What the Puck?

Brock Hardin MD[1,2], C. Andrew Gilliland MD[1,3], and David Rupp MD[1,2]

[1]Marshall University Primary Care Sports Medicine Fellowship
[2]Marshall University Department of Family and Community Health
[3]Marshall University Department of Orthopaedics

History

The patient is a 10 year old male who presents with a 1 week history of inner left thigh pain after being struck in the leg with a puck during hockey practice. He has a family history of hereditary multiple osteochondromas but is otherwise healthy. He complains of mild pain with ambulation and pain with palpation of the affected area. He denies any numbness, tingling, or weakness. He reports that there was erythema at the site immediately after the initial injury which has now resolved.

Physical Exam

The patient appears comfortable and is able to climb onto the exam table without difficulty. There is a palpable 4cm dense non-mobile mass on the medial distal left thigh. There is no erythema or bruising. The mass is tender to palpation. There are multiple other smaller dense non-painful masses palpated along the femur and tibia. There is no limitation in range of motion. Muscle strength is 5/5 in bilateral upper and lower extremities. Sensation is intact.

Differential Diagnosis

- Hematoma
- Tumor (i.e. osteochondroma)
- Myositis ossificans
- Myofascial trigger point
- Baker's Cyst

Imaging

4 view x-ray of the knee demonstrates multiple osteochondromas in the femur, tibia and fibula. Along the medial thigh there is a large teardrop shaped osteochondroma. At the neck of the osteochondroma there is an area of sclerosis, suggestive of a non-displaced fracture.

Discussion

This case provided an interesting clinical decision regarding return to play. Literature regarding activity limitations in Hereditary Multiple Osteochondromas is very limited. One study suggested that patients with HMO play less sports than controls[1] making it difficult to study. In this patient, the lesions were benign, did not affect weight bearing bone or growth plates, and strength, mobility, and dynamic function were at baseline. It was decided that the patient could return to play. Since there is not acute risk of further injury, the patient's fracture should not be a limiting factor. We felt that the psychological stress caused by labeling his chronic disease as a limiting disability would be detrimental.

Final Diagnosis

Non-displaced fracture of the femoral osteochondroma in Hereditary Multiple Osteochondromas

Outcome

The patient returned to activity as tolerated without restrictions. It was recommended to apply ice regularly and ibuprofen as needed for discomfort.

1. D'Ambrosi, R. Effect of multiple hereditary exostoses on sports activity in children. Journal of Orthopedics. 2018. 15(4):927-930

I'M "FELINE" PAIN IN MY SHOULDER

KASEY STICKLER M.D.[1,2] // DAVID RUPP M.D.[1,2,3] // CHARLES GIANGARRA M.D.[1,3,4]

[1]Marshall University Joan C. Edwards School of Medicine , [2]Marshall University Family Medicine Residency Program
[3]Marshall Primary Care Sports Medicine Fellowship, [4]Marshall University Department of Orthopaedics

PATIENT PRESENTATION

18 y/o male who initially presented to outpatient clinic with sharp pain and popping sensation in left axilla while lifting weight resulting in palpable nodule. Pain worsened with overhead movements. Attempted ice and heat to alleviate pain. He did have chills and complaints of night sweats. Denies fever, headache, shortness of breath, nausea, vomiting.

HISTORY

PMH: depression, asthma, submandibular adenopathy
Surgeries: tooth extraction
Meds: Zoloft
Family Hx: Maternal aunt lymphoma, breast cancer
Social Hx: Denies tobacco, alcohol, or illicit drug use. Plays baseball. Lives at home with parents and three pet cats.

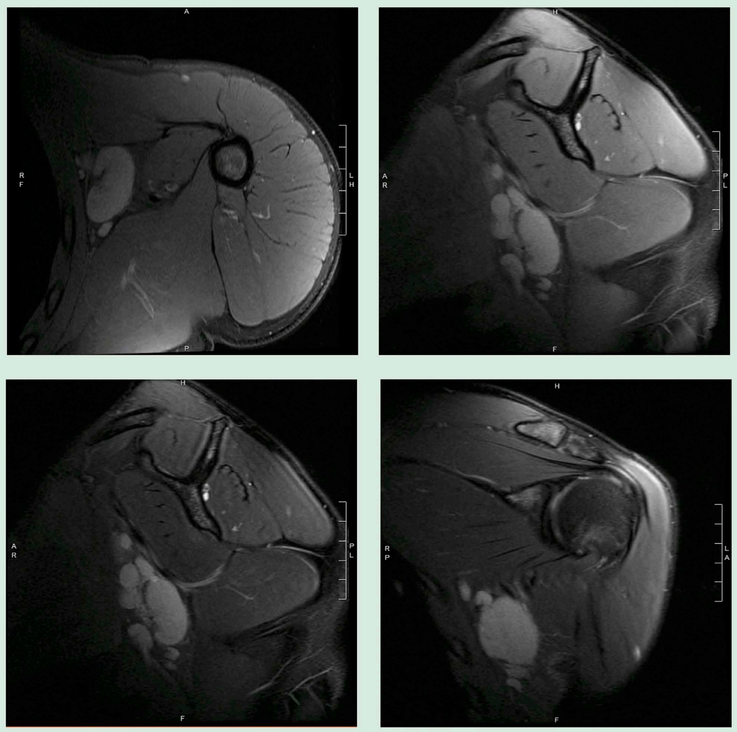
PHYSICAL EXAM

Vitals: Temp 98.1 HR 78 RR 18 BP 124/74
Sat 98% on room air
General: no acute distress, resting comfortably
HEENT, Cardiac, Lungs, Abdomen: unremarkable
Lymphatic: 1 cm palpable mobile, non tender subclavicular node and palpable 3 cm left axillary node
Skin: no rashes, ecchymosis, or lesions
MSK: Specifically, left upper extremity, full ROM. Upon palpation, swollen tendon like structure noted just under pec in anterior axilla. Neer, Hawkins, Drop Arm, Yergason's, O'Brien's , External rotation test negative. Neurovascularly intact distally
Neuro: CN2-12 grossly intact, reflexes 2+, sensation to light touch normal

LABS

TEST	RESULT
Peripheral Smear	atypical lymphocytes
CMV Ab IgM	Negative
CMV Ab IgG	Negative
EBV Ab VCA IgM	Negative
EBV Early Ag Ab IgG	Negative
EBV Ab VCA IgG	Positive (369)
EBV Nuclear Ag Ab IgG	Negative
B. Henselae IgG	Positive (1:2560)
B. Henselae IgM	Positive (1:800)

IMAGING



OUTCOME

Diagnosed with Cat Scratch Disease once serology resulted. Patient was treated with Azithromycin resulting in resolution of lymphadenopathy.

DISCUSSION

Cat scratch disease (CSD) generally occurs in immunocompetent individuals. Most commonly affects children and young adults. CSD can result from a scratch or bite of an infected cat, or cat fleas. B. henselae is the source of CSD. Cats are the main source for B. henselae. Most cats infected do not show clinical signs of infection. CSD presents in 85 to 90% of the time as a regional lymphadenopathy near the site of organism inoculation. However, in some individuals, the organisms can disseminate and infect the liver, spleen, eye, or central nervous system. Patients with localized disease generally have a self-limited illness. Diagnosis is through serologic testing for Bartonella. treatment is typically 5 day course of Azithromycin.

REFERENCES

- Klotz, Stephen A., et al. "Cat-Scratch Disease." American Family Physician, Am Family Physician, 15 Jan. 2011, www.aafp.org/afp/2011/0115/p152.html.
- Spach, David, and Sheldon Kaplan. "Microbiology, Epidemiology, Clinical Manifestations, and Diagnosis of Cat Scratch Disease." UpToDatewww.uptodate.com/contents/microbiology-epidemiology-clinical-manifestations-and-diagnosis-of-cat-scratch-disease
- Spach, David, and Sheldon Kaplan. "Treatment of Cat Scratch Disease." UpToDate, www.uptodate.com/contents/treatment-of-cat-scratch-disease?search=cat%2Bscratch%2Bdisease&source

Increased Utilization of Medicare Annual Wellness Visits within HMS via Standardization of Patient Interaction, PCMH, and Care Managers

Joshua Bryant, DO - PGY3, Jon Yun, DO – PGY2, Roger Quach, DO – PGY1, Arthur Huntley, DO – PGY1, Christopher Marazon, DO
Holzer Health System, Family Medicine Residency, Gallipolis, Ohio
jbryant@holzer.org; jyun@holzer.org ahuntley@holzer.org, rquach@holzer.org, cmarazon@holzer.org

Introduction

The Medicare Annual Wellness visit is an outpatient encounter developed to address patient needs that may not be fulfilled during a routine appointment. It focuses on preventative measures, home safety, the living will, and other important aspects of the older patient's life. Although many health systems work diligently to keep their patrons up-to-date on all matters of preventative medicine, the Medicare Annual Wellness Visit remains one aspect that showed persistent low captures across the nation. Our organization, Holzer Health Systems, worked to rectify this issue through the following means: use of Care Managers, monthly department meetings, and one-on-one patient discussion.

With these interventions in place, we were able to not only increase the number of Annual Wellness Visits in our communities, but also increase their capture within our system.

Methods

Methods for increasing the production and capture of MAWV:

1. Utilization of Care Managers: Care managers played a significant role in the MAWV. The Care Manager at the time of the visit obtained the height, weight and blood pressure of the patient; updating the patient chart ex: medication list, allergies, patient history. The patient then went through a brief questionnaire to determine their social needs. Also, quality measures such as vaccinations or preventative imaging, were ordered at the time of visit. Finally, the patient was educated on healthy life style, fall prevention, and other needed inquiries.

2. Patient-Centered Medical Home: 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.

3. One-on-One Patient/Provider Discussion: The final aspect of our strategy for AMW visit capture was patient-provider conversation. Many patients were unaware of the need for wellness appointments. Our provider staff worked each day to look through EMR charts to determine those in need of AMW during each appointment. They then explained to patients the importance of these visits so that our patrons can determine if this was something they wished to pursue. Finally, patients were scheduled for their follow-up MAWV.

Results

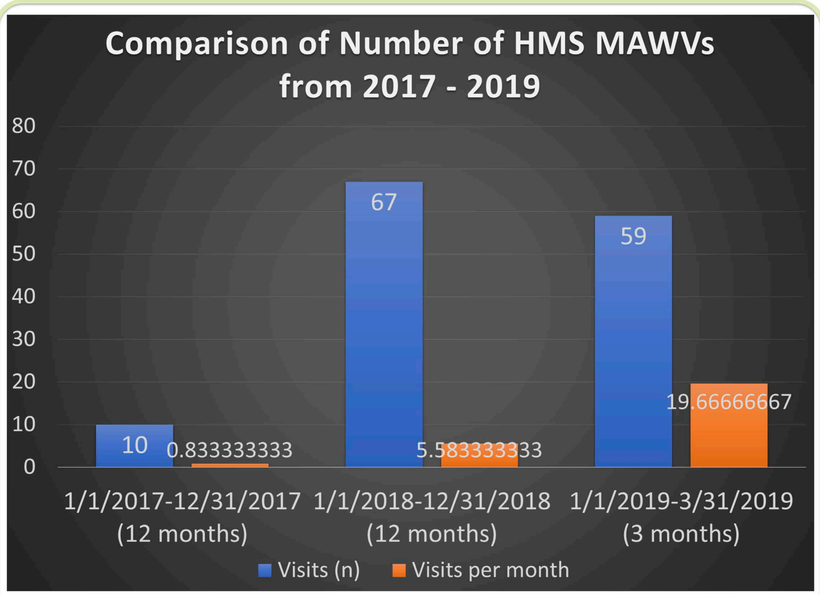


Figure 1. This graphic demonstrates the number of MAWV obtained at the beginning of our project in January 2017 to March 2019. The first two sets of columns show the number of visits captured each year. The final set of columns demonstrates the number of visits as of 2019.

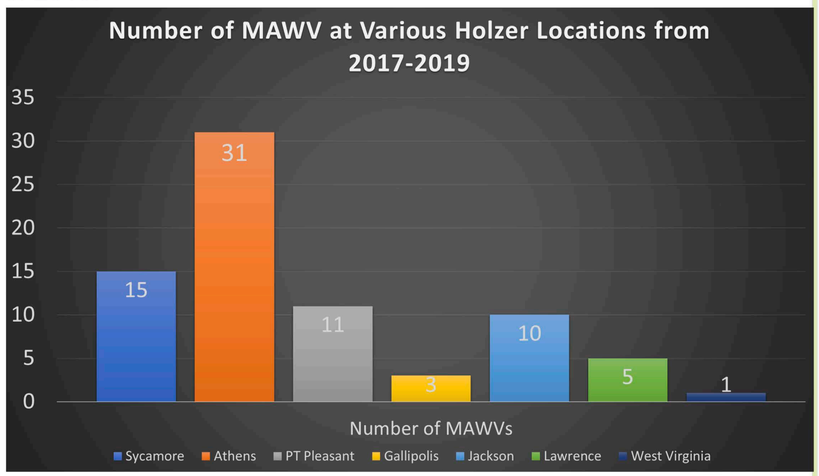


Figure 2. This graphic illustrates the number of Medicare Annual Wellness Visits obtained at our varying Holzer locations. These encounters were captured and recorded by our electronic medical record.

Conclusion

This research project was an attempt to better standardize data collection and practice professional integration in an attempt to better streamline Welcome to Medicare visitation. Care managers were employed, for the purpose of initially interviewing patients, which allowed physicians to continue with prior duties uninterrupted.

Care managers, although comprising several individuals of different titles, worked to answer all relevant questions associated with the visit, leaving the physician to handle aspects of education/care intervention. Modifier 25 codes utilized in billing for patients requiring follow ups, allow relevant care to continue immediately, while separating the visits, and not jeopardizing the Medicare reimbursement. We utilized PCMH (Patient Centered Medical Home) as an opportunity to analyze data, and view physician specific numbers to increase numbers and capture a larger patient population.

One on one conversations with patients upon completion of the Welcome to Medicare visit, was the most important addition to the model. After the care manager completed the questionnaire, the patient was roomed and allowed to directly converse with their physician, which offers several advantages. Understanding the next stages of care allows the patient to be on board with all care interventions, and to be apart of the preventative process.

Ultimately the project was viewed as a success, evident in many ways. The time needed to process a patient using these methods severely decreased over the course of the experiment and are now able to be done in a standard 15-minute patient slot. With the addition of GC modifiers, patient risk factors are now followed up on immediately, and patients are pleased that they are seeing the transition from welcome to Medicare to primary care intervention. One-on-one interactions leave patients more educated about preventable risk factors, educating our community while servicing them as well.

References

1.Scott Davis, DO, Monthly PCMH Presentations on Quality Measures
2.Beth Cochran, RN, Holzer Sycamore Care Manager
3.Matt Mossburg, Holzer Specialist on Population Health
4.https://www.ohio.edu/medicine/about/offices/core-research-office/getting-started.cfm
5.Joint Principles of the Patient-Centered Medical Home, March 2007. https://www.aafp.org/dam/AAFP/documents/practice_management/pcmh/initiatives/PCMHJoint.pdf
6.https://www.medicare.gov/index

Acknowledgements

We would like to thank Dr. Scott Davis, Matt Mossburg, and Beth Cochran who have been instrumental in improving the utilization of MAWV throughout our system. Thank you to the entire staff of HMS whose hard work is reflected in these results. Thanks to Jo Ann Raines for helping us through our poster creation. Finally, special thanks to Dr. Christopher Marazon for continuing to pioneer medical education at Holzer Health System.

Reducing Emergency Department Utilization Rates through Improvement of a Family Medicine Answering Service

A Resident-Driven Quality Improvement Project

Shawndra Barker, MD, Brandon Flores, MD (PGY-2), Gregory Hill (MS-III), Carolyn Curtis, MD, Adam Franks, MD

Marshall University Department of Family & Community Health

Introduction

In this day and age, 24-hour accessibility for patients is both extremely important and expected. It is widely known that ED utilization is too high and often inappropriate. Marshall Family Medicine provides a resident-based call service for our patients in the evenings and on weekends, providing an opportunity for them to speak with their medical team whenever they have concerns.

Our aim is to reduce the utilization of the Emergency Department through improved utilization of the Family Medicine Answering Service (FMAS).

Cycle 1

Plan – ID the problem: Emergency Department utilization is excessive. The Gatekeeper theory was used for the Answering Service being not utilized in an efficient manner. Levels of error could be physician- or patient-related.

Do – Collect all of the calls for a four-month period (March-June 2018) and analyze for disposition and documentation.

Study – Cycle 1 is the first four-month period prior to resident education/intervention. During this time, 56 calls were correctly documented in the patient's medical record; 72 calls were not documented. Throughout Cycle 1, 77 calls involved medical concerns, 23 calls concerned critical laboratory findings, and 25 calls involved medication refills. Three (3) calls did not fit into any category. Of these calls, eleven (11) patients were instructed to go to the ED for further evaluation, and 40 were managed on an outpatient basis.

Act – Plan an intervention to improve resident documentation and thereby help with future data collection.

Cycle 2

Plan – ID the problem: Poor documentation leads to poor patient care and flawed data collection. The Education Theory was utilized to re-establish expectations for appropriate documentation of tele-encounters as well as an emphasis on outpatient management.

Do – A re-orientation of PGY-2 and PGY-3 Family Medicine residents regarding appropriate documentation expectations on Answering Service was conducted at the start of the new resident year. Data was re-collected for the following four months (July-October 2018) of Answering Service for analysis.

Study – Throughout Cycle 2, after resident education/intervention, 27 calls were correctly documented in the patient's medical record; 14 calls were not documented (p=0.036). 42 calls involved medical concerns, 17 calls entailed critical lab findings, and seven (7) calls concerned medication refills. Two calls did not fit into any category. Thirteen (13) patients were instructed to go to the ED during this time, and 27 were managed as outpatients.

	Cycle 1	*Cycle 2*	*Chi-Square*	*P-Value*
Women	81	40		
Men	45	21	0.030	0.864
Medical	77	42		
Critical Lab	23	17		
Refill	25	7		
N/A	3	2	3.420	0.181
TO ED	11	13		
Outpatient	40	27	1.380	0.240
N/A	77	14		
Yes Documented	56	27		
Not Documented	72	14	4.405	0.036

Act – We plan to carry our current methodology and practice over into our next cycle to reduce inappropriate ED utilization.

Summary & Discussion

This project focused on implementing resident education concerning Answering Service documentation to better patient care and data collection. In order to determine the effectiveness of this service, initial data was collected to assess the variety of calls received.

Over a four-month period, information was collected and classified into three categories: medical concern, critical laboratory findings, and medication refills. A second four-month period again collected patient demographics, the nature of the call, and the ultimate outcome including referral to the ED for further management.

Documentation of after-hours call improved after resident education/intervention (p=0.036). This intervention is one of the first steps in improving this service for our patients. Our goal is to continue data collection and patient education/intervention with our next cycle in order to reduce inappropriate use of emergency departments.

References

1. Curtis P, Talbot A, Liebeseller V. The after-hours call: a survey of United States family practice residency programs. J Fam Pract. 1979 Jan;8(1):117-22.

2. Hildebrandt DE, Westfall JM, Fernald DH, Pace WD. Harm resulting from inappropriate telephone triage in primary care. J Am Board Fam Med. 2006 Sep-Oct;19(5):437-42.

3. Hildebrandt DE, Westfall JM, Smith PC. After-hours telephone triage affects patient safety. J Fam Pract. 2003 Mar;52(3):222-7.

4. Kjeldsen HC, Ovesen LC, Christensen MB, Olesen F [Are out of hours contacts with physicians necessary? Assessment by physicians on call and by patients]. [Article in Danish] Ugeskr Laeger. 2000 Apr 3;162(14):2032-6.

5. Scarfone RJ, Luberti AA, Mistry RD. Children referred to an emergency department by an after-hours call center: complaint-specific analysis. Pediatr Emerg Care. 2004 Aug;20(8):507-13.

Improving Pneumonia Vaccination Rates in a Provider-Based Clinic

A Resident-Led Quality Improvement Project

Katherine Bennett, MD, John Parker, MD, Adam Franks, MD

Marshall University Department of Family & Community Health

Background

Streptococcus Pneumoniae bacteria causes a number of illnesses ranging from mild ear and sinus infections to pneumonia, meningitis, sepsis and death. Adults over 65 have the highest risk of all age groups of infection and mortality from pneumococcal disease. This risk is even higher for those with certain comorbidities, or who smoke tobacco.

In addition to behavioral changes such as proper hand hygiene, the best way to prevent pneumococcal disease is through vaccination. According to the CDC, in 2017 the national percentage of adults age 65 and older in who have ever received a pneumococcal vaccine is 69%. Therefore, our aim for this intervention is to increase pneumonia vaccination rates in our patient population to the CDC reported national average of 69%.

Methods

Three “Plan, Do, Study, Act” (PDSA) cycles:

Primary Drivers	Interventions
Physician Knowledge	Physician Survey Regarding Barriers to Vaccination (Sept 2017)
	Grand Rounds Lecture (Sept 2017 “The Adult Wellness Visit)
Physician Reminders	Grand Rounds Lecture (Sept 2017 “The Adult Wellness Visit”
	Measure Added to PCMH Huddle System (Oct 2017)
Patient Misconceptions	Measure Added to PCMH Huddle System (Oct 2017)
	Informational Video Created and Played in PBC Waiting Room (Dec 2018)

Cycle 1

Plan – Problem Identified: Low pneumonia vaccination rates for patients age 65 or older. With an uncertain/unidentified cause, the theory was that it was a multifactorial issue.

Do – SEPT 2017: Survey created for physicians regarding perceived barriers and possible solutions to administering the pneumonia vaccine (physician knowledge, reminders, patient knowledge).

Study –

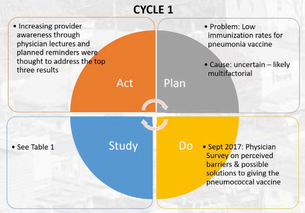


TABLE 1: Results from Physician Survey

20 total responses, binary Y/N responses, could vote more than 1 & write in suggestions

Barriers	Solutions
Patient Awareness – 15	Flyers - 14
Patient Misconception - 10	Ads in Clinic - 10
Provider Forgets – 8	Huddle - 10
Time Constraints – 4	Pocket Guides - 6
Patient is unsure they had it – 1	Better Records - 4
Patient obtains from pharmacy – 1	Grand Rounds - 3

Act – SEPT - OCT 2017: While patient-related concerns were the primary result, increasing provider awareness through grand rounds lecture and planned reminders placed on huddles were thought to address the top three results.

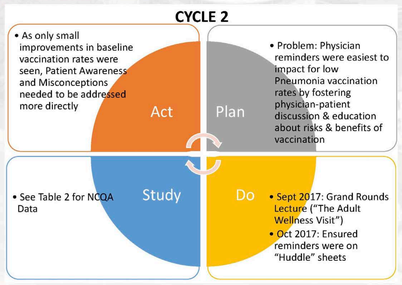
Cycle 2

Plan – Identified Problems: Physician Reminders were the easiest to impact for low pneumonia vaccination rates, with the theory being that adding the reminders to daily provider huddles would remind physicians to engage and educate patients about the risks and benefits of vaccination.

Do – OCT 2017: Ensured reminders were on Huddles

Study – See NCQA Data

Act – Since only small improvements in baseline rates were observed, Patient Awareness and Misconceptions needed to be more directly addressed.



Cycle 3

Plan – Identified Problem: Patient Knowledge/Misconception was a cause of low pneumonia vaccination rates. The theory that better educational opportunities provided to patients will lead to more informed decisions about medical safety and increase vaccination rates.

Do – DEC 2017 – DEC 2018: Plan and create an informational video to play in the waiting room (started playing Dec 2018)

Study – See NCQA Data

Act –

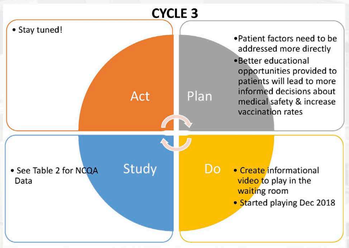


TABLE 2: Pneumonia Vaccination Rates (NCQA Data)*

End of:	March	June	Sept	Dec
2017	54.95%	55.01%	57.71% **	56.74% ***
2018	37.82%	58.02%	58.02%	59.60% ****

* This is a mobile measure that can decrease as patients in the population age into 65 years

** PDSA Cycle 1 implemented during this time

*** PDSA Cycle 2 implemented the month prior

**** PDSA Cycle 3 implemented during this time

References

1. Aka Aktürk Ü, Görek Dilektaşlı A, Şengül A, Musaffa Salepçi B, Oktay N, Düger M, Arık Taşyıkan H, Durmuş Koçak N. Influenza and Pneumonia Vaccination Rates and Factors Affecting Vaccination among Patients with Chronic Obstructive Pulmonary Disease. Balkan Med J. 2017 May 5;34(3):206-211. doi: 10.4274/balkanmedj.2016.1028. Epub 2017 Apr 6. PMID:28443565

2. Brown T, Goldman SN, Persell SD, Lee JY, Doan CT, Stephens Q, Baker DW, Cameron KA. Development and evaluation of a patient education video promoting pneumococcal vaccination. Patient Educ Couns. 2017 May;100(5):1024-1027. doi: 10.1016/j.pec.2016.12.025. Epub 2016 Dec 28. PMID:28069322

3. Çiftci F, Şen E, Demir N, Çiftci O, Erol S, Kayacan O. Beliefs, attitudes, and activities of healthcare personnel about influenza and pneumococcal vaccines.Hum Vaccin Immunother. 2018 Jan 2;14(1):111-117. doi: 10.1080/21645515.2017.1387703. Epub 2017 Nov 29. PMID:29049005

4. Lissenden B, Balkrishnan R. Does Risk Adjustment Reduce Vaccination in the Elderly? Evidence From Medicare Advantage. Med Care Res Rev. 2018 Jul 1:1077558718785559. doi: 10.1177/1077558718785559. [Epub ahead of print] PMID:29998793

5. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). 2017. “Pneumonia.”Last modified Jan 2017. https://www.cdc.gov/nchs/fastats/pneumonia.htm

6. NCQA. HEDIS Measures and Technical Resources.Pneumococcal Vaccination Status for Older Adults (PNU). https://www.ncqa.org/hedis/measures/pneumococcal-vaccination-status-for-older-adults/

7. Centers for Disease Control and Prevention (CDC). 2014. “Pneumonia Can Be Prevented—Vaccines Can Help.” Last modified Feb 18. http://www.cdc.gov/Features/Pneumonia/

The Impact of Body Mass Index on Adult Blunt Trauma Outcomes

Rahman Barry, M.D.*, Milad Modarresi, M.D., David Denning, M.D., Errington Thompson, M.D.,
Stephen Wilson, M.D., Juan Sanabria M.D.

Department of Surgery, Marshall University
Huntington, West Virginia

Introduction

Globally, 10% of all mortalities are related to trauma, accounting for approximately 5 million deaths each year. Trauma has become the sixth leading cause of death and the fifth cause of significant disability worldwide. The age group most frequently impacted by traumatic injuries are the between 15 and 45 years old, with males more frequently injured than females. Globally, It is estimated that 2.2 billion people will be overweight (BMI≥25) and 1.1 billion people will be obese (BMI≥30) by 2030.

Obesity is a known risk factor for sub-optimal outcomes related to surgery and complicates the management of coexisting medical conditions. Surgeries performed on obese patients have been found to be technically more challenging and carry a higher mortality risk when compared to patients with a lower body mass index (BMI). The aim of this study is to evaluate adult patient outcomes after blunt traumatic injuries based on their body mass index (BMI), injury severity, and mechanism of injury.

Methods

The incidence, prevalence, and mortality rates from blunt trauma by age, sex, cause, BMI, year, and geography were abstracted using datasets from i)The Global Burden of Disease(GBD) group ii)The United States *Nationwide Inpatient Sample*(NIS) databank iii)Two regional trauma centers.

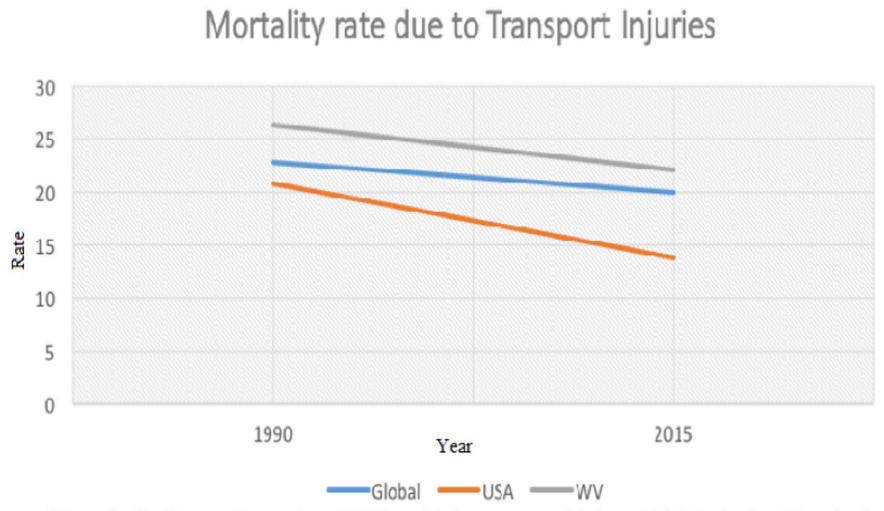


Figure-1: Showing mortality rate (per 100,000 people) due to transport injuries at Global, National, and State level.

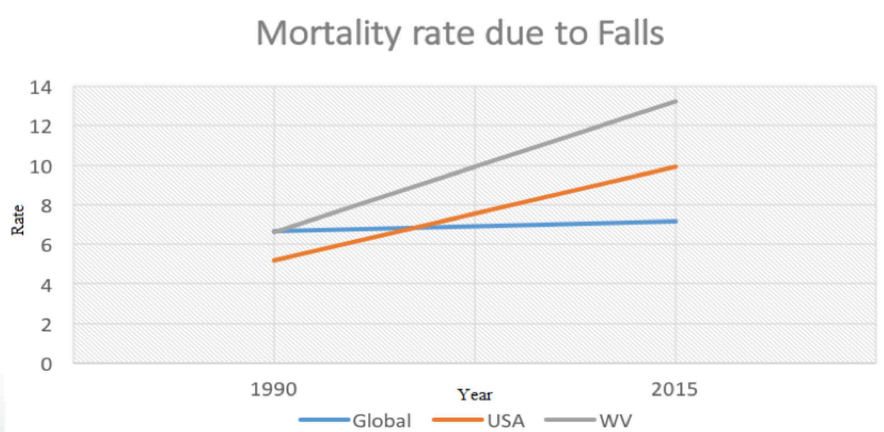


Figure-2: Showing mortality rate (per 100,000 people) due to fall injuries at Global, National and State level

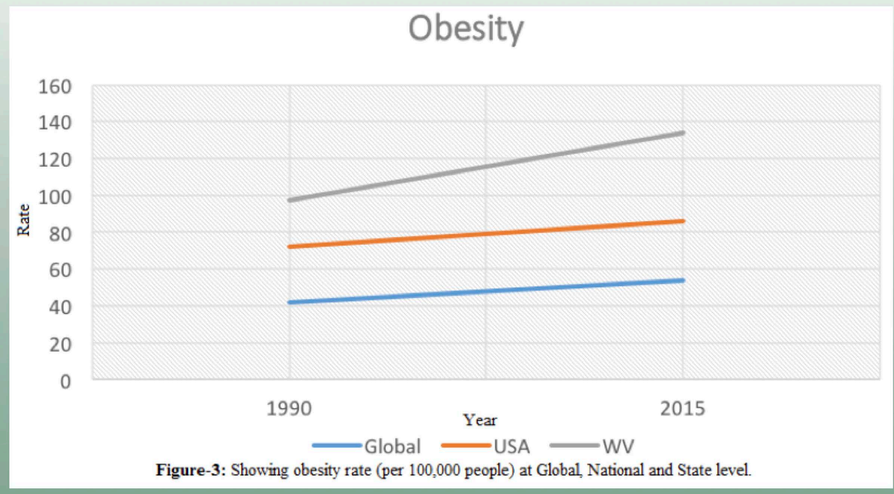


Figure-3: Showing obesity rate (per 100,000 people) at Global, National and State level.

Results

The incidence of blunt trauma secondary to falls increased at global, national, and state levels during our study period from 1990 to 2015, with a corresponding increase in BMI at all levels($p<0.05$). Mortality due to fall injuries was higher obese patients at all levels($p<0.05$). Analysis from *NIS* demonstrated higher mortality for obese patients nationally, both after motor vehicle collisions(MVC) and mechanical falls($p<0.05$). Regional data demonstrated in obese and non-obese patients, a higher blunt trauma mortality rate of 2.4% vs. 1.2%, respectively($p<0.05$) and a longer hospital length-of-stay(LOS) of 4.13 versus 3.26 days, respectively($p=0.018$).

Conclusion

Our data suggests that obesity results in worse outcomes following blunt trauma, as reflected by the higher mortality rate of obese patients in our study. Given the closely matched age, injury severity scores and medical comorbidities between our obese and non-obese cohorts, obesity independently predicted mortality in our study. In addition, obese trauma patients had a significantly longer hospital length of stay of approximately 1 day compared to their non-obese counterparts.

Pediatric High Blood Pressure Confirmation and Documentation: A Quality Improvement Project

Kathryn Huggins DO, Jack Stines MD, Mark Wippel MD, Jeffrey Harris MD

MARSHALL PEDIATRICS, HUNTINGTON, WV

BACKGROUND

- Pediatric blood pressure (BP) elevation represents an important finding as it correlates with a higher and earlier onset of hypertension. [1,2, 4]
- Accurate diagnosis and measurement can be influenced by patient cooperation, equipment, time constraints and accessibility to normal pediatric BP ranges. [3]
- Elevated BP readings should be rechecked to confirm diagnosis. Physician documentation is also important to ensure proper management.
- The 2017 American Academy of Pediatrics (AAP) BP guidelines help address these concerns.

OBJECTIVES

- Determine ways to improve pediatric BP measurement and resident documentation using the latest AAP blood pressure guidelines.

METHODS

- This was a retrospective study of patients aged 3-17 years old presenting to the clinic for a routine visit. Study began during the 2017-2018 academic year.
- A series of PDSA cycles were selected with reference to AAP guidelines, aimed at either nursing staff and/or residents. (Table 1)
- To determine if BP measurement improved, there needed to be 2+ BP measurements documented during the visit, per AAP guidelines. To determine improvement in BP documentation, the resident needed to document abnormality in the clinic note.
- 1-2 months after each intervention a randomized sample of 50 patients were selected. Only those with an abnormally high BP reading were included in the study (Figure 1) . Pre-study data was taken 2 months prior to study. To ensure validity of baseline data randomized samples were also obtained from the same date range 1 year prior to each PDSA cycle. (Figure 2)
- Statistical significance was determined by paired t-test data following each PDSA cycle.

Figure 1: Patient selection and outcomes.

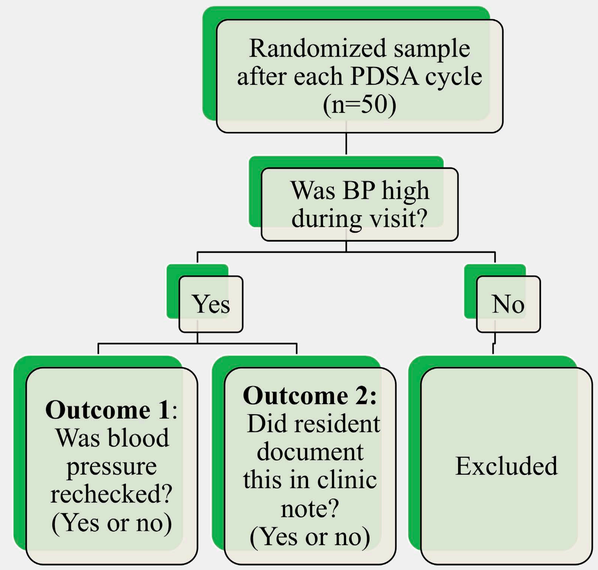


Table 1: Description of PDSA Cycles

PDSA Cycle	Description
1	Pediatric BP charts and elevated BP criteria placed in resident workspace
2	Nursing BP skills class and review of documentation requirements
3	Screening BP charts placed at nursing station
4	Badge given to residents summarizing screening BP chart and diagnostic criteria

Figure 2: Outcomes of pre-study data using 50-patient randomized groups from one year prior to each PDSA cycle.

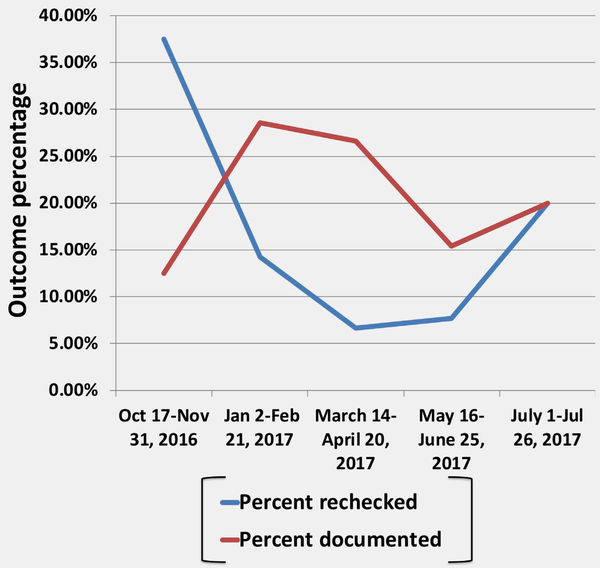
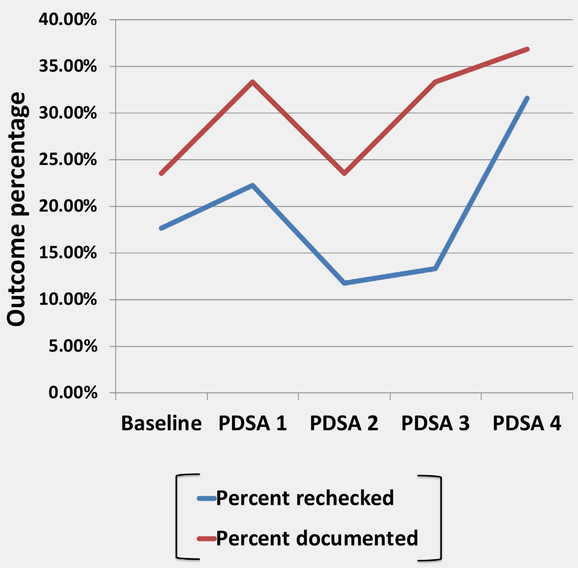


Figure 3: Outcomes of post-interventional data following each PDSA cycle.



RESULTS

- Compared to pre-study data, there was a statistical significance in both BP measurement and documentation after the final PDSA cycle (p-value <0.05).
- Documentation increased from baseline after all PDSA cycles, except for PDSA 2, which produced no change from baseline.
- Confirmatory BPs increased after placing pediatric BP charts and diagnostic criteria in resident workspace (PDSA 1) and after providing resident badges (PDSA 4).

CONCLUSIONS

- Abnormal pediatric BPs may be difficult for residents to identify since normal values are based on age, height, and sex.
- Resident badges with the AAP screening BP chart and diagnosis criteria showed the biggest improvement from baseline for both outcomes, suggesting easy accessibility to guidelines can improves identification of BP abnormalities.
- Further PDSA cycles are still warranted as the rates of documentation and confirmatory BPs are below 50%.

REFERENCES

1. Din-Dzietham R et al. (2007) High blood pressure trends in children and adolescents in national surveys, 1963 to 2002.
2. Hansen ML et al. (2007) Underdiagnosis of hypertension in children and adolescents.
3. Flynn, J. T et al. (2017, September 01). Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents.
4. Rosner B et al. (2013) Childhood blood pressure trends and risk factors for high blood pressure: the NHANES experience 1988-2008.

Cabell Huntington Hospital
Care Transition Team (CTT):
Readmission Reduction Program

Problem Statement

There was not a consistent process for post discharge coordination of care at Cabell Huntington Hospital, as evidenced by: poor compliance with follow-up appointments and medications, increased readmissions, and excessive health cost post discharge care.

Project Scope

Patient Discharged from CHH to 90 Days Post Discharge

Team Members

Amanda Keaton, RN, Care Transition Nurse

Denise Boudreau, Care Transition Medical Social Worker

Lisa Reynolds, RN, Director of Home Health

Project Goal

Establish a Care Transition Team to coordinate care post discharge for up to 90 days for Pneumonia and CHF patients. The goal for Pneumonia patients is to keep the readmission rate below the national average at 16.7%, and CHF patients below the national average at 21.7%.

