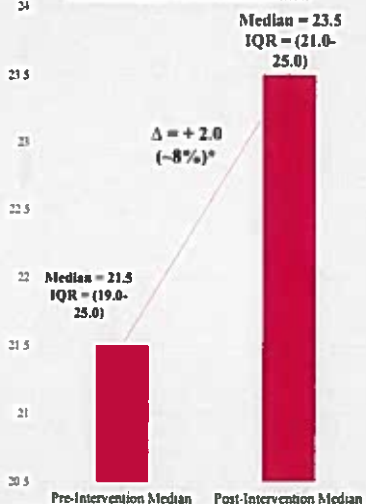
### Health Literacy (%)



### Frequency of Knowledge Questions Correct



### Change in Median Composite Self-Efficacy Score from Pre- to Post-Intervention



## Conclusions

- Video discharge education **significantly increases patient confidence** ( $p=0.043^{**}$ ) to overcome common post-discharge medication barriers.
- Knowledge retention after video education was high** with 95% of patients getting 4 or 5 questions correct.
- 90% of patients found the intervention helpful**
- 33% of patients stated that the video identified a new or previously not considered challenge**, demonstrating the benefit of the video as an **additive measure**.
- Nursing and patient feedback agree that the videos **reduce confusion** and prompt better discharge planning.
- The video discharge education is **feasible** because it is a standardized tool which requires little extra time, can be incorporated into nursing workflow and is inexpensive while being scalable.

## Next Steps

- Our data suggests that the use of video discharge materials is both clinically useful and feasible, however the next obstacle is obtaining devices and establishing a training regimen on tablet use for healthcare providers.
- One major source of exclusion in our study was language, in the future video series in Spanish and Mandarin may help provide increased care for patients who have historically had challenging discharges.
- This service has only been tested 5N/5C, should this become standard of care expansion to other floors would be a necessary step.

## Code Sepsis: An Early Sepsis Recognition & Management Project

Peter Steel, John Arbo, Catherine McHugh, Sunday Clark, NYP-Quality Analytics Group, Rahul Sharma

**Statement of the Problem:** Between 2000 and 2010, national inpatient sepsis-related mortality rates increased, the only diagnosis in the top 8 inpatient causes of death to do so. In response to these trends, WCMC ED developed a triage-initiated alert system for the early recognition and management of sepsis in adult patients. *Code Sepsis* – launched in May of 2016 – is a clinical, team-based workflow designed to build on historical successes with MI and stroke alert systems.

**Objective / Aim:** *Code Sepsis* was designed not only as a protocol for early recognition of sepsis, but also as a real-time, medical decision-making and documentation tool. The goals were to optimize both the clinical care of sepsis patients and the associated reportable metrics.

**Project Design / Methods:** Intervention phase included both sepsis management bundle education and *Code Sepsis* protocol training to ED staff, including physicians, RNs, PAs, NPs, Clerks and PCTs. A pre-post design was used to assess the effect of *Code Sepsis* on NYP's reportable sepsis performance. Performance measures as required by NYS-DOH and CMS were evaluated, including antibiotics <1 hour; antibiotics <3 hours; IV fluids (30mL/kg) <6 hours if SBP <90 or lactate >4; and lactate measurement <3 hours. In accordance with NYS-DOH requirements, NYP Analytics Quality Management Specialists identified all cases for review and independently derived all time-to-measure performance statistics. Proportions between time periods were calculated using Chi-square and Fisher's exact tests, as appropriate.

**Results:** 350+ *Code Sepsis* activations to date at WCMC ED. In Q3 2016, the first quarter in which *Code Sepsis* was fully implemented, *Code Sepsis* activations accounted for 47% (38/81) of cases extracted for review. Statistically significant improvement in NYS-DOH and CMS sepsis performance measures were observed. The 2016 NYP performance report for NYP-WCMC (below) reflects the impact of *Code Sepsis* on overall NYP sepsis performance (non-transferred patients).

Sepsis Performance Measure	Q4 2015 ED Overall	Q1 2016 ED Overall	Q3 2016 ED Overall (CS)
Antibiotics < 1 hour	15%	17%	44%
Antibiotics < 3 hours	64%	65%	75%
Lactate < 3 hours	73%	75%	79%
IVF (30mL/kg) <6 hours if SBP <90 or lactate >4	15%	24%	43%

**Conclusions:** Following implementation of *Code Sepsis* in the WCMC ED, we observed statistically significant improved performance with NYS-DOH and CMS performance measures. Implementation of *Code Sepsis* was made a 2017 institutional QPS goal. To date, *Code Sepsis* has been launched at NYP-CUMC, NYP-LM, NYP-Methodist and NYP-Queens. *Code Sepsis* has provided a unique opportunity for research, facilitating patient enrollment in the 'golden-hour' testing of a novel sepsis biomarker as part of a collaboration between multiple divisions within the Department of Medicine – the MBOSS Study.



