Community Health Network

Seventh Annual Multidisciplinary Scholarly Activity Symposium

Indianapolis, Indiana

Proceedings Monograph prepared by Barbara A. Gushrowski and Kaylee Burget

Seventh Annual
Multidisciplinary Scholarly Activity
Symposium Proceedings
2022

CONTENTS

Advancing Racial & Health Equity through Cultural Humility

Sylk Sotto, EdD, MBA, MPS
Indiana University School of Medicine

Dr. Sotto serves as the Vice-Chair for Faculty Affairs, Development, and Diversity in the Department of Medicine at Indiana University School of Medicine. She co-chairs the school's Diversity Council; serves on numerous institutional committees; and teaches several courses in research ethics, culturally relevant practices in medicine, and Foundations of Clinical Practice in the Spanish immersion program. Her scholarship and research center on (in)equity in academic medicine. Her interests include faculty affairs and professional development; STEM/medical education; organizational leadership; and the intersection of health equity and research ethics. She is affiliated with the Indiana Clinical and Translational Institute (IN CTSI) where she serves as co-director of Workforce Development and Director of All IN for Health, a program and statewide clinical trials registry focused on community-research engagement and health literacy. She is also the Health Equity Lead for the Office of Outreach and Community Engagement for IU Simon Comprehensive Cancer Center.

Additional Details

Dr. Sotto is also affiliated with the IU Center for Bioethics and the National Institute for Transformation and Equity (NITE). At the national level, Dr. Sotto served on the Board of Directors and as Diversity & Inclusion liaison for the Alliance of Academic Internal Medicine (AAIM). With over 20 years of administrative experience, she is also past-president of the Association for Administrators in Internal Medicine. Additionally, she is an active member of various AAMC groups, ASHE, the POD Network, NADOHE, and NAMME.

ORAL PRESENTATIONS

O1 Effects of 1-week Bedrest on Complication Rate and Range of Motion following Total Knee Arthroplasty. (Sarah Eaton, PT, DPT, ATC, LAT)

Purpose/Hypothesis: Current rehabilitation protocols after total knee arthroplasty (TKA) encourage early ambulation to avoid potential medical complications, such as DVT, PE, joint infection, and/or hospital re-admission. It is theorized that bedrest after TKA would increase a patient's likelihood of developing such complications, but very little research supports this. Our hypothesis is that, with our protocol of bedrest in the first week post-op, our rate of post-operative complications after TKA would not be higher than rates reported in current literature.
Subjects: 463
Methods: Between 2012-2018, 641 total knee arthroplasties were performed by a single orthopedic surgeon in 463 patients and enrolled in a long-term outcome study. All patients completed the same post-operative rehabilitation program to restore full, symmetrical ROM and strength. The goal of the early post-operative phase from 1-7 days is to decrease swelling, increase range of motion, promote normal leg control, and promote normal gait with an assistive device. Patients wear TED hose and use a Cryocuff and continuous passive motion (CPM) machine with the knee elevated. Patients remain supine with the leg elevated in the CPM with restroom privileges only in order to minimize swelling. Patients perform physical therapy exercises three times daily to maximize range of motion and maintain proper quadriceps/leg control.
Results: In 463 patients, 285 were unilateral TKA, 95 were bilateral TKA (190 knees) and 83 (166 knees) were staged bilateral TKA. Out of 641 surgeries performed, there were 22 total complications reported in 20 patients (3.4%). Complications reported were as follows: 2 DVT (0.3%), 4 joint infections (0.6%), 5 manipulations under anesthesia (MUA) for flexion loss (0.8%), 2 scar resections for extension loss (0.3%), 6 heart/lung related problems (0.9%), 1 hospital re-admission for pain, 1 medial femoral condylar fracture, and 1 patellar dislocation (0.2% each). Our average range of motion for patients at 1 week post-op was 0-2-104 degrees, at 2 weeks post-op was 0-1-112 degrees, and at 1 month post-op was 0-0-117 degrees. Our rate of motion loss of <1% rate compares favorably with that of the current literature. A systematic review by Zachwieja et al. reported 1.3-5.8% prevalence rate of stiffness after TKA, and studies by Werner et al. and Issa et al. reported MUA rates of 4.3% and 4.9% respectively. When comparing our rate of DVT, this also compares favorably with current literature, as multiple studies show DVT rates between 0.22-0.52%.4-6 Our infection rate compares with that of Teo et al. and Anis et al., who reported 0.44% and 0.7% prosthetic joint infection rates respectively.
Conclusion: In conclusion, patients did not have an increase in common complications seen after TKA despite compliance with our rehabilitation protocol that promotes immediate post-op 7-day bedrest. Clinical Relevance: Physical therapy programs may begin to incorporate delayed post-op ambulation after TKA as a way of decreasing pain and swelling, but encouraging improved range of motion and leg control without increasing complications.

O2 Comparison of Functional Outcomes after Total Knee Arthroplasty Based on Patellar Resurfacing. (Scot Bauman, PT, DPT; Rachel Slaven, PT, DPT; Rodney Benner, MD)

Purpose/Hypothesis: Patellar resurfacing with total knee arthroplasty (TKA) remains a controversial topic among orthopedic surgeons, as there are arguments for and against each method such as the avoidance of anterior knee pain and reducing the risk of complications, respectively. Existing literature

has not consistently shown an advantage in outcomes of either approach. The purpose of this study was to evaluate functional outcomes both preoperatively and postoperatively between resurfaced patellae and non-resurfaced patellae at the time of TKA. We hypothesized that there will be no difference in functional outcomes related to patellar resurfacing.
Number of Subjects: 717
Materials/Methods: From 2012-2019, 717 patients underwent a TKA by the same surgeon and were divided into two groups, resurfaced (363; 159 males, 204 females) and non-resurfaced (354; 220 males, 134 females). Both groups had the same preoperative rehabilitation consisting of range of motion (ROM) and strength exercises prior to surgery. Postoperatively, rehabilitation focused on ROM, swelling, and leg control, followed by a strength and conditioning program once adequate ROM was restored. Patients were followed for one year with measurements taken preoperatively, 1 and 2 weeks, and 1, 2, 3, 6, 9, and 12 months postoperatively. Objective measures include ROM, isokinetic quadriceps strength testing normalized to body weight, isometric single leg press (SLP) testing normalized to body weight, and the timed up and go (TUG) test. Subjective measures include all five subscales of the KOOS. Data was prospectively collected and retrospectively reviewed.
Results: Flexion ROM was found to be statistically significantly higher for the non-resurfaced group preoperatively and at 6, 9, and 12 months compared to the resurfaced group. Extension ROM was statistically significantly better for the resurfaced group at 3 months only. Strength on the isokinetic quadriceps strength test at both speeds (120°/second and 180°/second) as well as the isometric SLP test was statistically significantly higher for the non-resurfaced group preoperatively, and at 2, 3, 6, 9, and 12 months postoperatively. The TUG test did not show a statistically significant difference between groups. There were no statistically significant differences between groups for the KOOS subscales of pain, sport, or activities of daily living; however, the resurfaced group had better symptom scores at 1, 2, and 6 months and better quality of life scores at 2 months compared to the non-resurfaced group.
Conclusions: Following a TKA, those without a resurfaced patella have better flexion and strength compared to those that were resurfaced. However, patients with resurfaced patella had better extension at 3 months as well as higher subjective scores on the symptoms and quality of life subscales of the KOOS at various time points after surgery.
Clinical Relevance: Physical therapists treating those having a TKA need to consider the differences between these groups in order to provide realistic expectations for patient outcomes as flexion and strength may be better for those that are non-resurfaced, whereas extension and symptoms may be better for those that are resurfaced.

O3 Early Functional Improvements in Primary Total Knee Arthroplasty without Tourniquet Use.

(Rodney Benner, MD; Scot Bauman, PT, DPT; Adam Norris, BS; Jacob Bailey, Student)

Introduction: The use of tranexamic acid (TXA) in total knee arthroplasty (TKA) has significantly altered perioperative blood management and reduced transfusions, thus, increased interest in the potential benefits with tourniquetless TKA. The purpose of this study was to compare early functional progression and perioperative blood management for primary TKAs done with and without tourniquet. We hypothesized that tourniquetless primary TKA would provide better early range of motion (ROM) and return of strength, without consequent complications.
Methods: Sixty-nine consecutive primary TKAs done without tourniquet were selected with minimum 1-year follow-up. These patients were matched 1:1 to 69 patients by sex, age, and body mass index that underwent primary TKA under tourniquet, resulting in a total of 138 patients. All TKAs were completed by the senior author through a medial parapatellar arthrotomy, with intramedullary femoral and extramedullary tibial instrumentation and posterior stabilized implants. Tranexamic acid was utilized in all cases via a standard protocol and saline-cooled, bipolar cautery was used in tourniquetless cases.

Isokinetic strength, ROM, timed-up-and-go (TUG), assistive device use, blood management, length of stay (LOS), in-operating-room time, and Knee Injury and Osteoarthritis Outcome Scores (KOOS) data was collected for each patient at various points before, during, and after surgery. Descriptive statistics were obtained for comparison between groups separated only by tourniquet use.
Results: Demographic data did not differ between matched patient groups. Extension ROM was not different between groups, but mean flexion and total arc of motion were better in the tourniquetless group at all points versus those done with tourniquet, reaching statistical significance for flexion at 2 weeks, 1 month, and 2 months and for total arc of motion at 2 weeks (P<.05). Quadriceps strength compared to the contralateral knee via isokinetic testing at 120° per second was statistically significantly higher at 1, 6, and 12 months postoperative in the tourniquetless group. Pain scores, TUG, and assistive device use were not different between groups. Subjective scores were similar on the KOOS at most points for the total score and subscales, however, statistically significantly higher for the tourniquetless group at 1 month for the "symptoms" subscale, and for the tourniquet group at 2 months for the "sport" subscale. Mean LOS for the tourniquetless group was 1.3 days versus 2.0 days for the tourniquet group (P<.001). Postoperative day 1 mean hemoglobin values were statistically significantly higher in the tourniquet group (P=.035), however, likely not clinically significant (11.6 tourniquet; 11.1 tourniquetless). Transfusion rates in both groups were 1.6%. Mean in-operating-room time was statistically significantly lower in the tourniquetless group by 10 minutes (P=.01).
Discussion: Tourniquetless TKA resulted in statistically significant better ROM, return of quadriceps muscle strength, LOS, and surgical time when compared with TKAs done under tourniquet. While postoperative mean hemoglobin was slightly higher in the tourniquet group, this clinical significance is doubtful and transfusion rates did not differ.
Conclusions: Tourniquetless TKA results in early functional benefits when coupled with TXA usage and saline-cooled bipolar electrocautery. Given these results, the author has eliminated tourniquet usage for primary TKA.

O4 Rates of Total Knee Arthroplasty and Subjective Score Progression Based on the Location and Severity of Knee Osteoarthritis.

(Scot Bauman, PT, DPT; Rachel Slaven, PT, DPT; Rodney Benner, MD)

Background: Factors attributed with patients electing to have a total knee arthroplasty (TKA) include weight, age, symptoms, range of motion (ROM), and radiographic evidence of osteoarthritis (OA). Patient reported clinical symptoms lead patients to pursue TKA, whereas surgeons use clinical symptoms in addition to radiologic findings to determine candidacy. Previous studies have shown factors leading to TKA, however the effect OA location and severity have on outcomes leading to surgery is unknown. The purpose of this study was to determine differences in outcomes based on the location and severity of knee OA.
Methods: From 2013-2019, 337 patients diagnosed with knee OA were enrolled into the study and divided into 9 groups based on maximum radiographic OA grade (mild/moderate/severe) and location (medial, lateral, patellofemoral (PF)). Patients were excluded if they had more than one compartment with the same maximum grade. After enrollment, all patients participated in a rehabilitation program that consisted of ROM and then strengthening exercises. Patients were further categorized as TKA yes or no, which was retrieved from a surgical database or via survey response. Knee Injury and Osteoarthritis Outcome Scores (KOOS) were collected at enrollment, 1, 3, 6, and 12 months after enrollment. Patients stopped completing surveys after deciding to have surgery. Rates of having a TKA and KOOS scores over time were compared between groups.
Results: Patients with medial compartment OA showed statistically significantly different rates of TKA between grades (mild 9%, moderate 20%, severe 43%). For lateral and PF compartments, the rate of

having a TKA increased as the severity grade increased, however, no statistically significant differences were found. Patients with severe OA showed to have statistically significantly different rates of TKA based on location (medial 43%, lateral 17%, PF 9%). Those with mild and moderate OA did not show a statistically significant difference between locations. Subjective KOOS scores were statistically significantly higher for those not having surgery at 3 (no 70, yes 55) and 6 (no 69, yes 59) months. Patients that showed no improvement or got worse on the KOOS from 1 to 3 months were more likely to have surgery compared to those that improved in the same timeframe (OR = 4.8, p<.001). There was a statistically significant difference in KOOS scores at 3 months based on severity (mild 77, moderate 69, severe 62), however not at any other time point.
Conclusion: Patients tend to have TKA at a higher rate when OA is severe and located in the medial compartment. When starting conservative treatment, early subjective scores will be similar between those that will have surgery and those who will not; however, those who will go on to have a TKA have lower subjective scores at 3 months and stay lower through 6 months. Patients that plateau or regress between 1 and 3 months are 4.8 times more likely to have a TKA compared to those that show improvement in the same timeframe. Patients that improve early and continue conservative management are able to maintain high KOOS scores long term.