Research

"Poorly coordinated care transitions from the hospital to other care settings cost an estimated $12 billion to $44 billion per year."1

"In October 2012, the Centers for Medicare and Medicaid Services (CMS) instituted penalties for facilities with high readmission rates within 30 days of discharge for three conditions: myocardial infarction (heart attack), heart failure, and pneumonia."2

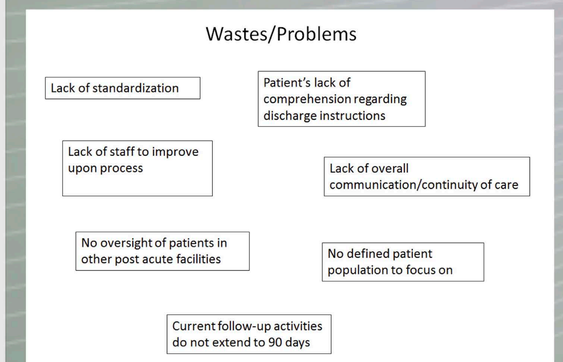
"Improving care transitions for complex patients moving from hospitals to SNFs, to their own home, or to another setting can result in significant savings while improving patient safety."2

1 L.O. Hansen, R.S. Young, K. Hinami, et al. 2011. Interventions to Reduce 30-Day Rehospitalization: A Systematic Review. *Annals of Internal Medicine 155*: 520–8.

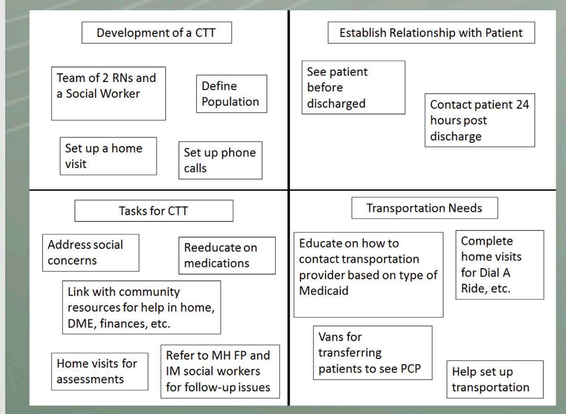
2. R. Burton. September 13, 2012. *Health Policy Brief: Improving Care Transitions. Health Affairs.* (Issue Brief). http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief_id=76 (accessed 10/3/13).

Step 1: Mapped Out Current State Process

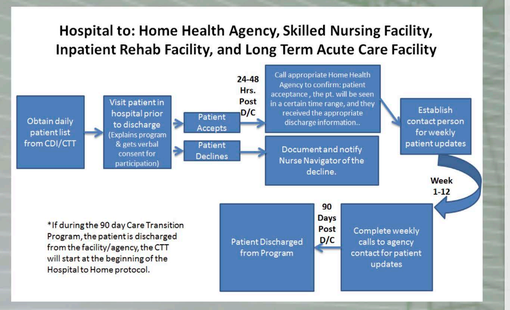
Step 2: Identified Opportunities for Improvement

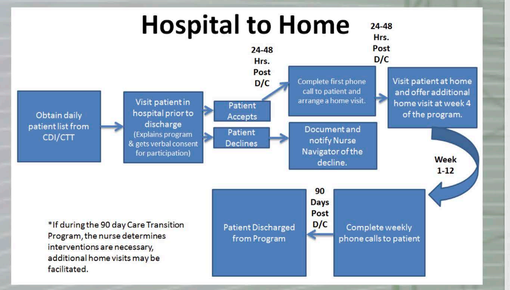


Step 3: Identified Solutions



Step 4: Mapped Out Future State Process





Step 5: Developed Standard Work

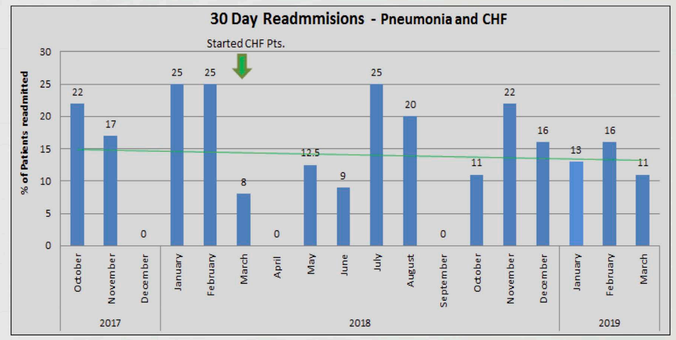
Home Visit Standard Work

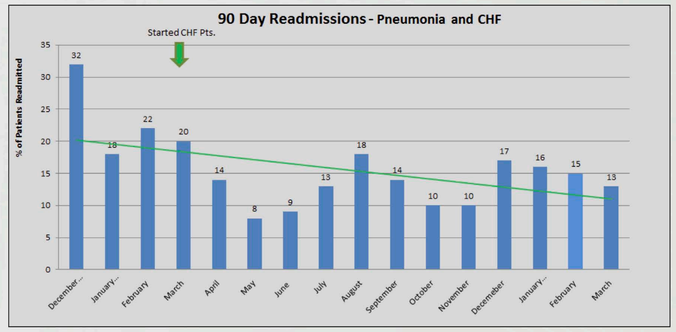
- Greet patient/family and explain role
- Complete consent/review of insurance (only used if any equipment needs identified)
- Identify PCP
- Determine PCP follow up appointment date and time and any secondary/specialists appointment date and time
- Discuss transportation needs to PCP and other appointments – intervene as necessary. Collaborate with CTT social worker, Denise Boudreau.
- Determine emergency contact (s)
- Review medical equipment needs against what was ordered – intervene as necessary
- Complete vital signs *
- Assess pain level *
- Assess cardio-pulmonary status *
- Asses blood sugar
- Review home equipment for operability when applicable *
- Review discharge medications
  - All in home medications –including over the counter meds, use of inhalers, medication schedule and indications
- Immunizations
  - Flu and Pneumonia
- Instruct on smoking cessations when applicable
- Assess home environment for:
  - other cohabitants
  - sanitation
  - physical safety- stairs, flooring, etc.
- Assess nutrition – food in kitchen, dietary education (low sodium, etc.)
- Assess education needs to promote self-management, discuss signs and symptoms of medical diagnosis and ways to manage the disease process.
- Review/ update advanced directives (CTT social worker)
- Establish goals for patient to promote health and safety
- Provide the patient/family with the CTT phone numbers and instruct to call with any questions or concerns.
- Any abnormalities reported to patients PCP and/or appropriate specialist*

Step 6: Identified Implementation Plan

What	Who	When
Education on Program	MH Providers Nursing Staff Management Staff Employee Newsletter	April 2017
Create Job Descriptions for: RNs and Medical Social Worker	Director of Home Health	February 2017
Hire Employees	Director of Home Health	February 2017
Determine location of program (HH)	Team	December 2016
Develop Standard Works for: Visiting patient prior to d/c Phone calls Home visits	Team	September 2016
Create Brochure for patients and providers	Team	September 2016
Determine how to identify patients for program (CDI)	Team	September 2016
Determine patient population for program (pneumonia and CHF)	Team	September 2016
Go Live	Team	April 2017

Outcomes





Goals for Future Development

- Automated "Care Transition Team Patient List" sent directly to CTT – Completed
- Add more diagnoses to be eligible for the program.
- Additional CTT RNs to cover more diagnoses and be provider group specific.
- Ability for documentation to be seen by hospital staff.
- Ability for Providers to consult CTT for high risk for readmission patients regardless of diagnosis.
- Look into billable service.
- Develop a standardized communication to the patient's PCP upon hospital discharge, to inform them of patient's participation in CTT Program.

Quality Improvement Project for Code Status Determination & Documentation

Julia Parsons, DO , Hisham Hirzallah, MD , Ashley Zawodniak, DO
MARSHALL INTERNAL MEDICINE

Background

Different services admit many patients everyday at CHH. Code Status should be determined for each patient and must be documented in the patient chart at admission time. There have been numerous occasions where rapid responses and code blues have been initiated on a patient only to find that they do not have a code status. When this occurs, treatment and intervention are continued as the patient is assumed full code, which results in trauma and un-wanted interventions in some patients who would not have wanted CPR or intubation.

Objective

We aimed to assess the frequency of such incidents when rapid response or code blue events occurred in a patient with undetermined code status and propose quality improvement measures to reduce the frequency.

Methods

Rapid response and code blue data from Jun-Nov 2018 was collected retrospectively. Descriptive analysis was done and results were obtained as depicted. We looked at whether or not the patient was full code, DNR, or did not have a code status documented.

Results

Out of **70 rapid response events** that happened during the study period, 47 (67%) were called on patients with undetermined code status (figure I), 6 out of these were continued as a code blue event. Out of 35 code blue events, 19 (54%) were called on patients with undetermined code status (Figure II).

Figure I

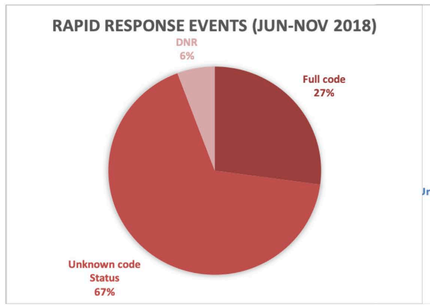


Figure II

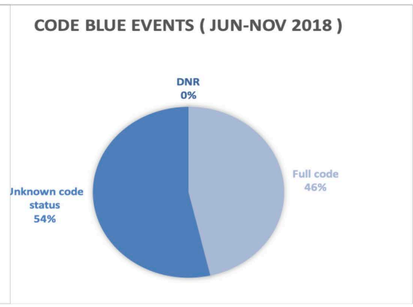


Figure III

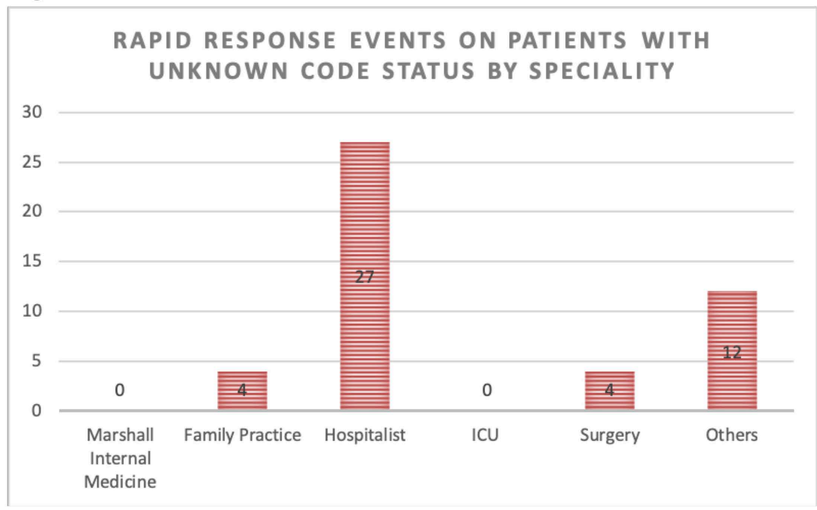
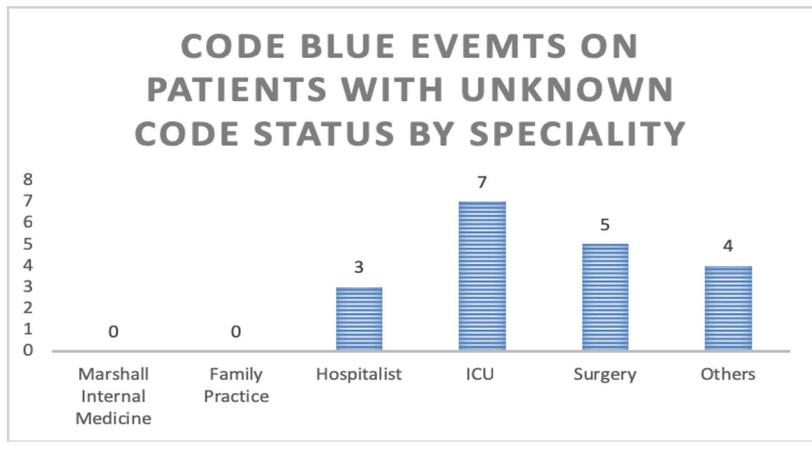


Figure IV



Looking at rapid response events that were called on patients with undetermined code status, we found that 27 out of 47 patients were admitted by hospitalist IM service, other services (OBGYN, Urology, Orthopedics, and Pediatrics) were responsible for 12 cases (figure III). Nearly one third of the code blue events on unknown code status patients happened in the ICU (Figure IV).

Quality Improvement Measures Proposal

We propose an electronic record generated check point that do not allow the admitting physician to proceed in the admissions orders before determining the code status or the reason behind the unknown code status.

Discussion

Although ICU had a high number of code blues without code status, we attribute that to emergent transfers to the floor without a code status that subsequently code before code status is determined by ICU team and also a higher proportion of codes due to acuity of patients. We propose the addition of a pop-up to be implemented in Cerner if a patient is admitted to the hospital and does not have a code status ordered. This pop-up would remind you each time you place an order on the patient that they do not have a code status ordered. We could look at the data again after implementation of this intervention to see the results.

The Role of Text Message Reminders in Adherence to Bowel Preparation in Outpatient Colonoscopies – A Preliminary Abstract

Dylan Weaver, Soheb Khan M.D., Ajay Sekhon M.D., Sutoidem Akpanudo M.D. PhD, MPH, FACP, Nihar Shah M.D.
Marshall University Joan C. Edwards School of Medicine

Introduction

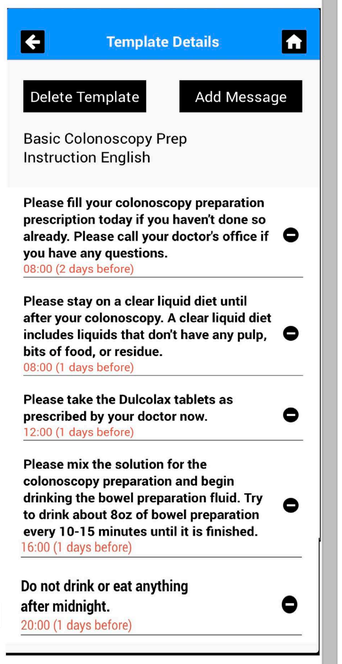
Colonoscopy is a powerful tool in the diagnosis of colorectal disease. Quality bowel preparation prior to colonoscopy is essential in achieving proper diagnostic quality of the procedure. Poor preparation can lead to missed diagnoses, increased time per procedure, and repeat procedures. This can decrease the diagnostic quality of the procedure and increase patient cost. Text message reminders are used to improve patient appointment attendance, adherence to medication, and future follow up. Using text messages as a reminder for colonoscopy preparation should improve the quality of the bowel preparation in patients receiving outpatient procedures.

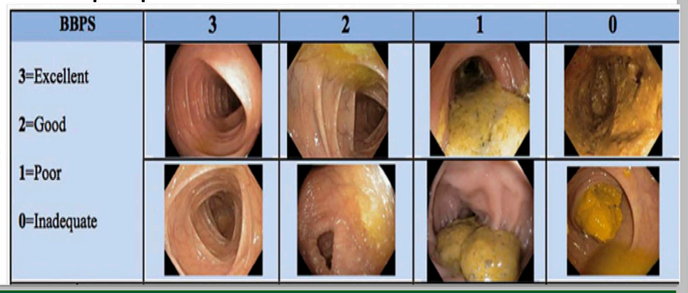
Participation Criteria

- **Inclusion criteria** - patients age 18-75 undergoing routine outpatient colonoscopy procedure
- **Exclusion criteria** - Patients with history of colorectal surgery, known colonic stricture or obstructing tumor, known or suspected bowel obstruction or perforation, pregnant or lactating women or patients who do not have text messaging capability or cannot give informed consent

Methods

- Patients who are getting outpatient colonoscopy screenings are consented to participate in study, and sorted into a text message receiving group and a control group
- Patients receive 5 text message reminders at appropriately timed intervals to remind them of the various stages of outpatient bowel preparation
- Colonoscopy is performed with the physician blinded
- Physician scores patient with Boston Bowel Preparation Score which numerically assigns a value to bowel preparation quality in the ascending, transverse, and descending colons





Results

	Receive Reminders	N	Mean	Standard Deviation	Standard Error Mean
Boston Bowel Preparation Score	Yes	15	7.000	1.309	.3381
	No	14	6.786	1.311	.3505

Discussion

Text messaging is a powerful communication tool used almost universally in our society. With statistical support, text message reminders such as those used in this study could be broadly implemented into practice. At this time, there is no statistical significance with the Mann-Whitney test or Independent Samples test. The patient participation for this study was limited which likely factored in to the lack of statistical significance. There was, however, an increased mean score for patients who received text message reminders prior to their procedure. With this information, we believe that with a larger sample size, there might be a statistically significant correlation between patient bowel preparation quality and the use of text message reminders. There might also be improvement in the time of procedure and a decrease in the number of repeat procedures required, which will improve patient care. Future studies should be performed with a larger sample size to prove this.

Literature Cited

- Nihar Shah MD, *Colonoscopy Prep Reminder* Computer Software. *Apple App Store* *Vivek Shah, Capermint Technologies Pvt. Ltd. 2018*
- Lai, Edwin J., et al. "The Boston Bowel Preparation Scale: a Valid and Reliable Instrument for Colonoscopy-Oriented Research." *Gastrointestinal Endoscopy*, vol. 69, no. 3, 2009, pp. 620–625., doi:10.1016/j.gie.2008.05.057.
- Calderwood AH,Jacobson BC. Comprehensive validation of the Boston bowel preparation scale. Gastrointest Endosc 2010;72:686-92
- Lorenzo-Zúñiga, Vicente, et al. "Preparation for Colonoscopy: Types of Scales and Cleaning Products." *Revista Española De Enfermedades Digestivas*, vol. 104, no. 8, 2012, pp. 426–431., doi:10.4321/s1130-01082012000800006

CT head in syncope workup in Emergency Department

Xiaoliang Qiu; Sammy Nassri; Kanaan Mansoor; Waiel Abusnina; Jo Ann Raines; Mitch Charles

Introduction

Syncope (passing out or fainting) or near-syncope (dizziness, lightheadedness or almost passing out) is a common reason for visiting an emergency department (ED) and most episodes are not serious. Many tests may be ordered for the workup of such episodes. However, expensive and low-yield diagnostic tests for syncope should not be routinely ordered. CT scans of the head are low-yield in patients without trauma or neurological findings. Choosing Wisely from American College of Emergency Physicians recommend **avoid CT head in asymptomatic adult patients in the ED with syncope, insignificant trauma and a normal neurological evaluation**.

Objective

The purpose of this study was to determine the yield of head CT scans in patients presenting to the ED in a tertiary teaching hospital with dizziness, lightheadedness, or syncope. We also aim to decide the outcomes of ED visit including discharge or hospital admission, and its related factors.

Methods

Study setting and patients: We retrospectively reviewed the electronic medical records of all patients presenting to ED in Cabell Huntington Hospital between January 1, 2018, and December 31, 2018, who presented with complaints of dizziness, lightheadedness, or syncope documented by triage nurse. A total of 794 patients were initially included, of which 14 patients were excluded from the study due to lack of ED physician documentation in patients with CT head within the 24 hours after ED registration. Therefore, 780 patients were finally enrolled in the study. Table 1 demonstrates the characteristics of 780 patients with mean age 45.5±0.7, of which 303(38.3%) of them were male.

CT head analysis: 265 (34%) patients got CT head scan including CTA in some patients, whereas 238 (30.5%) got admitted. Among patients with CT head, ED physician notes were all reviewed for recent trauma history including documented head hitting during syncope episode, associated symptoms, physical examinations especially neurologic findings, and CT head results. New significant CT findings is defined by newly diagnosed significant entities or remarkable change of known conditions regardless of the relevancy to syncope or near-syncope.

Statistical analysis: Data are presented as means±SEM. Two independent groups of continuous data were analyzed by unpaired Student t test. Categorical data were analyzed by $\chi 2$ test. A two-tailed $P<0.05$ was considered statistically significant.

Table 1. Characteristics of 780 patients visited ED of CHH with syncope or syncope-like symptoms in 2018

Characteristics	Dizziness	Lightheadedness	Syncope	Total
Age, years±SEM	46.6±1.0	42.7±1.9	44.8±1.4	45.5±0.7
Male, no. (%)	152(19.5)	47(6.0)	104(13.3)	303(38.3)
CT head, no. (%)	149(19.1)	25(3.2)	91(11.7)	265(34.0)
Admission, no. (%)	114(14.6)	30(3.8)	94(12.1)	238(30.5)

SEM, Standard Error of the Mean

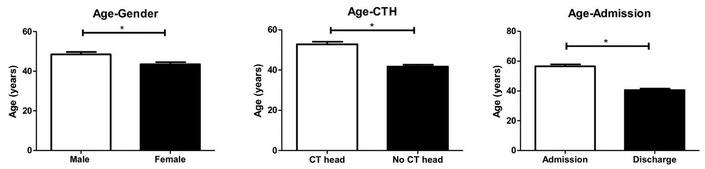


Figure 1. Age and CT head/Admission. * $P<0.05$

Table 2. Gender and Admission

		Admission		
		No	Yes	Total
Gender	Male	192	111	303
	% within Gender	63.4%	36.6%	100.0%
	Female	350	127	477
	% within Gender	73.4%	26.6%	100.0%
Total		542	238	780

$P=0.003$

Table 3. CT head and admission

		Admission		
		No	Yes	Total
CT head	No	382	133	515
	% within CT head	74.2%	25.8%	100.0%
	Yes	160	105	265
	% within CT head	60.4%	39.6%	100.0%
Total		542	238	780

$P<0.001$

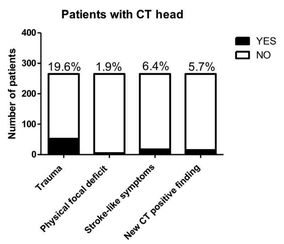


Figure 2. Clinical profile of patients with CT head.

Table 4. New significant CT findings and their related factors

New significant positive CT findings	Explain the syncope (Y/N)	Recent trauma history	Focal deficit on physical	Stroke symptoms	Comments
High-grade stenosis left subclavian artery 90%	Y	No	No	No	
Left internal carotid artery has 90/95% stenosis	Y	No	No	No	
Intracranial atherosclerosis with moderate to high-grade stenosis right P2 PCA	Y	No	No	No	
Small SAH	N	Yes	No	No	No neurosurgical intervention
SAH, temporal bone fracture	N	Yes	No	No	No surgical intervention
8 mm hyperdense focus within the right lentiform nucleus adjacent to the anterior limb of the right internal capsule	Y	No	No	No	MRI brain suspect AVM
R intraparenchymal hemorrhage and facial fractures	Y	Yes	No	No	
questionable acute left MCA territory ischemia	N	No	No	Right hemiparesis ? aphasia;	MRI Brain negative
Left frontal white matter hypodensity consistent with infarct	Y	No	No	Aphasia and hemiparesis/ imbalance	
Incidental dental abscess	N	No	No	No	Dizziness was thought to be due to gentamicin; Left AMA
Incidental cavernoma	N	No	No	No	Likely due to cardiac arrhythmia
Possible hydrocephalus	N	No	No	No	No surgical intervention
Nonocclusive superior sagittal thrombus	Y	No	No	Diplopia, ataxia	History of NHL; MRI brain negative
Scalp hematoma	N	Yes	No	No	
Cervical lesion with associated edema and mass effect on the fourth ventricle with dilatation of both lateral ventricles and third ventricle	Y	No	No	No	MRI brain Bilateral cerebellar masses, due to SCLC metastasis

Marshall Internal Medicine

Results

Overall, in all age group, more females (61.7% vs 38.3%) have ED visit with syncope or near-syncope (Table 1).

Males were older than females (48.5 vs 43.6) when they presented with syncope or near-syncope in ED (Figure 1A). Patients with advanced age were more likely to get CT head and be admitted(Figure 1B, C).

Males were more likely to get admitted 36.6% vs 26.6% compared with females (Table 2).

Patients with CT head are more likely to get admitted compared with patients without CT head 39.6% vs 25.8% (Table 3).

Only 19.6% patients with CT head had documented recent head injury or other relevant trauma history. Focal deficits in neurologic physical examinations documented in the ED physician note accounted for only 1.9% of total patients with CT head. Stroke associated symptoms like numbness, aphasia, unilateral weakness, drooling were documented in 17 (6.4%) of them (Figure 2). A total of 15 (5.7%) patients with CT head had new significant findings (Figure 2, Table 4), of which 8 findings can explain the syncope or near-syncope. Four patients with recent trauma history and 3 patients with stroke symptoms had corresponding significant CT findings (Table 4).

Discussion and Conclusion

Our results suggest:

*There are age and gender related differences in patients with syncope or near-syncope. Males have relatively less chance to visit ED with syncope or near-syncope, but are usually older and have more chance to be admitted compared with females consistent with some previous reports.

*Patients with CT head are more likely to get admitted compared with patients without CT head, although the yield of CT head is low

*Most patients presenting with syncope or near-syncope to the ED may not benefit from head CT unless they have a focal neurologic deficit, or have a history of recent head trauma.

References

- Grossman SA, Fischer C, Bar JL, Lipsitz LA, Mottley L, Sands K, Thompson S, Zimetbaum P, Shapiro NI. The yield of head CT in syncope: a pilot study. Intern Emerg Med. 2007 Mar;2(1):46-9.
- Mendu ML, McAvay G, Lampert R, Stoehr J, Tinetti ME. Yield of diagnostic tests in evaluating syncopal episodes in older patients. Arch Intern Med. 2009 Jul 27;169(14):1299-305.
- Edvardsson N, Garutti C, Rieger G, Linker NJ. Unexplained syncope: implications of age and gender on patient characteristics and evaluation, the diagnostic yield of an implantable loop recorder, and the subsequent treatment. Clin Cardiol. 2014 Oct;37(10):618-25.
- Romme JJ, van Dijk N, Boer KR, Dekker LR, Stam J, Reitsma JB, Wieling W. Clin Auton Res. Influence of age and gender on the occurrence and presentation of reflex syncope.2008 Jun;18(3):127-33

CT head in syncope workup in Emergency Department

Xiaoliang Qiu; Sammy Nassri; Kanaan Mansoor; Waiel Abusnina; Antony Valentine; Jo Ann Raines; Mitch Charles

Introduction

Syncope (passing out or fainting) or near-syncope (dizziness, lightheadedness or almost passing out) is a common reason for visiting an emergency department (ED) and most episodes are not serious. Many tests may be ordered for the workup of such episodes. However, expensive and low-yield diagnostic tests for syncope should not be routinely ordered. CT scans of the head are low-yield in patients without trauma or neurological findings. Choosing Wisely from American College of Emergency Physicians recommend **avoid CT head in asymptomatic adult patients in the ED with syncope, insignificant trauma and a normal neurological evaluation**.

Objective

The purpose of this study was to determine the yield of head CT scans in patients presenting to the ED in a tertiary teaching hospital with dizziness, lightheadedness, or syncope. We also aim to decide the outcomes of ED visit including discharge or hospital admission, and its related factors.

Methods

Study setting and patients: We retrospectively reviewed the electronic medical records of all patients presenting to ED in Cabell Huntington Hospital between January 1, 2018, and December 31, 2018, who presented with complaints of dizziness, lightheadedness, or syncope documented by triage nurse. A total of 794 patients were initially included, of which 14 patients were excluded from the study due to lack of ED physician documentation in patients with CT head within the 24 hours after ED registration. Therefore, 780 patients were finally enrolled in the study. Table 1 demonstrates the characteristics of 780 patients with mean age 45.5±0.7, of which 303(38.3%) of them were male.

CT head analysis: 265 (34%) patients got CT head scan including CTA in some patients, whereas 238 (30.5%) got admitted. Among patients with CT head, ED physician notes were all reviewed for recent trauma history including documented head hitting during syncope episode, associated symptoms, physical examinations especially neurologic findings, and CT head results. New significant CT findings is defined by newly diagnosed significant entities or remarkable change of known conditions regardless of the relevancy to syncope or near-syncope.

Statistical analysis: Data are presented as means±SEM. Two independent groups of continuous data were analyzed by unpaired Student t test. Categorical data were analyzed by $\chi 2$ test. A two-tailed $P<0.05$ was considered statistically significant.

Table 1. Characteristics of 780 patients visited ED of CHH with syncope or syncope-like symptoms in 2018

Characteristics	Dizziness	Lightheadedness	Syncope	Total
Age, years±SEM	46.6±1.0	42.7±1.9	44.8±1.4	45.5±0.7
Male, no. (%)	152(19.5)	47(6.0)	104(13.3)	303(38.3)
CT head, no. (%)	149(19.1)	25(3.2)	91(11.7)	265(34.0)
Admission, no. (%)	114(14.6)	30(3.8)	94(12.1)	238(30.5)

SEM, Standard Error of the Mean

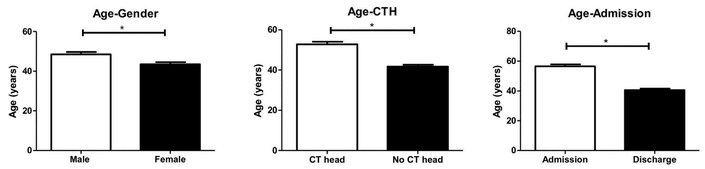


Figure 1. Age and CT head/Admission. * $P<0.05$

Table 2. Gender and Admission

		Admission		
		No	Yes	Total
Gender	Male	192	111	303
	% within Gender	63.4%	36.6%	100.0%
	Female	350	127	477
	% within Gender	73.4%	26.6%	100.0%
Total		542	238	780

$P=0.003$

Table 3. CT head and admission

		Admission		
		No	Yes	Total
CT head	No	382	133	515
	% within CT head	74.2%	25.8%	100.0%
	Yes	160	105	265
	% within CT head	60.4%	39.6%	100.0%
Total		542	238	780

$P<0.001$

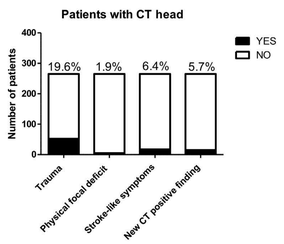


Figure 2. Clinical profile of patients with CT head.

Table 4. New significant CT findings and their related factors

New significant positive CT findings	Explain the syncope (Y/N)	Recent trauma history	Focal deficit on physical	Stroke symptoms	Comments
High-grade stenosis left subclavian artery 90%	Y	No	No	No	
Left internal carotid artery has 90/95% stenosis	Y	No	No	No	
Intracranial atherosclerosis with moderate to high-grade stenosis right P2 PCA	Y	No	No	No	
Small SAH	N	Yes	No	No	No neurosurgical intervention
SAH, temporal bone fracture	N	Yes	No	No	No surgical intervention
8 mm hyperdense focus within the right lentiform nucleus adjacent to the anterior limb of the right internal capsule	Y	No	No	No	MRI brain suspect AVM
R intraparenchymal hemorrhage and facial fractures	Y	Yes	No	No	
questionable acute left MCA territory ischemia	N	No	No	Right hemiparesis ? aphasia;	MRI Brain negative
Left frontal white matter hypodensity consistent with infarct	Y	No	No	Aphasia and hemiparesis/ imbalance	
Incidental dental abscess	N	No	No	No	Dizziness was thought to be due to gentamicin; Left AMA
Incidental cavernoma	N	No	No	No	Likely due to cardiac arrhythmia
Possible hydrocephalus	N	No	No	No	No surgical intervention
Nonocclusive superior sagittal thrombus	Y	No	No	Diplopia, ataxia	History of NHL; MRI brain negative
Scalp hematoma	N	Yes	No	No	
Cervical lesion with associated edema and mass effect on the fourth ventricle with dilatation of both lateral ventricles and third ventricle	Y	No	No	No	MRI brain Bilateral cerebellar masses, due to SCLC metastasis

Marshall Internal Medicine

Results

Overall, in all age group, more females (61.7% vs 38.3%) have ED visit with syncope or near-syncope (Table 1).

Males were older than females (48.5 vs 43.6) when they presented with syncope or near-syncope in ED (Figure 1A). Patients with advanced age were more likely to get CT head and be admitted(Figure 1B, C).

Males were more likely to get admitted 36.6% vs 26.6% compared with females (Table 2).

Patients with CT head are more likely to get admitted compared with patients without CT head 39.6% vs 25.8% (Table 3).

Only 19.6% patients with CT head had documented recent head injury or other relevant trauma history. Focal deficits in neurologic physical examinations documented in the ED physician note accounted for only 1.9% of total patients with CT head. Stroke associated symptoms like numbness, aphasia, unilateral weakness, drooling were documented in 17 (6.4%) of them (Figure 2). A total of 15 (5.7%) patients with CT head had new significant findings (Figure 2, Table 4), of which 8 findings can explain the syncope or near-syncope. Four patients with recent trauma history and 3 patients with stroke symptoms had corresponding significant CT findings (Table 4).

Discussion and Conclusion

Our results suggest:

*There are age and gender related differences in patients with syncope or near-syncope. Males have relatively less chance to visit ED with syncope or near-syncope, but are usually older and have more chance to be admitted compared with females consistent with some previous reports.

*Patients with CT head are more likely to get admitted compared with patients without CT head, although the yield of CT head is low

*Most patients presenting with syncope or near-syncope to the ED may not benefit from head CT unless they have a focal neurologic deficit, or have a history of recent head trauma.

References

- Grossman SA, Fischer C, Bar JL, Lipsitz LA, Mottley L, Sands K, Thompson S, Zimetbaum P, Shapiro NI. The yield of head CT in syncope: a pilot study. Intern Emerg Med. 2007 Mar;2(1):46-9.
- Mendu ML, McAvay G, Lampert R, Stoehr J, Tinetti ME. Yield of diagnostic tests in evaluating syncopal episodes in older patients. Arch Intern Med. 2009 Jul 27;169(14):1299-305.
- Edvardsson N, Garutti C, Rieger G, Linker NJ. Unexplained syncope: implications of age and gender on patient characteristics and evaluation, the diagnostic yield of an implantable loop recorder, and the subsequent treatment. Clin Cardiol. 2014 Oct;37(10):618-25.
- Romme JJ, van Dijk N, Boer KR, Dekker LR, Stam J, Reitsma JB, Wieling W. Clin Auton Res. Influence of age and gender on the occurrence and presentation of reflex syncope.2008 Jun;18(3):127-33

DECREASING THE INCIDENCE OF UNSATISFACTORY PAP SMEARS IN GYNECOLOGIC CYTOLOGY

Carla Prater, CT(ASCP)[1], Juli Swolsky, CT(ASCP)[1], Joseph Saxton, CT(ASCP)[1], Steven Adkins, CT(ASCP)[1], Frank Wellman, MT(ASCP)[2], Veronica Mayes MT(ASCP)[2] and Krista Denning MD[3]

[1]Cabell Huntington Hospital, Department of Cytopathology, [2]Cabell Huntington Hospital, Department of Laboratory Medicine,
[3]Joan C. Edwards School of Medicine at Marshall University, Department of Pathology

Background

Unsatisfactory pap smears are an under-appreciated and often unrecognized patient safety issue. A physician does not receive conclusive results needed for a diagnosis and approximately 30% of patients do not return to have the procedure repeated. Unsatisfactory cytology has an increased risk of CIN2+ disease, which leads to missed disease detection in patients who fail to follow-up. Multiple factors, including too few squamous cells, blood, inflammation and the presence of other material such as vaginal discharge and lubricants can cause a pap smear to be unsatisfactory. The national ThinPrep unsatisfactory rate is 1.3%. Our average unsatisfactory rate was 0.88% in 2017, however, we saw an increase in the rate of unsatisfactory pap smears during the months of December 2017 and January 2018 of 1.5% and 1.7%, respectively.

The objectives of this project were:

- Determine the reason why the unsatisfactory rate had increased in our institution.
- To decrease the number of unsatisfactory pap smears
- To increase the quality of patient care
- To decrease cost to the patient, physician offices and the cytopathology department

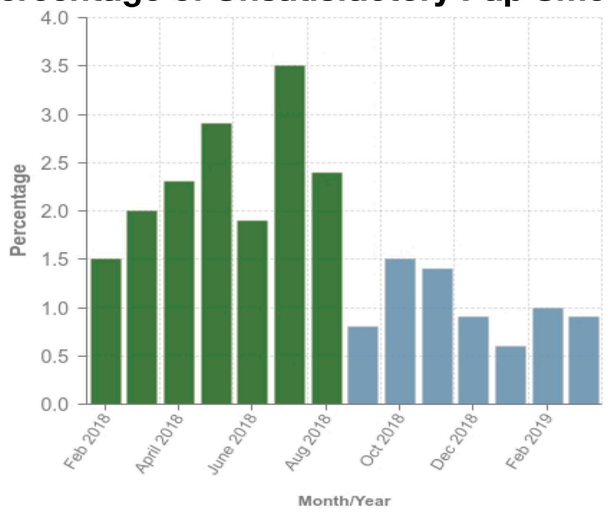
Methods

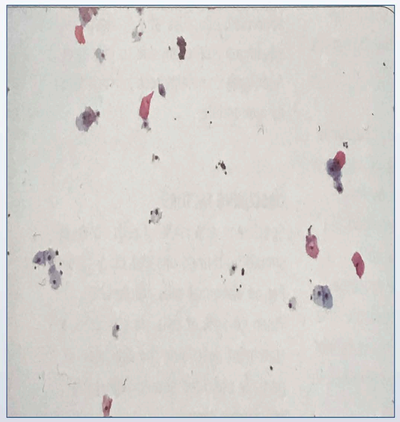
- Daily tracking of unsatisfactory pap smears and the physician who performed them was documented from February 2018 through March 2019.
- The Hologic ThinPrep Pap Test system was utilized in the department, along with the criteria listed in *The Bethesda System for Reporting Cervical Cytology (Third Edition)*, to determine adequacy.
- Physicians who had greater than five unsatisfactory pap smears were re-educated by a Hologic representative in late July 2018 on how to collect ThinPrep pap smears correctly.
- The type of lubricant being used in the physician's offices was investigated.

Results

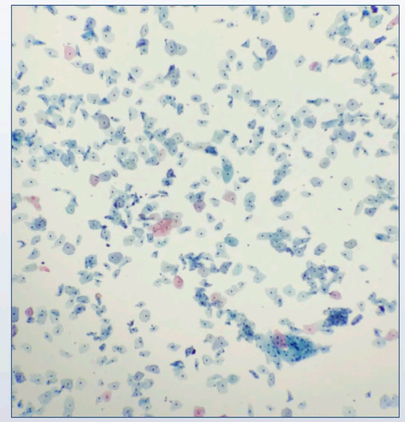
- From February 2018 through March 2019, 209 pap smears were signed out as unsatisfactory. Of these cases, 99% were unsatisfactory due to insufficient cellularity.
- The rate of unsatisfactory pap smears jumped to an average of 2.4% between January 2018 and August 2018, represented by the green bars the graph below.
- Three physicians were identified as having greater than five unsatisfactory pap smears and were re-educated on the proper ThinPrep pap smear collection method by a Hologic representative.
- It was determined that the lubricant the hospital's central supply was providing physician's offices had changed without notification of the cytopathology department. The lubricant being provided, McKesson Lubricating Jelly, had carbomers which adhered to the ThinPrep filter during processing, rendering the sample unsatisfactory. The lubricant was switched to HR Pharmaceutical Surgilube Surgical Lubricant, which is carbomer free, the third week of August 2018.
- After physician re-education and switching to the carbomer free lubricant, the unsatisfactory rate dropped to an average of 1.0% between September 2018 and March 2019, represented by the blue bars on the graph below.

Percentage of Unsatisfactory Pap Smears





Unsatisfactory ThinPrep Pap Smear 10X



Satisfactory ThinPrep Pap Smear 10X

Conclusions

By decreasing the rate of unsatisfactory pap smears:

- The quality of patient care increased, due to the ability to properly detect cervical/vaginal abnormalities
- Repeat office visits decreased, saving time and money for both the patient and physician
- Repeat pap smears decreased, saving time and the cost of supplies for the cytopathology department and the hospital

References

Fontaine D, Narine N, Naugler C. Unsatisfactory rates vary between cervical cytology samples prepared using ThinPrep and SurePath platforms: a review and meta-analysis *BMJ Open* 2012;**2:**e000847. doi: 10.1136/bmjopen-2012-000847

Nayar, R., & Wilbur, D. (Eds.). (2015). *The Bethesda System for Reporting Cervical Cytology*(Third ed.). Springer. doi:10.1007/978-3-319-11074-5

Tatyana Kalinicheva, Nora Frisch, Tamar Giorgadze et al. Etiologic factors related to unsatisfactory ThinPrep® cervical cytology: Evaluation and potential solutions to improve. Cytojournal. 2015; 12: 21.

