

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Obtaining Consistency of Antibiotic Use by Implementing a 48 Hour Hard Stop

**Objective**

Cabell Huntington Hospital has participated in adult antimicrobial stewardship programs for many years, however Hoops Family Children's Hospital and the neonatal intensive care unit (NICU) have been excluded from these programs. In January 2017, our senior leadership and NICU Committee voted to join the Vermont Oxford INICQ collaborative "Choosing Antibiotics Wisely". A NICU Antibiotic Stewardship Team was formed with the infection control department within the hospital. Our team identified key areas of improvement including renewed efforts of infection control, consistency among providers when selecting treatment dose and duration, implementation of a 48 hour computerized hard stop for all antibiotics for early onset sepsis, properly entering the diagnosis for "At risk for Sepsis", and auditing the use of antibiotics during physician rounds. We believe that with these efforts combined we can reduce antibiotic utilization in our NICU.

**Methods**

In January 2017, we assembled our QI team, developed a charter, and joined the INICQ Collaborative. The first Plan-Do-Study-Act was to conduct the VON Day Audit. We worked with our QI team members and antibiotic stewardship pharmacist to determine that additional software was needed to obtain the antimicrobial utilization rate (AUR) for the NICU. A retrospective study was conducted for one year prior to the study to determine the number of sepsis cases within our unit. Next, we identified multiple key drivers and potentially better practices. Our third PDSA cycle was to conduct a staff survey regarding the collection procedure of the blood culture and provide ongoing education to the bedside nurses. Our fourth PDSA cycle is to provide prescriber education on the duration of the antibiotic use in order to provide consistency. A retrospective study was conducted for the past 12 months and it was determined that each prescriber ordered antibiotic for various durations. The goal is to standardize our treatment duration for culture-negative early onset sepsis (EOS) to patients from 7-10 days to 7 days. The fifth PDSA cycle, was to create an automated physician order set in the EMR for empiric antibiotics use at 48 hours. This "48 hour hard stop" would include any empiric antibiotic on admission after a blood culture was obtained, and would consist of 6 doses of ampicillin and 2 doses of gentamicin. Our future PDSA cycle will focus on

auditing the use of antibiotics during rounds and reporting those results.

## **Results**

Our baseline treatment duration for the use of antibiotics for the treatment of “At risk for Sepsis” for neonates who were culture-negative for greater than 48 hours was 64% from September 2015- September 2016. Our goal is to reduce this to 40% by December 2018. The baseline treatment duration for the “48 hour hard stop” before the collaboration was 36% on the use of empiric antibiotics on culture negative neonates. The goal is to increase this to 55% due to the implementation of the 6 doses of ampicillin and 2 doses of gentamicin. We will conduct daily audit rounds using the antibiotic tool (figure 3) and report the results monthly. Baseline results for bedside nursing education on blood culture collection procedure was 79% at the beginning of the collaborative with a goal of 92% by October 1, 2017.

Starting in April there were zero data collected until an employee survey was conducted. In May the results concluded that 79% of bedside nurses were knowledgeable of the proper blood volume for blood cultures during the collection process. June education was provided to the staff regarding proper blood volume collection amounts. In July and August continuing education with new hires and the blood culture collection process. Power point presentation and in-services were conducted. By September 11, 2017, 100% of bedside nurses were competent in the knowledge of proper blood volume collection and process via education and competency during mandatory skills day.

## **Conclusion**

While we are in the early stages of this quality improvement initiative, we are seeing a decrease in prescribed empiric antibiotic usage past 48 hours. This may be due to chance or may be due to awareness of antibiotics over usage. Our team will continue to assess if our early PDSA cycles have the impact we initially desired. Next, will be focusing on the education of the healthcare prescriber team on the 48 hour hard stop, the development policies and guidelines for the utilization and duration of the antibiotics, and the use of the two diagnosis codes for “At risk for Sepsis”. We will begin to monitor the AUR with the new program through the Antibiotic Stewardship Pharmacist and report out monthly to the NICU Committee. In November, the audit tool will be initiated during rounds for data collection on the adherence to communication regarding antibiotic use in the NICU. This will also determine if we are having consistency among all prescribers. This will be posted monthly and given to prescribers.

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## Abstract

**Title**

Traditional bathing compared to bathing cloths: The impact on infection rates in the Adult Critical Care

**Objective**

The purpose for this study was to see if a change of bathing practices affected the critical care units' rates of healthcare associated infections (HAI) and to evaluate bath basins as a possible risk factor for HAIs

**Methods**

Patients admitted March 2017 through April 2017 were bathed using only disposable bathing cloths. No bath basins or wash clothes were available for use.

**Results**

Comparing the numbers  
2016- traditional bathing

CAUTI- 5  
CLABSI- 4

2017-disposable bath cloths only  
CAUTI-1  
CLABSI-1

CLABSI- 16% decrease in SICU, 30% decrease in MICU  
CAUTI- 86% decrease in SICU, 28% decrease in MICU

**Conclusion**

Single use bath cloths for bathing had a significant decrease in infection rates among patients in the Adult Critical Care compared to traditional bathing utilizing bath basins and washcloths.

Once the study was completed, bath basins were reintroduced into practice but only as single use along with the option to continue to use single use bathing cloths.

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## Abstract

**Title**

Reducing Narcotic Use After Cesarean Delivery with Enhanced Recovery: A Quality Improvement Project

**Objective**

Prescription drug abuse presents a major problem to society and can impact postoperative pain management. A substantial number of patients struggling with addiction started while undergoing treatment of acute pain. We aimed to reduce opioid use and pain scores after caesarian delivery with enhanced recovery.

**Methods**

We implemented a protocol using liposomal bupivacaine injected at the time of cesarean delivery. Patients were then given 500mg acetaminophen every 4 hours, 800mg ibuprofen every 8 hours and 5mg oxycodone every 6 hours as needed. In addition, patients were ambulated 4 hours after surgery and had their catheter removed from their bladder as soon as they could safely ambulate. Fifty patients were

prospectively recruited and then compared to a retrospective sample of fifty patients.

### **Results**

Patients in the treatment group utilized 63% less opioids ( $p<0.001$ ) with 29% not using any narcotics ( $p<0.001$ ) and reported 29% less pain ( $p<0.001$ ). 60% achieved a mean pain score  $\leq 3$  ( $p<0.001$ ). Hospital charges were equivocal between the groups. Patients on buprenorphine maintenance therapy who were in the treatment group utilized 42% less narcotics, with 50% not using any narcotics, however these did reach statistical significance. This cohort did, however, report 28% less pain ( $p<0.05$ ) with 63% achieving a mean pain score  $\leq 3$  ( $p<0.05$ ). Hospital charges were reduced by \$1,261 ( $p<0.01$ ).

### **Conclusion**

Our enhanced recovery protocol is an effective alternative to traditional pain control and significantly reduced both opioid use and pain scores without any significant increase in hospital costs.

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## Abstract

**Title**

Outcomes of Universal Screening for Suicidality in Medical Outpatient Clinics

**Objective**

As part of standard practice in the outpatient setting, the nurse asks whether a patient has had thoughts of harming self or others. The aim of our study was to determine whether this question was addressed by physicians after a patient had said “Yes” when asked by nursing, and to what extent there was follow-up planning when patients indicated they had suicidal ideation.

**Methods**

In our study, we performed a chart review of 246 patient encounters from a wide variety of outpatient clinics in Huntington, WV, including internal medicine, pediatrics, family medicine, surgical specialties, and

psychiatry. These encounters were selected for patients having answered “Yes” when asked about thoughts or self- or other-harm at intake.

### **Results**

Based on this review, we determined that physicians documented further exploration of suicidal ideation in around half of the cases, with significant variation between different specialties. When patients confirmed suicidal ideation to the physician, further planning (e.g. ER, inpatient admission, education, etc.) was documented only around 70% of the time. Regression analysis revealed that the only significant predictive factor for physicians following up on suicidal ideation was the presence of a depressive disorder in the patient’s chart.

### **Conclusion**

We determined that these gaps could be addressed by improving communication between nursing staff and physicians and providing better education to providers in all specialties on assessing and managing suicide risk.

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## Abstract

**Title**

Osteoporosis Screening in Patients Following with Marshall Endocrinology; A Quality Improvement Project

**Objective**

- Introduction:

The National Osteoporosis Foundation (NOF) estimates that in 2010 there were 10.2 million American

adults above the age 50 with osteoporosis, and another 43.4 million with low bone mass. It is projected that the number of those with osteoporosis or low bone mass will increase to 64.4 million in 2020. It causes an estimated two million fractures yearly which contribute to an increase in morbidity and mortality in this patient population, in addition to major healthcare costs. Screening for osteoporosis has now been recommended due to these concerns. The Endocrine Society and NOF recommend screening with a dual energy x-ray absorptiometry (DXA) scan for all females starting at age 65 and males starting at age 70. Earlier screening is recommended if there are additional risk factors for osteoporosis. Unfortunately, DXA screening is underutilized, only one third of females who qualify are screened.

- Objective:

To evaluate the frequency of screening for osteoporosis in patients following with Marshall Endocrinology clinics and implement changes to improve screening.

### **Methods**

Patients following for any reason with the Marshall University endocrine clinics during the period September 6-18, 2017 were screened. Those who meet the criteria for osteoporosis screening, females from age 65 and males age 70 or more, were included. A questionnaire was filled out asking about prior screening with a DXA scan and any history of osteoporotic fractures.

### **Results**

41 patients met the screening criteria for osteoporosis. 15 patients (36.5%) were appropriately screened. Amongst the 26 that were not screened, 6 (23%) had osteoporotic fractures. Males represented 34.1% of the patients, none of them were up to date on screening, 2 had osteoporotic fractures.

### **Conclusion**

- Intervention:

We distributed printed guidelines for osteoporosis screening in the primary care clinics of the internal medicine department. We gave a lecture to the internal medicine residents to encourage screening. We talked to our information technology department and reminders were incorporated into our clinic electronic medical records (EMR) for the screening of females. Unfortunately, we were unable to do the same for the males for technical reasons. These measures are expected to increase screening for patients referred within our own network. For those patients who follow with a primary care physician (PCP) outside our network, we provided patients who met screening guidelines with a letter to their PCP stating they met screening criteria based on their age. We can provide the screening if that is the desire of the PCP or the patient.

- Outcome:

We plan to re-evaluate the frequency of osteoporosis screening in the endocrine clinics 6 and 12 months after implementation of these changes. It is expected that the outcomes will take time to become evident due to the length of time between follow up visits.

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## Abstract

**Title**

Quality Improvement Project to Delay Umbilical Cord Clamping

**Objective**

We aimed for delayed umbilical cord clamping to be performed at greater than or equal to 30 seconds in 80% or more of deliveries on the Marshall Health service at CHH within 3 months of starting the project.

**Methods**

A random sampling of vaginal and cesarean deliveries were attended at Cabell Huntington Hospital from June-August 2016. The duration of time between delivery of the infant and cord clamping was recorded with a stopwatch.

Meetings were held with delivering physicians, L&D nursing staff, and the neonatal resuscitation team to discuss the benefits, indications, and contraindications of delayed cord clamping, included recommended technique and timing.

An intervention was devised in which timers were placed in all delivery rooms. Nursing staff set the timers to alarm 30 seconds after the birth of the baby.

Delivery notes within the EHR were modified so that delayed cord clamping could be easily documented for every delivery.

We tracked intervention compliance weekly. Time to cord clamping was recorded as delayed (>30s) or not delayed. If cord clamping was not delayed, the appropriate maternal or fetal contraindication to delayed cord clamping was noted.

**Results**

Prior to intervention, delayed cord clamping was occurring at a rate of 12%. After intervention, the rate increased to 96%. The difference in pre and post intervention clamping rates was significant with a p-value of <0.001 (chi squared test,  $\alpha=0.05$ ). In the 3 births where cord clamping was not delayed, the infant required immediate resuscitation.

**Table 1**

Rates of delayed cord clamping (DCC) pre and post intervention.

**Conclusion**

Our study shows that a quality improvement project to increase delayed cord clamping compliance was successful. We believe a large component of our success was related to the educational approach.

Anecdotally, many providers at our institution believed they were waiting 30 seconds, but our initial data collection revealed only 1/10 deliveries were meeting delayed cord clamping. In addition, we believe the timing of the ACOG publication encouraged compliance of delayed cord clamping. The simple design of our intervention should easily enable sustainability of delayed cord clamping at our institution.

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## Abstract

**Title**

Issues Concerning Tissue Sample and Culture Collections at CHH: Analysis of Current System and Ideas for Improvements

**Objective**

-FOCUS: To develop an efficient and error free process for biopsy acquisition and handling of specimens obtained from hospital floors, Interventional Radiology and the operating rooms. Secondary effects will be decreased cost, increased patient satisfaction, and reduction in error.

Many potential errors exist that can lead to increased hospital cost, unnecessary patient discomfort, and mishandling of tissue samples.

Involved Parties: Providers, Nursing, Specimen Transport, Specimen Processing, Laboratories, Pathology

Potential Errors: Acquisition, Labeling, Transport, Processing, Reporting

Cerner orders for culture / pathology not printed off by Nursing, Residents / Physicians that is to be sent with specimen

Pathology sample requisition form not submitted by the ordering physician to the reading pathologist

Lack of communication with Microbiology lab and Pathology lab after cultures and biopsy are placed

**Methods**

Primary Event occurred at Cabell Huntington Hospital:

Infectious Disease team member ordered a skin biopsy:

Sample was taken to Histology lab where ultimately the specimen was either mishandled or rendered unable to send for culture due to being placed in formalin

Process of Tissue Sample and Culture Collection:

Specimen placed in tissue sample vial

Vials, samples or bacterial cultures have to be placed in a biohazard bag with the patient's label identifying the sample along with the printed order placed in Cerner (indicating culture / biopsy). Sample requisition form for pathology / histology should then be completed by ordering provider and submitted with the sample

Tissue samples for Pathology review must be delivered by hand to the lab, pathology then confirms the order placed on Cerner

Pathologist reviews the "sample requisition form" followed by the completion of a "surgical pathology worksheet" prior to reviewing the sample

Tissue sample is then contained within the histology lab for 1-2 days prior to pathology review



Following analysis, the sample is maintained in the lab for approximately 7-10 days

If sample is requested for both culture and biopsy without two separate samples obtained, lab personnel will take the sample to Microbiology to split the specimen prior to placing in formalin. If placed in Formalin, specimen cannot be cultured

## **Results**

Perceived Errors:

- Sample requisition forms for pathology / histology not completed by physician ordering biopsy or culture

Amount of time the sample is left in the lab, unattended, with the possibility of the sample being mishandled or potentially lost.

Lack of communication with Pathology

Lack of knowledge of need for order for microbiology and pathology place in Cerner to be printed and sent with the specimen

## **Conclusion**

Proposals for Improvement:

- Allow Cerner to prompt providers to complete the necessary steps prior to sending specimen to lab when an order for culture or biopsy is placed

- Allow the sample requisition form to be completed on Cerner and then sent along with the sample

- Make one "complete" document available to Providers that encompasses all steps to avoid multiple forms

If both culture and biopsy are needed, two samples may need to be sent to the lab, one for microbiology and one to histology for review to prevent complete loss of the sample and placing the patient through repeat and unnecessary procedures

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## Abstract

**Title**

Assessing Colorectal Cancer Screening Barriers in Rural Appalachian Area

**Objective**

To determine and improve the barriers to colorectal cancer screening in rural Appalachia

**Methods**

Individuals of rural Appalachia were surveyed at various clinical and non-clinical sites. The survey which remained strictly confidential and anonymous consisted of questions regarding the patients' perceptions of colorectal cancer, screening behaviors, and some demographic information. The collected data were analyzed, and the preliminary report was established.