O5 Return of Quadriceps Strength following an Anterior Cruciate Ligament Reconstruction Based on Patellar Tendon Width for Contralateral and Ipsilateral Patellar Tendon Grafts. (Nicholas Brown, BS; K. Donald Shelbourne, MD)

Background: After anterior cruciate ligament reconstruction (ACLR), quadriceps muscle strength is an important factor on an athlete's confidence and ability to return to activity. The return of quadriceps strength following surgery using an ipsilateral patellar tendon graft (PTG) has been shown to be affected by the width of the tendon being harvested, with larger tendons regaining strength faster compared to smaller tendons. In order to achieve postoperative goals faster and more predictably, performing the surgery utilizing the contralateral PTG can be done. The purpose of this study was to determine differences in strength based on patellar tendon width (PTW) for those having surgery utilizing an ipsilateral and contralateral PTG.
Methods: A cohort of 114 patients having an ACLR were split between PTW, small (≤28 mm) and large (>28 mm), as well as surgery type, ipsilateral and contralateral (ipsilateral small n=22, ipsilateral large n=34, contralateral small n=35, contralateral large n=23). Following surgery, patients followed a similar rehabilitation program based on their surgery type with ipsilateral patients regaining motion prior to starting a strength training program of the graft-donor site, whereas, the contralateral patients were able to start strengthening the graft-donor site immediately as rehabilitation was done independent of the ACL reconstructed knee. Strength of the graft-donor site was assessed using isokinetic strength testing at 180°/second and was measured at 3 and 6 months postoperative. Strength was measured as a value normalized to body weight as well as calculated for limb symmetry within 10% of the other side. Statistical significance was set at a p-value less than 0.05 in this retrospective review.
Results: Larger tendons showed higher normalized strength values at both time points, regardless of surgery type, however failed to reach a statistically significant difference. Patients having a contralateral PTG showed a higher distribution of those having symmetric strength (52%) when compared to ipsilateral PTG (23%) at the 3-month time point (p=.002), however no difference was seen at 6 months (p=.082). When split between surgery types, small tendons showed to have a statistically significantly higher distribution of limb symmetry at 3 months (contralateral 54%, ipsilateral 18%); however, the large tendons failed to show the same statistically significant difference at the same time point (contralateral 48%, ipsilateral 27%). Neither large nor small tendons showed to have a statistically significant difference at 6 months when split between surgery types.

Conclusions: Regardless of surgery type, large tendons have higher strength values when compared to smaller tendons, albeit not statistically significantly different. Those having a contralateral PTG measure symmetric at a higher rate when compared to those having an ipsilateral PTG, most notably when tendons are smaller. Special attention early in the rehabilitation program should be made to those having an ipsilateral PTG, and have tendons smaller than 28 mm, as strength may be more difficult to regain following an ACLR.

O6 Anterior Cruciate Ligament Reconstruction Using a Contralateral Patellar Tendon Graft Allows Patients to Restore Normal Range of Motion, Strength, and Function Quickly and Reliably Following Surgery. (K. Donald Shelbourne, MD; Rodney Benner, MD; Scot Bauman, PT, DPT)

Background: Regaining preinjury levels of activity as well as the progression of objective factors after anterior cruciate ligament (ACL) reconstruction have shown poor results.1-8 The purpose of this study was to evaluate the progression of the timing and rate of return for knee range of motion (ROM), stability, strength, and subjective scores after ACL reconstruction with contralateral patellar tendon graft (PTG).
Methods: A cohort of 2148 patients (1238 males, 910 females) who underwent primary ACL reconstruction with a contralateral PTG from 1995-2017 and had complete objective data through 3 months follow-up were studied. All patients participated in a rehabilitation program specific to goals for each knee with the ACL reconstructed knee focused on achieving full ROM and minimizing swelling while the graft donor knee was focused on high repetition and low load strengthening exercises to regenerate the graft site. Patients were evaluated objectively with goniometric measurement of ROM, isokinetic quadriceps strength testing, and stability with a KT arthrometer. Subjective data were collected with an activity rating survey and with Cincinnati Knee Rating Scale (CKRS) and International Knee Documentation committee (IKDC) surveys at 2 and 5 years.
Results: Normal extension was attained for 95% of patients at 1 week postoperatively; normal flexion was reached by 77% by 3 months. At 3 months postoperatively, mean limb symmetry index strength was 104%, with both the ACL-reconstructed and graft-donor knees being roughly 86% when compared to preoperative baseline strength. Mean manual maximum stability difference was 2.0 mm at 1 month and was maintained through 2 years. Most patients, 90%, returned to level 8 sports or higher and did so at an average of 5.7 months after surgery. Mean IKDC scores for the ACL-reconstructed and graft-donor knees were 89 and 91 at 2 years and 84 and 90 at 5 years respectively after surgery. Mean CKRS scores for the ACL-reconstructed and graft-donor knees were 92 and 96 at 2 years and 88 and 94 at 5 years respectively.
Conclusion: For patients having an ACL reconstruction using a contralateral PTG, postoperative ROM and strength can be progressed safely, quickly, and effectively by splitting the rehabilitation into different goals between the two knees. Using a contralateral PTG, and this structured rehabilitation plan, can lead to a safe and quick return to sports as well as good subjective outcomes long-term.

O7 A Rare Case of Blastomycosis with Complicating Osteomyeltitis. (Austin Quebedeaux, DPM)

Introduction: Blastomycosis infections are a somewhat rare occurrence effecting 1 to 2 people out of 100,000 individuals yearly in the general USA population. It is found most frequently in North America with a higher occur rate in the Mississippi and Ohio River valley areas as well as the Midwest and areas surrounding the great lakes. It is common in decaying foliage predominantly near lakes and rivers and is typically seen in the male population. Unlike other fungal infections it is known to infect non-immunocompromised individuals. It primarily presents as a pneumonia from aerosolized particles. It can disseminate from this point and cause secondary infections in 25% of individuals. The most common

secondary infections include the soft tissue, genitourinary, and bone and joints. Infection of the bones occurs in 25% of extra-pulmonary infections and is most common in the long bones and vertebrae. Common clinical signs include localized pain and swelling with sinus tract development. Itraconazole remains the gold standard of treatment.
Here we present a case of a spontaneous pedal osteomyelitis in an immunocompetent male with no significant past medical history. This male patient presented to the ED with a previously presumed diagnosis of gout. A new positive x-ray for osteomyelitis of the foot was obtained accompanied with a draining sinus tract. The patient was otherwise asymptomatic with no noted current or previous pulmonary symptoms. The patient underwent Incision and Draining of the foot and subsequently of the hand, with imaging eventually showing osteomyelitis of the foot, hand and even vertebrae.
Methods: We prospectively followed the case of one immunocompetent male, with uneventful history, presenting for case of a spontaneous infection of the foot. Articles were researched on PubMed regarding etiology and treatment of blastomycosis and its dissemination to the bones.
Results: Once a successful diagnosis of blastomycosis was obtained, patient's bone infection and wounds were successfully treated with local wound care and a course of itraconazole.
Discussion: Blastomycosis remains an unusual diagnosis for the typical case of pedal osteomyelitis. Clinical suspicion must remain high especially when typical risk factors are eliminated, which in this case included diabetes, neuropathy, IV drug use, or history of trauma/laceration. A strong suspicion should lead to modified treatment including fungal cultures and more conservative surgical treatment. Close coordination with infectious disease specialists in this case was essential not only for treatment but proper antigen testing which was essential for proper diagnosis.

O8 **Get Faster! Interventions to Increase Clinician Efficiency.** (Daniel Fisher, MD)

Introduction: Current literature is sparse on interventions to improve individual provider efficiency in clinic. Effective interventions and teaching methods regarding efficiency have been proposed but not evaluated for efficacy. In this retrospective review we will assess a multimodal and longitudinal intervention for teaching efficiency.
Methods: The intervention group, a 30 resident family medicine residency, received multiple specified educational interventions for improving efficiency between January 2019 and December 2021. This will be compared to a control group of a smaller similar residency during the same time period, as well as the trend of a larger local group of attending family physicians. Specific objective measures of efficiency will be reviewed including Time in Inbasket Per Appointment, Seconds Per Complete Message, Time in Orders Per Appointment, Time in Notes Per Appointment, Length of Documentation Per Appointment, and Time in Clinical Review Per Appointment.
Results: To be presented at the 2022 Multidisciplinary Scholarly Activity Symposium.
Discussion: To be presented at the 2022 Multidisciplinary Scholarly Activity Symposium.

O9 **Addressing High Attrition Rates of Integrated Recovery Patients Discharged from Inpatient Services.** (Jacob Mulinix, DO; Jennifer Obrzydowski, MD; Jill Souders, LCSW; Jackie Black, LMHC; Ben Coplan, DO; Patrick McGuire, DO; Michael Welling, MD; Emily Zarse, MD)

Introduction: Substance abuse disorder patients have many barriers to following up with outpatient care after discharge from the hospital. These barriers lead to high levels of attrition within this patient population, a phenomenon seen across the United States as well as within Community Health Network. Currently, the attrition rate hovers close to 50 % within patients discharged from our IR and dual diagnosis units who are scheduled for outpatient care at Community associated clinics.

Methods: Our team implemented a script for social work to complete with patients in electronic medical record and nursing staff to read on day of discharge to patients when going over after visit summary. The goal was to standardize important information concerning follow up structure and help improve insight of transition to outpatient management within Community Health Network. The script included the direction to exact location to find specifics regarding outpatient follow up care within the After Visit Summary. Analysis of attrition rates was completed by chart auditing individual patients discharged from the IR and Dual Diagnosis units at CHN 6 months before and after implementation of script.
Results: The attrition rate over a period of 12 months, which included total of 228 patients in Community Health Network, was 66.7%. The attrition rate increased from pre-implementation to post implementation of our script from 57.9% to 74.8%. The SMART phrase was implanted in only 33.3% of eligible patients during post-implementation period. Attrition rate was lower in patient group who did not receive script prior to discharge than with the group of patients which did.
Discussion: Many variables exist which inhibit follow up with outpatient care after discharge in substance use patients. Though more significant barriers exist than communication, they may be beyond our scope for implementation pavilion-wide. Our hypothesis that improved communication prior to discharge from hospital would decrease attrition did not occur. A few major barriers specific to our project that had major impact were inconsistent staffing and turnover of those implementing SMART phrase (social workers, nurses), lack of project representation in the inpatient setting on our team, and abrupt network wide changes with virtual intakes outpatient.

O10 **ED High-Utilizers: A Mission to Address Substance-Related Disorders.** (Amna Siddique, DO; Rohn Nahmias, DO; Kierra Hayes, DO; Kimberlie Wells, DO; Raminder Brar, MD; Areef Kassam, MD; Duncan Brown, MSW; Ian Hylton, BS; Jason Todd, BS)

Introduction: Emergency departments (EDs) are the gateway to the inpatient healthcare world, however when rooms are not available for patients to be seen, the chain is broken and patients cannot receive the help they need. One of the largest, most avoidable, culprits of this issue is related to substance use, with alcohol-related issues being the most common and most expensive of all ED interventions. In 2010, visits to the ED in the United States for alcohol related diagnosis cost nearly $24.5 billion. By analyzing data from the Community Hospital North (CHN) ED, and taking a closer look at patients who have substance use concerns, processes can be improved to streamline visits. By decreasing the number of visits from those with substance use related problems, rooms in the ED will be available on a more regular basis, and wait times in the department could significantly drop. With lower wait times in the ED, more patients can be served, and better quality care can be provided all around.
Methods: To collect data surrounding ED visits from those with a substance use issues, PGY-2 residents collected data from the electronic medical record, EPIC. The team filtered for all patients ages 18 and older who had at least one visit to the CHN ED with substance use documented within the months of July, August, September, or October of 2020. Substance use disorders were defined as stated in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. This search generated 684 charts, and 40 charts were randomly selected from each month selected. Each chart was evaluated for several factors that depicted the ED stay. Additionally, the list was narrowed to patients with two or more visits to the ED for alcohol-related disorders within those four months. The data collected was analyzed by the team to establish common factors and patterns that could contribute to overcrowding in the CHN ED.
Results: After analysis, it was discovered that out of 96 visits included, only once had case management or social work seen the patient. On review of the encounter, there was no documentation of resources provided, only that the patient had been provided with bus tickets. Out of those same visits, three ended with patients being sent directly to an addiction treatment clinic, and 16 others were provided the name, address, and phone number of the clinic on after visit summary.

Discussion: Nearly half of all ED visits in the United States are related to substance use disorders (The DAWN Report, 2010). However, there is a gap in linking patients with substance use disorders to appropriate outpatient resources. The data collected was in line with prior research, and alcohol continued to be the most frequently involved substance related visit to ED visits. Through a literature review, it was found that making individualized care plans is an effective way to manage high utilizing patients. It is the team's hope that education from this presentation will start a conversation about making change.

O11 **The Project ECHO First Responder Resiliency Program: Curriculum Development, Listening Groups and Lessons Learned to Support Providers Virtually during a Pandemic**. (Kimble Richardson, MS, LMHC, LCSW, LMFT, LCAC)

Introduction: The First Responder (FR) Resilience ECHO Program continues as a virtual telementoring platform supporting FRs both within New Mexico and internationally. The program began initially to support FRs through the opioid epidemic, and as the COVID-19 pandemic grew, the curriculum and audience broadened to include self-care and resilience skills to participants around the world. The notion of a FR was changed as providers everywhere were facing new challenges in their front-facing experience, whether this be a sense of overwhelm, an experience of detachment or of overload. The curriculum was altered with ongoing input from participants to address the needs of those working to help others during the COVID-19 pandemic, and included didactics in psychological first aid, self-care and resilience, peak performance skills, communication methods, diagnostic and systems descriptions, as well as the development of effective peer support programs around the nation. Perhaps the most important innovation was the development of listening groups, where participants could connect with one another in breakout rooms (15–20 min) to witness one another's account of their current situation. Project ECHO is a well-established and renowned telementoring program that assists clinicians in the treatment of disease through the demonopolization of knowledge. The FR Resiliency ECHO Program grew out of the core ECHO model to assist FRs in developing skills to work with various crises that our society currently faces, in particular, the opioid epidemic and later, the COVID-19 pandemic. The project created a unique online experience and curriculum to facilitate both skill development and a sense of ongoing connection to a community of peers. This article describes the curriculum, the development of the listening group experience, and the feedback received from participants through focus groups.

O12 **Determinants of Area Agency on Aging Clients Vaccination Registration Intention Status**. (Kara Ann Cecil, DrPH, MPH; Angelitta Britt-Spells, PhD, MPH, MS)

Introduction: The COVID-19 pandemic continues to impact all aspects of society into 2022. The infectious disease poses a disproportionate risk to older adults and adults with chronic diseases. CICOA, as an Area Agency on Aging, serving Marion County and the eight surrounding counties was asked by the Governor to support registration processes. CICOA contacted clients as they became eligible by age in early 2021. This study analyzes the characteristics of CICOA clients who reported having already taken or an intention to take the COVID-19 vaccine and those who do not.
Objective: Determine the prevalence and risk factors of clients' vaccination registration intention status amongst CICOA clients in central Indiana.
Methods: Participants include adults aged 18 and older who were CICOA clients during the COVID-19 pandemic for assistance registering for the COVID vaccine as eligible by age. Clients were contacted to assess if they have already had the vaccine, intend to take the vaccine, need home-bound vaccine services, need assistance registering for the vaccine, or do not plan to take the vaccine.