Manufacturers' guide to cervical sample collection: http://www.thinprep.com/hcp/specimen_collection/brush_spatula.html

Improving Access to Outpatient Behavioral Health Care for Patients of a Provider-Based Clinic

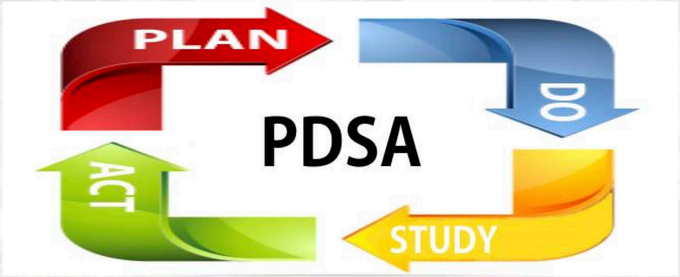
A Resident-Driven Quality Improvement Project

Sarah Dennemeyer, MD, Adam Franks, MD

Marshall University Department of Family & Community Health

Introduction

Access to behavioral health services is of paramount concern for those struggling with mental illness in rural areas. There is a known shortage of available patient visits for psychiatric specialty care as a result of excessive referrals, as well as a high rate of absenteeism for initial visits that establish care with a behavioral health specialist. Studies suggest that practitioners may prefer a combination of physical appointments with a primary care provider (PCP) and a behavioral health specialist, as opposed to phone consultation with a psychiatrist, for the most commonly treated mental disorders.



Objectives

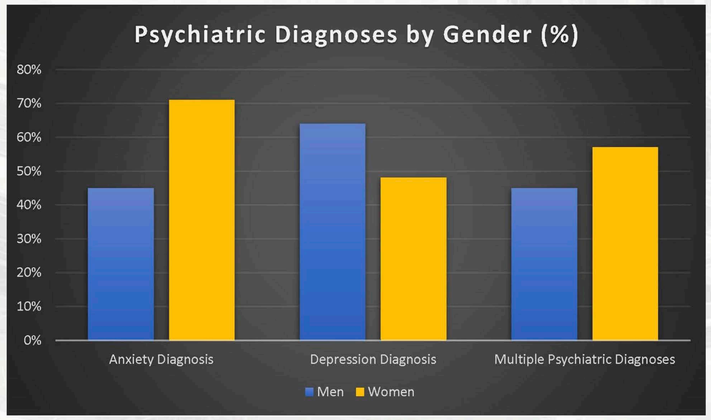
Further research is needed to determine what factors contribute to the breakdown in timely specialist behavioral health care access. Therefore, we developed a quality improvement plan to monitor the duration and scheduling difficulties of psychiatric appointments, as well as the demographics and behavioral health diagnoses of the patients frequenting our clinic.

Cycle 1

After determining that over-referrals play a large role in the shortage of available patient appointments, the schedule of the in-practice psychiatrist was analyzed, and data obtained in the following categories was assessed: age, gender, date of referral order, date the appointment was scheduled, status of visit including no-show/cancellation/bumped appointment, date of the actual appointment, diagnoses (limited to one or more of the following: major depressive disorder, bipolar disorder, generalized anxiety disorder or PTSD, ADHD, insomnia), the clinic location and academic status of the PCP (i.e., faculty or resident physician) and whether the patient returned to their PCP for a follow-up appointment after the behavioral health consultation occurred.

Results

A total of 53 patients, 42 women and 11 men, met criteria for the study. While 40% of female patients arrived to their scheduled initial visit, while nearly 82% of male patients presented to their first appointment. Of the diagnoses analyzed, rates of bipolar disorder and insomnia as stand-alone diagnoses were nearly equal between women and men. Patients diagnosed with generalized anxiety disorder, major depressive disorder and multiple psychiatric illnesses were separated by gender and are shown in the chart below:



In addition to these data, of patients found to have multiple psychiatric diagnoses, we found that almost 59% of patients were referred back to their PCP following psychiatric consultation, and only 27% failed to follow-up, indicating a desire for patients to prioritize their mental health treatment, were they given the means by which to do so.

Cycle 2

Given the results of our first Cycle, we deduced that the discrepancy in absenteeism for new behavioral health patients may be attributed to rescheduling on behalf of the department. However, with respect to the women in our study, nearly 16% cancelled their initial appointments, and approximately 28% were documented as "no-show" for their initial visit.

The data suggests that multiple factors are at play in low rates of new patient visit attendance. An important next step in this process would be implementing measures to improve patient attendance rates (e.g., upcoming appointment reminders, reducing rescheduling rates whenever possible). Additionally, it is recommended that increased emphasis be placed on patients' follow-up with their PCPs after their encounter with a behavioral health specialist to ensure proper continuity of care.

References

1. Allen D, Gillen E, Rixson L. The Effectiveness of Integrated Care Pathways for Adults and Children in Health Care Settings: A Systematic Review. JBI Libr Syst Rev. 2009;7(3):80-129.

2. Burns T, Knapp M, Catty J, Healey A, Henderson J, Watt H, Wright C. Home treatment for mental health problems: a systematic review. Health Technol Assess. 2001;5(15):1-139.

3. Furst MA, Gandré C, Romero López-Alberca C, Salvador-Carulla L. Healthcare ecosystems research in mental health: a scoping review of methods to describe the context of local care delivery. BMC Health Serv Res. 2019 Mar 18;19(1):173.

4. Levin C, Chisholm D. Cost-Effectiveness and Affordability of Interventions, Policies, and Platforms for the Prevention and Treatment of Mental, Neurological, and Substance Use Disorders. In: Patel V, Chisholm D, Dua T, Laxminarayan R, Medina-Mora ME, editors. Mental, Neurological, and Substance Use Disorders: Disease Control Priorities, Third Edition (Volume 4). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2016 Mar 14. Chapter 12.

Improving Access to Outpatient Behavioral Health Care for Patients of a Provider-Based Clinic

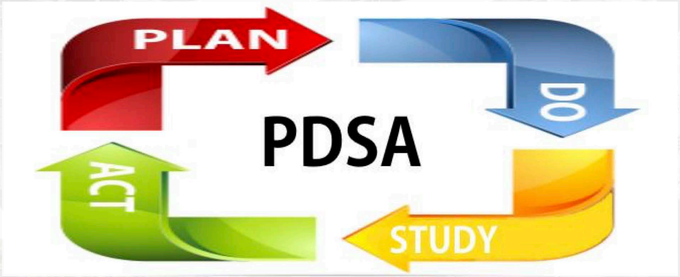
A Resident-Driven Quality Improvement Project

Sarah Dennemeyer, MD, Adam Franks, MD

Marshall University Department of Family & Community Health

Introduction

Access to behavioral health services is of paramount concern for those struggling with mental illness in rural areas. There is a known shortage of available patient visits for psychiatric specialty care as a result of excessive referrals, as well as a high rate of absenteeism for initial visits that establish care with a behavioral health specialist. Studies suggest that practitioners may prefer a combination of physical appointments with a primary care provider (PCP) and a behavioral health specialist, as opposed to phone consultation with a psychiatrist, for the most commonly treated mental disorders.



Objectives

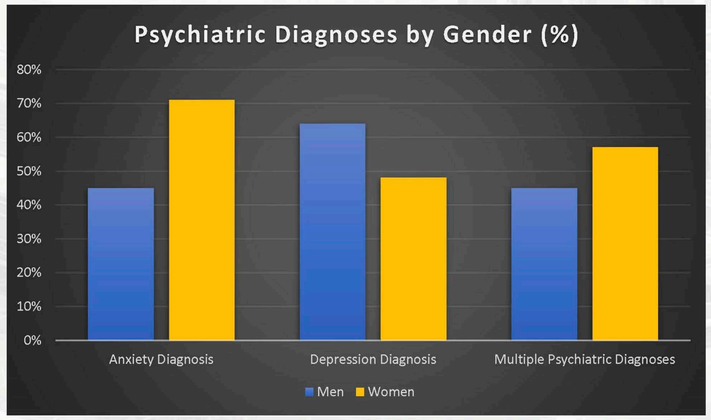
Further research is needed to determine what factors contribute to the breakdown in timely specialist behavioral health care access. Therefore, we developed a quality improvement plan to monitor the duration and scheduling difficulties of psychiatric appointments, as well as the demographics and behavioral health diagnoses of the patients frequenting our clinic.

Cycle 1

After determining that over-referrals play a large role in the shortage of available patient appointments, the schedule of the in-practice psychiatrist was analyzed, and data obtained in the following categories was assessed: age, gender, date of referral order, date the appointment was scheduled, status of visit including no-show/cancellation/bumped appointment, date of the actual appointment, diagnoses (limited to one or more of the following: major depressive disorder, bipolar disorder, generalized anxiety disorder or PTSD, ADHD, insomnia), the clinic location and academic status of the PCP (i.e., faculty or resident physician) and whether the patient returned to their PCP for a follow-up appointment after the behavioral health consultation occurred.

Results

A total of 53 patients, 42 women and 11 men, met criteria for the study. While 40% of female patients arrived to their scheduled initial visit, while nearly 82% of male patients presented to their first appointment. Of the diagnoses analyzed, rates of bipolar disorder and insomnia as stand-alone diagnoses were nearly equal between women and men. Patients diagnosed with generalized anxiety disorder, major depressive disorder and multiple psychiatric illnesses were separated by gender and are shown in the chart below:



In addition to these data, of patients found to have multiple psychiatric diagnoses, we found that almost 59% of patients were referred back to their PCP following psychiatric consultation, and only 27% failed to follow-up, indicating a desire for patients to prioritize their mental health treatment, were they given the means by which to do so.

Cycle 2

Given the results of our first Cycle, we deduced that the discrepancy in absenteeism for new behavioral health patients may be attributed to rescheduling on behalf of the department. However, with respect to the women in our study, nearly 16% cancelled their initial appointments, and approximately 28% were documented as "no-show" for their initial visit.

The data suggests that multiple factors are at play in low rates of new patient visit attendance. An important next step in this process would be implementing measures to improve patient attendance rates (e.g., upcoming appointment reminders, reducing rescheduling rates whenever possible). Additionally, it is recommended that increased emphasis be placed on patients' follow-up with their PCPs after their encounter with a behavioral health specialist to ensure proper continuity of care.

References

1. Allen D, Gillen E, Rixson L. The Effectiveness of Integrated Care Pathways for Adults and Children in Health Care Settings: A Systematic Review. JBI Libr Syst Rev. 2009;7(3):80-129.

2. Burns T, Knapp M, Catty J, Healey A, Henderson J, Watt H, Wright C. Home treatment for mental health problems: a systematic review. Health Technol Assess. 2001;5(15):1-139.

3. Furst MA, Gandré C, Romero López-Alberca C, Salvador-Carulla L. Healthcare ecosystems research in mental health: a scoping review of methods to describe the context of local care delivery. BMC Health Serv Res. 2019 Mar 18;19(1):173.

4. Levin C, Chisholm D. Cost-Effectiveness and Affordability of Interventions, Policies, and Platforms for the Prevention and Treatment of Mental, Neurological, and Substance Use Disorders. In: Patel V, Chisholm D, Dua T, Laxminarayan R, Medina-Mora ME, editors. Mental, Neurological, and Substance Use Disorders: Disease Control Priorities, Third Edition (Volume 4). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2016 Mar 14. Chapter 12.

Cost-benefit Analysis for Urinalysis and Urine Culture Ordered in Patients Admitted from ED to ICU at Cabell Huntington Hospital: Is it Justifiable?

Dipali Nemade MD, MPH, Shantanu Singh, MD, Dazzle Dadra, MD, Imran Khawaja, MD.

Division of Neurology and Pulmonary Medicine, Marshall University School of Medicine, Huntington, WV.

Objective

1.A cross sectional study to analyze utility of urine analysis and urine culture.

2.To evaluate cost-effectiveness of the urinalysis and urine culture tests.

3. Identify patient population to optimize the utility of test.

4. Address both knowledge gaps and relevant cognitive biases.

Study Details

Introduction:

Urinalysis and urine culture are commonly ordered in the emergency department and Inpatient hospital admission. Mismanagement of asymptomatic patients results in antimicrobial-related adverse events and increases health care cost.

Inclusion/Exclusion Criteria:

Inclusion criteria:

1. Must be equal or more than 18 years old.
2. Must have urine analysis ordered on admission.

Exclusion Criteria:

3. Age <18 years old will be excluded from study.

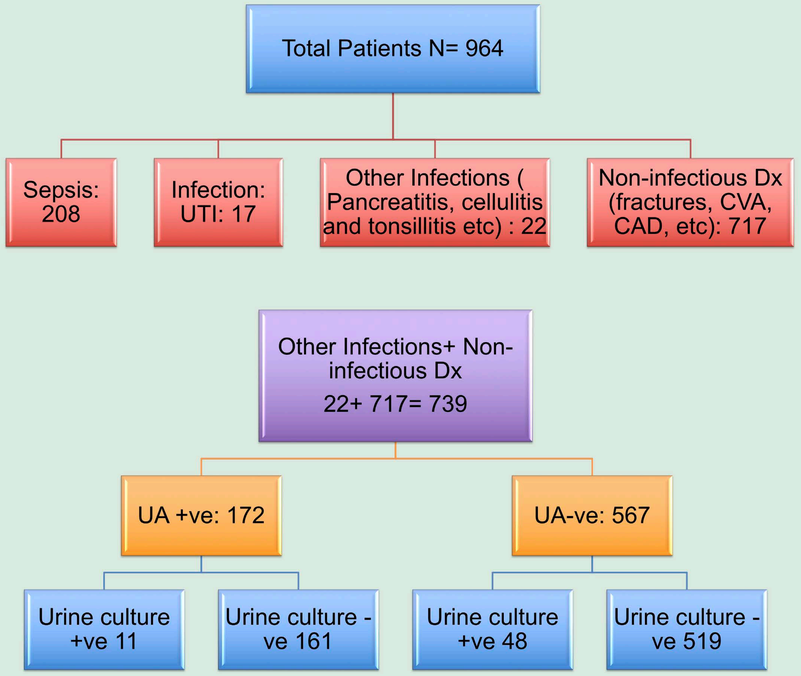
Data Collection:

After IRB approval, data from 964 patients who were admitted from emergency department to MICU and SICU were collected on whom routine urine analysis was ordered on admission for the period June 2017 - July 2018 using ICD-10 search. This is a cross sectional study.

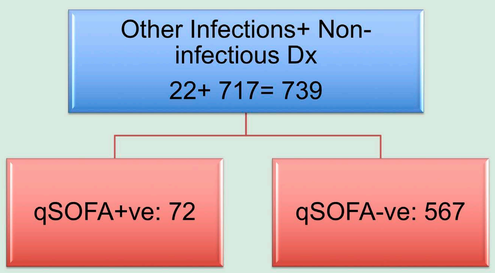
Information regarding sociodemographic variables like MRN no. age, sex, race, body mass index, education, occupation, marital status, diagnosis on admission, sepsis, vitals, urine analysis component such as leukocyte esterase, nitrites, WBC, bacteria etc. urine cx results, symptoms, indwelling catheter, chronic urological conditions, antibiotics administered, and final diagnosis and alternative source of infection were collected from patient record.

The data was tabulated and analyzed using descriptive statistics, frequency and cross tabulation. Statistical software used was IBM SPSS -23 version.

Flow Charts



Why was UA ordered in 739 patients? Were they qSOFA positive?



Definition of UA+: We defined UTI as urine WBC ≥ 10 and corresponding Leukocyte esterase or Nitrite positive.

Criteria for Sepsis: qSOFA: Respiratory rate ≥22/minute, Altered mentation (GCS< 15) and Systolic blood pressure ≤100 mmHg. High risk: ≥2 and low risk is ≤1.

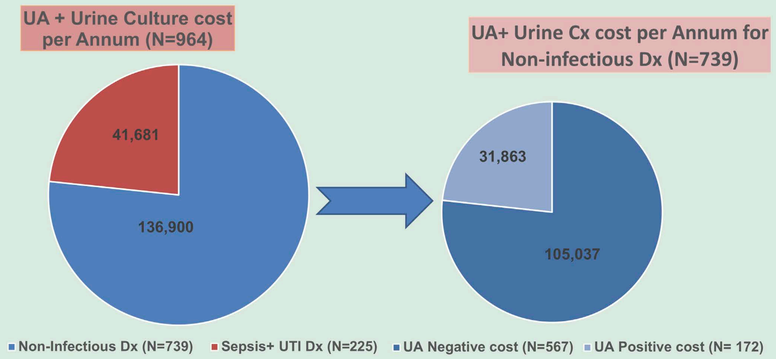
Cost of routine Urine analysis is **$75**
Cost of Urine culture is **$110.25**

Abbreviation: UA: Urine analysis, UC: Urine Culture

Cost Benefit analysis

FOR ONE YEAR

Total Cost in 964 patients: $178,581
Total Cost of UA and UC in Non-Septic Patients (739): $136,899.75
Total Cost of UA and UC in Non-Septic patients with positive UA (172): $31,863
Total Cost savings could have been: $136,899.75 - $31,863 = $105,036.75
This is saving just for ICU, It could be much more if we include all patients on floor, those discharged from ED,PICU etc.



Out of 59 people who had Positive Urine culture, 9 were contamination (skin flora, staph aureus), 7 were candida species, which could be possible contamination given UA negative. Thus only 43 people had positive urine culture.

Conclusion:

1. Routine urine analysis should only be ordered if there is strong clinical suspicion.
2. Out of 739 patients, only 43 had a positive urine culture, that means that only 5.8% of patients were positive. Therefore, Urine culture should only be ordered in the event of abnormal UA.
3. Additionally, we have not even included the cost of antibiotics used to treat asymptomatic bacteriuria or the cost associated with complications like C. Diff due to inappropriate use of antibiotics.

References:

1.McNeeley SG, Baselski VS, Ryan GM. An evaluation of two rapid bacteriuria screening procedures. Obstet Gynecol 1987; 69:550.
2. Pfaller MA, Koontz FP. Laboratory evaluation of leukocyte esterase and nitrite tests for the detection of bacteriuria. J Clin Microbiol 1985; 21:840.
3. Pappas PG. Laboratory in the diagnosis and management of urinary tract infections. Med Clin North Am 1991; 75:313
.Williams GJ, Macaskill P, Chan SF, et al. Absolute and relative accuracy of rapid urine tests for urinary tract infection in children: a meta-analysis. Lancet Infect Dis 2010; 10:240.
5. Devillé WL, Yzermans JC, van Duijn NP, et al. The urine dipstick test useful to rule out infections. A meta-analysis of the accuracy. BMC Urol 2004; 4:4.

CABELL HUNTINGTON HOSPITAL MEDICAL READINESS COMMITTEE

Cabell Huntington Hospital is Dedicated to Preparing for Man-Made and Natural Disasters in Our Community

Pulse Nightclub shooting

Tornado outbreak 2019

California wild fire victims

CHH Emergency Department staff

Some members of our committee, photographed March 2019

2017 Centers for Medicare and Medicaid Services Requirements for Hospital Emergency Preparedness

Four Core Elements of CMS Rule

1.Emergency Plan: Develop an emergency plan based on a risk assessment and using an "all-hazards" approach, which will provide an integrated system for emergency planning that focuses on capacities and capabilities.

2.Policies and Procedures: Develop and implement policies and procedures based on the emergency plan and risk assessment that are reviewed and updated at least annually. The policies and procedures must address the provision of subsistence needs, such as food, water and medical supplies, for staff and residents, whether they evacuate or shelter in place.

3. Communication Plan: Develop and maintain an emergency preparedness communication plan that complies with federal, state and local laws. Patient care must be coordinated within the facility, across healthcare providers, and with state and local public health departments and emergency management systems to protect patient health and safety in the event of a disaster.

4. Training and Testing: Develop and maintain training and testing programs, including initial training in policies and procedures. Facility staff will have to demonstrate knowledge of emergency procedures and provide training at least annually. Facilities must conduct drills and exercises to test the emergency plan or participate in an actual incident that tests the plan.

Centers for Medicare and Medicaid Final Rule - Administration

- Published September 16, 2016 with an implementation date of November 15, 2017
- Applies to all 17 provider and supplier types
- Compliance required for participation in Medicare (and Medicaid, as applicable)
- Emergency Preparedness is one new CoP/CfC of many already required
  - For example, many providers and suppliers are required to meet life safety codes that protect residents against fires and health safety codes that keep a reasonable temperature for residents.
- Facilities began being surveyed for the new requirements after November 2017 in conjunction with their existing survey cycles
- In the event facilities are non-compliant, the same general enforcement procedures will occur as is currently in place for any other conditions or requirements cited for non-compliance.

PHASE 1: 2018 MASS CASUALTY EXERCISE – CHH PREPARATION AND PARTICIPATION

Operation Safe Highlanders August 2018

Cabell Wayne LEPC

Scenario: Two isolated, disgruntled students launch a bomb attack at Huntington High School followed by systematically shooting staff and students. There is a prolonged hostage situation.
There are multiple shooting victims.

This was the largest Cabell Wayne community exercise to date with 381 total participants.

For the first time, simulated patients from the annual exercise are brought into the hospital. Although intended to receive many more, CHH received 28 patients.

Cabell Huntington Hospital preparation and participation in the exercise.

Accomplishments:

Staff: large physician participation appreciated by exercise reviewers.

Pharmacy developed "push packs" of rapidly accessible critical medications.

Resident services identified as readily available skilled medical providers. Training in hospital MCI response conducted. Large exercise participation by pediatric and family medicine services.

Alternate triage area tested and gaps identified.

Rapid registration system tested and gaps identified.

Pediatric patient identification system in collaboration with school board tested.

Pediatric and Adult MCI carts, burn cart developed and deployed to ED successfully to provide critical equipment rapidly.

Respiratory rapid response tested.

Security rapidly locked down hospital, deployed security coverage to alternated medical care sites, obtained needed intelligence and communicated to ED.

Abbreviations

CMS: Centers for Medicare and Medicaid Services
CoP: Conditions of Participations
CfC: Conditions for Coverage
MCI: Mass Casualty Incident
ED: Emergency Department

Mass Casualty Supplies

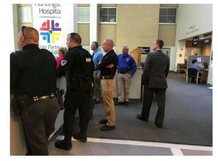
During a no-notice mass casualty event, basic supplies must be readily available until the situation allows for normal supply chain. Pediatric and Adult Mass casualty supply carts were developed to supply the medical items to care for a surge of patients within the first 15 minute. Supplies on these carts will augment the normal Emergency Department supply and are mobile and easily accessible. They contain supplies needed for hemorrhage control, wound care, intubation, rapid iv access. The burn unit developed a separate burn supply cart with the basics needed to treat a large number of burns in a short time frame. The stock is rotated as needed to avoid expiring product. A storage area for the carts was determined and staff trained in rapid deployment.

Adult and Pediatric MCI carts with MCI cart covers

Burn supply cart

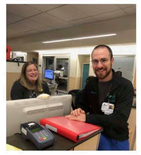
Security

Security addressed the need for Local law enforcement familiarity with the structure of CHH. Security conducted walk- throughs with Huntington Police Department, Cabell County Sheriff and the Cabell County Sheriff's Office to introduce them to the layout of the hospital in the event of a response requiring law enforcement. Maps and/or blueprints were obtained for each agency. Rapid lock down was accomplished during the exercise and security was quickly deployed to all of the alternate medical sites. Intelligence was maintained throughout to watch for threats from the event.



Pharmacy

Pharmacy developed "push packs" of critical drugs in a mass casualty incident. A system was developed and staff trained to proactively send packs to the emergency department. This will temporarily bypass the slower pyxis system.
The committee pharmacists reviewed and updated the hospital cache of antidotes including pediatric recommendations.
Pharmacists deployed immediately to ED during exercise



BRING TO RED ZONE IN ED

DRUG	AMMOUNT
Etomidate 20 mg vial	20 vials
Succinylcholine 100 mg syringe	10 syringes
Rocuronium 50 mg vial	10 vials
Rocuronium 50 mg VIAL infusion	1 vial
Epinephrine ADULT infusion	1 drip
Epinephrine PED	1 over 10 kg
Ceftaroln 2 g	10 bags
Ceftaroln 1 g	14 bags
1 Mg	24 syringes
D Tag	6 syringes
Code Tray ADULT	Any trays checked and ready to go at time of triage call (goal = 5 trays)
Code Tray PED	Any trays checked and ready to go at time of triage call (goal = 5 trays)

LOAD INTO ED MAIN PYXIS

DRUG	AMMOUNT
Midazolam 2 mg/mL vials	10 vials
Midazolam ADULT infusion	2 infusions
Midazolam PED infusion	1 over 10 kg, 1 under 10 kg
Fentanyl vials	10 vials
Fentanyl ADULT infusion	3 infusions
Fentanyl PED infusion	1 over 10 kg, 1 under 10 kg
Norepinephrine infusion	4 infusions
RSI KV ADULT	Any kits checked and ready to go at time of triage call
Sedation Kit PED	Any kits checked and ready to go at time of triage call

**Pharmacy stand by to make gentamicin drips, epinephrine drips, penicillin for contaminated wounds (4 million units) and to address stock outs, or other emergent needs. Rx-fill crash carts and airway kits as they enter the pharmacy. Consider preparation to re-fill ORs as the patient load may drain the medications available as the code triage event progresses
***Based on CDC recommendations, in the event of MCI where blood cross contamination between patients may occur, such as a mass shooting, the need for hepatitis B vaccines may increase
****IV Fluids, lidine, chlorhexadine, hydrogen peroxide are not available from pharmacy

If green zone is determined to be anywhere other than ED, have additional list of items to pick for Green zone, which would not be as time sensitive. It includes oral ABX, oral Pain meds, and wound care.

Training

Pediatric, Internal Medicine and Family Medicine physician services were trained in Grand Rounds format in 1) hospital physician MCI response during 2) basic emergency medical techniques for disasters such as hemorrhage control, rapid intravenous access, and rapid triage.
Most hospital staff has been trained in Stop the Bleed.

Dr Lee Van Horn, CHH Emergency Dept, and Jenny Murray MSN, RN,TCRN Director of Trauma Services teaching Stop the Bleed.

Roger Frye, PCA

Cabell Huntington Hospital conducted staff training for the emergency department with the West Virginia National Guard Civil Support Team to train emergency department staff in mass casualty decontamination set-up and the decontamination process.

This process was later reviewed by a pediatric subcommittee and pediatric patient issues regarding the decontamination process are being addressed.

PHASE 2: GOALS FOR 2019

1. Review current mass casualty and in-hospital threat response training on 3 levels: hospital-wide, department specific and specialized roles. Identify gaps and develop sustainable plan for training.
2. Review current in-hospital threat response. Identify gaps and investigate solutions.
3. Prepare for annual community-wide exercise and expand hospital participation to test systems in place.
4. Develop family reunification system for pediatric patients.

4 more greens
Coming
Updates on suspects?
Not yet
So far on board we have:
3 reds
23 green
Total here
Suspects apprehended
All 3?
Yes
We only had 1 red
Maybe 2 more coming ?
Now 8 total reds on board
8 red, 23 green, 4 yellow
When you get a chance will you text someone at scene and see if they set up decon on the scene
So we are confused. Did you know BOE staff were here helping with reunification?
Yes. I put them with security
1 shooter dead. 1 on loose
Ok
Eoc is checking on description
Thanks. Said was carrying a bag

Quality improvement study- quality and standardization of pulmonary function testing evaluating DLCO

Emad Alkhankan MD., Hazim Bukamur MD., Haitem Mezughi MD., Shantanu Singh MD., Chelsey White DO., Mohammed Aljasmi MD., Nancy Munn MD.

Marshall University School of Medicine, Division of Pulmonary Disease

Introduction

Pulmonary function tests (PFTs) are a valuable tool for physicians. The data obtained from a PFT helps physicians better understand specific pulmonary disease processes and how to best treat patients. A good quality PFT is of great value to the physician unpretending pulmonary disease. In 2017, ATS/ERS standards were published for the diffusing capacity of carbon monoxide, or DLCO for single breath carbon monoxide uptake in the lung which evaluates passive diffusion of oxygen from alveoli to pulmonary capillaries. we analyzed PFTs that were performed at our hospital to see if we were following ATS/ERS DLCO guidelines, as well as, quality of the study and the reports provided to physicians

Methods

The study was conducted at Cabell Huntington Hospital for PFTs that recently performed on 54 patients. We used Microsoft Excel 2016 for entering data, making calculations and plotting percentages. Variables evaluated included the DLCO grading scale, repeatability, acceptability, and inspired volume capacity (IVC) to vital capacity (VC- FVC or SVC whichever is largest) ratio. Per guidelines, IVC to VC ratio should be equal to or greater than 90% to meet acceptability criteria

Criteria for acceptability

A V_I ⩾90% of the largest VC in the same test session; alternatively, a V_I ⩾85% of the largest VC in the same test
session and V_A within 200 mL or 5% (whichever is greater) of the largest V_A from other acceptable manoeuvres
85% of test gas V_I inhaled in <4 s
A stable calculated breath-hold for 10±2 s with no evidence of leaks or Valsalva/Müller manoeuvres during this time
Sample collection completed within 4 s of the start of exhalation. For RGA systems, virtual sample collection should be initiated after dead-space washout is complete

Criteria for repeatability

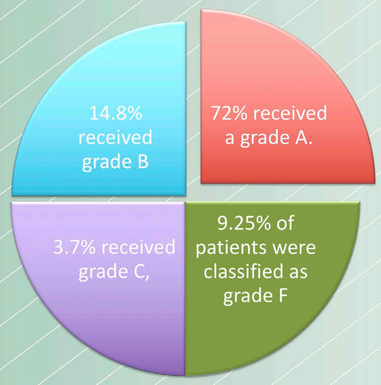
At least two acceptable D_{LCO} measurements within 2 mL·min^{-1}·mmHg^{-1} (0.67 mmol·min^{-1}·kPa^{-1}) of each other

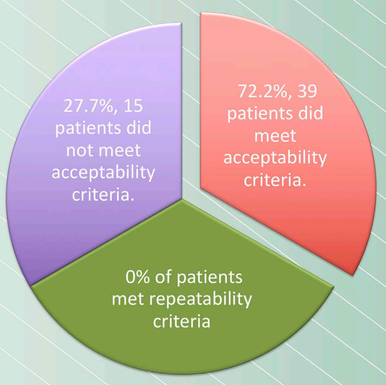
Quality control grading#

Score	V_I/VC	t_{BH}	Sample collection
A	⩾90%¶	8–12 s	⩽4 s
B	⩾85%	8–12 s	⩽4 s
C	⩾80%	8–12 s	⩽5 s
D	⩽80%	<8 or >12 s	⩽5 s
F	⩽80%	<8 or >12 s	>5 s

V_I: inspired volume; VC: vital capacity; V_A: alveolar volume; t_{BH}: breath-hold time; D_{LCO}: diffusing capacity of the lung for carbon monoxide. #: only grade A manoeuvres meet all acceptability criteria. The average D_{LCO} values from two or more grade A manoeuvres that meet the repeatability criterion should be reported. If only one grade A manoeuvre is attained, the D_{LCO} value from that manoeuvre should be reported. If no grade A manoeuvre is obtained, manoeuvres of grades B to D might still have clinical utility. The average of such manoeuvres should be reported but these deviations from the acceptability criteria must be noted to caution the interpreter of the test results. Manoeuvres of grade F are not useable. ¶: or V_I/VC⩾85% and V_A within 200 mL or 5% (whichever is greater) of the largest V_A from another acceptable manoeuvre.

2017 ATS/ERS guidelines for DLCO acceptability, repeatability and quality control





15 out of 54 patients had a IVC/FVC ratio less than 90%

39 out of 54 patients had a IVC/FVC ratio greater than 90%.

The lowest used IVC/FVC was 63% and the highest was 110%.

Discussion

- Our data showed PFT testing are deficient in repeatability criteria There should be two acceptable DLCO measurements.
- If there was one acceptable DLCO measurement, the test was not repeated.
- Graphical representations of the DLCO measurements were not being provided in the PFT report for physician review.
- The software used at our current hospital PFT lab is outdated, which is not up to date to current guideline requirements.

Future intervention

- Education will be provided to fellows, respiratory technicians and staff regarding the 2017 ATS/ERS guidelines and components of a quality pulmonary function test.
- We recommend all graphical representations of DLCO maneuvers be included for physician review.
- Repeatability should be incorporated into future PFT testing, DLCO maneuvers be performed at minimum two times for repeatability.
- We will also request an updated software be implemented to assist with the transition.
- Appointment time slots may require adjustment so that the respiratory technician has adequate time with the patients.

A Quality Improvement Project To Decrease Burnout and Increase Empathy In Pediatric Residents

Elizabeth Endicott, D.O., Rabia Noor, M.D., Aeesha Ranavaya, MS4., Marie Frazier, M.D., Meagan Shepherd, M.D., Susan Flesher, M.D.

Department of Pediatrics – Marshall University, JCESOM, Huntington WV

Background

• Physician burnout has been linked to poorer quality of care, patient dissatisfaction, increased medical errors, and decreased ability to express empathy.

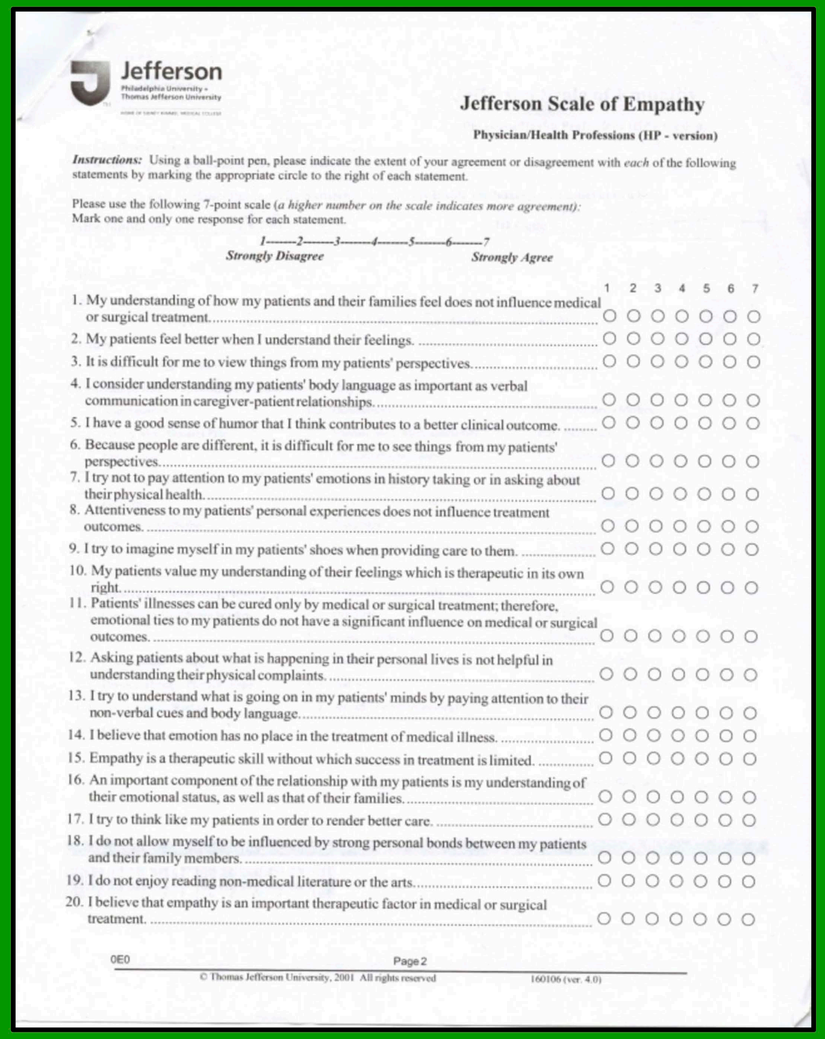
• Up to 60% of practicing physicians report symptoms of burnout, defined as emotional exhaustion, depersonalization, and low sense of accomplishment.

• To address this, resident wellness is becoming more widely accepted as protected time for residents across the country as a mean to decompress and discuss issues that arise during oftentimes busy and sometimes emotionally exhausting rotations.

Objective

Our goal was to measure and compare residents' feelings of empathy and burnout before and after implementing resident wellness time into our weekly lecture block.

Questionnaire



Jefferson
Philadelphia University + Thomas Jefferson University

Jefferson Scale of Empathy

Physician/Health Professions (HP - version)

Instructions: Using a ball-point pen, please indicate the extent of your agreement or disagreement with *each* of the following statements by marking the appropriate circle to the right of each statement.

Please use the following 7-point scale (*a higher number on the scale indicates more agreement*):
Mark one and only one response for each statement.

1--------2--------3--------4--------5--------6--------7
Strongly Disagree ***Strongly Agree***

	1	2	3	4	5	6	7
1. My understanding of how my patients and their families feel does not influence medical or surgical treatment.	○	○	○	○	○	○	○
2. My patients feel better when I understand their feelings.	○	○	○	○	○	○	○
3. It is difficult for me to view things from my patients' perspectives.	○	○	○	○	○	○	○
4. I consider understanding my patients' body language as important as verbal communication in caregiver-patient relationships.	○	○	○	○	○	○	○
5. I have a good sense of humor that I think contributes to a better clinical outcome.	○	○	○	○	○	○	○
6. Because people are different, it is difficult for me to see things from my patients' perspectives.	○	○	○	○	○	○	○
7. I try not to pay attention to my patients' emotions in history taking or in asking about their physical health.	○	○	○	○	○	○	○
8. Attentiveness to my patients' personal experiences does not influence treatment outcomes.	○	○	○	○	○	○	○
9. I try to imagine myself in my patients' shoes when providing care to them.	○	○	○	○	○	○	○
10. My patients value my understanding of their feelings which is therapeutic in its own right.	○	○	○	○	○	○	○
11. Patients' illnesses can be cured only by medical or surgical treatment; therefore, emotional ties to my patients do not have a significant influence on medical or surgical outcomes.	○	○	○	○	○	○	○
12. Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints.	○	○	○	○	○	○	○
13. I try to understand what is going on in my patients' minds by paying attention to their non-verbal cues and body language.	○	○	○	○	○	○	○
14. I believe that emotion has no place in the treatment of medical illness.	○	○	○	○	○	○	○
15. Empathy is a therapeutic skill without which success in treatment is limited.	○	○	○	○	○	○	○
16. An important component of the relationship with my patients is my understanding of their emotional status, as well as that of their families.	○	○	○	○	○	○	○
17. I try to think like my patients in order to render better care.	○	○	○	○	○	○	○
18. I do not allow myself to be influenced by strong personal bonds between my patients and their family members.	○	○	○	○	○	○	○
19. I do not enjoy reading non-medical literature or the arts.	○	○	○	○	○	○	○
20. I believe that empathy is an important therapeutic factor in medical or surgical treatment.	○	○	○	○	○	○	○

0E0 Page 2

© Thomas Jefferson University, 2001 All rights reserved 160106 (ver. 4.0)

References:

1. Maslach Burnout inventory Human services survey for Medical Personnel.
2. Jefferson scale of empathy

Methods

• Pediatric residents were given two separate previously validated questionnaires, one regarding feelings of burnout, the other regarding empathy. The pre-test was given prior to the start of the intervention.

• The intervention involved having a 15-20 minute session during protected lecture time to discuss positive patient interactions or words of praise for fellow residents and attending physicians.

• After an eight week period of weekly sessions, the same questionnaires were given as post- test to measure if there was an impact on feelings of burnout and empathy.

Results

• Paired t-tests revealed significant improvement in empathy pre and post-tests ($p<0.03$).

• Significant negative correlation using Spearman's rho between empathy and burnout pre-tests ($p<0.02$) as well as post-tests ($p<0.04$).

Conclusion

• Significant improvement in residents' feelings of empathy after participating in weekly sessions .

• Significant negative correlation between feelings of empathy and burnout among residents.

Ensuring Appropriate Hypertension Medications in an Outpatient Provider-Based Clinic

S. Andrew Ford, DO, Brock Hardin, MD, David Rupp, MD, Adam Franks, MD

Department of Family & Community Health, Joan C. Edwards School of Medicine, Marshall University

Cycle 1

Plan: Identified office was below acceptable rate of prescribing appropriate medications for patients with a diagnosis of hypertension (HTN).

Do: Evaluate 100-patient sample with the diagnosis of HTN to determine causes of failing the AHM measure.

Study: 64 patients were determined to be adherent to treatment. 36 patients were determined to be non-adherent. Reasons for failure were evaluated via chart and listed in **Table 2**.

Conclusions

We plan to continue to improve in the PCMH measure of AMH and exceed minimum passing levels with our provider-based clinic.

A larger portion of our failed measure was due to diet-controlled hypertension with a coinciding diagnosis instead of poorly managed hypertension.

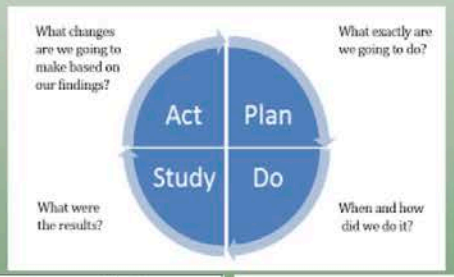
Continuation will include completing the listed survey in order to determine physician opinion, present this to committee, and determine how this will affect our provider-based clinic practices and adherence for the future.