# Code Sepsis: An Early Sepsis Recognition & Management Project

Peter Steel, John Arbo, Catherine McHugh, Sunday Clark, NYP-Quality Analytics Group, Rahul Sharma

## Problem Statement

Between 2000 and 2010, national inpatient sepsis-related mortality rates increased, the only diagnosis in the top 8 inpatient causes of death to do so. In response to these trends, WCMC ED developed a triage-initiated alert system for the early recognition and management of sepsis in adult patients. *Code Sepsis* – launched in May of 2016 – is a clinical, team-based workflow designed to build on NYP’s historical success with early MI and stroke alert systems.

## Objective

*Code Sepsis* was designed not only as a low-threshold protocol for early recognition of sepsis, but also as a real-time, medical decision-making and documentation tool. The goals were to optimize both the clinical care of sepsis patients and the associated reportable metrics.

## Design/Methods

A pre-post design was used to assess the effect of *Code Sepsis* on NYP’s reportable sepsis performance. Performance measures as required by NYS-DOH and CMS were evaluated, including antibiotics <1 hour; antibiotics <3 hours; IV fluids (30mL/kg) <6 hours if SBP <90 or lactate >4; and lactate measurement <3 hours. Proportions between time periods were calculated using Chi-square and Fisher’s exact tests, as appropriate.

## Design/Methods (cont.)

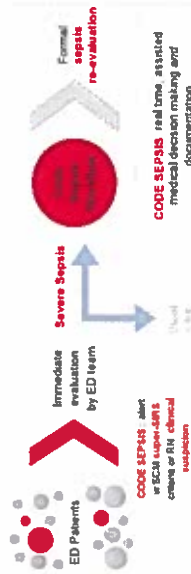
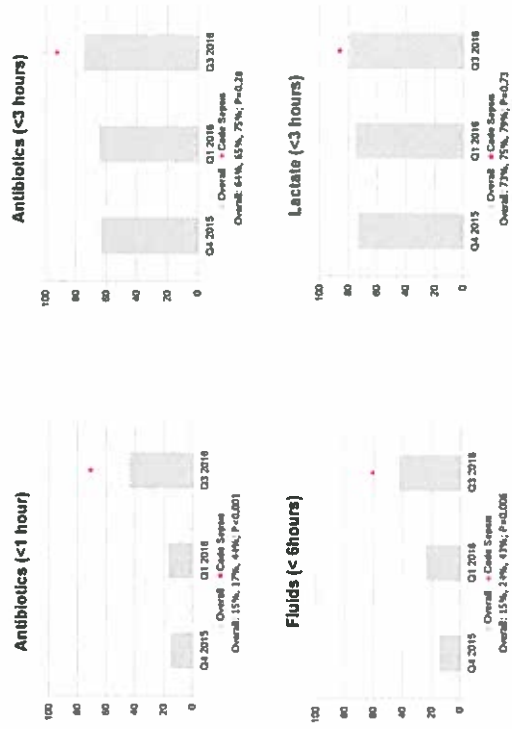


Diagram 1: Code Sepsis Workflow

Intervention phase included both sepsis management bundle education and *Code Sepsis* protocol training to ED staff, including physicians, RNs, PAS, NPs, Clerks and PCTs.

## Results

350+ *Code Sepsis* activations to date at WCMC ED. In Q3 2016, the first quarter in which *Code Sepsis* was fully implemented, *Code Sepsis* activations accounted for 47% (38/81) of cases extracted for review. Statistically significant improvement in DOH & CMS sepsis performance measures were observed. The 2016 NYP performance report for NYP-WCMC (below graphs) reflect the impact of *Code Sepsis* on overall NYP sepsis performance (non-transferred patients).



## Conclusions

Following implementation of *Code Sepsis* in the WCMC ED, we observed statistically significant improved performance with NYS DOH and CMS performance measures.

Implementation of *Code Sepsis* was made a 2017 institutional QPS goal. To date, *Code Sepsis* has been launched at NYP-CUMC, NYP-LM, NYP-Methodist and NYP-Queens.

*Code Sepsis* has provided a unique opportunity for research, facilitating patient enrollment in the 'golden-hour' testing of a novel sepsis biomarker as part of a collaboration between multiple divisions within the Department of Medicine – the MBOSS Study.

## Future Work

Assess the impact of *Code Sepsis* on NYP inpatient sepsis mortality.

Continue to refine *Code Sepsis* workflow as directed by continued multi-campus performance review, staff feedback and changes to the NYS-DOH and CMS Sepsis Data Dictionary.

Develop, launch and monitor an EMR-based assisted decision-making tool for early sepsis recognition and management in the adult ED.