**Results**

The preliminary analysis demonstrated that the following factors have a positive influence on colorectal cancer (CRC) screening: having a PCP, knowledge and awareness of CRC screening, having a family history of CRC risks, having concerns or symptoms prior to screening, and prior screening experience especially if accompanied by the discovery of polyps or other lesions. On the other hand, the following factors have a negative influence on colorectal cancer screening: busy work schedule, the cost and the length of the screening procedure, the uncomfortable nature of the conversations regarding CRC screening and the screening itself, fear of diagnosis, feeling of embarrassment, bowel preparation, and when the place of residence is rural.

**Conclusion**

The colorectal cancer screening rate in rural Appalachia has been significantly lower than those of the state and the nation. The analyzed results shown in this study suggest that there is a tremendous room for improvement to increase the screening rate, thus, decreasing the colorectal cancer morbidity and mortality. It is critical to consider the implementation of a new or revised colorectal cancer screening policies and procedures to accommodate the individuals who have not been screened yet and to further increase education and raise awareness on colorectal cancer and its screening modalities.

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## Abstract

**Title**

Improving Pre and Post Outpatient Heart Cath Documentation

**Objective**

Medical documentation is an important aspect of patient care. In the cath holding area there are important pieces of documentation required pre and post procedure. The purpose of these documents are to ensure appropriate patient care and also ensuring adherence to appropriate use criteria. This project was done to improve the pre and post cath documentation for the outpatients.

**Methods**

Prior to the project a Fishbone diagram was done looking at the major reasons there may be missed Fellow documentation in the cath holding department. Then surveys were developed from these ideas and given to each nurse in the department. The preproject survey revealed delays and absence in documentation that could benefit from a QI project. Next, a pre and post cath checklist was developed covering each of the required portions. There was a nurse and fellow box to be checked for each piece. These checklists were used for a total of 2 months. Finally, a follow up survey was collected.

**Results**

The initial survey revealed some areas where improvement could be made. Upon initiation of the project compliance was a significant issue. After the first 3 weeks, all of the nurses and fellows were retrained on the protocol. After this was done there was an improvement in utilization of the checklists. The utilization was not 100%, however, when it was used there was a significant improvement in the pre and post cath

documentation. The post project survey was also completed showing overall improvement with the checklists.

**Conclusion**

Medical documentation is an important aspect of patient care. As has been seen in other areas of healthcare and industry, a checklist has the potential to greatly improve compliance, especially in areas where specific components are required. In this setting the pre and post cath checklists act as both a reminder to complete the documentation and also a way to easily verify their completion. Overall, the project was successful at improving pre and post cath documentation.

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## Abstract

**Title**

Streamlining Cath Holding Discharge

**Objective**

Cath holding frequently has patients staying overnight following their procedure requiring discharge the following day. It is often unclear as to which patients need to be discharged due to all charts looking the same. The purpose of this project was to implement a protocol and method of identifying the patients on the MU Cardiology service requiring discharge. The ultimate goal was to improve timeliness of patient discharge in order to reduce hospital time and improve room availability for incoming patients.

**Methods**

The first phase of the project was determining if there was an underlying error that was slowing discharge. A survey was given to the nurses in cath holding prior to undergoing the project. Next, a Fishbone diagram was done looking at the potential key issues delaying discharge. Then, a protocol was put into trial requiring the Interventional Cardiology Fellow to check the Cath Holding desk every morning for a list of patients awaiting discharge. The fellow would review this and check each one off after completion. Finally, a follow up survey was done.

**Results**

The initial review of the discharge process revealed a lack in timeliness of patient discharge, often resulting in a significant delay. The utilization of the patient list was initially very poor. After revisiting the protocol with the Fellows, the frequency the list was used improved. However, the variable having the most effect

on discharge was the time of arrival and case load in the mornings and the list had little effect on patient discharge. It is possible the discussions on discharge and a new emphasis on timeliness indirectly resulted in an improvement in the overall process.

**Conclusion**

Cath holding frequently has patients staying overnight following their procedure requiring discharge the following day. The implementation of a patient list for the Fellows to follow did not have a direct impact on the timeliness of discharge. Instead, the morning arrival time and case load had the most effect. The process showed overall improvement, which was likely secondary to a new emphasis and discussions on timeliness of patient discharge.

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## Abstract

**Title**

Evaluation of Adherence to Screening Colonoscopy Guidelines and Its Effect on Overall Mortality after Curative Resection in Patients with Stage II and Stage III Colorectal Cancer: A Single Institutional Retrospective Review and Quality Improvement Project

**Objective**

Colorectal cancer is the third most common cause of cancer in the United States and the second most common cause of deaths related to cancer. Early stage colorectal cancer can be cured by resection but are at high risk for recurrence. Unfortunately, 30-50% of colorectal cancer survivals will relapse and many of those will die because of it. Data is also showing that adherence to follow-up is suboptimal. Follow-up and surveillance programs after curative resection have the purpose of early detection and to improve survival. Guidelines for surveillance per NCCN are directed at stage II and III colorectal cancer and recommend colonoscopy within 1 year of diagnosis. In this retrospective single institutional study, we



wanted to review our adherence to guidelines for those patients with stage II and III colorectal cancer for quality purposes and to assess its potential impact on mortality.

### **Methods**

Data was obtained via retrospective chart review on ninety-one patients treated in our institution with stage II and III colorectal cancer from 2011-2016. Chart review allowed us to determine if they had a follow-up screening colonoscopy within 1 year of diagnosis (+/- 3 months.)

### **Results**

Among the 91 patients in our study, only 66% (n=60) of patients had colonoscopy within 1 year of surgery compared to 34% (n=31) who did not. Additionally, we compared all-cause mortality between the two groups of patients. Of 91 patients, we looked at those still alive at time of analysis. Of these patients, 76% versus 84% were still alive at time of analysis in regards to those who had proper follow-up colonoscopy versus those who did not, respectively.

### **Conclusion**

This study shows that we have much room for improvement regarding adherence to colorectal cancer guidelines. This is consistent with national data showing lack of compliance with follow-up and we hope that awareness of the issue may ignite conversations between our multi-disciplinary team to identify patient barriers. The variability of compliance in our institution is likely secondary to a multitude of factors and we have currently initiated discussions between the multi-disciplinary teams in order to improve the coordination and quality of patient care.

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## Abstract

**Title**

Inappropriate Testing for Clostridium difficile Infection in Hospitalized Patients: Update

**Objective**

Clostridium Difficile (C-Diff) infection is a known cause of mortality and morbidity in hospitals, adding nearly 4.8 billion dollars a year to the health care burden. Testing for this organism is governed by guidelines highlighted in the Infectious Diseases Society of America (IDSA). Only patients with clinically significant diarrhea benefit from testing as a positive test can represent colonization or active disease. Our objective is to minimize unnecessary testing for C-Diff by providing health care clinicians with the latest evidence based guidelines in managing patients' diarrhea. We also aim to outline the financial benefits that result from minimizing inappropriate testing.

**Methods**

Prospective study performed at a university tertiary medical center. A clinically significant diarrhea was defined by the IDSA guideline for C-diff testing "as passage of 3 or more unformed stools in 24 or fewer consecutive hours". Unless this was clearly documented in the patient's file, a bedside patient interview was held for verification. Complete profile review was performed for all patients who were hospitalized for greater than or equal to seven days and tested for C-diff. Our aim was to detect any potential medications or interventions that could lead to developing diarrhea; Including antibiotics and proton pump inhibitor (PPI) use within 7 days prior to development of diarrhea, a bowel regimen for constipation or tube feeding within 48 hours of onset of diarrhea

**Results**

Results from data collected over one month period. A total of 53 C-Diff DNA amplified tests were performed, of those 53 cases, only 16 cases (30%) met the guidelines for collection while 37 cases (70%) did not meet these guidelines. Of the 16 cases that met the guidelines, only 5 (31%) cases came back positive for C-Diff, which is equal to 9.4% of the total sample. Of the 37 cases that didn't meet the guidelines, 13 cases didn't undergo any testing as patients were unable to provide a stool sample, the other 24 cases were tested for C-diff and all were found to be negative. The financial burden of the negative tests that did not meet the guidelines was around \$7534 (\$314 per test). Projected over one year, the price would be \$90408. Taking into account, that this number doesn't include the cost of sample containers, transport, testing kits, prophylactic antibiotics, and isolation rooms/equipment's. The data also showed 50% of the patients tested were on laxatives.

**Conclusion**

Testing for C-Diff infection in patients with no clinically significant diarrhea has an extremely low yield. Additionally, testing those patients has a significant negative financial impact, as well as a negative psychological impact that results from being placed in isolation rooms. In addition, there is risk of side effects with the unnecessary use of prophylactic antibiotics.

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## Abstract

**Title**

The Effect of Obesity on Hospital Admission Rate and Co-morbidities

**Objective**

To determine the rate of hospital admission and the effect on co-morbidities in patients with documented obesity

**Methods**

The data will be collected through the EMR/HER system. First, we will determine whether the patient is obese per the primary care physician's clinical note. Then, the rate of hospital admission and the presence of co-morbidities for those patients will be analyzed.

**Results**

Obesity is a carefully packaged condition accompanied by diabetes mellitus, arthritis, hypertension, high cholesterol levels, and obesity-related cancers. Approximately 15.0% of West Virginia adults have diabetes, about 42.7% have high blood pressure, and 39.0% have high cholesterol. Many of these patients are regularly admitted to the hospital for management of multi-morbid chronic conditions. We expect to see a significantly higher rate of hospital admission for patients with obesity compared to that of non-obese individuals.

**Conclusion**

The state of West Virginia has the highest adult obesity rate in the country which is currently at 37.7

percent (71.1 percent including overweight adult patients) and steadily increased over the last two decades. Obesity is not only a critical health concern itself, but it is also accompanied by many associated co-morbidities such as cardiovascular diseases, cerebrovascular diseases, respiratory conditions, diabetes mellitus, and arthritis. In West Virginia, it is one of the biggest drivers of preventable chronic diseases and healthcare costs which is estimated at \$2.4 billion in 2018. After the analysis on the hospital admission rate and the effects of obesity on its co-morbidities, we hope to implement exercise and dietary programs as well as a multi-morbid chronic disease management protocol to reduce the prevalence of obesity and to participate in the state-wide movement towards reducing the healthcare costs spent on preventable chronic diseases.

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## Abstract

**Title**

Promoting Higher Quality of Care Through Education of Pediatric Residents on the Medical Home Model

**Objective**

Over the last several decades, the American Academy of Pediatrics has been developing and endorsing the Patient and Family Centered Medical Home (PFCMH) model for pediatric outpatient practices. A curriculum based around the PFCMH model was developed after the Resident Education Initiative Work Group (REIWG) assessed the needs of pediatric residency training programs for education on the PFCMH model. The Accreditation Council for the Graduate Medical Education (ACGME) program requirements also focus on the need for expertise in the principles of the medical home. Modules on the PFCMH were developed and are available to residency programs as a tool for educating pediatric residents. These educational modules were presented to pediatric residents with the aim of improving residents' understanding of the PFCMH model.

**Methods**

Module based presentations were created and presented during pediatric resident block lectures. The format of the presentations was learning objectives, pre-test, overview, case study, summary, post-test, reflections to consider, references, and resources. The pre-tests and posts-tests were administered according to this format. The pre- and post-tests were then scored and compared using Chi-square



Fisher's exact test analysis

### **Results**

The average pre- and post-test percent correct were: Module 1 – 84% and 96%; Module 2 – 73% and 82%; Module 3 – 54% and 71%; Module 4 – 39% and 64%; Module 5 – 83% and 93%, respectively. The difference between pre- and post-test percent correct for modules 1, 2, 3 and 5 were not statistically significant. There was a statistically significant difference in the pre- and post-test percent correct for module 4 ( $P = 0.0136$ ). Although not all modules had statistically significant differences in pre- and post-test scores, there was visible improvement in the post-test percent correct of all five modules.

### **Conclusion**

Incorporating presentations of the modules into the pediatric resident curriculum is an effective way to improve resident knowledge of the principles and implementation techniques of the PFCMH model. This quality improvement project can be further developed by standardizing the module presentations as well as verifying that all test content is being adequately covered by the presentations.

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## Abstract

**Title**

Quality Improvement of Patient Handoffs in Pediatric Inpatient Service

**Objective**

The objectives of the current study are to (1) assess the continued quality of handoffs after the implementation of I-PASS and automated CORES PDSA's and; (2) assess handoff quality and adherence

to the I-PASS model after resident re-education has occurred.

### **Methods**

This is a continuing quality improvement project assessing the quality of handoffs after the initiation of I-PASS in 2015 and initiation of an automated CORES list which guides the handoff process through the I-PASS components. New baseline data was collected to assess if the initial interventions' quality were continuous, then a third intervention consisting of the re-educating the residents on the I-PASS components and automated CORES list was implemented. Data was collected after it was in place for 6 months.

### **Results**

Inclusion of six key elements of handoffs changed as follows from the full implementation of the I-PASS system to post-initiation of CORES list: Illness severity 97.2% to 13.1%; Diagnosis 100% to 62.2%; Patient summary 100% to 51.7%; Action list 100% to 86.8%; Situational Awareness 100% to 42.1 %; Synthesis by receiver 97.2% to 24.5%. Following re-education of the residents of I-PASS elements, inclusion changed as follows: Illness severity 13.1% to 13%; Diagnosis 62.2% to 83.7%; Patient summary 51.7% to 81.5%; Action list 86.8% to 93.4%; Situational awareness 42.1% to 91.3%; Synthesis by receiver 24.5% to 36.9%.

### **Conclusion**

Inclusion of I-PASS elements and quality of handoffs improved following full implementation of I-PASS but declined between full implementation and CORES implementation. Handoffs improved following re-education but elements of Illness severity, Action list, and Synthesis by receiver were essentially unchanged. Resident education at all levels of training is required to ensure quality handoff. Anticipated interventions include printing cards listing appropriate handoff elements, resident education regarding CORES functionality and resident responsibility in updating patient list, yearly handoff lectures during resident orientation, and surveying residents on satisfaction with automated patient list and I-PASS handoffs.

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## Abstract

**Title**

Mother baby dyad: Transitioning the model of care

**Objective**

Traditionally, our facility has both a Labor & Delivery unit and a separate Mother Baby unit. As we seek to optimize outcomes of our mothers and babies as well as their satisfaction with their birthing experience we have begun to evaluate our practices in caring for the mother-baby dyad. Keeping the mother and baby together in the immediate postpartum period, "the golden hour," has demonstrated proven benefits including more stable blood glucose levels, better temperature regulation, longer breastfeeding durations and increased maternal attachment and is recommended by multiple agencies including the World Health Organization. Extending the initial bonding period further, into the hours after delivery, and delaying routine procedures extends those same benefits.

We have promoted family-centered care in our birth experience but with separate Labor & Delivery and Postpartum Units our practice has traditionally been to separate the mom and baby after the first hour for routine baby care. Our goal is to extend our mother/baby skin to skin time to allow our babies the above mentioned benefits with a "Nursery Stork Nurse" assigned to Labor & Delivery to bypass the traditional nursery.

**Methods**

Our practice change began with site visits to comparable facilities and speaking with subject experts. We developed a shared unit committee to provide the opportunity for ongoing discussion of the process and

any barriers encountered. Patient rounding and comments were used to gauge the patient response.

**Results**

This has resulted in extending skin to skin time, performing newborn assessments at the mother's bedside, and delaying the first bath to allow family involvement.

**Conclusion**

With the implementation we hope as we evaluate the process to see a reflection of the benefits in decreased admissions/transfers to NICU, increased breastfeeding rates and a continued satisfaction of patients with their birthing experience.