Introduction

Identified below acceptable rates of prescribing appropriate medications (**Table 1**) and aim to improve the Patient-Centered Medical Home (PCMH) measure of Appropriate Medication for Hypertension (AMH) to minimum passing levels of 80% within a provider-based clinic (PBC).

End of	March	June	Sept.	Dec.
2017	45.85%	51.25%	63.24%	64.61%
2018	62.80%	49.09%	57.37%	73.61%

Table 1



Number of Patients	Reason for Non-Adherence
27	Diet Controlled
1	Patient Preference
3	Physician Preference
2	No Explanation
2	Not Filled Correctly
1	Invalid ID#

Table 2

1. If a HTN patient has normal BPs with diet and exercise, are they still hypertensive?
2. If a HTN patient has normal BPs with diet and exercise, should HTN come off the problem list?
3. If a HTN patient has normal BPs with diet and exercise, would you resolve the diagnosis?
4. Should normotensive diet controlled patients with HTN diagnosis count against our measure?
5. How long (months) of normal BPs should there be before HTN problem is resolved? (Never was acceptable)
6. How many visits of normal BPs should there be before the HTN problem is resolved? (Never was acceptable)

Table 3

Cycle 2

Plan: Identified that diet-controlled hypertensive patients were falsely worsening the AMH measure. Despite this, we continued to avoid prescribing our patients unnecessary medications. Diet-controlled hypertension maintains diagnosis, but these patients need monitoring.

Do: Need to understand what the physician believes to be the appropriate management in these patients.

Study: Proposed a resident/attending survey in order to determine significance among office physicians. (see **Table 3**).

Resources

1. Matsumura S, Watanabe K, Fukuhara S. The association between physician's affiliation and patients' adherence to their antihypertensive medication and pharmaceutical knowledge. J Gen Fam Med. 2018 Nov 20;20(1):19-24. doi: 10.1002/jgf2.219.

2. Mzoughi K, Zairi I, Jemai A, Ben Kilani M, Ben Daamar H, Ben Gaied Hassine E, Kraiem S. Factors associated with poor medication compliance in hypertensive patients. Tunis Med. 2018 Jun;96(6):385-390. PMID:30430478

3. Uchmanowicz B, Chudiak A, Uchmanowicz I, Mazur G. How May Coexisting Frailty Influence Adherence to Treatment in Elderly Hypertensive Patients? Int J Hypertens. 2019 Jan 6;2019:5245184. doi: 10.1155/2019/5245184.

4. Williams LG, Peacock E, Joyce C, Bazzano LA, Sarpong D, Whelton PK, Holt EW, Re R, Frohlich E, He J, Muntner P, Krousel-Wood M. Risk Factors for Low Pharmacy Refill Adherence Among Older Hypertensive Men and Women by Race. Am J Med Sci. 2018 Nov;356(5):464-475. doi: 10.1016/j.amjms.2018.07.007.

A Case of Disseminated Cat Scratch Disease Presenting as Osteomyelitis

Alicia Heyward, DO; Jasmyn Atalla, MSIII; Jay Lakhani, MD
Marshall University School of Medicine Department of Pediatrics
Huntington, WV

Introduction

- Cat Scratch Disease is a bacterial infection caused by the organism Bartonella henselae. The organism typically causes a regional lymphadenitis that is benign and self-limiting.
- Rare complications with liver, spleen, bone, heart and brain involvement can occur.
- Such complications are thought to be more common among immunosuppressed individuals, but are increasingly being reported in immunocompetent individuals as well.

Case Presentation

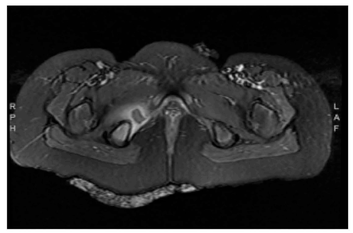
3-year-old female presents to the emergency room

- **Chief Complaint:** History of fevers for 16 days and new onset left hip pain.
- **History of Present Illness:** Initially evaluated by PCP and given two courses of antibiotics, including azithromycin. Afebrile for 48 hours after completion of antibiotics, but fevers returned with addition of left hip pain and limp. Parents recall lesion on left wrist present for a few weeks.
- **Social History:** Family pets include two outdoor cats.
- **Physical Exam:** Antalgic gait on the left. No erythema or edema of left hip, full ROM. Unable to assess pain as patient is uncooperative.

Clinical Course

- Due to her left hip pain and abnormal labs, the orthopedic team was consulted due to concern for septic arthritis.
- Vancomycin and ceftriaxone therapy were started following joint aspiration.
- MRI showed evidence of left hip septic arthritis with left acetabular and femoral osteomyelitis, along with a right obturator abscess. Bone culture was obtained.
- Patient continued to have daily fevers despite IV antibiotics, and inflammatory markers remained elevated. Cultures were all negative. Patient transferred for Infectious Disease evaluation.
- Repeat MRI showed multifocal osteomyelitis with minimally larger abscess in right obturator muscle.
- Diagnosis was made after muscle abscess biopsy was positive for Bartonella on PCR.
- Patient was diagnosed with disseminated Cat Scratch Disease with multifocal lesions in the spleen.
- She was started on Bactrim and Rifampin for four weeks and discharged home.

Imaging



MRI findings significant for right obturator abscess

Diagnosis and Outcome

Final Diagnosis:
Disseminated Cat Scratch Disease

Discussion

- Cat scratch disease (CSD) is typically a self-limited regional lymphadenopathy presenting in children ages five to nine, caused by Bartonella henselae.
- It commonly occurs due to a scratch or bite from an infected cat but can also be spread through contact with a cat's saliva into mucosal surfaces.
- A localized lymphadenopathy is the presenting sign in 85-90% of cases, and appears 3-10 days post infection, and lasts for about 2 weeks to a few months.
- After conducting a literature search, there are 47 cases reported of CSD causing osteomyelitis. These cases typically involved younger children and most commonly affected the pelvic girdle and vertebral column, though there were no cases of concomitant splenic involvement.
- Our case demonstrates a rare occurrence of disseminated CSD presenting as osteomyelitis with splenic abscess.
- Visceral organ involvement is an unusual manifestation of CSD but should be considered in children that are not improving with treatment of osteomyelitis
- While Cat Scatch Disease is considered a self limiting disease it is important to treat in the early stages of lymphadenitis, as up to 14% of children with untreated CSD will develop a disseminated infection with visceral organ involvement.

References

- Bartonellosis. NORD. http://Rarediseases.org/rare-diseases/bartonellosis/. Accessed January 4, 2019.
- Nelson CA, Saha S, Mead PS. Cat-Scratch Disease in the United States, 2005-2013. Emerg Infect Dis. 2016 Oct;22(10):1741-6.
- Florin TA, Zaoutis TE, Zaoutis LB. Beyond cat scratch disease: widening spectrum of Bartonella henselae infection. Pediatrics. 2008;121(5):e1413.
- Moriarty RA, Margileth AM. Cat scratch disease. Infect Dis Clin North Am. 1987;1(3):575.
- Carithers HA. Cat-scratch disease. An overview based on a study of 1,200 patients. Am J Dis Child. 1985;139(11):1124-1133.
- Hajjaji N, Hocqueloux L, Kerdraon R, Bret L. Bone infection in cat-scratch disease: a review of the literature. J Infect. 2007;54(5):417.

Addition of CORES™ to the IPASS Handoff: Sustaining the Effects of Quality Improvement

Lauren Tufts M.D. // Luke Damron M.D. // Kelly O'Neill RNC, BSN // Susan Flesher M.D.

Marshall University School of Medicine, Department of Pediatrics

Background

A structured handoff, such as the evidence-based IPASS mnemonic, has been shown to decrease sentinel events and improve patient care. Previously, a resident-driven QI study was performed to improve inclusion of IPASS elements in resident handoff. This is a continuing QI study after implementation of the IPASS handoff bundle.

Objectives of the study were to:

1. Determine compliance with inclusion of IPASS elements
2. Determine whether addition of CORES™ would improve compliance and

Aim Statement

Our aim is that each I-PASS element will be included in 100% of resident handoffs.

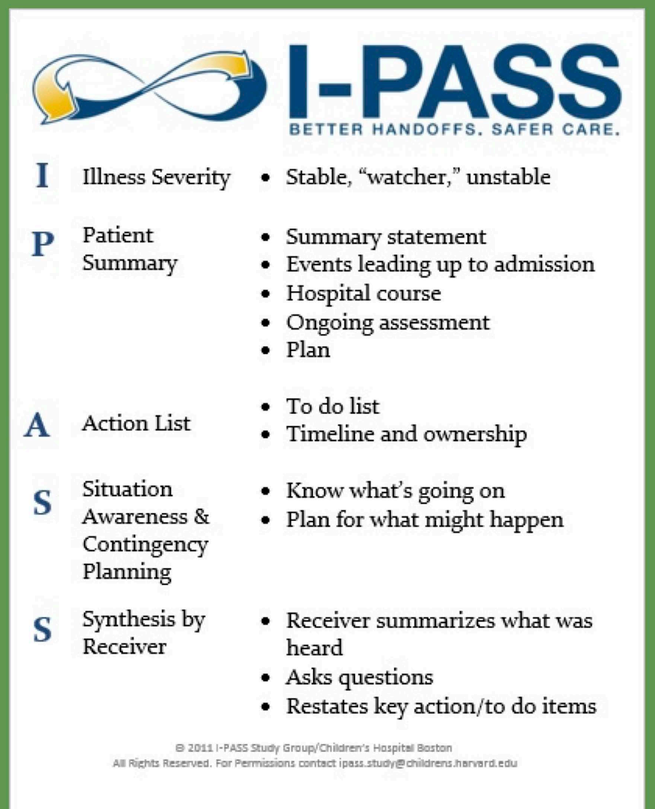
References

1. Studeny et al. "Quality Improvement Regarding Handoff." SAGE Open Medicine. 2017 Aug 5.
2. Starmer AJ, Sectish TC, et al. Rates of Medical Errors and Preventable Adverse Events Among Hospitalized Children Following Implementation of a Resident Handoff Bundle. *JAMA*.2013;310(21):2262–2270. doi:10.1001/jama.2013.281961
3. 2014 IPASS Study Group/ Boston Children's Hospital

Methods

A multidisciplinary QI team developed an Aim Statement. Five PDSA cycles were conducted. PDSA cycles 1-3 occurred during previous implementation of the IPASS handoff bundle. This included an educational series involving lecture and role playing, printed cards stating the IPASS elements, and a tool to minimize interruptions by nursing staff during handoff.

In this study, PDSA cycles 4-5 were conducted. In PDSA cycle 4, the CORES electronic handoff tool was implemented. In PDSA cycle 5, residents were re-educated on the IPASS elements and importance of quality handoff.



Results

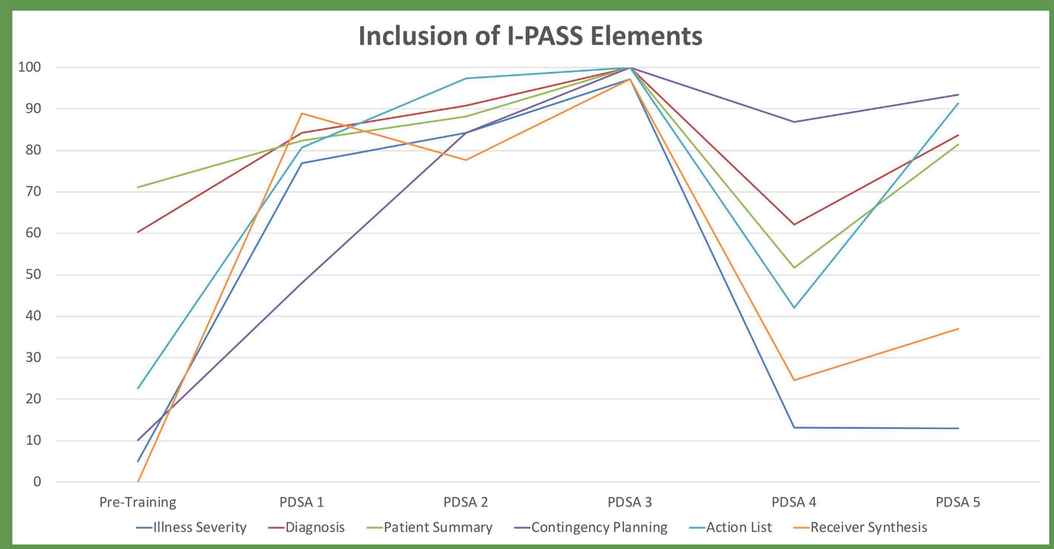


Figure 1: Percent inclusion of IPASS elements during each PDSA cycle with associated p-value

Pre-Intervention	PDSA cycle 1	PDSA cycle 2	PDSA cycle 3
% Inclusion	% Inclusion (p value compared to previous study)	% Inclusion (p value compared to previous study)	% Inclusion (p value compared to previous study)
5	97.2 (<0.001)	13.1 (<0.01)	13 (>0.999)
47	100 (<0.001)	62.2 (<0.001)	83.7 (0.001)
71	100 (<0.001)	51.7 (<0.001)	81.5 (<0.001)
22.6	100 (<0.001)	86.8 (<0.001)	93.4 (0.164)
10	100 (<0.001)	42.1 (<0.001)	91.3 (<0.001)
0	97.2 (<0.001)	24.5 (<0.001)	36.9 (0.066)

Figure 2: Percent inclusion of IPASS elements during each PDSA cycle

Conclusion

The IPASS handoff system can be successfully implemented by a multidisciplinary team-led QI project. However, after implementation, frequent resident re-education is needed in order to sustain the positive effects of quality handoff.

Improving Pediatric Resident Comfort Level with ACGME Required Procedures

Kathryn Huggins DO // Alicia Heyward DO // Lauren Tufts MD // Meagan Shepherd MD

MARSHALL PEDIATRICS, HUNTINGTON, WV

INTRODUCTION

- The Accreditation Council for Graduate Medical Education (ACGME) states that all pediatric residents must be able to perform procedures that are considered essential for general practice:
  - Bladder catheter, immunization, I&D of abscess, lumbar puncture, neonatal intubation, peripheral IV insertion, reduction of simple dislocation, simple laceration repair, simple removal of foreign body and splinting fractures. [1]
- In our program's last ACGME survey there were 5 procedures graduating seniors felt uncomfortable performing unsupervised:
  - Bladder catheterization, IV insertion, reduction of simple dislocation, simple laceration repair, and neonatal delivery room resuscitation.
- Some studies have shown higher comfort levels in certain populations including small program size, rural location, subspecialty career goal and high case volume. [2,3] However, many of these factors are fixed after an individual enters residency.
- The ACGME suggests procedural competence can be reached by mastering 5 key components for each procedure: steps, indications, contraindications, management and post-procedural care.

METHODS

- Design – Quality improvement project with voluntary and confidential participation of all pediatric and combined medicine/pediatric residents. This project was initiated during the 2018-2019 academic year.
- Baseline information – Obtained using a two-part questionnaire:
  - Resident characteristics: multiple choice; residency program, degree, area of focus, method of learning, comfort seeking procedures, procedure enjoyment.
  - Comfort level with each procedure: rated using 5-point Likert scale: indications, consent, equipment, complications, performing the procedure unsupervised.
- Baseline data analysis – Ordinary one-way ANOVA tests between three groups. Data was used to identify two procedures that both PGY1 and graduates felt uncomfortable performing unsupervised: peripheral IV insertion and bladder catheterization.
- Intervention – Reminder sheets were given to interns during their inpatient floor month during the first 6 months of residency. During this time residents encouraged to perform each of these procedures at least once before completing the rotation.
- Post-intervention – PGY1 residents completed the procedural portion of the initial questionnaire and were also asked about the usefulness of the intervention.
- Post-interventional data analysis – Ordinary one-way ANOVA tests between 3 groups and Mann-Whitney exact tests.

RESULTS

Baseline data:

- No significant correlations between comfort level and resident characteristics.
- Significant change in comfort level with components in 6 procedures between PGY1 and PGY2 residents ($p<0.05$).
- 4 procedures had low ratings across all post-graduate levels, based on average comfort level using 5-point Likert scale of ≤ 2.5.

Post-interventional data:

- 100% PGY1 residents rated reminder sheets as useful tool in improving comfort levels.
- PGY1 residents felt significantly more comfortable with 4 procedures, which included the two tested procedures ($p<0.05$).
- Between pre-intervention PGY2 residents and post-intervention PGY1 residents there was not a significant difference in comfort level.

TABLE 1: PGY1 residents were less comfortable than PGY2 residents with components in 6 procedures ($p<0.05$)

Procedure	Components
IV insertion	**Indications, Complications**
Bladder catheter	**Consent**
Bag- mask	Indications
Neonate intubation	All components
Lumbar puncture	All components
Umbilical catheter	All components

TABLE 2: All residents were less comfortable with 4 procedures (average score of < 2.5 using a 5-point Likert scale)

Procedure	PGY1	PGY2	PGY3-4
Reductions	1.475	1.403	1.888
Foreign body removal	1.700	2.006	2.333
Splinting	1.700	1.714	1.977
Umbilical catheter	1.250	2.514	2.510

TABLE 3: PGY1 residents were more comfortable with 4 procedures, including those addressed with reminder sheets ($p<0.05$)

Procedure	Components
IV insertion	**Indications, Complications**
Bladder catheter	**Complications**
Neonatal intubation	Complications
Lumbar puncture	Consent, Complications

OBJECTIVES

- Determine ways to improve resident comfort level with ACGME-required procedures.
- Determine if comfort level correlates with certain characteristics of current residents.

CONCLUSIONS

- Achieving competence with 13 procedures may be overwhelming to residents.
- Reminder sheets can be a useful tool to improve procedural comfort level by creating smaller, more manageable goals during each rotation.
- Regardless of post-graduate year, some procedures have low comfort levels overall.
- This suggests the need for new PDSA cycles to address these issues.

REFERENCES

1. ACGME Program Requirements for Graduate Medical Education in Pediatrics
2. Graduating Pediatric Resident Reports on Procedural Training and Preparation. Schumacher DJ et al. 2017
3. Relationships Between Program Size, Training Experience, and Career Intentions: Pediatrics Resident Reports From 2010 to 2014. Schumacher et al. 2016

Improving Pediatric Resident Comfort Level with ACGME Required Procedures

Kathryn Huggins DO // Alicia Heyward DO // Lauren Tufts MD // Meagan Shepherd MD

MARSHALL PEDIATRICS, HUNTINGTON, WV

INTRODUCTION

- The Accreditation Council for Graduate Medical Education (ACGME) states that all pediatric residents must be able to perform procedures that are considered essential for general practice:
  - Bladder catheter, immunization, I&D of abscess, lumbar puncture, neonatal intubation, peripheral IV insertion, reduction of simple dislocation, simple laceration repair, simple removal of foreign body and splinting fractures. [1]
- In our program's last ACGME survey there were 5 procedures graduating seniors felt uncomfortable performing unsupervised:
  - Bladder catheterization, IV insertion, reduction of simple dislocation, simple laceration repair, and neonatal delivery room resuscitation.
- Some studies have shown higher comfort levels in certain populations including small program size, rural location, subspecialty career goal and high case volume. [2,3] However, many of these factors are fixed after an individual enters residency.
- The ACGME suggests procedural competence can be reached by mastering 5 key components for each procedure: steps, indications, contraindications, management and post-procedural care.

METHODS

- Design – Quality improvement project with voluntary and confidential participation of all pediatric and combined medicine/pediatric residents. This project was initiated during the 2018-2019 academic year.
- Baseline information – Obtained using a two-part questionnaire:
  - Resident characteristics: multiple choice; residency program, degree, area of focus, method of learning, comfort seeking procedures, procedure enjoyment.
  - Comfort level with each procedure: rated using 5-point Likert scale: indications, consent, equipment, complications, performing the procedure unsupervised.
- Baseline data analysis – Ordinary one-way ANOVA tests between three groups. Data was used to identify two procedures that both PGY1 and graduates felt uncomfortable performing unsupervised: peripheral IV insertion and bladder catheterization.
- Intervention – Reminder sheets were given to interns during their inpatient floor month during the first 6 months of residency. During this time residents encouraged to perform each of these procedures at least once before completing the rotation.
- Post-intervention – PGY1 residents completed the procedural portion of the initial questionnaire and were also asked about the usefulness of the intervention.
- Post-interventional data analysis – Ordinary one-way ANOVA tests between 3 groups and Mann-Whitney exact tests.

RESULTS

Baseline data:

- No significant correlations between comfort level and resident characteristics.
- Significant change in comfort level with components in 6 procedures between PGY1 and PGY2 residents ($p<0.05$).
- 4 procedures had low ratings across all post-graduate levels, based on average comfort level using 5-point Likert scale of ≤ 2.5.

Post-interventional data:

- 100% PGY1 residents rated reminder sheets as useful tool in improving comfort levels.
- PGY1 residents felt significantly more comfortable with 4 procedures, which included the two tested procedures ($p<0.05$).
- Between pre-intervention PGY2 residents and post-intervention PGY1 residents there was not a significant difference in comfort level.

TABLE 1: PGY1 residents were less comfortable than PGY2 residents with components in 6 procedures ($p<0.05$)

Procedure	Components
IV insertion	**Indications, Complications**
Bladder catheter	**Consent**
Bag- mask	Indications
Neonate intubation	All components
Lumbar puncture	All components
Umbilical catheter	All components

TABLE 2: All residents were less comfortable with 4 procedures (average score of < 2.5 using a 5-point Likert scale)

Procedure	PGY1	PGY2	PGY3-4
Reductions	1.475	1.403	1.888
Foreign body removal	1.700	2.006	2.333
Splinting	1.700	1.714	1.977
Umbilical catheter	1.250	2.514	2.510

TABLE 3: PGY1 residents were more comfortable with 4 procedures, including those addressed with reminder sheets ($p<0.05$)

Procedure	Components
IV insertion	**Indications, Complications**
Bladder catheter	**Complications**
Neonatal intubation	Complications
Lumbar puncture	Consent, Complications

OBJECTIVES

- Determine ways to improve resident comfort level with ACGME-required procedures.
- Determine if comfort level correlates with certain characteristics of current residents.

CONCLUSIONS

- Achieving competence with 13 procedures may be overwhelming to residents.
- Reminder sheets can be a useful tool to improve procedural comfort level by creating smaller, more manageable goals during each rotation.
- Regardless of post-graduate year, some procedures have low comfort levels overall.
- This suggests the need for new PDSA cycles to address these issues.

REFERENCES

1. ACGME Program Requirements for Graduate Medical Education in Pediatrics
2. Graduating Pediatric Resident Reports on Procedural Training and Preparation. Schumacher DJ et al. 2017
3. Relationships Between Program Size, Training Experience, and Career Intentions: Pediatrics Resident Reports From 2010 to 2014. Schumacher et al. 2016

Using a Diabetic Health Home Model in a Patient-Centered Medical Home to Facilitate Efficient Patient Care Coordination and Improve Health Outcomes

A Multi-Disciplinary Quality Improvement Project

Syeda J. Z. Mansur, MD, Benjamin C. Schnakenberg, MD (PGY-2),
Jessica M. Dingess, MSW, James B. Becker, MD, Kimberly I. McClelland, MD, MPH, MBA,
Todd H. Davies, PhD, Adam M. Franks, MD
Marshall University Department of Family & Community Health

Introduction

Given the debilitating impact diabetes has had on our patient population over the past several years, we sought to further examine the relationship between mental health, social work intervention, body mass index (BMI) and blood glucose control (HbA_{1C}) in adult patients diagnosed with diabetes.

Objectives

Studies have shown that care collaboration within a patient-centered medical home (PCMH) has presented itself as a promising intervention to monitor and improve the quality of patient care and health outcomes in those with depression and chronic illnesses (i.e., diabetes). Thus, in order to facilitate an efficient care coordination model that patients would embrace, we developed the Diabetic Health Home, which serves as a cost-effective, four-month evaluation of diabetic patients' mental health, BMI and glucose control under the care of our clinicians and the guidance of our social work team. Our ultimate goal was to improve HbA_{1C} levels by 1% and BMIs by 2.5 kg/m^2 in diabetic patients at-risk for or diagnosed with obesity, while simultaneously improving their scores on the PHQ-9 and GAD-7 inventories (to screen for depression and anxiety, respectively).

Cycle 1

Plan: With respect to identifiying the current problem, we have observed that patients diagnosed with diabetes and obesity, especially those with concomitant psychiatric issues, have poor measurable outcomes. Therefore, the Theory of Self-Care was utilized to: 1) increase patients' ability to care for themselves and 2) augment their medical care with regular follow-up provided by our social work management team.
Do: Within the participating residents' patients, we created a coordinated care program (i.e., the Diabetic Health Home) for diabetic patients (HbA_{1C} >6.49%) at-risk for obesity (BMI >29.9 kg/m^2) who have $HbA_{1C} \geq 7\%$ and a psychiatric condition.
Study: Inadequate numbers were attained for the purpose of our planned intervention.
Act: As a result of our diminished patient census, it was decided to expand the group of potential patients to all providers within the Family Medicine Center (FMC).

Cycle 2

Plan: As a result of having encountered more difficulty enrolling patients than had been anticipated, the Theory of Minimal Numbers was employed to ensure an adequate number of participants for the project.
Do: Enrollment was extended to all FMC patients who were diagnosed with diabetes and a psychiatric condition, and electronic health record (EHR) verification ensured that patient information was accurate.
Study: Adequate numbers of patients were identified.
Act: We enrolled, managed and monitored patients using HbA_{1C} levels, BMIs, and PHQ-9 and GAD-7 scores.

Cycle 3

Plan: Given the aforementioned observations, we continued to utilize the Theory of Self-Care to facilitate and increase patients' individual care management.
Do: Eligible patients were offered to be enrolled in the Diabetic Health Home program. HbA_{1C}, BMI, PHQ-9 scores and GAD-7 scores were recorded upon enrollment and at each re-enrollment period (i.e., every four months). Changes to patients' diabetic and psychiatric medications were also documented at these points, as were the number and type of patient encounter with our social work team (e.g., office visits, phone calls, letters mailed).
Study: 20 patients have been enrolled in the study, with 17 having been re-enrolled at the four-month mark. Statistical analysis using paired t-tests showed statistically significant correlations between participants' HbA_{1C}s when depression and anxiety were not included in the analysis (n=20; p=0.43), as well as when depression and anxiety were included (n=17; p=0.23).

The slightly decreased sample size might have played a role in the dramatically increased statistical significance; however, despite our small sample size, these preliminary data indicate the promising efficacy of the current Diabetic Health Home model. Additionally, while anxiety was not found to be statistically significant (p=0.262), depression was nearly so (p=0.53), an observation that warrants further investigation as enrollment numbers (and the statistical power of the study) increase over time.

Paired Samples T-Test	Variables	N	Sig. (2-tailed)
Pair 1	Start Date HbA1C - End Date HbA1C	20	.043
Pair 2	Start Date BMI - End Date BMI	20	.403

Paired T-Test: HbA1C and BMI levels

Paired Samples T-Test	Variables	N	Sig. (2-tailed)
Pair 1	Start Date HbA1C - End Date HbA1C	17	.023
Pair 2	Start Date BMI - End Date BMI	17	.174
Pair 3	Start Date PHQ-9 - End Date PHQ-9	17	.053
Pair 4	Start Date GAD-7 - End Date GAD-7	17	.262

Paired T-Test: HbA1C, BMI, PHQ-9 and GAD-7

Act: Since our results have demonstrated a beneficial impact of our Diabetic Health Home model, we plan to gather data on our enrolled patients as their participation continues. In addition to monitoring patients' HbA_{1C} levels and BMI, we will also document PHQ-9 and GAD-7 scores from patients at the end of their enrollment period to ensure that a comparison can be made to their baseline scores should they decide not to re-enroll. We also hope to increase the visibility of the Diabetic Health Home within our community in order to assist those who require simultaneous mental health and chronic illness management.

References

1. Chomko ME, Odegard PS, Evert AB. Enhancing Access to Diabetes Self-management Education in Primary Care. Diabetes Educ. 2016 Oct;42(5):635-45. doi: 10.1177/0145721716659147.
2. McLendon SF, Wood FG, Stanley N. Enhancing diabetes care through care coordination, telemedicine, and education: Evaluation of a rural pilot program. Public Health Nurs. 2019 Mar 13. doi: 10.1111/phn.12601.
3. Szafran O, Kennett SL, Bell NR, Torti JMI. Interprofessional collaboration in diabetes care: perceptions of family physicians practicing in or not in a primary health care team. BMC Fam Pract. 2019 Mar 13;20(1):44. doi: 10.1186/s12875-019-0932-9.
4. Tronieri JS, Wadden TA, Chao AM, Tsai AG. Primary Care Interventions for Obesity: Review of the Evidence. Curr Obes Rep. 2019 Mar 19. doi: 10.1007/s13679-019-00341-5.
5. Rustad JK, Musselman DL, Nemeroff CB. The relationship of depression and diabetes: Pathophysiological and treatment implications. Psychoneuroendocrinology. 2011;36(9):1276-1286. doi:10.1016/j.psyneuen.2011.03.005.

Importance of Medication Reconciliation for Hospital Follow up Patients

Saad Rahoma MD[1], Xiaoliang Qiu MD[1], Yazan Numan MD[1], Simon Abdullah MD[1], Laurie Wilson MD[1], Kanaan Mansoor MD[1],Elizabeth A. Saunders MD[1], Stephen A. Roy MD[1],
Department of Internal Medicine[1], Marshall University School of Medicine

Background:

- Data from multiple organizations has shown that inadequate medication reconciliation accounts for 46% of all medication errors and up to 20% of adverse drug events among hospitalized patients
- Medication reconciliation is defined as the process of "creating the most accurate list possible of all medications a patient is taking—including drug name, dosage, frequency and route—and comparing that list against the physician's admission, transfer and/or discharge orders, with the goal of providing correct medication to the patient at all transitions points within the hospital".
- Medication reconciliation consists of four steps that help to ensure patient safety across the healthcare system: (1) verification: the current medication list is obtained; (2) clarification: the medication and dosages are checked for adequacy; (3) reconciliation: newly-prescribed and previous medications are compared and documented; and (4) transmission: an updated and verified medication list is communicated to the next healthcare provider.

Results:

- A total of 43 patients had follow up scheduled with the WIC in the months of May, June and July 2018. 18.6% patient had proper documentation of medication reconciliation on their follow up visits.
- A total of 45 patient had follow up scheduled with the WIC in the months of Aug, Sept and Oct 2018. 68.9% patients had proper documentation of medication reconciliation on their follow up visits.
- A paired T –Test was performed. T value of 7.6 with a p value of 0.017.

VARIABLE	PRE	POST	P Value
Medication Reconciliation	0.13	0.58	0.017
	0.07	0.71	
	0.38	0.82	

Discussion:

- The admission, discharge and transition to the ambulatory care environment is a service stream composed of many nested core processes each adding either value or waste to the patient's care.
- Authors has reported interventions that improve medication reconciliation are cost-effective for preventable adverse drug events compared with no intervention.
- The percentage of patients with one or more medication discrepancy at hospital discharge has been reported at 14.1% and 32.4%. Of the errors discovered at hospital discharge in a prospective observational study, 51% had the potential to result in moderate to severe harm.
- Our study shows that simple interventions are cost effective and potentially prevent adverse effects for the patients and liability for the physicians taking care of the patients. This intervention was Phase 1 of the quality improvement measures that internal medicine department as taken for improved medication reconciliation.

Methodology:

- Hospital follow up patients presenting to "Internal Medicine Walk in Clinic" were the focus of this study.
- In August 2018 residents staffing the "Walk in Clinic" were given a handout about performing medication reconciliation in the EMR medication list and selecting the suitable statement for the changes made by them.
- The statement in patient encounter note was considered to be the measure of quality for this study.
- Data of all the hospital follow up patients and their medication reconciliation was collected for three months prior to the intervention and three months post intervention.
- Data was tabulated in Excel and a paired T test was performed and P value of less then 0.05 was considered to be significant.

Marshall Internal Medicine

Conclusion:

- Our study demonstrates that adherence to quality measures can improve with simple interventions, which can significantly impact patient care.

References:

1. Varkey P, Cunningham J, Bisping S. Improving Medication Reconciliation in the Outpatient Setting. Jt Comm J Qual Patient Saf. 2016;33(5):286–92.
2. Kreckman J, Wasey W, Wise S, Stevens T, Millburg L, Jaeger C. Improving medication reconciliation at hospital admission, discharge and ambulatory care through a transition of care team. BMJ Open Qual. 2018;7(2):e000281.
3. Bedell S.E., et al.: Discrepancies in the use of medications: Their extent and predictors in an outpatient practice. Arch Intern Med 160:2129–2134, Jul. 24, 2000

Importance of Medication Reconciliation for Hospital Follow up Patients

Saad Rahoma MD[1], Meena Shehata MD[1], Yazan Numan MD[1], Simon Abdullah MD[1], Laurie Wilson MD[1], Kanaan Mansoor MD[1],Elizabeth A. Saunders MD[1], Stephen A. Roy MD[1],
Department of Internal Medicine[1], Marshall University School of Medicine

Background:

- Data from multiple organizations has shown that inadequate medication reconciliation accounts for 46% of all medication errors and up to 20% of adverse drug events among hospitalized patients
- Medication reconciliation is defined as the process of "creating the most accurate list possible of all medications a patient is taking—including drug name, dosage, frequency and route—and comparing that list against the physician's admission, transfer and/or discharge orders, with the goal of providing correct medication to the patient at all transitions points within the hospital".
- Medication reconciliation consists of four steps that help to ensure patient safety across the healthcare system: (1) verification: the current medication list is obtained; (2) clarification: the medication and dosages are checked for adequacy; (3) reconciliation: newly-prescribed and previous medications are compared and documented; and (4) transmission: an updated and verified medication list is communicated to the next healthcare provider.

Results:

- A total of 43 patients had follow up scheduled with the WIC in the months of May, June and July 2018. 18.6% patient had proper documentation of medication reconciliation on their follow up visits.
- A total of 45 patient had follow up scheduled with the WIC in the months of Aug, Sept and Oct 2018. 68.9% patients had proper documentation of medication reconciliation on their follow up visits.
- A paired T –Test was performed. T value of 7.6 with a p value of 0.017.

VARIABLE	PRE	POST	P Value
Medication Reconciliation	0.13	0.58	0.017
	0.07	0.71	
	0.38	0.82	

Discussion:

- The admission, discharge and transition to the ambulatory care environment is a service stream composed of many nested core processes each adding either value or waste to the patient's care.
- Authors has reported interventions that improve medication reconciliation are cost-effective for preventable adverse drug events compared with no intervention.
- The percentage of patients with one or more medication discrepancy at hospital discharge has been reported at 14.1% and 32.4%. Of the errors discovered at hospital discharge in a prospective observational study, 51% had the potential to result in moderate to severe harm.
- Our study shows that simple interventions are cost effective and potentially prevent adverse effects for the patients and liability for the physicians taking care of the patients. This intervention was Phase 1 of the quality improvement measures that internal medicine department as taken for improved medication reconciliation.

Methodology:

- Hospital follow up patients presenting to "Internal Medicine Walk in Clinic" were the focus of this study.
- In August 2018 residents staffing the "Walk in Clinic" were given a handout about performing medication reconciliation in the EMR medication list and selecting the suitable statement for the changes made by them.
- The statement in patient encounter note was considered to be the measure of quality for this study.
- Data of all the hospital follow up patients and their medication reconciliation was collected for three months prior to the intervention and three months post intervention.
- Data was tabulated in Excel and a paired T test was performed and P value of less then 0.05 was considered to be significant.

Marshall Internal Medicine

Conclusion:

- Our study demonstrates that adherence to quality measures can improve with simple interventions, which can significantly impact patient care.

References:

1. Varkey P, Cunningham J, Bisping S. Improving Medication Reconciliation in the Outpatient Setting. Jt Comm J Qual Patient Saf. 2016;33(5):286–92.
2. Kreckman J, Wasey W, Wise S, Stevens T, Millburg L, Jaeger C. Improving medication reconciliation at hospital admission, discharge and ambulatory care through a transition of care team. BMJ Open Qual. 2018;7(2):e000281.
3. Bedell S.E., et al.: Discrepancies in the use of medications: Their extent and predictors in an outpatient practice. Arch Intern Med 160:2129–2134, Jul. 24, 2000

Improving Patient Self Care and Decreasing Out of Medical Home Utilization for Heart Failure with Reduced Ejection Fraction (HFrEF) through a Multi-Disciplinary Heart Failure Action Plan

A Resident-Driven Quality Improvement Project

W. Clay Mitchell, MD, Audrey Plummer, DO, Samantha Grabo-Wright, PharmD,
W. Mitchell Shaver, MD, Adam Franks, MD
Marshall University Department of Family & Community Health

Background

Heart Failure with Reduced Ejection Fraction (HFrEF) or Systolic Congestive Heart Failure (sCHF) is a disease process that impacts both patient morbidity and mortality and is rampant not only in West Virginia, but nationwide. Sadly, many primary care physicians, as opposed to specialists, tend to take a more reactive approach to the issue. The importance of this is evident in the fact that several quality indicators have been created to monitor this condition, including routine echocardiography (ECHO), medication adherence and readmission rates. Therefore, our goal in this intervention is to decrease baseline rates of urgent care, Emergency Department (ED) and hospital utilization by improving patient education through a multi-disciplinary Heart Failure Action Plan.

Cycle 1

Plan – Identify the Problem: Systolic Heart Failure, or Heart Failure with Reduced Ejection Fraction (HFrEF), exacerbations are a major cause of acute visits in both the office and the hospital. The theory that patient understanding of their disease process is the main barrier to appropriate treatment of HFrEF and by removing that barrier, ED utilization for this diagnosis would decrease.

Do – Create and Implement an Action Plan for outpatient visits based upon best practices in collaboration with nursing and pharmacy.

Study – When the data was collected there were not enough patients enrolled within the Red Resident Team.

Act – It was felt that the patient population was inadequate within the Red resident team and the project should be opened up to the entire Family Medicine Center (FMC).

Cycle 2

Plan – Problem Identified: There was an inadequate population of patients with HFrEF within the Red Resident Team. The theory that increasing the potential pool of patients would increase the impact and power of this project was utilized.

Do – With an inadequate initial patient number, the project was opened up to the entire FMC. To increase Awareness of the project within the FMC: 1) reminders were added to the huddle system for HFrEF; 2) efforts were made to educate residents and attendings at the FMC; and, 3) red folders containing HFrEF action plan were placed at each pod.

Study – When the data was collected there still were not enough patients within the FMC.

Act – It was felt that coding variations for HFrEF did not identify all of the patients with the diagnosis and that the patient pool could be expanded with proper coding.

Cycle 3

Plan – Identified Problem: There was an inadequate population of patients with HFrEF within the FMC. Our theory was that variations in coding practices of the providers in the FMC failed to capture all of the eligible patients required more specific diagnosis of HFrEF in the FMC.

Do – A search of the Electronic Health Record (EHR) for all diagnoses of heart failure was conducted. Correct coding was determined and specific results were discussed with providers to better document HFrEF.

Study – 26 additional patients were identified.

Act – Plan to target utilize the Action Plan with the patients within the FMC with the newly discovered/clarified diagnosis of HFrEF.

Cycle 4

Plan – Identified Problem: Wide varieties of physician practices regarding treatment of HFrEF contribute to lack of patient understanding of their medical condition, how to self-care and how seek care for exacerbation. We believe that decreasing variations of care and education by utilizing a multidisciplinary Action Plan will improve self-care and decrease ED utilization.

Do – Implement a multi-disciplinary HFrEF Action Plan at visits for patients with HFrEF

Study – Patient Surveys (5-point Likert Scale and Days/Week)

	Total (n=10)	1st Visits (n=6)	2nd Visits (n=4)
Understood Heart Failure	4.10	4.00	4.25
Dyspnea	4.10	3.83	4.50
Swelling	3.60	3.33	4.00
Chest Pressure	4.10	4.00	4.25
Felt better able to give Self Care	4.22	4.20	4.25
Salt Reduction (days/week)	5.63	4.80	7.00
Weight Management (days/week)	3.63	2.60	5.33
Meds (days/week)	6.00	5.40	7.00
Exercise (days/week)	3.00	2.80	3.33
Understood How to Seek Care - Mild	4.50	4.50	4.50
Understood How to Seek Care - Severe	4.42	4.33	4.50
Number of Urgent Care Visits	0.00	0.00	0.00
Number of Emergency Department Visits	1.00	0.00	1.00
Number of Hospitalizations	1.00	0.00	1.00
Satisfied with CHF Care	4.50	4.50	4.50

Act – As the preliminary results were seen as promising, albeit small, it was decided to continue with the Action Plan and data collection. Baseline rates for utilization of urgent care, ED and hospital will be collected from a separate cohort of patients with HFrEF in the next cycle.