Results: Prevalence and risk factors will be determined using descriptive statistics and associations via SPSS. The intention of the study is to better understand the populations that do and do not plan to take the COVID-19 vaccine by age, race, gender, housing status, and other potential risk factors for complications with COVID-19
Discussion: The results of this study will help inform future vaccination efforts against novel infectious diseases particularly among vulnerable adult populations. This study will help inform public health education campaigns to improve messaging to vulnerable adult populations.

O13 **Retrospective Analysis Evaluating Impact of Race on Pharmacist Managed Diabetes Outcomes**. (Jocelyn Tao, PharmD; Nick Sciacca, PharmD, BCACP; Lisa Miller, PharmD, BCACP; Megan Dorrell, PharmD, BCACP)

Introduction: Diabetes is one of the most prevalent disease states in America, with a little over 1 in 10 adults being diagnosed. Within this population lies potential for health disparities in diabetes prevalence, outcomes, and treatment with guideline directed care. Numerous studies have shown that minority populations suffer a greater burden of disease, experience more complications, and have poorer diabetes outcomes compared to non-minority populations. The objective of this study is to analyze diabetes outcomes and pharmacy interventions across race to identify potential disparities in care.
Methods: A retrospective chart review will be completed on patients newly referred for pharmacist diabetes management from August 2020-June 2021 to compare diabetes outcomes and care between non-Hispanic white and non-Hispanic black populations. The primary objective will assess mean A1c reduction over 3 months. The secondary objectives will compare percentage of patients attaining A1c <8%, percentage of patients on a statin, number of pharmacy appointments, and number of pharmacist interventions (which includes number of diabetes medication changes). Inclusion criteria include: age 18-90 years old, type 2 diabetes mellitus, baseline A1c >9%, attendance of an appointment with ambulatory care pharmacist under a collaborative drug therapy management (CDTM) protocol at Community Health Network during the study time frame, and at least one additional A1c. Exclusion criteria include: missing race data in chart and vulnerable populations. Results will be compared with descriptive statistics and multivariate analysis to assess the impact of race on diabetes outcomes.
Results: To be presented at the 2022 Multidisciplinary Scholarly Activity Symposium.
Discussion: To be presented at the 2022 Multidisciplinary Scholarly Activity Symposium.

O14 **Evaluating Pharmacist Interventions during Transitional Care Management Visits following a Post-Acute Care Discharge: A Retrospective Chart Review**. (Maria Elizabeth Szeszol, PharmD; Kathryn Pelkey, PharmD, BCACP, BCGP; Jennifer Collins, PharmD, BCACP; Megan Dorrell, PharmD, BCACP)

Introduction: Transitional care management (TCM) is a mechanism by which health systems can improve communication and care coordination upon a patient's discharge. Numerous studies have demonstrated that with TCM, there are reductions in 30 day readmission rates, total health care costs, and the length of stay at post-acute care (PAC) centers. Pharmacists play a vital role in this process by identifying medication errors or concerns; however, there is a paucity of information relating to patients who have a TCM visit conduced post-PAC discharge. This study aims to evaluate the pharmacist scope in post-PAC TCM reviews. This information will help guide future delivery of services by appraising and ascribing pharmacist actions.
Methods: A retrospective chart review was conducted on adults who were discharged from a PAC facility between January 1 2021-June 30 2021 and who had a TCM appointment with a Community

Health Network pharmacist 30 days post-PAC discharge. Patients who were pregnant, incarcerated, or fell outside the range of 18-89 years old were excluded. The primary objective was quantifying pharmacist interventions during TCM visits 30 days after a PAC discharge. Secondary objectives included qualifying pharmacist interventions during TCM visits and describing the number of visits conducted in-person or virtually. A subanalysis was completed to identify if there was an impact on readmission rates based on the time a pharmacist spoke to patient after PAC discharge.
Results: In total, 265 patients met eligibility criteria. The average age at time of discharge was 72 years old. The median time to a pharmacist visit was 3.4 days after PAC discharge. A total of 987 interventions were observed, with an average of 3.7 interventions completed per visit. The most frequent interventions detected include the following: identified that further physician intervention was needed, safety intervention completed, and medication adherence discussed. The majority of patients identified as white (84.6%) and female (61%). There were 3 in-person visits (0.2%) and 264 virtual visits (99.8%), via either telephone or video. Thirty-three patients were readmitted amongst those who met eligibility. Of those, 15 (45.5%) spoke with a pharmacist in <3 days from PAC discharge and 16 (48.5%) saw a pharmacist within 3-7 days of discharge. Patients without a pharmacist-led post-PAC TCM visit had a readmission rate of 18.8% whereas those who completed this type of visit had a readmission rate of 15.9%.
Discussion: This retrospective chart review demonstrated the significant impact pharmacists have on post-PAC TCM visits. These findings were clinically significant and indicated that pharmacists' numerous interventions led to a reduction of all-cause 30-day readmission rates by approximately 3%.

O15 **Implementation of a Comfort Bundle during Routine Shots for Children**. (Scott Showen, MSN, RN, CPN; Cynthia Bowers, DNP, RN, CNE; Susan Tyler, MSN, RN-BC, PCNS-BC, CPN)

Introduction: Needlestick procedures cause pain, anxiety, and fear in children and can have lifelong consequences. Needle-fear is a contributing factor in avoiding health promoting behaviors. Comfort bundles are being implemented in pediatric healthcare settings to provide a more comfortable experience related to procedural pain.
Methods: This project implemented a procedural pain management comfort bundle during routine shots in a pediatric primary care clinic. The "ABCD's comfort bundle" includes, Allowing the child's caregiver to participate, use of the Buzzy device or Breastfeeding for infants, Comfort positions, Distraction techniques, and swaddling for infants. The project design was non-experimental quantitative research using survey data in a pilot setting. Medical team members (n = 10) responsible for the safe administration of immunizations were surveyed for their perceptions related to the acceptability, applicability, and feasibility of implementing the ABCDs comfort bundle elements into clinical practice. Child caregivers (n = 52) were asked to complete a brief survey related to their child's shot experience.
Results: Medical team members demonstrated an overall positive perception of acceptability (AIM, M = 4.3, SD 0.3), applicability (IAM, M = 4.3, SD, 0.2), and feasibility (FIM, M = 4.2, SD 0.2) for ABCDs comfort bundle implementation. Nearly 81% (n = 42) of child caregivers indicated the ABCDs comfort bundle interventions provided their child with a better experience during their shots.
Discussion: The recommendation from this project is to further implement the ABCDs comfort bundle as standard practice in pediatric primary care offices throughout this healthcare organization.

O16 Improved Outcomes and Cost Savings from Attention to National Metrics and Reducing Post-Cardiac Intervention Bleeding

(Michael Robertson, MD; Ashley Ponsler, MSN, RN, FNP-C; Joann Mader, RN; Angie Foley, MSN, RN, CVAPRN-BC; Shellie Robbins, RN; Cheryl Roth, RN; Laine Hunter, RN, BSN, RCIS, CV-BC)

Introduction: Bleeding events around the time of coronary interventions are an important cause of and contributor to peri-procedural morbidity and mortality. The ACC/NCDR Percutaneous Coronary Intervention (PCI) national registry tracks this as an important quality metric for participating hospitals. In 2019 we recognized that our performance at Community Health Network on this national benchmark metric was poor.

Methods: A multidisciplinary team was organized in the Cardiology Product Line to design a quality initiative (QI) project to improve peri-procedural bleeding. The multidisciplinary team reviewed quarterly ACC/NCDR registry data to establish our baseline peri-procedural bleeding rates. The EPIC electronic medical record (EMR) was queried to identify the baseline rate of radial access versus femoral access utilization in PCI across the cardiology service line and by provider. Using the EMR, systematic and thorough reviews were performed on the patients who had suffered bleeding events over the baseline twelve month period. Strategic initiatives were then formulated by the multidisciplinary team. Starting in the first quarter of 2021, educational efforts began for physicians with regards to best practices, particularly emphasizing the known benefits of radial artery utilization for access. Performance relative to peers was given in blinded fashion. Standardized order sets were developed for pre-procedural and post-procedural monitoring and laboratory draws. Every bleeding event was reviewed by the multidisciplinary team to assess for opportunities for improvement, and feedback loops were created to continually funnel this information to the procedural operators and the nurses caring for the patients. A cost analysis was performed, primarily focusing on average length of stay and its associated costs after a PCI, using previously established and published methodology. Our baseline performance assessment in January 2020 showed that collectively, our providers used radial artery access infrequently at 38% (below 50th percentile for best practice nationally). There was significant variability between providers. Our hospital network also had higher peri-procedural bleeding rates at 6% (below the 10th percentile on national benchmark). Multiple interventions were initiated in Quarter 1 of 2020 that included providing education to the physician operators about radial access benefits, and adopting standardized order sets post-procedurally.

Results: By April of 2021 we had increased our use of radial artery access to 58% (above national benchmark). Bleeding rates were decreased from 6% to 2% (above the 50th percentile nationally). In the first six months of 2021 this was estimated to have resulted in a cost savings of approximately $176,000.

Discussion: Peri-procedural bleeding remains a significant cause of morbidity, mortality, and extra cost around the time of percutaneous coronary intervention. Organizing a focused multidisciplinary QI team to implement targeted strategies for process improvement resulted in rapid and dramatic improvement in bleeding rates and outcomes. Our results suggest this type of methodology 1) can result in rapid improvement on quality benchmarks that are becoming increasingly visible to patients, providers, and payors, 2) could likely be used as a model for other focused QI projects, and 3) emphasizes that standardization and adoption of best practices with regards to safety can often result in cost savings.

Physicianeering: How Being a Nerd Can Be Heroic and Fuel Change

Jay Lee, MD
Share Our Selves Community Health Center in Costa Mesa

Jay W. Lee, MD, MPH, FAAFP, is a dynamic physician executive with over a decade of experience leading and innovating in family medicine and primary care delivery systems, Dr. Lee currently serves as Chief Medical Officer at Share Our Selves, a federally-qualified health center in Orange County, CA, and the recipient of the Primary Care Collaborative's 2020 Advanced Primary Care Practice Award.

After graduating from the Program in Human Biology at Stanford University, Jay worked for a non-governmental organization in post-war rural northern El Salvador supporting local physicians, organizing public health projects, and growing his hair long before returning stateside for medical school at the University of Southern California and family medicine residency training at Long Beach Memorial Medical Center. He then worked at community health centers in southern California and Boston, where he earned his Masters of Public Health at Harvard University with an emphasis in Health Policy and Management.

Dr. Lee co-founded the Family Medicine Revolution, a grassroots social media brand (#FMRevolution) giving the power of telling family medicine's story back to family physicians and building a global community of thought leaders, and was recognized as the California Academy of Family Physicians' 2018 Hero of Family Medicine and 2021 Family Physician of the Year. He is married to a local pediatrician with whom he shares the joys and the challenges of raising 3 children.

POSTER PRESENTATIONS

Effects of 1-Week Bed Rest on Complication Rate and Range of Motion Following Total Knee Arthroplasty

Sarah Eaton, PT, DPT, ATC, LAT, and Rodney Benner, MD
Shelbourne Knee Center at Community East Hospital, Indianapolis, IN

Introduction

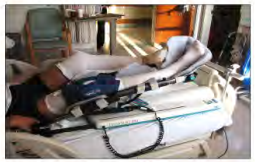
- Current rehabilitation protocols after total knee arthroplasty (TKA) encourage early ambulation to avoid potential medical complications, such as DVT, PE, joint infection, and/or hospital re-admission.
- It is theorized that bedrest after TKA would increase a patient's likelihood of developing such complications, but very little research supports this.

Hypothesis

- We hypothesized that, with our protocol of bedrest in the first week post-operatively, our rate of post-operative complications after TKA would not be higher than rates reported in current literature.

Methods

- Between 2012-2018, 641 total knee arthroplasties were performed by a single orthopedic surgeon in 463 patients and enrolled in a long-term outcome study.
- In 463 enrolled patients:
  - 285 were unilateral TKA
  - 95 were bilateral TKA (190 knees)
  - 83 were staged TKA (166 knees)
- All patients completed the same post-operative rehabilitation program to restore full, symmetrical range of motion (ROM) and strength.
- Goals of the early post-operative phase from 1-7 days:
  - Decrease swelling
  - Increase ROM
  - Promote normal leg control
  - Promote normal gait with assistive device
- Patients wear TED hose and use cold/compression and continuous passive motion (CPM) machine with the knee elevated.



- Patients remain supine with the leg elevated in the CPM with restroom privileges only in order to minimize swelling, and perform physical therapy exercises three times daily to maximize ROM and maintain proper quadriceps/leg control.

Results

- Out of 641 surgeries performed, there were 22 total complications reported in 20 patients (3.4%).

Total Reported Complications

(N)	% of study pop.	Complication
1	0.2%	Medial Femoral Condyle Fracture
1	0.2%	Hospital Readmission for Pain
1	0.2%	Patellar Dislocation
2	0.3%	Deep Vein Thrombosis
2	0.3%	Scar Resection for Extension Loss
4	0.6%	Joint Infection
5	0.8%	Manipulations Under Anesthesia For Flexion Loss
6	0.9%	Heart/Lung Related Problem

- Average ROM for patients at 1 week post-op was 0-2-104 degrees, at 2 weeks post-op was 0-1-112 degrees, and at 1 month post-op was 0-0-117 degrees.

Literature Review

- Our rate of motion loss of <1% rate compares favorably with that of current literature.
  - Systematic review by Zachwieja et al. reported 1.3-5.8% prevalence rate of stiffness
  - Werner et al. and Issa et al. reported MUA rates of 4.3% and 4.9% respectively.
- When comparing our rate of DVT, this also compares favorably with current literature, as multiple studies show DVT rates between 0.22-0.52%.
- Our infection rate compares with that of Teo et al. and Anis et al., who reported 0.44% and 0.7% prosthetic joint infection rates respectively.

Conclusion

- Patients did not have an increase in common complications seen after TKA despite compliance with our rehabilitation protocol that promotes immediate post-op 7-day bedrest.

