Community Health Network

Second Annual Multidisciplinary Scholarly Activity Symposium

May 19, 2017

Cover design – Nate Fishback
Proceedings Monograph prepared by Barbara A. Gushrowski and Kaylee Burget

Second Annual
Multidisciplinary Scholarly Activity
Symposium Proceedings
2017

CONTENTS

KEYNOTE SPEAKER

Chad Priest, RN, JD - Chief Executive Officer, American Red Cross Indiana Region

Chad S. Priest, JD, MSN, RN is Chief Executive Officer of the American Red Cross – Indiana. He is also Adjunct Assistant Professor of Emergency Medicine at the Indiana University School of Medicine and Program Director of the Disaster Medicine Fellowship Program; a Visiting Scholar at the Indiana University Center for Law, Ethics and Applied Research in Health Information and an affiliated investigator at the IU Center for Bioethics.

His research and scholarship interests include international disaster risk reduction, healthcare emergency management, crisis leadership and community resilience to disasters and crisis events. He is a frequent international on issues related to healthcare emergency management and disaster medicine and nursing.

Prior to assuming leadership of the Indiana Region of the American Red Cross, Priest served as Assistant Dean for Operations and Community Partnerships at the Indiana University School of Nursing where he also directed the interdisciplinary Social Network Health Research Laboratory. Previously Chad was Chief Executive Officer of The MESH Coalition, an innovative public-private partnership that enables healthcare providers to effectively respond to emergency events and remain viable through recovery. Chad formerly practiced as an attorney at the law firm of Faegre Baker Daniels practicing public health and healthcare law in the Indianapolis and Washington, D.C. offices. Chad served on active duty as an officer in the United States Air Force with the 89th Medical Group, Andrews Air Force Base, Maryland.

ORAL PRESENTATIONS

O1 Suicidality in an Adolescent Patient Taking Generic Guanfacine ER (Michael Welling, MD)

Introduction: Intuniv is an alpha-agonist drug that is used to treat ADHD symptoms. Unfortunately, there is limited data regarding severe adverse reactions, especially regarding the therapeutic equivalency and adverse reactions of generic guanfacine ER, and especially in children. We report the case of a pediatric patient having severe suicidality and aggression after the conversion from brand-name to the generic formulation.
Methods: A 17-year-old male patient, diagnosed with ADHD (among several other DSM-5 diagnoses), and on several medications (including brand-named Intuniv). His insurance company requested a change from brand-name Intuniv to generic guanfacine ER. On the generic form, he became rapidly and severely suicidal and aggressively threatening, requiring inpatient psychiatric hospitalization. After appeal to the insurance company, we were able to restart the brand-name Intuniv. His suicidality rapidly resolved and he returned to baseline functioning.
Results: The likely etiology for the sudden onset of severe suicidality and aggression is the change in formulation from brand-name to the generic version. Other factors including drug-drug interaction, preparation by a different pharma, social changes, and genetic factors were also considered.
Discussion: The remainder of the case study will focus on difference of brand-named medications and the generic medication counterparts; clarification of definitions of generic medications and brand-name medications; and a discussion of the variances in generic versus brand-name, and why that can matter.

O2 Helping the Helpers: Implementing a Critical Incident Response Program for your Organization (Kimble Richardson, MS, LMHC, LCSW, LMFT, LCAC; Sherri Stinson, MSN, RN)

Employees witness an active shooter kill a colleague. A local hospital emergency department becomes overwhelmed by a sudden surge of accident victims after a building collapses during a music concert. A company's popular CEO is found dead in his office in an apparent suicide. Tragedies like these can have a lasting impact on an organization's most valuable resource: their employees and staff. If not handled appropriately, the emotional toll of those experiencing these types of critical incidents could result in absenteeism, loss of productivity, and potentially loss of employment. Implementing a team of trained peers and mental health professionals in certain types of crisis management techniques such as Critical Incident Stress Management (CISM) can make the difference in how fast and how completely an organization recovers from a significant crisis and/or critical incident. A support program will be presented from conception to implementation to maintenance. Selecting an evidenced based crisis intervention training, recruiting team members, conducting interviews, devising team membership criteria, implementing call outs, collecting data, and providing team support and supervision will be presented. A large healthcare organization in Indiana with approximately 12,000 employees implemented an employee support team in 2013. The team has responded to over 125 requests for assistance, have been recognized by the organization's top leadership, and are supported, in part, by the International Critical Incident Stress Foundation, Community Health Network, and the Indianapolis Coalition for Patient Safety

O3 Successful Naloxone Challenge Test in a Patient with Atrial Flutter: A Case Report (Taylor Harlow, PharmD Candidate)

Background: Following acute opioid detoxification, naltrexone long-acting injection (LAI) (Vivitrol®, Alkermes Inc.) is an option for patients who pursue medication therapy to prevent relapse to opioid dependence. It improved retention in treatment and increased mean time to dropout compared to. Naltrexone is an opioid antagonist that may produce prolonged withdrawal in patients who have not fully completed detoxification from opioids (7 to 10 days), which may not feasible for many reasons for an acute inpatient detoxification
One solution is the naloxone challenge test (NCT), which consists of administering consecutive doses of naloxone and monitoring symptoms of withdrawal. If there is no response to naloxone, the patient can be administered naltrexone. However, a NCT should still be given cautiously leading in patients with cardiovascular comorbidities. The following case report describes a patient in atrial flutter who received a naloxone challenge test following opioid detoxification.
Case description: A 5O-year-old Caucasian male presented inpatient detoxification from opioids. He had a significant past medical history of cardiovascular comorbidities. As the admission continued, the patient began to experience tachycardia and electrocardiogram (ECG) changes that revealed atrial flutter. Cardiology recommended an electrophysiology study (EPS) and, likely, ablation. Prior to the cardiac workup, a NCT was utilized. The patient experienced no withdrawal symptoms after undergoing the NCT, as well as no worsening of cardiac function. Prior to transfer to the cardiovascular hospital, the patient's heart rate was well-controlled but remained in atrial flutter and he was administered naltrexone LAI. During the patient's admission at the cardiovascular hospital, the patient successfully underwent EPS and atrial flutter ablation without complications.
Conclusion: This case report illustrates the potential safety for a NCT in a patient with cardiovascular comorbidities prior to receiving LAI naltrexone. Further study should be performed or data reported to confirm these results in larger patient populations.

O4 Incidence and Clinical Outcomes of Unintended Discrepancies in Warfarin Discharge Orders (Lindsay DeWind, PharmD)

Introduction: Historically, warfarin has been the most commonly prescribed anticoagulant for venous thromboembolism (VTE) prevention and treatment as well as the prevention of stroke in patients with atrial fibrillation. However, there are many complexities in warfarin dosing due to wide variability in patient response, a narrow therapeutic index, multiple drug-drug interactions, and drug-food interactions. Inappropriate management of warfarin can lead to serious and potentially fatal adverse events, including thrombotic and hemorrhagic events. The adverse drug reactions (ADR) caused by warfarin may lead to emergency department visits and hospitalizations. One study found that warfarin was the most commonly implicated drug in ADR-related hospital admissions through the emergency department, accounting for 15.2% of all ADR-related admissions. In 2013, Community Health Network (CHNw) implemented a protocol that allowed pharmacists to automatically manage all adult inpatient orders for warfarin. Pharmacists leave daily progress notes indicating adjustments or continuations of warfarin doses that have been made, including recommendations for initial outpatient dosing. However, upon patient discharge from the hospital, it is the physicians' responsibility to reconcile the warfarin dosing. CHNw has never examined warfarin prescribing habits on discharge to determine if physicians follow the recommendation of the pharmacist.
Objectives: The primary objective of this study was to determine the percentage of patients discharged on warfarin with an unintended discrepancy in warfarin dosing. The secondary objectives were the

number of patients with an INR less than 2 or greater than 5 at their first anticoagulation clinic appointment post-discharge, the number of patients returning to the hospital within 30 days of discharge with a thrombotic event, the number of patients returning to the hospital within 30 days of discharge with a major bleeding event, the incidence of dosing discrepancies when discharged on a weekday versus a weekend, and the incidence of discrepancies when the pharmacist discharge dosing recommendations is in a progress note versus included in the discharge summary or after visit summary (AVS).
Methods: This study was a retrospective chart review evaluating the number of unintended discrepancies in warfarin dosing at discharge at Community Hospital North, Community Hospital South, Community Hospital East, and Community Heart and Vascular Hospital between July 1, 2015 and June 30, 2016.
Results and Conclusion: To be presented at the Multidisciplinary Scholarly Activity Symposium.

O5 Persistence in Addiction Recovery: Pharmacist Role in Transition to Care to Outpatient Rehabilitation (Jacob Peters, PharmD, BCPS)

Background: The transition of care for patients with opioid use disorder who are seeking treatment after inpatient detoxification is crucial and often involves significant planning and interdisciplinary involvement. Pharmacist-led discharge education has shown to be effective in improving medication adherence, rate of follow-up, while decreasing rate of admission in other chronic disease states. To date, no studies have been done to assess this pharmacist-driven intervention in patients with opioid use disorder.
Objective: To determine whether pharmacist involvement in the discharge process for patients with a primary diagnosis of opioid use disorder increases their persistence in treatment for substance use.
Methods: The study objective will be met by identifying a cohort of patients who have a diagnosis of opioid use disorder and are discharging from the Integrated Recovery unit at Community Health Network Behavioral Health Pavilion and will be receiving outpatient rehab at Gallahue Mental Health Services. These patients will receive discharge education provided by the PGY2 Psychiatric Pharmacy Resident. All patients eligible for the study must receive a prescription for either buprenorphine/naloxone or naltrexone long-acting injectable at discharge. At 30- and 90-day follow-up intervals, the patient will be contacted for a structured phone interview to report attendance at follow-up appointments, occurrence of relapse, and use of counseling resources. Additionally, a chart review will be conducted at these follow-up dates to assess for attendance at outpatient appointments, positive urine drug screens, and readmissions. A historical control group will be generated to compare with the prospective cohort. The primary will be evaluated as a composite of initial fill and refills of the discharge medication and 30- and 90-day follow-up information.
Results and Conclusion: To be presented at the Multidisciplinary Scholarly Activity Symposium.
Significance: The results of this study may ultimately lead to a continued implementation of pharmacist-led discharge education providing improved transitions of care and outcomes for patients with opioid use disorder.

O6 Hospital Committees: What do your residents really think? (Jesse Clark, DO; Katie Westerfield, DO; Christina Raguckas, DO; Richard Gray, DO; Kehinde Eniola, MD, MPH; La Toya Jackson, DO; Lisa Harris, DO; Jasmyne Womack, MPH; Todd Zakrajsek, PhD)

Purpose: Family medicine residents are required to be involved in hospital committees to help develop their role as leaders in their profession, but this new requirement is presenting new barriers to many

programs. Our study examines both overall resident attitudes regarding participation on hospital committees and also analyzes these attitudes based on their postgraduate year.
Methods: An anonymous survey regarding attitudes towards hospital committee involvement was distributed electronically to residents of thirteen family medicine residency programs during June 2016. Results were received from 94 residents.
Results: Notable quantitative results include 97.8% of responders believing physicians should serve on hospital committees (n = 92), but when asked if there is value to being assigned to a hospital committee during residency on a scale of 0 = extremely unvaluable to 100 = extremely valuable, the overall mean was 51.74 (SD = 26, n = 88). When asked if they saw themselves participating in a hospital committee within the next year, the graduating class of 2016 on a scale of 0 = extremely unlikely to 100 = extremely likely, had a mean of 56.27 (SD = 32.72, n = 15).
The participants were also asked a number of open ended questions, such as a why they do or do not see themselves participating in a hospital committee over in the next year, what committee they were most likely to join, what their thoughts were if they were required to attend two hospital committees, and what is the primary role of a physician on a committee. These responses offer insight into their attitudes, and will be presented in the presentation.
Conclusions: There are multiple barriers preventing many of our residents from fully benefiting from their roles as members of hospital committees. By using this data as a starting point to identify and address these barriers, we can begin to train them as future leaders of family medicine.

O7 **Development Program for Ambulatory Care Clinical Pharmacists** (Lauren Behrle, PharmD; Daniel Kerner, PharmD)

Introduction: Continuous professional development (CPD) is a "lifelong process of active participation in learning activities that assists individuals in developing and maintaining continuing competence, enhancing their professional practice, and supporting achievement of their career goals." The CPD model includes a feedback process for individual self-reflection, goal-setting, and creation of an action plan to achieve the specified goals. Realizing the advantages of CPD and need to provide support for pharmacists' individualized life-long learning, a CPD program is being developed for the ambulatory care clinical pharmacy department at Community Health Network. The pilot program will begin in early 2017 and will be evaluated on an annual basis. The goals of this program are to increase pharmacist involvement within the department, expand pharmacist clinical knowledge, support personal growth and achievement of personal goals, and develop precepting skills for pharmacy students and residents. Participation in program activities is flexible and may include any of the following: inter-department education sessions, pharmacy grand rounds, preceptor development, blinded chart reviews, and patient appointment shadowing. Completion of activities will be tracked by the individual pharmacist and reviewed periodically with their supervisor.
Objective: The objective of this study is to evaluate ambulatory care clinical pharmacists' knowledge and perceptions of a CPD program.
Methods: All ambulatory care clinical pharmacists participating in the CPD program will be provided the opportunity to voluntarily complete a 13-item survey. The survey consists of four demographic questions, one knowledge-based question, and eight perception-based questions. The survey will be sent out electronically via Survey Monkey and participants will receive two reminder emails to complete the survey. The participants will have six weeks to complete the survey. All survey responses will remain anonymous as no identifiable information will be collected.
RESULTS AND CONCLUSION: To be presented at the Multidisciplinary Scholarly Activity Symposium.

O8 **Implementation of an Accountable Care Unit in a Community-Based Family Medicine Residency** (Daniel Fisher, MD; Mickell Curtis, RN; Tracy Costello, PharmD)

Currently patients for each physician team are scattered across the hospital on multiple nursing units. In an Accountable Care Unit (ACU}, the patients of an individual physician team are preferentially assigned to a single unit. By grouping patients by provider onto a single unit, the physician team is able to better collaborate and coordinate with the dedicated nursing staff of that unit. The co-location of physician team, nursing team, and patients onto a single unit promises improved efficiency and communication. Structured, interdisciplinary bedside rounding (SIBR) on the ACU also contributes to improvement in team-based care. In July 2016, the Community Family Medicine Residency inpatient team partnered with a unit of Community Hospital East to implement this model of care. In this study, we review retrospectively the unit-based outcomes since implementation of the ACU and SIBR, including readmission rates, average lengths of stay, and patient satisfaction data through review of unit-level HCAHPs data. We also compare a pre-implementation survey of physicians and nursing staff to a post-implementation survey, specifically reviewing physician and nursing satisfaction, communication, and perception of patient safety and quality.

O9 **Initiating Pre-Visit Planning for Colon Cancer Screening: A Change Management Project** (Scott Lakin, MSN, RN)

The Patient Centered Medical Home (PCMH) is a unique model of care designed to achieve the Triple Aim: improve the patient experience, improve population health, and reduce the cost of healthcare. The term "medical home" was first published by the American Academy of Pediatrics in 1967 and has grown into the PCMH concept legislated, in part, by the Patient Protection and Affordable Care Act of 2010. A portion of the population health component is care management that includes pre-visit planning. The goal of pre-visit planning is create a complete and up-to-date record of the patient condition before the patient arrives for their next visit. Pre-visit planning may include medication reconciliation, lab test result review/follow-up, and surveillance of preventative exam completion. An important element of the PCMH movement includes increased quality of care and decreased healthcare costs which include utilization. This presentation will describe the process of completing pre-visit planning specifically to conduct surveillance of preventative testing for colorectal cancer. It will review the journey of one family medicine residency to install pre-visit planning into their culture, review change management theory as it relates to performance improvement, and propose a model that will assist practices to begin using pre-visit planning in their daily work.

O10 **Comparison of Burst versus Taper Steroid Dosing in Chronic Obstructive Pulmonary Disease (COPD) Exacerbations** (Paul Szostak, PharmD)

Introduction: For chronic obstructive pulmonary disease (COPD) exacerbations, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines recommend treatment with five days of prednisone 40 mg to improve outcomes.
Objective: The objective of this study is to assess 30 day readmission rates based on prescriber practices of either steroid taper dosing versus sustained, burst steroid dosing.
Methods: A retrospective, observational chart review will be performed at CHNw. Patients eligible for inclusion will have been admitted to CHNw with a primary diagnosis of acute exacerbation of COPD. Additionally, patients must be between the ages of 18 and 89 years of age and discharged on a systemic

corticosteroids (SCS). Patients will be excluded if they are pregnant, a prisoner, discharged to hospice, expire on initial admission, or have a history of asthma.
Data collected will include: age, gender, smoking history, initial hospital length of stay, hospital of admission, patient location, comorbidities, home COPD medications, medication changes at discharge, doses of SCS used, antibiotics given, supplemental oxygen, readmission in 30 days from discharge, number of days until readmission, primary diagnosis at readmission, and death within 30 days.
Burst therapy will be defined as not more than one decrease in steroid dose throughout admission and discharge prescription. An SCS regimen will be considered a taper if the dose of SCS is changed more than once throughout the course of the admission and upon discharge.
Statistical analysis will be used to compare if a significant difference exists between readmission rates based on type of steroid regimen prescribed.
RESULTS AND CONCLUSION: To be presented at the Multidisciplinary Scholarly Activity Symposium.