References

1. Cavalcante LM, Lima FET, Custódio IL, Oliveira SKP, Meneses LST, Oliveira ASS, Araújo TL. Influence of socio-demographic characteristics in the self-care of people with heart failure.Rev Bras Enferm. 2018;71(suppl 6):2604-2611. doi: 10.1590/0034-7167-2017-0480.

2. Edvinsson ML, Stenberg A, Åström-Olsson K. Improved outcome with standardized plan for clinical management of acute decompensated chronic heart failure. J Geriatr Cardiol. 2019 Jan;16(1):12-18. doi: 10.11909/j.issn.1671-5411.2019.01.002.

3. Huynh QL, Whitmore K, Negishi K, Marwick TH; ETHELRED Investigators. Influence of Risk on Reduction of Readmission and Death by Disease Management Programs in Heart Failure. J Card Fail. 2019 Feb 2. pii: S1071-9164(18)31057-1. doi: 10.1016/j.cardfail.2019.01.015.

4. Nordfonn OK, Morken IM, Bru LE, Husebø AML. Patients' experience with heart failure treatment and self-care-A qualitative study exploring the burden of treatment. J Clin Nurs. 2019 Jan 22. doi: 10.1111/jocn.14799.

THE IMPACT OF AN ADOLESCENT GYNECOLOGY PROVIDER ON INTRAUTERINE DEVICE AND IMPLANT USE AMONG ADOLESCENT PATIENTS

Courtney Crain MD// Anne DeFruscio MS3 //Preeya Shah MS3 // Laura Hunt MPH// Jennie Yoost MD MSc

Marshall University // Joan C. Edwards School of Medicine

Background

Pediatric and Adolescent Gynecologists (PAG) have expertise in the provision of long acting reversible contraceptives (LARC) to adolescents. Despite ACOG's strong recommendation that providers should offer LARCs as first line contraceptives for adolescents, there remains hesitancy among general OBGYN providers in offering these methods to a younger population. This study aimed to assess how a PAG provider effects the use of LARCs (intrauterine devices and implants) among girls ages 13-24. To do this we compared LARC use among adolescents for a period of time before PAG availability to a period of time after PAG availability.

Methods

This is a retrospective study analyzing LARC use from 2010-2016 in an academic practice among all payors and Title X funded patients in three surrounding counties. Subjects were included if they had an IUD or implant procedure during the study period.

Two time periods were assessed. Period 1 included LARC procedures performed from 2010-2012 prior to the arrival of a PAG provider. Period 2 included LARC procedures from 2013-2016 including those placed by a PAG provider.

Subject charts were reviewed for age at insertion, type of device, diagnosis for LARC use, parity, discontinuation, and sequential LARC placement. Each year was analyzed by age groups of subjects 13-17, 18-24. and ≥25.

Data obtained on Title X funded patients was limited to year of placement, LARC type, and patient age grouping.

Frequency of LARC insertion was compared between clients of all payor sources at a general practice (GP) consisting of 12 generalist OBGYNS, a PAG provider at that same site, and clients paid for directly by Title X at 11 clinic locations out of a 3 county selection.

References: ACOG Committee Opinion No. 735: Adolescents and Long-Acting Reversible Contraception: Implants and Intrauterine Devices. Obstet Gynecol. 2018 May;131(5):e130-e139.

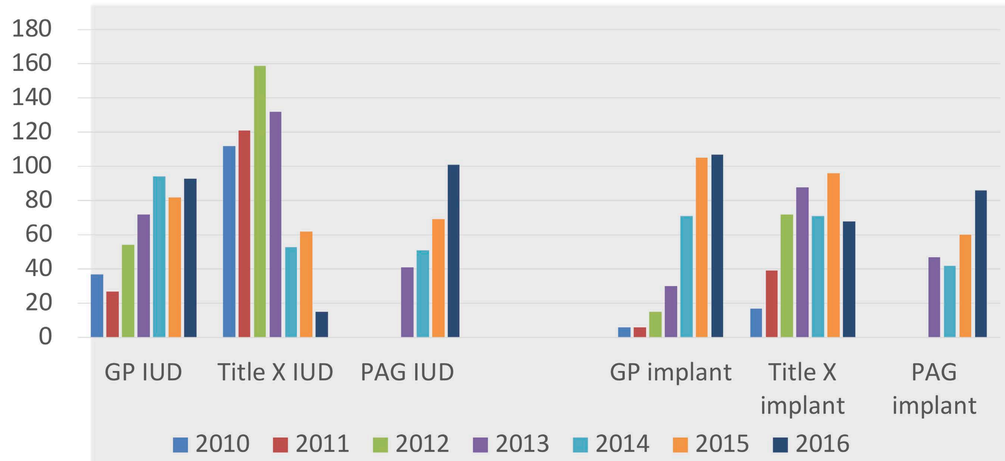


Figure 1: Number of IUDs and implants provided each year to 13-24 year olds by the General Practice (GP) which included 12 general OBGYN physicians, 11 Title X clinics from three neighboring counties, and one PAG provider.

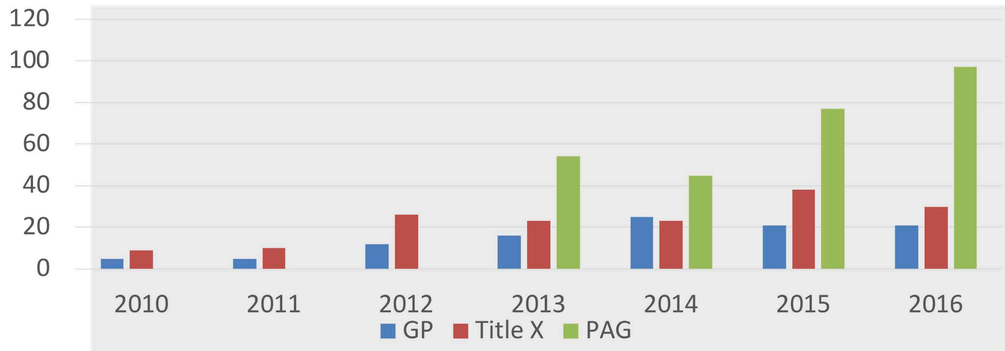


Figure 2: The number of subjects age 13-17 receiving LARCs by provider type.

	RR	95% CI	p value
13-17 IUD	3.1	(1.91, 5.33)	<.001
13-17 implant	0.89	(0.65, 1.22)	0.46
18-24 IUD	2.63	(2.12, 3.23)	<.001
18-24 implant	2.5	(1.96, 3.19)	<.001

Table 1; Rate of LARC use among PAG provider compared to General practice

	RR	95% CI	p value
13-17 IUD	32.5	(4.55, 232.5)	<.001
13-17 implant	.31	(0.24, 0.42)	<.001
18-24 IUD	1.02	(0.82, 1.27)	0.82
18-24 implant	0.88	(0.68, 1.12)	0.31

Table 2: Rate of LARC use among PAG provider compared to Title X.

Results

- 5170 LARC insertions were performed during the study period. 1946 (37.6%) during Period 1, and 3224 (62.3%) during Period 2.
- During Period 2, the GP group performed 1500 (46.5%); Title X 1227(38%) and PAG 497 (15.4%)
- The proportion of nulliparous subjects increased among GP providers from Period 1 to Period 2 (19.9% to 30.7%, p=<0.001). However, the proportion of subjects age 13-17 did not change between Period 1 and Period 2 among the GP (6.5% vs 5.5%, p=.82).
- The proportion of subjects age 13-17 did change significantly among Title X (2.8% vs 9.3%, p= <.001), yet this was due to implant use alone.
- Implant use increased over time among all providers, while IUD use declined among Title X. (Figure 1)
- The PAG provider had the highest frequency of LARC insertions among the 13-17 year age group, (Figure 2).
- The RR for IUD performance for the PAG provider among 13-17 year olds was 3.1 and 32.5 compared to GP and Title X (Tables 1 &2)
- The RR showed no significant differences in implant use among 13-17 year olds between the PAG provider and GP
- Title X providers were 2.9 (2.27,3.79) and 2.8 (2.06, 3.81) more likely to provide implants to 13-17 year olds compared to PAG and GP, respectfully (p<0.001).
- Among those who discontinued a LARC, a greater proportion of subjects seen by the PAG provider received a new LARC method compared to those who discontinued with the GP (40.3% vs 21.2%, p=.001).

Discussion

A PAG provider can have positive impact on LARC uptake among adolescents in a community where this specialist service has not previously been available. This was especially noted among 13-17 year old patients receiving IUDs. Title X providers were the most impactful in the provision of implants to 13-17 year old patients.

Management of Bone Health in Breast Cancer Patients on Aromatase Inhibitors: A Single Institution Review

Heather Katz, DO, FACOI [1], Mohit Harsh, MS IV [2], Nafeeza Hussain, MS IV [2], Muhammed Omer Jamil, MD [1]
Department of Hematology/Oncology [1], Marshall University, Joan C. Edwards School of Medicine [2]

Introduction

- Aromatase Inhibitors (AI) block the peripheral conversion of androgens to estrogen.
- Treatment with AIs, therefore, results in bone loss due to estrogen deficiency.
- Guidelines for cancer treatment-induced bone loss include supplementation with calcium and vitamin D. [1]
- Per NCCN guidelines, monitoring of bone health with a bone mineral density determination at baseline and periodically thereafter should be obtained in those women on AIs [2].

Methods

- A retrospective chart review, quality improvement study was performed
- 507 charts of patients with hormone positive breast cancer who were treated at the Edwards Comprehensive Cancer Center in Huntington, West Virginia from January 1, 2010 – December 30, 2015 was analyzed.
- 346 patient charts of patients who received aromatase inhibitors were further reviewed to see if these patients are appropriately receiving Vitamin D and Calcium and received a DEXA scan prior to starting an aromatase inhibitor

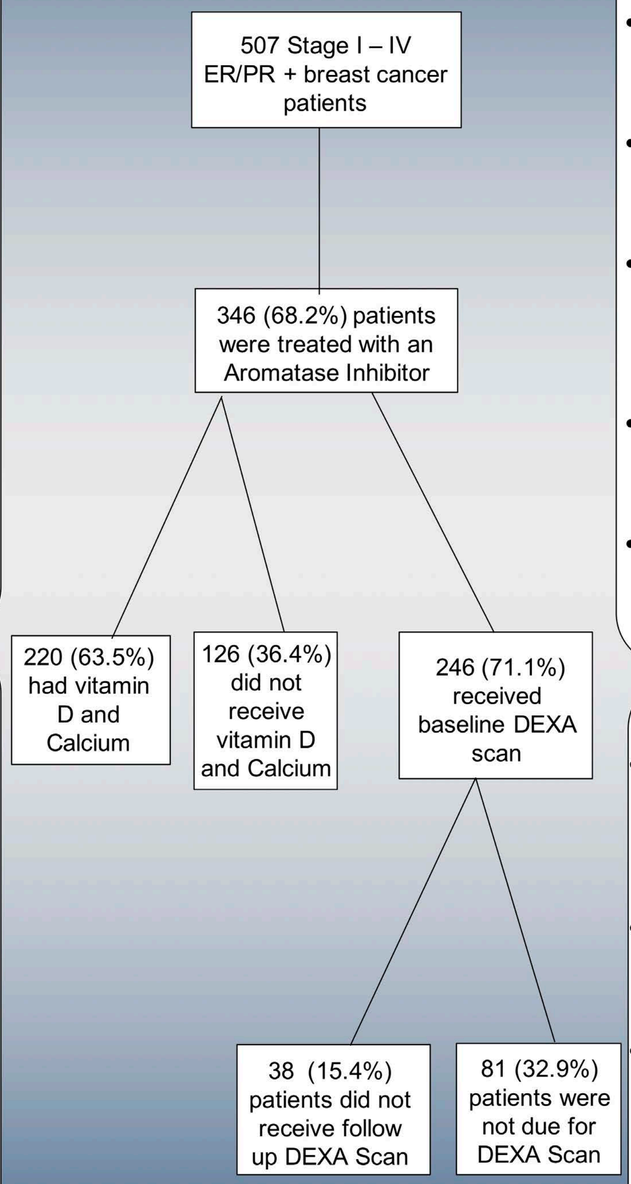


Figure 1: study schema and results

Results

- 507 patients analyzed had stage 1-4 hormone (ER/PR) positive breast cancer.
- 346 (68.2%) patients were treated with an Aromatase Inhibitor and remained in the study.
- Of those patients who received Aromatase Inhibitors, 220 (63.5%) had vitamin D and Calcium documented on their current medical reconciliation.
- 246 (71.1%) patients on Aromatase Inhibitors received a baseline DEXA Scan.
- Thirty eight(15.4%) patients did not receive follow up scans and 81 (32.9%) patients were not due for DEXA Scan follow up at the time of data collection. [Figure 1]

Conclusions

- This study indicates that better compliance with National Comprehensive Cancer Center guidelines regarding baseline and follow-up DEXA scans is needed.
- Supplementation with calcium and vitamin D is also less than adequate to protect bone health and needs to be improved.
- Suggestions to likely improve adherence of the recommended guidelines:
  - The use of specific questioning about calcium and vitamin D and proper documentation by medical assistants
  - more detailed physician documentation about date and results of DEXA scans
  - a breast navigator to confirm that baseline DEXA scans are ordered and reviewed when starting a patient on an AI

References

1. Gralow, Julie. NCCN Task Force Report: Bone Health in Cancer Care. Journal of the National Comprehensive Cancer Network. Vol 11, supp 3. Aug 2013
2. NCCN guidelines: breast cancer

Patients without Doctor

Ngoc Nguyen, MD
Marshall University

Introduction

When patient comes to St. Mary's medical center for outpatient left heart catherization (LHC), patient will go to the catherization holding area.

After the left heart catherization has been done, patient can go home if the LHC is normal. Or the patient would be admitted to inpatient for coronary artery bypass grafting (CABG) at a different floor in the hospital.

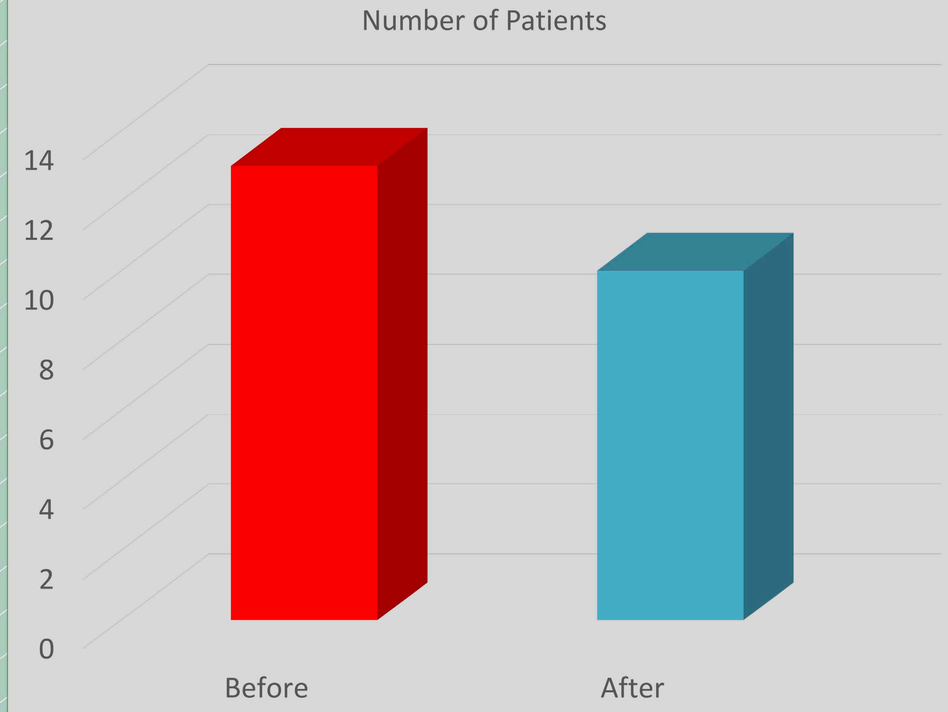
Sometimes, when the patient arrives on the floor, the primary team is not aware. Therefore, the patient would not have a doctor until the nurse notifies the primary team.

Method

Educate the primary team to go to cath holding area at the end of the day to see which patient is admitted to the floor.

Asked the fellow who did the LHC to notified the primary team of the patient who is admitted

Result



Safety

Patient is safer if the primary team know about the patient's admission.

There is still need improvement.

Conclusion

The intervention help reduced the number of patient without a doctor.

In the future, we will add an order to the post left heart catherization.

Before the patient goes from cath holding to the floor, the patient's nurse would record the patient name on a paper. At the end of the day, the primary team would go to the cath holding and get the paper with the patient's name.

Once the patient reaches the floor, the ward clerk on the floor notifies the primary team

Improving Management of Diabetes Mellitus through Implementation of a Chronic Care Management Program

Courtney Nichols, PGY-4, Elizabeth Saunders, MD, Linda Ferrell, RN, Amber Byard, LPN, and Shannon Browning, RPH, MD

INTRODUCTION

Diabetes mellitus is a serious chronic disease, including a major contributor to heart disease, renal disease, vascular disease, and stroke. Recent statistics indicate that 9.4% of adults in the United States have diabetes, including 25.2% of all individuals over 65 years of age. The prevalence of diabetes has risen every year since the mid 1990's. Due to the health complications associated with diabetes and its increasing prevalence, this disease imposes a significant economic burden on the health care system and society. More personal healthcare resources are utilized in the management of diabetes than any other chronic medical condition, with an associated $245 billion health care dollars being spent towards the management of diabetes annually, impacting not only the individual, but also causing financial burden on private insurers, employers and state and federal governments[1].

To help patients achieve better management of their diabetes, the Internal Medicine Department at our institution implemented a departmental chronic care management program in May 2018, with a focus for this program to improve quality of care and to promote interactions between more empowered and knowledgeable patients and goal-oriented health care teams in the management of certain chronic diseases, including diabetes. Recent studies suggest that health care team reorganization involving chronic care models may help to improve overall diabetes management[2,3]. The purpose of this project is to review diabetic patients enrolled in and receiving diabetes management through the internal medicine chronic care management program, and to evaluate if management of their diabetes improved based on the HgbA1c for each patient when they enrolled in the chronic care management program and 3-6 month later when a follow up HgbA1c was monitored.

BIBLIOGRAPHY

1. Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2017.
2. Delaney G, Newlyn N, Pamplona E, Hocking SL, Glastras SJ, McGrath RT, et al. Identification of Patients With Diabetes Who Benefit Most From a Health Coaching Program in Chronic Disease Management, Sydney, Australia, 2013. Prev Chronic Dis 2017;14:160504.
3. Wiens A, Pontarolo R, Regis L, Reis W, and Correr C. The Chronic Care Model for Type 2 Diabetes: A Systematic Review. *Diabetology & Metabolic Syndrome*. 2016; 68:7.

METHODS

In May 2018, the Marshall University Internal Medicine Department implemented a Chronic Care Management Program targeting a patient population with two or more chronic medical conditions. Under the care of a CCM coordinator, these patients would receive individualized comprehensive care plans focusing on two or more chronic conditions on a monthly basis involving 20-minutes of non-face-to-face time per calendar month as outlined by the Centers for Medicare and Medicaid Services. Patients were enrolled in the Chronic Care Management Program after informed consent obtained by the patient care coordinator.

For this project, we selected all patients enrolled in the chronic care management model with diabetes as one of their chronic health conditions, and then compared each patient's HgbA1C at time of enrollment in the chronic care management program and after 3-6 months of disease management in the chronic care management program to determine if HgbA1c had increased, decreased, or remained stable after being enrolled in the CCM program. Patients were excluded who had been enrolled in the CCM program less than 3 months or who had no repeat HgbA1c after enrolling in the program. For the groups of patients who saw an increase or decrease in their HgbA1c during this period, the overall average change in HgbA1c was calculated for each group.

Changes in HgbA1c 3-6 Months After Enrollment in Chronic Care Management Program

	HgbA1c Decreased	HgbA1c Unchanged	HgbA1c Increased	Total Patients
Number of Patients (%)	13 (46.4%)	4 (14.3%)	11 (39.3%)	28
Change in HgbA1c	- 0.79	-	+ 0.52	-

Table 1: This table shows the number of patients whose HgbA1c increased, decreased, and was stable after 3-6 months in the CCM program. This table also shows the average HgbA1c change for both the group where HgbA1c increased and decreased during this time period.

RESULTS

Through this project, we identified 28 patients enrolled in the Department of Medicine's Chronic Care Management Program who were diabetics and have been enrolled in the program for more than 3 months. These patients each had both an initial HgbA1c when they enrolled in the chronic care management program, and a follow-up HgbA1c 3-6 months later.

The results of this quality improvement project showed that after enrollment in the CCM program, 46.4% of diabetic patients enrolled had an improvement in their HgbA1c, with an average improvement of 0.79%. Conversely, 39.3% of diabetic patients included in this project saw an increase in their HgbA1c, with an average increase seen of 0.52%. We also found that 4 patients (14.3%) had no change in the HgbA1c during this period.

DISCUSSION

The Department of Internal Medicine successfully implemented a Chronic Care Management Program in May of 2018 with the goal of delivering improved quality of care through individualized health care plans for our patients enrolled in the program. We have found through this project that while some of our patients with diabetes did see an improvement in their diabetes control (measured through improvement in their HgbA1c) in the first 3-6 months that they were enrolled in the chronic care management program, nearly 40% percent of our diabetic patients had an increase in their HgbA1c.

Further follow up and monitoring of these patients through participation in the chronic care management program is needed to determine if, given more time enrolled in the chronic care management program, a greater percentage of diabetic patients would see an improvement in diabetes control with an associated improvement in their HgbA1c. Future studies could be done to continue to monitor overall changes in the HgbA1c for these patients and to analyze changes in HgbA1c for additional new diabetic patients who continue to become enrolled in the chronic care management program.

The Department of Internal Medicine continues to utilize the Chronic Care Management Program for both improved tracking of our patients with multiple chronic medical condition and improved overall healthcare quality through individualized care plans for patients with these chronic disease states. We found through analysis of our diabetic patients that additional improvements can be created to help improve quality of care for our diabetic patients. With the increasing prevalence and complications associated with diabetes, including an increased health care cost for diabetic patients, the Chronic Care Management Program is an essential tool for both improved quality of care and creating an individualized patient care plan for better diabetes management.

The Impact of Age, Injury Severity and Mechanism on Orbital Blow-out Fracture Patterns After Blunt Trauma: A 11-Year Review

Rahman Barry, M.D.*, Thao Wolbert, M.D., David Denning, M.D., Peter Ray, M.D.

Department of Surgery, Marshall University
Huntington, West Virginia

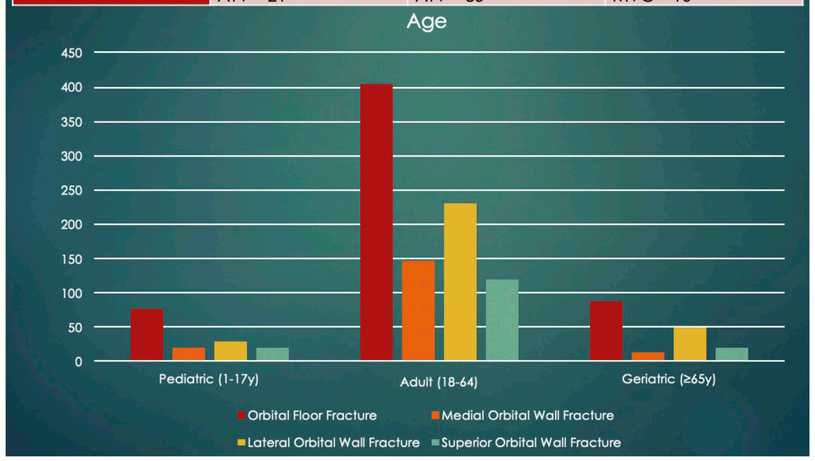
Introduction

Craniofacial injuries contribute substantially to morbidity after blunt trauma, with orbital fractures seen in approximately 10-25% of all traumatic facial fractures. Orbital blow-out fractures occur when an orbital wall is fractured with an intact orbital rim, and usually occurs after significant blunt trauma from an object larger than the orbital aperture. The aim of this study is to determine the impact of age, injury severity, and mechanism of injury on orbital blow-out fracture patterns.

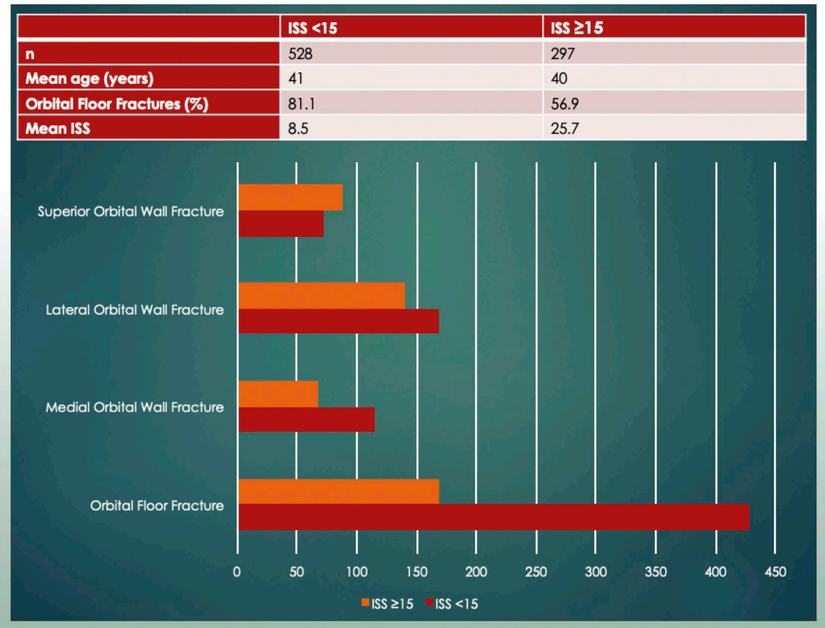
Methods

We retrospectively reviewed all patients admitted to a regional Level 2 Trauma Center, who sustained blunt orbital fractures, over a 11-year period, from January 2006 to December 2016. We excluded all patients who had orbital rim fractures and all penetrating trauma. Only patients who had a computed tomography scan of their face on presentation were included. There were 825 patients who met inclusion criteria. Individual charts were reviewed for demographics, length-of-stay(LOS), mechanism of injury(MOI), injury severity score(ISS), and mortality. Individual facial CT scans were reviewed along with the formal radiologist report to determine fracture locations. Statistical significance was set at a p value ≤0.05. This study was approved by our Institutional Review Board.

	Pediatric (1-17y)	Adult (18-64)	Geriatric (≥65y)
n	105	608	112
Mean age(years)	10	39	77
Mean ISS	14.8	14.9	13.5
Male Percent	64%	83%	53%
Mechanisms of Injury	MVC – 29 ATV – 21	MVC – 166 ATV – 85	Fall – 75 MVC – 16



	ISS <15	ISS ≥15
n	528	297
Mean age (years)	41	40
Orbital Floor Fractures (%)	81.1	56.9
Mean ISS	8.5	25.7



Results

Our cohort consisted of 825 patients, with 42 mortalities(5.1%). The mean LOS was 5.4 days(range 0-78) and the mean ISS was 14.7. The most common MOI was motor vehicle collisions(MVC) in 211 patients. Overall, the most common orbital blow-out fracture involved the orbital floor in 567 patients(68.7%), followed by the lateral, medial, superior(roof), and posterior walls in 310(37.6%), 183(22.2%), 160(19.3%), and 16(1.8%) patients, respectively. Patients with ISS <15 were significantly more likely to have an orbital floor fracture when compared to patients with ISS ≥15, with fractures present in 81.1% and 56.9% of patients, respectively($p<0.05$). MCC resulted in the highest mean number of orbital blow-out fractures per patient(1.83), which was significantly higher than other mechanisms ($p<0.05$). Patients who had ground-level mechanical falls were most likely to have orbital floor blow-out fractures(90.0%) compared with other mechanisms($p<0.05$).

Conclusion

Orbital blow-out fractures are a common injury after significant blunt craniofacial trauma. The orbital floor is most frequently involved, and patients who have mechanical falls seem particularly prone to this injury. Patients with lower ISS in our cohort likely had more concentrated craniofacial injuries, explaining their worse fracture patterns. MCC appears to confer the greatest craniofacial trauma with the most severe orbital blow-out fractures patterns. Age did not independently predict fracture patterns.

Screening of Osteoporosis in Elderly Men

Le Yu Khine MD, Matthew LaRoe MD, Rodhan Khthir MD

Problem Statement & Objectives

International Society of Bone Densitometry (ISCD) AND National Osteoporosis Foundation recommend screening all men above the age of 69 for osteoporosis and screening men with other risk factors at younger age.

Only 1.7% of men above the age of 70 visited internal medicine clinic had DEXA scan according to our pre-intervention data.

Our data from Cabell Huntington Hospital showed 61 men who were above 70 were admitted with fragility fracture from May 2017 to April 2018.

Objectives:

-To identify the barriers that prevent the screening for osteoporosis in elderly men and ways to resolve them

-To improve the screening of osteoporosis in men in primary care physicians' offices

-To decrease the prevalence of fragility fracture

-To decrease the fracture related comorbidities (immobility, pain, placement in nursing home and other health problems)

Plan

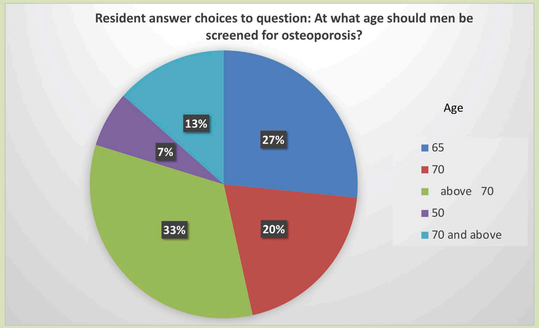
We obtained our pre-intervention data by pooling the three months data of elderly men above 70 in Marshall Internal Medicine clinic except walk in clinic. We shared the data with providers and trainees at internal medicine clinic and endocrine clinic

We conducted a survey among internal medicine residents to identify baseline knowledge, perception and the main barriers for the low screening rate.

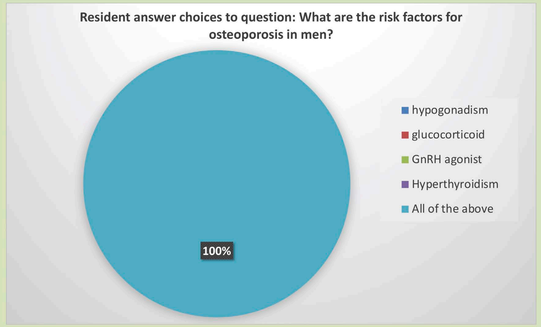
Resident Survey data showed only 13% of the residents answered right age for screening of osteoporosis. 100% answered the risk factors for osteoporosis correctly. 43% of the residents identified high risk population under 70 years old men.73% of the residents are aware that elderly men are under-screened for osteoporosis in Internal Medicine clinic. 78% of the residents response mentioned that DEXA is the screening tool for osteoporosis

We identified based on the survey the root causes of low screening rate and we ranked the root causes.

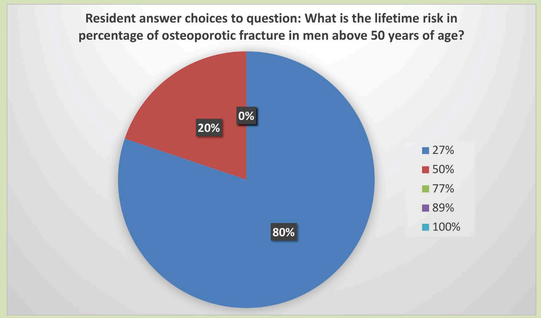
Residents' Survey response



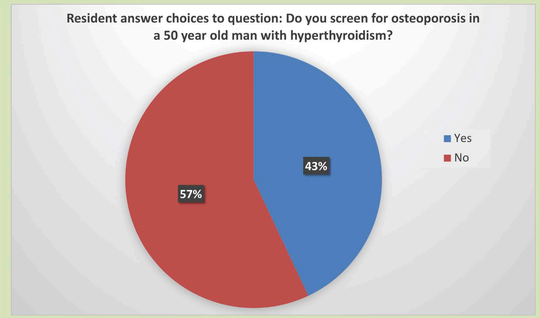
13% of residents replied correctly with answer choice 70 and above



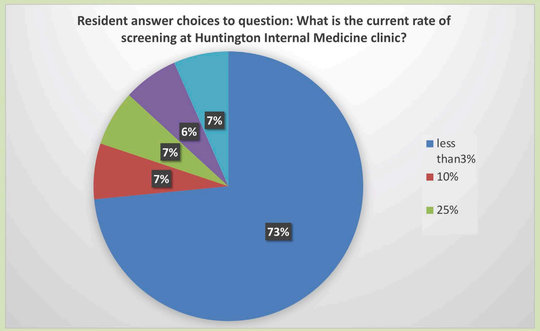
100% of residents replied correctly with answer choice all of the above



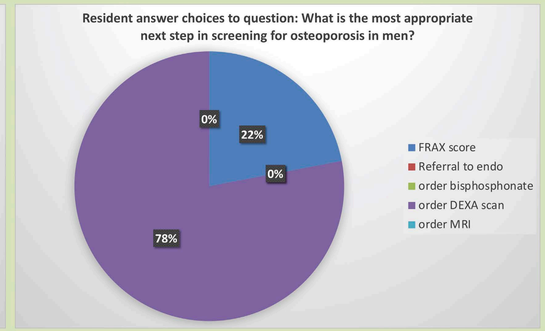
80% of residents replied correctly with answer choice 27%



43% of residents replied correctly with answer choice yes



73% of residents replied correctly with answer choice less than 3%



78% of residents replied correctly with ordering DEXA scan as next step

Do

We targeted the following 2 areas based on the root cause analysis:

1. **Knowledge gap and clinical inertia** : Educational flyers for patients and providers were created based on the feedback from Internal Medicine physicians and they were all posted on each patient's room including endocrine clinics.

2. **Insurance rejection**: We identified the diagnostic codes and the criteria accepted by insurance companies to approve osteoporosis screening for men. Providers were educated on the proper selection of patients and ordering

Study

Our follow up data showed overall small improvement in rate of screening to 2.45%. The pre-intervention rate was 1.72% .

Act

Our performance improvement project targeted an opportunity to improve Men's health and prevent a very serious events like hip fracture which is associated with high mortality and morbidity rate. Hazard ratio for mortality during the first three months following a hip fracture of 5.75 in older women and 7.95 in older men.

Improving knowledge about the disease for both patients and providers and decreasing the main barriers for low screening resulted in significant improvement among endocrine clinic patients.

Reducing the Overtreatment of Urinalysis in Obstetric Triage Patients

KRISTIN SINNING M.D. // EMELIA WINSTON D.O. // SUKHMIT KAUR M.D. // KATHERINE ADDICOTT M.D.

MARSHALL UNIVSERSITY JOAN C. EDWARDS SCHOOL OF MEDICINE-OBSTETRICS & GYENCOLOGY

OBJECTIVE

- Asymptomatic bacteriuria (ASB): significant amount of bacteria in urine without signs or symptoms of a urinary tract infection (UTI). It affects 2% to 10% of pregnant women.
- UTIs are a source of morbidity during pregnancy for both mother and fetus, and therefore routine urinalysis (UA) is performed during prenatal care.
- Overtreatment of ASB can lead to adverse side effects and antimicrobial resistance.
  - Disturbance of the intestinal flora increases risk of Clostridium difficile infection, antibiotic resistance, and increased health care costs.
  - Treatment of ASB may eliminate low-virulence strains that suppress the development of uropathogens, leading to the development of symptomatic UTIs.
- Several studies show that at least a third to half of patients are being over treated; most of these studies involve non-pregnant patients
- The purpose of this study was to determine the number of patients presenting to OB triage who were over-treated for a UA, and if an educational intervention could reduce the incidence of overtreatment.

METHODOLOGY

- A retrospective chart review analyzing UA results and outcomes of OB triage patients who came through labor and delivery before and after an educational intervention was given to the residents
- Two time periods were chosen: Cohort 1 (Pre-intervention) included patients from March- May of 2017. Cohort 2 (Post-intervention) included patients from March – May 2018.
- The time periods were chosen a year apart so that training levels were similar
- Patients were excluded if they were treated multiple times for UTIs during the pregnancy, were given antibiotics at an outside facility, or seen by an attending physician only.
- Chart review data included subject age, gestational age, history of diabetes, hypertension, obesity or kidney disease, UA result, culture result, whether a script was provided, and if pyelonephritis occurred.
- Based on UA criteria it was then determined if subjects were treated appropriately.

Table 1: Baseline characteristics of both cohorts

	Pre (n=601)	Post (n=711)	p value
Age	24.7 (SD 5.3)	25.4 (SD 5.4)	0.32
Gestational age*	29.6 (SD 8.3)	29.3 (SD 8.1)	0.23
Hypertension n(%)	118 (19.6)	106 (14.9)	0.027
Diabetes n(%)	34 (5.7)	64 (9)	0.026
Obesity n(%)	289 (48.1)	403 (56.7)	0.002
Recurrent UTIs n(%)	22 (3.7)	30 (4.2)	0.67
Pyelonephritis n(%)	9 (1.5)	9 (1.3)	0.81
Kidney Pathology** n(%)	13 (2.2)	26(3.7)	0.14

*Cohort 1: 1 unknown GA, 0 postpartum
*Cohort 2: 4 unknown GA, 13 postpartum
**Kidney disease (nephrotic syndrome, nephrolithiasis, horseshoe kidney)

Table 2: Patients in each cohort treated appropriately, overtreated or missed

	Pre (n=601) n(%)	Post (n=711) n(%)	p value
Treated Appropriately	21(3.5)	19 (2.7)	0.38
Overtreated	60 (10)	36 (5.1)	0.001
Missed	3 (0.5)	11 (1.5)	0.10

Treated appropriately= met criteria for treatment and received script
Overtreated= did not meet criteria for treatment and received script
Missed= met criteria for treatment and did not receive script

EDUCATION

- UA: highly specific, poorly sensitive
- Positive for nitrites, leuk est, and bacteria suggests a UTI, however if epithelial cells are present (>15/hpf) this is likely contamination and it is appropriate to wait for culture (depending on symptoms)

RESULTS

- 1312 charts were reviewed; 601 in Cohort 1 (pre intervention) and 711 in Cohort 2 (post intervention)
- Groups did not differ by age, GA or history of GU pathology, but were slightly different in other past medical history. (Table 1)
- There was no significant difference in the number of subjects treated appropriately or the number of patients who should have been treated but were not (“missed”) in both time periods. (Table 2)
- There was a significant reduction in subjects who were over-treated for UA following the intervention (Table 2)
- In both cohorts, all cases of pyelonephritis were treated appropriately.

CONCLUSION

- A resident to resident didactic session appears to have reduced the incidence of overtreatment of bacteriuria. This type of intervention could lead to more cost efficient care and reduce antibiotic-related complications for pregnant patients.
- Limitations to this study include the retrospective nature of data collection and changes in the resident staff prior to Cohort 2 patient encounters.

REFERENCES

1. Didbaridze, T., Tharashvili, A., Nino Gogokhia, N., Metskhvarishvili, N., & Rizhvadze., M. (2017); Asymptomatic bacteriuria in normal pregnancy. *International Journal of Advanced Research* **5** (5). 535-537. http://dx.doi.org/10.21474/IJAR01/4141
2. Eyer, M., Läng, M., Aujesky, D., & Marschall, J. (2015). Overtreatment of asymptomatic bacteriuria: A qualitative atudy. *Open Forum Infectious Diseases*, *2*(Suppl 1), 164. http://doi.org/10.1093/ofid/ofv133.42
3. Flokas, Myrto Eleni, Nikolaos Andreatos, Michail Alevizakos, Alireza Kalbasi, Pelin Onur, and Eleftherios Mylonakis. 2017. “Inappropriate management of asymptomatic patients With positive urine cultures: A systematic review and meta-analysis.” Open Forum Infectious Diseases 4 (4): ofx207. doi:10.1093/ofid/ofx207. http://dx.doi.org/10.1093/ofid/ofx207.
4. Gilbert, N. M., O'Brien, V. P., Hultgren, S., Macones, G., Lewis, W. G., & Lewis, A. L. (2013). Urinary tract infection as a preventable cause of pregnancy complications: Opportunities, challenges, and a global call to action. *Global Advances in Health and Medicine*, *2*(5), 59–69. http://doi.org/10.7453/gahmj.2013.061
5. Matuszkiewicz-Rowińska, J., Małyszko, J., & Wieliczko, M. (2015). Urinary tract infections in pregnancy: old and new unresolved diagnostic and therapeutic problems. *Archives of Medical Science: AMS*, *11*(1), 67–77. http://doi.org/10.5114/aoms.2013.39202

Reducing the Overtreatment of Urinalysis in Obstetric Triage Patients

KRISTIN SINNING M.D. // EMELIA WINSTON D.O. // SUKHMIT KAUR M.D. // KATHERINE ADDICOTT M.D. // DR. KEVIN CONAWAY // DR. JENNIE YOOST

MARSHALL UNIVSERSITY JOAN C. EDWARDS SCHOOL OF MEDICINE-OBSTETRICS & GYENCOLOGY

BACKROUND AND OBJECTIVE

- Asymptomatic bacteriuria (ASB): significant amount of bacteria in urine without signs or symptoms of a urinary tract infection (UTI). It affects 2% to 10% of pregnant women.
- UTIs are a source of morbidity during pregnancy for both mother and fetus, and therefore routine urinalysis (UA) is performed during prenatal care.
- Overtreatment of ASB can lead to adverse side effects and antimicrobial resistance.
  - Disturbance of the intestinal flora increases risk of Clostridium difficile infection, antibiotic resistance, and increased health care costs.
  - Treatment of ASB may eliminate low-virulence strains that suppress the development of uropathogens, leading to the development of symptomatic UTIs.
- Several studies show that at least a third to half of patients are being over treated; most of these studies involve non-pregnant patients
- The purpose of this study was to determine the number of patients presenting to OB triage who were over-treated for a UA, and if an educational intervention could reduce the incidence of overtreatment.