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## Abstract

**Title**

Outcomes after Open Reduction with Internal Fixation of Mandible Fractures

**Objective**

Mandible fractures contribute substantially to morbidity after blunt trauma. Controversy exists surrounding the appropriate timing of surgical intervention and benefit from routine post-reduction imaging.

**Methods**

We retrospectively reviewed 146 patients who sustained traumatic mandible fractures at a level 2 trauma center over a 5-year period, between January 2012 and December 2016. We excluded all patients who did not undergo surgery, underwent operative closed reduction only, sustained other significant maxillofacial injuries, penetrating mechanisms, and other major injuries based on injury severity scores(ISS) over 15. There were 51 patients meeting inclusion criteria. We reviewed admission face computed tomography(CT) scans and Panorex x-rays. Patients were divided into early (<72h) and late (>72h) ORIF groups. We reviewed demographics, mechanism of injury (MOI), post-reduction imaging, and ISS. All statistical analyses were performed using Stata® 15.

**Results**

There were 39 males (76%) and 12 females (24%) in our study, with a mean age of 32 years. 28 patients (55%) underwent early ORIF and 23 patients (45%) underwent late ORIF, with no mortalities. There was no statistically significant difference in ISS between the 2 groups ( $p=0.081$ ). Pre-operative face CT scans were performed in 49 patients (96%) and Panorex in 2 patients (4%). 8 patients (16%) had both modalities,

with CT face identifying fractures in 5 patients not seen on Panorex, resulting in a change in operative approach. Post-reduction imaging was obtained in 33 patients (65%), of which 26 were Panorex X-rays. These demonstrated adequate reduction in 31 patients (94%) and did not change management in any instance. Complications occurred in 19 patients (37%), of which there were 11 with uncontrolled pain after 1 week, 6 abscesses, 5 nonunions/malunions, 2 hardware extrusions, and one incisional dehiscence. A positive urine drug screen (UDS) predicted uncontrolled pain ( $p < 0.05$ ). There was no statistically significant difference in complications between the two groups.

### **Conclusion**

Our data suggests that CT scans of the face are superior to panoramic radiographs in traumatic mandible fracture evaluation, with no apparent benefit from routine post-reduction imaging in detecting complications. ORIF remains an effective treatment with favorable outcomes, and operative delays >72 hours do not appear to increase complication rates.

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## Abstract

**Title**

Outcomes after Rib Fractures in Geriatric Blunt Trauma Patients

**Objective**

Blunt trauma in the geriatric population is fraught with poor outcomes, with rib fractures contributing substantially to morbidity and mortality. Our aim was to evaluate blunt trauma patients  $\geq 65$  years with rib fractures over a 6-year period, to determine the impact on mortality, hospital and ICU stay, need for mechanical ventilation (MV), and overall outcomes.

**Methods**

We retrospectively reviewed 255 patients  $\geq 65$  years old at a level 2 trauma center between January 2010 and December 2015, who sustained blunt trauma resulting in rib fractures. We collected admission vital signs, base deficit, Glasgow Coma Scale (GCS) score, Revised Trauma Score (RTS), Injury Severity Score (ISS), number and location of ribs fractured, and presence of a hemothorax or pneumothorax. Outcomes measured include mortality, hospital length of stay (LOS), intensive care unit (ICU) admission, ICU LOS, need for MV, and MV days.

**Results**

There were 24 deaths (9.4%), of which 7 were early ( $<24$ h). There were 130 patients (51%) admitted to ICU, and 49 (19.2%) of these required MV. The mean ICU and MV days were 5.9 and 6.3 days respectively. ICU admission was predicted by a base deficit  $<-2.0$ ,  $ISS > 15$ , bilateral rib fractures, a pneumothorax or hemothorax on chest x-ray (All  $p < 0.001$ ), as well as hypotension,  $GCS < 15$ , and 1st rib fractures (All  $p < 0.05$ ). Mortality was predicted by a base deficit  $<-5.0$ , a GCS score of 3 (Both  $p < 0.001$ ), as well as hypotension,  $ISS \geq 25$ ,  $RTS < 7.0$ , bilateral pneumothoraces, 1st rib fractures, and  $>5$  rib fractures (All  $p < 0.05$ ). Age did not independently predict survival, but increasing age was associated with a longer LOS ( $p < 0.001$ ). Higher ISS predicted a longer LOS in survivors ( $p < 0.001$ ). Men had significantly more rib fractures than women ( $p = 0.003$ ), and survivors had fewer rib fractures than those who died ( $p = 0.004$ ).

**Conclusion**

Rib fractures in elderly blunt trauma patients are associated with significant mortality and morbidity, but



outcomes can be predicted to allow for early and aggressive intervention and disposition, especially in facilities that do not have adequate ICU and MV capabilities.

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## Abstract

**Title**

The Impact of Obesity on Outcomes in Geriatric Blunt Trauma

**Objective**

Blunt trauma is poorly tolerated in the elderly, and the degree to which obesity, which is a known risk factor for sub-optimal outcomes in trauma, affects this population, remains to be determined.

**Methods**

The incidence, prevalence and mortality rates of blunt trauma by demographics, year, and geography were found using datasets from both the Global Burden of Disease (GBD) group, and a local level II trauma registry. GBD data was extracted from 284 country-year and 976 subnational-year combinations from 27 countries from 1990 to 2015. Our local trauma registry dataset was interrogated for patients  $\geq 65$ yo admitted with blunt trauma between 2014 and 2016.

**Results**

The incidence of elderly blunt trauma from falls increased from 1990 to 2015 by 78.3%, 54.7% and 42.7%, with a mortality rate of 5.7%, 102.6% and 89.3% at a global, national and state level, respectively. Our local cohort consisting of 320 obese and 926 non-obese patients had a statistically similar mortality rate of 4.8% and 4.4% respectively ( $p=0.903$ ). The hospital length-of-stay (LOS), Glasgow Coma Scale (GCS) score and systolic blood pressure on presentation were similar [4.13 vs. 4.03 days, 14.61 vs. 14.46, and 146 vs. 146 mmHg for obese vs non-obese patients respectively ( $p>0.05$ )]. There were also no differences in Injury severity scores (ISS) when subdivided based on severity. Major medical comorbidities were identified in 280 (87.5%) and 783 (84.6%) patients in the obese and non-obese groups, respectively.

**Conclusion**

Blunt trauma secondary to falls has increased in elderly patients, with no difference in mortality when comparing obese and non-obese blunt trauma patients in our study, possibly due to similar comorbidity rates.

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## Abstract

**Title**

Laparoscopic Vertical Sleeve Gastrectomy: A 5-year Veterans Affairs Review

**Objective**

Laparoscopic sleeve gastrectomy(LSG) has recently gained popularity as a definitive bariatric surgery procedure. Data is lacking on long-term outcomes, particularly in a Veterans Affairs(VA) population. Our aim was to evaluate outcomes after LSG in this unique population.

**Methods**

We retrospectively reviewed 223 patients undergoing LSG between January 2009 and June 2014 for morbid obesity. All met NIH criteria. Data on length-of-stay(LOS), complications, interval weight loss up to 5 years postoperatively, comorbidities, and number of therapies preoperatively and at long-term follow-up(LTFU) were collected. The data were analyzed using simple descriptive statistics, the Student's t-test, and ANOVA.

**Results**

There were 164 males and 59 females(74% vs. 26%) with an average age of 53 years who underwent LSG. The mean weight and body mass index(BMI) were 139.4 kg and 45.4kg/m<sup>2</sup>, respectively. The average American Society of Anesthesiologists(ASA) score was 2.6. The mean percent excess weight loss at 1 year was 62.9% and at 5 years was 47.0%. Weight loss continued until 12-18 months, when there was a nadir in weight loss ( $P<0.001$ ). There were 4 deaths and 4 staple-line leaks. 3 deaths were related to late cardiac events. One early death occurred in a very high-risk patient. All staple-line leaks were managed non-operatively. Of the 223 patients, 193 had hypertension, 137 diabetes, 158 hyperlipidemia, 119 obstructive sleep apnea(OSA) and 125 gastroesophageal reflux disease. Preoperatively, patients were on a mean of 1.9 anti-hypertensive medications, 0.9 hyperlipidemic agents, 0.9 anti-reflux agents and 0.9 oral hypoglycemics. 50% of diabetics were on insulin and 68% with OSA used CPAP/BiPAP. We found significant absolute reductions in mean anti-hypertensive medications(-0.8), anti-hyperlipidemic agents(-0.4), anti-reflux agents(-0.4), oral hypoglycemics(-0.6), insulin use(-25%), and use of CPAP/BiPAP(-55%)(All  $P<0.001$ ).

**Conclusion**

Laparoscopic sleeve gastrectomy is a safe and effective bariatric surgery procedure, resulting in significant early weight loss up to 18 months and long-term improvement in all major obesity-related comorbid conditions.

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## Abstract

**Title**

Comparison of Geriatric Trauma Outcomes When Admitted to a Medical or Surgical Service After a Fall

**Objective**

Blunt trauma in the geriatric population is fraught with poor outcomes, with injury severity and comorbidities impacting morbidity and mortality. The aim of our study was to determine patient outcomes related to mortality, length-of-stay, and discharge disposition when admitted to a surgical service compared to a medical service.

**Methods**

We retrospectively reviewed 2172 patients  $\geq 65$  years old who fell, requiring hospital admission between 01/2012 and 12/2016. There were 403 patients in the surgical arm(SA) and 1,769 patients in the medical arm(MA). Ground-level falls were the only mechanism of injury(MOI) included. We excluded all ICU admissions and deaths within 24 hours.

**Results**

There were 5 deaths(1.24%) in the SA and 16 deaths(0.90%) in the MA( $p=0.57$ ). The mean TRISS survival probability prediction in the SA was 96.9% versus 97.1% in the MA. MA patients had more comorbidities overall than SA patients. There was no difference in mortality between the SA and MA groups in multiple logistic regression models that accounted for TRISS and comorbidities. Unadjusted hospital LOS was 1 day shorter(median; 95% CI -1.4 to -0.6) in the SA and 0.5 days shorter(median; 95% CI -0.8 to -0.1) when adjusted for TRISS and comorbidities using multiple quantile regression. Finally,

patients in the SA were 2.1 (95% CI 1.7 to 2.6) times more likely to be discharged home compared to patients in the MA and this remained significant (OR 1.9; 95% CI 1.5 to 2.5) with simultaneous adjustment for TRISS and comorbidities using multiple logistic regression.

### **Conclusion**

Geriatric blunt trauma patients admitted to surgical services after mechanical falls have no difference in survival, a shorter median LOS, and increased likelihood of discharge home compared to patients admitted to medical services.

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## Abstract

**Title**

Postpartum Depression: Improving Rates of Recognition and Referral by Incorporating Maternal Screening into Well-Child Care

**Objective**

Postpartum depression is currently recognized as the most underdiagnosed obstetric complication in the United States. Mothers are often discharged home from the hospital with no contact from their obstetrician until their 6-week postpartum visit. At the start of this initiative, approximately half of those mothers were reported to miss this crucial appointment. They were, however, in contact with their infant's pediatrician several times throughout the first 6 months of life, during which time mothers are at utmost risk for developing postpartum depression. By incorporating maternal screening for postpartum depression into well-child care, we hope to achieve early recognition and thereby intervention for those mothers affected.

**Methods**

In December 2017, a multi-disciplinary meeting was held in the Marshall Health pediatric department. Among the attendees were pediatricians, obstetricians, nurses, social workers, and administrative staff. It was decided at this time to incorporate the Edinburgh Postpartum Depression Screen into well-child checks performed at 1-, 2-, 4-, and 6 months. This screening tool is a 10-question screen to be completed by the mother and scored by the nurse. The results were then verified by the ordering pediatrician, and positive screens were referred to their obstetrician's office with the help of our social worker. The OB/GYN department at Marshall Health agreed to see mothers the same day, or at their convenience. Screening was initiated in February 2018 among Marshall Health pediatricians at the main medical center. A goal

was set with hopes to screen at least 80% of mothers at these visits.

### **Results**

The screening process was initiated in February 2018, with data being collected so far over a period of 6 weeks. A total of 189 visits were eligible for screening during this time, with 127 mothers actually being screened. Of those screened, 20 were found to be positive, and therefore at higher risk for PPD. These mothers were directed to our social worker, who referred them to their OB if a clear and present risk was identified. Our goal was met on week 3 (80%), which is significantly better than week 1 (46%). Overall, however, our goal has not yet been reached.

### **Conclusion**

As pediatricians, we have the ability to play an integral role in the detection and prevention of complications related to postpartum depression. These complications affect not only the mother, but also the infant. By taking advantage of the longitudinal relationship that exists between mothers and pediatricians, we can recognize postpartum depression and promptly refer these mothers for appropriate therapy.



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## Abstract

**Title**

Using Resident and Faculty Focus Groups to Obtain Stakeholder Input During the ACGME Self-Study Process

**Objective**

The Accreditation Council for Graduate Medical Education (ACGME) clearly describes eight steps to provide guidance to programs who are organizing their first self-study. The process relies heavily on obtaining stakeholder input and then circling back to stakeholders to validate findings. Focus group methodology has been noted to have several benefits including encouraging participation from those who may be reluctant to provide input by other methods or feel they have nothing to contribute (BMJ, 1995). Our objective was to obtain a clear picture of stakeholder values, priorities, and opinions as they relate to program aims, opportunities, and threats.

**Methods**

A series of focus groups was conducted with residents and core faculty members. The first session for each group consisted of a series of questions designed to elicit responses regarding program aims, opportunities, and threats. Prior to the second session each group was provided copies of ten years of annual program evaluations as well as aggregated data in a summarized form. The goal of the second session was to evaluate perceived program progress over the past ten years and to identify ongoing needed areas for improvement. Responses during the focus groups were recorded in writing and inductive content analysis methods were used to identify major themes. Additional focus groups were conducted six months into the self-study process. These groups focused on gaining input regarding the progress of the eight improvement teams.

**Results**

Eight program aims as well as activities to advance the aims were identified. Opportunities and threats were pinpointed and discussed. Areas for improvement were selected and presented back to stakeholders who confirmed their appropriateness. Outcome measures are being followed for all aims. For the first aim, resident attendance at neonatal resuscitations increased from 29% to 76% (p value<0.001 Chi Square). For our fourth aim, there was improved confidence in providing anticipatory guidance (p value= 0.003; paired T test). For our fifth aim, a survey showed increased perceived preparedness of interns becoming seniors after intervention (p value 0.2231; Chi square).

**Conclusion**

Focus groups are an effective way to initiate the self-study process, examine the programs aims, opportunities and threats, and formulate a detailed improvement plan. They are also useful as part of continual evaluation during a dynamic change process.

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## Abstract

**Title**

Improving Resident Education by Increasing Exposure to Various Clinic Attendings

**Objective**

Each physician has their own way of practicing medicine, which directly reflects their training or lack thereof in certain areas. Medicine and the demands of a primary care physician are constantly changing. This has never been more evident than with the burgeoning field of mental and behavioral health in pediatrics. This has created gaps in resident education, as medical training has changed across generations. Our objective was to broaden resident education in the outpatient pediatrics clinic by creating a yearly rotating continuity clinic schedule, thereby increasing time spent with various clinic attendings from diverse backgrounds.

**Methods**

In April 2017, a self-study focus group was held among pediatric residents. In this forum, it was discussed

that certain continuity clinic days were associated better training in mental/ behavioral health issues. In order to provide residents with equal educational opportunities, it was proposed that the continuity clinic schedule change yearly. This plan was implemented in July 2017. To assess satisfaction among residents, a survey was sent to them in November 2017.