Community Health Network

Contact information:
Sarah Eaton, Physical therapist
Phone #: 317-957-9314
Email: seaton2@ecommunity.com

SHELBOURNE KNEE CENTER

Return of Quadriceps Strength Following an Anterior Cruciate Ligament Reconstruction Based on Patellar Tendon Width for Contralateral and Ipsilateral Patellar Tendon Grafts

Nicholas Brown, OMS-II, K. Donald Shelbourne, MD
Shelbourne Knee Center at Community Hospital East, Indianapolis, IN

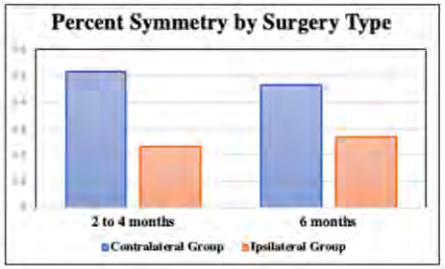
Introduction and Purpose

- After anterior cruciate ligament reconstruction (ACLR), quadriceps muscle strength is an important factor in an athlete's confidence and ability to return to activity.
- The return of quadriceps strength following surgery using an ipsilateral patellar tendon graft (PTG) has shown that larger tendons regain strength faster compared to smaller tendons.
- To achieve post-operative goals faster and more predictively, a contralateral PTG can be done.
- The purpose of this study was to determine differences in strength based on patellar tendon width (PTW) for those having surgery utilizing an ipsilateral and contralateral PTG.

- 114 patients having an ACLR were split between PTW, small (≤28 mm) and large (>28 mm), as well as surgery type, ipsilateral and contralateral.

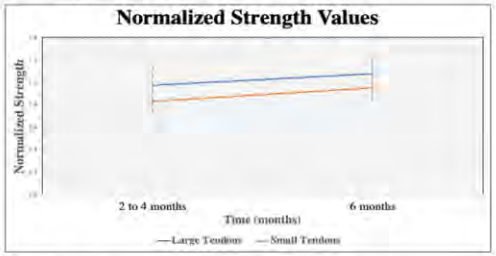
Patients within Each Group		
	Small Tendon	Large Tendon
Contralateral graft	35	23
Ipsilateral graft	22	34

- A similar rehabilitation plan was followed for both surgery types, however, ipsilateral patients worked on regaining motion before strengthening, while contralateral patients immediately began strengthening on the graft side.
- Strength of the graft donor site was assessed using isokinetic strength testing at 180°/second and measured at 3 and 6 months postoperative. Strength was normalized by dividing the strength value by body weight.
- Symmetry was defined as strength between each leg being within 90% of each other.



- Patients with a contralateral PTG showed a higher distribution of symmetric strength (52%) when compared to ipsilateral PTG (23%) at the 3-month time point, but not at the 6-month time point.
- Only small tendons showed statistically significant symmetry difference at 3 months when compared between surgery types.

- Larger tendons showed higher strength values at both time points, regardless of surgery group, but failed to reach statistical significance.



- Neither large or small tendons showed statistical significance at 6 months.

Conclusion

- Regardless of surgery type, large tendons have higher strength values when compared to smaller tendons, but this is not a statistically significant difference.
- Patients undergoing contralateral PTG measure symmetric at a higher rate than patients undergoing ipsilateral PTG, most notably with smaller tendons.

Clinical Relevance

- Special attention early in the rehabilitation program should be made to those having an ipsilateral PTG, and have tendons smaller than 28 mm, as strength may be more difficult to regain following an ACLR.

Achieving Strength Limb Symmetry after ACL Reconstruction is Not Associated with Subsequent ACL Injury Rates

Sarah Eaton, PT, DPT, ATC, LAT
Shelbourne Knee Center at Community East Hospital, Indianapolis, IN

Introduction

- After ACL reconstruction, the primary goal is to allow patients to return to their pre-injury level of sport while minimizing the risk of subsequent injury.
- Return-to-sport criteria often include isokinetic muscle tests and functional tests, but there are conflicting findings regarding the relationship between passing specific return-to-sport tests and the risk of subsequent ACL injury.

Purpose/Hypothesis

- The purpose of this study was to investigate the association between achieving limb symmetry with objective strength testing at the time patients returned to sport and sustaining a subsequent ACL injury.
- We hypothesized the subsequent ACL tear rate to either knee will be higher in patients that did not achieve limb symmetry to within 10% with strength and functional testing at the time of return to sport compared to those that did achieve limb symmetry at the time of return to sport.

Methods

- Between 1995-2018, 1251 patients who were <18 years old at the time of primary ACL reconstruction with contralateral patellar tendon graft were enrolled in a long-term follow-up study, of which 559 patients returned to sport at <6 months after surgery and were the subjects for this analysis.
- Patients reported their timing of return to sport using a self-reported activity rating scale.
- Patients completed an assessment of quadriceps strength using Cybex isokinetic dynamometer testing at 180°/sec and 60°/sec and hop performance using single leg hop testing.
- We recorded subsequent ACL injury to either knee within 2 years of surgery.
- Patients were categorized into two groups – symmetry "yes" (strength within 10% between knees) or symmetry "no" for each test.
- Injury rates for each knee were evaluated based on the two groups.

Results

- Of 559 patients meeting criteria for the study, 424 had complete strength data for analysis (76%).
- Thirty-six patients sustained an ACL graft tear (8.5%) and 16 patients sustained a contralateral knee tear (3.8%).
- Patients in the ACL graft tear group returned to sport at a mean of 3.8 months vs. no tear group at 3.9 months (P=.381).
- Patients in the ACL opposite tear group returned to sport at a mean of 4.0 months vs. no tear group at 3.9 months (P=.712).

# of Patients with Limb Symmetry "Yes" or "No"			
	Cybex 180°/sec	Cybex 60°/sec	Single Leg Hop
Symmetry "yes"	214/424 (52%)	142/424 (34%)	312/424 (76%)
Symmetry "no"	210/424 (48%)	282/424 (66%)	112/424 (24%)
P-value (ACL graft tear)	.422	.828	.128
P-value (ACL opp knee tear)	.525	.445	.239

- There was no statistically significant difference between symmetry "yes" and symmetry "no" groups for those that went on to sustain an ACL graft tear or ACL opposite knee tear for quadriceps strength at 180°/sec and 60°/sec, or single leg hop test.

Conclusion

- Patients who did not achieve strength limb symmetry with quadriceps and single leg hop testing at the time of return to sport did not have a statistically significantly higher rate of sustaining a subsequent ACL injury compared to those that did achieve symmetry.
- Strength limb symmetry alone may not be the best way of determining the likelihood of subsequent ACL injury and should be used in conjunction with other clinical factors.

Community Health Network

SHELBOURNE KNEE CENTER

Subcutaneous Verrucous Carcinoma of the Plantar Calcaneus

[1]Jay Badell DPM MS, [1]Daniel Elmes DPM MPH, [1]Paige Danner DPM, [2]Tracy Lee DPM

[1]PGY3 Resident, Community Health Network, Indianapolis, IN; [2]Foot and Ankle Surgeon, Podiatry Associates of Indiana, Indianapolis, IN

Introduction/Purpose

Verrucous carcinoma (VC) is a rare diagnosis, and even more rare when encountered in the deep tissues of the foot. VC is a type of squamous cell carcinoma, and can occur in any area of the skin or mucosa (1). Although it has low metastatic potential, it can have adverse effects on surrounding tissues, and thus should be treated with wide excision or amputation. When it comes to malignant tumors of the foot and ankle, prompt identification, diagnosis, and referral to the appropriate specialist is vital in the treatment of the patient.

Case Report

Our patient presented to the surgery center in July of 2020 for surgical excision of a plantar medial heel wound with primary closure. The patient was an uncontrolled diabetic and had >1 year history of this wound with local wound care and surgical debridement. The patient did have a biopsy by an outside provider approximately 1 year earlier, which returned as "wound tissue". The patient had no evidence of bony changes on radiographs, or clinical abnormality suggesting alternate diagnosis to chronic diabetic wound. Operative summary is described here:

Patient was brought into the operating room under monitored anesthesia care with local in supine position and high ankle tourniquet. The wound visualized on the plantar medial heel was approximately 3mm in diameter with deep extension into the soft tissues. Two semi elliptical incision were made about the wound and the skin was excised (Fig. A blue arrow). Upon further examination of the surgical wound, a well defined soft tissue mass was noted within the plantar calcaneal fat pad. The abnormal appearing tissue was located extending from the wound base and traveled laterally along the plantar aspect of the foot in close apposition to the plantar fascia. The soft tissue mass appeared to have its own blood supply and was fully encapsulated and spongy in nature. Sharp and blunt dissection was used to carefully dissect around the soft tissue mass along the plantar aspect of the right heel with care taken to leave only normal-appearing tissue in the foot. It is important to note that the surrounding subcutaneous fat was distinctly separate from the soft tissue mass. Once the soft tissue mass had been fully dissected and no further abnormal tissue was visualized, the soft tissue mass was completely removed from the plantar aspect of the right heel and placed on the back table (Fig. A green arrow, Fig. B). This soft tissue mass was labeled and sent to pathology. Incision and surgical site were then flushed with 3L of sterile normal saline in pulse lavage fashion. Bone biopsy was also taken at this time from the calcaneus. Wound was primarily closed and foot was placed in a sterile dressing.

Case Report

The bone biopsy taken was negative for osteomyelitis. The pathology report was received 8 days later reading 4.1 x 3.0 x 2.1 cm irregular shaped lobulated tan-pink soft tissue containing atypical squamous hyperplasia suggestive of verrucous carcinoma. Pathology recommended further excision of the lesion due to atypical cells extending into the peripheral margins of the submitted specimen. It was at this time that referrals to dermatology and oncology were made for further follow up. Patient underwent conservative and surgical interventions after diagnosis from several care teams including foot and ankle surgery, dermatology, and oncology. The patient failed to follow-up consistently and unfortunately developed diffuse osteomyelitis of the calcaneus. The patient underwent below knee amputation on the affected limb.

Fig. A

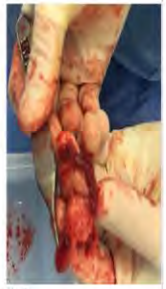


Fig. B

Discussion

Initial literature review indicates very few reported cases of VC of the foot, with even fewer located in the deep tissues (2). One study by Pempinello et al. identified a case of verrucous carcinoma that invaded the adjacent bony structures of the foot and ankle, which required below knee amputation (3). Several other studies have noted VC in the dermal and epidermal layers of the foot and ankle. Di Palma et al. presented a similar case of bilateral VC in a patient with chronic diabetic ulcers, which also delayed the diagnosis (4). They stress the importance of high index of suspicion for chronic non-healing wounds in the diabetic foot.

Although slow growing, verrucous carcinoma is a malignant soft tissue tumor and must be handled with care and prompt treatment to prevent further spread. In some cases with deeper involvement into adjacent structures, amputation may be warranted. Unfortunately our patient underwent amputation due to osteomyelitis of the calcaneus.

1. Miller SB, Brandes BA, Mahmarian RR, Durham JR. Verrucous carcinoma of the foot: a review and report of two cases. J Foot Ankle Surg. 2001 Jul-Aug;40(4):225-31.
2. Gordon DK, Ponder EN, Berrey BH, Kubik MJ, Sindone J. Verrucous carcinoma of the foot, not your typical plantar wart: a case study. Foot (Edinb). 2014 Jun;24(2):94-8.
3. Pempinello C, Bova A, Pempinello R, Luise R. Verrucous carcinoma of the foot with bone invasion: a case report. Case Rep Oncol Med. 2013 Apr 9.
4. Di Palma V, Stone JP, Schell A, Dawes JC. Mistaken Diabetic Ulcers: A Case of Bilateral Foot Verrucous Carcinoma. Case Rep Dermatol Med. 2018 Jan 23.

Financial Disclosures: none

Effects of Varying Blood Flow Restriction Pressures on Heart Rate, Microvascular Oxygenation, and Pain During Walking Exercise

Peyton Romig[1], Scott Hjelm[1], Yousef Abd El Raouf[1], Kelly M. Naugle[2], Nathanial R. Eckert[1], Trent E. Cayot[1]
[1]University of Indianapolis, Indianapolis, Indiana, USA
[2]Indiana University Purdue University - Indianapolis, Indianapolis, Indiana, USA

Abstract

INTRODUCTION: Application of blood flow restriction (BFR) techniques, partially restricting blood flow to exercising limb(s), have demonstrated beneficial cardiorespiratory adaptations (increased maximal oxygen uptake) when used during low-intensity (walking) training programs. An important variable practitioners must consider when using BFR is what occlusion pressure to use during exercise. Exercising occlusion pressures can be individually prescribed as a submaximal percentage of the participant's limb occlusion pressure (LOP). Understanding how the magnitude of exercising occlusion pressures impact the exercise response could provide evidence to better design BFR exercise prescriptions. Therefore, the primary aim of the study was to investigate the effects that exercising occlusion pressures had on heart rate (HR), microvascular tissue oxygenation (StO_2), and pain responses during walking exercise. **METHODS**: Five healthy adult subjects reported for three testing sessions separated by at least 48 hours. During session one, subjects walked on a treadmill for 15 minutes at a speed that elicited a rating of perceived exertion of 3/10 (RPE3). During the remaining sessions, subjects walked on a treadmill for 15 minutes at the session 1 speed with application of a randomized exercising occlusion pressure of either 40% LOP (40BFR) or 80% LOP (80BFR) applied bilaterally to the proximal thighs. Heart rate and near-infrared spectroscopy sensors were used to continuously record the HR and StO_2 (vastus lateralis) responses during the exercise sessions, respectively. Perceived pain (Visual Analog Scale (VAS), 0-100) was recorded every minute throughout the exercise sessions. Two-way repeated measures analysis of variance was used to examine if exercise condition (RPE3, 40BFR, 80BFR) and/or time (1-15 min) had an effect on HR, StO_2, or perceived pain. Significant main effects were further analyzed using Tukey's post hoc analysis. Significance was established at $p<0.05$. **RESULTS**: 80BFR (55±10 percent heart rate reserve, %HRR) resulted in a higher exercising HR compared to RPE3 (20±2 %HRR) and 40BFR (24±2 %HRR) throughout the entire exercise session. 80BFR (-31.5±22.3 delta baseline, ΔBSL) elicited a greater local metabolic demand (lower StO_2) compared to RPE3 (2.2±10.6 ΔBSL) during minutes 8-15. 80BFR (61±17 VAS score) and 40BFR (24±6 VAS score) elicited a higher perceived pain compared to RPE3 (0±0 VAS score) throughout the entire exercise session. 80BFR also resulted in a higher perceived pain compared to 40BFR throughout the entire exercise session. **DISCUSSION**: According to the present findings, it is recommended when using BFR during low-intensity walking to prescribe an occlusion pressure higher than 40BFR, as 40BFR did not significantly alter the cardiovascular (HR) or local metabolic demand (StO_2) during the walking exercise despite increasing the perceived pain. Although 80BFR did elevate exercising HR, it was not until 8 minutes of walking that the local metabolic demand was altered. However, practitioners/clinicians should consider that 80BFR resulted in the highest perceived pain during exercise which may challenge a participant's exercise tolerance of the modality.