METHODOLOGY

- A retrospective chart review analyzing UA results and outcomes of OB triage patients who came through labor and delivery before and after an educational intervention was given to the residents
- Two time periods were chosen: Cohort 1 (Pre-intervention) included patients from March- May of 2017. Cohort 2 (Post-intervention) included patients from March – May 2018.
- The time periods were chosen a year apart so that training levels were similar
- Patients were excluded if they were treated multiple times for UTIs during the pregnancy, were given antibiotics at an outside facility, or seen by an attending physician only.
- Chart review data included subject age, gestational age, history of diabetes, hypertension, obesity or kidney disease, UA result, culture result, whether a script was provided, and if pyelonephritis occurred.
- Based on UA criteria it was then determined if subjects were treated appropriately.

Table 1: Baseline characteristics of both cohorts

	Pre (n=601)	Post (n=711)	p value
Age	24.7 (SD 5.3)	25.4 (SD 5.4)	0.32
Gestational age*	29.6 (SD 8.3)	29.3 (SD 8.1)	0.23
Hypertension n(%)	118 (19.6)	106 (14.9)	0.027
Diabetes n(%)	34 (5.7)	64 (9)	0.026
Obesity n(%)	289 (48.1)	403 (56.7)	0.002
Recurrent UTIs n(%)	22 (3.7)	30 (4.2)	0.67
Pyelonephritis n(%)	9 (1.5)	9 (1.3)	0.81
Kidney Pathology** n(%)	13 (2.2)	26(3.7)	0.14

*Cohort 1: 1 unknown GA, 0 postpartum
*Cohort 2: 4 unknown GA, 13 postpartum
**Kidney disease (nephrotic syndrome, nephrolithiasis, horseshoe kidney)

Table 2: Patients in each cohort treated appropriately, overtreated or missed

	Pre (n=601) n(%)	Post (n=711) n(%)	p value
Treated Appropriately	21(3.5)	19 (2.7)	0.38
Overtreated	60 (10)	36 (5.1)	0.001
Missed	3 (0.5)	11 (1.5)	0.10

Treated appropriately= met criteria for treatment and received script
Overtreated= did not meet criteria for treatment and received script
Missed= met criteria for treatment and did not receive script

EDUCATION

- UA: highly specific, poorly sensitive
- Positive for nitrites, leuk est, and bacteria suggests a UTI, however if epithelial cells are present (>15/hpf) this is likely contamination and it is appropriate to wait for culture (depending on symptoms)

RESULTS

- 1312 charts were reviewed; 601 in Cohort 1 (pre intervention) and 711 in Cohort 2 (post intervention)
- Groups did not differ by age, GA or history of GU pathology, but were slightly different in other past medical history. (Table 1)
- There was no significant difference in the number of subjects treated appropriately or the number of patients who should have been treated but were not (“missed”) in both time periods. (Table 2)
- There was a significant reduction in subjects who were over-treated for UA following the intervention (Table 2)
- In both cohorts, all cases of pyelonephritis were treated appropriately.

CONCLUSION

- A resident to resident didactic session appears to have reduced the incidence of overtreatment of bacteriuria. This type of intervention could lead to more cost efficient care and reduce antibiotic-related complications for pregnant patients.
- Limitations to this study include the retrospective nature of data collection and changes in the resident staff prior to Cohort 2 patient encounters.

REFERENCES

1. Didbaridze, T., Tharashvili, A., Nino Gogokhia, N., Metskhvarishvili, N., & Rizhvadze., M. (2017); Asymptomatic bacteriuria in normal pregnancy. *International Journal of Advanced Research* **5** (5). 535-537. http://dx.doi.org/10.21474/IJAR01/4141
2. Eyer, M., Läng, M., Aujesky, D., & Marschall, J. (2015). Overtreatment of asymptomatic bacteriuria: A qualitative atudy. *Open Forum Infectious Diseases*, *2*(Suppl 1), 164. http://doi.org/10.1093/ofid/ofv133.42
3. Flokas, Myrto Eleni, Nikolaos Andreatos, Michail Alevizakos, Alireza Kalbasi, Pelin Onur, and Eleftherios Mylonakis. 2017. “Inappropriate management of asymptomatic patients With positive urine cultures: A systematic review and meta-analysis.” Open Forum Infectious Diseases 4 (4): ofx207. doi:10.1093/ofid/ofx207. http://dx.doi.org/10.1093/ofid/ofx207.
4. Gilbert, N. M., O'Brien, V. P., Hultgren, S., Macones, G., Lewis, W. G., & Lewis, A. L. (2013). Urinary tract infection as a preventable cause of pregnancy complications: Opportunities, challenges, and a global call to action. *Global Advances in Health and Medicine*, *2*(5), 59–69. http://doi.org/10.7453/gahmj.2013.061
5. Matuszkiewicz-Rowińska, J., Małyszko, J., & Wieliczko, M. (2015). Urinary tract infections in pregnancy: old and new unresolved diagnostic and therapeutic problems. *Archives of Medical Science: AMS*, *11*(1), 67–77. http://doi.org/10.5114/aoms.2013.39202

Physician Compliance with Pediatric Obesity Screening Guidelines and Related Complications

Meghan Pauley DO, Deborah Preston BS-CCRC, Yoram Elitsur MD

Marshall University Joan C. Edwards School of Medicine, Pediatrics Department, Division of Gastroenterology

Introduction

Obesity has been recognized as a global health crisis in both adult and pediatric populations alike. National data reports that obesity rates are continuing to rise, and 1 out of every 5 children and adolescents in the U.S. is obese.[1] Obese children are five times more likely to become obese adults compared to their normal weight counterparts.[2] This is especially concerning to our team, as our home state of West Virginia has the highest prevalence of adult obesity of all states in the U.S.[3]

Childhood obesity is associated with a vast number of comorbidities, such as type 2 diabetes mellitus (T2DM), dyslipidemia, non-alcoholic fatty liver disease (NAFLD), and many more.[4,5] Furthermore, the CDC reports that if children have obesity, once they reach adulthood, their obesity and disease risk factors are likely to be more severe than if they had not had childhood obesity.[6] Many expert organizations endorse screening guidelines regarding pediatric obesity and its associated comorbidities. Recommendations begin with obtaining BMI for all patients 2 years of age or older and classifying BMI percentile per pediatric growth charts for age and gender. If the patient is found to be obese, further evaluation should include laboratory screening for T2DM, dyslipidemia, NAFLD, and Vitamin D deficiency. These recommendations are summarized in Table 1 and the image below.[5]

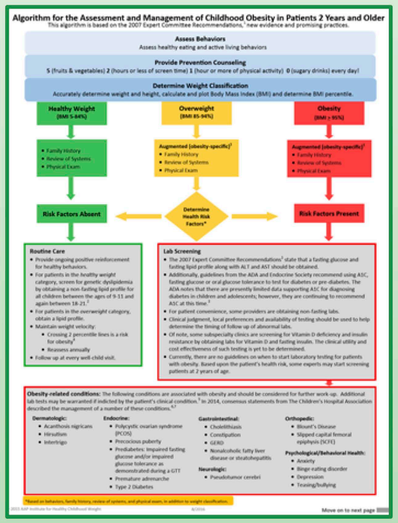


Table 1. Screening Recommendations for Obese Pediatric Patients by Comorbidity

Organization	Year	Diabetes Mellitus	Dyslipidemia	NAFLD	Vitamin D Deficiency
American Diabetes Association[7]	2019	FPG OR 2h glucose during OGTT OR $HbA1_c$ (after onset of puberty or ≥10 years old)	N/A	N/A	N/A
Endocrine Society[4,8]	Vit D: 2011 Others: 2017	FPG OR 2h glucose during OGTT OR $HbA1_c$	Fasting lipid profile	ALT	Serum 25(OH)D
Expert Committee on Obesity[9]	2007	FPG (≥10 years old)	Fasting lipid profile	AST and ALT	N/A
Expert Panel on Integrated Guidelines for CV Health and Risk Reduction in Children and Adolescents[10]	2011	FPG (per ADA guidelines)	Fasting lipid profile (as early as 2 yrs old)	N/A	N/A
NASPGHAN[11]	2017	N/A	N/A	ALT (9-11 yrs old; sooner if severe obesity, risk factors)	N/A

Methods

- Retrospective chart review of 124 obese children seen in our gastroenterology (GI) clinic for various GI-related complaints (excluding obesity).
- Inclusion Criteria – obese children presenting with BMI% ≤ 95%-tile, 2-18 years of age, referred by their primary care physician (PCP) to our GI clinic between 2013-2018. PCPs had to provide previous patient documentation.
- 24 charts excluded for not meeting inclusion criteria: 5 did not follow with our GI clinic, 2 did not meet criteria for obesity upon presentation to GI clinic, 14 were referred by a physician other than the PCP (ED, specialists, etc), and 3 patients had no accompanying documentation from PCP.
- PCP and GI clinic documentation was reviewed for obesity-related assessments: documentation of BMI, presence or absence of an obesity diagnosis, screening or laboratory tests (fasting glucose, insulin, lipids; ALT/AST; Vitamin D; HbA1C; abdominal imaging).
- Due to variations in laboratory-reported reference ranges, we obtained reference ranges from the Harriet Lane Handbook (HLH) with the exception of fasting insulin, which is not in HLH.[12] The raw insulin values were used for calculating HOMA-2 scores as part of the GI clinic patient evaluation for insulin resistance (IR).

Results

Table 2. Results from Prior PCP Evaluations

Factor Evaluated	Patients with documented results from PCP evaluation	Patients with abnormal results from PCP evaluation	Details
BMI	82/100 (82.0%)	82/82 (100.0%)	Overweight: 2 Obese: 80
Obesity diagnosis	23/80 (28.8%)	N/A	+1 pt with dx but no recorded BMI
Glucose	23/100 (23.0%)	6/23 (26.1%)	Pre-diabetic range: 6
HbA1c	2/100 (2.0%)	0/2 (0.0%)	
Vitamin D	1/100 (1.0%)	0/1 (0.0%)	
Lipids	5/100 (5.0%)	LDL: 1/5 (20.0%) HDL: 2/5 (40.0%) Trigs: 3/5 (60.0%)	
AST/ALT	24/100 (24.0%)	AST: 5/24 (20.1%) ALT: 7/24 (29.2%)	
Abd Imaging (US/MRI/CT for NAFLD)	16/100 (16.0%)	5/16 (31.3%)	

Table 3. Results from GI Clinic Evaluations

Factor Evaluated	Patients with documented results from GI evaluation	Patients with abnormal results from GI evaluation	Details
BMI	100/100 (100.0%)	100/100 (100.0%)	All obese
Obesity diagnosis	99/100 (99.0%)	N/A	
Glucose	75/100 (75.0%)	4/75 (5.3%)	Pre-diabetic range: 3 Diabetic range: 1
Insulin	72/100 (72.0%)	N/A	
HOMA-2	70/100 (70.0%)	49/70 (70.0%)	≥2.0
HbA1c	3/100 (3.0%)	1/3 (33.3%)	Prediabetic: 1
Vitamin D	81/100 (81.0%)	66/81 (81.5%)	Insufficient: 25 Deficient: 41
Lipids	72/100 (72.0%)	LDL: 7/72 (9.7%) HDL: 11/72 (15.3%) Trigs: 27/72 (37.5%)	
AST/ALT	73/100 (73.0%)	AST: 9/73 (12.3%) ALT: 20/73 (27.4%)	
Abd Imaging (US/MRI/CT for NAFLD)	4/100 (4.0%)	2/4 (50%)	

Table 4. Abnormalities Newly Identified by GI Clinic

Factor Evaluated	Percentage of abnormal results identified by GI clinic not previously identified by PCP
Obesity diagnosis	73/99 (73.7%)
Glucose	3/4 (75.0%)
HbA1c	1/1 (100.0%)
Vitamin D (insufficiency and deficiency)	66/66 (100.0%)
Lipids (one or multiple abnormal)	35/37 (94.6%)
AST/ALT (one or both abnormal)	15/20 (75.0%)
Abdominal imaging	2/2 (100%)

Discussion

Childhood obesity is now one of the most common health issues affecting the pediatric population and is associated with significant comorbidities such as dyslipidemia, hypertension, insulin resistance, T2DM, asthma, NAFLD, anxiety, depression, and many more. Obese children are more likely to become obese adults, and their obesity and disease risk factors in adulthood are likely to be more severe.[6]

Primary care physicians are the first line of defense to prevent, identify and diagnose, and/or address obesity and its associated complications. There is not a true consensus on screening recommendations across the expert organizations, although most recommend calculating and classifying BMI percentile, then screening obese patients for associated comorbidities including T2DM, dyslipidemia, NAFLD, and Vitamin D deficiency. Historically, rates of diagnosis of childhood obesity and related screenings are inadequate and inconsistent despite the published screening recommendations.[13,14] Results from this study parallel results from similar studies published as many as 20 years ago, with only 28.8% of our obese patients receiving an obesity diagnosis from their PCP.[13,14] Additionally, our subsequent GI clinic evaluations found previously unidentified comorbidities in many patients, suggesting that accurate diagnosing, along with earlier and complete screening, could improve outcomes for obese patients.

Study limitations:

- Small sample size
- Patient population derived from single subspecialty clinic
- Study dependent on PCP providing information from patient chart
- Assume patient compliance with obtaining screening labs

Conclusions

1. Primary care physician compliance with established pediatric obesity screening guidelines continues to be inconsistent and inadequate
2. Obesity and associated comorbidities found to be present, yet were previously undiagnosed by PCPs
3. Our study results, along with similar previously published studies, highlight the need for consensus on screening guidelines and reference values, as well as improved PCP awareness of guidelines

References

1. Fryar, C., MSPH, Carroll, M., MSPH, Ogden, C., PhD, Division of Health and Nutrition Examination Surveys. Prevalence of Overweight, Obesity, Severe Obesity Among Children and Adolescents Aged 2–19 Years: United States, 1963–1965 Through 2015–2016. NCHS Health E-Stats. Sept 2018
2. USPTF. Screening for Obesity in Children and Adolescents: Recommendation Statement. Am Fam Physician. 2017Oct15;96(8): Online
3. Crouch, B.J., Gupta, R., MD, MPH, MBA, FACP, Williams, A., RN, BSN, MS-HCA, Christy, D.M., MPA. West Virginia Behavioral Risk Factor Surveillance System Report 2016. WV DHHR, Health Statistics Center.
4. Styne DM, Arslanian SA, Connor EL, Farooqi IS, Murad MH, Silverstein JH, Yanovski JA. Pediatric Obesity-Assessment, Treatment, and Prevention: Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2017;102(3):709-757.
5. AAP Algorithm for Healthy Childhood Weight (Institute). https://ihcw.aap.org/Documents/Assessment%20%20and%20Management%20of%20Childhood%20Obesity%20Algorithm_FINAL.pdf . Accessed on 2/25/2019.
6. Centers for Disease Control and Prevention. (2016, Dec 16). Childhood Obesity Causes & Consequences. Retrieved from https://www.cdc.gov/obesity/childhood/causes.htmlences. Retrieved from https://www.cdc.gov/obesity/childhood/causes.html
7. American Diabetes Association. Children and Adolescents: Standards of Medical Care in Diabetes-2019. Diabetes Care Jan 2019, 42 (Supplement 1) S148-S164
8. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, et al. Evaluation, treatment, and prevention of Vitamin D deficiency: An endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2011;96:1911–30
9. Barlow SE. Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report. Pediatrics 2007; 120(Suppl. 4): S164–S192
10. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents; National Heart, Lung, and Blood Institute. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. Pediatrics. 2011;128(Suppl 5):S213–56
11. Vos MB, Abrams SH, Barlow SE, Caprio S, Daniels SR, Kohli R, et al. NASPGHAN clinical practice guideline for the diagnosis and treatment of nonalcoholic fatty liver disease in children: recommendations from the Expert Committee on NAFLD (ECON) and the NASPGHAN. JPGN. 2017;64:319–34.
12. Harriet Lane Service (Johns Hopkins Hospital), Hughes, H., & Kahl, L. (2018). *The Harriet Lane handbook: A manual for pediatric house officers* (Twenty-first edition.). Philadelphia, PA: Elsevier.
13. Benson, L.J., Baer, H.J., and Kaelber, D.C. Screening for obesity-related complications among obese children and adolescents: 1999-2008. Obesity (Silver Spring). 2011; 19: 1077–108
14. Riley MR, Bass NM, Rosenthal P, et al. Underdiagnosis of pediatric obesity and underscreening for fatty liver disease and metabolic syndrome by pediatricians and pediatric subspecialists. J Pediatr. 2005;147(6):839–842

Implementation of an Enhanced Recovery After Surgery Protocol after Minimally Invasive Hysterectomy in an Area with Endemic Opioid Abuse: A Quality Improvement Project

Shirin Azadi, MS 4 // Kevin White, M.D. // Nadim Bou Zgheib, M.D. //Brenda Mitchell, M.D. // Amanda Pauley, M.D.

Department of Obstetrics and Gynecology

Introduction

- Enhanced Recovery After Surgery (ERAS) programs reduce hospital stay, decrease cost, opioid use and post operative complications without any impact on patient pain control ant satisfaction scores[1-7].
- ERAS protocols generally include premedication, early ambulation, early urinary catheter removal, early feeding and multimodal approaches to pain control to minimize opioid use[1-7]
- Prior to the development of these protocols, 30.4% of patients at Cabell Huntington Hospital had a morphine or hydromorphone patient centered anesthesia (PCA) for the first post operative night.

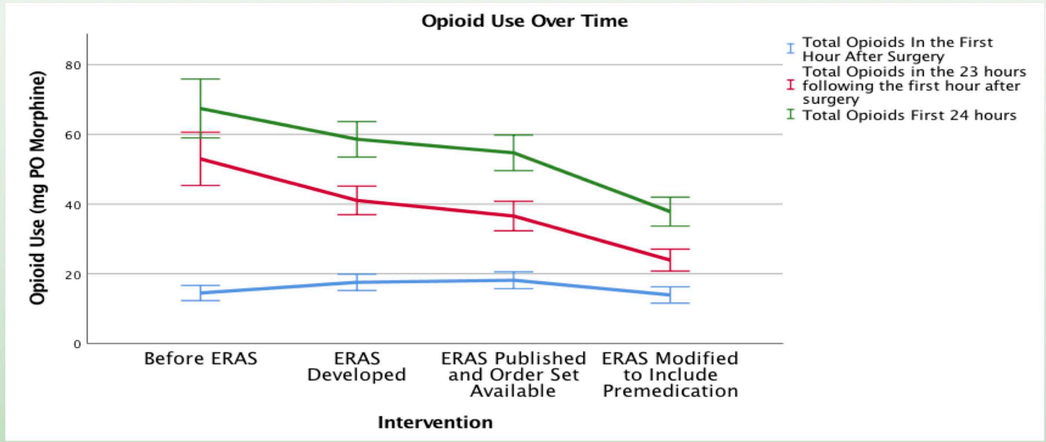
Methods

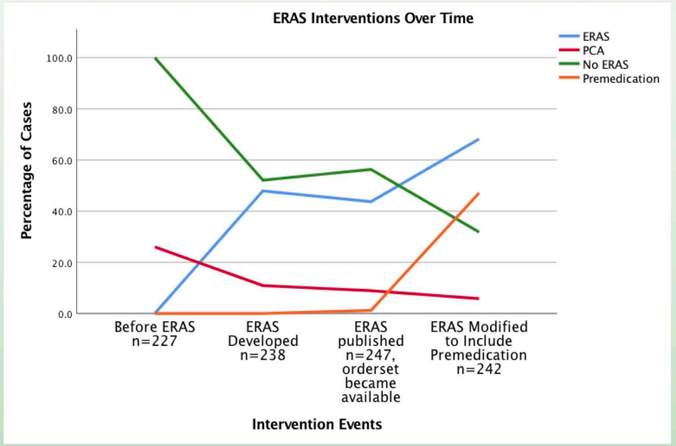
- Goal: To evaluate the effect of the implementation of ERAS at CHH
- Retrospective cohort study comparing pre and post-implementation over a 2 year period

Intervention Stages

Group	Dates	Protocol Used
Preintervention n=207	September 1, 2016 - December 31, 2017	• No premedication • On-Q®, 266mg subcutaneous liposomal bupivacaine or none • 10mg PO ketorolac q6 hours • 325/5 or 325/10 acetaminophen-oxycodone PO q4hr as needed for moderate or severe pain • IV morphine, hydromorphone, or PCA for breakthrough pain
ERAS developed n=226	January 1, 2017 – July 31, 2017	• Traditional as in preintervention OR • No premedication • 266mg subcutaneous liposomal bupivacaine • 500mg PO acetaminophen q4 hours scheduled • 800mg PO ibuprofen q8 hours scheduled • 50mg PO tramadol q4 hours scheduled or as needed • 5mg PO oxycodone q6 hours as needed for severe breakthrough pain • 80mg PO simethicone three times daily • Abdominal binder
Protocol Published and EMR Orderset Available n=276	August 1, 2017 – March 31, 2018	• Traditional as in preintervention OR • No premedication • 266mg subcutaneous liposomal bupivacaine • 500mg PO acetaminophen q4 hours scheduled • 800mg PO ibuprofen q8 hours scheduled • **50mg PO tramadol q4 hours scheduled or as needed** • 5mg PO oxycodone q6 hours as needed for severe breakthrough pain • 80mg PO simethicone three times daily • Abdominal binder
Premedication added n=251	April 1, 2018 – August 31, 2018	• Traditional as in preintervention OR • **Premedication with 1g PO acetaminophen, 200mg PO celecoxib, 75mg PO pregabalin** • 266mg subcutaneous liposomal bupivacaine • 500mg PO acetaminophen q4 hours scheduled • 800mg PO ibuprofen q8 hours scheduled • 50mg PO tramadol q4 hours scheduled or as needed • 5mg PO oxycodone q6 hours as needed for severe breakthrough pain • 80mg PO simethicone three times daily • Abdominal binder

Results





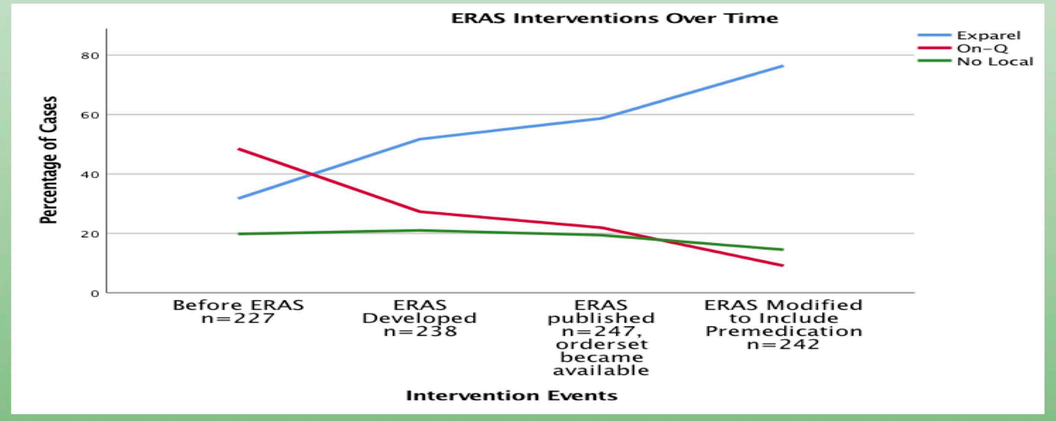


Table 1. Practice Patterns Over Time By Group (n=991)

Characteristic	Preintervention (n=207)	ERAS developed (n=257)	Pilot Study/Order-set (n=276)	Premedication (n=251)	p
Postop Pain Mgmt.					<.001§
Traditional	207 (100)	141 (55)	157 (57)	78 (31)	
ERAS Sched. Tramadol	0 (0)	98 (38)	70 (25)	26 (10)	
ERAS PRN Tramadol	0 (0)	18 (7)	49 (18)	147 (59)	
PCA	63 (30)	31 (12)	28 (10)	14 (6)	<.001§
Premedication	0 (0)	0 (0)	5 (2)	115 (46)	<.001§
Local					<.001§
Liposomal Bupivacaine	54 (26)	123 (48)	145 (53)	185 (74)	
On-Q®	93 (45)	65 (25)	58 (21)	25 (10)	
None	60 (29)	69 (27)	73 (26)	41 (16)	

Data are n(perecent)

Table 2. Outcomes by Group (n=991)

Characteristic	Preintervention (n=207)	ERAS developed (n=257)	Pilot Study/Order-set (n=276)	Premedication (n=251)	p
Opioid use (mg PO Morphine)					
PACU	14.6 (12.2– 16.9)	17.6 (15.3-19.8)	17.6 (15.3-19.9)	13.7 (11.4-15.9)	0.029‡
(% change, p)*		+20 (0.074)	+20 (0.078)	-6 (0.591)	
After PACU	54.8 (46.6-63.1)	42.4 (38.5-46.4)	35.8 (31.8-39.8)	23.7 (20.7-27.7)	<0.001‡
(% change, p)*		-23 (.005)	-35 (<.001)	-57 (<.001)	
Total	69.4 (60.3-78.5)	60.0 (55.1-64.9)	53.4 (48.6-58.2)	37.4 (33.4-41.4)	<0.001‡
(% change, p)*		-14 (0.061)	-23 (0.001)	-53 (<0.001)	

Discussion

- First stage was a pilot study and major education effort, by presenting the data at grand rounds and local research forums.
- The major advance in implementation was development of the ERAS order-set became available ERAS utilization rose to 69%.
- During ERAS implementation, traditional pain approaches decreased from 100% to 31%. PCA use dropped from 30% to 6%.
- Overall opioid use decreased by 53% over the 2 year study period. Adding up to approximately 13,624 mg less opioid.
- Median pain scores did not vary over the implementation period.

References

- Gustafsson UO, Hausel J, Thorell A, Ljungqvist O, Soop M, Nygren J, et al. Adherence to the enhanced recovery after surgery protocol and outcomes after colorectal cancer surgery. Arch Surg 2011;146:571-7. PubMed PMID: 21242424.
- Dickson E, ARgenta PA, Reichert JA. Results of introducing a rapid recovery program for total abdominal hysterectomy. Gynecol Ovsts Invest 2012; 74;21-5. PubMed PMID: 22156551.
- Nelson G, Kalgera E, Dowdy SC. Enhanced recovery pathways in gynecologic oncology. Gynecol Oncol 2014;135:586-94. PubMed PMID: 25316170.
- Dickson EL, Stockwell E, Geller MA, Vogel RI, Mahmy SA, Ghebre R, et al. Enhanced recovery program and length of stay after laparotomy on a gynecologic oncology service: A Randomized control trial. Obstet Gynecol. 2017; 129(2):355-362. PubMed PMID: 28079776.
- White KD, Wallace WC, Bou Zgheib N. Reducing postoperative opioids after minimally invasive gynecologic surgery with multimodal pain control.
- Kalogera E, Makkum-Gamez JN, Weaver AL, Moriarty JP, Borah BJ, et al. Abdominal incisions injection of liposomal bupivacaine and opioid use after laparotomy for gynecologic malignancies. Obest Gynecol 2016; 128(5):1009-1017. PubMed PMID: 27741199.
- Chapman JS., Roddy E, Ueda S, Brooks R, Chen LL, Chen LM. Enhanced recovery pathways for improving outcomes after minimally invasive gynecologic oncology surgery. Obstet Gynecol 2016; 128(1):138-44. PubMed PMID: 27275797.
- Exparel® (package insert). Pacira Pharmaceuticals, Inc., San Diego, CA; 2016.
- Adult Obesity by State. 2015. Obesity in the United States [March 2017]. Available from: http://www.stateofobesity.org.
- Injury Prevention and Control: Opioid Overdose. Drug Overdose Death Data. 2016 [March 2017]. Centers for Disease Control and Prevention. Available from: https://www.cdc.gov/drugoverdose/data/statedeaths.html
- Opioid Dose Calculator. [March 2017]. Agency Medical Directors Group. Available from http://www.agencymedicaldirectors.wa.gov/Calculator/Opioid_calculator.htm.
- Equivalency Table. [March 2017]. Stanford School of Medicine: Palliative Care. Available from https://palliative.stanford.edu/opioid-conversion/equivalency-table.
- Tran JP, Padilla PL, McLaughlin J, Aliano KA, Doan M, Phillips LG. Comparative Analysis of Intraoperative use of Liposomal Bupivacaine (Exparel) and On-Q pump for postoperative analgesia in abdominal body contouring surgery in massive weight loss patients. Clinics in Surgery. 2016; 1080(1):1-5. PubMed PMID: 26307232.
- McNeil BJ. Hidden barriers to improvement in the quality of care. New England Journal of Medicine 2001; 345:1612-1620.

Hold On, I Gotta Take This

Dr. Ryan Clagg, M.D. // Dr. Chadd Mays, D.O.

MARSHALL UNIVERSITY JOAN C. EDWARDS SCHOOL OF MEDICINE

Introduction

Pediatric residents are allotted 30 minutes for checkout at shift change where they are not to be disturbed unless necessary for patient care. However, checkout often goes beyond 30 minutes. This project focuses on nursing phone calls as a factor for prolonged checkout (figure 1). Our aim was to decrease checkout time to less than 30 minutes by decreasing nursing phone calls by 50% within two weeks.

Methods – Plan-Do-Study-Act (PDSA)

For the first 11 days (PDSA Cycle 1), nursing was allowed to call the resident phone as usual for any question or clarification regarding patient care. Morning and evening checkout duration was measured, and the number of calls during checkout was recorded. After 11 days, nursing was requested to report to the charge nurse before calling the resident phone. If the charge nurse felt the call was relevant and/or time sensitive, nursing called the resident phone. For the next 12 days (PDSA Cycle 2), morning and evening checkout duration was measured, and the number of calls during checkout was recorded.

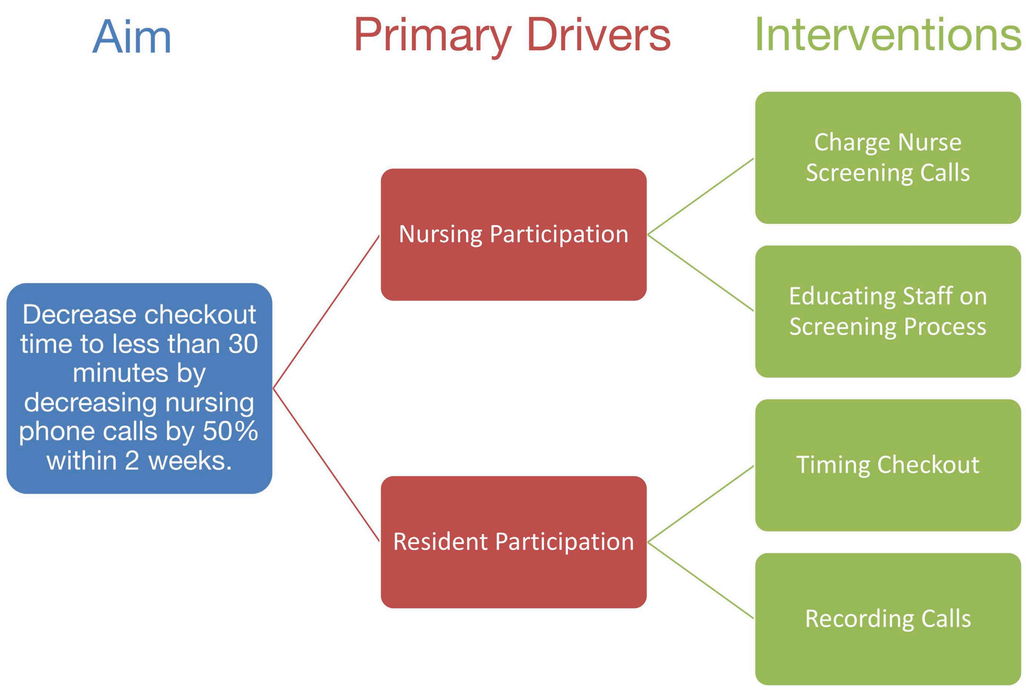


Fig. 1 – Key Driver Diagram illustrating factors and interventions contributing to the aim.

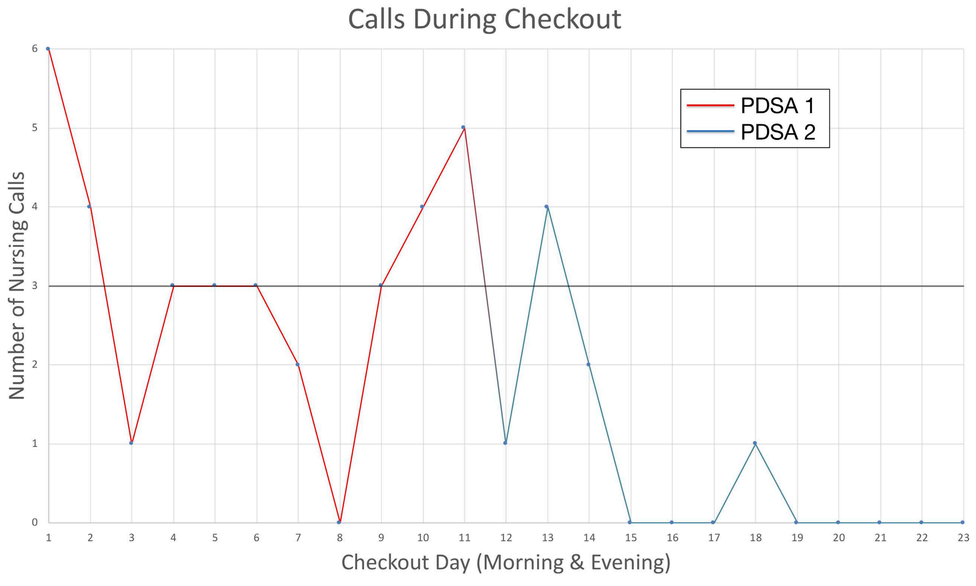


Fig. 2 – Run Chart of nursing calls during checkout for PDSA Cycle 1 (red) and PDSA Cycle 2 (blue). The median number of calls is represented by the horizontal black line.

Results

Round 1 average checkout duration was 37.6 and 38.1 minutes in morning and evening respectively. Round 1 average number of calls during morning and evening checkout combined was 3. Round 2 average checkout duration was 24.25 and 18.25 minutes in morning and evening respectively. Round 2 calls during morning and evening checkout combined was 0.6. This was an 80% decrease in nursing calls. The number of calls during checkout for each day during the PDSA cycles is plotted in figure 2.

Conclusion

After initiation of having the charge nurse screen calls, the nursing call frequency decreased significantly, and checkout duration decreased to less than 30 minutes. Our aim was met, suggesting that fewer calls contribute to a faster checkout. Decreasing checkout duration through nursing calls can improve overall checkout efficiency by allowing residents to focus on details of patient care with limited interruption. Permanent application of this method has implications for continued efficiency, potentially leading to better patient care.

Demographic Descriptive Analysis of Patients at Marshall

Ethan Lafferty DDS and Travis Wagner DMD

Marshall Dentistry and Oral Surgery

INTRODUCTION

The purpose of this project is to use descriptive statistics to analyze the socioeconomics, health literacy, and demand for dental care of patients in the Marshall Dentistry clinic in order to improve current and future dental treatment. These aforementioned factors are components of barriers to care, which is defined as any factor that prevents a patient from obtaining needed medical care. Our goal is that by identifying patients experiencing barriers to care and collecting data pertaining to specific barriers, that changes can be made to both the clinical environment and provision of care to help minimize the barriers present in our patient population. Fewer barriers means greater quality of care for more patients, the end result being augmentation of the community's oral health.

A 1981 paper written by Pechansky and Thomas proposed a framework for barriers to care comprising: affordability, accommodation, availability, accessibility, and acceptability. Some of these are self-explanatory, but others less so. For example, accommodation refers to how the supply of medical resources are proportioned and made available to the population- for example a clinic's hours of operation. While availability refers to the volume of medical services in relation to patient volume and patient needs- for example the number of clinicians or the number of clinics that serve patient with special needs.

Pechansky's model is helpful for considering the wide variety of patient hardships, as even though the cost of healthcare garners much attention, less glamourous is the education, transportation, and health literacy of the patient. It also draws attention to the issue that access to care is multifactorial. For example, having insurance and a provider within the general vicinity of the patient doesn't guarantee accessible care. Our demographics survey hopes to identify which of these barriers are most pertinent to our patient population.

Rural communities are susceptible to many factors that make them more likely to experience barriers to healthcare. Examples of these factors include: higher poverty rates, cultural norms surroundings health behaviors, educational disparities, limited transportation options, unemployment, and lack of access to healthy foods (3).

An example of a program created to mitigate the financial hardship of obtaining dental care is Medicaid, which is a joint federal-state program that provides health coverage to low asset individuals. It is available to families that earn 130% of the federal poverty level. For example, the poverty level of a two member household is $16,910. Data collected in the 2017 Census reveals that the average household income of Huntington, WV is $30,359 with an average of 2.21 persons per household (2). This places the average family approximately $8,000 above the threshold for Medicaid.

METHODS

Patients were asked to complete an anonymous survey which consisted of varying questions that depicted their socioeconomic status, distance from practice, demographics, and other barriers to care. Fifty-five patients were randomly selected and surveyed individually over the course of a month. After one month, collected data was assessed with percentages, means, histograms and odds ratio analysis.

RESULTS

Most of the patients sampled were between ages 55-64 with the average age being 42 years old (Figure 1). A high school diploma was the highest level of education completed for 75% of the patients (Figure 4). Patients drove an average of 10.8 miles to get to our dental clinic, with most residing within the 25701 zip code. Almost half of the patients had private health insurance, 46%, while the second most common coverage was Medicaid at 32% (Figure 2). Greater than half of the patients believe their current oral health is good/fair (Figure 6). Gross income was almost evenly split between three strata, with those earning less than $25,000, between $25,000 to $50,000, and $50,000 to $75,000 comprising 22%, 27%, and 18% of the sample size, respectively (Figure 3). The three most common reasons cited that dental care is unable to be obtained is due to the cost of treatment, followed by lack of dental insurance and anxiety (Figure 5).

Through an odds ratio analysis, it was determined that a patient is 1.05 times more likely to have anxiety surrounding dental care if a patient's highest education is a high school diploma and no further education. Moreover, a patient is 0.14 times more likely to have anxiety surrounding dental care and consider their oral health to be good to excellent.

DISCUSSION

Though a wide variety of patients present to Marshall Dentistry and Oral Surgery, it is not possible, nor is it recommended, to treat them uniformly. Considering a small sample size of patients were surveyed, variation in responses could be seen.

Patients represent a wide variety of life experiences, education, income, anxiety, and cultural backgrounds. The average income of patients surveyed was $25,000-$50,000; however, patients indicated in our results that the lack of dental insurance and the cost of dental care are the biggest reasons why they had difficulty obtaining dental care within the past 5 years. It was found in one study that working age adults who are insured have 60% more dental expenditures (5). Therefore, to better serve our patients more affordable dental insurance plans need to be offered by businesses in our area and more healthcare financing services such as Care Credit need to be presented to patients to better help their needs.

On the whole, patients surveyed mainly thought that their oral health was good to fair. Paradoxically, West Virginia in multiple polls ranks in the bottom three of states in America with the worst oral health as well as systemic health (6) Therefore, it can be interpreted that patients are frequently unaware if they truly have poor oral health. The connection between oral health and systemic health has been studied and found to be connected (7). If patients are not explained this connection between systemic and oral health than dentists as well as other healthcare providers fail in their role of necessitating long term health. Hence, a unified health promotion message among all healthcare providers is vital if the healthcare of patients within our clinic and beyond are to be improved (8).