### **Results**

Eleven residents were surveyed. All were upper-level (PGY-II, III, or IV) residents that had experienced clinic changes. The survey inquired if residents felt that the schedule change had improved their outpatient experience. Six residents responded "Definitely" (54.55%), and five "Somewhat" (45.45%). Zero residents replied that it was "Not at all" helpful (0%). When asked if the schedule changes should be continued for 2018-2019, nine residents replied "Yes" (81.82%), zero replied "No" (0%), and two replied "Not sure" (18.18%).

### **Conclusion**

By changing our continuity clinic schedule, residents have been given the opportunity to work with various clinic attendings, thereby improving and expanding their medical experience in outpatient pediatrics.

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## Abstract

**Title**

Improving Resident Transitions from Intern to Senior Resident

**Objective**

Our objective was to provide guidance to rising second year residents, helping them improve their confidence and better understand their role as a senior resident.

**Methods**

In June 2017, a pediatric floor attending, neonatologist, and selected senior resident met to discuss the goals and expectations that they had of rising senior residents. These expectations were passed on by the senior resident during a meeting with rising second year residents. A Q&A session was also held at this time. In November 2017, the current second year residents were surveyed, assessing their level of preparedness before and after the discussion. As a comparison, the current PGY-III's were also surveyed to assess their level of preparedness prior to becoming a senior resident.

**Results**

Three PGY-III's were surveyed. When asked how well-prepared they felt prior to becoming a senior resident, one PGY-III responded "Not prepared at all" (33.33%), and two responded "Somewhat prepared" (66.67%). They were also asked whether a meeting with a senior resident would have been helpful, and all those surveyed responded "Yes" (100%). Four current PGY-II's that attended the discussion were surveyed. When asked how well-prepared they felt to become a senior resident prior to the meeting, two residents responded "Not prepared at all" (50%), one responded "Somewhat prepared" (25%), and one resident felt "Well-prepared" (25%). After the meeting, three of these residents felt "Well-prepared" (75%) to become a senior resident, and one resident felt "Somewhat prepared" (25%). All four of the PGY-II's felt that the discussion was helpful (100%).

**Conclusion**

By providing guidance and setting expectations early for rising senior residents, this can improve their confidence and feeling of preparedness as they enter their second and third years of residency.

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## Abstract

**Title**

Decreasing Central Line Associated Blood Stream Infections in a Level 2 Trauma Center

**Objective**

Central line associated blood stream infections (CLABSI) are an important cause of morbidity and mortality in ICU patients. We instituted a protocol to decrease both the number of days central venous catheters are

in place and CLABSI in our trauma ICU.

### **Methods**

We conducted a prospective trial to decrease the CLABSI rate and central line days in patients admitted to a trauma ICU at a level 2 trauma center. We examined our CLABSI rate for one year before (2015-2016) and after (2016-2017) instituting a central line educational program for surgery residents and ICU nursing staff. We reviewed patient demographics including age, ICU length of stay, hospital length of stay, and ventilator days. We compared pre- and post-intervention outcomes in days central lines were present and CLABSI.

### **Results**

We examined 108 patients with 1122 central line days. 58 central lines were in the pre-intervention group and 50 were in the post-intervention group. There was no statistically significant difference in patient age (46y v 46y,  $p>0.05$ ), ICU length of stay (10d v 8.0d,  $p>0.05$ ) and ventilator days (7.7d v 5.7d,  $p>0.05$ ). There was also no statistically significant difference in location of central line placement ( $p>0.05$ ). There were no associated CLABSI in either group. Hospital length of stay was significantly decreased in our post-intervention group (16.9 v 12.7,  $p<0.05$ ). There was a statistically significant reduction in number of central line days (11.8d pre-intervention v 8.8d post-intervention,  $p<0.05$ ).

### **Conclusion**

In our level 2 trauma center, instituting an educational program for ICU nursing staff and residents significantly decreased the average number of days a patient had a central line in place. Due to the size of our cohort, there were no CLABSI in either group. By decreasing the central line days, the likelihood of CLABSI should decrease.



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## Abstract

**Title**

Surviving Surgical Sepsis: Utility of SIRS Alerts on the General Surgery Floor

**Objective**

To facilitate early diagnosis of sepsis, a systemic inflammatory response syndrome (SIRS) alert system was implemented at our institution. However, postoperative patients will exhibit SIRS symptoms due to the

stress of surgery. The over-diagnosis of sepsis can worsen outcomes through increased interventions and over-prescription of antibiotics. The aim of this study was to examine the predictive value of SIRS alerts in diagnosing sepsis in surgical floor patients.

### **Methods**

We conducted a retrospective chart review of 61 patients admitted to the surgical floor with 88 SIRS alerts from 2016 to 2017 at a university hospital. We excluded pediatric patients and those admitted to an intensive care unit(ICU). We evaluated patient demographics, admission diagnoses, specific triggers of SIRS alerts, and temporal association of alerts with surgical procedures. Outcomes measured included mortality, ICU admission within 48h of alert and diagnosis of sepsis.

### **Results**

We reviewed 88 sepsis alerts in 61 patients. Thirty-six percent of alerts occurred within 48h of a procedure and were considered false positives. Thirty-two percent of patients on whom alerts were triggered had a known infection at admission. Of the patients who met SIRS criteria, 47% were already on antibiotic therapy, most commonly Piperacillin/Tazobactam. Overall, the most common criterion in the SIRS alert was tachycardia(94%), followed by leukocytosis (85%), hyperglycemia (38%), and tachypnea (35%). There were 5.7% of patients diagnosed with sepsis, with no statistically significant association between SIRS alerts and the diagnosis of sepsis ( $p>0.05$ ). Leukocytosis (80%) and tachycardia (80%) were also the factors most predictive of sepsis, however this was not statistically significant ( $p>0.05$ ). Only 3.4% of our cohort required ICU admission within 48h of an alert. The overall mortality in our cohort was 5.7%.

### **Conclusion**

In our cohort, SIRS alerts were not predictive of sepsis in surgical floor patients. Further investigation is needed to determine an accurate method of early detection of sepsis in these patients. In the future, we intend to examine whether utilizing a new sepsis order bundle improves morbidity and mortality in general surgery floor patients.

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## Abstract

**Title**

Improving Recognition and Response to Severe Range Blood Pressure in a Pregnant Patient

**Objective**

Hypertensive disorders affect up to 10% of all pregnancies and pre-eclampsia is the leading cause of maternal morbidity and mortality. A significant portion of morbidity is attributed to “near misses.” The goal of our study is to improve recognition and response to severe hypertension and to improve its management.

**Methods**

Pretest surveys were handed out to staff on labor and delivery, antepartum, and the mother baby units. Educational information is currently being provided to these units. The information provided includes proper blood pressure cuff selection and patient positioning, a review of hypertension classification, and a review of treatment protocols. A post educational survey is immediately given. Results will be compared.

**Results**

Pre-educational surveys indicate not all staff are comfortable recognizing or treating severe range blood pressure.

**Conclusion**

With rising rates of hypertension and pre-eclampsia, it is increasingly important to improve recognition and response to these disorders to improve patient care and outcomes.

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## Abstract

**Title**

Improving Resident Confidence in Providing Anticipatory Guidance in Resident Clinic

**Objective**

Our aim was to improve resident confidence in providing anticipatory guidance in resident clinic.

**Methods**

Our team met to discuss our aim and key drivers. We conducted several PDSA (plan, do, study, act) cycles. Handbooks and textbooks were provided to residents. Counseling was given to attending physicians to ensure they were reviewing anticipatory guidance. The intern class was surveyed one month after changes were implemented and our team met to address ongoing areas needing improvement. Another survey was given to the intern class four months after changes were implemented. A survey was also given to the previous intern class to assess whether the changes that were implemented resulted in improvements for the 2017 intern class as compared to their peers the year before who did not have the benefit of the improvements.

**Results**

Eight intern residents and nine second year residents were surveyed. Improvement was seen in the goal of anticipatory guidance being reviewed for each visit. For the 2017 intern class: (response based on percent of visits anticipatory guidance reviewed) one resident 0-25%, three residents 25-50%, and three residents 50-75%. From the 2016 intern class seven residents 0-25% of the time and two residents 25-50% of the time. This difference was statistically significant ( $p < 0.0001$ ). Improvement was also noted in

the level of confidence providing anticipatory guidance after completing four months of residency. The 2017 intern class felt more confident in their ability to provide anticipatory guidance when compared to the 2016 intern class ( $p = 0.0023$ ). Data analysis was done using an unpaired t-test.

**Conclusion**

Our team's aim to improve resident confidence in providing anticipatory guidance was attained by providing residents with resources and counseling of attending physicians.

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## Abstract

**Title**

"Don't Forget the Resident" at Neonatal Resuscitations

**Objective**

The purpose of this quality improvement project was to increase the number of residents attending neonatal resuscitations. Aim 1: Determine what percentage of neonatal resuscitations were attended by resident physicians. Aim 2: Determine if attendance changed after simple interventions were instituted. Aim 3: Continue providing opportunities for more experience with resuscitations to increase attendance to 85%.

**Methods**

This continuing quality improvement project examined 35 months of data. Fourteen months of baseline data was analyzed for percent of resident attendance at neonatal resuscitations. Once established, 6 PDSA cycles: Signage, Self-Reporting, Schedule Change/Phone, Paging System, Unit Clerk, Nurse Reward were completed, with a seventh pending.

**Results**

The initial percent of attended resuscitations during working hours was 29%. After PDSA 1, it increased to 45% (p-value <0.001) using Chi-square analysis. A Chi-square subgroup analysis was done to verify the change in attendance from pre-intervention (27%) to PDSA 1 (46%) for the data from March through November, confirming the change as statistically significant (p-value <0.001). Although each PDSA cycle did not show statistically significant increase, the overall percentages did increase. When comparing pre-intervention to current resident attendance, there is a statistically significant increase (29% vs. 76%, p-value <0.001).

**Conclusion**

This project is an example of how a simple change can make a significant impact on opportunities for resident education. Due to other resident obligations such as lectures and continuity clinics, the attendance is not expected to reach 100%. In the future, we plan to conduct a survey of residents to determine if PDSA cycle 3 (schedule change and phone placement) helped to offer more opportunity and responsibility at night as well as more opportunity to assist and observe normal newborn deliveries. Our ultimate goal is

to achieve 85% attendance which includes the next PDSA for a new paging system which will allow direct communication with residents, leaving their response as the only hindrance to attending neonatal resuscitations.



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# **Abstract**

## **Title**

An Often-Missed Opportunity: Tobacco Use Screening and Cessation in the Hospitalized Patient

## **Objective**

The objective of this study was to improve measure quality to improve screening and educate veterans about possible options and strategies available for tobacco cessation.

## **Methods**

- The importance of obtaining tobacco use history and offering cessation strategies was aggressively reinforced during monthly onboarding presentations. Care coordinators for each team were instructed to cite deficiencies.
- Data used for this study was secondary data from VHA external peer review to maintain blinding of the data, and to prevent possible biases during data collection.
- VHA external peer review reports from 4 months prior, and 4 months after the intervention were collected and tabulated in SPSS.

## **Results**

- Pre-intervention screening for tobacco use was obtained for 80.5% patients on a average. In comparison, post-intervention screening was performed for 91% of patients.
- Pre-intervention treatment for tobacco use at admission was provided to 72.25% patients on a average, while post-intervention treatment was provided to 97.5% patients.
- Pre-intervention nicotine cessation strategies employed at discharge were provided to 66.0% patients. Post-intervention treatment was provided to 96.5% patients.

## **Conclusion**

Tobacco use screening and cessation counseling is an often overlooked aspect of our inpatient management strategy. Implementation of mechanics to provide aggressive education, reinforcement, and policy assurance can lead to a significant increase in tobacco cessation.

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## Abstract

**Title**

Conquering the Challenge of High Level Disinfection in Ultrasound

**Objective**

To find a safe and efficient method for disinfecting ultrasound probes. High level disinfection is one of the 2018 Patient safety goals.

**Methods**

Research different methods of disinfection and chose the one that meets all criteria.

**Results**

Found a safe approach to disinfecting probes that is FDA approved. Also that is recognized by TJC. Safe for patients and probes.

**Conclusion**

The trophon was the answer to our needs. Safe and efficient and no worries of chemical spills. An easy way to record and keep records of disinfection.

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# **Abstract**

## **Title**

Weight Measurements in the Intensive Care Unit

## **Objective**

To compare the reported weight of patients during their ICU stay upon arrival and 5 subsequent days. In order to ensure accurate weight measurements in our unit.

## **Methods**

We evaluated the weights recorded in the charts of 15 patients for 5 continuous days in the ICU. Patient had to be in ICU for at least 4 days prior to date of evaluation. Measurements are obtained mostly by performing bed weights, however scales and hoist lifts are available as well.

## **Results**

12/15 patient had no change in weight during the 5 day window examined. 2/15 had a weight that varied during this 5 day window and one patient had only 1 weight recorded during our time window.

## **Conclusion**

Our data shows that 80% of the patients studied had no change recorded in their weight. It is imperative to corroborate that these are accurate weights in the setting of critically ill patient that may require multiple medication regimens, evaluation of fluid resuscitation and possible cardiac dysfunction.

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## Abstract

**Title**

Preparing for the Worst: Creating and Distributing Emergency Bedside Cesarean Section Supplies at Cabell Huntington Hospital

**Objective**

Maternal cardiovascular and pulmonary events can lead to the emergent need for delivery to prevent

adverse fetal or maternal outcomes. Bedside cesarean sections are fortunately a rare occurrence, but can prevent poor fetal outcomes when time is limited. Having the necessary tools and staff readily available is crucial to deliver the fetus expediently. Below we discuss a recent case in which a bedside cesarean section was performed in the Intensive Care Unit with good maternal and fetal outcomes.

This patient is a 27 year old female at 29 weeks and 1 day gestation, pregnancy complicated by dichorionic diamnionic twins and intravenous drug use, who was transported from an outside hospital for septic shock and pending respiratory failure secondary to infective endocarditis and pulmonary septic emboli. The patient was admitted to the Intensive Care Unit and obstetrics was consulted. The patient vocalized the desire to have everything done to save her babies. The Maternal Fetal Medicine recommendation was to use continuous external fetal monitoring, give betamethasone for lung maturity, and have supplies ready for delivery. The patient had worsening respiratory distress on hospital day 2 and required intubation. Fetal bradycardia was noted in both fetuses and confirmed by ultrasound. Decision was made to proceed with an emergent bedside cesarean section. The patient tolerated the procedure well and both babies are currently doing well in the Neonatal Intensive Care Unit.

### **Methods**

We will assemble a bedside cesarean bundle to be placed in the Emergency Department, Intensive Care Units, and Labor and Delivery. The bundle will include a disposable scalpel and a disposable vaginal delivery tray that will contain a cord clamp and an infant blanket. It will contain sterile drapes, OR towels, chloraprep, betadine, surgical gowns, and sterile gloves. It will also include a checklist for the nursing staff with important phone numbers such as the NICU and anesthesia. The check list will include infant care steps that can be performed by the nurse until the NICU team arrives.

### **Results**

Data collection is ongoing.

### **Conclusion**

Due to foresight and preparation in the case of the patient discussed above, a good fetal and maternal outcome was achieved. If a cesarean tray had not been preemptively placed bedside, valuable time would have been wasted collecting supplies or transporting the patient from the Intensive Care Unit to the operating room. The goal of this project is to have supplies readily available in the event of an emergency to optimize maternal and fetal outcomes.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Change through Learning, and Education About Needle Exchange (CLEAN)

**Objective**

Injection Drug Use (IDU) is a Major threat to our population. In the United States the use of Heroin nearly doubled 2006 and 2013. Concomitantly the rate of IDU related endocarditis increased from 6-8 % in 2000-



2008 to 12% in 2013. More younger generation are being victims. Needle Exchange Programs (NEPs) are currently available valuable tool to help this population. We decided to target our vulnerable population, IDU patients, through increase awareness about these programs and provide guidance about the other available resources. Echocardiogram is the major point of contact, as cardiologists, to reach out to this population and provide the needed education. Hence, we started our CLEAN program, hoping for success and expansion of this program on both local and national level.