O11 5th Metatarsal Fractures: When is intervention necessary? (Will Adams, DPM)

Background: The fifth metatarsal is the most commonly fractured metatarsal, and generally, one of the most commonly fractured bones in the foot. Foot and ankle surgeons have been debating for many years which types of fifth metatarsal fractures need to be repaired surgically, and which can be treated conservatively. The goal of this presentation is to offer a literature review, as well as a case study, in an attempt to concisely provide evidence on which areas of the bone need to be repaired, and which do not.
Methods: PubMed was utilized to perform a literature review of all articles that could be accessed for the past 30+ years regarding surgical correction of fifth metatarsal fractures. Also, a case study on a 60 y/o male with a proximal fifth metatarsal fracture was utilized.
Results: By using the AOFAS classification system for fifth metatarsal fractures a literature review showed an overwhelming tendency to recommend conservative care for zone 1 fractures, surgical intervention in zone 2, and surgical intervention only in particular instances in zone 3 fractures.
Conclusion: Following a review of the literature, and the presenter's personal experience involved in the case study there is an overwhelming amount of evidence to support surgical correction of zone 2 fractures. However, there are still instances for zones 1, and 3, in which surgical correction may be debated.

O12 Innovating for the Future: How to Implement Suicide Prevention within a Healthcare Department (Physical Therapy and Rehab): Champions, Challenges and Change (Laurie Gerdt, LMHC)

Background: With the award of a cohort 9 GLS SAMHSA grant, Community Health Network is pursuing implementation of zero suicide initiatives in its healthcare departments. Community Health Network is adopting the culture shift of suicide prevention from being a responsibility of "specialty niche staff' to "part of everyone's job". One such healthcare department that is championing this culture shift through practice change is Physical Therapy and Rehabilitation. With the impetus of a change in law in Indiana that allows patients to seek physical therapy and rehabilitation services without a doctor's prescription, physical therapy and rehabilitation departments were experiencing being the first point of care within the Community Health Network healthcare system. Initial evaluations became of utmost importance to ensure appropriate service and level of care. In addition, Sentinel Event 56 from the Joint Commission on Accreditation of Healthcare Organizations announced in February of 2016 their recommendation that "health care providers in all settings to better detect suicide ideation in patients, and to take

appropriate steps for their safety and/or refer these patients to an appropriate provider for screening, risk assessment, and treatment."
Objectives: Recognize how medical conditions and depression are often connected and necessitate depression screening. Plan how to obtain leadership buy-in, implement the use of screening tools, and address resistance including overcoming organizational stigma around mental health issues in their own organizations. Map out operational planning of practice change and discuss the benefit of data collection on the impact of use of screening tools.
Methods: How to manage both the demands of providing appropriate physical therapy and rehabilitation services with meeting the standards recommended by accrediting organizations was the catalyst for innovation and strategic planning within the Physical Therapy and Rehabilitation department. With the use of SBAR (Situation, Background, Assessment and Request) communication, project management activities, and timelines Community Health Network Physical Therapy and Rehabilitation made the decision to use the Patient Health Questionnaire 9 as part of all their initial evaluations.
RESULTS/CONCLUSIONS: To be presented at the Multidisciplinary Scholarly Activity Symposium

O13 2016 Updates for Transitional Care Management Services in a Patient Centered Medical Home

(Kimberly Jones, LCSW; Nora Sharaya, PharmD, BCPS, BCACP)

Introduction: Adequate continuity of care between inpatient and outpatient settings is essential to support safe and successful transitions for patients as they return to the community setting. Throughout this transition, patients can face many barriers that can put them at risk for unnecessary readmissions. Successful transitions for complex patients often require advance care coordination and a team effort in order to efficiently address patient barriers. As a patient-centered medical home, the Community Group Family Medicine and Residency program (CGFMC) delivers a comprehensive model of care through an inter-professional team.
Objectives: In July 2014, CGFMC began delivering Transitional Care Management (TCM) services to our patients transitioning from the inpatient to the outpatient setting in order to maintain continuity of care and decrease patients' risk of readmissions.
Methods: Services are designed to uphold the TCM billing requirements set by Medicare while providing team-based care to our patients who have returned to the community setting and have risk for readmission. Throughout the TCM services, patient's hospitalizations and care needs are assessed by a social worker, pharmacist, nurse care manager, and physician through both direct and indirect encounters. Patients are followed by the appropriate care team members throughout the first 30 days post discharge in order to intervene with barriers to care and support self-management of their conditions.
Results: In the last year, the role of the nurse care manager has been developed and implemented throughout the clinic. Also, the annual data for 2016 shows a readmission rate of 13.1% out of the 84 patients who completed an entire episode of TCM services.
Conclusion: This presentation will outline our program design, the roles of each profession in the team-based model, and provide updates on the developments of TCM services and data over the last year.

O14 **Feel the Burn: UTIs and Antimicrobial Stewardship** (Jason White, MD, MBA; Jafreen Sadeque, MD, MS; Eileen Rohrbach, PharmD; Kathryn Bachman, DO; Luke Pittman, MD, MBA; Allison Gilberts, MD; Sandra Peña, MD; Patrick King, MD; Nora Sharaya, PharmD, BCPS, BCACP)

The goal of this project is to improve the antibiotic stewardship of resident physicians, namely to decrease the number of times resident physicians prescribe an antibiotic when there is no UTI on culture and/or when they prescribe an antibiotic which does not cover the infectious agent grown on culture. These changes will be effected by educating the residents about antibiotic stewardship and best practices for prescribing antibiotics via a lecture in January 2017 and by providing them with easy reference tools such as pocket cards and EMR dot-phrases. Baseline data will be gathered on the providers from the months of February and March of 2016, specifically by running a report for all encounters with resident providers where a dx code for the encounter refers to urinary tract infections and then reviewing all these encounters to determine what antibiotic, if any, was prescribed and if it was appropriate given the data available, such as urinalysis and culture data. The same data points will then be gathered for February and March of 2017 and the two will be compared to determine if the inappropriate use of antibiotics decreased.

O15 **Implementation of a Pharmacist-Driven, Emergency Department Culture Review at Community Hospital South** (Eileen Rohrbach, PharmD; Jackie Frisz, PharmD Candidate)

Introduction: Knowledge of evidence-based regimens, drug interactions, and formulary options as well as the ability to collaborate with patients and healthcare providers equip pharmacists for involvement in emergency department (ED) clinical functions, such as antimicrobial stewardship programs. Previously published studies have shown these programs decrease ED visits and 30-day readmission rates while reducing the time to positive culture review. Larger-scale impact on the hospital system can be observed secondary to minimized resistance development and improved resource utilization. The primary objective of this study is to compare and contrast readmission rates, process time, and antibiotic appropriateness between a nursing-driven and pharmacist-driven process for reviewing positive cultures in the ED of Community Hospital South.
METHODS: A retrospective case-control study will compare pre- and post-implementation of a pharmacist-led ED microbial culture review process. Eligible patient will be identified through a computerized decision-support program which will include patients from June 1, 2016 through August 31, 2016 and October 1, 2016 through December 31, 2016 for the pre- and post-implementation groups, respectively. Included patients will have been treated in the study hospital's ED and had a urine culture drawn that resulted positive within in the study timeframe. Excluded patients were those who were admitted inpatient or observation; those less than 18 years of age or greater than 89 years of age; and those with protected status. The following data will be collected: patient demographics; ED diagnosis; antibiotic allergies; cultured species and sensitives; antibiotic prescribed at discharge; time from positive culture to intervention by staff member; intervention required, if necessary; and ED visits or hospital admissions within 8 weeks. Data from the two study groups will be compared to identify any differences in readmission rates, process time, and antibiotic appropriateness.
RESULTS/CONCLUSIONS: To be presented at the Multidisciplinary Scholarly Activity Symposium.

POSTER PRESENTATIONS

P1

Community Health Network

Implementation of an Interprofessional Collaboration Model in an Ambulatory Setting

Jean L. Putnam, MS, RN, CPHQ

Purpose/Significance

The purpose of this project is to provide interprofessional training to Community Health Network employees to enhance their ability to work effectively in interprofessional teams and strengthen their capabilities to apply process improvement methods in their work to improve processes of care and, ultimately, patient care outcomes.

As early as 1978, the World Health Organization (WHO) acknowledged interprofessional collaboration was essential to ensure the success of primary health care. In their report entitled *Framework for Action on Interprofessional Education and Collaborative Practice*, WHO and its partners recognized interprofessional collaboration in education and practice as a creative strategy to change the global health workforce crisis (WHO, 2010).

Objectives

- Design and facilitate collaborative team functioning and overcome impediments to interprofessional collaborative practice.
- Evaluate the educational and clinical outcomes associated with an interprofessionally educated team – specifically, CPAT, CG-CAHPS, and PROMIS-10 survey results.

Framework

1) Relational Coordination Theory

2)Kotter's Change Management Model

Research reported in this Doctorate of Nursing Practice Scholarly Project was supported by the Nurse Education, Practice, Quality, and Retention Grant from the Health Resources and Services Administration (HRSA) under award number # UD7HP26902.

Disclaimer: The content is solely the responsibility of the author and does not necessarily represent the official views of the Health Resources and Services Administration.

Methods

A core team (primary care and pediatric physicians, a nurse practitioner, registered nurses, medical assistants, a social worker, pharmacist, front office personnel, and administrative leaders at a primary care physician office (comprising of approximately 40 clinicians) was identified to receive training on Relationally Coordinated Care and Lean Six Sigma process improvement. Over the following 30 months, projects to improve processes of care were introduced to the team including: access to care, front office workflow, role clarification, standardized care protocols, EMR optimization, and 5S supply organization. Additionally, white, yellow, green, and black belt training was provided to enhance the contextual capabilities of the workforce to support improvements not only related to the ambulatory projects, but to support process improvement in the workforce in general. The work, funded in part by the Health Resources and Services Administration (HRSA), seeks to learn whether care is improved when provided by teams trained in interprofessional collaboration.

Results

Early results demonstrate that employee engagement improved over 24 months, Collaborative Practice Assessment Tool (CPAT) survey results demonstrated evidence of improvement, and efficiencies were gained from workflow improvements. Data is being evaluated currently to identify trends in patient perception (via the CG-CAHPS survey), quality of life (PROMIS-10 survey), and ED utilization.

Conclusion

Collaborative practice is necessary for the changing environment of healthcare, yet it is not widely implemented. The challenge remains that while this is needed in practice, it has not been a part of curriculums in nursing, medicine, pharmacy, therapy, or dietary sciences until recently. Collaborative practice breeds shared decision making, which increases the engagement of care team members, and improves patient outcomes.

Acknowledgements

Norma Hall, DNP, RN-BC, CNE; Interim Dean, Unidy School of Nursing

Kathy Zoppi, PhD; Chief Academic Officer & SVP Community Health Network, Clinical Partner

Cynthia Bowers, DNP, RN, CNE; Faculty Advisor, Unidy

Susan K. DeCrane, PhD, RN, ACNS-BC; Associate Professor, Unidy

References

Gittell, J. (2009). *Relational coordination: Guidelines for theory, measurement, and analysis*. Waltham, MA: Brandeis University.

Kotter, J. (1996). *Leading change*. Boston, MA: Harvard Business School Press.

World Health Organization [WHO] (2010). *Framework for action on interprofessional education and collaborative practice*. Geneva, Switzerland: World Health Organization.

Laboratory Monitoring of High-Risk Medications within a Primary Care Setting

Lauren Behrle, PharmD[1]; Allen Antworth, PharmD, BCACP[1]; Jessa White, PharmD[1]; Jessica Wilhoite, PharmD, BCACP[1]
[1]Community Health Network, Indianapolis, Indiana

Community Health Network

Background

- The Institute for Safe Medication Practices (ISMP) defines a high-alert medication as "drugs that bear a heightened risk of causing significant patient harm when they are used in error."
- ISMP has generated a list of medications considered high-alert medications frequently prescribed within the ambulatory care setting.[1]
- Mitigation strategies to prevent medication errors in high-risk medications include providing patient education, standardizing the medication use process, and regular laboratory monitoring to provide safe and effective use.[1]
- Studies have shown 60.8% of preventable adverse drug events leading to hospitalization are caused by errors in medication monitoring.[2]
- Of the adverse drug reactions that were considered to be serious, life threatening, or fatal in Medicare enrollees, 42.2% were deemed preventable with proper monitoring.[2]
- Medications that regularly require outpatient monitoring, in order to prevent toxicity, accounted for 41.5% of the estimated hospitalizations from adverse drug events.[3]

Tjia J et al.

- Newly-initiated: <20% of recommended monitoring was completed
- Refills: ~40% of recommended monitoring was completed

Need for Study

- This study will evaluate any current gaps in care regarding laboratory monitoring for high-risk medications at Community Health Network.

Methods

- Retrospective chart review evaluating the incidence of appropriate laboratory monitoring for high-risk medications prescribed by internal medicine or family medicine providers within Community Health Network in Indianapolis, IN between July 1, 2014 and June 30, 2015.
- Laboratory monitoring will be considered appropriate if the laboratory value was ordered within 14 days after the specified due date and completed by the patient within 42 days after specified due date.
- Baseline laboratory results for new medication prescriptions will be considered appropriate if completed within 180 days prior to the written prescription date.
- If the medication is a refill prescription, laboratory monitoring will be considered appropriate if completed within 365 days prior to the refill written prescription date.

Medication	Laboratory Test	Monitoring Frequency
Amiodarone	AST/ALT	Baseline and every 6 months
	TSH	Baseline and every 3-6 months
Carbamazepine	AST/ALT	Baseline and yearly
	CBC	Baseline, monthly for 3 months, then yearly
	Carbamazepine level	2-4 weeks after initiation, with changing clinical status, and yearly
Digoxin	SCr	Baseline and yearly
	Potassium	Baseline and yearly
	Digoxin level	5-7 days after dose change and yearly
Methotrexate	AST/ALT	Baseline and every 2-3 months
	CBC	Baseline and monthly
	SCr	Baseline and every 2-3 months
Phenytoin	AST/ALT	Baseline, monthly for 6 months, then yearly
	Phenytoin level	2-4 weeks after initiation then yearly
Valproic Acid	AST/ALT	Baseline, every 2 months for 6 months, then yearly
	CBC	Baseline and yearly
	Valproic acid level	2-4 weeks after initiation, with changing clinical status, and yearly

SCr=serum creatinine, AST=aspartate aminotransferase, ALT=alanine aminotransferase, TSH=thyroid-stimulating hormone, CBC=complete blood count

Methods

Inclusion Criteria:
- Patients 18 – 89 years of age

Exclusion Criteria:
- Pregnancy
- Incarceration
- Received one-time prescription for high-risk medication

Objectives

Primary
- Determine the incidence of appropriate laboratory monitoring for high-risk medications prescribed by primary care providers.

Secondary
- Determine differences in appropriate laboratory monitoring based on the following:
  - Patient age
  - Number of total chronic medications
  - Number of high-risk medications
  - Number of chronic conditions
  - Presence of a pharmacist on the patient's care team

Results

- Data collection is ongoing and results will be shared when completed.

Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.
- Lauren Behrle, PharmD – nothing to disclose
- Jessica Wilhoite, PharmD, BCACP – nothing to disclose
- Allen Antworth, PharmD, BCACP – nothing to disclose
- Jessa White, PharmD – nothing to disclose

References

1. ISMP List of High-Alert Medications in Community/Ambulatory Healthcare. Available at: https://www.ismp.org/community/tools/ambulatory/tablet1.asp
2. Gurwitz JH, Field TS, Harrold LR, et al. Incidence and Preventability of Adverse Drug Events Among Older Persons in the Ambulatory Setting. JAMA. 2003; 289(9): 1107-1116.
3. Sweitz DS, Pollock DA, VanBerkhem KA, et al. National Surveillance of Emergency Department Visits for Outpatient Adverse Drug Events. JAMA. 2006; 296(15): 1858-1866.
4. Tjia J, Field TS, Barber LD, et al. Development and pilot testing of guidelines to monitor high-risk medications in the ambulatory setting. Am J Manag Care. 2010; 16: 489-96.

P3

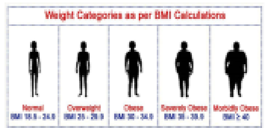
Community Health Network

Avoid It No Longer!
BMI Documentation and Intervention

BMI = Weight (lb) * 703 / height² (in²) OR Weight (kg) / height² (m²)

Background
- Obesity is a main contributor to multiple co-morbidities such as hypertension, hyperlipidemia, coronary heart disease, depression, musculoskeletal conditions and cancers such as endometrial, esophageal, renal, colon and breast. [1,2,3]
- Patients with obesity have a higher rate of hospitalization and mortality. [4,5,6]
- Morbidity associated with obesity is equal to that attributable to poverty, smoking and alcoholism. [4]
- According to CDC data from 2014, 28.9% of the United States population was obese.[14] In the state of Indiana, average obesity rate was 32.7%.[13,14]
- In 2009, obesity was responsible for estimated costs ranging from $70 billion to $100 billion dollars annually. Health care costs for patients who are obese are $1,429 higher than those of normal weight.
- Still, many primary care providers undermanage obesity since it is often not treated as a disease. [3,4,7-10] This may be attributable to inadequate use of BMI data to diagnose abnormal weight. [3,11-12]

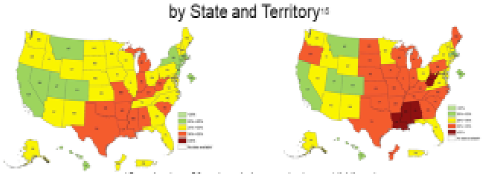
Objective
- To Increase documentation and intervention in patients with BMI ≥ 25.