Due to a small sample size, large scale predictions or generalized inferences cannot be reliably drawn. Future revisions to this study could consist of obtaining a larger sample size. The questionnaire could also be modified to include more questions to address shortfalls in information collection such as: what experiences at the dentist provoke the most anxiety, correlating patients' perceived oral health with an oral health exam, or more specific information pertaining to patient's oral health knowledge.

REFERENCES

1) Amadeo, Kimberly. "Are You Eligible for Federal Benefits in 2019?" The Balance, 12 Mar. 2019, www.thebalance.com/federal-poverty-level-definition-guidelines-chart-3305843.

2) "U.S. Census Bureau QuickFacts: Huntington City, West Virginia." Census Bureau QuickFacts, US Census Bureau, 1 July 2017, www.census.gov/quickfacts/fact/table/huntingtoncitywestvirginia/PST045217.

3) Bolin, J., and G. Ballamy. "Barriers to Health Promotion and Disease Prevention in Rural Areas - RHIhub Toolkit." Barriers to Health Promotion and Disease Prevention in Rural Areas - RHIhub Toolkit, NORC Walsh Center for Rural Health Analysis, Oct. 2014, www.ruralhealthinfo.org/toolkits/health-promotion/1/barriers.

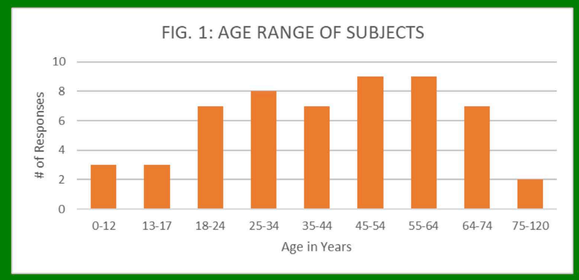
4) Humphris, G. , Freeman, R. , Campbell, J. , Tuutti, H. and D'Souza, V. (2000), Further evidence for the reliability and validity of the Modified Dental Anxiety Scale. International Dental Journal, 50: 367-370.

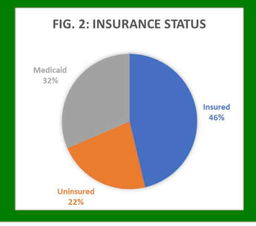
5) Teusner, D, and V Smith. "Examining Dental Expenditure and Dental Insurance Accounting for Probability of Incurring Expenses." Community Dental Oral Epidemiology, vol. 45, no. 2, May, doi:10.1111/cdoe.12264, www.ncbi.nlm.nih.gov/pubmed/27774670.

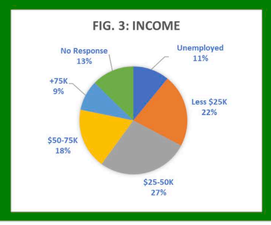
6) "West Virginia Lags Behind the Nation in Overall Dental Health." The State Journal, 3 Feb. 2017, www.wvnews.com/statejournal/west-virginia-lags-behind-the-nation-in-overall-dental-health/article_399f5d71-03da-5989-affa-a1fd310fdc33.html.

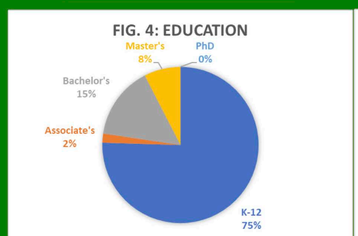
7) "The Connection Between Oral Health and Systemic Disease." Editorial. Pennsylvania Dental Association, 2017, www.padental.org/Online/Resources___Programs/News_Releases/Past_News_Releases/Connection_Between_Oral_Health_and_Systemic_Diseases.aspx.

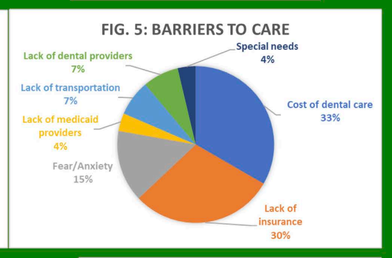
8) Veselicky, L T., et al. "Perceptions of oral health by the WV community." West Virginia Medical Journal, vol. 109, no. 6, Dec. 2013, www.ncbi.nlm.nih.gov/pubmed/24371858.

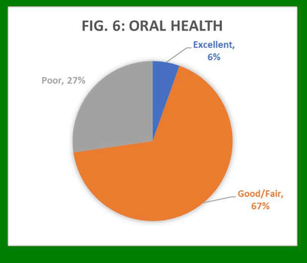


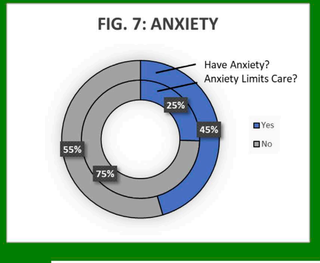












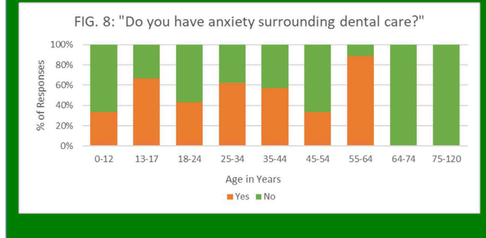
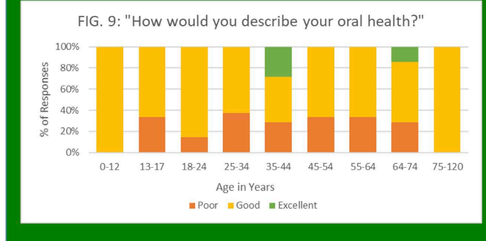
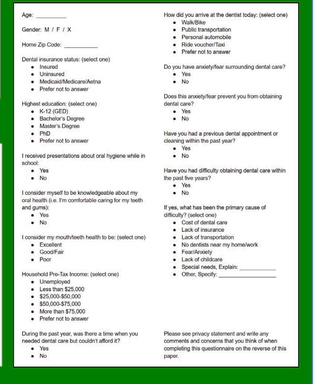


Table 1. Odds Ratio Analysis of Anxiety with Respect to Educational Level and Oral Health Ideology	
	Odds Ratio
Anxiety/Educational Levels	1.05
Anxiety/Oral Health Ideology	0.14





Age: _____

Gender: M / F / X

Home Zip Code: _____

Dental insurance status: (select one)
- Insured
- Uninsured
- Medicaid/Medicare/Aetna
- Prefer not to answer

Highest education: (select one)
- K-12 (GED)
- Bachelor's Degree
- Master's Degree
- PhD
- Prefer not to answer

I received presentations about oral hygiene while in school:
- Yes
- No

I consider myself to be knowledgeable about my oral health (i.e. I'm comfortable caring for my teeth and gums):
- Yes
- No

I consider my mouth/teeth health to be: (select one)
- Excellent
- Good/Fair
- Poor

Household Pre-Tax Income: (select one)
- Unemployed
- Less than $25,000
- $25,000-$50,000
- $50,000-$75,000
- More than $75,000
- Prefer not to answer

During the past year, was there a time when you needed dental care but couldn't afford it?
- Yes
- No

How did you arrive at the dentist today: (select one)
- Walk/Bike
- Public transportation
- Personal automobile
- Ride voucher/Taxi
- Prefer not to answer

Do you have anxiety/fear surrounding dental care?
- Yes
- No

Does this anxiety/fear prevent you from obtaining dental care?
- Yes
- No

Have you had a previous dental appointment or cleaning within the past year?
- Yes
- No

Have you had difficulty obtaining dental care within the past five years?
- Yes
- No

If yes, what has been the primary cause of difficulty? (select one)
- Cost of dental care
- Lack of insurance
- Lack of transportation
- No dentists near my home/work
- Fear/Anxiety
- Lack of childcare
- Special needs, Explain: _____
- Other, Specify: _____

Please see privacy statement and write any comments and concerns that you think of when completing this questionnaire on the reverse of this paper.

A More Cost Effective Method of Labor Induction: Comparison of Dinoprostone with Misoprostol

Melissa Nehls, M.D. // Emily Sloane, M.D. // Jerrod Justice, M.D. // Kevin White, M.D. // Kelly Cummings, M.D.

Department of Obstetrics and Gynecology, Marshall University

Background

- Induction of labor (IOL) is undertaken for either maternal or fetal indications and electively after 39 weeks gestation.
- For those with with an unfavorable cervix this process begins with the use of prostaglandins. There are two currently available:
  - Prostaglandin E1 (misoprostol, i.e., Cytotec™)
  - Prostaglandin E2 (dinoprostone, i.e., Cervidil™)
- Dinoprostone has been widely used at CHH for years as it is the only FDA approved prostaglandin. The 2014 Cochrane Review evaluated 76 trials with 14,412 patients comparing misoprostol and dinoprostone. When compared to dinoprostone, misoprostol:
  - Reduced the use of augmentation with oxytocin
  - Reduced epidural anesthesia
  - Reduced time to vaginal delivery
  - Reduced cesarean section rate
  - Vaginal misoprostol equal to oral misoprostol
- Misoprostol is more cost effective than dinoprostone:
  - Patient cost of misoprostol $0.94
  - Patient cost of dinoprostone $1704.20
  - Misoprostol can be stored at room temperature
  - Dinoprostone must be kept frozen prior to its use

Quality Improvement Intervention

- Oral misoprostol is more effective and more cost effective than dinoprostone for the induction of labor.
- Marshall OB/GYN residents held a grand-rounds debate in mid-July, 2018, comparing the two cervical ripening agents.
- The goal of this quality-improvement (QI) intervention was to asses the efficacy of the education campaign in furthering the use of misoprostol.
- To assess this, we compared misoprostol use rate with dinoprostone use rate 6 months prior to and 6 months after the education debate. We also evaluated cesarean section and complication rates.

Table 1. Outcomes by Intervention Time (n=189)

	Pre-Intervention (n=92)	Post-Intervention (n=97)	p
Demographics			
Delivery >37 weeks	79 (85.9)	84 (86.6)	0.884‡
Primiparous	62 (67.4)	79 (81.4)	0.027‡
Method of Induction			<0.0001‡
Dinoprostone	84 (92.3)	35 (36.1)	
Vaginal Misoprostol	3 (3.3)	2 (2.1)	
Oral Misoprostol	4 (4.4)	59 (60.8)	
PV and PO Misoprostol	0 (0)	1 (0.5)	
Delivery Method			0.462‡
Vaginal	68 (73.9)	67 (69.1)	
Cesarean	24 (26.1)	30 (30.9)	
Patient Cost Per Induction ($)	1556.16	617.27	<0.0001*

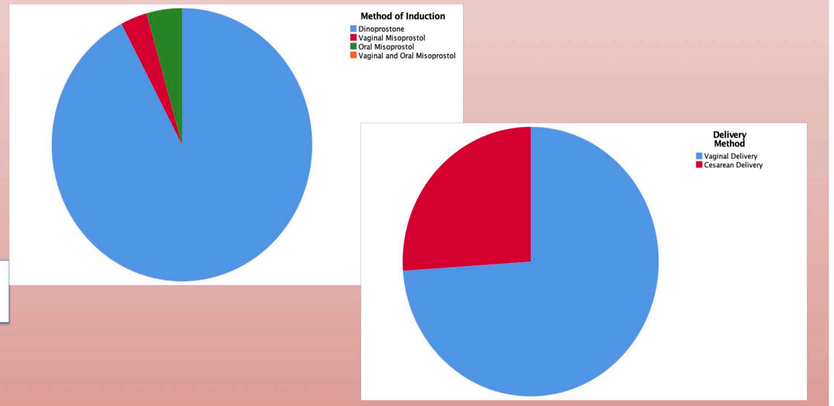
Data are n(%)
‡Chi-Square
*t-test

Table 2. Delivery Method by Induction Method (n=189)

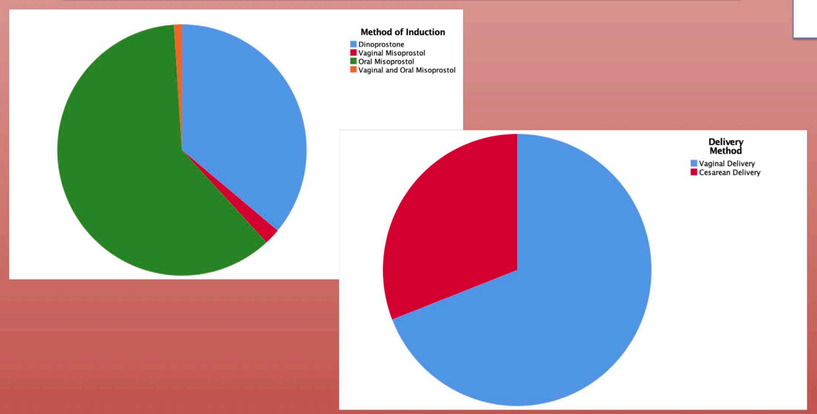
	Vaginal (n=135)	Cesarean (n=54)	p
Medication			0.317‡
Dinoprostone	88 (73.9)	31 (26.1)	
Misoprostol	47 (67.1)	23 (32.9)	
Induction Method			0.322‡
Vaginal Dinoprostone	88 (73.9)	31 (26.1)	
Vaginal Misoprostol	3 (60.0)	2 (40.0)	
Oral Misoprostol	43 (68.3)	20 (31.7)	
PV followed by PO Misoprostol	0 (0)	1 (100.0)	

Data are n(%)
‡Chi-Square

Before Intervention

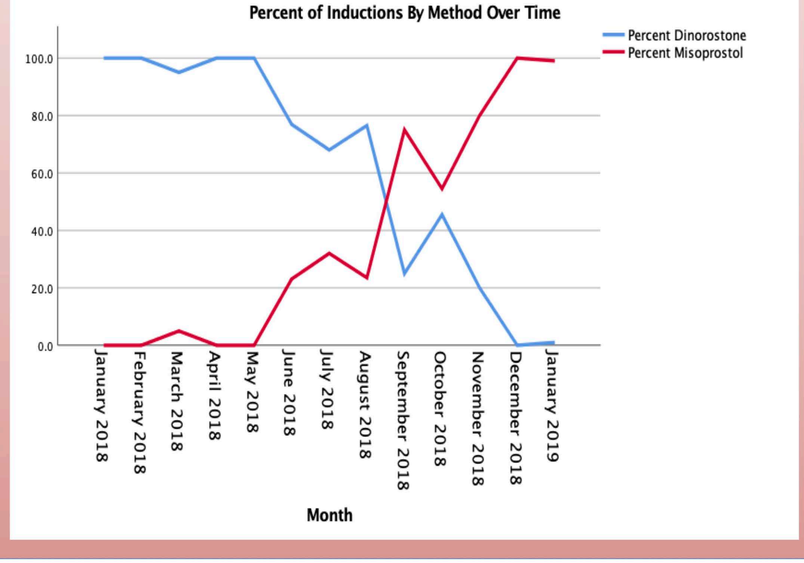


After Intervention



Results & Discussion

- There was a marked 61% increase in the number of misoprostol inductions post-intervention compared to pre-intervention ($p < 0.0001$).
- The post intervention labor induction costs were reduced by 60% and added up to $83,291 over 6 months.
- In the last month of the study, almost 100% of inductions were misoprostol. At this rate the savings would be $286,332 annually.
- There was a 4.8% higher, but nonsignificant, rate in cesarean deliveries post-intervention cohort. This was likely due to the statistically significant 14% more primiparous patients in the post-intervention cohort.
- The debate style education method was effective in driving the shift from dinoprostone to misoprostol.
- Most common dosing regimen:
  - 50mcg PO x 1
  - 25mcg PO q4 hours until Bishop = 6



Resources

1. Alfirevic Z, Aflaifel N, Weeks A. Oral misoprostol for induction of labor. Cochrane database syst rev. 2014;13(6)
2. ACOG Practice Bulletin 107. Induction of Labor. 2009.
3. Chitrakar NS. Comparison of Misoprostol versus Dinoprostone for pre-induction cervical ripening at term. 2012;10(1):10-5
4. Eilkeder et al. Induction of labor at term with oral misoprostol versus a Foley catheter (PROBAAT-II): a multicenter randomized controlled non-inferiority trial. Lancet; 387(10028)1619-28.
5. Faucett AM, Daniels K, Lee HC, El-Sayed YY< Blumenfeld YJ. Oral misoprostol versus dinoprostone for labor induction in nulliparous women at erm. J Perinatol 2014;34(2): 95-9
6. Gornisiewicz T, Jaworowski A, Zembala-Szczerba M, Babyczk D, Huras H. Analysis of intravaginal misoprostol 0.2mg versus intracervical dinoprosotne 0.5mg doses for labor induction at term. Ginekol Pol. 207;88(6):320-324.
7. Martinez de Tejada B, Martillotti G, Lapaire O, Hoesli I, Irion O. The risk of placental abruption when using prostaglandins for cervical ripening in women with preeclampsia: comparing misoprostol vs dinoprostone. J Matern Feral Neonatal Med. 2010; 23(9)988-93.
8. Nadia-Bennett K, Park H, Cioffi J, Calixte R, Vintzileos A. A comparison of obstetrical outcomes and costs between misoprostol and dinoprostone for induction of labor. J Matern Fetal Neonatal Med. 2016; 29(22):3732-6.
9. Neri C, Famillari A, Preziosis F, Vassallo C, Bota A, Lanzone A, Carducci B, Carusa A. Oral misoprostol versus intravaginal dinoprostone for labor induction: a comparison study. Mierva Ginecol 2018; epub ahead of print.
10. Oliveria TA, Melo EM, Aquino MM, Mariani Neto C. Efficacy of dinoprostone and misoprostol for labor induction in nulliparous women. Rev Bras Ginecol Obstet. 2011;33(3)118-22.
11. Rossi RM, Warshak CR, Masters HR, Regan JK, Kritzer SA, Magner KP. Comparison of prostaglandin and mechanical cervical ripening in the setting of small for gestational age. J Maternal Fetal Neonatal Med. 2018. Epub ahead of print
12. Thorbiomson A, Vladic T, Stiemholm YV. Oral versus vaginal prostaglandin for labor induction. J Matern Fetal Neonatal Med. 2017; 30(7)789-792.
13. Trabelsi H, Mathlouthi N, Zayen S, Dhouib M, Chaabene K, Trabelsi K, AMouri H, Ben Ayed B, Guermazi M. Cervical ripening at erm. A randomized an dprospective study: Misoprostol verus dinoprostone.
14. Tsikouras P, Koukouli Z, Manav B, Soilemetzidis M, Liberis A, Csorba R, Typsianis G, Galazios G. Induction of labor of post-term nulliparous and parous women- potential advantages of misoprostol over dinoprostone. Geburtshife Frauenheilkd. 2016; 76(7):785-792.
15. Veena B, Samal R, Inbaraj LR, George CE. Sublingual Misoprostol (PGE1) versus intracervical dinoprostone (PGE2) gel for induction of labour: A randomized control tiral. J Obstet Gynaecol India. 2016;66(suppl 1):122-8.

MU Surgery Resident Radiation Safety

Gerola, Ruth; Corsello, Jenalee; Thiel, Jordyn; Hale, Jessica; Weaver, Andrew

Marshall University: Department of Surgery
Huntington, West Virginia

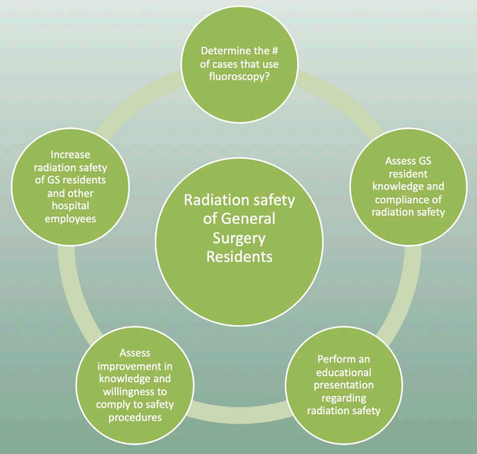
Background

Radiation is the emission of energy that takes form of waves or particles which readily penetrate human tissues. Ionizing radiation exposure can result in molecular changes that lead to DNA damage and mutations. For example, low dose X-rays have been linked to goiters, breast and lung cancers, cataracts, and leukemia[1]. Exposure is either by direct absorption from beam itself, or by scatter waves that are deflected off a surface. Pathologic effects can be further divided into deterministic and stochastic. Deterministic are short term responses only after a threshold of exposure is reached and are subsequently worsened with repeated exposure. Stochastic effects are more concerning, and continue to compound without a definitive time period or threshold level[2]. The amount of radiation use in the medical profession has been increasing[3], and the cumulative effects can be detrimental[4]. This has increased the concern for radiation-related morbidity and mortality. Risk of damage to DNA is linked to the radiation dose[3]. Monitoring this exposure can help protect those involved as well as increase awareness of exposure time[4].

Common procedures done by surgeons that require use of radiation include vascular procedures, laparoscopic cholecystectomy with cholangiogram, ERCPs, and bronchoscopic lung biopsies. Endovascular procedures require long exposure to radiation and comprise more than 50-75% of vascular procedures[6]. Very few studies have looked at the radiation exposure done during a laparoscopic cholecystectomy with cholangiogram[7], one of the most common general surgery procedures.

Standard hospital safety procedures require radiation detecting badges that are worn during surgery in order to monitor the amount of exposure[5]. Protection falls under 3 concepts; distance, time, and shielding. Longer distance from the source of at least 6-10ft, and shorter time of exposure result in lower exposure. Shields of about 3-5mm thick, can provide of up to 90% protection. There appears to be a general lack of knowledge among employees regarding proper protection from radiation[1].

Radiation exposure at teaching institutions may likely be higher as trainees often require longer fluoroscopy times and tend to stay closer to the patient and source of radiation. There are no studies that look at the exposure among general surgery residents[5]. At Marshall University, general surgery residents do not have any way to monitor radiation exposure such as film badges. There is no education material specifically regarding radiation safety policy and procedures. This study will determine radiation exposure risks and knowledge of Marshall University General Surgery residents.



Project Outline

Hypothesis:
The purpose of this QI project is to determine how much knowledge and radiation exposure general surgery residents have here at Marshall University, with the ultimate goal of increasing overall radiation safety at CHH. Increase in knowledge and compliance of radiation safety precautions will protect general surgery residents, attendings, nurses and other employees that are constantly exposed to radiation.

Measures:
•Perform a database search to determine number of cases that surgery residents participate in like angiograms and cholecystectomy with intraoperative cholangiograms from January 2016-December 2018. This shows that there is an increased use of fluoroscopy.
•Administer a questionnaire to general surgery residents to determine basic radiation knowledge, barriers, and if they have ever received any orientation regarding radiation safety at CHH.
•Perform an educational presentation on radiation safety and precautions for general surgery residents.
•Administer another questionnaire to determine improvement in knowledge and awareness of radiation safety.
•Increase awareness and compliance of radiation safety precautions implemented at CHH.

Outcomes:
•Measured outcome will be the number of cases that use fluroscopy or x-rays
•Measure the number of percent correct of basic knowledge of occupational radiation safety prior and after an educational presentation
•Measure the number of residents who are willing to participate in increasing radiation safety awareness including following guidelines in lowering occupational radiation exposure

Timeline:
•Radiation safety presentation and questionnaire to general surgery residents March 27, 2019

Interventions

Initial Actions:
•Database search to determine how many cases residents participate in that use fluoroscopy
•Create a survey to determine the number of general surgery residents have undergone radiation safety training
•Create a survey to determine knowledge and barriers of compliance to radiation safety measures

Modifications:
•None

Methods and Data

Methods
Database search was obtained to determine number of angiograms, laparoscopic cholecystectomies with intraoperative cholangiogram and mediport insertions between Jan 2016-December 2018 here at CHH.

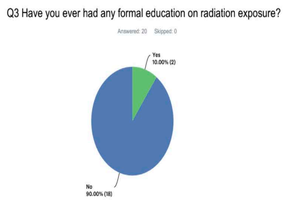
Questionnaire was given to 20 MU general surgery residents (4 were excluded as they were not present during the presentation) prior to presentation of radiation safety to determine basic knowledge of general surgery residents, rate of compliance and the barriers of compliance to standard radiation safety measures. Another questionnaire was given after the presentation to assess if general surgery residents' knowledge improved and if they would practice radiation safety measures.

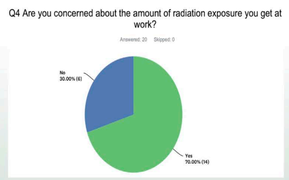
Results

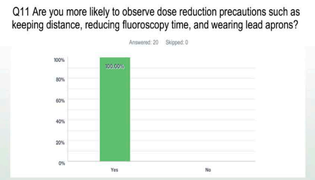
Results
Based on database search between January 2016-December 2018, there are 357 mediport insertions, 125 angiograms and average of 82 cases of laparoscopic cholecystectomy with IOC done by Marshall General Surgery here at Cabell Huntington Hospital.

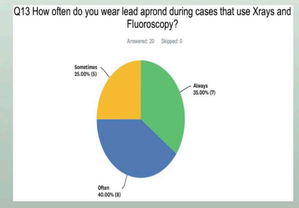
Based on the questionnaire, 90% of MU general surgery residents did not have any formal education on radiation exposure. 70% are concerned about radiation exposure. Average number of correct regarding 8 basic knowledge questions is 54% prior to the presentation. After the education, the average improved to 91%.

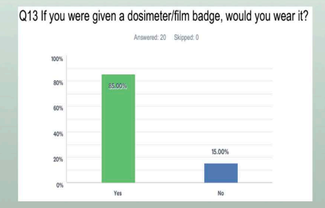
In regards to radiation safety precautions, only 35% wear lead aprons all the time. 75% states that they can not find lead aprons. 25% states that they don't fit. 75% often see other hospital employees not wearing any shielding during cases that use x-ray or fluoroscopy. 100% would practice precautions to decrease radiation exposure such as decrease time in using radiation, increase distance from the source of radiation, and use of shielding after the educational presentation. 100% would use shielding if they had their own lead aprons that are maintained and easily accessible. 85% would also wear film badges to allow tracking of radiation exposure.

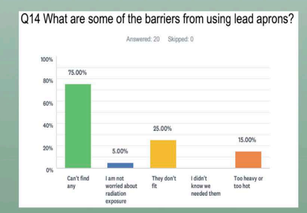


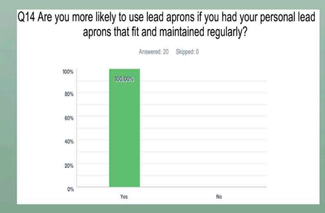












Discussion

Although the awareness of the issues of radiation protection amongst general surgery residents in our institution is high, the inaccessibility of lead with addition to improperly fitting lead were obstacles from practicing safe radiation protection. It is well known throughout the literature that ill-fitting lead aprons result in increased radiation exposure and poor overall radiation protection[8]. General surgery residents are exposed to radiation not only in the operating room but also in the trauma bay and in patient rooms during bedside procedures on a daily basis. It is standard hospital policy to require badges to assess the amount of exposure overtime. MU general surgery residents do not have dosimeter badges, making it difficult to properly estimate the amount of exposure. Our aim of this study was to create awareness to not only practicing appropriate radiation protection but also to give insight to general surgery residents the amount of radiation they are potentially exposed to. With this we hope to obtain radiation monitoring badges to appropriately determine the amount of exposure a general surgery resident acquire during their residency.

Conclusion

In conclusion, we found that there was a lack of basic knowledge on the effects and level of exposure to radiation at our institution. This is likely due to the lack of formal education on this issue. While there was concern for radiation exposure, that concern did not manifest into the consistent use of shielding while having potential to exposure. Formal education on this issue is of great importance, as is the monitoring of levels of exposure, and the availability of shielding equipment in the operative areas. Raising awareness is just the first step in constructing more efficient and effective protocols to minimize risk of radiation exposure.

References

1. Unal, E., Gelis, K., Baykan, P. Investigation of awareness levels about the radiation safety of personnel working in the imaging units of the hospitals in Agri, Turkey. Journal of Radiation Research and Applied Sciences. 11 (2018) 111-115.
2. Narain, A. S., Hijji, F. Y., Yom, K. H., Kudaravalli, K. T., Haws, B. E., & Singh, K. (2017). Radiation exposure and reduction in the operating room: Perspectives and future directions in spine surgery. *World journal of orthopedics*, *8*(7), 524-530. doi:10.5312/wjo.v8.i7.524
3. Faggioni, L., Paolicchi, F., Bastiani, L., Guido, D., Caramella, D. Awareness of radiation protection and dose levels of imaging procedures among medical students, radiography students, and radiology residents at an academic hospital: results of a comprehensive survey. European Journal of Radiology. 86 (2017) 135-142.
4. Kachaamy, T., Harrison, E., Pannala, R., Pavlicek, W., Crowell, M. D., & Faigel, D. O. (2015). Measures of patient radiation exposure during endoscopic retrograde cholangiography: beyond fluoroscopy time. *World journal of gastroenterology*, *21*(6), 1900-6.
5. Hudson, L., Ray, J., Velazquez, O., Radiation Risk in Residency: Is It Worth the Worry? General Surgery News. 2018
6. Shaw P, Vouyouka, A., Reed, A (2012) Time for radiation safety program guidelines for pregnant trainees and vascular surgeons. J Vasc Surg. 2012 Mar;55(3):862-868.e2. doi: 10.1016/j.jvs.2011.11.045. Epub 2012 Jan 24.
7. Karthikesalingam, A., Markar, S., Weerakkody, R., Walsh, S., Carroll, N., Praseedom, R. (2009) Radiation exposure during laparoscopic cholecystectomy with routine intraoperative cholangiography. Surg Endosc. 2009 Aug;23(8):1845-8. doi: 10.1007/s00464-008-0279-0. Epub 2009 Jan 1.
8. Bates, K., Tootell, A., England, A., Szczepura, K. Does an inappropriately fitted lead apron result inincreased radiation dose to axillary breast tissue? European Society of Radiology. 2016.Doi:10.1594/ecr2016/C-2394.

MU Surgery Resident Radiation Safety

Gerola, Ruth; Corsello, Jenalee; Thiel, Jordyn; Hale, Jessica; Weaver, Andrew; Denning, David

Marshall University: Department of Surgery
Huntington, West Virginia

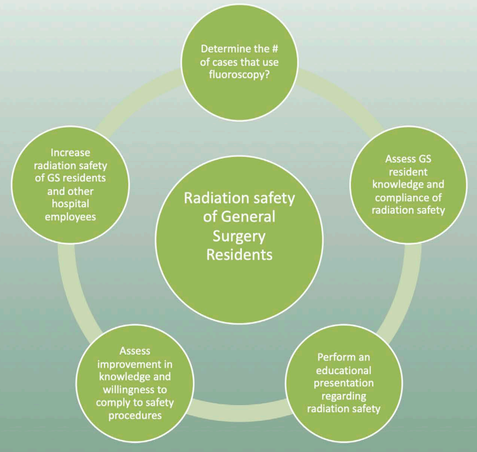
Background

Radiation is the emission of energy that takes form of waves or particles which readily penetrate human tissues. Ionizing radiation exposure can result in molecular changes that lead to DNA damage and mutations. For example, low dose X-rays have been linked to goiters, breast and lung cancers, cataracts, and leukemia[1]. Exposure is either by direct absorption from beam itself, or by scatter waves that are deflected off a surface. Pathologic effects can be further divided into deterministic and stochastic. Deterministic are short term responses only after a threshold of exposure is reached and are subsequently worsened with repeated exposure. Stochastic effects are more concerning, and continue to compound without a definitive time period or threshold level[2]. The amount of radiation use in the medical profession has been increasing[3], and the cumulative effects can be detrimental[4]. This has increased the concern for radiation-related morbidity and mortality. Risk of damage to DNA is linked to the radiation dose[3]. Monitoring this exposure can help protect those involved as well as increase awareness of exposure time[4].

Common procedures done by surgeons that require use of radiation include vascular procedures, laparoscopic cholecystectomy with cholangiogram, ERCPs, and bronchoscopic lung biopsies. Endovascular procedures require long exposure to radiation and comprise more than 50-75% of vascular procedures[6]. Very few studies have looked at the radiation exposure done during a laparoscopic cholecystectomy with cholangiogram[7], one of the most common general surgery procedures.

Standard hospital safety procedures require radiation detecting badges that are worn during surgery in order to monitor the amount of exposure[5]. Protection falls under 3 concepts; distance, time, and shielding. Longer distance from the source of at least 6-10ft, and shorter time of exposure result in lower exposure. Shields of about 3-5mm thick, can provide of up to 90% protection. There appears to be a general lack of knowledge among employees regarding proper protection from radiation[1].

Radiation exposure at teaching institutions may likely be higher as trainees often require longer fluoroscopy times and tend to stay closer to the patient and source of radiation. There are no studies that look at the exposure among general surgery residents[5]. At Marshall University, general surgery residents do not have any way to monitor radiation exposure such as film badges. There is no education material specifically regarding radiation safety policy and procedures. This study will determine radiation exposure risks and knowledge of Marshall University General Surgery residents.



Project Outline

Hypothesis:
The purpose of this QI project is to determine how much knowledge and radiation exposure general surgery residents have here at Marshall University, with the ultimate goal of increasing overall radiation safety at CHH. Increase in knowledge and compliance of radiation safety precautions will protect general surgery residents, attendings, nurses and other employees that are constantly exposed to radiation.

Measures:
•Perform a database search to determine number of cases that surgery residents participate in like angiograms and cholecystectomy with intraoperative cholangiograms from January 2016-December 2018. This shows that there is an increased use of fluoroscopy.
•Administer a questionnaire to general surgery residents to determine basic radiation knowledge, barriers, and if they have ever received any orientation regarding radiation safety at CHH.
•Perform an educational presentation on radiation safety and precautions for general surgery residents.
•Administer another questionnaire to determine improvement in knowledge and awareness of radiation safety.
•Increase awareness and compliance of radiation safety precautions implemented at CHH.

Outcomes:
•Measured outcome will be the number of cases that use fluroscopy or x-rays
•Measure the number of percent correct of basic knowledge of occupational radiation safety prior and after an educational presentation
•Measure the number of residents who are willing to participate in increasing radiation safety awareness including following guidelines in lowering occupational radiation exposure

Timeline:
•Radiation safety presentation and questionnaire to general surgery residents March 27, 2019

Interventions

Initial Actions:
•Database search to determine how many cases residents participate in that use fluoroscopy
•Create a survey to determine the number of general surgery residents have undergone radiation safety training
•Create a survey to determine knowledge and barriers of compliance to radiation safety measures

Modifications:
•None

Methods and Data

Methods
Database search was obtained to determine number of angiograms, laparoscopic cholecystectomies with intraoperative cholangiogram and mediport insertions between Jan 2016-December 2018 here at CHH.

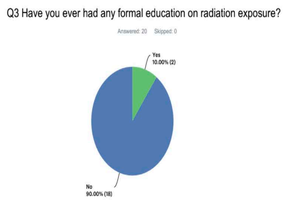
Questionnaire was given to 20 MU general surgery residents (4 were excluded as they were not present during the presentation) prior to presentation of radiation safety to determine basic knowledge of general surgery residents, rate of compliance and the barriers of compliance to standard radiation safety measures. Another questionnaire was given after the presentation to assess if general surgery residents' knowledge improved and if they would practice radiation safety measures.

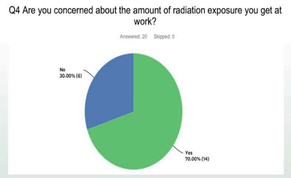
Results

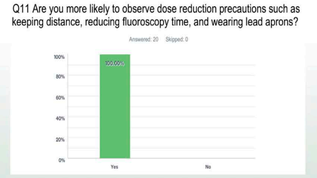
Results
Based on database search between January 2016-December 2018, there are 357 mediport insertions, 125 angiograms and average of 82 cases of laparoscopic cholecystectomy with IOC done by Marshall General Surgery here at Cabell Huntington Hospital.

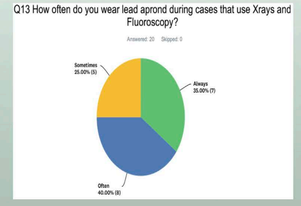
Based on the questionnaire, 90% of MU general surgery residents did not have any formal education on radiation exposure. 70% are concerned about radiation exposure. Average number of correct regarding 8 basic knowledge questions is 54% prior to the presentation. After the education, the average improved to 91%.

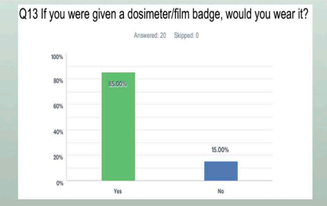
In regards to radiation safety precautions, only 35% wear lead aprons all the time. 75% states that they can not find lead aprons. 25% states that they don't fit. 75% often see other hospital employees not wearing any shielding during cases that use x-ray or fluoroscopy. 100% would practice precautions to decrease radiation exposure such as decrease time in using radiation, increase distance from the source of radiation, and use of shielding after the educational presentation. 100% would use shielding if they had their own lead aprons that are maintained and easily accessible. 85% would also wear film badges to allow tracking of radiation exposure.

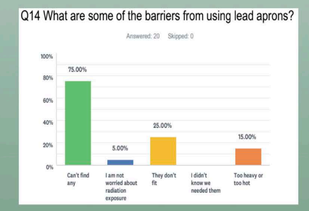


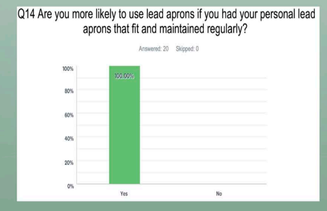












Discussion

Although the awareness of the issues of radiation protection amongst general surgery residents in our institution is high, the inaccessibility of lead with addition to improperly fitting lead were obstacles from practicing safe radiation protection. It is well known throughout the literature that ill-fitting lead aprons result in increased radiation exposure and poor overall radiation protection[8]. General surgery residents are exposed to radiation not only in the operating room but also in the trauma bay and in patient rooms during bedside procedures on a daily basis. It is standard hospital policy to require badges to assess the amount of exposure overtime. MU general surgery residents do not have dosimeter badges, making it difficult to properly estimate the amount of exposure. Our aim of this study was to create awareness to not only practicing appropriate radiation protection but also to give insight to general surgery residents the amount of radiation they are potentially exposed to. With this we hope to obtain radiation monitoring badges to appropriately determine the amount of exposure a general surgery resident acquire during their residency.

Conclusion

In conclusion, we found that there was a lack of basic knowledge on the effects and level of exposure to radiation at our institution. This is likely due to the lack of formal education on this issue. While there was concern for radiation exposure, that concern did not manifest into the consistent use of shielding while having potential to exposure. Formal education on this issue is of great importance, as is the monitoring of levels of exposure, and the availability of shielding equipment in the operative areas. Raising awareness is just the first step in constructing more efficient and effective protocols to minimize risk of radiation exposure.

References

1. Unal, E., Gelis, K., Baykan, P. Investigation of awareness levels about the radiation safety of personnel working in the imaging units of the hospitals in Agri, Turkey. Journal of Radiation Research and Applied Sciences. 11 (2018) 111-115.
2. Narain, A. S., Hijji, F. Y., Yom, K. H., Kudaravalli, K. T., Haws, B. E., & Singh, K. (2017). Radiation exposure and reduction in the operating room: Perspectives and future directions in spine surgery. *World journal of orthopedics*, *8*(7), 524-530. doi:10.5312/wjo.v8.i7.524
3. Faggioni, L., Paolicchi, F., Bastiani, L., Guido, D., Caramella, D. Awareness of radiation protection and dose levels of imaging procedures among medical students, radiography students, and radiology residents at an academic hospital: results of a comprehensive survey. European Journal of Radiology. 86 (2017) 135-142.
4. Kachaamy, T., Harrison, E., Pannala, R., Pavlicek, W., Crowell, M. D., & Faigel, D. O. (2015). Measures of patient radiation exposure during endoscopic retrograde cholangiography: beyond fluoroscopy time. *World journal of gastroenterology*, *21*(6), 1900-6.
5. Hudson, L., Ray, J., Velazquez, O., Radiation Risk in Residency: Is It Worth the Worry? General Surgery News. 2018
6. Shaw P, Vouyouka, A., Reed, A (2012) Time for radiation safety program guidelines for pregnant trainees and vascular surgeons. J Vasc Surg. 2012 Mar;55(3):862-868.e2. doi: 10.1016/j.jvs.2011.11.045. Epub 2012 Jan 24.
7. Karthikesalingam, A., Markar, S., Weerakkody, R., Walsh, S., Carroll, N., Praseedom, R. (2009) Radiation exposure during laparoscopic cholecystectomy with routine intraoperative cholangiography. Surg Endosc. 2009 Aug;23(8):1845-8. doi: 10.1007/s00464-008-0279-0. Epub 2009 Jan 1.
8. Bates, K., Tootell, A., England, A., Szczepura, K. Does an inappropriately fitted lead apron result inincreased radiation dose to axillary breast tissue? European Society of Radiology. 2016.Doi:10.1594/ecr2016/C-2394.