### **Methods**

Patients with IDU recorded who have transesophageal echocardiography will be approached. An educational resource regarding Infective Endocarditis, needle exchange programs, and local available resources will be distributed. Information will be provided in 5th- 6th grade language. A simple questionnaire will be given to the patients to assess usefulness and uptake of the information. Data from the survey will be collected and analyzed to assess significance.

### **Results**

Pending

### **Conclusion**

Pending

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

The Effect of Targeted Text Messaging on Smoking Cessation

**Objective**

The use and abuse of cigarettes is the main cause of preventable death in the US, significantly contributing to greater than 480,000 deaths per year<sup>1</sup> and remains the single greatest risk factor, other than advanced age, for coronary artery disease<sup>2</sup>.

Nowhere is this felt more than in West Virginia, with nearly 1 in 4 adults (24.8%) counted as active smokers, compared with the national average of approximately 15.5%<sup>3</sup>. This directly correlates to the higher incidence in WV when compared to the national average of death due to cardiovascular disease (321.2 vs. 270.4 per 100,000)<sup>4</sup>.

Every outpatient and inpatient visit is a valuable opportunity to intervene in this malignant disease process, though there are several barriers to cessation.

While the addictive nature of cigarettes is well known, this only account for part of the difficulty – another aspect is that physicians themselves may not assess smoking status at every visit, and may be uncomfortable using some of the cessation aids. This is particularly concerning, given that quitting smoking is undoubtedly “the single most important intervention in preventative cardiology”<sup>2</sup>.

The 2008 guidelines on smoking cessation outlined a 5-step process (the 5 A's: ask, advise, assess, assist, arrange) to aiding in cessation, and presented a meta-analysis of 83 studies that identified the nicotine patch + the nicotine gum or spray as having the highest estimated abstinence rate – higher than varenicline and bupropion<sup>5</sup>.

Given the relative comfort of most clinicians with nicotine replacement therapy, a combination of reminders to assess pt smoking as well as encouragement to prescribe nicotine replacement therapy may be the most effective strategy to decrease smoking rate – and therefore death due to cardiovascular disease – in the state of West Virginia.

1. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health

Promotion, Office on Smoking and Health, 2014 [accessed 2018 Feb 22].

2. Braunwald, Eugene, and Robert O. Bonow. Braunwald's heart disease. Elsevier Saunders, 2012.

3. [https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/adult\\_data/cig\\_smoking/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/index.htm)

4. 2012 West Virginia State Health Profile:

<http://www.dhhr.wv.gov/publichealthquality/statepublichealthassessment/Documents/2012%20State%20Health%20Profile%20Final%20May%202013.pdf>

5. Tobacco, The Clinical Practice Guideline Treating. "A clinical practice guideline for treating tobacco use and dependence: 2008 update: a US public health service report." American journal of preventive medicine 35.2 (2008): 158.

## **Methods**

OVisits to the Marshall Cardiology Fellows clinic were evaluated for evidence of assessment of tobacco use and methods of cessation for one month before and after the intervention. Allscripts visit notes were searched for smoking status in the HPI, tobacco use as an active problem, tobacco use in the social history, counselling via built-in template, assessment of tobacco use as an active problem, cessation in the plan, method of cessation, and whether or not there exist any discrepancies within the note regarding smoking status.

Each week, every fellow received a text message encouraging them to employ the 5 A's and to utilize nicotine replacement therapy.

## **Results**

537 patient visits were assessed over the course of a two month period, with an average of 27.25% identified as smokers, slightly higher than the 2012 data. A single weekly text message resulted in a 58.46% increase the total number of smoking status documented in HPI, a 40% increase in the documentation of smoking as an active problem, a 56.25% increase in nicotine cessation counselling, and a 75% increase in the total number of NRT prescriptions.

## **Conclusion**

The data indicate that targeted text messaging is a simple, cost-effective intervention to increase the rates at which smoking is addressed and treated in the primary care setting.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Making Better Palliative Care Decisions- Performance Improvement Team Findings and Recommendations

**Objective**

Greater than or equal to 14% (20% stretch goal) of BCBS patients discharged (as defined by specific ICD 9/ICD 10 codes) between July 2015- December 2015 will receive a palliative care consult during hospitalization or are enrolled in the Advanced Illness Service (AIS) program before discharge

In addition, the overall number of palliative care consults will increase 10% over baseline performance 13.1% (July 2014-September 2014)- Goal 14.41%

Current BCBS QB 2018 goal is 17.57%

**Methods**

Utilized several PI tools to identify the process failures, meet requirements and streamline the process.

Additional efforts deployed included:

Ongoing provider, staff, and patient/family education regarding palliative care and its benefits

Weekly multidisciplinary team meeting to review current patient list for patient needs and additional patients appropriate for the program

Oncology Fellow  
Pharmacy  
Palliative Care Team  
Navigator

#### Daily Multidisciplinary Team Meeting Participation

Created a Cerner report - Identifies patients that qualified for palliative care services – Continue to add additional patient trigger criteria to the report (Oxygen Dependence, Dialysis, Cardiac Diagnoses)

Developed real time Midas alerts to identify patients that qualified for Palliative Care and did not receive the ICD 10 Code to promote prompt review as to why the patient was missed

Expanded program to outpatient areas such as the ECCC

Developed a physician leadership/collaboration role within the program

Dr. S. Mitchell in the Cancer Center- Outpatient

New Palliative Care provider- Dr. M. Bullock Starts August 2018 in the inpatient care setting

#### **Results**

BCBS Goals met for 2016, 2017 and on track for 2018.

#### **Conclusion**

Future state process not always simpler than current/past state process

Realization that the current/past state process was inconsistent and unclear at times

Performance Improvement tools helped develop a well defined process that is consistent!

All improvement efforts are ongoing with rapid Plan- Do- Study- Act (PDSA) cycles

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## Abstract

**Title**

Post Percutaneous Coronary Intervention (PCI) Antiplatelet Medications

**Objective**

Prasugrel is a thienopyridine that was approved in 2009 for use in patients with acute coronary syndromes undergoing PCI. It offers more consistent, faster platelet inhibition and has superior anti-ischemic efficacy at the cost of a higher risk of bleeding complications compared with clopidogrel. However, the increased use of prasugrel at discharge following PCI has resulted in its inappropriate use in patients that have absolute or relative contraindications to this drug. We conducted this research in order to assess the frequency of inappropriately used prasugrel and to encourage that physicians should use more caution when prescribing this drug.

**Methods**

In this retrospective study we assessed the patterns of prasugrel use among 937 patients who underwent percutaneous coronary intervention and were discharged alive from July 2014 to July 2015 at a university-based tertiary medical center in West Virginia, USA. We defined the potential inappropriate use of prasugrel as use in patients who had a history of cerebrovascular disease (CVA), weighed less than 60kg or aged 75 year old or more.

**Results**

Prasugrel was prescribed to 12.9% (n=121) of patients who underwent PCI on hospital discharge. Among patients prescribed prasugrel, 42.1% (n=51/121) presented with acute coronary syndrome, while 57.8% (n=70/121) of patients received prasugrel for indications other than acute coronary syndromes. One or more known contraindications to the drug were present in 19.8% of patients discharged on this medication. Of those who were discharged inappropriately on prasugrel, 5% had history of CVA, 11.5% were aged 75 year old, and 3.3% weighed less than 60kg.

**Conclusion**

Prasugrel use in patients with known contraindications is not uncommon, but according to our study it's been used inappropriately more frequently in our hospital when compared to literature data. This study

aims to raise the awareness of the inappropriate use of prasugrel. Therefore, physicians should use more caution when prescribing this drug to patients undergoing PCI as inappropriate use may result in significant morbidity.

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## Abstract

**Title**

Better Outcomes for Children through Safe Transitions

**Objective**

The goal of this project is to implement an already validated pediatric discharge toolkit with the aim of enhancing the effectiveness of transition from hospital to home.

**Methods**

This quality improvement project utilized a validated pediatric discharge planning toolkit. The key elements in the toolkit were: (1) comprehensive patient risk assessment on admission, (2) teach-back curriculum, (3) fax or phone call to PCP, (4) 72-hour follow-up calls, and (5) follow up appointments scheduled prior to discharge within 2 weeks from discharge from hospital. Using the toolkit, data was gathered on pediatric patients as they were admitted and prepared for discharge during the time period of December 2016 until March 2017. The main focus of the project was an increase in follow up appointments scheduled upon discharge, reduction in 30 day readmissions to the hospital, and increased patient satisfaction scores. This was compared with hospital administrative pediatric data collected from December 2015 through March 2016.

**Results**

Data collected during study period (n=91) compared to hospital administrative data collected from the year prior (n=132) showed a 2.2% reduction in readmissions (4.8% and 7%), p=0.004. Patient satisfaction scores remained unchanged with no statistical significance. All patients in the study group had follow up appointments made prior to discharge.

**Conclusion**

Data suggests the use of this pediatric discharge toolkit improves the efficacy of transition from hospital to home. This improved efficacy, leads to reduced readmission rates and significant health care dollars being saved. Further research is being done to determine PCP satisfaction with this process, follow up appointment attendance, and whether follow up attendance correlated with likelihood of readmission.





# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Improving Workflow Efficiency in a Patient-Centered Medical Home

**Objective**

The purpose of this research is to improve the efficiency of workflow in our Patient Centered Medical Home. More specifically it was designed to identify barriers to rooming a patient. It is evident that this topic is important to our patients, nurses, and our medical providers. Recently physicians have been charged to improve the quality of care and the safety of our patients while maintaining patient satisfaction. Participating in a patient centered medical home aims to improve quality of care. The requirements do create additional tasks for nurses and physicians.

**Methods**

This project consisted of an assessment and an intervention. The assessment consisted of two phases and included qualitative and quantitative methods. The nurses completed a survey designed to

subjectively identify the largest barrier to rooming patients. That survey also included questions to assess job satisfaction. The quantitative data were obtained through direct observation. Each patient was monitored and the times of each task necessary to room the patients' were recorded. After completing phase one the data was analyzed. An intervention was designed to address the task identified after analyzing the quantitative and qualitative data. The intervention sought to address the time from when a patient becomes "nurse ready" to when the nurse retrieves patient from the waiting room. It was felt that the time was affected by the notification system of our current electronic health record. We implemented a pager system that would provide direct communication between the front desk and the primary nurse when a patient was ready to be roomed. After the installation of the pager system and education was completed the quantitative and qualitative data were recollected and analyzed.

## **Results**

The amount of time that elapses from a patient completing registration and subsequently being retrieved from the waiting room was identified as the most time consuming task using the quantitative data and was identified as a barrier by nursing staff. Prior to our intervention a patient would wait 7 minutes on average. After implementing a pager system this time was reduced to 6 minutes. This result was statistically significant.

## **Conclusion**

Implementation of a simple pager system reduced the time that a patient waited for nursing after they had completed the registration process. We feel that our current electronic health record lacks a notification system that is effective in a practice where nurses have multiple roles. The times were reduced from 7 minutes pre-intervention to 6 minutes post-intervention. While 60 seconds may not seem significant this finding can be extrapolated into a busy patient centered medical home and could save over 3 hours per day. The intervention also provides a time that is easier to utilize. One minute in between patients may not provide ample time to complete a task or phone call, but having 20 minutes at the end of the day for both physicians and nurses would allow for multiple tasks and possible pre-planning for the next day. This intervention would be easy to study in another Patient Centered Medical Home. If the results are duplicated this simple and affordable intervention may reduce wait times and improve staff satisfaction. This intervention can also be implemented without changing the entire workflow of rooming a patient, which also makes it more applicable to other practices.

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## Abstract

**Title**

Implementation of a Systolic CHF (HFrEF) Action Plan in a Provider Based Clinic (Red RAFT Team)

**Objective**

To observe the effects of implementing a systolic CHF action plan within our RAFT (resident and faculty team) in increasing patient education, optimizing medical treatment based off best practice guidelines, and reducing hospitalizations and ER visits.

**Methods**

A QA/QI protocol for standardization of care for patients of the Red RAFT Team with HFrEF will be developed through utilizing the standard guidelines. This best practice protocol will triage patients base upon ECHO results into Stage 1-4 categories and include recommendations for medications, consults and follow-up. The protocol's educational information will consist of Marshall health's CHF Action Plan, which is a protocol developed in conjunction with the Pharmacy program and approved by the Family Medicine's

Vice Chair of Clinical Development. Finally, an anonymous knowledge survey will also be administered at each visit.

### **Results**

In the process of implementation the patient population was inadequate within the designated RAFT. We then broadened out patient population by educating the entire family medicine center about the project, creating huddles identifying these patients, and adding red folders containing HFrEF action plan at each pod.

### **Conclusion**

It was felt that coding variations for HFrEF didn't identify all of the patients with the diagnosis and there is a need to better classify the diagnosis of heart failure within the family medicine center population.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Polypharmacy of Antihypertensive Medications, A Quality Improvement Project

**Objective**

Hypertension (HTN) is a disease process that is ubiquitous not only in West Virginia but nationwide. Not only

does it directly increase the morbidity and mortality from such pathologies as Myocardial Infarctions, Cerebrovascular Accidents and Chronic Kidney Disease. Many other disease processes, like coronary Artery

Disease, Portal Hypertension, Palpitations, Diabetes, Congestive Heart Failure, Migraines, Esophageal Spasm,

Benign Prostatic Hypertrophy, Essential Tremor and Palpitations, utilize medicines considered to be classically

used for HTN. This causes a stacking of multiple medications that can impact a patient's health to the point

of

hospitalization and at times even death. The objective of this project is to develop a protocol to reduce the number of antihypertension medications for our patients where possible, while considering the additional diagnoses that may be affected by the patients' antihypertensive regimens.

### **Methods**

A QA/QI protocol for minimizing polypharmacy for patients of the Teal RAFT Team with HTN will be developed

in conjunction with the School of Pharmacy and will involve utilizing best practices of medication use in the above mentioned medical conditions treated with medications commonly considered antihypertensive. This stepwise intentional thought protocol will evaluate need for medication, need for specific medication for co-morbid conditions and maximize the efficiency of the patient's antihypertensive medications. The protocol's educational information will consist a sheet detailing diet, exercise, tobacco abuse, risks of uncontrolled HTN,

and action plan for medication problems. Finally, an anonymous knowledge survey will also be administered at each visit.

### **Results**

This project is currently in the data acquisition and improvement implementation phase.

### **Conclusion**

TBD

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Impact of using DyeVert PLUS on incidence of acute kidney injury after cardiac catheterization with coronary interventions in high-risk patients

**Objective**

Approximately 30% of patients presenting for coronary angiography procedures are at risk of acute kidney injury following the procedure. Contrast media used in the procedure can be toxic and cause renal damage in high risk patients. Osprey Medical received US FDA 510(k) clearance for its advanced DyeVert PLUS contrast reduction system in March 2017. This new device manages dye administration during coronary procedures and has been shown to reduce contrast volumes used by up to 40%. Our study looked at the clinical impact of DyeVert on incidence of post procedure acute kidney injury (AKI) at our hospital.

**Methods**

Between July 1, 2017 to December 30, 2017, Patients undergoing cardiac catheterization with coronary



interventions with chronic kidney disease defined as having a GFR < 60 by MRDR calculation method and/or Serum Cr. >1.5 were eligible to have the DyeVert system utilized during the procedure as a contrast reduction strategy. The decision to use the device was left to the treating cardiologist's discretion. Patients received the usual pre and post procedural hydration specific to the treating physician. Patients incurring AKI were defined as an absolute increase of  $\geq 0.3\text{mg/dL}$  or a relative increase of 50% in serum creatinine.