Setting
- A General Family Medicine Resident Clinic at Jane Pauley Community Health Center - a Federally Qualified Health Center (FQHC) in Indianapolis, IN.

Intervention
- Residents were able to use 2 forms of documentation that helped remind them to document BMI and what ICD-10 codes to use:
  - Standard Visit Note with BMI smart phrase (macro) embedded within the note.
  - Separate BMI smart phrase with same data able to embed in an individual note.
- We consulted the clinic dietitian and were educated and given appropriate references and resources we could use during intervention.
- We consulted the behavioral faculty and were educated on appropriate motivational interviewing techniques.

Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory[15]



2011 — *Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%. — 2015

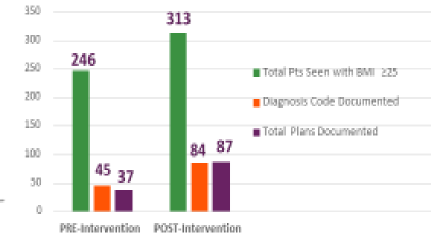
Parameters

PATIENTS
- BMI: ≥ 25
- Age: ≥ 18
- Excluded Pregnant Patients

PERIOD OF STUDY
- PRE-Intervention: 10/1/2017-12/31/2016
- POST-Intervention: 1/1/2017-3/31/2017

Results

	Pre-Intervention	Post-Intervention
Total Pts Seen with BMI ≥25	246	313
Diagnosis Code Documented	45	84
% Code Documented	18%	27%
Total Plans Documented	37	87
% Plan Documented	15%	28%



Barriers
- Upon reviewing the charts, we noticed there were differences in how the standardized smart phrase was used; some embedded it as a reminder in their standard note then deleted the smart phrase, others brought in the smart phrase when they noticed a patient with an increased BMI and others used the original embedded smart phrase.
- Final chart review was done by hand as it was difficult to set the specific parameters during report generating given the different methods of BMI and plan documentation preference.

Follow up
- Despite barriers, the overall project did indeed make improvement and was successful. This is pertinent as it shows us the opportunity for further improvement in a future expanded BMI process improvement project.
- We would like to add a demographic breakdown, clarify methods of documentation, and add any results the intervention has made on decreasing a patient's BMI.
- We would also like to have a formal informaticist assist us in producing the appropriate search parameters to eliminate errors.

Conclusion
- Overall, BMI documentation and intervention made a significant improvement between Pre and Post Intervention. There was a 9% increase in BMI documentation and a 13% increase in plan documentation.
- It was concluded that having a standard note with a BMI embedded in the chart was most helpful with documenting the BMI, and having a chart reminder (via smart phrase) embedded in the chart or smart phrase available were helpful in reminding providers to document a plan.

Primary Author: Michelle Williams, MD
Co Authors: Jason White, MD, MBA; Lauren McKay, DO; Ashley Walker, MD; Maurice Hamala, MD, FAAFP
Supporting Contributors: Cynthia Menaghini, MD, FAAFP; Laura D. Schoocher, LCSW; Kimberly Jones LCSW; Kim Hardin, RD

Literature Cited

Impact of Ambulatory Care Pharmacists on Health Plan Medical Costs

Daniel Kerner, PharmD[1]; Nick Sciacca, PharmD, BCACP[1]; Megan Dorrell, PharmD, BCPS[1]; Kanitha Phalakornkule, MIS, MS[2]

[1]Ambulatory Pharmacy Department, Community Health Network, Indianapolis, Indiana

[2]Shelbourne Knee Center, Community Health Network, Indianapolis, Indiana

Introduction

- Healthcare expenditures in the United States continue to rise.[1]
- Healthcare costs can be attributed to several factors, including hospitalizations, emergency department visits, medications, and imaging, among others.[2,3]
- Pharmacist-delivered care can have a positive impact on both clinical and economic outcomes in chronic disease states.[4,5]
- Community Health Network (CHNw), a self-insured employer, offers a pharmacy benefit program, known as Bridges to Health (BTH), to employees and employee spouses or dependents with certain chronic disease states.

Study Endpoints

Primary Endpoint

- Per member per month (PMPM) medical plan cost for patients with diabetes and/or asthma from July 1, 2015 – June 30, 2016

Secondary Endpoints

- ED visits/1000 members
- Inpatient admits/1000 members
- Inpatient medical days/1000 members
- ED visits related to breathing
- Inpatient medical days and medical admits related to breathing

Methods

Retrospective, observational chart review

Patient utilization and cost data from reports generated by CHNw's insurance provider

Clinical data from reports generated through the electronic medical record

CHNw employees, spouses and dependents using CHNw insurance but not enrolled in BTH used as a comparator group

Results

Financial Outcomes

	PMPM Saving	Estimated Yearly Saving
Diabetes	$754.45	$4,648,901.53
Asthma	-$253.86	-$1,168,261.61
Total		$3,480,639.92

ED visits/1000 members

	Bridges to Health	Non-Bridges to Health	Difference
Diabetes	231.74	270.34	38.6
Asthma	211.21	467.63	256.41

Inpatient admits/1000 members

	Bridges to Health	Non-Bridges to Health	Difference
Diabetes	74	112.86	38.86
Asthma	49.54	35.97	(13.57)

Inpatient medical days/1000 members

	Bridges to Health	Non-Bridges to Health	Difference
Diabetes	301.85	414.7	112.85
Asthma	153.85	100.72	(53.13)

ED Visits Related to Breathing

	Bridges to Health	Non-Bridges to Health	P Value
Patients	48	35	
Patients with visits related to breathing	8	7	
% patients with visits related to breathing	16.67	20.0	0.77

Inpatient Medical Days and Medical Admits Related to Breathing

	Bridges to Health	Non-Bridges to Health	P Value
Patients	15	8	
Patients with admissions related to breathing	6	2	
% patients with admissions related to breathing	40	25	0.65
Length of stay, mean	3.53	3.88	0.84

Discussion

- Strengths: Patients with higher medical costs more likely to be in BTH group, Medical costs came from payer, Data encompasses entire group populations
- Limitations: Clinical data only from CHNw electronic medical record, Retrospective study, Sample size too small to determine statistical difference, No randomization
- Results show a positive return on investment for BTH
- The BTH diabetes program demonstrated positive financial and clinical outcomes for all endpoints
- The BTH asthma program produced an improvement in ED-related events, but not hospital admissions or medical plan costs
- Due to the small sample size, further research is needed

Next Steps

Continue diabetes program → Perform same analysis for different time frame → Review sustainability of asthma program

Disclosure

The authors have no actual or potential conflicts of interest in relation to this presentation

References

1. Centers for Disease Control and Prevention. Health, United States, 2015 – Health Expenditures. Available at: http://www.cdc.gov/nchs/hus/healthexpenditures.htm#tocal. Accessed Aug 14, 2016.
2. Rothberg AE, McEwen LN, Fraser T, et al. The impact of a managed care obesity intervention on clinical outcomes and costs: A prospective observational study. Obesity (Silver Spring). 2012 Nov; 21(11): 2167–2182. doi: 10.1002/oby.20097
3. Meeng DD, Graham J, Oreff TR, et al. Reducing long-term cost by transforming primary care: evidence from Geisinger's medical home model. Am J Manag Care. 2012 Mar;18(3):149-55.
4. Cranor CW, Bunting BA, Christensen DB. The Asheville Project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. J Am Pharm Assoc. 2003 Mar-Apr;43(2):173-84.
5. Bunting BA, Cranor CW. The Asheville Project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. J Am Pharm Assoc. 2006 Mar-Apr;46(2):133-47.

Community Health Network

Development and Analysis of a Screening Tool to Assess Appropriateness of Outpatient DVT Treatment in ED Patients

Shaina Musco, PharmD; Shannon Smallwood, PharmD, BCPS; Jill Gossard, PharmD, BCPS

Purpose

Evidence-based clinical practice guidelines recommend that patients with acute deep vein thrombosis (DVT) for whom "circumstances are adequate" be treated at home rather than in the hospital. There is currently no procedure in place at Community Health Network (CHNw) to aid in the identification of qualifying individuals prior to admission. Through the development of screening criteria for use in the emergency department (ED), unnecessary hospitalization for DVT treatment can be avoided in order to improve patient satisfaction, reduce nosocomial exposures, and decrease costs.

Methods

The information presented here is part of a longitudinal investigation to evaluate individuals appropriate for outpatient treatment of DVT, which will be conducted in three sequential phases:

I. Compilation and vetting of screening criteria
II. Value assessment of criteria through retrospective chart application and quantification of potential cost savings
III. Implementation and operationalization of criteria within an ED-based screening procedure at CHNw

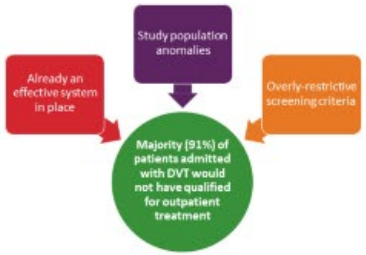
Results

During study phase I, screening criteria to assess appropriateness of outpatient treatment in ED patients diagnosed with DVT were compiled from evidence-based practices, then vetted through a multidisciplinary review process at CHNw. The resultant disqualification parameters derived from these resources fell into 5 major categories.

1. Hemodynamic instability
2. Significant organ dysfunction
   - Renal
   - Hepatic
   - Cardiac
3. Abnormal pharmacokinetic parameters
4. High risk of bleeding or clotting
   - Antithrombotic therapy prior to admission
   - Active bleeding
   - Uncontrolled hypertension
   - Active cancer
   - Recent history of the following conditions
     - VTE in previous 6 months
     - ICH in previous 6 months
     - CVA/stroke in previous 4 weeks
     - Surgery in previous 2 weeks
     - GI bleed in previous 2 weeks
   - Any history of bleeding or clotting disorder
5. High risk venous thromboembolism characteristics

When criteria were retrospectively applied to eligible patients admitted with a diagnosis of DVT between January 1-June 30, 2016, 89 of 98 would not have qualified for outpatient DVT treatment. This may have been the result of multiple factors.

Figure 1: Factors Limiting Number of Qualifying Patients

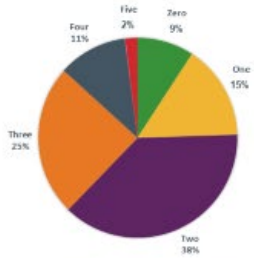


Composite length-of-stay data for the 9 admissions avoided through the retrospective application of screening criteria were extrapolated out to one year in order to predict annual cost avoidance.

Figure 2: Annual Cost Avoidance Predictions

To determine if there were any individual screening criteria that excluded a disproportionate number of patients, the number of categories fulfilled was examined. The majority of patients (76%) fulfilled data points within at least 2 criteria categories.

Figure 3: Number of Categorical Criteria Fulfilled



Of the 5 disqualification categories, "high risk of bleeding or clotting" was fulfilled by the most patients. Within this category, "antithrombotic therapy prior to admission" was the data point most frequently met, disqualifying 53 patients. The most common agent was aspirin 81 mg (21 patients), but only one patient possessed this as a singular factor preventing them from qualifying.

Conclusions

Based on the retrospective application of screening criteria, most patients admitted to CHNw with DVT would not have been appropriate for outpatient treatment. This may have resulted from:

- Patients with DVT already being appropriately triaged in the ED for outpatient treatment
- Complexity of VTE disease state and principles of antithrombotic therapy make it challenging to develop discrete criteria
- Criteria must maintain a high level of selectivity to get buy-in for protocol initiation

In light of these findings, pursuing study phase III was determined unlikely to be a high-yield process improvement project. Rather, other opportunities for pharmacist involvement in facilitating the transition of care from ED to outpatient setting for DVT treatment are being explored.

Figure 4: Other Avenues for Process Improvement

By appropriately triaging and treating ED patients for outpatient treatment of DVT, CHNw can at once improve patient care and reduce costs.

Disclosures

Shaina Musco: Nothing to disclose.
Shannon Smallwood: Nothing to disclose.
Jill Gossard: Nothing to disclose.

Community Health Network

Ipratropium/albuterol inhaler: medication use evaluation

Tracy Costello, PharmD, BCPS and Shannon Smallwood, PharmD, BCPS

Special Acknowledgment: Brandon Elpers, Bradley Carqueville, Danielle Thomas, Dalena Vo, Taylor Harlow; PharmD Candidates

Background

•Ipratropium/albuterol combination is commonly prescribed as needed or scheduled for symptomatic control in patients with Chronic Obstructive Pulmonary Disease (COPD).[1]

- The ipratropium/albuterol inhaler is only available in a 30-day inhaler, which contains 120 doses and is not ideal for institutionalized use.[2]
- In November of 2015, the CHNw Pharmacy and Therapeutics (P&T) committee approved a new guideline restricting the use of ipratropium/albuterol inhalers to reduce drug expenditure. It was estimated that CHNw would spend over $130,000 on this medication in 2015.[3]

•A review since the removal of the inhaler from order sets showed no change in purchasing patterns with $160,000 spent on this medication in 2016.

Methods

A retrospective chart review was performed

- All patients: • Clarity report generated for all Epic orders • January 1, 2016 through May 31, 2016
- Inclusion: • All patients with an order for ipratropium/albuterol inhaler
- Exclusion: • Outpatient order • Age < 18 • Age > 89

Study Objective

An MUE was completed to optimize the use of ipratropium/albuterol inhalers within CHNw

Primary Outcome

To identify the percent of inpatient orders for ipratropium/albuterol that were a continuation of a home medication

Secondary Outcomes

- Percent of orders for ipratropium/albuterol inhalers without doses administered
- Number of doses used compared to doses available
- Number of ipratropium/albuterol inhalers continued upon discharge
- Other inhalers at admission and discharge

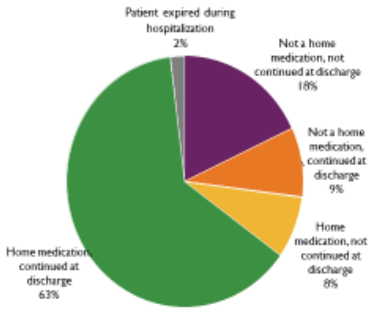
Patient Characteristics

- 197 patient charts reviewed
- Majority of patients were female (112/197;57%) with an average age of 63 ± 13.7 years
- Average length of stay was 5.6 ± 4.2 days
- Primary indication for inhaler was COPD (118/197;60%)

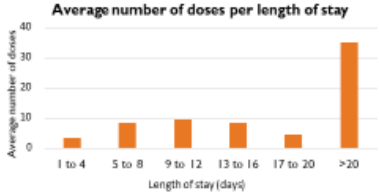
Results

73.6% of ipratropium/albuterol inhaler orders were a continuation of a home medication

Relationship between previous outpatient use and new prescriptions at discharge



Average number of doses per length of stay



Conclusion

•The inhaler is frequently underutilized with an average of 6.2 doses used per inhaler

- 37% of orders did not have any doses administered
- The ipratropium/albuterol nebulizer solution is a cheaper alternative that may aid in cost containment measures
- Since most inhalers were a continuation of a home medication, a therapeutic interchange would have the greatest impact on those orders

•The MUE findings, as well as the availability of more cost-effective options, support the need for a therapeutic interchange and removal of ipratropium/albuterol inhaler from formulary

Antimuscarinic/beta-agonist Interchange	
Formulary agents:	
ipratropium/albuterol nebulizer	
Therapeutic interchange:	
ipratropium/albuterol inhaler any order	ipratropium/albuterol 2.5-0.5mg/3 ml nebulization same schedule

- Therapeutic interchange and formulary change were approved by the CHNw P&T committee on November 8, 2016 and implemented February 1, 2017

References

1. Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2016. www.goldcopd.org
2. Community Health Network Pharmacy and Therapeutics Committee Minutes, April 2015.
3. Community Health Network Pharmacy and Therapeutics Committee Minutes, August 2015.

A Case Report on Novel Treatments for Chronic Eustachian Tube Dysfunction

Brett C. Erickson, D.O.
Community Westview Family Medicine Residency Program
Indianapolis, IN

ABSTRACT

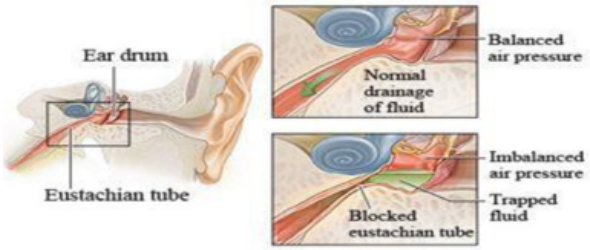
Introduction: Eustachian Tube dysfunction (ETD) describes a failure of the functional valve of the ET to open and/or close properly. ETD can lead to ear pain, discomfort, hearing loss, otitis media, effusion, TM rupture, and cholesteatomas. Incidence in adults ranges from 1-5%, and in children, upwards of 40%. Chronic ETD can lead to debility and can be a difficult problem to treat. This case focuses on a novel treatment approach to ETD - utilizing an automated politzer device.