Trastuzumab Induced Cardiotoxicity: Are We Monitoring and Managing Appropriately?

Heather Katz, DO, FACOI [1], *Hassaan Jafri, MD[1], Emilia Cindy Leigh, MD[2], Layana Biglow, MD[2] , Madhulika Urella, MD[2], Vivek Yadala, MD[2], Isna Khan, MD[2], MariaTria Tirona, MD, FACP[1]*

Marshall University, Joan C. Edwards School of Medicine

Department of Hematology/Oncology [1], Department of Internal Medicine[2]

Introduction

- Per NCCN guidelines, Left Ventricular Ejection Fraction (LVEF) should be evaluated prior to and during treatment with Trastuzumab.
- Optimal frequency of assessment is unknown [1].
- The FDA label recommends monitoring LVEF prior to initiation and every 3 months during therapy.
- Trastuzumab should be held for 4-8 weeks when LVEF decreases ≥ 16% from pretreatment values or LVEF is below institutional limits of normal and decreases ≥ 10% from pretreatment values.
- Trastuzumab should be permanently discontinued for a persistent (> 8 weeks) LVEF decline or when Trastuzumab is stopped ≥3 times for cardiomyopathy [2].

Methods

- Retrospective chart review was performed analyzing 98 charts of patients with stage I – III HER2 positive breast cancer
- Patients were seen at the Edwards Comprehensive Cancer Center (ECCC) in Huntington, WV from January 1, 2012 – December 30, 2017.
- Patients who received Trastuzumab at ECCC (59) were further reviewed to see if cardiac function was assessed prior to treatment, at 3 month intervals and if trastuzumab was held or discontinued permanently if indicated.

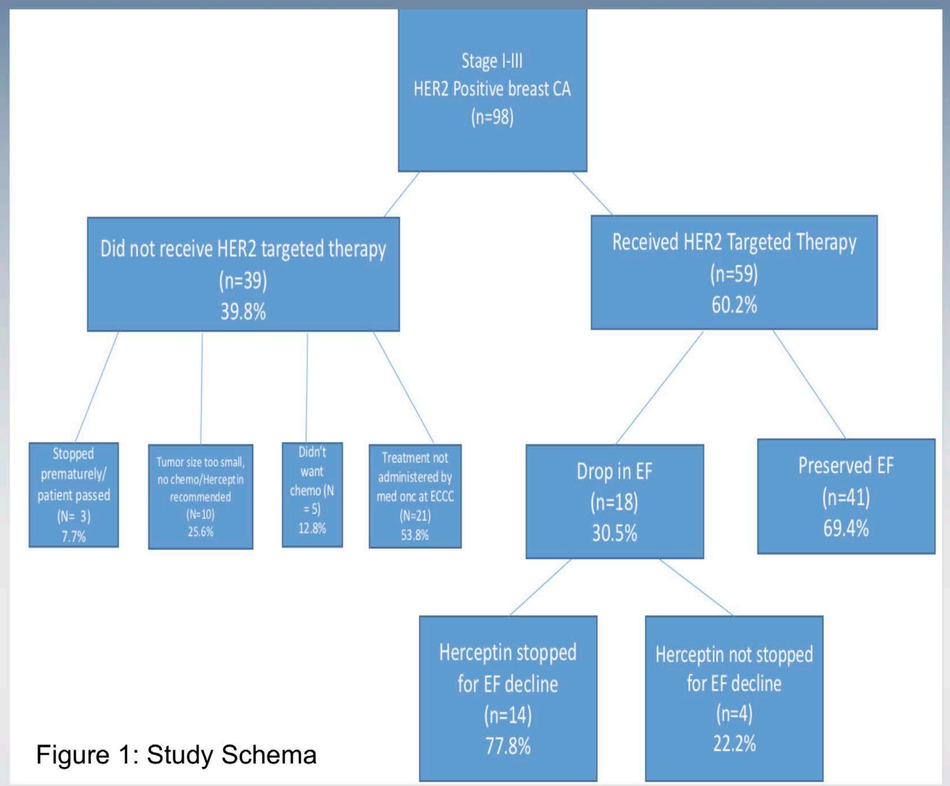


Figure 1: Study Schema

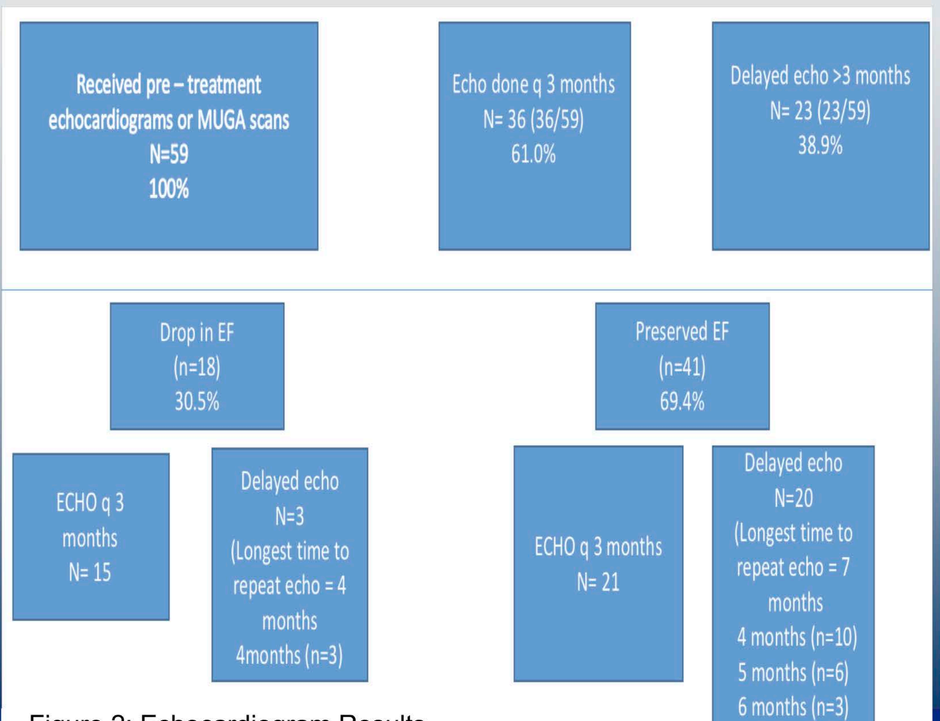


Figure 2: Echocardiogram Results

Results

- Fifty-nine patients (60.2%) received Trastuzumab under supervision of a medical oncologist at ECCC and continued in the study.
- All patients (100%) had their LVEF evaluated prior to treatment.
- LVEF was evaluated every 3 months in 36 (61%) patients while 23 (38.9%) occurred at longer time intervals.
- Preserved EF was seen in 41(69.4%) patients.
- Eighteen (30.5%) patients had a decrease in LVEF by the defined criteria and Trastuzumab was not held appropriately in 4 of those patients (22.2%).
- Ten of 18 patients that had a drop in LVEF had persistent LVEF decline or had stopped treatment ≥3 times for cardiomyopathy.
- Trastuzumab was permanently discontinued appropriately in 4 of the 10 patients (40%).

Conclusions

- Better compliance is needed to monitor LVEF at 3-month intervals while on Trastuzumab.
- Improvement to recognize when to hold Trastuzumab to prevent cardiotoxicity is needed.
- Suggestions to improve adherence to current recommendations for cardiac assessment and to determine if Trastuzumab should be held or stopped:
  - Better documentation
  - easier accessibility to previous EF results
  - multidisciplinary team (breast navigator, cardiologist, oncologist and pharmacist)

References:

1.NCCN guidelines: Breast Cancer.
2.Herceptin Prescribing Information. Genentech, Inc. 2017

Severity and Type of Parental Stress in Pediatric Patients with Attention Deficit Hyperactivity Disorder (ADHD) Alone vs. ADHD with Coexisting Autism Spectrum Disorder (ASD): A Controlled Study

Kristen Hyberg M.D., Jodi Pitsenbarger M.D., Brian Dunlap M.D., Rebecca Wingfield BS, Jesse Lewis BS, James Lewis M.D.

Department of Pediatrics, Joan C. Edwards School of Medicine at Marshall University

Background

Parental stress levels have been found to be higher in families whose children have special health care needs, including the mental health disorders of ADHD or ASD. Research has demonstrated a transactional relation between child behavioral problems and parental stress. The total level of stress may be due primarily to the parent, child or their interaction. The combined diagnoses of ADHD and ASD was approved in the 2013 DSM-5. The percentage of children or adolescents who have both ADHD and ASD features (AF) is uncertain but has been reported as high as 50%. Currently there is little known about the impact of coexisting ADHD with AF on the degree and type of parental stress as compared to children with ADHD alone.

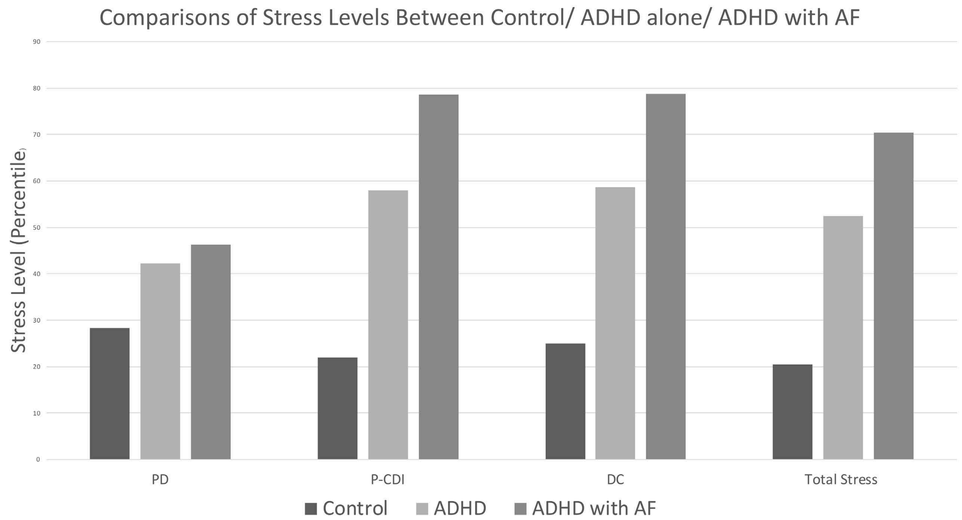
Hypothesis

Parents of children with ADHD with coexisting AF have higher levels and different types of parenting stress compared to parents of children with ADHD alone or controls.

Methods

Over a 4-month period in 2018, parents of children diagnosed and treated for ADHD according to current American Academy of Pediatrics guidelines were assessed for the presence of AF by completion of the Social Communication Questionnaire (SCQ). A total combined score of ≥ 15 in the categories of difficulties in social interaction or communication and restricted, repetitive interests or activities was considered positive. The Parenting Stress Index-Short Form (PSI-4-SF) measuring total parental stress (TPS) and the 3 subdomains of parental distress (PD-often maternal depression), parent-child dysfunctional interaction (P-CDI), and difficult child (DC) was also completed by the ADHD group. The PSI-4-SF was also administered to a control population without either ADHD or AF.

Results



Comparison of stress level (percentile score) for the domains of the Parenting Stress Index-Short Form between control, ADHD alone, and ADHD with AF. PD = Parent Distress; P-CDI = Parent-Child Dysfunctional Interaction; DC = Difficult Child

PSI-4-SF domain	Control		ADHD		ADHD with AF		P-value		
	Mean	SD	Mean	SD	Mean	SD	Control/ ADHD	Control/ ADHD with AF	ADHD/ ADHD with AF
PD	28.3	14.3	42.3	28.7	46.3	28.2	0.192	0.152	1.00
P-CDI	21.9	14.5	58.0	25.1	78.6	15.4	<0.001*	<0.001*	<0.01*
DC	25	21.1	58.6	29.9	78.7	21.0	<0.001*	<0.001*	<0.01*
Total stress	20.5	16.0	52.5	27.5	70.4	18.8	<0.001*	<0.001*	<0.01*

Mean scores and standard deviations for 4 domains of PSI-4-SF with chi-square and ANOVA comparison with Bonferroni correction between controls, ADHD, and ADHD with AF patients

Results

The study groups were comprised of 155 ADHD patients, 131 (85%) without AF and 24 (15%) with AF and 15 controls. Scores of TPS and the 3 subdomains of stress associated primarily with the parent, the relationship between parent and child, or the child were compared between the 3 groups using Chi square and ANOVA. Statistically significant differences were found between the ADHD, ADHD/AF and control populations in the levels of TPS, P-CDI, and DC. While PD was not statistically significantly different between these groups, high PD scores were significantly correlated with high TPS levels (Pearson correlation 0.78, $p<0.001$). The highest TPS scores were recorded in the ADHD/AF group ($p<0.01$).

Discussion

Parents of children with ADHD with AF experience higher levels of total parenting stress when compared to children with ADHD alone and a control population. The extent to which parents felt competent, conflicted or depressed in their role as a parent, however, was similar in all three groups. The extent to which parents felt satisfied with their child and their interaction and their perception of the child as difficult to take care of was, however, significantly higher in the ADHD/AF and ADHD groups. The highest total stress scores were found in the ADHD/AF group. Parenting stress has been associated with negative impact on the parent's well-being thus decreasing their self-efficacy and ability to implement interventions. It is also possible that at least one of ten children with ADHD may have complicating autistic features. Thus, evaluating and addressing stress among parents of children with ADHD and screening for AF in those children should be considered for optimal medical and behavioral management. This study is limited due to the use of a referral ADHD population and the relatively small numbers of controls.

Conclusion

Although the level of maternal emotional disorders (primarily depression) is similar in pediatric populations with or without ADHD or ADHD/AF, the latter 2 groups report significantly higher total levels of stress specifically associated with the child and the dysfunctional relationship. AF may be present in up to 15% of children with ADHD.

Impact Of Risk Stratification on Standardized Mortality Ratio for ICU Patients

Kanaan Mansoor [1], Yoseph Elala [1], Damir Kusmic [1], Nabil Alzaeim [1], Nancy J. Munn [2], Zeid M. Fuad [2], Pedro Ottaviano [2]

[1] Department of Internal Medicine, Joan C. Edwards School of Medicine

[2] Department of Pulmonology, Joan C. Edwards School of Medicine

Objective:

The objective of this project was to study the effect of risk stratification on admission and its impact of **30 day standardized mortality ratio (SMR30)** and **in hospital mortality SMR**.

Background:

- **SMR30** is a ratio of the actual number of acute care patients who died within 30 days of hospital/ICU admission, divided by the expected death of all acute care patients using risk adjusted mortality models that predicts death at 30 days.
- **In hospital mortality SMR** is a ratio of actual number of deaths during a hospital/ICU stay or within a day of discharge divided by expected number of deaths predicted to occur during a hospital/ICU stay or within a day of discharge.
- From 2000 to 2005 in the United States, the number of critical care beds increased more than 6.5%, and critical care spending is now estimated to account for almost 1% of the Gross Domestic Product.
- Stepdown beds, also referred to as intermediate care beds or high-dependency beds, are one possible approach to providing higher levels of care while improving the efficiency of patient flow.

Methods:

- "Medical Step Down Unit" was added as a level of care for patients. Admitting services and ED physicians were given orientation session on admission criteria for MSDU. This intervention was performed in the third quarter of 2017.
- Data used for this study was extracted from VA Strategic Analytics Improvement and Learning (SAIL) Data, which maintained blinding of the data, and prevented possible biases during data collection.
- VA – SAIL data for six quarters prior to intervention and post intervention were collected and tabulated in Ms. Excel and a paired t-test was performed, p value of <0.05 was considered to be significant.

Results:

- SMR 30 pre and post intervention had an average difference of -0.34 with a p value of 0.003.
- In hospital mortality SMR pre and post intervention had an average difference of -0.34 with a p value of 0.028.
- The average difference of SMR pre and post intervention was -34%** while the in hospital mortality SMR pre and post intervention was also -34%**. This not only signifies that there were 34% fewer deaths in comparison to the expected model but also indicates that discharge practices did not have any influence, hence negating biases.

**The reference value of both SMR and SMR30 is 1.00. A value of 1.20 suggests 20% more deaths occurred than were expected. Similarly, a value of 0.80 indicates 20% fewer deaths than expected.

Variables	Pre Intervention		Post Intervention		p Value
30 DAY SMR	Q2 '16	1.36	Q4 '17	1.30	0.003*
	Q3 '16	1.44	Q1 '18	1.10	
	Q4 '16	1.71	Q2 '18	1.18	
	Q1 '17	1.56	Q3 '18	1.22	
	Q2 '17	1.61	Q4 '18	1.14	
	Q3 '17	1.45	Q1 '19	1.16	
In Hospital Mortality SMR	Q2 '16	1.32	Q4 '17	1.33	0.028*
	Q3 '16	1.34	Q1 '18	1.10	
	Q4 '16	1.73	Q2 '18	1.03	
	Q1 '17	1.37	Q3 '18	1.21	
	Q2 '17	1.58	Q4 '18	0.94	
	Q3 '17	1.41	Q1 '19	1.06	

Marshall Internal Medicine

Discussion:

Analysis of a U.S. national database by Herring et al demonstrated that from 2001 to 2009, the percentage of emergency room visits resulting in ICU admissions increased 79%, from 1.2 to 2.2 million. This exponential growth requires better stratification of patients according to their needs to improve the designation of human resources available in the healthcare profession.

Medical patients admitted to SDUs specifically as an alternative to full intensive care have not been well researched, but some studies have reported that after the establishment of an SDU, cost of care and ICU length of stay actually increases because the hospitals are able to admit more patients with a high severity of illness.

Our project focused on risk stratification for admissions of acutely ill patients and their appropriate placement. Addition of MSDU provided better patient management and outcomes which was reflected by the gradual improvement in the SMR30 and in hospital SMR.

Conclusion:

Introduction of MSDU and better risk stratification on the admission of an acutely ill patient has a significant effect on SMR and SMR30. Rigorous comparisons of different SDU care models are needed to establish better designs, optimize critical care capacity, manage healthcare costs, and improve overall patient care.

References:

- Pouw, M. E., Peelen, L. M., Lingsma, H. F., Pieter, D., Steyerberg, E., Kalkman, C. J., & Moons, K. G. M. (2013). Hospital standardized mortality ratio: consequences of adjusting hospital mortality with indirect standardization. *PloS One*, *8*(4), e59160.
- Prin, M., & Wunsch, H. (2014). The role of stepdown beds in hospital care. *American Journal of Respiratory and Critical Care Medicine*, *190*(11), 1210-1216.
- Strategic Analytics for Improvement and Learning (SAIL) Value Model Measure Definitions - Quality of Care. (n.d.). Retrieved April 1, 2019, from https://www.va.gov/QUALITYOFCARE/measure-up/SAIL_definitions.asp

Documentation of Code Status in Surgical Critical Care

A Venardi MD[1], J Tate MS3[2], Y Wei MD[1], T Wolbert MD[1], B Czarkowski MD[1]

[1]Marshall University Department of Surgery, [2]Joan Edwards School of Medicine at Marshall University, Huntington, WV

INTRODUCTION

The documentation of a patient's code status is a critical step in admission to the hospital. It guides physician's decision making and directs the goals of care. The decision is best made by the patient themselves given an appropriate amount of time and consideration to the matter. This is typically something that patients address only when reaching the later years of life with a slowly declining health status. In this case, there is ample time and opportunity to allow proper decision making and documentation of a patient's end of life wishes by the medical care community. Unfortunately, this is not always the case, as a declining health status is often unexpected.

The most critically ill patients are admitted to intensive care services, making the documentation of code status a top priority. However, there are often challenges to proper decision making and documentation of these patients' preferences. These challenges are particularly prevalent in patients under the care of surgical services. Surgeons care for patients through all walks of life. Patients often present to surgical care services acutely ill and without warning. They may be transported to the hospital in critical condition without the presence of family members to direct questions to. Additionally, patients often have DNR/DNI rescinded for surgical intervention with failure to reassess after completion of the surgery. Aside from the patient population, surgeons themselves often possess a dogma that may interfere with proper end of life care. This is the predisposition to continue fighting in effort to preserve life in all circumstances.

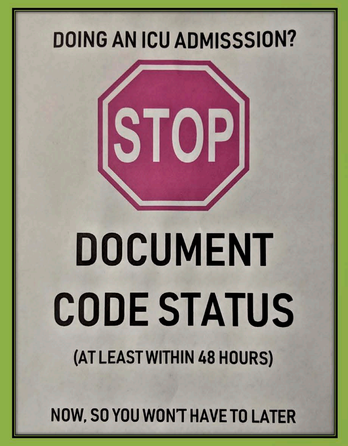
It was identified that the surgical services at Cabell Huntington Hospital were doing an inadequate job of documenting code statuses on patients admitted to critical care services. This leads to difficult conversations and decisions being made in a high stress setting. This project aimed to improve the documentation of a patient's code status to provide an overall higher quality of care.

MATERIAL AND METHODS

A retrospective chart review was performed for February 2019 to examine the documentation of code status within the first 48 hours on critically ill surgical patients. These patients included general surgery, trauma, and burn patients admitted under the surgical service. Data represents patients who had a surgery done by a Marshall surgeon and then were admitted to an ICU service.

Knowing that these numbers were less than ideal, the surgical service was made aware of these findings and an effort was made to publicize the importance of code status. A quick educational meeting was held to raise awareness and promote improvement. Signs were placed in the surgery call rooms and a sticker was affixed to the top left corner of the computer screens as a reminder.

Documentation of code status was then compared to March 2019, post-quality improvement measures. Patients were excluded from data if they were transferred to or from the surgical care service or if they were discharged within 24 hours. Data was compared using a two sample t test.



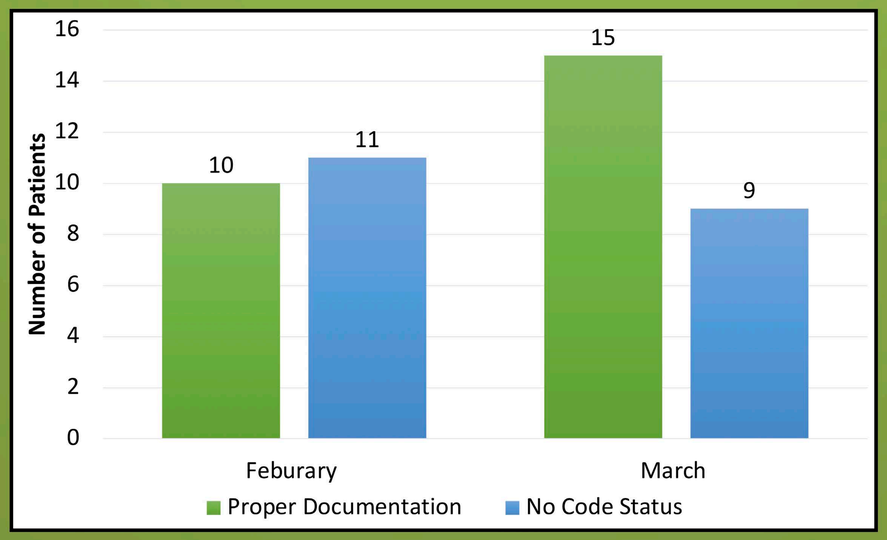


Table 1. February numbers are pre-improvement measures. Data illustrates that 47.6% of patients had a code status documented within 48 hours of admission. In March, after improvement measures, this improved to 62.5% of patients having a code status documented within the first 48 hours of admission.

DISCUSSION

- There was not a statistically significant difference in code status documentation seen in the patient population accounted for. However, any improvement in documentation of such an important piece of patient care is clinically significant.
- Data represents only patients of which had a surgical procedure, while the intervention affected all patients admitted to a critical care service under the surgery care team. Data including all targeted patients was unable to be obtained in the allotted time. The number of patients of which were affected by this intervention is much greater than what is represented by the results shown.
- A challenge to improvement in this data after intervention could be the monthly changes in residents and education of all healthcare workers on the importance of the matter.
- Future goals of this study include obtaining data on all patients admitted to a critical care service by the surgical team at Marshall. This would increase the power of study as well as illustrate the magnitude of impact that was made. An additional step could be taken to place a reminder or hard stop within Cerner forcing a code status to be documented on patients admitted to critical care services.
- With these interventions, difficult conversations regarding a patient's care can be had at more ideal times. This allows physicians to practice both beneficence and nonmaleficence without question of a patients end of life wishes, resulting in overall better care as well as patient and physician satisfaction.

CONCLUSION

With further interventions including integrating a reminder into Cerner EMR ICU order sets, the surgery service will continue to improve their documentation of code status.

The Regulation and Function of L-Type Amino Acid Transporter 1 in Response to Adipokines in Human Breast Cancer Cells

Travis Salisbury, Ph.D

Departments of Biomedical Sciences and Clinical and Translational Sciences
Joan C. Edwards School of Medicine, Marshall University, Huntington, WV 25755

Background:

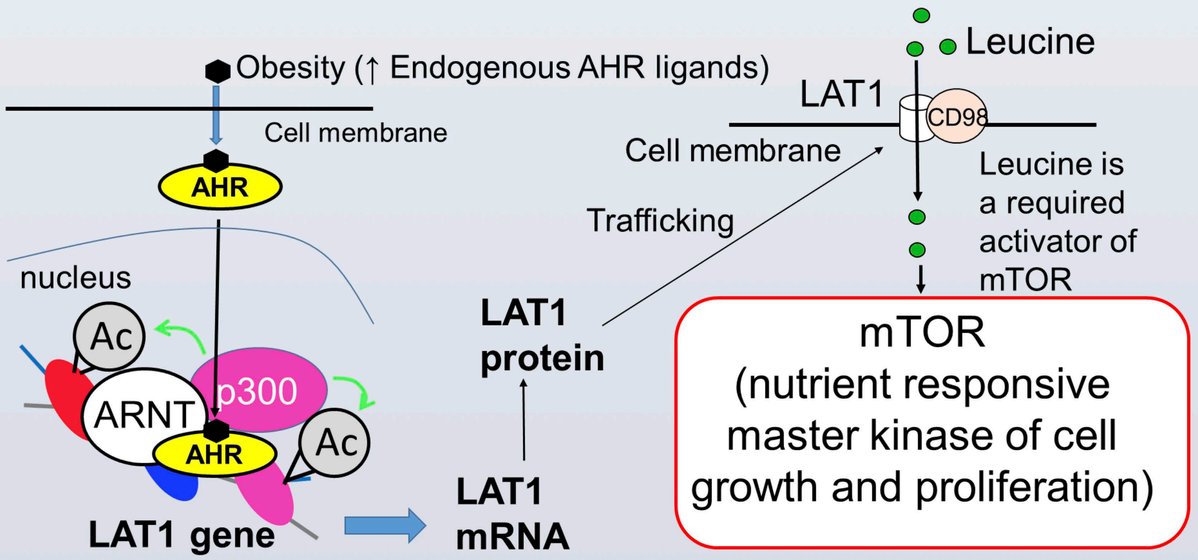
- Breast cancer is the second most common cancer and the second leading cause of cancer death among women in West Virginia/Central Appalachia
- One in five female cancer deaths are related to obesity and Appalachia and West Virginia have the highest rates of obesity in the country.
- Obese women (especially in postmenopausal women) have higher rates of breast cancer incidence, are less responsive to cancer therapy and have worse clinical outcomes than non-obese women.

Obesity is a major risk factor for certain cancers (colon and breast), though how obesity causes cancer is not fully understood. The absorption of nutrients by cancer cells could be part of the problem

Obesity-Cancer Hypothesis

The Adipokine Hypothesis
Obesity leads to an alteration in the profile of hormones secreted by adipose tissue (adipokines). In the obese state, adipose tissue secretes proportionally more adipokines that promote cancer and fewer adipokines that inhibit cancer.

The Obesity-driven AHR-LAT1-Leucine cancer hypothesis

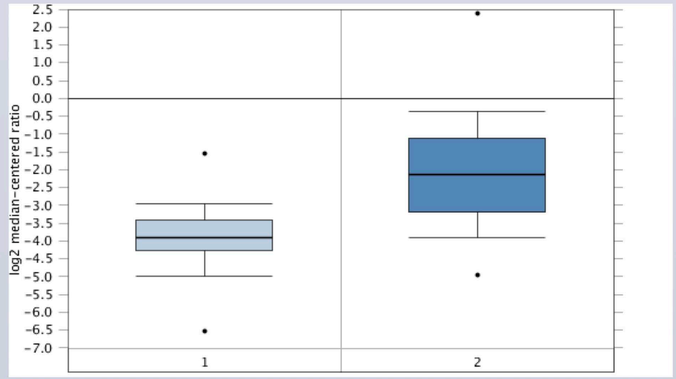


LAT1 mRNA expression is higher in breast cancer compared with normal breast in patient samples

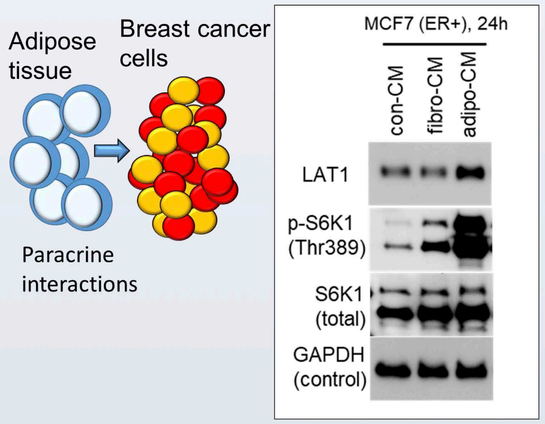
1 = breast (N=61)
2 = invasive ductal breast carcinoma (N=389)

P-value: 1.65E-28
T-test: 14.459
Fold Change: 3.443

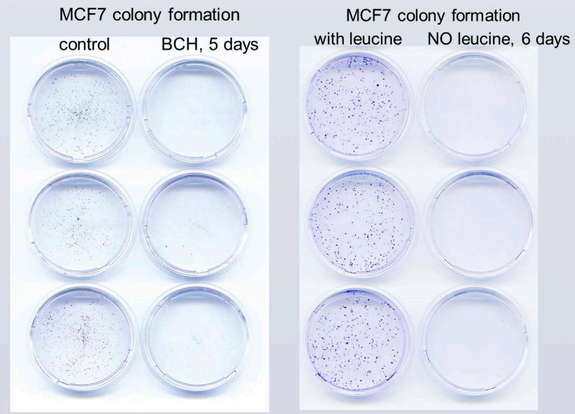
LAT1 Expression in TCGA Breast Cancer Dataset



Adipocyte-secreted factors (ASFs) stimulate LAT1 expression and promote mTOR activation in breast cancer cells



Extracellular Leucine and LAT1 are critical for MCF7 colony formation



Acknowledgements

This project is supported by the National Institute Of General Medical Sciences of the National Institutes of Health under Award Number P20GM121299-01A1. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health (NIH). The Appalachian Center for Cellular transport in Obesity-Related Disorders (ACCORD) is an NIH-funded Center of Biomedical Research Excellence (COBRE) focused on the molecular mechanisms of cellular transport abnormalities in obesity-associated health disparities in West Virginia and Central Appalachia.

Treatment of Cardiac Arrhythmias with Electrical Cardioversion in Pregnancy

Catherine Adams MD, Hisham Hirzallah MD, Julia Parsons DO, Ellen Thompson MD

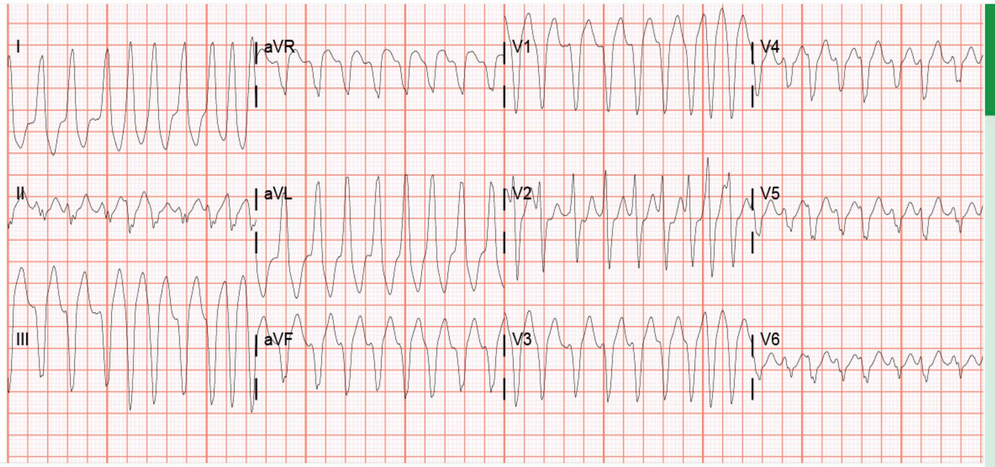
Department of Internal Medicine, Department of Cardiology, Marshall University, Huntington, WV

Introduction

Physiological changes in pregnancy can result in tachyarrhythmias in previously asymptomatic Wolf Parkinson White (WPW) patients. Sustained symptomatic arrhythmias can result in hemodynamic compromise in mother and fetus; therefore, rapid intervention is crucial. Electrical cardioversion (ECV) is utilized in life-threatening situations when the patient is hemodynamically unstable. Literature review indicates there are no large-scale studies concerning the safety and efficacy of ECV in pregnant populations. This case report describes the effective use of ECV during pregnancy.

Case Presentation

A 26 year old white female G1P0 at 33 weeks of gestation with a past medical history significant for asymptomatic WPW syndrome presented with: sudden onset of shortness of breath, sustained palpitations, dizziness and chest tightness. Her heart rate was 180-220 bpm and blood pressure was 84/60 mmHg with MAP of 68 mmHg. On physical examination, gravid uterus above the umbilicus was noted. Initial serial EKGs showed wide complex irregular tachyarrhythmia and atrial fibrillation with RVR. Her laboratory work up was normal. She was evaluated by a team consisting of Cardiology, OB/GYN and Electrophysiology. She underwent cardioversion with synchronized 150J DC shock under sedation without maternal or fetal complications. Post-procedure EKG showed sinus rhythm with heart rate of 90 bpm, short PR interval and delta wave. She was admitted for observation overnight and she was started on flecainide (50 mg daily) to prevent further tachyarrhythmias. On the following day, she was discharged without additional sequalae with plans for post-partum ablation.



12 leads (top), lead II (bottom) before cardioversion

12 leads (top), lead II (bottom) after cardioversion

Discussion

WPW syndrome was first described by Wolf, Parkinson and White in 1930. It is a pre-excitation syndrome due to an anomalous pathway bypassing the AV node. The overall incidence of arrhythmia resulting in WPW syndrome is reported to be up to 1% per year. However, the exact incidence of tachyarrhythmias in pregnant WPW syndrome patients is unknown. In 1961, Gleicher et al suggested that pregnancy may facilitate onset of tachyarrhythmias in patients with asymptomatic pre-excitation syndrome. Tachyarrhythmias in pregnancy can result in hemodynamic compromise to the fetus causing hydrops fetalis. It is also reported to cause premature delivery and intrauterine growth restriction. Therefore, rapid conversion to sinus rhythm is crucial for the wellbeing of both mother and fetus. Trials of medical cardioversion were reportedly unsuccessful in the past and given the special circumstances in our case where the patient was hemodynamically unstable, rapid management with electrical cardioversion under sedation was considered.

Conclusion

Pregnancy predisposes tachyarrhythmias in previously asymptomatic WPW syndrome patients. Electrical cardioversion can be considered a safe and effective treatment.

Citations

1. Widerhorn, J., et al., *WPW syndrome during pregnancy: increased incidence of supraventricular arrhythmias.* Am Heart J, 1992. **123**(3): p. 796-8.
2. Tromp, C.H., et al., *Electrical cardioversion during pregnancy: safe or not?* Neth Heart J, 2011. **19**(3): p. 134-136.
3. Trappe, H.J., *Emergency therapy of maternal and fetal arrhythmias during pregnancy.* J Emerg Trauma Shock, 2010. **3**(2): p. 153-9.
4. Gleicher, N., et al., *Wolff-Parkinson-White syndrome in pregnancy.* Obstet Gynecol, 1981. **58**(6): p. 748-52.

A Case of Disseminated Cat Scratch Disease Presenting as Osteomyelitis

Alicia Heyward, DO; Jasmyn Atalla, MSIII; Jay Lakhani, MD
Marshall University School of Medicine Department of Pediatrics
Huntington, WV

Introduction

- Cat Scratch Disease is a bacterial infection caused by the organism Bartonella henselae. The organism typically causes a regional lymphadenitis that is benign and self-limiting.
- Rare complications with liver, spleen, bone, heart and brain involvement can occur.
- Such complications are thought to be more common among immunosuppressed individuals, but are increasingly being reported in immunocompetent individuals as well.

Case Presentation

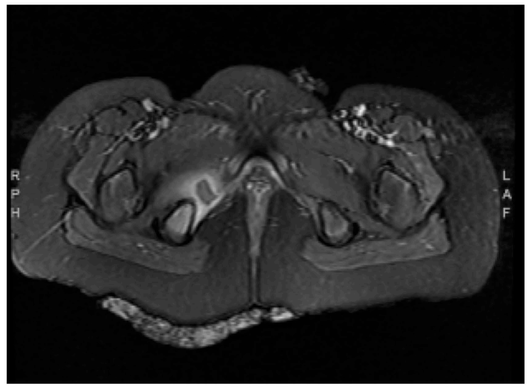
3-year-old female presents to the emergency room

- **Chief Complaint:** History of fevers for 16 days and new onset left hip pain.
- **History of Present Illness:** Initially evaluated by PCP and given two courses of antibiotics, including azithromycin. Afebrile for 48 hours after completion of antibiotics, but fevers returned with addition of left hip pain and limp. Parents recall lesion on left wrist present for a few weeks.
- **Social History:** Family pets include two outdoor cats.
- **Physical Exam:** Antalgic gait on the left. No erythema or edema of left hip, full ROM. Unable to assess pain as patient is uncooperative.

Clinical Course

- Due to her left hip pain and abnormal labs, the orthopedic team was consulted due to concern for septic arthritis.
- Vancomycin and ceftriaxone therapy were started following joint aspiration.
- MRI showed evidence of left hip septic arthritis with left acetabular and femoral osteomyelitis, along with a right obturator abscess. Bone culture was obtained.
- Patient continued to have daily fevers despite IV antibiotics, and inflammatory markers remained elevated. Cultures were all negative. Patient transferred for Infectious Disease evaluation.
- Repeat MRI showed multifocal osteomyelitis with minimally larger abscess in right obturator muscle.
- Diagnosis was made after muscle abscess biopsy was positive for Bartonella on PCR.
- Patient was diagnosed with disseminated Cat Scratch Disease with multifocal lesions in the spleen.
- She was started on Bactrim and Rifampin for four weeks and discharged home.

Imaging



MRI findings significant for right obturator abscess

Diagnosis and Outcome

Final Diagnosis:

Disseminated Cat Scratch Disease

Discussion

- Cat scratch disease (CSD) is typically a self-limited regional lymphadenopathy presenting in children ages five to nine, caused by Bartonella henselae.
- It commonly occurs due to a scratch or bite from an infected cat but can also be spread through contact with a cat's saliva into mucosal surfaces.
- A localized lymphadenopathy is the presenting sign in 85-90% of cases, and appears 3-10 days post infection, and lasts for about 2 weeks to a few months.
- After conducting a literature search, there are 47 cases reported of CSD causing osteomyelitis. These cases typically involved younger children and most commonly affected the pelvic girdle and vertebral column, though there were no cases of concomitant splenic involvement.
- Our case demonstrates a rare occurrence of disseminated CSD presenting as osteomyelitis with splenic abscess.
- Visceral organ involvement is an unusual manifestation of CSD but should be considered in children that are not improving with treatment of osteomyelitis
- While Cat Scatch Disease is considered a self limiting disease it is important to treat in the early stages of lymphadenitis, as up to 14% of children with untreated CSD will develop a disseminated infection with visceral organ involvement.

References

- Bartonellosis. NORD. http://www.Rarediseases.org/rare-diseases/bartonellosis. Accessed January 4, 2019.
- Nelson CA, Saha S, Mead PS. Cat-Scratch Disease in the United States, 2005-2013. Emerg Infect Dis. 2016 Oct;22(10):1741-6.
- Florin TA, Zaoutis TE, Zaoutis LB. Beyond cat scratch disease: widening spectrum of Bartonella henselae infection. Pediatrics. 2008;121(5):e1413.
- Moriarty RA, Margileth AM. Cat scratch disease. Infect Dis Clin North Am. 1987;1(3):575.
- Carithers HA. Cat-scratch disease. An overview based on a study of 1,200 patients. Am J Dis Child. 1985;139(11):1124-1133.
- Hajjaji N, Hocqueloux L, Kerdraon R, Bret L. Bone infection in cat-scratch disease: a review of the literature. J Infect. 2007;54(5):417.