## **An Initiative to Promote Antibiotic Citizenship on the Internal Medicine Service**

Stephanie J. Tang, MD, Renuka Gupta, MD, Matthew S. Simon, MD, Adrian Majid, MD, Parimal Patel, MD, Elizabeth Park, MD, Rebecca Boas, MD, Leigh Efid, PharmD, MPH, Angela Loo, PharmD, Shawn Mazur, PharmD, David Calfee, MD, Alexi Archambault, MPH, Arthur Evans, MD, Savira Kochhar, MS, Jennifer Lee, MD

### **Statement of the Problem:**

Antibiotic resistance is a significant public health problem nationally and institutionally. The CDC estimates 30-50% of antimicrobial use in hospitals is unnecessary or inappropriate.

### **Objective/Aim of the study**

During Sept-Dec 2016, on general medicine housestaff services, our goals were to:

- Decrease inappropriate broad-spectrum antibiotic usage by 15%
- Ensure  $\geq 90\%$  patients with pneumonia & UTI receive antibiotic therapy consistent with NYP guidelines (with special focus on de-escalation & length of therapy)
- Decrease antibiotic costs by 15%

### **Project Design/Methods:**

An antibiotic rationale checklist for daily attending rounds and progress note template was developed to promote critical thinking about antibiotic plans. Three general medicine housestaff teams (blue, gold, red) were instructed to utilize these measures, and trainees were also provided NYP empiric guideline pocket cards. In addition, gold team had stewardship rounds 2x/week with an ID PharmD/MD, and red team had daily stewardship performed by a PharmD 5x/week during attending rounds.

### **Results:**

#### **Outcomes:**

- Broad spectrum antibiotic utilization decreased by 26.2% on blue team and 32.4% on red team, with statistically significant improvement on red over blue team.
- There was a trend in increased adherence to guideline length of therapy for urinary tract infections and pneumonias, but this did not meet statistical significance.
- Antibiotic costs decreased \$80,000. Extrapolated to all medicine services, this would result in an annual cost savings of nearly 1 million dollars.
- Length of stay decreased from 9 days to 7 days on blue team and to 6 days on red team.

#### **Process Measures:**

- There was modest adherence to progress note template, overall only 32% compliance.
- All teams improved on self-reported reassessment of antibiotic therapy 48-72 hours after initiation of antibiotic therapy. There were few improvement in measures of confidence.
- Stewardship rounds resulted in interventions on 52% of patients on antibiotics on gold team and 75% of patients on red team. The most common interventions were to discontinue antibiotics, define length of therapy, and de-escalation.

#### **Balancing Measures:**

- There were no changes in inpatient mortality, ICU transfer, or 30 day readmission.

### **Conclusions:**

Simple educational measures to improve prescriber-initiated antibiotic reassessment habits significantly decrease broad-spectrum antibiotic use. The addition of daily stewardship rounds with a PharmD produces the greatest effect. These interventions produce significant cost savings and potentially decrease length of stay. In the future, we hope to expand the initiative to additional medical/surgical units and other NYP sites as well as obtain additional pharmacy resources for antimicrobial stewardship to sustain and expand this initiative.

## An Initiative to Promote Antibiotic Citizenship on Internal Medicine Teaching Services

Stephanie J. Tang, MD, Renuka Gupta, MD, Matthew S. Simon, MD, Adrian Majid, MD, Parimal Patel, MD, Elizabeth Park, MD, Rebecca Boas, MD, Leigh Efrid, PharmD, MPH, Angela Loo, PharmD, Shawn Mazur, PharmD, David Calfee, MD, Alexi Archambault, MPH, Arthur Evans, MD, Savira Kochhar, MS, Jennifer Lee, MD

Quality Improvement Patient Safety Poster Session | May 17, 2017

### Problem Statement

- Antibiotic resistance is a significant public health problem both nationally and institutionally
- The CDC estimates 30-50% of antimicrobial use in hospitals is unnecessary or inappropriate

### Objective/Aim Statement

During Sept-Dec 2016 on medicine housestaff services, our goals were to:

- decrease inappropriate broad-spectrum antibiotic usage by 15%
- ensure ≥90% patients with pneumonia & UTI receive antibiotic therapy consistent with NYP guidelines (with special focus on de-escalation & length of therapy)
- decrease antibiotic costs by 15%


### Design/Methods




An antibiotic rationale checklist for daily attending rounds and progress note template was developed to promote critical thinking about antibiotic plans.

**Rounds Antibiotic Checklist:**

- Indication (ex. PNA, UTI, sepsis of unknown etiology)
- culture results
- # days of abs patient has received thus far
- anticipated length of therapy
- can abs be de-escalated, converted to oral, or discontinued?