## **Results**

A total of 109 patients met inclusion criteria and were included in the study. 41 patients (Mean age 68.5, HTN 90.2%, DM 53.6%) had procedures using DyeVert while 68 patients (Mean age 71.3, HTN 92.6%, DM 51.2%) had procedures without the DyeVert device. Mean pre and post procedure Cr in DyeVert group was 1.56 and 1.56 with a mean decrease of 0.002 ( $p=0.97$ ). Mean pre and post procedure Cr without DyeVert was 1.51 and 1.54 respectively with a mean increase of 0.35 ( $p=0.44$ , SD 0.37, 95% CI [-0.06, 0.12]). The incidence of AKI in the DyeVert vs non-DyeVert group was 12.2% vs 16.2% ( $p=0.56$  pearson Chi Sq, OR 0.71, 95% CI [0.23, 2.24]). Average contrast usage in DyeVert vs non-DyeVert group was 128 ml vs. 155 ml.

## **Conclusion**

Utilization of the DyeVert Plus resulted in lower average contrast use during procedures. The pre and post-procedure Cr did not have a significant difference in either group. The DyeVert group showed lower absolute incidence of AKI but this difference was not statistically significant. The true clinical impact of DyeVert may not have been observed due to the small sample size and bias due to general awareness of contrast levels and AKI. Larger studies are warranted to evaluate this impact.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

### Title

Surgery Inpatient Medication Reconciliation

### Objective

The purpose of this QI project is to improve the number of completed admission medication reconciliations within the first 24h of admission, with the ultimate goal of achieving and sustaining a completion rate of 100%. Completing a patient's admission med rec within 24h will result in improved control of blood pressure, blood sugar, and pain, as well as patient comfort, and overall wellbeing.

### Methods

Initial Plan:

Add a column to the patient list to signify whether the admission reconciliation was completed.  
Attach small laminated cards to each monitor in surgery call rooms as reminders to do med rec.

Modifications:

Phase out old excel spread sheet and convert to CORES list. This gives dynamic monitoring of med recs and does not rely on resident manual updates.

Small laminated post-it notes were updated to reflect changes in project design.

Utilizing the "task list" on Cores to create reminders to restart held meds.

Do:

Initial plan initiated 02/12/2018  
Modifications initiated 03/20/2018

**Study:**

Data collection from administration database for baseline completion, then post initiation date to track progress.

**Act:**

Each surgery resident was educated on the QI project and how to update the patient list.  
Specific times of when to check for med rec completion given: ie at time of admission, after daily progress note, and before check out

**Results**

From baseline completion rate of approximately 40% total completion of med recs to a completion rate of 87% in Feb, 94% in March and April data is pending

**Conclusion**

The process of medication reconciliation is important to prevent medication errors and maintaining continuity of care. The aim of the project was to have the medication reconciliation completed within 24 hours of admission or earlier. One difficulty encountered during this project was that the medications weren't always entered into the EMR within that time period. Therefore, the rec wouldn't be completed in a timely manner and often times was forgotten about for several days. The first intervention that took place was to create a column to document whether medication reconciliations were complete or incomplete for the entire surgical patient list to serve as a reminder to complete med recs. The issue we encountered with this was that the list was not being updated. To improve this, this list was transitioned over to Cerner's CORES list, which automatically lists the status of the med rec. This took away the need for someone to manually update the list. We collected the data over week and compared to our first intervention.

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# Abstract

## Title

Postpartum Surgical Site Infections Before and After the Introduction of Vaginal Preparation Protocol

## Objective

Over 1.2 million cesarean deliveries are performed in the United States annually, ranking as one of the most common surgical procedures nationally. Thus, postpartum surgical site infections (SSI) - with an incidence of 2-6% - not only pose a significant morbidity for the patient, but significantly impact the healthcare system as well. Vaginal cleansing immediately prior to cesarean delivery has been shown to reduce postoperative infection. The objective of this retrospective cohort analysis is to examine the impact of vaginal preparation prior to cesarean delivery on the postpartum SSI rate at Cabell Huntington Hospital, Huntington, WV.

## Methods

A retrospective review of infection rates prior to and after the implementation of a vaginal preparation protocol was conducted from January 2017 to March 2018. Both deep tissue infections, such as endometritis, and superficial wound infections were included.

## Results

In the 7 months prior to the implementation of the vaginal preparation protocol, 12 patients out of 588 cesarean deliveries were found to have an SSI, resulting in an incidence rate of 2.04%. In the 7 months following implementation of the protocol, 9 patients out of 605 cesarean deliveries were found to have an SSI, resulting in an incidence rate of 1.48%. In the 31 months following implementation, 25 patients out of 2,509 cesarean deliveries were found to have an SSI, resulting in an incidence rate of .987%. That indicates an absolute risk reduction of 1.053% (95% CI -2.26 -0.1514) and risk ratio of .48 (CI 95%, .244-.957,  $p < .05$ ) within 31 months of implementation.

## Conclusion

Surgical Site infections are an important quality of care measure. More data is required to qualitatively measure the effect of vaginal preparation protocols on SSI rates. One weakness in our design was the retrospective nature of our analysis which did not allow for us to control for confounding variables. However, the results still indicate a clinical benefit to using vaginal preparation protocols as they are a low cost safeguard in the effort to reduce SSI infections.

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## Abstract

**Title**

Implementation of a COPD Action Plan in a Provider Based Clinic

**Objective**

The WV-KY-OH tri-state area prevalence of cigarette use leads the nation and resultant COPD burden is high both in terms of years of potential life lost and in healthcare dollars spent. Severe COPD patients are admitted to the hospital frequently, particularly during bad cold and flu seasons such as 2017-2018. This resident led quality improvement study aimed to configure baseline data concerning Marshall Health Family Medicine COPD patients and to evaluate patient understanding of acute on chronic lung disease.

**Methods**

We triaged patients based upon clinical presentation and yearly spirometry results into Gold Stages 1-4. Recommendations for each stage included medications, immunizations, education, rehabilitation, and follow up, organized into a COPD Action Plan. We evaluated patient's understanding of their COPD using

surveys. These protocols, based the patient's individualized medications, were given to each patient and discussed in detail with either the PCP or clinical pharmacist, in hopes of reducing unnecessary hospitalizations and ER visits.

## **Results**

Participation in the study was limited. It is believed we have many COPD patients at Marshall Health Department of Family Medicine, though adequately capturing them over the course of this project has proved difficult. Two cycles of enrollment were used: initially limited to single clinical team and ultimately expanded clinic-wide. Patient survey data demonstrated patient satisfaction with care (93% of polled) but a proclivity to seek ER consultation (94% knew to go to ER for severe exacerbation, but only roughly half--52.6%--knew to seek PCP treatment for mild exacerbation). Furthermore, nearly 20% of those polled did not even know their chronic COPD meds.

## **Conclusion**

Patient education and coordinated action plans can limit follow up hospitalizations for acute exacerbation of COPD and improve long term outcomes. Poor patient compliance with controller medications often plays into worsening chronic lung conditions and additionally works to confound further investigation into quality-based outcomes. Length of follow up was an additional confounder. Future studies should either be longer-term or focus on more limited interventions with shorter follow-up periods to allow for multiple cycles of intervention and assessment to be completed.

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## Abstract

**Title**

Managing Inpatient Normoglycemia

**Objective**

Through clinical observation, there have been many occurrences of basal insulin doses being held while patient's have a normal or near normal blood sugar. This often results in hyperglycemia which is clearly associated with poorer outcomes in the literature. There is often no reason documented for held dose, or the documented reason is not a reason for which endocrinology would have held the dose.

1. To improve the management of inpatient diabetes patients who are being managed with insulin therapy via reducing the number of missed basal insulin doses.

**Methods**

1. Assess 1,000 patient hours of admitted diabetic patients' data and document both number of missed basal insulin doses and also any documented reason for missed dose.
2. Educational methods (video, in person teaching, handout) on appropriate insulin management guidelines for both basal bolus regimens and basal plus sliding scale regimens.
3. Re-assess 1,000 patient hours of admitted diabetic patients' data after intervention and compare results.

**Results**

Data collection ongoing



**Conclusion**

Will be based on data assessment!

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## Abstract

**Title**

Fluid Volume Management: The Effect of Accurate Weight Documentation on the Number of Hospitalized Days

**Objective**

To determine the effect of accurate daily weight checks on the number of days that the patients remain at the hospital.

**Methods**

The data will be collected through the EMR/HER system. First, we will determine whether the daily weight checks are being performed. If performed, we will determine the accuracy of the documentation when cross-referenced with I & O's shows appropriate correlation. Then, the association between the weight documentations deemed accurate and the number of days spent at the hospital will be measured and analyzed.

**Results**

Daily weight documentation is a routine assessment that is fundamental to fluid balance assessment and calculation. It is vital that the weight documentation is done correctly on a daily basis to appropriately assess the progress of the patients' conditions that cause fluid imbalances such as fluid overload due to heart failure which are common on the floor and, especially, in the ICU. Correct weight documentation in comparison to the I & O's will allow more accurate assessment and management of fluid overloaded patients; therefore, this has the potential to decrease the number of unnecessary days spent at the hospital.

**Conclusion**

Any inconsistencies or errors in documenting patient body weight can have a detrimental impact on patient care since it can decrease the accuracy of diagnosis and increase the risk of errors in management and treatment plans. Body weight must be recognized as an important tool for ongoing assessment throughout the patients' recovery process, and the staff documenting daily body weight should have the appropriate knowledge and training. Many medical conditions such as heart failure, renal insufficiency, and infections can lead to fluid imbalances, which require fluid management protocols and careful monitoring to be followed. Ensuring the accuracy of daily body weight documentation will improve the quality and patient safety by allowing better management of the patients' fluid status, thus, decreasing the number of days the patients must remain at the hospital.

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## Abstract

**Title**

Improving Outcome For patients with Sepsis At Cabell Huntington Hospital

**Objective**

Introduction:

Sepsis and septic shock are life threatening conditions that arise when the body's response to infection injures its own tissues, there are around 1.6 million Cases of sepsis in the United States per year. However, SIRS, Sepsis and Septic Shock has a high mortality rate, 7%, 16% and 46% respectively. In our project we provided education about SIRS, Sepsis and Septic Shock to all medical and surgical departments at Cabell Huntington Hospital, then we compared the mortality rate before and after the education campaign.

**Methods**

The Importance of Early Detection of Sepsis and Septic shock:

Our efforts to just treat recognized sepsis alone is not enough, therefore, the critical aspect of mortality reduction has been pushing practitioners to identify sepsis as early as possible, earlier recognition accounts for much of the signal in mortality reduction and partially explains sharply increasing incidence, thus, without recognition that the clock is ticking and mortality is rising.

What impacts mortality in sepsis and septic shock:

Primary Source infection control, Awareness and accurate documentation, respond to sepsis alert, and activation of sepsis and septic shock three hours protocol bundle.

Method:

After a detailed discussion about what were the reasons for increased mortality of sepsis and septic shock at Cabell Huntington Hospital compared to national rate, we found that ignoring alerts, poor emergency response, delayed detection of sepsis, unequal treatment and mainly unawareness of sepsis and septic shock bundle in our electronic medical records systems (Cerner system) were the main reasons of high mortality rate. Therefore, we brought the idea of sepsis education campaign, we prepared a fully explained power point presentation that discussed each step of SIRS, Sepsis and Septic shock pathophysiology, as well as awareness of sepsis and septic shock first 3 hours and 6 hours bundles which we presented during the morning and noon conferences to internal medicine department, hospitalist, Family medicine department, surgery department, and Nurses.

**Results**

Result:

Statistic study is pending and will be ready before the presentation.

**Conclusion**

Education about early detection, documentation, and following protocols of sepsis and septic shock will dramatically increase the awareness of sepsis and septic shock as well as will decrease the morbidity and mortality.

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## Abstract

**Title**

Cardiac Rehabilitation Assessment

**Objective**

To determine whether patients with cardiovascular disease are being appropriately referred to cardiac rehabilitation following hospitalization in order to further improve their cardiovascular health. Then, based on these findings, we plan to implement a cardiac rehabilitation program protocol for those who are eligible and can benefit from cardiac rehab.

**Methods**

The data will be collected through the EMR/EHR system. Individuals who are admitted to the hospital for atherosclerotic cardiovascular disease (ASCVD) such as stable angina, acute coronary syndrome (ACS), heart failure (HF) are eligible for cardiac rehabilitation program as recommended by the American Heart Association (AHA). Then, we will determine how many of these eligible individuals are being referred to a cardiac rehabilitation program following discharge from their hospitalization.

**Results**

Cardiac rehabilitation is a means of secondary prevention in individuals with cardiovascular disease. There are three main aspects: exercise counseling and training, healthy heart education, and stress reduction counseling. Physical activities such as walking, jogging, swimming, or biking with strength and stretching exercises are proven to be beneficial for the heart and for the quality of life and is recommended for all individuals with heart conditions. In addition, healthy heart education will promote awareness of risk factors, dietary balance, correct medications and their effects, and harmful effects of cigarette smoking. Additional counseling will further benefit the patients by identifying and targeting everyday sources of physical and emotional stress. As a result, we expect the patients to benefit tremendously from cardiac rehab.

**Conclusion**

Cardiac rehabilitation is a medically supervised program designed to help individuals with eligible cardiovascular diseases: ASCVD including STEMI/NSTEMI, stable angina, and peripheral vascular

disease; stable congestive HF; following cardiovascular procedures or surgery such as CABG, PCI, valve replacement, or placement of a pacemaker or an ICD. Although cardiac rehabilitation may not necessarily reverse the damage already done, it can help patients with cardiovascular history improve their hearts' future. As discussed in the results section, the implementation of cardiac rehab program protocol is crucial in increasing the benefits of the patients with any heart conditions.



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## Abstract

**Title**

Treatment Plan Coordinator in the Dental Setting

**Objective**

The study focused on reducing the number of no show rates at the clinic, and improve treatment plan acceptance rate, by instituting a Treatment Plan Coordinator position. The objective behind the position was to better utilize providers chair time and improve patient care. After adding the treatment plan coordinator to our dental team, we are hoping to decrease our current no show rate of 19.81% by 2 percent and increase the treatment plan acceptance rate of 64.17% by 5 percent by April 1, 2018.

**Methods**

Changes will be measured by running a systematic analysis that correlate the rate of no shows, the three months prior to instating a treatment plan coordinator versus one month after instituting the coordinator. A comparison of down time per provider will be calculated three months before and one month after introducing the position. The percentage of accepted treatment plan by new patients will be calculated and compared to three months prior and one month after the change. A questionnaire to evaluate the overall efficiency of the office from an inside perspective was completed by the office staff who were impacted by the treatment planning process.

**Results**

The average treatment acceptance rate increased from 64.17% to 70% and the average no show rate was reduced from 19.81% to 15.89%. Down time per provider decreased from 80 mins/ provider to 50 minutes/ provider. The questionnaires revealed, the new process has increased the staff's efficiency, made their job less stressful, and the patients are more prepared for their financial responsibility. The questionnaire also provided feedback on further improving the treatment planning process.