Case Summary: A 30 year old male with chronic ear and facial pain. Patient described dealing with left ear congestion and left peri-aural pain/numbness since adolescence. He underwent numerous tests, including head CT, MRI, nasopharyngoscopy, all with unremarkable results. His symptoms caused him significant daily distress, noting hearing loss, pain, mental fog, and reduced concentration. He found mild relief using guaifenasin/phenylephrine combos, and nasal steroids. Patient had an accidental TM rupture and noted his symptoms completely resolved. After TM repair and healing, his symptoms returned. Patient subsequently began having tubes placed in his ear. He would get temporary resolution of his symptoms until his tubes clogged or fell out. Patient was given a Rx for a device called an Ear Popper (EP). Patient noted that using the device, he was able to clear his ear pressure and in doing so, feel better. Patient has continued to have success using the EP.

Discussion: Autoinflation refers to the opening of and forcing of air through the ET by the raising of intranasal pressure. A Politzer device such as the EP is designed to aid in this process. In one study, use of a politzerization device led to resolution of abnormal TM peak pressures in 71% of cases vs 21% of non-treated cases. Another study reported improvement in negative middle ear pressures and otomicroscopic findings in children with persistent OME. Another study showed improvements in hearing sensitivity to within normal limits, following device use. Such findings suggest that politzerization devices may be beneficial in treatment of Chronic ETD. This could mean reduced need for surgery, tubes, as well as reduced need for chronic medication use.

INTRODUCTION

Eustachian tubes are dynamic tube structures that open and close to ventilate the middle ear. While there is not a precise definition of Eustachian Tube Dysfunction (ETD), it is commonly understood to mean that the Eustachian tube (ET) fails to provide adequate ventilation to the middle ear. In essence, it describes a failure of the functional valve of the Eustachian tube to open and/or close properly. Proper functioning of the ET is important for equalization of pressure across the tympanic membrane (considered essential for optimal hearing), protecting the middle ear from infection, and clearance of middle ear secretions. Dysfunction is broken down into dilatory dysfunction or patulous dysfunction. Patulous dysfunction describes ET tube valve incompetency, leading to chronic patency. The most common complaint of this problem is autophony: hearing one's own voice or breathing sounds. This review, however, will focus on dilatory dysfunction. Dilatory dysfunction of the ET can lead to ear pain, discomfort, fullness, hearing loss, otitis media, middle ear effusion, TM rupture, and cholesteatoma formation. It is thought that ETD has an incidence in adults ranging from 1% to 5%, and in children up to 10, upwards of 40% have experienced at least temporary ETD. Chronic ETD can lead to debility and can be a difficult problem to treat. This case focuses on a novel treatment approach to ETD – utilizing an automated politzer device.



CASE PRESENTATION

This case details the story of a 30 year old male with chronic ear and facial pain. Patient noted he had dealt with left ear congestion and left peri-aural pain/numbness since adolescence. He underwent numerous tests, including head CT, head MRI, nasopharyngoscopy, all with unremarkable results. Patient's symptoms caused him significant daily distress, noting hearing loss, pain, ear pressure, mental fog, and reduced concentration. He found mild relief using daily guaifenasin/phenylephrine combos, and nasal steroid sprays -- but noted if he did not take them – his symptoms immediately and distressingly magnified. Patient did not have a history of teeth grinding or TMJ. He electively had a root canal and crown on a cracked upper molar – hoping some of his pain symptoms could be related. His symptoms did not improve. Patient noted he had an accident in a lake where his left TM was ruptured. His symptoms interestingly completely resolved after this. He had his TM patched for his perforation repair, and once it completely healed, patient's symptoms gradually returned. Patient subsequently began having ear tubes placed in his left ear for his ETD. He had 3 tubes placed in his left TM in his 20's. He had temporary resolution of his symptoms, typically for several months. He noted his tubes eventually would clog, fall out, and his symptoms would return. Patient was given a Rx for a device called an Ear Popper. Patient noted that using the device, he was able to clear his ear pressure with regular use, and in doing so, feel better. Patient has continued to have success using the Ear Popper and no longer suffers from all of his prior ETD symptoms.

DISCUSSION

Autoinflation refers to the opening of and forcing of air through the Eustachian tube by the raising of intranasal pressure. A Politzer device such as the Ear Popper is designed to aide in this process. Studies have looked into how politzer devices may aide in the management of Eustachian Tube Dysfunction. One study has shown that use of a politzerization device led to resolution of abnormal tympanometric peak pressures in 71% of cases vs 21% of non-treated cases. Another study reported improvement in negative middle ear pressures and otomicroscopic findings in children with persistent otitis media with effusion (OME). Another study showed improvements in hearing sensitivity to within normal limits, following device use. Such findings may suggest that politzerization devices may be beneficial in treatment of Chronic ETD. Long term, large scale studies will be helpful in the future, to further validate these findings.

Historically, treatment options for ETD have consisted of decongestants, anti-histamines, nasal corticosteroids, antibiotics, myringotomy, tympanostomy tubes, and insufflation of the ET with valsalva technique. There are new novel procedures, such as ET balloon dilation, that appear promising. However, balloon dilation is not mainstream yet, long term studies have not been conducted, and, it's an invasive procedure. Politzer devices, as such, appear to provide promising treatment potential for patients with symptomatic ETD, where medical management has failed, and surgical management is not preferred. This is significant since patient's treated successfully with an autoinflation device may have a reduced future need for surgery, ear tubes, chronic medication use, and as a result, may save money as well.

REFERENCES

Arick, Dan, and Shlomo Silman. "Treatment of Otitis Media with Effusion Based on Politzerization with an Automated Device." *ENT Journal* 79.4 (2000): n. pag. Web.

Bidanian, Moniri, and M. Ramos. "Autoinflation for Treatment of Persistent Otitis Media with Effusion in Children: A Cross-over Study with a 12-month Follow-up." *International Journal of Pediatric Otorhinolaryngology*. U.S. National Library of Medicine, 2014. Web. 05 Mar. 2017.

Perera, Rafael, Paul Glasziou, and Carl Heneghan. " Cochrane." *Autoinflation for Hearing Loss Associated with Otitis Media with Effusion (glue Ear) | Cochrane*. Cochrane Library, 31 Mar. 2013. Web. 05 Mar. 2017.

Poe, Dennis, and Bassem Hanna. "Eustachian Tube Dysfunction." *Eustachian Tube Dysfunction*. Uptodate, 21 Sept. 2016. Web. 05 Mar. 2017.

Silman, Shlomo, and Daniel Arick. "Efficacy of a Modified Politzer Apparatus in Management of Eustachian Tube Dysfunction in Adults." *Journal of the American Academy of Audiology* 10.9 (1999): 496-501. Web.

Silman, Shlomo, and Dan Arick. "Nonsurgical Home Treatment of Middle Ear Effusion and Associated Hearing Loss in Children. Part II: Validation Study." *ENT Journal* (2005): n. pag. Web.

Community Health Network

Anaerobic Osteomyelitis and Its Rarity

Paolo Balmaseda MD; Collin Bowman MD; Ragan Brackett MD; Mark Lisby MD and Tracy Costello PharmD, BCPS

Community Health Network Family Medicine Residency, Indianapolis, IN

Objective

Osteomyelitis caused by anaerobic bacteria is a life-threatening disease that can be overlooked or inadequately treated due to infrequent occurrences, problematic isolation, and the often slow growing nature of these bacteria. This case will illustrate a unique presentation, difficult treatment course, and distinctive etiology of right humerus osteomyelitis caused by anaerobic bacteria.

Case Report

V.D is a 58 year old Caucasian female who presented to Community East Emergency Department with a 3 week history of right arm pain. Pertinent past medical history included a ventral hernia repair with a seroma complication 3 months ago. Two days prior, the patient noticed increased swelling and erythema in her right arm. The patient denied trauma or IV drug use, had an elevated WBC count of 21,000, and a temperature of 100.1F. CT of the right upper extremity revealed an abscess and myositis along the humeral shaft extending into the deltoid, biceps, and triceps. Intravenous Vancomycin and Ceftriaxone were started. She underwent an I&D of her right shoulder abscess. Anaerobic and aerobic wound cultures were obtained. Results showed *Streptococcus constellatus* and *Peptostreptococcus* spp. Antibiotics were transitioned to oral Amoxicillin/Clavulanate. Her WBC count improved to 12,700 (day of discharge). She was discharged with oral Amoxicillin/Clavulanate for additional 10 days.

The patient re-presented to Community East Emergency Department, 6 days after discharge, with a popped sensation in her right arm. She attempted to open a food item and felt a pop accompanied by pain. X-ray of the right humerus revealed a closed displaced oblique fracture with suspicion of osteomyelitis. MRI revealed extensive osteomyelitis of the humerus with pathological fracture of the diaphysis and extensive pyomyositis of the right upper arm muscles with intramuscular abscess. The patient had an elevated WBC count of 13,600. Intravenous Vancomycin and Meropenem were started. Infectious Disease recommended switching antibiotic to Ampicillin and Gentamicin. Patient underwent a repeat I&D. Panorex X-ray and echocardiogram were unremarkable. Repeat blood cultures, aerobic/anaerobic and fungal cultures were unremarkable. Antibiotics were switched from intravenous Ampicillin and Gentamicin to Ceftriaxone. Patient was discharged to a LTAC with a PICC line to complete a six week antibiotic course.

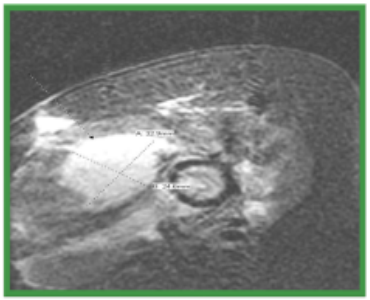


Figure 1: MRI shows a 3.5 cm x 2.5 cm abscess within deltoid muscle

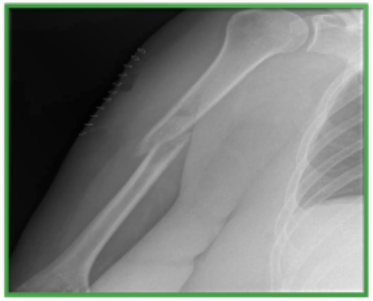


Figure 2: XR shows obliquely oriented comminuted fracture with 9 mm medial displacement of the distal fragment

Discussion

Anaerobic organisms less frequently cause osteomyelitis. Why is it imperative to distinguish between aerobic and anaerobic etiologies of osteomyelitis? Anaerobic infections can be missed due to increased difficulties isolating from improper anaerobic techniques. This can lead to inappropriate antibiotic regiments and subsequent treatment failures. Also, given anaerobic bacteria prevalence in the gastrointestinal tract, intraabdominal infection(s) leading to osteomyelitis seeding must be ruled-out.

As with the case of V.D., the first abscess culture grew *Peptostreptococcus* spp. and *Streptococcus constellatus* (some anaerobic strains). She was treated with Vancomycin / Ceftriaxone and transitioned to Amoxicillin/Clavulanate. The subsequent pathologic fracture most likely occurred due to inadequate antibiotic coverage. The etiology of this infection was not clear, however, it could be attributed to a ventral hernia repair two months prior with subsequent seroma aspiration. Nearly three months post-discharge, the patient was healing, although slowly, with continued tenderness to palpation at fracture site but with increasing range of motion.

Conclusion

Osteomyelitis is a diagnosis that is often attributed to aerobic bacteria. However, anaerobic bacteria can also be the culprit. Due to factors such as difficulty with isolation, this source of infection can be missed. Antibiotic regiments could be incorrectly tailored, leading to treatment failures, further pathology, and increasing hospital expenses. Always order anaerobic cultures and keep a high suspicion for anaerobic infection if treatment fails to progress.

References

[1]Brook, Itzhak. "Joint and bone infections due to anaerobic bacteria in children." Pediatric Rehabilitation 5.1 (2002): 11-19. Print.
[2]Koyuncu, Semmi, and Firat Ozan. "Morganella morganii osteomyelitis complicated by secondary septic knee arthritis: a case report." Acta Orthop Traumatol Turc 46.6 (2012): 464-67. Print.
[3]Rousseau, M. C., and J. R. Harle. "Spondylitis Caused by Peptostreptococcus." Clinical Rheumatology 17 (1998): 538-39. Web. 30 Mar. 2017. Print.

P9

INFECTION-INDUCED CLOZAPINE TOXICITY

Hira Naqvi BS[1], Dennis Anderson MD[2], Cheen Lum PharmD[2]

[1]Marian University College of Osteopathic Medicine; [2]Community Health Network, Indianapolis, IN

Community Health Network

MARIAN UNIVERSITY Indianapolis College of Osteopathic Medicine

INTRODUCTION

Clozapine is an atypical antipsychotic used for the treatment of refractory schizophrenia. Although the medication has been proven to be efficacious, its use is limited due to serious side effects, including agranulocytosis, seizures, and myocarditis. Clozapine toxicity may also be exacerbated with concomitant used of P-450 modulators. [4]

CASE DESCRIPTION

A 43 year old male with a past medical history of schizophrenia presented to the emergency room with a three day history of upper respiratory symptoms. Patient was found to have influenza, thrombocytopenia, neutropenia, and toxic level of clozapine.

Our patient was being prescribed clozapine (800 mg/day) by his outpatient psychiatrist. Two days prior to emergency department visit, the patient's labs showed a toxic clozapine level (1,410 mcg/ml) and a mildly elevated valproic acid level. It was found that the patient was currently being tapered off clozapine due to increased seizure activity and high clozapine level.

By day 4 of admission, clozapine was completely tapered, and the patient was started on aripiprazole. In spite of tapering and eventually stopping clozapine, it's levels continued to rise.

REFERENCES

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]

LAB VALUES

Lab	Prior to Admission	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
WBC	---	9.1	8.7	3.8	3.0	4.2	6.0
HGB	---	13.3	12.6	11.4	11.8	11.7	11.8
HCT	---	40.2	38.4	35.2	35.9	36.2	38.4
PLT	---	81	67	63	67	97	115
Clozapine	1,410	---	---	---	---	1,820	---
Norclozapine	324	---	---	---	---	510	---
Valproic Acid	107	---	---	---	---	---	---
ANC	4.4	4.4	6.7	2.3	0.9	1.7	2.8

DIAGNOSIS/DISCUSSION

Our patient's clozapine level continued to rise despite decreasing and eventually discontinuing the medication. He also presented with a moderate neutropenia. These were likely secondary to multiple factors.

During the patients stay at the hospital hematology and neurology were consulted. Hematology attributed the neutropenia to a viral infection, while neurology stated it was likely secondary to valproic acid and clozapine. About 2.9% of patients on clozapine will develop neutropenia, and 0.03% of those develop fatal agranulocytosis.[1] Our patients lowest ANC level coincided with the highest clozapine toxicity, and improved with the cessation of clozapine.

DIAGNOSIS/DISCUSSION CONT…

Clozapine is mainly metabolized by CYP1A2, which is inhibited during infectious processes, leading to a toxic level of the drug. A study conducted by the University of Kentucky Research Center found that during an infection the concentration-to-dose ratio of clozapine can increase up to 2.9, subsequently causing a decrease in metabolism by about a factor of 2. This research study concluded that clozapine dosage should be closely monitored and may need to be reduced by half during serious respiratory infections. [2]

Clozapine is also metabolized by CYP2C19, CYP2D6, and CYP3A4 leading to many possible drug-drug interactions. Our patient was on three medications that potentially interacted with clozapine: valproic acid, azithromycin and metoprolol. A study performed by the Institute of Pharmacology in Italy found a minor increase in clozapine levels with concomitant use of valproic acid due to its inhibitory effects on CYP1A2 and CYP3A4. [3] Use of azithromycin has also been associated with elevated clozapine levels due its weak inhibitory effects on CYP1A2. [5] Lastly, our patient was on metoprolol which is a substrate of CYP2D6. Co-administration of two CYP2D6 substrates can theoretically lead to increased levels of both drugs. [4]

CONCLUSION

Clozapine was likely the cause of our patients neutropenia. The infection, along with multiple drug-drug interactions, caused a toxic dose of clozapine in the body which may have exacerbated the neutropenia. It may be prudent to check clozapine levels in patients with an active respiratory infectious process.

CERBERA ODOLLAM: A CASE REPORT OF ATTEMPTED SUICIDE BY PONG PONG

HIRA NAQVI BS[1], LAURA F. RUEKERT PHARMD[2], E. ANN CUNNINGHAM DO[2],
[1]Marian University College of Osteopathic Medicine; [2]Community Health Network, Indianapolis, IN

INTRODUCTION

Cerbera odollam, also known as "suicide tree" or "pong pong," is a tree primarily found in coastal areas of Southeast Asia which yields toxic seeds.[1] The active ingredient found in these seeds is cerberin, which has similar cardiotoxic effects as digitalis, including cardiac dysrhythmias and hyperkalemia.[1,2] Although it has many uses, the highly toxic seeds historically have been used for both suicidal and homicidal purposes.[1] With the ease of online technology and the growing rate of suicide in the United States, Western physicians should be aware of the presentation, diagnosis, and treatment of Cerbera odollam toxicity. [4]

CASE DESCRIPTION

A 33 year old female with a history of suicide attempts presented to the emergency department with nausea and one episode of emesis shortly after intentionally ingesting two seeds of Cerbera odollam. The patient was transferred to a progressive care unit with telemetry and electrolyte monitoring and for supportive care. Within 3 hours of the time of admission, the patient had an EKG demonstrating some digitalis-like effect. However subsequent EKGs did not have this ST abnormality and were unremarkable. DigiBind was on hand in case of bradycardia/heart block, or hemodynamic compromise, but this agent did not have to be used. Upon medical clearance, the patient was transferred for psychiatric treatment.