*"For patient's catheter-associated UTI, today is day 2 of 5d. Urine culture is growing GNR. Foley was exchanged and we will narrow once susceptibilities are back for total 5 day course."*



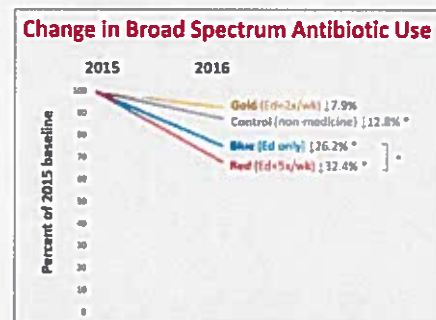
*"For patient's pneumonia, continue antibiotics."*

**abs**

Infection/indication:  
Culture confirmed infection or empiric therapy?  
Current antibiotic(s):  
# days received of abs:  
Anticipated total length of therapy for this infection:  
Will abs be de-escalated, converted to oral, or discontinued?

### Results

- Broad spectrum antibiotic use decreased by 26.2% on blue and 32.4% on red with statistically significant improvement on red over blue team.



- There was a trend towards increased adherence to guideline length of therapy for UTI and pneumonias, but this did not meet statistical significance.
- Antibiotic costs decreased \$80,000. Extrapolated to all medicine services, this would result in an annual cost savings of nearly 1 million dollars.
- Length of stay (LOS) decreased from 9 to 7 days on blue and from 9 to 6 days on red.
- There were no changes in inpatient mortality, ICU transfer or 30 day readmission

### Conclusions/Lessons Learned

- Simple educational measures to improve prescriber-initiated antibiotic reassessment habits significantly decrease broad-spectrum antibiotic use
- The addition of daily stewardship rounds with a pharmD produces the greatest effect
- These measures produce significant cost savings and potentially decrease LOS.

### Next Steps

- Expand the initiative to additional medical/surgical units and other NYP sites
- Increase support for additional pharmacy resources for antimicrobial stewardship to sustain and expand this initiative

## **Improving Identification of Healthcare Proxy and Surrogate Decision Makers in the Medical Intensive Care Unit**

Wagner M, Krishnan JK, Ness L, Shaw AL, Kwon A, Rajwani K.

**Objective/AIM:** In the intensive care unit (ICU), less than 5% of patients are deemed to have capacity to make necessary medical decisions.<sup>1</sup> In these situations, a health care agent or surrogate needs to be accurately identified and documented. Often, the most dominant family member is assumed incorrectly to be a patient's decision maker. Our project's primary aim is to ensure that 80% of patients admitted to the intensive care unit for at least 12 hours have the correct decision maker documented both informally in the handoff tab and formally in an advance directive note in the electronic medical record (EMR) at the end of five months.

**Methods:** We designed a multidisciplinary intervention that included a brief, five minute, in-person standardized educational orientation for residents at the beginning of every two-week ICU rotation. The unit social worker provided a daily reminder card to residents on newly admitted patients detailing inaccuracies in documentation. Performance data was displayed on a weekly basis. Pre- and post-intervention surveys were completed every two weeks. Outcome measures included the percentage of ICU patients with a correctly documented medical decision maker in the handoff tab and the advance directive follow up note. Process measures included the total number of notes completed (regardless of accuracy) and survey data of the residents gauging their increased level of understanding. Balancing measures included perceived burden on workflow and percentage inaccurate advance directive notes. We completed one-week plan-do-study-act (PDSA) cycles with adaptive changes to finish seventeen cycles.

**Results:** Through seventeen PDSA cycles there has been an overall increase in the percentage of correctly documented decision makers from 35% to 88% (mean over last three weeks) in our informal handoff documentation, and from 10% to 84% (mean over last three weeks) in advanced directive notes. Improvement in accurate decision maker identification from the first week of the rotation to the second week was demonstrated in five out of eight resident groups. Repeating our orientation for those who miss the first day of the rotation due to specifics of the resident call schedule led to a substantial improvement in our outcome measures. The number of incorrectly completed advance directives notes was one per week on average, with week three having a maximum of four incorrect notes. Survey data demonstrate that despite our intervention emphasizing advance directive note completion, residents still look most frequently (76% of the time) at the handoff tab to determine a patient's decision maker, emphasizing the importance for the handoff tab to be accurately completed.

**Conclusions:** Honoring patients' wishes is necessary to provide quality medical care. In this feasibility study, we were able to show significant improvement in frequency and accuracy of documentation of health care proxy and surrogate information. One limitation of our project is that collecting data as weekly 'snapshots' may reflect an overall overestimate or underestimate of the actual state. Next steps will be to create a sustainable process for orientation and performance feedback.

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<sup>1</sup> Carlet J, Thijs LG, Antonelli M, Cassell J, Cox P, Hill N, et al. Challenges in end-of-life care in the ICU. Statement of the 5th International Consensus Conference in Critical Care: Brussels, Belgium, April 2003. *Intensive Care Med.* 2004 May;30(5):770-784.