**Conclusion**

The treatment plan coordinator position has reduced the number of no show rates and improved the utilization of provider's available time. The new treatment planning process has increased the overall

efficiency of the office.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Improving Time to CT for Trauma Patients

**Objective**

Computed tomography is a vital component in the evaluation of trauma patients and can facilitate the diagnosis of life-threatening injuries in polytrauma patients. Early high resolution CT scanning enables for

rapid therapeutic intervention of active bleeding or neurosurgical emergencies. Contrast-enhanced CT scan has a sensitivity of up to 95% in detecting liver and spleen lacerations, hematomas and active bleeding. A previous study reported a reduction in mortality from 15% to 8.6% with total-body CT scanning as well as reducing the length of stay in the trauma room markedly. Therefore, early diagnosis with rapid whole body CT scanning is imperative for early intervention which improves mortality rates and leads to a better outcome for trauma patients. The aim of this QI project was to improve time to CT to be under 20 minutes, which is the time of arrival to when the patient leaves the trauma bay for CT scan.

## **Methods**

Beginning in January 2017, the data and times from trauma flow sheets were taken of each trauma patient of each month. We used the time of arrival into the ED to when the patient left the trauma bay for CT scan, which we recorded as Time to CT. We also recorded the date of the trauma, trauma alert level (P1 or P2), mode of arrival, physician, and type of trauma. We then took the average and median time to CT of each month to see how often we were under or over 20 minutes.

## **Results**

The time to CT data was used for all trauma patients from January 2017 to October 2017.

January 2017: Average time- 21 minutes; Median time- 17 minutes

February 2017: Average time- 19.4 minutes; Median time- 21 minutes

March 2017: Average time- 17.2 minutes; Median time- 19 minutes

April 2017: Average time- 22.6 minutes; Median time- 22 minutes

May 2017: Average time- 16.2 minutes; Median time- 18 minutes

June 2017: Average time- 18.4 minutes; Median time- 18 minutes

July 2017: Average time- 21.8 minutes; Median time- 21 minutes

August 2017: Average time- 21 minutes; Median time- 20 minutes

September 2017: Average time- 21.6 minutes; Median time- 19 minutes

October 2017: Average time- 16.8 minutes; Median time- 19 minutes

For average time to CT, we were only able to be under 20 minutes for 5 of 10 months. For median time to CT, we were under 20 minutes for 6 of 10 months.

## **Conclusion**

Early diagnosis is imperative for an early intervention of life-threatening injuries of trauma patients which improves mortality rates. Rapid CT scanning will allow for better outcomes and reduce the length of stay in the ED. The aim of the project was to improve the time to CT to 20 minutes by first recording the time to CT more accurately to track our progress. To improve our time to CT, our first intervention would be to implement a clock timer in each trauma bay that not only keeps track of the time but also gives visual or auditory reminders of when it is close to 20 minutes the patient has been in the trauma bay. At times, many healthcare workers are distracted from the time by trying to stabilize the trauma patient and tend to forget how long the patient has been in the ED. Therefore, by establishing a timer with auditory and/or visual reminders of the time, we believe we can not only consistently improve our time to CT to 20 minutes but lower it by 10% to 15%.

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## Abstract

**Title**

Evidence Based Protocol to Reduce Surgical Site Infections after Breast Reconstruction

**Objective**

Postoperative infection in tissue expander breast reconstruction causes increased morbidity, cost, and suboptimal patient outcomes. To improve outcomes, it is imperative to take every possible measure to minimize this dreaded complication. The aim of this study was to extensively review the literature and provide guidelines to protect patients from infection in pre-, intra- and post-operative stages.

**Methods**

A systematic review was performed, prospective and level two retrospective studies that assessed measures to reduce postoperative infection after tissue expander breast reconstruction were included. Based on the findings of these studies all the factors that could lead to decreased infection were identified. In order to develop the guidelines, the identified interventions were categorized in three different groups

depending on the timing of their effect.

## **Results**

The pre-operative measures were:

- Optimizing medical comorbidities
- Bacterial Decolonization:
  - o 5-day topical Mupirocin and Chlorhexidine
  - o Body Scrub for MRSA carriers
  - o Prophylaxis Antibiotics (ABX).

Intraoperative steps were:

- Preparation
- Strict Barrier Controls
- Preoperative ABX 30-60 minutes before incision
- IV Vancomycin for MRSA (+) patients
- Chlorhexidine with 95% alcohol skin preparation
- Draping
- Disposable Drape
- Re-drape After mastectomy
- OR Environment
- Minimizing human traffic in and out of OR
- Laminar airflow, filtered air exchange
- Positive room pressure
- Prosthetics
- Mesh
- TIGR matrix
- Acellular Dermal Matrices
- Fetal bovine = Bovine pericardium = porcine-based
- Pocket Preparation
- Adequate Flap Perfusion
- Minimize trauma to mastectomy Skin Flap
- Consider Native Tissue Reinforcement
- Achieve Hemostasis
- Avoid Milk Ducts or Reclean Intraoperative
- Implants
- Povidine-iodine and triple antibiotics to irrigate the implant pocket
- Expansion to <50% or <300ml
- New set of Talc-free gloves
- Minimize handling Time & Personnel
- Closure and Drains
- Layered closure with absorbable monofilament

Post operative actions were:

- Post-op ABX for 24 hours
- >24hours ABX for high-risk or preop radiated patients
- PO ABX if neoadjuvant chemo
- Drain
- Removal during 1st week
- Topical mupirocin

## **Conclusion**

Postoperative infection in tissue expander breast reconstruction is a dreaded complication that can significantly compromise the treatment course of patients with breasts cancer.

By implementing these guidelines we aim to minimizing the risks for infection development, improve patient care, and quality of the care.



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## Abstract

**Title**

Development of a Preoperative Calculator to Determine the Odds of Postoperative Surgical Site Infections after Colorectal Surgeries

**Objective**

Surgical site infection (SSI) continues to be a challenge in colorectal surgery. Over the years, various modalities have been used in an attempt to reduce SSI risk in elective colorectal surgery, which include mechanical bowel preparation before surgery, oral antibiotics and intravenous antibiotic prophylaxis at induction of surgery. Preoperative identification of patients at higher risks of SSI is imperative to allow medical optimization and targeted prevention. The purpose of this study was to create a preoperative risk calculator for SSI after colorectal surgery by assessing a patient's individual risk for treatment failure based on pre-operative variables.

**Methods****METHODS:**

Medline, Embase and the Cochrane Library were searched. Any randomized controlled trials (RCTs) or cohort studies after 1990, which investigated the risk factors of SSIs after elective or emergent colorectal surgery were included. By pooling the data the risk factors for SSI were identified.

**DATA COLLECTION AND ANALYSIS:**

Two review authors independently examined the title and abstracts of all studies identified by the search



strategy, then assessed study quality and extracted data from those that met the inclusion criteria.

### **Results**

Twenty-three RCTs and eight cohorts were included. In descending order of relative weight, the ten significant risk factors for SSI after colorectal surgery were: diabetes mellitus, emergent vs. elective surgery, body mass index > 35 kg/m<sup>2</sup>, liver disease, cardiovascular events, smoking, open colorectal resection, male sex, preoperative transfusion, and hypothyroidism. The area under the curve (AUC) for this risk model was 0.666 (95% CI: 0.635-0.698).

### **Conclusion**

This study aimed to provide a preoperative calculator so that the surgeons could assess the patients for their risk of SSI prior to colorectal procedures. By identifying the patients who are at higher risk and implementing medical optimizations we aim to improve the patient care and quality of care.

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## Abstract

**Title**

What Are the Risk Factors of Surgical Site Infection after Breast Reconstruction? A Meta Analysis

**Objective**

Surgery has been used as part of breast cancer treatment for centuries; however any surgical procedure has the potential risk of infection. Infection rates for surgical treatment of breast cancer are documented at between 3% and 15%, higher than average for a clean surgical procedure. There is paucity in the literature on risk profiling for patients who are interested in postmastectomy implant reconstruction. Given the potential repercussions, it is imperative that surgeons have a full and accurate understanding of the risks associated with this reconstructive option. The aim of this study was to identify these risk factors and therefore, improve the quality addressing them prior to an elective surgery and potentially reduce infection rate.

**Methods**

#### **SEARCH METHODS:**

We searched the Cochrane Wounds Group Specialised Register (March 2018); the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library); the Database of Abstracts of Reviews of Effects (DARE) (The Cochrane Library); Ovid MEDLINE; Ovid MEDLINE (In-Process & Other Non-Indexed Citations); Ovid EMBASE; and EBSCO CINAHL. We applied no language or date restrictions.

#### **SELECTION CRITERIA:**

Randomized controlled trials and level two retrospective studies were included. Primary outcomes were risk factors and rates of surgical site infection (SSI).

#### **Results**

A total of eleven studies (2867 participants) were included in the review. Pooled odds ratios (ORs) or standardized mean differences (SMDs) with 95% confidence intervals (CIs) were calculated. Patient characteristics, surgical-related factors and comorbidities, as potential risk factors, were investigated. The main factors associated with SSI after breast reconstruction were: diabetes mellitus (OR, 3.1; 95% CI, 2.2-4.4), obesity (OR, 2.8; 95% CI, 1.25-3.2), age (SMD, 2.6; 95% CI, 1.3-2.8), smoking (OR, 2.2; 95% CI, 1.3-2.89), American Society of Anesthesiologists (ASA) scale>2 (OR, 1.8; 95% CI, 1.1-2.59), alcohol abuse (OR, 1.8; 95% CI, 1.32-2.68), operative time (SMD, 1.49; 95% CI, 0.19–0.78), urinary tract infection (OR, 1.3; 95% CI, 1.09–2.16), and systemic inflammatory disease (OR, 1.2; 95% CI, 1.01-1.6).

#### **Conclusion**

To our knowledge, this is the first meta-analysis to identify the risk factors of SSI after breast reconstruction. We strongly urge the medical community to be cognizant of these identified risk factors. By optimizing these risk factors we aim to decrease the risk of this devastating complication after breast reconstruction and improve patient care and quality.

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## Abstract

**Title**

Can Aspirin Reduce the Incidence of Persistent Wound Drainage after Total Hip and Knee Arthroplasty?

**Objective**

Persistent wound drainage (PWD) after total hip arthroplasty (THA) and total knee arthroplasty (TKA) has been recognized as one of the major risk factors for periprosthetic joint infection (PJI). Morbid obesity, diabetes, hypothyroidism, and systemic inflammatory diseases have been identified to predispose patients to PWDs. However, it is unknown whether DVT prophylaxis agents can play a role in the incidence of PWDs. The aim of this study was to compare the rate of PWDs between patients who received Aspirin versus Coumadin for DVT prophylaxis after THA and TKA.

**Methods**

Upon institutional review board approval we conducted a retrospective study and investigated the patients who underwent THA and TKA between years 2008-2016. 5,516 patients were identified, of which 2,183 received Aspirin. Elixhauser and Charlson comorbidity indexes were used to match the patients between the two groups. PWDs were identified as wound drainage longer than 72 hours. Furthermore, the incidence of venous thromboembolisms (VTEs) and subsequent PJIs were compared between the two groups.

**Results**

The overall rate of PWD in our cohort was 6.4% (353/5,516). Patients who received Aspirin had a significantly lower incidence of PWDs (3.2%,  $p < 0.0001$ ). The rate of 30 day VTEs was comparable between the two groups (1.3% in the ASA group vs. 1.4%,  $p = 0.722$ ). Patients who received Coumadin had a higher incidence of PJIs within 6 months of their surgery (1.8% vs. 1.4% in the ASA group); however, this was not statistically significant ( $p = 0.233$ ).

**Conclusion**

Based on the findings of this study we found that the use of Aspirin is associated with lower incidence of PWDs after THA and TKA. Our findings were in line with previous studies and showed that the use of Aspirin does not increase the rate of VTE events. Moreover, it appears that patients who received Aspirin

had a lower likelihood for developing PJI. Aspirin is a safe drug that can effectively prevent VTE events and is associated with lower likelihood of serious complications such as PJI and PWDs.

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## Abstract

**Title**

How to Manage Persistent Draining Wounds after Total Joint Arthroplasty

**Objective**

Persistent wound drainage has been recognized as one of the major risk factors of periprosthetic joint infection (PJI). Currently, there is no consensus on the management protocol for patients who develop wound drainage after total joint arthroplasty (TJA). The objective of our study was to describe a multimodal protocol for managing draining wounds after TJA and assess the outcomes.

**Methods**

We conducted a retrospective study of 4,873 primary TJAs performed between 2008 and 2015. Using an institutional database, patients with persistent wound drainage (>48 hours) were identified. A review of the medical records was then performed to confirm persistent drainage. Draining wounds were first managed by instituting local wound care measures. In patients that drainage persisted over 7 days, a superficial irrigation and debridement (I&D) was performed if the fascia was intact, and if the fascia was not intact modular parts were exchanged. TJAs that underwent subsequent I&D, revision surgery, or developed PJI within one year were identified.

**Results**

The overall rate of persistent wound drainage was 6.2% (302/4,873). 65% (196/302) of patients with draining wounds did not require any surgical procedures. Of the patients with persistent drainage, 9.8% underwent I&D and 25.1% underwent revision arthroplasty. Moreover, 15.9% of these patients developed PJI within one year. Compared to those without wound drainage, TJAs complicated by wound drainage demonstrated an odds ratio of 16.9 (95% CI: 9.1-31.6) for developing PJI, and 18.0 (95% CI: 11.3-28.7) for undergoing subsequent surgery.

**Conclusion**

Wound drainage after TJA is a major risk factor for subsequent PJI and therefore, proper management of these patients has paramount importance. Our results demonstrated that drainage ceased spontaneously in 65% of the patients with local wound care measures alone. Wounds with persistent drainage were at

substantially higher risk for PJI than those that healed uneventfully.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

What Are the Risk Factors of Persistent Wound Drainage after Total Hip and Knee Arthroplasty?

**Objective**

Persistent wound drainage (PWD) has been recognized as one of the major risk factors of periprosthetic joint infection (PJI). The aim of this study was to determine the risk factors contributing to PWD and its relationship to the length of hospital stay and PJI development.

**Methods**

We conducted a retrospective study of 4,873 total joint arthroplasties (TJA) (1,218 total hip arthroplasties [THA] and 3,655 total knee arthroplasties [TKA]). To identify the risk factors, Charlson and Elixhauser comorbidity indexes along with the patients' demographics were taken into account. Acute PJI was identified based on the musculoskeletal infection society criteria within 90 days postoperatively. A multivariate logistic regression model was designed to calculate the odds ratios.

**Results**

Diabetes (odds ratio [OR]:21.2, 95%Confidence Interval[CI]:12.8-25.1), morbid obesity (OR: 17.3, 95%CI:14.7-21.5), rheumatoid arthritis (OR: 14.2, 95%CI:11.7-16.5), chronic alcohol use (OR: 4.3, 95%CI:2.3-6.1), hypothyroidism (OR: 2.8, 95%CI:1.3-4.2), female gender (OR: 1.9, 95%CI:1.1-2.2), total knee arthroplasty (OR: 1.4, 95%CI:1.1-1.6) were associated with PWD. Interestingly, morbid obesity was strongly associated with PWD in the total hip arthroplasties ( $p = 0.005$ ) but not in the total knee arthroplasties ( $p=0.681$ ). In 2014 our anticoagulation protocol changed from Coumadin to Aspirin. The rate of PWD significantly dropped at this time point from 6.3% to 3.1% ( $p<0.001$ ). Furthermore, PWD resulted in a significantly longer hospital stay in both groups ( $p<0.005$ ) and higher rates of PJI (OR:16.9, 95%CI:9.1-31.6).

**Conclusion**

Several modifiable risk factors were identified to contribute to PWD development after TJA. Surgeons must be cognizant of these comorbidities and optimize patients' general health prior to an elective TJA. Our findings were in line with the previous studies and demonstrated significant increased rates of PJI when



PWDs occur. Moreover, it appears that using aspirin for anticoagulation can potentially help reducing the incidence of PWD and therefore, the subsequent PJI.