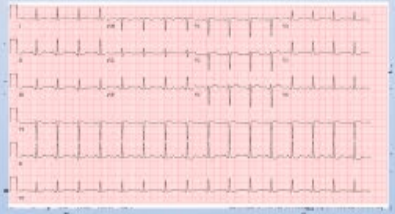
LAB VALUES/VITAL SIGNS

The following laboratory values were obtained on initial presentation.

8.1	13.1 / 38.9	357		136	99	24	310
				4.3	28	1.23		

T: 98.4° P: 99 RR: 16 BP: 216/110

EKG



DISCUSSION

Cerbera odollam toxicity can manifest with symptoms such as hyperkalemia, hypercalcemia, arrhythmias, diarrhea and vomiting. Other studies have shown possible effects on the nervous system resulting in hyporeflexia and hypotonia. [3]

DISCUSSION CONT.

Diagnosing Cerbera odollam toxicity is challenging and often dependent on report of ingestion and clinical presentation. Urine toxicology and digitalis levels are likely to be unremarkable in patients after ingestion of the seeds. Definitive diagnosis may be made by thin-layer chromatography and liquid chromatography in conjunction with mass spectrometry. [1]

Treatment consists of gastric decontamination, supportive measures and DigiBind.[1] Mortality is seen in 20-28% of patients and is likely to occur within 3-6 hours after ingestion.[2,3]

CONCLUSION

This case is concerning for multiple reasons. First, Cerbera odollam toxicity is difficult to diagnose with conventional diagnostic methods. Second, the ease of online access to the Cerbera odollam seeds which have a significantly high rate of mortality is a noteworthy concern. Lastly, there is limited awareness and scientific research of Cerbera odollam toxicity. This case adds to the literature by demonstrating a known, intentional ingestion which fortunately did not end with a patient death.

REFERENCES

1.Kassas, D., Donovan, M., Cohee, B., Mabe, D., Wiebers, E., and Atwood, J. "An unusual case of cardiac glycoside toxicity." International Journal of Cardiology 170.3 (2014): 434-37.
2.Gaillard, Y, Krishnamoorthy, A., and Bevalot, F. "Cerbera odollam: a "suicide tree" and cause of death in the state of Kerala, India." Journal of Ethnopharmacology 95.2-3 (2004): 123-26.
3.Iyer, G. and Narendranath, M. "A preliminary report on the neurological manifestations of Cerbera odollam poisoning." Indian Journal of Medical Research 63.2 (1975): 312-4.
4.Curtin SC, Warner M, Hedegaard H. Increase in suicide in the United States, 1999-2014. NCHS Data Brief, no 241. Hyattsville, MD: National Center for Health Statistics. 2016.

Weight Loss Programs and Attrition Rate

Deepal Dharia, D.O. PGYIII Jennifer Collins, PharmD, BCACP
Community Westview Osteopathic Family Medicine Residency Program
Indianapolis, Indiana

Community Health Network

ABSTRACT

Background: More than 1 in 3 U.S adults have obesity. The patient is required to stay committed to achieve successful weight loss; however weight loss clinics tend to have greater than 30% attrition rate.
Hypothesis: Determine whether attrition rates can be less than 30% through the use of group visits. Secondarily, determine if group visits can increase motivation and weight loss.
Method: Epic EMR was used to screen for patients with a BMI ≥ 30 seen from April, 2015 to March, 2016 at the Speedway Family Medicine Clinic. 983 patients were contacted to participate in weight loss group visits. 55 patients accepted the invite and 47 patients attended the first meeting. The visits took place every other week over the span of 14 weeks to discuss diet, exercise, surgery, medications, etc. Attendance was measured at each visit. A questionnaire was administered at the first and last visits to assess for motivation. Patient weights were measured at the initial and final visits. Data was retrospectively analyzed.
Results: Attendance decreased by 83%, (Z-score 8.74, P≤0.0001 95% CI 7.51-28.38) calculated from one proportion z-test. For patients who were present in both initial and final visits, self-reported motivation levels increased. Overall, there were more patients who gained weight (mean weight gain=9.09 lbs, n=4) than patients who lost weight (mean weight loss=12.29 lbs, n=2)
Conclusion: Attrition was higher than 30% showing that group visits did not decrease attrition. This could be due to interest, time and effort. Motivation for weight loss improved from the group visits. However, it is difficult to determine if this had an effect on weight loss as six patients completed the study.

BACKGROUND & HYPOTHESIS

Background:
36.5% of U.S adults have obesity.
Cost of obesity in the U.S. was $147 billion in 2008 U.S. dollars
Medical costs for people who are obese were $1,429 higher than those of normal weight

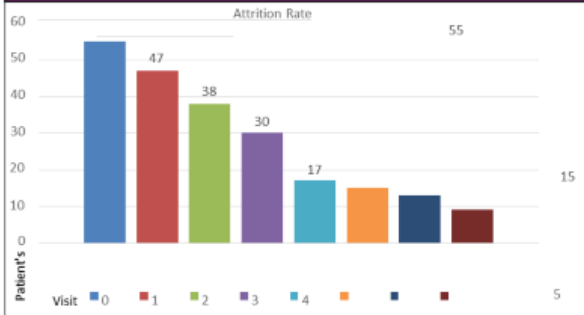
Weight loss methods: surgery, diet, exercise or pharmacotherapy.
Commitment is required to achieve successful weight loss
However weight loss clinics tend to have greater than 30% attrition rate.

Hypothesis:
Determine whether attrition rates can be less than 30% through the use of group visits.
Secondarily, determine if group visits can increase motivation and weight loss.

METHODS

- **Screening:** • Epic EMR was used to screen for patients with a BMI ≥30 seen from April, 2015 to March, 2016 at the Speedway • 983 patients were contacted to participate in weight loss group visits.
- **Population:** • 55 patients accepted the invite and 47 patients attended the first meeting.
- **Consent:** • The visits took place every other week over the span of 14 weeks to discuss diet, exercise, surgery, medications
- **Measurement:** • Attendance was measured at each visit. • A questionnaire was administered at the first and last visits to assess for motivation. • Patient weights were measured at the initial and final visits. Data was retrospectively analyzed.
- **Data Analysis:** • Data was retrospectively analyzed using the one proportion z-test to determine the significance of the attrition

RESULTS



Attendance Rate Decrease	83%	Z-Score 8.74 P. Value: <0.001 CI7.51-28.38

CONCLUSION

- Determine whether attrition rates can be less than 30% through the use of group visits.
  - Attrition was higher than the referenced studies showing that group visits did not decrease attrition.[5,6]
  - This could be due to interest, time and effort.
  - Wanted more one on one attention
  - Patient population characteristics
- Determine if group visits can increase motivation and weight loss.
  - Motivation for weight loss improved from the group visits.
  - However, it is difficult to determine if this had an effect on weight loss as six patients weighed in during the last visit
- Future Studies
  - Characteristics of the patient population
  - Income level, social economic factors, time.

REFERENCES

1) Adult Obesity Facts." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 01 Sept. 2016. Web. 07 Jan. 2017.
2) Honas, Jeffery J., James L. Early, Doren D. Frederickson, and Megan S. O'brien. "Predictors of Attrition in a Large Clinic-Based Weight-Loss Program." Obesity Research 11.7 (2003): 888-94. Web
3) Wadden, T. A., Foster, G. D., Letizia, K. A., Stunkard, A. J. (1992) A multicenter evaluation of a proprietary weight reduction program for the treatment of marked obesity. *Arch Int Med.* **152**

IRB approval received

P12

Community Health Network

Rectal Cancer Mimicking Opioid Induced Constipation

Kathryn D. Freeman, DO, PGY-1
Proctology, Community Health Network
Indianapolis, IN

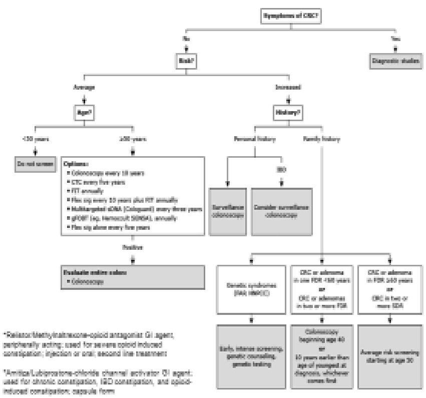
Background

Colorectal cancer (CRC) is the second leading cause of cancer deaths in the United States (U.S.), making up 8.3% of cancer related deaths. Annually, approximately 135,430 patients in the U.S. are diagnosed with CRC and approximately 50,260 patients die of CRC each year. The lifetime incidence of CRC in the average risk patient in the U. S. is 4.3-5%. (4,1) Incidence rises after age 40 but the majority (90%) of cases occur after age 50. (4,5)

The majority of CRC results from adenomatous polyps. These typically begin as small polyps growing into larger polyps, developing dysplasia and becoming carcinomas (cancer). This process takes approximately 10 years. Adenomatous polyps make up 2/3 of colorectal polyps. 1/3 of polyps are hyperplastic which rarely increases the risk of CRC. (4,5) Removal of adenomatous polyps prevents CRC. However, there is a lack of adequate screening for CRC. As of 2013, only 61% of adults ages 50-75 in the U.S. were up to date on screening for CRC. (5)

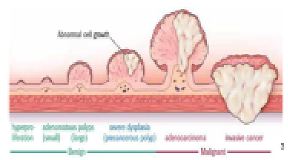
In addition screening, patients presenting with "red flag" symptoms should be evaluated through diagnostic colonoscopy. These signs and symptoms include but are not limited to fatigue, weight loss, rectal bleeding, abdominal pain, change in bowel habits, iron deficiency anemia, or positive hemoccult. Failing to evaluate these signs can result in missed CRC. (See algorithm below).

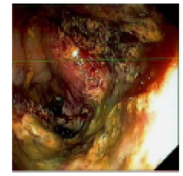
Algorithm for CRC screening and surveillance in average-risk and increased-risk populations



*Relistor/Methylnaltrexone-opioid antagonist GI agent; peripherally acting; used for severe opioid induced constipation; injection or oral; second line treatment

*Amitiza/Lubiprostone-chloride channel activator GI agent; used for chronic constipation, IBD constipation, and opioid-induced constipation; capsule form





Case Description

A 58 year old Caucasian male began having back pain after picking up a large flower pot. The patient saw his primary care physician (PCP) and was placed on Norco for low back pain. Two weeks later the patient went to the emergency room complaining of new constipation, rectal bleeding, chest pain, and shortness of breath for the last week. An abdominal x-ray showed non-obstructive bowel gas patterns. The patient's chest pain and shortness of breath were worked up and he was given Relistor* with no bowel movement. He was sent home on Miralax and was told to follow up with his PCP. One week later, he saw his PCP and was placed on Amitiza*, stool softeners, and told to continue daily Miralax. A week later the patient was seen by proctology with complaints of 3 weeks of constipation, blood in stool, anorectal pain, and generalized abdominal pain.

Past medical history: Diabetes Mellitus type 2, anxiety/depression, back pain
Past surgical history: lipoma removal from the back; never had a colonoscopy
Home medications: treatment for DM type 2; new meds: Norco, Amitiza, and Miralax
Allergies: No known Drug Allergies
The patient had no pertinent family or social history.

Physical exam revealed bowel sounds in all 4 quadrants and soft abdomen that was diffusely tender to palpation. Rectal examination revealed external hemorrhoids, good sphincter tone, soft stool present in the rectal vault, and a palpable rectal lesion at fingertip on exam.
Lab work showed no abnormalities.

A complete colonoscopy was performed and found a rectosigmoid lesion covering 2/3-3/4 of the circumference of the colon from the second valve of Houston into the rectosigmoid region. (See pictures and diagram above and to the right). Biopsies revealed invasive moderately differentiated adenocarcinoma in a background of tubular adenoma with high grade dysplasia with lymphvascular space involvement. A CT scan showed diffuse circumferential rectal wall thickening with a 2.2 cm mass as well as perirectal lymphadenopathy, prominent perirectal lymph nodes, and possible metastatic liver lesions.

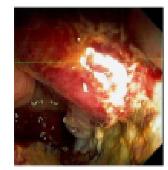
The patient was diagnosed with stage IV T2N2aM1a adenocarcinoma of the rectum. (See TNM staging to the right). He was not a surgical candidate due to metastatic disease found on further work up. The patient received three rounds of chemotherapy, radiation of the primary lesion and lymph nodes, and radiation of metastatic bone lesions. The patient had an 8 month survival following diagnosis.

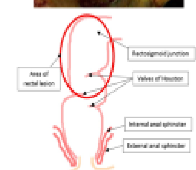
Discussion

This patient's case demonstrates the importance of screening colonoscopies. It is likely that if the patient had a screening colonoscopy at the recommended time, based on medical guidelines, his cancer would have been detected at an early stage or prevented. This case also demonstrates the importance of taking a detailed history and physical, including rectal examination, when a patient presents with "red flag" symptoms for CRC.

Current recommendations are that patients of average risk should be screened for CRC starting at age 50, surveillance following the initial screening are based on initial findings and risk factors. (2,5) There are a variety of CRC screening methods, however, colonoscopy remains the gold standard for CRC screening. Colonoscopy is both diagnostic and therapeutic allowing for visualization of the colon and removal of polyps and colon lesions at the time of the procedure. Alternative testing should be reserved for patients who are unable to undergo colonoscopy or those who refuse colonoscopy. When alternative testing results are positive, a colonoscopy is the diagnostic and therapeutic treatment. (5)

CRC screening, specifically through colonoscopy, prevents colorectal cancer. Patients should be encouraged to obtain CRC screening, via colonoscopy, at the recommended ages in order to prevent CRC. Patients presenting with rectal bleeding, blood in their stool, change in bowel habits, new abdominal pain, weight loss, or iron deficiency anemia should be evaluated for CRC with colonoscopy. In patients presenting with new onset constipation or bowel habit changes that do not respond to initial treatment, colonoscopy should be considered in order to rule CRC. (See algorithm to the left). (5)





TNM staging for colorectal cancer

Primary tumor (T)	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ: intraepithelial or invasion of lamina propria*
T1	Tumor invades submucosa
T2	Tumor invades muscularis propria
T3	Tumor invades through the muscularis propria into pericolorectal tissues
T4a	Tumor penetrates to the surface of the visceral peritoneum¶
T4b	Tumor directly invades or is adherent to other organs or structures¶Δ
Regional lymph node (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in one to three regional lymph nodes
N1a	Metastasis in one regional lymph node
N1b	Metastasis in two to three regional lymph nodes
N1c	Tumor deposit(s) in the subserosa, mesentery, or nonperitonealized pericolic or perirectal tissues without regional nodal metastasis
N2	Metastasis in four or more regional lymph nodes
N2a	Metastasis in four to six regional lymph nodes
N2b	Metastasis in seven or more regional lymph nodes
Distant metastasis (M)	
M0	No distant metastasis
M1	Distant metastasis
M1a	Metastasis confined to one organ or site (eg, liver, lung, ovary, nonregional node)
M1b	Metastases in more than one organ/site or the peritoneum

4

References:
1. Colorectal Cancer. (n.d.). [illegible]
2. Colorectal Cancer Screening Guidelines. (2014, February [illegible]). [illegible]
3. [illegible]
4. [illegible] Colorectal cancer: Epidemiology, risk factors, and protective factors. [illegible]
5. Screening for colorectal cancer: Strategies in patients at average risk. (n.d.). [illegible]

Cotard's Syndrome Resulting from Valacyclovir Toxicity

Areef S. Kassam, MD, E. Ann Cunningham, DO
Community Health Network, Indianapolis, IN

Aim

The aim of this case study is to increase vigilance of neuropsychiatric effects of valacyclovir toxicity as well as educate on presentation of phenomena of Cotard's Syndrome.

Introduction

Valacyclovir is an anti-viral medication used often in treatment of shingles caused by varicella zoster, among many other indications. As it is renally excreted, kidney functioning must be assessed to determine proper dosing. Neurotoxicity is uncommon but serious side effect of improper dosing. We will describe a patient with bilateral renal cell carcinoma (RCC) on home hemodialysis who was not given renally adjusted valacyclovir dosing and presented with Cotard's Syndrome. First described by Jules Cotard in 1882, it mostly commonly presents with prominent nihilistic delusions, anxiety, agitation, and sensory impairment.

Case Presentation

Ms. C was a 55 year old female with Bilateral Renal Cell Carcinoma and a psychiatric history significant for only anxiety. She was brought to hospital emergency department after change in mental status. Ms. C presented with laughing, dancing, and screaming, "I am in Heaven." She was focused on her being deceased and in heaven throughout the initial assessment. Per family, symptoms had began the morning of presentation, and this was the first time patient had ever presented in this fashion. The patient denied any complaints to treatment team.

Thorough work-up was initiated and was significant for acute kidney injury showing elevated BUN and Creatinine and an abnormal EEG showing moderately severe diffuse encephalopathy without focal, lateralized, or epileptiform discharges. Upon gaining further collateral information from family, patient was being treated for Shingles (varicella zoster) and was prescribed valacyclovir 1000mg q TID. Given patient's history of RCC, valacyclovir should have been renally adjusted to 500mg/day.