Introduction

- Aerobic exercise combined with blood flow restriction (BFR) has shown positive neuromuscular, metabolic, and cardiovascular adaptations in healthy, obese, and elderly adults (5).
- Near-infrared spectroscopy (NIRS) sensors emit near-infrared light (650 -1000 nm) into the tissue of interest. The near-infrared light will either be absorbed or refracted based upon if the hemoglobin/myoglobin is oxygenated or deoxygenated (3).
- Maximal oxygen uptake (VO_{2max}) and exercising stroke volume has been shown to increase while exercising heart rate (HR) decreased subsequent to a BFR walking intervention (5). Additionally, dynamic strength (one repetition maximum) and muscle cross sectional area increases following a BFR walking intervention (1).
- The primary aim of the study was to investigate the effects that exercising BFR occlusion pressures had on HR, microvascular tissue oxygenation (StO_2), and pain responses during walking exercise.

Methods

- 10 healthy adult subjects (age = 24 ± 3 years) completed three walking sessions for 15 minutes on a treadmill (T170DE, Cosmed, Rome, Italy) under one of three conditions (RPE3, 40BFR, 80 BFR) while HR, StO_2, THb, and perceived pain were collected.

Limb Occlusion Pressure
- Posterior Tibial Artery
- Doppler Ultrasound & Rapid Cuff Inflator (Figure 1A)

Near-Infrared Spectroscopy
- Vastus Lateralis Midpoint of Dominant Leg (Figure 1B)
- Two Minute Resting Baseline (Data Normalization, ΔBSL)

Exercise
- RPE3 - 15 Minute Walk At RPE 3
- 40BFR – 15 Minute Walk At RPE 3 With 40%LOP
  - 113 ± 21 mmHg
- 80BFR – 15 Minute Walk At RPE 3 With 80%LOP
  - 223 ± 26 mmHg

- Exercising StO_2 and THb data was averaged for the last 15 seconds of each minute and normalized to the resting baseline (2). Thus exercising StO_2 and THb data are presented as a change from baseline (ΔBSL).
- HR was continuously monitored throughout exercise using a HR monitor (Polar Electro, Lake Success, NY) and was recorded within the last 15 seconds of each minute.
- Every minute throughout the exercise bout the perceived pain was recorded using a visual analog scale (0 – 100).
- Two-way repeated measures analysis of variance was used to determine if exercise condition (RPE3, 40BFR, 80BFR) and/or time (1-5 min) affected exercising StO_2, THb, HR, and/or perceived pain. Significant main effects and pairwise differences were further analyzed using Tukey's post-hoc test.
- Statistical significance was established *a priori* at $p < 0.05$.

Figure 1A. Assessing limb occlusion pressure (LOP) using Doppler ultrasound and rapid cuff inflator (LEFT). **Figure 1B.** Placement of near-infrared spectroscopy sensor on dominant leg (RIGHT).

Results

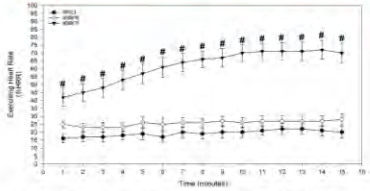


Figure 2. Exercising Heart Rate (HR). *Significantly different from RPE3. #Significantly different from RPE3 and 40BFR.

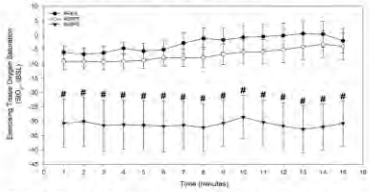


Figure 3. Exercising Tissue Oxygen Saturation (StO_2). *Significantly different from RPE3. #Significantly different from RPE3 and 40BFR.

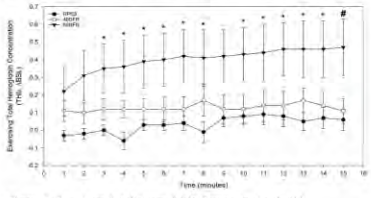


Figure 4. Exercising Total Hemoglobin Concentration (THb). *Significantly different from RPE3. #Significantly different from RPE3 and 40BFR.

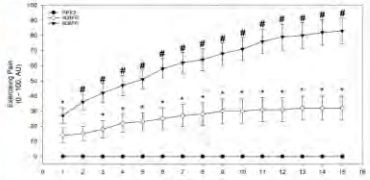


Figure 5. Perceived Pain During Exercise. *Significantly different from RPE3. #Significantly different from RPE3 and 40BFR.

Conclusions

- 80BFR (42-72 %HRR) significantly increased exercising HR compared to RPE3 (16-22 %HRR) and 40BFR (23-28 %HRR) throughout the entire exercise bout (Figure 2).
- 80BFR (-28.6 to -32.8 ΔBSL) significantly increased exercising metabolic demand (lower StO_2) compared to RPE3 (0.5 to -6.7 ΔBSL) and 40BFR (-3.2 to -9.4 ΔBSL) throughout the entire exercise bout (Figure 3). The 80BFR metabolic demand was similar to the metabolic demand (-30.0 to -31.5 ΔBSL) previously observed during peak cycling intensities without BFR (2).
- 80BFR elicited a higher microvascular blood volume (higher THb) compared to RPE3 during minutes 3-8 and 10-15 (Figure 4). Additionally, 80BFR yielded a higher microvascular blood volume compared to 40BFR during minute 15 (Figure 4).
- 80 BFR elicited a higher perceived pain response during most (minutes 2-15) or the entire exercise bout compared to 40BFR (80BFR = 36-83, 40BFR = 15-32) and RPE3 (80BFR = 27-83, RPE3 = 0), respectively (Figure 5). 40BFR (18-32) had a higher perceived pain response compared to RPE3 (0) during minutes 3-15 (Figure 5).
- When prescribing occlusion pressures, practitioners are encouraged to use occlusion pressures higher than 40BFR as this condition did not significantly alter the physiological stress (HR, StO_2, THb) from the control condition (RPE3) but did elicit a greater perceived pain.
- Although 80BFR did provide significant central (HR) and peripheral (StO_2, THb) stresses during exercise, 80BFR also elicited the highest perceived pain. This high level of perceived pain may challenge a participant's exercise tolerance of the modality.

References

1. Abe T, Kearns CF, Sato Y. *Muscle size and strength are increased following walk training with restricted venous blood flow from the leg muscle, Kaatsu-walk training.* J Appl Physiol 100: 1460-1466, 2006.
2. Cayot TE, Robinson SG, Davis LE, Bender PA, Thistlethwaite JR, Broeder CE, Lauver JD. *Estimating the lactate threshold using wireless near-infrared spectroscopy and threshold detection analyses.* Int J Exerc Sci 14: 284-294, 2021.
3. Jones, S., Chiesa, S. T., Chaturvedi, N., & Hughes, A. D. *Recent developments in near-infrared spectroscopy (NIRS) for the assessment of local skeletal muscle microvascular function and capacity to utilise oxygen.* Artery Research, *16*: 25-33, 2016.
4. Park S, Kim JK, Choi HM, Kim HG, Beekley MD, Nho H. *Increase in maximal oxygen uptake following 2-week walk training with blood flow occlusion in athletes.* Eur J Appl Physiol 109: 591-600, 2010.
5. Silva JCG, Neto EAP, Pfeiffer PAS, Neto GR, Rodrigues AS, Bemben MG, Patterson SD, Batista GR, Cirilo-Sousa MS. *Acute and chronic responses of aerobic exercise with blood flow restriction: a systematic review.* Front Physiol 10:1239, 2019. doi: 10.3389/fphys.2019.01239.

Community Health Network

Conversion Disorder Mimics True Pathology

Jacob L. Holtz, DO, Brittany Simpson, DO
Community Health Network-Osteopathic Family Medicine Residency Program

Introduction:

- Conversion disorder, or functional neurologic symptom disorder, is a rare disorder in the general public with an annual incidence of four to 12 per 100,000 and a prevalence of 50 per 100,000 .
- The estimated healthcare cost for patients with conversion disorder in the United States is around $20 billion annually.
- The case discussed is an example of a patient with conversion disorder that developed after a cerebrovascular accident (CVA) and the patient's subsequent medical encounters.
- This case study serves to demonstrate a patient whose conversion symptoms mimic those of his original CVA, an uncommon finding.

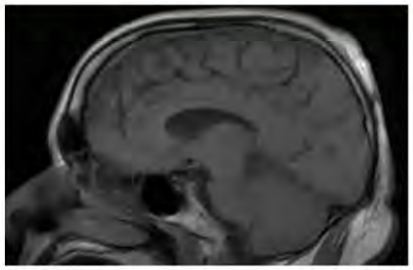
Case Presentation:

- 48-year-old male who presented to the hospital several times over the course of approximately one year.
- His initial presentation was due to a CVA which required several weeks of rehabilitation.
- He returned to the hospital two months after the CVA for atypical chest pain requiring a coronary artery bypass graft.
- Since the CVA and bypass graft, the patient visited the hospital several times for stroke-like symptoms following large emotional events.
- Symptoms included right sided hemiparesis, facial droop, tremoring, and decreased speech; symptoms consistent with his previous CVA.
- Each visit, the patient had thorough workup to exclude another CVA, but each time the workup was unremarkable.

Differential Diagnosis:

- Cerebrovascular accident
- Transient ischemic attack
- Major depressive disorder with abnormal features
- Factitious disorder
- Conversion Disorder

Imaging:



No new or acute abnormalities!

Final Diagnosis:

- **Conversion Disorder**

Treatment/Outcome:

At presentation:

- CVA-like symptoms; ruled out with CT and MRI
- Neurology consultation; no apparent medical explanation
- Psychology consultation; ruled out mood disorder, personality disorder, and factitious disorder

Follow Up:

- Diagnosis of conversion disorder discussed with patient; verbalized understanding at that time
- Advised SSRI and cognitive behavioral therapy (CBT) as an outpatient
- Patient has not followed up with PCP or psychiatry despite repeated attempts at scheduling and discussion
- Patient has refused CBT to date
- Patient has visited the emergency department for similar symptoms at least five times that is demonstrated in the chart; negative workup in ED each time

Discussion:

- This case of conversion disorder serves to demonstrate the difficulty with treating conversion disorder in many patients.
- The literature suggests that symptoms persist in 40-66% of patients[1].
- Worse prognosis is associated with paralysis, tremor, and dystonia compared with sensory symptoms[1].
- The unique part of this case is the conversion symptoms experienced by the patient are the same as the patient's original CVA symptoms.
- This patient's presentation poses a challenge regarding the very decision making that occurs in the office as well as emergency setting when a potential CVA could be missed
- While his symptoms are somewhat consistent with common symptoms of conversion disorder, the patient has a significant medical history including a CVA that presented in the same manner as his conversion symptoms.
- There may be a place to discuss the nuances of missing a diagnosis and anchoring bias. There is no known data on malignancy risk from repeated head imaging, but cost is certainly increased in the long term.

References:

- Ali, S., Jabeen, S., Pate, R., Shahid, M., Chinala, S., Nathani, M., Shah, R. Conversion disorder-mind versus body: a review. *Innovations in Clinical Neuroscience* 2015; 12: 5-6 (27-33). Published 2015 May-June. PMC4479361.
- Stone, J., Sharpe, M. Conversion disorder in adults: Epidemiology, pathogenesis, and prognosis. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA. (Access on December 16, 2021.)

Psychosis in an Adult Male Undergoing Methadone Taper: A Case Report

Community Health Network

Heinrich Aurnhammer, OMS-IV; Taimur Mian, MD; Kiersten Olsen, MD; Elizabeth Cunningham, DO

Aim

We present this case to bring to attention that methadone withdrawal can present with psychiatric sequelae including psychosis, and to further discuss diagnostic and management challenges.

Introduction

Methadone is a long-acting full opioid agonist and is commonly used as maintenance treatment for patients with chronic opioid dependance (4). Upon tapering of methadone maintenance dose, it is expected that mild opioid withdrawal symptoms can be precipitated with each dose decrease. However, in a few cases methadone withdrawal has been associated with the development of psychiatric symptoms (1,3).

Our case report aims to highlight the unusual presentation of primary onset psychosis in a 39-year-old former opioid addict undergoing a methadone taper.

Psychotic symptoms, such as delusions, hallucinations or disorganized thinking can broadly be categorized into 3 groups: Idiopathic psychoses, psychoses due to a medical condition, and toxic psychoses (2).

Psychosis induced by recreational substances is a subcategory of toxic psychoses and includes psychotic symptoms that are temporally related to substance intoxication or withdrawal (2). Although rare, it is important for the astute clinician to recognize and manage methadone withdrawal psychosis.

Case Presentation

A 39-year-old Caucasian male with past psychiatric history of generalized anxiety disorder, panic disorder, major depressive disorder, insomnia and opioid use disorder on methadone maintenance, presented to the crisis clinic with psychotic symptoms. He had a previous psychiatric hospitalization the week prior for primary onset of psychosis. Of note, the patient had been diagnosed with opioid use disorder, severe, dependence (hydrocodone) after a MVC in the early 2000s associated with several lumbar compression fractures. He had been on chronic methadone maintenance treatment for years with highest documented maintenance dose of 122 mg daily. Later during his admission, the patient revealed that his outpatient dose of methadone had been weaned to 103 mg. The decrease in methadone over the past few weeks coincided with his new onset psychosis.

Management & Outcome

Upon further evaluation and insufficient ability to safety plan, he was admitted to the inpatient psychiatry unit for further evaluation and treatment. Home medications at time of psychiatric admission included lisinopril, paroxetine, buspirone, trazodone, and methadone. Risperidone had been started during the previous admission.

Physical exam was unremarkable. Mental status exam revealed "anxious" mood and blunted affect. His thought process was linear, and goal directed, but at times he became disorganized, e.g. abruptly standing during interview. Labs (thyroid panel, lipid profile, CBC, CMP) were unremarkable except his UDS (positive for methadone). MRI brain with and without contrast showed few, nonspecific, small, scattered hyperdense foci that may relate to sequela of migraines.

During hospitalization, risperidone was replaced with aripiprazole for concerns of QT prolongation with a QTc of 484 milliseconds. Aripiprazole was titrated without clear benefit and replaced with olanzapine, which provided relief of negative symptoms. Aripiprazole was added back on eventually due to resistant psychotic symptoms.