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## Abstract

**Title**

Development of Preoperative Risk Calculator for Stiffness after Total Knee Arthroplasty; A Multicenter Study

**Objective**

Arthrofibrosis is a debilitating complication of total knee arthroplasty (TKA). It is one of the leading causes of hospital readmission and a predominant factor for TKA failure. Risk factors of arthrofibrosis after primary TKA are well established, however, there is a paucity of literature identifying these risk factors after revision TKA (rTKA). The purpose of this study was to determine the incidence, timing, and risk factors associated with after TKA and rTKA and provide a preoperative risk calculator.

**Methods**

Upon institutional review board approval we conducted a multicenter retrospective study and reviewed patients who underwent TKA and rTKA between 2008-2017.

Patients who underwent ipsilateral manipulation under anesthesia (MUA) for arthrofibrosis were identified. Time to MUA was calculated monthly. Possible risk factors analyzed included preoperative narcotic use, smoking, anxiety and/or depression, diabetes, obesity, age, race, rheumatoid arthritis, and sex. Multivariate logistic regression was used to determine odds ratio.

**Results**

In total, 10,842 TKAs were included in the study of which 3,247 were rTKA. 1.9% of patients (n=206) underwent MUA after surgery. 72% of MUAs occurred within the first 3 months postoperatively. Younger patients (<50 years) had significantly higher odds of MUA after rTKA (6.5,  $P < .0001$ ). The remaining significant risk factors in descending order were: obesity (odds ratio [OR]: 5.1, 95%Confidence Interval [CI]: 3.8-6.9), diabetes (OR: 4.7, 95%CI: 3.5-5.8), smoking (OR: 3.9, 95%CI: 2.1-4.6), rTKA (OR: 3.6, 95%CI: 2.8-4.8), and rheumatoid arthritis (OR: 2.4, 95%CI: 1.5-3.3).

**Conclusion**

In this large multicenter cohort study, 1.9% of patients underwent MUA after TKA and rTK. Younger patients were 6 times more likely to have a MUA than patients over 50 years old. Determining these risk

factors and utilizing the preoperative risk calculator designed based on these risk factor will help the surgeons to identify the patients who are at higher risk and modify them prior to an elective TKA.

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## Abstract

### Title

Time to CT Scanner: Can a simple order sheet make a difference?

### Objective

Trauma injury is the leading cause of death in individuals from 1 to 44 years old. The use of imaging, especially computed tomography (CT), has been increasingly utilized in early detection of major underlying injuries. Early identification of these injuries leads to early intervention and eventually better outcomes for trauma patients. At Saint Mary's Medical Center (level II trauma center) in Huntington, West Virginia, a dedicated trauma order sheet was incorporated during the initial assessment in order to expedite this process. The trauma order sheet was filled out by the trauma team and the CT scan orders were then placed by designated personnel. This new process was implemented in hopes to reduce the time to CT scanner, which would ultimately result in improved patient outcomes.

### Methods

We measured time to CT scanner in minutes both before and after implementation of a trauma order sheet for all priority 1 and 2 traumas from 8/1/14 to 2/13/18. The order sheet was initiated on 5/1/2016, and prior to this, the trauma team consisting of surgical residents and attendings were inputting the CT scan orders directly into the EMR. After implementation of the order sheet, the trauma team selected the desired orders which were then entered into the EMR by designated ED personnel. The order sheet was designed so that orders could be selected quickly and effortlessly in order to help streamline this process. We excluded any patients whose time to CT scanner was not recorded. Unrecorded times were due to multiple reasons including patients who bypassed CT scan to undergo emergent surgery, patients who had prior CT scans at an outside facility, and patients who had a fatal event in the trauma bay.

### Results

After application of the exclusion criteria we had a total of 728 out of 827 patients in the pre-sheet sample vs. 808 out of 921 patients in the post-sheet sample. The mean time to CT scanner was 29.43 minutes in

the pre-sheet sample and 27.28 minutes in the post sheet sample with a difference of 2.15 minutes. Using a 95% CI and one-tailed T-test analysis, the p value was calculated to be 0.98. Since  $p > 0.05$ , the difference in average time to CT scanner was not significant for these two samples.

### **Conclusion**

Even though our study did not show that the reduction in time to CT scanner was significant after utilization of a trauma order sheet, we believe that it is too early to draw a conclusion that the order sheets are not effective. Multiple variables account for a delay to CT scan including insertion of central lines and chest tubes, emergent intubations for decompensating patients and multiple sequential or concurrent trauma activations. We also considered that the sample size in each arm might be insufficient, thus leading to an underpowered study. Moving forwards, we will perform further data stratification and analyze more patients in hopes to show that utilization of the order sheet will significantly decrease the time to CT scanner. We expect that this will have a substantial impact on patient outcomes for our trauma population here in West Virginia and its surrounding areas.

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## Abstract

**Title**

Improving Behavioral Health Access and Outcomes in a Practice Based Clinic by Creating an Integrated PCP-MH Practice

**Objective**

Mental Health (MH) problems (depression, anxiety and bipolar disorder) are pervasive in West Virginia and throughout the nation. Family Physicians and other Primary Care Providers (PCP) encounter these pathologies on a daily basis and are trained to deal with their management, but frequently are faced with more serious pervasive illness that requires the expertise of colleagues in the Mental Health (MH) Specialties. However, local demand far exceeds availability and due to limited providers and resources, patients sometimes face extended waits before getting much needed care. By creating an integrated PCP-MH practice, we hope to not only allow for MH provider/PCP shared treatment plans that reach the patient in a more timely manner, but also to allow for more effective triage of patients in an effort to maximize efficiency of the strained local MH resources by directing patients with the most urgent need to the

professionals best suited to care for them. The initial effort in creating an integrated PCP-MH practice lends itself to the Plan-Do-Study-Act methodology in identifying the most relevant questions of interest, scope of need for integrated care, current opinions in best-practice among practitioners, and identification of educational gaps among stakeholders.

## **Methods**

Cycle one of the Plan-Do-Study-Act initiative includes the following:

Plan – Identify the problem: Shortage of available patient visits for psychiatric specialty care because of limited providers facing intense local demand.

Do – Assess the number of patients with a diagnosis of interest that were referred for specialty psychiatric care and obtain limited epidemiologic data including time from referral to initial specialty office visit. Create survey to assess resident and attending practices that elucidate comfort level, experience, current active patient plans, and frequency of referral in initial and advanced treatment of the diagnoses being studied.

Study – Analyze the results of epidemiologic assessment to more clearly define problem and magnitude of need. Analyze results of survey to create a best practice plan for Anxiety, Bipolar and Depression treatment and to better characterize the role and scope of the PCP in the diagnoses being studied.

Act – Standardize the common practice of the department regarding recommended management of Anxiety, Bipolar Disorder and Depression and develop a multi-specialty, multi-platform educational resource for the enrichment of all providers in the integrated PCP-MH practice.

## **Results**

We are currently in the initial cycle of the initiative. We assembled a multi-disciplinary team with the objective of creating a survey that would accurately assess providers' comfort level, experience, current active patient plans, and frequency of referral in initial and advanced treatment of anxiety, depression, and bipolar disorder. We have made the survey available to all providers in the Marshall Family Medicine Clinic. Assessment of time from referral to time of initial specialty evaluation is also ongoing as patients fitting current criteria for diagnoses of interest are identified by their PCP's.

## **Conclusion**

The proposed scope of the initiative necessitates the combined work of many practitioners over the course of a projected two to three year period. Faculty engagement has been encouraging and initial information regarding current access to mental health specialists for patients with a diagnosis of depression, anxiety, or bipolar disorder suggest a need for improved efficacy in the current separate-provider model.

Conclusions as to the efficacy of an eventual integrated PCP-MH are well beyond the scope of the current effort, but we believe that the current design provides a strong base of inquiry and methodology for that eventual goal.



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## Abstract

**Title**

Adding Touch to Task

**Objective**

Engaging the patient in bedside report and hourly rounding and it's effect on HCAHPS Scores.

**Methods**

Include the patient in bedside report. Encourage the patient to ask questions. Ask the 4 Ps on hourly rounding. Educate on new information and revisit this information to ensure the patient understands. Get to know the patient and their story throughout the shift. Show the patient empathy and support. Don't look rushed. Manager and/or Clinical Coordinator rounding on every new patient every day and every patient Monday, Wednesday, and Friday. Manager/Coordinator rounding includes Ask 3, Meds to Beds explanation, questions and/or concerns, ask about the experience so far for the patient and explain the survey they may receive in the mail.

**Results**

Communication with nurses HCAPS scores increased from 74.7% in August 2017 to 90.10% in February 2018. Communication with doctors increased from 71.4% in August 2017 to 87.7% in February 2018. Communication about Meds increased from 39% in August 2017 to 73.3% in February 2018. Response of Staff increased from 61.3% in August 2017 to 82.2% in February 2018.

**Conclusion**

Engaging the patient and making the patient feel important, can exponentially increase the patient satisfaction rate. It also has an impact of the patient's perception of their entire experience and the hospital as a whole. It is important the staff involve the patient in their everyday rounding and reports and get to the know the patient and their story. This has a tremendous impact on HCAHPS scores, therefore having an impact on the patient, their family, their experience and the reimbursement the hospital may receive.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Reduction of Pressure Ulcers Utilizing Prssure Mapping Tool

**Objective**

The purpose of this study is to see if the use of a pressure mapping system tool will decrease hospital acquired pressure injuries

**Methods**

with patients admitted November and December 2017, the pressure mapping system was utilized as an additional tool for pressure injury prevention. Inclusion criteria: ventilator support greater than 24 hours, one or more vasopressors, IV sedation, immobile or paraplegic, requiring paralytics, braden score 18 or less, hemodynamically instability, history of pressure injury, albumin <2.5

**Results**

In 2016, 79 patients were admitted and 3 hospital acquired pressure injuries occurred during this time

In 2017, 87 patients were admitted and 2 hospital acquired pressure injuries occurred during this time.

data for both years were collected during the months of November and December

**Conclusion**

the number of hospital acquired pressure injuries that occurred was not a significant enough decrease to note major improvements when the mapping system was utilized.

# Quality & Safety Summit Abstract Submission Form

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## Abstract

**Title**

Patient Centered Medical Home and Improved Patient Care

**Objective**

A patient centered medical home (PCMH) is a practice model developed in 2007 by multiple primary care associations including the AAFP, AOA, AOC, and AAP. It was designed to implement comprehensive, patient-centered healthcare with a focus on quality, safety, accessibility, and coordinated care.

Holzer Health System began a trial program of Comprehensive Primary Care Plus (CPC+) through Centers for Medicare and Medicaid Services which implemented a PCMH in January 2017.

The purpose of this project is to evaluate the effectiveness of the program and strategies utilized to improve quality measures which include:

Cervical Cancer Screening

Depression Screening

Pneumonia Vaccinations

Aspirin Use in Ischemic Vascular Disease

LDL Control in Diabetic Patients

**Methods**

Methods for quality measure improvements include:

Quality measures relevant to each patient are printed from a quality dashboard prior to patient encounter by nursing staff. These forms are reviewed during the appointment and deficiencies related to patient care are discussed and addressed.

Workflow handouts are created and distributed to appropriate staff and providers for quality metrics that are not meeting national standards.

Office staff called patients in need of cervical cancer screening in order to schedule them for a preventative medicine appointment with the residency clinic or their preferred provider.

Depression screening questions were asked during nursing assessment. Positive screening questions were followed with a Patient Health Questionnaire (PHQ9).

Nurses have a standing order for pneumococcal vaccinations and may administer vaccine per patient request.

Monthly meetings involving entire clinical team including receptionists, secretaries, laboratory and x-ray technicians, office managers, nurses and providers were conducted in order to discuss progress of the program. Each individual provider was evaluated in an unblinded fashion on every quality measure.

Data was retrieved using the electronic medical record (EMR) designed to record patient quality metrics in percentage format. This data was then compared to the 50th percentile of each metric nationally as provided by the CPC+ program.

## Results

Includes tables and charts

	Black	Bryant	Jude	
Cervical Cancer Screening				
Pre-PCMH34	41.7	37.9		
Current	60.5	77.1	64.9	
50th %tile	31	31	31	
PHQ-9 Depression Screening				
Pre-PCMH	0	0	0	
Current	99.4	92.5	97.1	
50th %tile	12	12	12	
ASA in Ischemic Vascular Disease				
Pre-PCMH	72.2	85	83.7	
Current	89.9	92.5	85.3	
50th %tile	75	75	75	
Pneumonia Vaccination				
Pre-PCMH	19.4	24	23	
Current	53.2	59.7	58.9	
50th %tile	44	44	44	
LDL <100 in DM				
Pre-PCMH	34	56	67	
Current	69.4	69.8	64.9	
50th %tile	43	43	43	

## Conclusion

\*Rough Draft

The patient centered medical home shows an overall increasing trend in the organization's percentage of capture CQI measure.

Previous deficiencies, such as Depression Screening and Cervical Cancer Screening, displayed a significant percentage increase, surpassing the nation's 50th percentile.

Through the implementation of printed handouts, direct patient communication, and monthly meetings to

evaluate individual provider progress, the Holzer PCMH continues its development of enhancing patient care.

Future CQI improvements include Diabetic Eye Exams, Cognitive Assessment in the Elderly, and Depression Trending via PHQ-9 Scoring.

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## Abstract

**Title**

Impact of using DyeVert PLUS on incidence of acute kidney injury after cardiac catheterization with coronary interventions in high risk patients

**Objective**

Approximately 30% of patients presenting for coronary angiography procedures are at risk of acute kidney

injury following the procedure. Contrast media used in the procedure can be toxic and cause renal damage in high risk patients. Osprey Medical received US FDA 510(k) clearance for its advanced DyeVert PLUS contrast reduction system in March 2017. This new device manages dye administration during coronary procedures and has been shown to reduce contrast volumes used by up to 40%. Our study looked at the clinical impact of DyeVert on incidence of post procedure acute kidney injury (AKI) at our hospital.

## **Methods**

Between July 1, 2017 to December 30, 2017, Patients undergoing cardiac catheterization with coronary interventions with chronic kidney disease defined as having a GFR < 60 by MRDR calculation method and/or Serum Cr. >1.5 were eligible to have the DyeVert system utilized during the procedure as a contrast reduction strategy. The decision to use the device was left to the treating cardiologist's discretion. Patients received the usual pre and post procedural hydration specific to the treating physician. Patients incurring AKI were defined as an absolute increase of  $\geq 0.3\text{mg/dL}$  or a relative increase of 50% in serum creatinine.

## **Results**

A total of 109 patients met inclusion criteria and were included in the study. 41 patients (Mean age 68.5, HTN 90.2%, DM 53.6%) had procedures using DyeVert while 68 patients (Mean age 71.3, HTN 92.6%, DM 51.2%) had procedures without the DyeVert device. Mean pre and post procedure Cr in DyeVert group was 1.56 and 1.56 with a mean decrease of 0.002 ( $p=0.97$ ). Mean pre and post procedure Cr without DyeVert was 1.51 and 1.54 respectively with a mean increase of 0.35 ( $p=0.44$ , SD 0.37, 95% CI [-0.06, 0.12]). The incidence of AKI in the DyeVert vs non-DyeVert group was 12.2% vs 16.2% ( $p=0.56$  pearson Chi Sq, OR 0.71, 95% CI [0.23, 2.24]). Average contrast usage in DyeVert vs non-DyeVert group was 128 ml vs 155 ml.

## **Conclusion**

Utilization of the DyeVert Plus resulted in lower average contrast use during procedures. The pre and post procedure Cr did not have a significant difference in either group. The DyeVert group showed lower absolute incidence of AKI but this difference was not statistically significant. The true clinical impact of DyeVert may not have been observed due to the small sample size and bias due to general awareness of contrast levels and AKI. Larger studies are warranted to evaluate this impact.