Table 2 Recommended Valacyclovir Dosing[9]

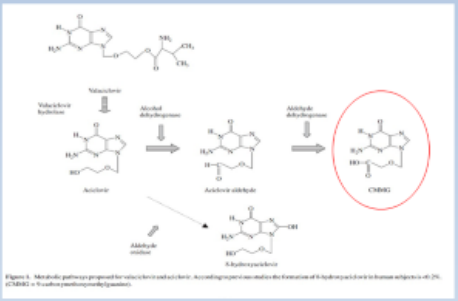
GFR (mL/min)	Dosing
50	1000 mg q 8H × 7 days
30-49	1000 mg q 12H
10-29	1000 mg q 24H
<10	500 mg q 24H
Hemodialysis	500 mg post hemodialysis

GFR = glomerular filtration rate; q = every; H = hours.

She underwent immediate hemodialysis, and she was dialyzed for 4 hour sessions for three consecutive days. Patient showed marked improvement by day two with disappearance of her nihilistic delusions, and she demonstrated a complete return to baseline on day three of treatment initiation.

Discussion

Valacyclovir is the L-valyl ester pro-drug of acyclovir. Acyclovir is metabolized and oxidized to 9-carboxymethoxymethylguanine (9-CMMG). A mechanism of neuropsychiatric effects of anti-viral toxicity is likely due to 9-CMMG levels crossing the blood-brain barrier to inhibit mitochondrial DNA polymerase as well as increase uremic toxicity.



A four hour session of hemodialysis reduces 9-CMMG levels by 64%. Thus signs of toxicity should subside with daily hemodialysis sessions. Risk factors which may a role in neurotoxicity include older age and renal dysfunction.

Cotard's Syndrome can be a part of several different pathologies, so it is imperative to get a thorough history and collateral information which will influence the appropriate management plan. Gross structural changes have not proved to be appreciated on imaging historically. Several proposed mechanisms have been proposed including decreased volume in the anterior insular cortex (AIC). Interoception, conscious awareness of internal sensations, is linked to this area of the brain. Only 200 cases of Cotard's Syndrome have ever been documented in literature. Analysis of cases show a mean age of 52 years, female, and loadings of depression and anxiety as being risk factors for individuals to develop Cotard's Syndrome.

This case was a unique opportunity to witness a rare psychiatric presentation in the setting of a substance toxicity. Further, it showcased the need for providers to be able to recognize neuropsychiatric symptoms and keep a broad, yet reasonable differential diagnosis.

References

1.Asahi, T., Tsutshui, M., Wakasugi, M., Tange, D., Takahashi, C., Tokui, K., Okazawa, S., & Okudera, H. (2009). Valacyclovir neurotoxicity: clinical experience and review of the literature. *European Journal of Neurology.* 16: 457-460.
2.Berrios, G.E., & Luque, R. (1995b). Cotard's syndrome: analysis of 100 cases. *Acta Psychiatrica Scandinavica.* 91: 185-188.
3.Berry, L., & Venkatesan, P. (2014). Acyclovir-induced neurotoxicity: Utility of CSF and serum CMMG levels in diagnosis. *Journal of Clinical Virology.* 61: 608-610.
4.Hellden, A., Lycke, J., Vander, T., Svensson, J., Odar-Cederlof, I., & Stahle, L. (2007) The acyclovir metabolite CMMG is detectable in the CSF of subjects with neuropsychiatric symptoms during acyclovir and valacyclovir treatment. *Journal of Antimicrobial Chemotherapy.* 57: 945-949.

Investigating Abuse of an Unscheduled Medication: A Case of Gabapentin Abuse

Community Health Network

Kelsey Cowden, Benjamin Hart, Gabriel Martinez, Allison Palmer, Areef S. Kassam, MD, Jendayi Olabisi, MD, Syed M. Hasan, MD

Introduction

Gabapentin is an analogue of γ-aminobutyric acid (GABA) used in the treatment of neuropathic pain and as an adjunct to anti-seizure medications. Though other GABA analogues, such as pregabalin, have been federally scheduled due to documented abuse potential, gabapentin prescribing has not been similarly regulated. There appears to be mounting clinical evidence gabapentin is being abused in patients with a history of polysubstance abuse. One such patient was treated at the Community Hospital North Behavioral Health Pavilion showcased by patient's desire for euphoric effects experienced with gabapentin.

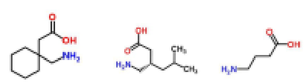


Figure 1: The structure of the neurotransmitter GABA, as compared to its analogues. Pregabalin is a beta-substituted analogue while Gabapentin is aromatized.

Case Presentation

Ms. H was a 35 year old female with a past psychiatric history of Bipolar I Disorder, Borderline Personality Disorder, Opiate use disorder, Alcohol Use Disorder, and Benzodiazepine use Disorder who initially presented after an attempted overdose on gabapentin and alcohol. This was Ms. H's 6th suicide attempt within six years. Per patient, she has a history of epileptic seizures first showing in her chart in 2012, which initiated her gabapentin use. It is not known if her seizure disorder is characterized by epileptic seizures or whether these are withdrawal seizures. A thorough work-up of her seizures was not found upon chart review. Despite several attempts in the past to take her off the medication, she continued her gabapentin use by means of accruing numerous providers and taking tablets from her cousin who has a similar history. According to the patient, she enjoyed the effects she experienced when abusing gabapentin which included euphoria, improved socialization, and increased energy which would last between 1-3 days. Her desire to abuse gabapentin was driven by her euphoria and fear of withdrawal leading her to take 30-50 pills of 800 mg daily in addition to her alcohol intake. On initial examination, she displayed some psychomotor retardation demonstrated by generalized bradykinesia with a steady and ordinary gait. The patient was alert to questioning however spoke softly, slowly, and at times demonstrated delayed speech. She reported her mood as "depressed" and exhibited a blunted affect. Her thought content and thought process appeared normal with her association intact. She was started on naltrexone while in the hospital to help with her alcohol and opiate use as well as hopes for off-label usage to decrease the dopamine reward pathway for her addiction to gabapentin. On the day of discharge, she was overheard calling pharmacies to see if her gabapentin prescriptions were still on file. All providers found on her INSPECT report were notified of her improper use of the medication as well as her prescription-seeking behavior.

Discussion

Although gabapentin is currently a federally unscheduled medication, evidence of its abuse potential exists. This case demonstrates not only gabapentin abuse, but also preferential abuse of gabapentin over specific scheduled substances. It also exhibits one person's gabapentin withdrawal symptoms: anxiety, agitation, nausea, diaphoresis, and tremor. Research into gabapentin abuse yield numerous reports of abuse, as well as evidence that rates of abuse have increased since 2006. The mechanism behind gabapentin's reward pathway is largely unknown, but evidence exists implying that addiction could relate to increased GABA concentrations and rate of GABA synthesis. This increased GABA concentration is induced by a blockage of voltage-dependent calcium channels on presynaptic neurons, which causes a reduced calcium influx into cells and a corresponding influx of neuronal GABA. It has been hypothesized that this increased GABA causes altered glutamate concentrations in some parts of the brain, specifically in the locus ceruleus. It has also been hypothesized that gabapentin's addictive mechanism stems from alterations in neural plasticity leading to enhanced glutamatergic signaling.

Pertinent to the topic of gabapentin abuse is the topic of scheduling. Gabapentin is currently a federally unscheduled drug. Pregabalin, another GABA analogue, was deemed a schedule V drug in 2005, one year after its initial FDA approval. The difference in the scheduling status of gabapentin and pregabalin can be tied to the rates of euphoria demonstrated in clinical trials. Pregabalin showed a 3.7% rate of euphoria (compared to 0.5% rate in placebo), while the rate of euphoria with gabapentin use was < 1%. Although this difference is significant, clinical case studies such as this one have demonstrated that gabapentin has the ability to cause euphoria, especially in the setting of polysubstance abuse. As the use increases in the US, it is necessary to reconsider the scheduling status of gabapentin so that prescribing can be regulated and monitored.

	Schedule I	Schedule II	Schedule III	Schedule IV	Schedule V
Potential for abuse	The drug or other substance has a high potential for abuse	The drug or other substance has a high potential for abuse	The drug or other substance has a potential for abuse less than the drugs or other substances in schedules I and II	The drug or other substance has a low potential for abuse relative to the drugs or other substances in schedule III	The drug or other substance has a low potential for abuse relative to the drugs or other substances in schedule IV
Medical use	The drug or other substance has no currently accepted medical use in treatment in the United States	The drug or other substance has a currently accepted medical use in treatment in the United States or a currently accepted medical use with severe restrictions	The drug or other substance has a currently accepted medical use in treatment in the United States	The drug or other substance has a currently accepted medical use in treatment in the United States	The drug or other substance has a currently accepted medical use in treatment in the United States
Consequences of abuse	There is a lack of accepted safety for use of the drug or other substance under medical supervision	Abuse of the drug or other substance may lead to severe psychological or physical dependence	Abuse of the drug or other substance may lead to moderate or low physical dependence or high psychological dependence	Abuse of the drug or other substance may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule III	Abuse of the drug or other substance may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule IV

Figure 3: Current drug scheduling guidelines in the United States. Although Pregabalin was designated a Schedule V medication in 2005, Gabapentin remains unscheduled.

References

1. Sills G. The Mechanisms of Action of Gabapentin and Pregabalin. *Current Opinion in Pharmacology*. 2006;6(1):108-113. doi:10.1016/j.coph.2005.11.003. doi:10.1016/j.coph.2005.11.003.
2. Mason, B. Quello S, Goodell V, Shadan F, Kyle M, Begovic A. Gabapentin Treatment for Alcohol Dependence. *JAMA Internal Medicine*. 2014;174(1):70. doi:10.1001/jamainternmed.2013.11950.
3. Mersfelder T, Nichols W. Gabapentin. *Annals of Pharmacotherapy*. 2016;50(3):229-233. doi:10.1177/1060028015620800.
4. Banker K, Ruckert L, Hasan S. Compulsive gabapentin abuse despite lack of desirable effects: A case report. *Journal of Substance Use*. 2017:1-3. doi:10.1080/14659891.2016.1271042.
5. Shebak S, Varipapa R, Snyder A, Whitham M, Milam T. Gabapentin Abuse and Overdose: A Case Report. *Journal of Substance Abuse & Alcoholism*. 2014;2(3):1018 art. https://pdfs.semanticscholar.org/[illegible].pdf
6. Smith B, Higgins C, Baldacchino A, Kidd B, Bannister J. Substance Misuse of Gabapentin. *British Journal of General Practice*. 2012;62(601):406-407. doi:10.3399/bjgp12X653516
7. Dart R, Bartelson B, Severtson S, Bau G, Green J. Increasing abuse of gabapentin and pregabalin as reported to U.S. poison centers 2006 through 2014. *Drug and Alcohol Dependence*. 2017;171:e51. doi:10.1016/j.drugalcdep.2016.08.152.
8. Hellwig T, Hammerquist R, Termaat J. Withdrawal symptoms after gabapentin discontinuation. *American Journal Of Health-System Pharmacy*. 2010;67(11): 910-912. doi:10.2146/ajhp090313.
9. Barrueto F, Green J, Howland M, Hoffman R, Nelson L. Gabapentin withdrawal presenting as Status Epilepticus. *Journal of Toxicology: Clinical Toxicology*. 2002;40(7):925-928. doi:10.1081/clt-120016965.
10. Rosebush P, MacQueen G, Mazurek M. Catatonia Following Gabapentin Withdrawal. *Journal of clinical psychopharmacology*. 1999;19(2):188-9. doi:10.1097/00004714-199904000-00019.
11. See S, Hendriks E, Hsiung L. Akathisia Induced by Gabapentin Withdrawal. *Annals of Pharmacotherapy*. 2011;45(6):e31-e31. doi:10.1345/aph.1q057.
12. Pittenger C, Desan P. Gabapentin Abuse, and Delirium Tremens Upon Gabapentin Withdrawal. *Journal of Clinical Psychiatry*. 2007;68:483-484. doi:10.4088/jcp.v68n0320a.
13. Moran M. Cystine/Glutamate Exchange Regulates Metabotropic Glutamate Receptor Presynaptic Inhibition of Excitatory Transmission and Vulnerability to Cocaine Seeking. *Journal of Neuroscience*. 2005;25:6389-6393. doi:10.1523/jneurosci.1007-05.2005.
14. Mah L, Hart M. Gabapentin withdrawal: Case report in an Older Adult and Review of the Literature. *Journal of the American Geriatrics Society*. 2013;61(9):1635-7. doi:10.1111/jgs.12427.
15. Petroff O, Hyder F, Rothman D, Mattson R. Effects of Gabapentin on Brain GABA, Homocarnosine, and Pyrrolidinone in Epilepsy Patients. *Epilepsia*. 2000;41(6):675-80. doi:10.1111/j.1528-1157.2000.tb00227.x.

Compromised by Alcohol, an uncommon infection in a common setting.

Cody Walker, D.O. M.S.
Community Westview Osteopathic Family Medicine Residency Program
Indianapolis, Indiana

ABSTRACT

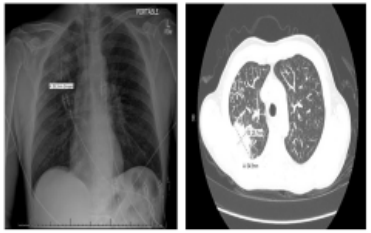
Introduction: We present a case of pulmonary Nocardiosis complicated by cerebral emboli with cerebral edema in an alcoholic patient. Disseminated *Nocardia spp.* infections have been reported in immunocompromised and immunocompetent patients, but infections due to chronic alcoholism are uncommon. The inhibitory effects of alcohol consumption on NK, T and B cells are of importance in this case. A tissue biopsy is usually conclusive of bacterial dissemination, however our patient's cerebral biopsy was negative. This case demonstrates that physicians should consider opportunistic infections like Nocardiosis in patients with chronic alcoholism.

Case Presentation: A 54 year old male with a history of chronic alcoholism presented to the Emergency Department with a complaint of anorexia and weakness. The patient was recently worked up for hemoptysis with chest radiograph and PET scan that showed pulmonary and mediastinal masses. Core biopsy of the pulmonary mass was negative for malignancy but grew *Nocardia spp.* The patient was admitted for possible disseminated Nocardiosis after MRI of the brain showed multiple supratentorial and infratentorial lesions. Intravenous meropenem and trimethoprim/sulfamethoxazole were started until culture sensitivities showed resistance to carbapenems. Stereotactic-guided frontal lobe biopsy revealed only reactive gliosis and no cerebral infection. High dose intravenous steroids were started after the patient had worsening cerebral edema on MRI and developed acute changes in neurological status. After biopsy confirmed no cerebral bacterial involvement, the patient likely suffered from septic emboli that caused the cerebral edema. The patient completed four weeks of outpatient intravenous antibiotics and is back to his baseline neurologic status on oral trimethoprim/sulfamethoxazole.

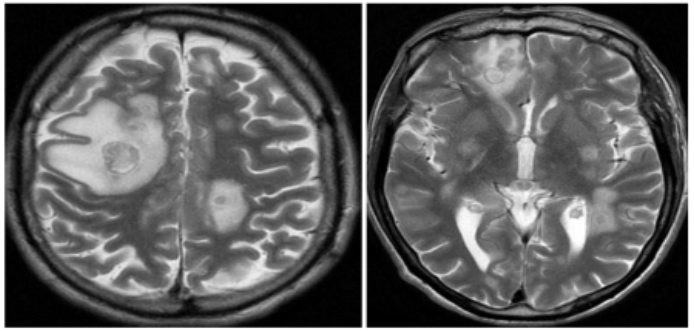
Discussion: A 54 year old male with a history of chronic alcoholism presented to the Emergency Department with a complaint of anorexia and weakness. The patient was recently worked up for hemoptysis with chest radiograph and PET scan that showed pulmonary and mediastinal masses. Core biopsy of the pulmonary mass was negative for malignancy but grew *Nocardia spp.* The patient was admitted for possible disseminated Nocardiosis after MRI of the brain showed multiple supratentorial and infratentorial lesions. Intravenous meropenem and trimethoprim/sulfamethoxazole were started until culture sensitivities showed resistance to carbapenems. Stereotactic-guided frontal lobe biopsy revealed only reactive gliosis and no cerebral infection. High dose intravenous steroids were started after the patient had worsening cerebral edema on MRI and developed acute changes in neurological status. After biopsy confirmed no cerebral bacterial involvement, the patient likely suffered from septic emboli that caused the cerebral edema. The patient completed four weeks of outpatient intravenous antibiotics and is back to his baseline neurologic status on oral trimethoprim/sulfamethoxazole.

INTRODUCTION

Nocardia is gram positive actinomycete that typically causes suppurative infections in humans and animals. Infections can either be localized or systemic and commonly occur in immunocompromised patients, but up to one third of patients affected are immunocompetent. Here we present a case of pulmonary Nocardiosis with several areas of cerebral emboli complicated by severe cerebral edema in a chronic alcoholic. Stereotactic-guided biopsy usually is conclusive of bacterial dissemination but our patient's biopsy was negative. This unusual case shows that chronic alcoholism should warrant consideration by the physician for more serious opportunistic pathogens.



Left: CXR, Right: CT CHEST



CASE PRESENTATION

A 54 year old male with a PMH of chronic alcoholism was brought to the ED for weakness and anorexia. The patient was previously worked up for a RUL mass that was seen on X-ray and CT SCAN after presenting with hemoptysis to the outpatient clinic. PET SCAN and core RUL biopsy was performed as an inpatient and was negative for any malignancy but positive for Nocardia spp. The patient was discharged from the ED that day in stable condition with oral antibiotics after the culture returned positive for Nocardia. The patient, however, never filled his prescription.