Despite dual antipsychotic therapy, only mild improvement of psychotic symptoms were achieved. Ultimately the patient was stable to safety plan and was discharged. However, since discharge, the patient had multiple re-admissions for psychotic symptoms.

Figure 1: https://www.uspharmacist.com/CMSImagesContent/2012/5/_USP1205-Opiate-tbl-T2.gif

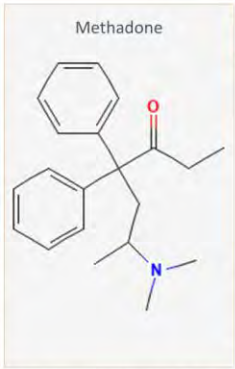


Figure 2: https://www.ncbi.nlm.nih.gov/books/NBK501233/

Discussion

The case describes the importance of recognizing atypical symptoms of opioid withdrawal such as psychosis. While common side effects are listed in figure 1, unusual side effects, such as psychotic symptoms are possible, especially as part of a post-acute withdrawal syndrome.

Though further research is required to determine specific mechanisms by which methadone withdrawal can lead to psychosis, hypotheses include methadone being a drug with antipsychotic properties, changes in the kappa-opioid receptor activation, and attenuated opioid withdrawal (5).

Of note, neither antipsychotic provided significant relief in positive symptoms. It is mentioned in literature, that an increase of methadone dose, back to the original dose has been successful in treating psychosis in similar cases (4). This intervention was not attempted in the patient.

There should be a high degree of suspicion for methadone induced psychosis, onset during withdrawal, when there is a temporal relationship with methadone tapering and the onset of psychosis. Management with antipsychotics may not work, and treatment may require increasing the patient's methadone dose.

References

1. Levinson I, Galynker II, Rosenthal RN. Methadone withdrawal psychosis. J Clin Psychiatry. 1995 Feb;56(2):73-6. PMID: 7852256.
2. Lieberman JA, First MB. Psychotic Disorders. N Engl J Med. 2018 Jul 19;379(3):270-280. doi: 10.1056/NEJMra1801490. PMID: 30021088.
3. Lozano-López MT, Gamonal-Limcaoco S, Casado-Espada N, Aguilar L, Vicente-Hernández B, Grau-López L, Álvarez-Navares A, Roncero C. Psychosis after buprenorphine, heroin, methadone, morphine, oxycodone, and tramadol withdrawal: a systematic review. Eur Rev Med Pharmacol Sci. 2021 Jul;25(13):4554-4562. doi: 10.26355/eurrev_202107_26248. PMID: 34286498.
4. Pacini M, Maremmani I. Methadone reduces the need for antipsychotic and antimanic agents in heroin addicts hospitalized for manic and/or acute psychotic episodes. Heroin Addict Relat Clin Probl. 2005;7(4):43-8.
5. Sutter M Md, Walter M, Dürsteler KM, Strasser J, Vogel M. Psychosis After Switch in Opioid Maintenance Agonist and Risperidone-Induced Pisa Syndrome: Two Critical Incidents in Dual Diagnosis Treatment. J Dual Diagn. 2017 Apr-Jun;13(2):157-165. doi: 10.1080/15504263.2016.1269224. Epub 2016 Dec 9. PMID: 27935442.

Community Health Network

A Case of COVID-19 Induced Mania

Alison Cheng, MD, Swetha Uppalapati, DO, Taimur Mian, MD

Introduction

- SARS-CoV-2 (COVID-19) is in the same group of beta-coronaviruses as SARS and MERS, which have lead to development of neuropsychiatric symptoms
- Symptoms can include encephalitis, manic-depression, agitation, and delirium
- We present a case of new-onset mania in a patient recently infected with COVID-19
- Review of neuropsychiatric manifestations of SARS/MERS infections can provide valuable clinical insight into the symptoms and complications that may arise from COVID-19

Case Presentation

A 54-year-old male was admitted for psychiatric evaluation due to a sudden change in behavior suggestive of a manic episode. **The patient displayed pressured speech, increased goal-directed activity, psychomotor agitation, flight of ideas, tangentiality, and mood lability on evaluation.** He had no significant past medical, psychiatric, or substance abuse history. **Head CT, RPR, Vit B12, Folate, CBC, CMP, EKG, and UA were unremarkable. The only significant history was a recent COVID-19 diagnosis 15 days prior to admission.** He reported cold-like symptoms which resolved during isolation. Given the unlikeliness of first-break mania at this patient's age and no other apparent biological cause of his mania, consideration was given to COVID-19 induced mania.

Management and Outcome

The patient was hospitalized for 16 days and required three mood stabilizers (Invega, Lithium, and Depakote) to show improvement. Patient had some residual manic symptoms at time of inpatient discharge, but had resolution of his symptoms 9 days post-discharge on outpatient follow-up.

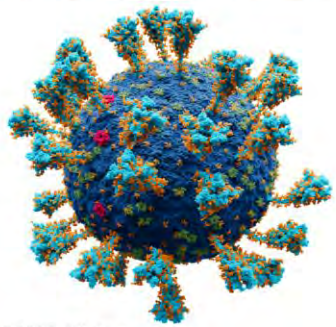


Fig 1. COVID-19 virus

Discussion

- Although COVID-19 is more commonly associated with respiratory symptoms, studies show it can be a multisystemic disease
- Manifestation of neuropsychiatric symptoms in COVID-19 is similar to what was seen with the SARS virus in the past, including symptoms ranging from anger, anxiety, depression to hallucinations and mania

Discussion continued

- COVID-19 treatments, corticosteroids and antivirals, could induce psychosis, but this is less likely in our patient as he self-isolated
- Inflammation has been shown to play a role in pathogenesis of mood and thought disorders as well as systemic symptoms of COVID-19
- COVID-19 can trigger a cytokine storm with high levels of interleukins, TNF-alpha, CRP, resulting in neuroinflammation
- Inflammatory markers were not obtained in our patient, but it would be prudent to order cytokine profiles to help aid in management
- Treatment with traditional mood stabilizers and antipsychotics has limited efficacy as demonstrated by this case

Further research is needed to determine the role of immunomodulators and cytokine inhibitors in managing neuropsychiatric symptoms in COVID-19

References

- Banerjee D, Viswanath B. Neuropsychiatric manifestations of COVID-19 and possible pathogenic mechanisms: Insights from other coronaviruses. *Asian Journal of Psychiatry.* (2020) 54(102350). https://doi.org/10.1016/j.ajp.2020.102350
- Desai S, Sheikh B, Belzie L. New-Onset Psychosis Following COVID-19 Infection. *Cureus.* (2021) 13(9):e17904. DOI: 10.7759/cureus.179041
- He Y, Yu R, Ren J. The correlation between psychiatric disorders and Covid-19: A narrative review. *Psychiatria Danubina.* (2021) 33(1):76-85. https://doi.org/10.24869/psyd.2021.76
- Lim ST, Janaway B, Costello H, et al. Persistent psychotic symptoms following COVID-19 infection. *BJPsych Open.* (2020) 6(e105):1–4. doi: 10.1192/bjo.2020.76
- Tripathy S, Singh N, Singh A, et al. COVID-19 and Psychotic Symptoms: the View from Psychiatric Immunology. *Current Behavioral Neuroscience Reports.* (2021). https://doi.org/10.1007/s40473-021-00235-8
- File: Coronavirus. SARS-CoV-2.png. (2022, January 9). *Wikimedia Commons, the free media repository.* Retrieved 19:53, February 9, 2022 from https://commons.wikimedia.org/w/index.php?title=File:Coronavirus._SARS-CoV-2.png&oldid=620510664.

Community Health Network

Retrospective study of incidence of psychiatric disorders in patients within 90 days of new diagnoses of non-severe COVID-19 infection during a four-month period

W. Logan Dedmon, DO; Estefania Laboy-Gonzalez, MD; Jennifer R. Collins, PharmD, BCACP

Background

- Mental illness has been a point of focus during the COVID-19 pandemic.
- Current research has shown an increased incidence of mental illness in those affected by COVID-19. Evidence suggests that those with a positive diagnosis of COVID-19 are at higher risk of developing clinical diagnoses of depression, anxiety, and insomnia, as well as other mood disorders.
- Additional research has looked at specific populations, such as healthcare workers and caregivers, though general populations and those with less severe disease have not been addressed. Several studies have looked at these trends on early pandemic data, but limited data exists for trends more recently in 2021.
- Greater understanding of risk factors and trends for mental illness in the setting of a global pandemic can help us better identify at risk individuals and prepare for long-term effects of COVID-19 on mental health.

Need For Study

- An increase in new mental health diagnosis is likely to put even greater strain on our healthcare system.
- There is a growing interest in symptoms and long-term consequences of infection with COVID-19, including the development of "Long Covid," which may include mental illness as a sequela of COVID-19 infections.
- Social determinants of health continue to be valid predictors of clinical outcomes. Identifying key risk factors may improve additional screening and early treatment for those at risk for new diagnoses of mental illness.

Methods and Design

- Retrospective chart review and data collection was conducted via Community Health Network's EMR (EPIC) using depersonalized data.
- Incidence of new mental illness in individuals aged 18 – 65 years with a positive COVID-19 diagnosis between the dates of March 1, 2021 and June 30, 2021 was compared to individuals with non-COVID related upper respiratory infection (URI/control group) during a similar time frame and analyzed
- Individuals with severe COVID-19 infection (defined as those who required hospitalization), as well as those with prior documented COVID-19 infection at time of investigation were excluded.

	URI Group (n=50)	Covid-19 Group (n=50)
Age, mean (SD)	37.9 (11.7)	46.6 (10.9)
BMI, mean (SD)	34.0 (7.2)	33.1 (7.9)
Male	14	15
Female	34	35
White	40	32
Black	9	16
Hispanic	1	0
Other	0	2
Prior Mental Illness	43	45
New Mental Illness	4	6
Comorbidity		
HTN	6	14
DM	5	7
Obesity	32	29

Results

- No significant difference was seen between the two groups regarding COVID exposure and new mental illness (OR = 1.57, 95% CI, [0.414, 5.94])
- Both groups showed significance for the presence of prior mental illness as a predictor of new incidence of mental illness (Chi-square URI 31.8, $p<0.05$, COVID 37.2, $p<0.05$)

Discussion

- Both URI and COVID groups shared similar demographics, and did not show significant difference in incidence of new onset mental illness in the post-infectious period
- Prior mental health appears to be a better predictor of new onset mental illness than after an acute viral infection
- Comparisons of incidence in regards to risk factors from social determinants of health and comorbities should be completed
- Additional stats with larger sample size would be more revealing of additional trends

References

- *Halpin, Stephen et al. "Long COVID and chronic COVID syndromes." Journal of medical virology vol. 93,3 (2021): 1242-1243. doi:10.1002/jmv.26587*
- *Louise Murphy, Kathleen Markey, Claire O' Donnell, Mairead Moloney, Owen Doody, The impact of the COVID-19 pandemic and its related restrictions on people with pre-existent mental health conditions: A scoping review, Archives of Psychiatric Nursing, Volume 35, Issue 4, 2021, Pages 375-394, ISSN 0883-9417, https://doi.org/10.1016/j.apnu.2021.05.002.*
- *Maxime Taquet, John R Geddes, Masud Husain, Sierra Luciano, Paul J Harrison, 6-month neurological and psychiatric outcomes in 236 379 survivors of COVID-19: a retrospective cohort study using electronic health records, The Lancet Psychiatry, Volume 8, Issue 5, 2021, Pages 416-427, ISSN 2215-0366, https://doi.org/10.1016/S2215-0366(21)00084-5.*
- *Taquet, Maxime et al. "Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62 354 COVID-19 cases in the USA." The lancet. Psychiatry vol. 8,2 (2021): 130-140. doi:10.1016/S2215-0366(20)30462-4*

Tuberous Sclerosis and Psychosis Comorbidity with concurrent hypersexuality: A case study

Community Health Network

Dr. Michael J. Shain, DO; Dr. Taimur K. Mian, MD; Dr. E. Ann Cunningham, DO

Abstract

Tuberous sclerosis (TS) is a rare genetic disorder that affects 40,000-80,000 people in the United States (annually or lifetime prevalence) that is mainly characterized by development of tumors in different parts of the body. Other well known disease components include intellectual disability (likely an Autism Spectrum Disorder), ADHD, ash-leaf spots, shagreen patches, and epilepsy. Multiple cases have also been documented of patient developing psychosis secondary to TS. Although TS associated neuropsychiatric disorders have been described, a clear association between tuberous sclerosis and psychosis has not been established. We present a case of a 21-year-old male with a history of TS and Intellectual disability who presented with a chief complaint of suicidal thinking and symptoms of visual and command auditory hallucinations of a demon. His presentation was unique and challenging to manage as the patient lacked executive function, resulting in hypersexuality and impulsivity. Clinicians should be aware of the association of TS with psychotic symptoms, and the unique challenges in their management.

Introduction

Tuberous sclerosis (TS) is a debilitating, rare genetic disease with multisystem involvement due to mutations in the TSC1 gene or the TSC2 gene. TS has been shown to affect people's skin (Webb, Fryer, & Osborne, 1996), with distinctive angiofibromas, shagreen patches, ash-leaf spots, along with renal, cardiovascular, pulmonary, ophthalmic, and CNS manifestations.

CNS manifestations such as Autism and autistic behaviors like hyperactivity, self-injurious behavior, inattention/ADHD, cognitive disability and epilepsy, are common in TS and are collectively called TSC-associated neuropsychiatric disorders (2,3,4,5). Other psychiatric symptoms such as psychosis, including delusions and hallucinations, have been documented in TS patients as well but a clear association of psychosis and TS has not been established.

This case study describes a young adult patient with tuberous sclerosis who presented with both delusions and hallucinations, along with prominent hypersexual and impulsive behaviors which made management challenging. This case adds to the literature another significant example of a patient with TS presenting with psychotic symptoms, and raises the question whether there is a direct association between the two.

Case

Mr. C is a 21-year-old African American male with a past medical history of tuberous sclerosis, schizophrenia, and intellectual disability who initially presented to the ED with hallucinations and suicidal ideation. He had been discharged 24 hours previously from another network hospital after a four-day history of similar symptoms. He was sent home on risperidone, which he never filled upon discharge. His tuberous sclerosis reportedly manifested with ophthalmic tumors and growths on his kidney, along with rare absence seizures.

He was sexually preoccupied, inappropriate, and aggressive. The patient required IM olanzapine due to his agitation. He was admitted to an inpatient psychiatric floor for his safety and further stabilization. His urine drug screen was negative, and he displayed no evidence suggesting respective substance use or withdrawal. Additionally, he endorsed hearing and seeing a male demon figure who intermittently told him to hurt himself and hurt others. He often repeated that the demon wanted to have sexual intercourse with him and was telling him to consume sugar.