The patient was brought in several days later for the same symptoms, on hospital admission the patient was started on intravenous Merrem and Bactrim for antibiotic coverage. Shortly after admission the patient began developing symptoms of metabolic encephalopathy and subsequently MRI of the brain (as seen above) showed multiple areas of hyper-intensity with surrounding cerebral edema . A 10mg bolus of IV Decadron was started followed by scheduled 4mg Q4 hours. Further workup was negative for HIV and other infectious etiologies. After his neurologic status was stable the patient was discharged to rehab and his antibiotics were switched oral Bactrim after culture sensitivities showed resistance to Carbopenems. Stereotactic Frontal Lobe biopsy was done and pathology revealed no presence of bacteria or fungus and final cultures after 6 weeks were negative for acid fast or fungal organisms. Repeat MRI of the Brain 5 months post initial presentation showed multiple, stable frontal, temporal and brainstem lesions with decreased surrounding edema.

DISCUSSION

Pulmonary Nocardiosis is an uncommon, but not rare, condition caused by the Nocardia spp, most commonly *N. brasiliensis, N. asteroides or N. farcinica* in an IC patient. Up to 30% of case reports of nocardia, however, have included immunocompetent patients. Nocardia typically infects the lungs and can involve the skin, soft tissue or central nervous system. Nocardia is notorious for reoccurring or progressing despite appropriate antibiotic therapy.

In our case, the patients' chronic alcoholism likely led to his primary pulmonary infection. Chronic alcoholism along with chronic lung disease, malignancy, long term corticosteroid use, HIV and stem cell transplant recipients are high risk factors. The reported immuno-modulatory effects of alcohol consumption by *G. Szabo* include a reduced number of Natural killer cells as well as decreased cellular recognition of virally infected and metastatic tumor cells. The antigen specific innate immune response is also depressed due to decreased antigen expression as well as decreased cell-cell activation between Th1 and Th2 cells.

Our case of Nocardia presented initially as a pulmonary disease followed by extra-pulmonary dissemination to the skin. It is vital to rule out any opportunistic pathogens like Listeria, Klebsiella, Legionella, Mycobacterium as well as Nocardia early in the disease process in IC patients. Although typically not helpful, sputum culture showing Nocardia spp. could have potentially lead to a diagnosis sooner. Treatment consists of one year of antibiotics and beginning treatment as soon as possible is crucial.

Thus we present our case to remind Family Physicians to be aware of the immunocompromising effects of alcohol consumption. Considering more serious bacterial pathogens as those mentioned above in your alcoholic patient can help prevent any delay in treatment.

REFERENCES

1) Szabo, G. *Consequences of Alcohol Consumptions on Host Defense.* J. Alcohol & Alcoholism. Vol. 34, No. 6, pp. 830-41, 1999
2). Romeo, J. *et al. Moderate Alcohol consumption and the immune system: A Review.* British J. of Nutrition. **98,** Suppl. 1, S111-S115, 2007
3)Uhde KB, Pathak S, McCullum I Jr, et al. *Antimicrobial-resistant Nocardia isolates,* United States, 1995-2004. Clin Infect Dis, 2010; 51: 1445.
4)Lederman ER, Crum NF. *A case series and focused review of Nocardiosis: clinical and microbiologic aspects.* Medicine (Baltimore) 2004; 83:300.

Thiamine Supplementation and Wernicke Encephalopathy

Jendayi Olabisi, PSM, MD Dr. Magdoline Daas, MD
Community Health Network, Indianapolis, IN

Aim

The aim of this case study is to provide awareness and education to health care providers about a potentially fatal disease presentation that should be included in the standard workup of altered mental status.

Introduction

Altered mental status (AMS) encompasses a wide spectrum of disease in terms of patient presentation, workup and etiology. Patients often have nonspecific symptoms, cannot provide adequate histories, and have significant medical comorbidities. This presents a challenge for clinicians in forming a comprehensive differential diagnosis and diagnostic workup. This case study highlights an important disease entity to have on the differential diagnosis for AMS, that is Wernicke encephalopathy (WE). If untreated, the consequences include irreversible memory impairment (Korsakoff syndrome) and even death. In this case, a male patient who after being admitted for pulmonary emboli, developed acute onset of mental status changes of unknown etiology. An extensive lab workup, including for paraneoplastic processes was completed with less attention to more common and easily treatable disease entities associated with acute AMS, namely WE due to thiamine deficiency.
Thiamine (vitamin B1) is an essential nutrient used as an enzymatic cofactor by all organisms. It is synthesized in few organisms including plants, fungi, and bacteria. One of its chief roles is as a cofactor in the metabolism of glucose. Deficiencies are associated with a variety of diseases including Anorexia Nervosa, Hyperemesis gravidarum, various malabsorption disorders, parenteral nutrition, thyroid diseases and chronic alcohol use. When deficient in thiamine, there is a combination of central and peripheral nervous system dysfunction termed WE.

Despite being first described in 1881 and having safe, effective, and readily available treatment, the diagnosis of WE is often delayed and missed altogether. Unfortunately, this can be a costly mistake as if left untreated WE can be fatal.

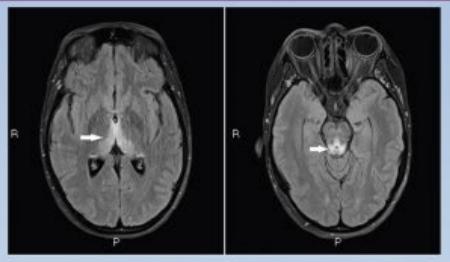
Case Presentation

A 64 year old male was admitted for complaint of dyspnea and was found to have extensive bilateral pulmonary emboli. On day two of the hospitalization he developed altered mental status characterized by dysarthria of speech, short term memory loss, disorientation and paranoid delusions. During initial chest CT imaging, an incidental and ill-defined pancreatic mass was detected. Although workup for the mass was in its initial stages, there was concern that a paraneoplastic process was contributing to or causing the acute onset of mental status changes. An MRI of the brain was obtained and was negative for any abnormalities.

Case Presentation (cont.)

A multidisciplinary approach was employed in the care of this patient such that several services were consulted including gastroenterology, who performed biopsy of the pancreatic mass, psychiatry, and lastly neurology. Psychiatry was consulted and their recommendations were to not use antipsychotics and the patient was diagnosed with 'Psychosis NOS'.
On day five of admission the neurologist saw the patient and it was noted that he had decreased vertical gaze with the left eye and hyperopia on the right eye.
Given the newly discovered neurological findings coupled with the mental status changes, the differential diagnosis shifted from paraneoplastic process to processes with both an encephalopathic component and focal neurological symptoms. This included WE, syphilis, hyper/hypothyroidism amongst other diagnoses. For prophylactic and perhaps preventative treatment, oral thiamine supplementation was initiated at that time while additional labs and imaging were pending. Within 72 hours of thiamine supplementation the patient's mental status returned to baseline. The patient progressed and became oriented, had no evidence of psychosis and near the time of discharge admitted to having a history of daily alcohol use in the past.

Imaging



Left: MRI FLAIR sequence from a sample case demonstrating bilateral thalamic attenuation which is a typical finding in WE. Right: Demonstrates hyper intensities in the periaqueductal gray matter. Other areas that often show abnormalities on MRI include the mammillary bodies and tectal plate. Thiamine deficiency leads to brain lesions in regions with high thiamine metabolism in 2-3 weeks. This is the timeframe when symptoms usually emerge.

Discussion

WE is a rare, but treatable, condition that is often underdiagnosed. This can result in increased morbidity if the disease progresses to the irreversible form, Korsakoff's syndrome or it can be fatal. Some studies estimate that up to 16% of all alcoholics have signs of WE. However, it is essential to note that there are other patient populations
at risk.
The clinical diagnosis requires at least two of the following: suspected dietary deficiencies, oculomotor abnormalities, cerebellar dysfunction, and either altered mental status or mild memory impairment.
Symptoms can start within days to weeks and progress rapidly if not treated. The classic textbook triad of eye movement abnormalities, ataxia and confusion is not present in all patients with WE.
Neuroimaging, specifically MRI is helpful but not required for the diagnosis of WE.

Unfortunately, there are no formal recommendations on acute treatment; however, the standard of care is generally to infuse via IV 200 mg thiamine hydrochloride three times daily via until symptoms resolve. Some authors have recommended continuing oral supplementation; however, this is generally not practiced. Prophylaxis via IV or oral formulation is standard practice in many emergent and acute care settings for patients with a known history of alcohol use. Additionally, many bariatric surgery patients are maintained on oral supplemental thiamine for up to six months after surgery.

As a general recommendation, clinicians should be vigilant and mindful of this diagnosis, especially in vulnerable populations. Given the potential morbidity and mortality, relatively low cost of treatment, safety and effectiveness of treatment, in appropriate settings prophylactic supplementation is warranted.

References

1. Caine D, Halliday GM, Kril JJ, Harper CG. Operational criteria for the classification of chronic alcoholics: identification of Wernicke's encephalopathy. J Neurol Neurosurg Psychiatry. 1997;62:51–60.
2. Galvin R, et al. EFNS guidelinese for diagnosis, therapy and prevention of Werbicke encephalopathy. European Journal of Neurology. 2010, 17: 1408–1418
3. Pitel A, et al. Signs of Preclinical Wernicke's Encephalopathy and Thiamine Levels as Predictors of Neuropsychological Deficits in Alcoholism without Korsakoff's Syndrome. Neuropsychopharm11 Feb; 36(3): 580–588.
4. Scalzo SJ, Bowden SC, Ambrose ML et al. Wernicke-Korsakoff syndrome not related to alcohol use: a systematic review. *J Neurol Neurosurg Psychiatry* Published Online First January 14, 2015

Improving Sleep Disturbance Management in Mental Health Care

Megan Foley, DNP, PMHNP-BC, Linda Sue Hammonds, DNP, FNP-BC, PMHNP-BC,
Magdoline Daas, MD, Jane Narciso Newkirk, MSN, PMHCNS-BC, Elizabeth Ann Cunningham, DO

Community Health Network

Introduction

- Sleep disturbance is a common, but distressing symptom experienced by many psychiatric patients.
- Mental illness can interfere with sleep, just as sleep problems can exacerbate psychiatric symptoms.[1]
- Pharmacological sleep aids are often used as first-line treatment for sleep problems, but may be associated with adverse effects, cost, and tolerance.
- Alternative approaches to address sleep disturbance include sleep hygiene and sleep disorder screening.
- Obstructive sleep apnea, or OSA, is a common but often undiagnosed sleep disorder that can have both dangerous physical and psychiatric symptoms.[2]

Project Purpose

Purpose:

- To investigate the usefulness of a sleep quality, sleep hygiene, and OSA screening program in managing sleep disturbance in a psychiatric intensive outpatient program (IOP).

Project aims:

- Improve rates of sleep hygiene and OSA screening.
- Improve patient sleep quality and sleep hygiene habits.
- Improve identification of OSA risk.

Setting

- The project occurred at a psychiatric IOP at a Community Health Network behavioral health office in Indianapolis, IN.
- Eligible participants were IOP patients, age 18 or older, who anticipated being in the program for an additional 3-6 weeks.
- The project period was from February to May 2016.

Materials and Methods

Baseline rates of sleep hygiene and OSA screening by prescribers were measured over two weeks. Staff were then educated on the project tools and interventions.

The Pittsburgh Sleep Quality Index (PSQI) was used to screen for impaired sleep quality in all consenting participants.[3]

In those with sleep disturbance, the Sleep Hygiene Index (SHI) and STOP-Bang questionnaire were then administered to assess for sleep hygiene issues and OSA risk.[4,5] Education was provided based on assessment results.

Changes in sleep quality, sleep hygiene habits, and OSA risk management were assessed 3-6 weeks after education. Rates of screening were also measured at four points during the project.

Results

- Sleep hygiene and OSA screening rates increased by 25.7% and 1461%, respectively, after project implementation.
- Of 31 initial participants, 27 completed initial assessments, and 20 additionally completed follow-up.
- Sleep hygiene education was associated with average individual improvement by 23.8% in sleep quality and 25.65% in sleep hygiene behaviors.
- Participants demonstrated an average improvement on most PSQI subdomains as well (Table 1).
- For OSA screening (Table 2), 32% of participants had already had a sleep study, of which 55% had received an OSA diagnosis.
- Of participants with no previous sleep study, 26.3% were high risk for OSA. None of the high risk participants followed-up with further medical evaluation during the project period.

Table 1. Average Changes in Individual PSQI Domains.

PSQI Domain	Average Individual Score Change*
Sleep Quality	-30%
Sleep Latency	-5%
Sleep Duration	-37.5%
Sleep Efficiency	-40.8%
Sleep Disturbance	-7.5%
Sleep Medication Usage	5%
Daytime Dysfunction	-11.7%

*Note that reduction in scores is associated with improved sleep quality.

Table 2. OSA Risk Assessment Results.

OSA Risk Level	Number of Participants (n=28)	Percentage of Participants
Previous OSA Diagnosis	5	17.9%
Past Sleep Study Negative for OSA	4	14.3%
Low Risk	9	32%
Moderate Risk	5	17.9%
High Risk	5	17.9%

Discussion

- Implementation of this project was associated with increased rates of sleep hygiene and OSA screening and education, as well as improved sleep hygiene habits and sleep quality in participants.
- While OSA screening and education did not result in patient follow-up or diagnosis of OSA, the project indicates that OSA screening may be beneficial due to the risk level of the population.
- Limitations include limited generalizability as the project was implemented in only one clinic; selection bias as those with existing sleep disturbance were more willing to participate; limited follow-up as some clients stopped coming to the program; and the non-controlled nature of this project as progression through the IOP and improved medication management may have contributed to general improvement in sleep quality scores.
- In the future, implementation of similar screening projects in larger outpatient psychiatric populations and over a longer period of time would be valuable.

References

1. Anderson, K.N., & Bradley, A.J. (2013). Sleep disturbance in mental health problems and neurodegenerative disease. *Nature and Science of Sleep, 5*, 6-75. doi: 10.2147/NSS.S34842
2. Gupta, M.A., & Simpson, F.C. (2015). Obstructive sleep apnea and psychiatric disorders: A systematic review. *Journal of Clinical Sleep Medicine, 11*, 165-175. doi: 0.5664/jcsm.4486
3. Buysse, D.J., Reynolds, C.F., Monk, T.H., Berman, S.R., & Kupfer, D.J. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Research, 28*(2), 193-213.
4. Mastin, D.F., Bryson, J., & Corwyn, R. (2006). Assessment of sleep hygiene using the sleep hygiene index. *Journal of Behavioral Medicine, 29*, 223-227. doi: 10.1007/s10865-006-9047-6
5. Chung, F., Subramanyam, R., Liao, P., Sasaki, E., Shapiro, C., & Sun, Y. (2012). High STOP-Bang score indicates a high probability of obstructive sleep apnea. *British Journal of Anaesthesia, 108*, 768-775. doi: 10.1093/bja/aes022

Community Health Network

Cyberbullying, and their effects on children and adolescents

Magdoline Daas, MD

Objectives

Define cyberbullying. Identify cyberbullying behaviors
Outline the effects of cyberbullying. Discuss steps that can be taken to prevent and address cyberbullying

What is Cyberbullying?

The use of electronic communication to bully a person, typically by sending messages of an intimidating or threatening nature.

A New Face for an Old Monster

Traditional bullying:

.Direct/In person
.Can be physical including hitting, punching and shoving
.Contained location (playground, locker room)
.Limited audience
.Responsible party easily identified

Cyberbullying:

.Can be Anonymous or at the very least veiled by the protection provided by the computer screen
.Emotional abuse
.Can occur any time or any place
.No where to hide
.Large audience
.May be an extension of traditional bullying

Effects

Some victims found cyberbullying more devastating than traditional bullying

- Depression
- Poor self-esteem
- Anxiety
- Suicidal ideation
- Psychosomatic symptoms including headaches and difficulty sleeping
- Intensified feelings of humiliation and isolation
- An anonymous attack can make the victim feel more vulnerable
- Knowing the cyberbully can make the attack feel more personal
- Because there are so many possible avenues to afflict the attack, some victims reported feeling like **there was no escape** from cyberbullying

Statistics

- **70%** of students report seeing frequent bullying online.
- Nearly 43%of kids have been bullied online. 1 in 4 has had it happen more than once
- Over **80%** of teens use a **cell phone** regularly, making it **the most common medium for cyber bullying**.
- **81%** of young people think bullying online is easier to get away with than bullying in person.

Girls are about **twice as likely** as boys to be victims and perpetrators of cyber bullying.
Comments include: "Go kill yourself". "No body likes you". "why aren't you dead?"

Impact at School

Although most cyberbullying occurs outside of school, it often begins with an incident that occurred during school. The impacts at school are evident:
Desire to avoid school
Lower grades
Difficulty concentrating
Feeling unsafe throughout school day

Interventions

Old Approaches:
- Block the sender
- Ignore the message
- Get the authorities to track down the number
- Report the bully
- Alert someone
- Change address/ number
- Ask the bully to stop and fight back

New Approaches:
- Change privacy settings
- Change email address
- Parental controls
- Don't visit certain sites
- Keep evidence of cyberbullying – though this can be emotionally damaging to the victim because it is not easily forgotten

Cyberbullying & Suicide in Children

-Cyberbullying victims were 1.9x more likely to have attempted suicide; cyberbullying offenders were 1.5x more likely

-Most victims of cyberbullying do not commit suicide. Those who do usually have experienced a host of other issues, making it difficult to isolate the effects of cyberbullying

- **Even one death is too many**
- Bullied youth — both the offender and target — were more likely to report suicidal thoughts and to have previously attempted suicide
- Being a target of bullying significantly increases the risk of suicide ideation in pre-adolescent children

-There is a relationship between bullying and suicide; however, no conclusive statistical evidence has shown that a cyberbullying incident directly "leads to" or causes suicide While by itself it is unlikely to lead to suicide, it may aggravate the victim's existing vulnerabilities. It exacerbates instability and hopelessness in the minds of adolescents already struggling with stressful life circumstances.

References :Bullying in a Networked Era: A Literature Review. Harvard University. September 2012. Garnez, Manuel PhD. Orue, Izaskun PhD. Smith, Peter PhD. Longitudinal and Reciprocal Retaions of Cyberbullying With depression and substance abuse, Journal of Adolescent Health. issue 4, October, 2013.

Who cyberbullies?

Can come from any economic, cultural, or religious background
Lack empathy
Often been victims of physical abuse or bullying themselves
Are concerned with their own desires rather than those of others
Find it difficult to see things from someone else's perspective
Are willing to use others to get what they want

A Clinician's Role

Educate yourself about the warning signs, effects and interventions. Talk to parents and children about the risks and consequences. Include questions on cyberbullying as part of regular visits. Ask about specific behaviors, not just if they have been bullied

Some Interventions

Focus on: EMPOWERING students in terms of digital literacy
- Technological skills. -Critical thinking skills. -Online etiquette.-E-safety.-Assessing their own online risks
- Measures to protect themselves, their reputation and their privacy online

Solutions

Empowering peers to be ready to respond in these situations is the first step.Greater awareness of the technological and legal aspects of cyberbullying would assist psychological service providers, teachers, and parents in working toward informed approaches for responding to incidents when they occur.**EDUCATION IS KEY** (for student, educators, parents and the community).Must focus on digital literacy and citizenship, positive uses for the internet, empathy, self-esteem, healthy behaviors and social skills
Adults need better training and engagement with the online world if they wish to bridge the so-called digital gap
School climate plays an important role – schools need clear policies – promote and model pro-social norms, student well-being, and a positive learning environment
Focus more on education rather than regulation
Create a culture of "self-regulation" which includes critical thinking about the content consumed or downloaded and posted or uploaded

Where do Parents fit in?

- Several studies have shown that parental supervision is fleeting and sporadic
- Parents can partner with schools in finding appropriate solutions and learn alongside the educators
- Encouraging an open line of communication in the home, where children are able to have opportunities for dialogue about online activities
- At home parents can help model appropriate behavior and keep technology in an open, neutral area (not in the bedroom, especially not at night)

How Schools Can Help

A training manual for schools should include

- Basics of cyberbullying
- Practice orientation
- Information about training skills and strategies for diagnosis and intervention
- Focus on narratives
- Multimedia resources

Agoraphobia with Panic Disorder: An Unexpected Benefit of Utilizing the Patient Centered Medical Home

Benjamin C. Gans, D.O.
Community Westview Osteopathic Family Medicine Residency Program
Indianapolis, Indiana

ABSTRACT

Introduction: Agoraphobia with panic disorder is a common diagnosis seen within the family practice community. Patients with agoraphobia commonly avoid areas that they fear will cause panic, such as doctors' offices or new surroundings. The current movement of primary care toward a patient centered medical home (PCMH) has added benefits specifically for patients with agoraphobia by having them see familiar buildings, staff, and clinicians for all their medical needs. Currently, no articles have addressed this potential mental health benefit. PCMHs are currently established in 36 states and seek to combine multiple primary care facets under one roof.

Case Summary: A 36 year old female with past medical history of agoraphobia with panic disorder, depression, and asthma presented to our clinic after being dismissed from her psychiatrist. The patient was discharged after missing 5 appointments. She described being unable to leave her home due to panic surrounding confrontations with the staff. She was also unable to maintain control over her asthma as her other physician was in an unfamiliar office. The patient was distraught during our first visit, so she was referred her to our in-house social worker. Over the course of a year and with constant follow up our patient was able to make almost every appointment with behavioral services and her physician under the same roof. Her GAD-7 decreased 9 points, she missed only 2 appointments, and her quality of life improved. She was able to follow up regarding her asthma and acute illness with the physician while also meeting with the social worker to manage her anxiety and panic attacks.

Discussion: Our patient had failed traditional therapy due to chronic inability to leave her home and fear of panic in several situations. At our clinic the patient was able to be evaluated for medical reasons and be seen in the same office for behavioral services. The patient suffered less anxiety with this familiarity, missed fewer appointments, and her GAD-7 score decreased. The PCMH appears to ease anxiety in agoraphobic patients with panic disorder. These findings could potentially be extrapolated for other anxiety diagnoses when considering a PCMH.

INTRODUCTION

The health care delivery model of the patient centered medical home (PCMH) has its foundation in the primary care setting. Family physicians coordinate care for patients in the hopes of providing comprehensive medical care to patients. A benefit to this model of health care delivery is having multiple specialties all under one roof. Patients could potentially see their PCP first, head down the hall to discuss insulin management with the clinical pharmacist, then meet with the social worker to talk about transportation difficulties. All of this occurring in the same building.

An unforeseen benefit of this particular care model appears to be in its physical containment. Patients suffering from agoraphobia with or without panic disorder commonly avoid places they're afraid may cause intense fear. This can manifest in any place they may feel trapped, embarrassed, or a place that is unfamiliar to them. By having behavioral health in the same building as their PCP, a patient sees familiar buildings, staff, and clinicians without having to navigate new and potentially panic-invoking places.

CASE PRESENTATION

A 36 year old female presented to the clinic with severe agoraphobia with panic disorder. The patient had been seeing a psychiatrist for several years but was recently discharged after missing five consecutive appointments. The patient stated she was unable to leave her home due to continuous panic attacks stemming from a confrontation that occurred at a previous visit. At that time she was unable to maintain control of her asthma because her PCP was in a separate office. She had been on several medications including Lexapro, BuSpar, and Valium – all of which could not be refilled without an office visit.

At her first visit to our office the patient was distraught and tearful, often tangential in her speech. She was referred to the clinic's in-house behavioral specialist who saw her the same day. Her initial Generalized Anxiety Disorder score (GAD-7) was 17, measuring as severe anxiety. The patient made weekly appointments at first. She would see the physician first then walk down the hall to meet with the behavior specialist. The patient made all but two appointments over the course of a year and a half.

Over the next several months the patient was gradually put back on her original medications. She was also able to control her asthma. The patient continued to see the behavioral specialist for Cognitive Behavioral Therapy and learned several non-pharmacological ways to manage her stress and anxiety. Within six months her GAD-7 score decreased to 11. After a full year and a half her GAD-7 score was 8.

DISCUSSION

Utilizing multiple healthcare services under the same roof, our patient was able to make remarkable progress. The patient suffered less anxiety and panic attacks with the familiarity of the staff and her surroundings. She missed fewer appointments and was able to control her asthma. These findings could potentially be extrapolated for other anxiety or mental health diagnoses which could be an opportunity for further research.

If future studies suggests similar findings, it could aid the push to incorporate behavioral health into primary care settings. In 2015, the American College of Physicians published a position paper outlining the need for better integration of behavior health in PCP offices. The paper specifically calls for increased research in this area. Our research supports this notion in a way previously not studied.

It should be noted that the patient received CBT as well as pharmacological interventions which is the current recommended treatment of Agoraphobia with panic disorder. Without further inquiry it is difficult to determine the extent to which her settings played a role in her recovery. One of the limitations to this case study is the ability to quantify our findings. Future research would focus on tools with this ability.

Also, incorporation of behavioral health services into a primary care offices is not limited to PCMHs. Many offices do this currently while not being recognized as an official PCMH. Further research would look into the success of this model vs. a PCP with integrated behavioral health.

REFERENCES

1)Crowley RA, Kirschner N. "The integration of care for mental health, substance abuse, and other behavioral conditions into primary care." *Annals of Internal Medicine* 2015; 163(4): 298-299
2)Hoffart A, Hedley LM, Svanoe K, et al. "Agoraphobia with and without panic disorder: A 20 year follow up of integrated exposure and psychodynamic therapy." *Journal of Nervous & Mental Disease* 2016; 204(2):100-107.
3)"Is agoraphobia the same as social anxiety disorder." *Mayo Clinic Health Letter* 2012; 30(8):8
4)Primiano, S, Marchand A, Gosselin P, et al. "The effect of combined versus a conventional cognitive-behavioral therapy on quality of life for comorbid panic disorder and generalized anxiety disorder: Preliminary results." *Behavior Modification* 2014; 38(1): 5-24.
5)Ramos, C. "It's not my job or is it? The role of an RT in a PCMH." 2015. Image adapted from power point presentation.
6)Van Balkom A, Bakker A, Spinhoven P, et al. "A meta-analysis of the treatment of panic disorder with or without agoraphobia: A comparison of psychopharmacological, cognitive-behavioral, and combination treatments." *The Journal of Nervous and Mental Disease* 1997; 185(8) 510-516.

Management of Bulimia Nervosa in a Community Hospital

Adam J Connell, MD & Syed J Khan, MD
Community Health Network, Indianapolis, IN

Aim

The aim of this case study is to educate on the medical comorbidities of bulimia nervosa as well as provide basic guidelines for management of patients with bulimia admitted to facility that does not specialize in the treatment of eating disorders.

Introduction

Bulimia nervosa is a serious, potentially life-threatening eating disorder characterized by recurrent episodes of binge eating followed by a recurrent, inappropriate, compensatory behavior. These compensatory behaviors are meant to prevent weight gain and commonly include self-induced vomiting, laxatives, fasting, or excessive exercise.

Patients with bulimia nervosa often present with oral and gastrointestinal complications with serious electrolyte and endocrine complications. We will present a patient that decompensated medically while admitted to the behavioral health pavilion after being stabilized on the inpatient medicine service.

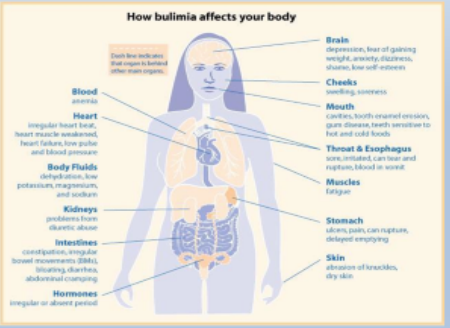
Case Presentation

Mr. E is a 19 year-old Caucasian male with a psychiatric history of bulimia nervosa, antisocial personality disorder, and major depressive disorder that presented to the emergency department with hypokalemic, hypochloremic metabolic alkalosis secondary to purging.

He was brought to the emergency department for suicidal ideation and was medically asymptomatic, the metabolic derangements were an incidental finding. Initial labs on presentation were remarkable for [K: 2.0; Cl: 78; CO2: 49; Cr:2.40]. He was hypotensive at 78/33. Urine drug screen was positive for cannabis.

He was admitted to the medical floor and stabilized with normal saline and IV potassium before being transferred to the inpatient psychiatric unit for treatment of his comorbidities.

His labs began to decompensate after a day on the unit with limited supervision. This decompensation fluctuated with varying levels of supervision on the unit, which was limited at times due to staffing. This continued until guidelines from centers that specialized in eating disorders were researched and implemented.



Discussion

Patients with eating disorders require a firm, but understanding, non-judgmental, and non-punitive approach to management. They often illicit intense countertransference and negative reactions from staff. This was especially prevalent in our case due to the comorbid diagnosis of antisocial personality disorder. Throughout his admission he continually exhibited lying, manipulation, and splitting of staff – all of which contributed to his medical decompensation.

Some additional themes and basic guidelines for treating patient with eating disorders include:

- Consistent multi-disciplinary team approach to minimize potential for splitting.
- A clear plan for the purpose of admission and what medical risk factors are present to assist in identifying necessary restrictions on the unit.
- Supervision is a priority, at all times, as any observed time can be used for purging food – including time in bathroom and shower.
- When supervision is limited, locating the patient as close to the nurses station as possible is ideal.
- Supervision and bed rest is strongly advised for 1 hour post-meal.

Additional medical recommendations include:

- Patients should be weighed in the morning prior to breakfast and should be instructed to empty bladder prior to weighing.
- Daily medical monitoring for at least the first 7-10 days as serum levels of electrolytes and creatinine need to be monitored, even if normal.

Hypokalemia is the most serious electrolyte abnormality seen in bulimia as it may cause cardiac arrhythmias, rhabdomyolysis, muscle weakness, hypokalemic cardiomyopathy, and tetany. Several mechanisms contribute to hypokalemia. Direct loss due to vomiting as well as the concomitant loss of chloride ions and gastric acid leads to a hypokalemic-hypochloremic metabolic alkalosis.

Additionally, as purging results in volume depletion the renin-angiotensin hormonal system is activated. This leads to renal retention of sodium in exchange for hydrogen and potassium ions, which are excreted in the urine.

This case supports guidelines recognizing the necessity for strict supervision and medical management for bulimic patients while admitted to a center that does not specialize in eating disorders.

References

1.Mehler, PS.; Crews, C.; Weiner, K. (2004). "Bulimia: medical complications.". *J Womens Health (Larchmt)*. 13 (6): 668–75
2.NSW Ministry of Health (2015). "Guidelines for the management of adult eating disorders in general medical and psychiatric settings in NSW." North Sydney, NSW.
3.American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (Fifth ed.). Arlington, VA: American Psychiatric Publishing.

KEYNOTE SPEAKER

Ileana Ponce-Gonzalez, MD, MPH, CNC - Executive Director, Community Health Worker Coalition for Migrants and Refugees

Over the past 15 years Dr. Ponce-Gonzalez has been responsible for a wide range of professional activities, including academic, clinical and public health administration by managing and administrating public health programs in health service research, health disparities, health literacy, and human right advocacy in an effort to deliver quality health services, education, and behavioral training to populations that need these services the most. She has extensive experience working with diverse segments of the community as well as state and local government public health systems in three different countries: Nicaragua, Chile and the United States.

Her areas of expertise include infectious diseases, community health and public health administration. She has more than 14 years of experience in developing health care programs and outreach initiatives for underserved communities. Her experience is also focused on building collaborative networks, performing needs assessments, devising technical assistance programs, training programs for community health workers, and strategic planning. I am fluently in Spanish and English.

In Nicaragua, Dr. Ponce-Gonzalez directed the Infectious Disease Prevention Program, focused on the prevention of STD, HIV/AIDS, STD, malaria, TB, and a wide-range of other tropical illnesses in Tipitapa, a rural village located in Managua. In the USA, she has been involved in numerous trainings and educational activities for health practitioners, and community health workers to address their principal social and health problems.

Most recently Dr. Ponce-Gonzalez developed, coordinated and served as a Course Coordinator and Instructor for a 10-month webinar series conducted in Spanish on the Principles of Public Health for Community Health and Outreach Workers. As a Senior Advisor for Community Outreach for Group Health Research Institute she is responsible for integrating cultural competences and inclusion of underserved populations to establish and promote the Diabetes Self-Management for Adults with Type 2 Diabetes in Yakima, Spokane and Tri-cities in WA.

Dr. Ponce-Gonzalez is the Executive Director and founder of the Community Health Worker Coalition for Migrants and Refugees (CHWCMR) a passionate group of passionate volunteer dedicated to the promotion, empowerment, leadership, continuing education and integration of CHWs into the health care system to improve the quality of life of migrants, mobile poor and refugees.

ORGANIZING COMMITTEE

Kate Bol, JD
Stewart Brown, MD
Valerie Brown, CPS
Kaylee Burget, BS
Nancy Campbell, RN, MS, BC
E. Ann Cunningham, DO
Megan Dorrell, PharmD
Barb Gushrowski, MLS
Sue Heinzman, DNP, RN, ACNS-BC
Gurinder Hohl, PT, MS, MPH, GPC
Sarah Lackey, PharmD, BCPS
Deborah Lyons, MSN, RN
Kathy Zoppi, PhD, MPH

REVIEWERS

Glen Bingle, MD, PhD, MACP
Janel Borkes, MSN, RNBC, CNS
Ginger Breeck, MSN-MBA, CPHRM, RN
Jennifer Collins, PharmD
Deb Ferguson, MSN, RN, CCRN-K, CNRN, SCRN
Tricia Hern, MD
Tim Hobbs, MD, MBA
Amy Hughes, MLS
Randy Lee, MD
Bob Lindeman
Theresa Murray
Jaclyn Myers, PharmD, PhD
Julie Painter, MSN, RN, AOCNS, OCN
Kanitha Phalakornkule, PhD
Felicia Preston, BS
Jean Putnam, DNP, MS, RN, CPHQ, NEA-BC
Nora Sharaya, PharmD, BCPS, BCACP
Megan Siebert, MSN, AGCNS-BC, PCCN
Beth Sims, DNP, RN
Dawn Sullivan-Wright, MSN, RN, ACNS-BC, CEN, TCRN
Tom West, MBA
Jessica Wilhoite, PharmD, BCACP

SPONSORS

Community Health Network Foundation

Alexion

Astellas Pharma

EHBO

Merck

Nestle Maternal
& Infant Nutrition

Novonordisk

Sanofi

Sunovion

INDEX TO PRESENTERS/CONTRIBUTORS