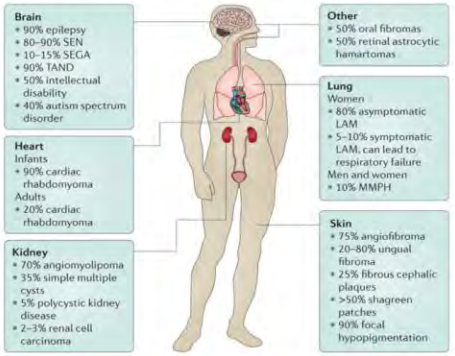
Over the course of his admission, multiple trials of antipsychotic treatment were attempted due to the patient's vulnerability to developing sialorrhea. He was stabilized on haloperidol with adjunctive treatment with valproic acid for disinhibition, and glycopyrrolate to help control his sialorrhea.

First-rank symptoms in schizophrenia

1. Audible thoughts - hearing one's thoughts spoken aloud
2. Somatic passivity - the feeling of being touched or strange unexplained sexual sensations
3. Thought insertion - the feeling an external force is putting thoughts into one's mind
4. Thought withdrawal - thoughts are withdrawn
5. Thought broadcasting - the feeling people can read one's mind
6. Made feelings - the feeling an external force is making you experience something
7. Made impulses - the feeling an external force is making you want something
8. Made volition - the feeling an external force is making you act a certain way
9. Voices arguing/discussing (often referring to the patient as "he" or "she")
10. Voices commenting - voices narrate one's actions as if giving a running commentary
11. Delusional percepts - a physical sensation (such as seeing or feeling something) that is interpreted as a very special event has happened and something important is realized

Graphic 76914 Version 1.0

Tuberous sclerosis manifestations



Nature Reviews | Disease Primers

Discussion

In the current literature, most cases exploring psychiatric associations with tuberous sclerosis focus on anxiety, depression, obsessive-compulsive disorder, and ADHD. To our knowledge four case studies have previously been published in journals that describe a patient with tuberous sclerosis with psychotic features, making this fifth.

One experiment was completed by Hunt and Dennis (1987) that showed an association between TS and psychosis, but it only involved children and did not determine any causality. Over 50 percent of the sample showed psychotic behavior, 59 per cent were hyperkinetic, and 13 percent were severely aggressive.

Due to increasing examples that there may be an association with TS and the development of psychosis, further case controlled or cohort studies are needed to further study a potential association. Based on our experience, we recommend treatment with antipsychotics and/or mood stabilizers in TS patients with psychotic or manic symptoms.

If an association is found to exist, it would be beneficial to patients diagnosed with tuberous sclerosis, as such patients could be screened and treated earlier for symptoms of psychosis, in addition to the more common neuro-psychiatric features of TS.

P11

Follow-up Outcomes after Opioid Overdose Visit to Emergency Department

Community Health Network

Gretchen Johnson, DO; Emily Zarse, MD; Michael Miller, MD

Background:

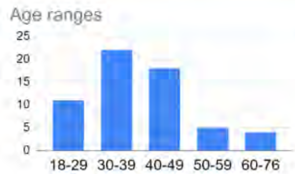
-Opioid epidemic in the United States continues to be well documented.
-Number one cause of accidental death in the US is drug overdose, and there is concurrent documented increase in mortality from drug overdose, opiate prescriptions, and inpatient admissions for treatment of substance use disorder(SUD) (Jones 2018).
-Despite the existence of effective treatments for opioid use disorder, multi-factorial barriers to care prevent about 4 out of every 5 patients from receiving treatment (Madras, 2020).
-In a 2020 study, only 10% of patients discharged from an emergency department (ED) after opioid overdose were engaged with any outpatient treatment services (Haley).
-Outpatient services offer evidence-based, life-saving, comprehensive options within the context of therapeutic relationships with care team members.

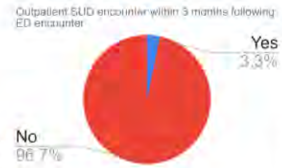
Objectives:

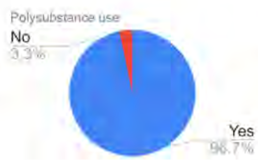
Investigate the following questions:
-Are patients who experience an opioid overdose engaging in outpatient treatment within 3 months of their overdose?
-Do these patients have subsequent opioid OD-related ED visits?
-How often are these patients lost to follow-up?

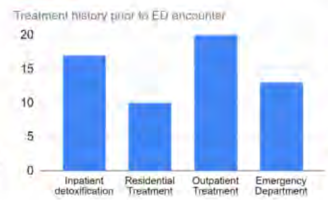
Method:

-Retrospective chart review
-Inclusion Criteria: Community health network (CHN) Emergency department (ED) encounter between April 1, 2021 to May 31, 2021, requiring Naloxone administration for opioid overdose, and subsequent discharge home from the ED.
-Exclusion Criteria: Pregnant, incarcerated in a correctional facility, minor, admitted through Crisis to an inpatient psychiatric setting at CHN behavioral pavilion.
-n=60









Analysis:

-Statistical analysis performed using Chi-Square Goodness of Fit testing; p-value obtained at <0.05.

Conclusions:

-Statistically significant majority of people who received CHN ED care for opioid overdose were not engaged in outpatient treatment within 3 months following their overdose.
-Limitation: only certain organizations have data available through EMR sources searched. There was full access to records for Community health primary care, Community Health Gallahue behavioral health and Eskenazi. There is inherent uncertainty as to whether patients were engaged in other outpatient treatment programs, such as Fairbanks, CleanSlate, Methadone Clinics, or private counseling organizations.
-Nearly half of patients had a subsequent ED visit for opioid overdose.
-Majority of patients had polysubstance use.
-Prior treatment (inpatient, residential, outpatient, or ED) was not correlated with better outpatient follow-up outcomes.
-The most common zip codes listed as primary address for patients were the areas closest to the ED that sees the most opioid overdoses in the network; Community East Hospital.
-Age distribution of patients was concentrated in the 30s and 40s; as age increased, opioid overdoses decreased.

References:

Haley, D. F., & Saitz, R. (2020). The Opioid Epidemic During the COVID-19 Pandemic. JAMA, 324(16), 1615. https://doi.org/10.1001/jama.2020.18543

Holland, K. M., Jones, C., Vivolo-Kantor, A. M., Idaikkadar, N., Zwald, M., Hoots, B., Yard, E., D'Inverno, A., Swedo, E., Chen, M. S., Petrosky, E., Board, A., Martinez, P., Stone, D. M., Law, R., Coletta, M. A., Adjemian, J., Thomas, C., Puddy, R. W., . . . Houry, D. (2021). Trends in US Emergency Department Visits for Mental Health, Overdose, and Violence Outcomes Before and During the COVID-19 Pandemic. JAMA Psychiatry, 78(4), 372. https://doi.org/10.1001/jamapsychiatry.2020.4402

Jones, G. H., Bruera, E., Abdi, S., & Kantarjian, H. M. (2018). The opioid epidemic in the United States-Overview, origins, and potential solutions. Cancer, 124(22), 4279–4286. https://doi.org/10.1002/cncr.31713

Larochelle, M. R., Slavova, S., Root, E. D., Feaster, D. J., Ward, P. J., Selk, S. C., Knott, C., Villani, J., & Samet, J. H. (2021). Disparities in Opioid Overdose Death Trends by Race/Ethnicity, 2018–2019, From the HEALing Communities Study. American Journal of Public Health, e1–e4. https://doi.org/10.2105/ajph.2021.306431

Lyden, J., & Binswanger, I. A. (2019). The United States opioid epidemic. Seminars in Perinatology, 43(3), 123–131. https://doi.org/10.1053/j.semperi.2019.01.001

Madras, B. K., Ahmad, N. J., Wen, J., & Sharfstein, J. (2020). Improving Access to Evidence-Based Medical Treatment for Opioid Use Disorder: Strategies to Address Key Barriers Within the Treatment System. NAM Perspectives. Published. https://doi.org/10.31478/202004b

Stoicea, N., Costa, A., Periel, L., Uribe, A., Weaver, T., & Bergese, S. D. (2019). Current perspectives on the opioid crisis in the US healthcare system. Medicine, 98(20), e15425. https://doi.org/10.1097/md.0000000000015425

Neutropenia Induced by Multiple Antipsychotics

Lindsey Clark, MD Cynthia Gatiri, MD Laura Ruekert PharmD, BCPP, BCGP E. Ann Cunningham, DO

Community Health Network, Department of Psychiatry, Indianapolis, IN

Introduction

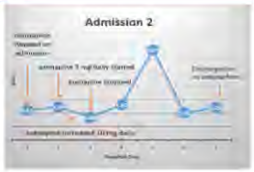
Effective treatment of schizophrenia spectrum disorder is often a complicated process of finding the right antipsychotic and dose for a patient, as well as monitoring and managing potential adverse effects. Agranulocytosis is a rare, but potentially life-threatening hematologic adverse effect of antipsychotic treatment, with incidence rates reported at 0.1%.[1] Lithium administration has been studied and reported in individual-case studies as a potential method for stimulating granulocytosis in patients experiencing neutropenia and in need of treatment for mood stabilization and psychosis.[1,2] However, to date, managing schizophrenia in patients with neutropenia and utilizing lithium remains an understudied issue in psychiatry.[3,4]

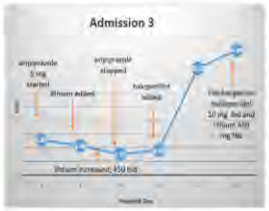
Case Presentation

A 19-year-old male with past psychiatric history of unspecified schizophrenia spectrum disorder, ADHD, and cannabis use disorder was hospitalized for treatment of worsening psychosis. An ANC on admission 2.87 and olanzapine was started and titrated to 15 mg BID with valproic acid (VPA) to target affective symptoms. No other ANC drawn prior to discharge. Subsequent readmissions followed where different antipsychotics were trialed (see graphs). Each trial correlated with drop in ANC. Benign ethnic neutropenia was ruled out. When antipsychotics were discontinued, the patient's psychotic agitation worsened requiring restraints and seclusion. Also, the ANC immediately trended towards normal, confirming a direct causal relationship. Due to the need for antipsychotic therapy, lithium was chosen to replace VPA to prevent the observed antipsychotic induced neutropenia. The granulocyte effects of lithium were not as immediate (~3 day) as the antipsychotic effects on the ANC (~ 1 day). However Successful stabilization was achieved with patient on the combination.

Graph

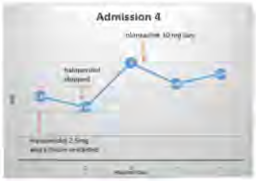
After admission 1, the patient was readmitted and olanzapine was stopped. After a slight ANC increase, asenapine was titrated, directly causing a drop in ANC. The asenapine was discontinued, and the ANC improved. The patient was discharged on VPA only





Readmission occurred due to uncontrolled psychosis. Aripiprazole was trialed and another ANC drop was noted, so lithium was chosen to replace VPA. A further drop in ANC led to aripiprazole discontinuation. Lithium improved the ANC and haloperidol was started (stabilization achieved).

Upon subsequent readmission due to medication nonadherence, the regimen was restarted. The haloperidol dropped the ANC and was held while awaiting lithium to stimulate granulocytes. Once ANC trended upwards, olanzapine was started for psychosis



Management and Outcomes

Frequent ANC monitoring (typically the next day's lab results) confirmed a direct, causal relationship with each separate antipsychotic trial where the ANC would decrease upon antipsychotic initiation and subsequently trend upwards upon discontinuation. Some literature suggests a lower risk of neutropenia with typical antipsychotics versus atypical antipsychotics.[5] The treatment team decided to trial haloperidol, in order to target the patient's psychotic symptoms. Additionally, lithium was added to the medication regimen to increase granulocytes and provide therapeutic benefit. The patient's symptomology and ANC stabilized, and the patient was discharged.

Discussion

There is a paucity of literature discussing the presentation and management of multiple atypical antipsychotics inducing neutropenia in a single patient. Therapeutic doses of lithium have been documented to induce stimulation of leukocytosis, involving a true proliferative response. This case report serves to add to the body of literature on the presentation and management of multiple antipsychotic induced neutropenia.

References

1. Oyesanmi, O., Kunkel, E. J., Monti, D. A., & Field, H. L. (1999). Hematologic Side Effects of Psychotropics. *Psychosomatics*, *40*(5), 414–421. https://doi.org/10.1016/s0033-3182(99)71206-5
2. Aydin, M., Ilhan, B. C., Calisir, S., Yildirim, S., & Eren, I. (2015). Continuing clozapine treatment with lithium in schizophrenic patients with neutropenia or leukopenia: brief review of literature with case reports. *Therapeutic Advances in Psychopharmacology*, *6*(1), 33–38. https://doi.org/10.1177/2045125315624063
3. Yoshida, K., & Takeuchi, H. (2021). Dose-dependent effects of antipsychotics on efficacy and adverse effects in schizophrenia. *Behavioural Brain Research*, *402*, 113098. https://doi.org/10.1016/j.bbr.2020.113098
4. Crépeau-Gendron, G., & L'Heureux, S. (2014). Quetiapine XR-induced neutropenia: is a clozapine trial still possible for treatment-resistant schizophrenia? A case report. *Early Intervention in Psychiatry*, *9*(2), 151–155. https://doi.org/10.1111/eip.12134
5. Sood, S. (2017). Neutropenia with multiple antipsychotics including dose dependent neutropenia with lurasidone. *Clinical Psychopharmacology and Neuroscience*, 15(4), 413-415. https://doi.org/10.9758/cpn.2017.15.4.413

Community Health Network

Overcoming Barriers to Metabolic Monitoring of Atypical Antipsychotics in a Pediatric Population

Hayley Krushinski, PharmD, BCPS; Benjamin Coplan, DO; Chad Knoderer, PharmD; Laura Ruekert, PharmD, BCPP, BCGP

Background

- The increased use of antipsychotic medications for both FDA-approved and off-label indications in pediatric populations throughout the 1990s and first decade of the century has been well documented.[1]

FDA-Approved Indications:[2]

Schizophrenia	Bipolar I disorder	Irritability in autism spectrum disorder	Tourette's syndrome

Off-Label Uses:[3]

ADHD with associated reactive anger/irritability	Disruptive behavior disorders

- Despite their clinical efficacy, the significant side effect burden of atypical antipsychotics in children raises concern. Side effects range from metabolic disturbances, including weight gain, type 2 diabetes, and dyslipidemia to cardiovascular abnormalities such as QT interval corrected for heart rate (QTc) prolongation as well as movement disorders.[4]
- In 2011, the American Academy of Child and Adolescent Psychiatry (AACAP) published the guidelines listed below for the evaluation of potential side effects.[5]

Monitoring Parameter	Baseline	4 Weeks	8 Weeks	12 Weeks	Annually
Body Mass Index (BMI)	X	X	X	X	
Blood Pressure	X			X	X
Fasting Plasma Glucose	X			X	X
Fasting Lipid Profile	X			X	
Extrapyramidal Symptoms	Baseline and regularly				
Electrocardiogram	If on ziprasidone, cardiac history, or symptomatic				

Need For Study

- A retrospective chart review evaluating adherence to metabolic monitoring guidelines within Community Health Network conducted by Harlow et al. in 2018 showed inconsistent monitoring among primary care providers (PCP) and psychiatrists for pediatric patients on atypical antipsychotic medication.[6]

Monitoring Parameter (% Adherent)	PCP N=153	Psychiatrist N=153	p-value
BMI	22%	63%	<0.005
Fasting Blood Glucose	2.6%	8.5%	0.043
Lipids	2%	7.8%	0.031
Blood pressure	47.7%	90%	<0.005
Extrapyramidal Symptoms	4.5%	90%	<0.005
Electrocardiogram	33%	100%	0.071

Objectives

To identify contributing factors to inconsistent monitoring of metabolic parameters in pediatric patients on antipsychotic medication.

Primary goal was to propose potential clinical process improvements to enhance patient safety and prevent significant adverse effects.

Methods and Design

Initially, authors were involved in the aforementioned study by Harlow et al. that showed inconsistent metabolic monitoring and saw areas for improvement within Community Health Network.

Authors utilized information from Harlow et al. and systematically evaluated data to propose quality improvement processes.

Qualitative analysis of data was performed by a team of psychiatrists and pharmacists to identify contributing factors.

Contributing factors were categorized into provider, patient, and health system related process improvements.

Analysis

Four main factors identified:

Quality Improvement Recommendations

Provider-Related Process Improvements

- **Education:** aimed at enhancing familiarity with monitoring guidelines
- **Technology:** utilize computerized provider order entry to display monitoring recommendations when antipsychotic is ordered

Patient-Related Process Improvements

- **Education:** aimed at emphasizing the importance of metabolic monitoring
- **Technology:** automatic dietitian consult when prescribed an antipsychotic

Health System-Related Process Improvements

- **Education:** for lab personnel to look for all open lab orders when a patient is seen to avoid missing previous unfulfilled orders
- **Education:** coordination and/or recommendation of patient peer support groups for healthy lifestyle choices
- **Technology:** automatic orders for metabolic monitoring at point-of-care when patients are at a lab facility
- **Technology:** automatically refer patients to an ambulatory care pharmacist or primary care provider pool when a patient is prescribed an antipsychotic
- **Team:** utilize intensive primary care team to help address metabolic health with high-need patients
- **Team:** addition of pharmacists to treatment team to facilitate consistent and timely monitoring of lab work and expand patient services

Full Disclosure

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

Acknowledgements

- Authors would like to acknowledge Taylor Harlow, PharmD, BCPP for her work in evaluating adherence to metabolic monitoring within Community Health Network.

References

1. Kalverdijk LJ, Buchrooni CJ, Aagaard L, et al. A multi-notional comparison of antipsychotic drug use in children and adolescents, 2005-2012. *Child Adolesc Psychiatry Ment Health*. 2017;11:53. doi:10.1186/s13034-017-0192-1.
2. Christen R, Szendrö L, Gleyses NL, et al. Appendix A, tables of FDA-approved indications for first- and second-generation antipsychotics. Future research needs for first- and second-generation antipsychotics for children and young adults [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK84636/
3. Sohn M, Mojo DC, Blumenschein K, et al. National trends in off-label use of atypical antipsychotics in children and adolescents in the United States. *Medicine (Baltimore)*. 2016;95(21):e3794. doi: 10.1097/MD.0000000000003794
4. Fedorowicz VJ, Fombonne E. Metabolic side effects of atypical antipsychotics in children: a literature review. *J Psychopharmacol*. 2005;19(5):533-50. doi: 10.1177/0269881105056543
5. Findling RL, Drury SS, Jensen PS, et al. Process parameter for the use of atypical antipsychotic medications in children and adolescents. *J Am Acad Child Adolesc Psychiatry*. 2013;52(9):976-90. doi: 10.1016/j.jaac.2013.02.008
6. Harlow TR, Coplan BM, Amador EC, et al. Comparison of prescribing patterns of atypical antipsychotics and monitoring parameters between primary care providers and psychiatrists in a pediatric population. Poster presented at: Community Health Network Multidisciplinary Anxiety Symposium; 2019; Indianapolis, IN.

Impact of Sensory-Modulation Space on Youth Psychiatric Inpatient Unit Restraint and Seclusion Rates

Sarah Heming, DO Calvin Nguyen, DO Kiersten Olsen, MD Nikita Patel, MD
Community Health Network, Department of Psychiatry, Indianapolis, IN

Aim

The aim of this study is to investigate implementing sensory-modulation spaces on youth psychiatric inpatient units at Community Health Network and look at the possible impacts these spaces have on overall restraint and seclusion rates in these youth psychiatric inpatient units.

Introduction

In Community Health Network's Behavioral Health Pavilion, from September 2020 through June 2021, 380 seclusion and restraint events occurred in patients aged 5-18 years old. Increased seclusion and restraint events jeopardize the psychological and physical safety of patients and their caregivers. Leadership has determined 380 events as higher than desired and would like to decrease the number significantly.

Sensory-modulation spaces have been shown to reduce seclusion and restraint use (1). These spaces can be used to facilitate self-organization, self-regulation, relaxation, sensory and self-awareness in a person-centered, supportive environment for patients experiencing dysregulation. They can allow for a controlled, multisensory experience aligning with patient needs. Potential sensory modulation interventions can include calming music, image projectors, hands-on tools and aromatherapy (2). In one study, sensory modulation techniques reduced restraint use by 72% (3).

A similar model will be implemented at Community Health Network Inpatient Psychiatric Youth unit in efforts to reduce seclusion and restraint rates over a six month period.

Methods

BH De-stimulation Care policy has been approved by the network (February 2022).

Policy includes:

- information on assessing patient's need for using de-stimulation room/equipment
- Removing shoes/pocket contents prior to entry into room for safety
- RN to assess patient's ability to safely use sensory items and to give clear, concrete instructions
- Patient's to remain on line of sight (camera or in-person)
- Room/equipment to be cleaned per hospital policy

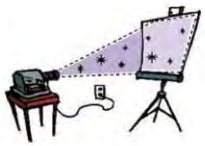
Items to be made available to use include:

- Sensory balls
- Bean bag chairs
- Sensory/balance discs
- Fidget toys/therapeutic brushes

Other items that will be stored in secure area:

- Hard candy
- Sensory doughs (single patient use only)
- Diffuser and essential oils
- Sound Machine

Plan to collect data on seclusion and restraint events once implemented, over a 6 month period.



Discussion

At this time, planning for implementation continues to be in progress. Decisions to come include utilizing a separate room on the unit vs dayroom area for sensory modulation spaces, providing staff education on utilization, and purchasing supplies for the spaces.

Outcomes

Project still in progress for implementation. Metrics identified include restraint and seclusion rates and patient demographics (age).

References

1. Andersen C, Kolmos A, Andersen K, Sippel V, Stenager E. Applying sensory modulation to mental health inpatient care to reduce seclusion and restraint: a case control study. Nord J Psychiatry. 2017 Oct;71(7):525-528.
2. Seckman A, Paun O, Heipp B, Van Stee M, Keels-Lowe V, Beel F, Spoon C, Fogg L, Delaney KR. Evaluation of the use of a sensory room on an adolescent inpatient unit and its impact on restraint and seclusion prevention. J Child Adolesc Psychiatr Nurs. 2017 May;30(2):90-97.
3. Yakov S, Birur B, Bearden MF, Aguilar B, Ghelani KJ, Fargason RE. Sensory Reduction on the General Milieu of a High-Acuity Inpatient Psychiatric Unit to Prevent Use of Physical Restraints: A Successful Open Quality Improvement Trial. J Am Psychiatry Nurses Assoc. 2018 Mar/Apr;24(2):133-144.

Acknowledgements

Authors would like to thank Ryan Wilson, Elizabeth Wright, Drs. Cunningham and Kassam.

Community Health Network

Everyone's Favorite Chief Complaint: Altered Mental Status

Rachel Snell, MD – Nicholas Volz, DO
Community Health Network Hospitalist Fellowship

INTRODUCTION

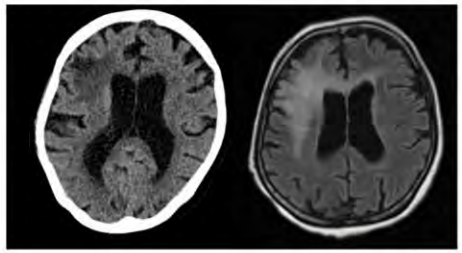
- Altered mental status is one of the most common Emergency Department presentations (up to 5% of all ED visits.
- Differential diagnosis is enormous ranging from hypoglycemia and UTI to intentional drug overdose and stroke.
- It is important to have a structured approach to help facilitate workup and management of these patients

CASE PRESENTATION

- 61 year-old female of Indian descent presented to the ED with chief complaint of several days of nausea, vomiting, and altered mental status.
- History obtained from family as patient spoke little/no English and no translators available.
- For the past 10-14 days, has been unable to perform ADLs.
- Only answers yes or no; having urinary incontinence as well; eating and drinking normally
- History of left hemispheric stroke due to left ICA occlusion 15 months prior.
- Endorses compliance with aspirin and Plavix.
- PMH notable for type 2 diabetes mellitus, hypothyroidism, and hypertension.
- ED workup notable for CT head w/o contrast that showed a new right front temporal encephalomalacia concerning for infarction.
- Admitted to Medicine with principal diagnosis of "Altered Mental Status."

CLINICAL COURSE

- Neurology consulted on admission and ordered MRI brain without contrast: "new moderately large area of cortical and subcortical abnormality involving the entire right frontal lobe and extending across the midline involving the left frontal lobe to lesser degree; worrisome for mass or neoplasm."
- Neurosurgery consulted due to concerns for tumor
- Infectious Disease consulted due to concern for infectious etiology as having intermittent fevers.
- Right craniotomy for biopsy performed on hospital day 10.
- Patient started on empiric antibiotics while waiting for pathology to return.
- Pathology subsequently positive for PML (progressive multifocal leukoencephalopathy), JC virus.
- Family denied knowledge of any history of immunocompromising conditions, such as malignancy or HIV, but agreeable to testing the patient.
- HIV test returned positive and started antiretroviral medications per ID.
- By this time, the patient very weak and family met with Palliative Care.
- She was discharged after approximately 1 month in the hospital and unfortunately passed away a month later.



CT MRI

DISCUSSION

- This case illustrates that even rare diagnoses present with very common complaints.
- It is our job as clinicians to keep an open mind and explore all differential diagnoses.
- In this particular case, I do not believe the patient's outcome would have been different if her HIV diagnosis/treatment had been determined earlier, as PML has a high mortality rate. However, prompt diagnosis and treatment is always something we should strive for.
- Progressive multifocal leukoencephalopathy (PML) is a severe demyelinating disease of the central nervous system.
- Caused by the JC virus which is prevalent in about 85% of the adult population.
- JC virus is typically harmless but in immunocompromised individuals can spread to the brain leading to demyelination of white matter in the brain.
- Common symptoms include clumsiness, progressive weakness, vision loss, impaired speech, and cognitive deterioration including personality changes.
- Considered one of many "AIDS-defining illnesses."
- PML has a mortality rate of 30–50% in the first few months, and those who survive can be left with varying degrees of neurological disabilities
- It is estimated that about 4,000 people develop PML in the United States and Europe combined every year.

REFERENCES

1. https://my-ms.org/med_pml.htm
2. https://rarediseases.org/rare-diseases/progressive-multifocal-leukoencephalopathy/
3. https://www.saem.org/about-saem/academies-interest-groups-affiliates2/cdem/for-students/online-education/m4-curriculum/group-m4-approach-to/approach-to-altered-mental-status
4. UpToDate – Progressive Multifocal Leukoencephalopathy

Implementation of a Pharmacy Protocol and Electronic Medical Record Optimization to Reduce Overnight Medication Administrations in a Health System

Jacklyn Gries, PharmD; Sarah Cocke, PharmD, BCPS; Natalie Madere, PharmD, BCCCP, BCPS; Nicole Willer, PharmD
Pharmacy Department, Community Health Network, Indianapolis, IN

Community Health Network

Objective

Decrease overnight medication administrations in order to:

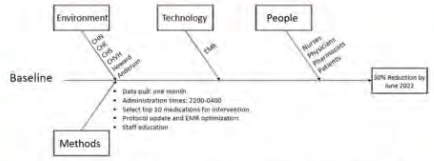
Background

- **Sleep is critical to a patient's recovery process. Sleep disruptions in the hospital have been hypothesized to cause delirium and contribute to sleep disorders after discharge.[1]**
- **Multiple studies found that delirium worsens patient outcomes and extends hospital length of stay (+10 days). By limiting nighttime sleep disruptions from hospital staff, delirium was significantly decreased.[2,3,4]**
- **A 2018 study found that sleep deprivation in the intensive care unit (ICU) was associated with increased morbidity rates. In this study, 100% of the ICU pharmacists said yes when questioned whether patient sleep should be assessed. On the contrary, only 9% of those pharmacists reported having sleep protocols in place at their hospital.[3]**

AIM Statement

- **The primary aim of this quality improvement project is to reduce overnight medication administrations between the hours of 2200 – 0400 ("quiet hours") by 30% in Community Health Network's hospitals by June 2022.**

Methods

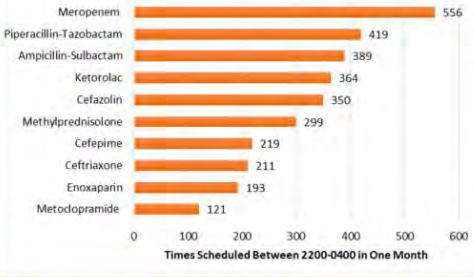


- **A report was ran from the electronic medical record (EMR) to gather the top 20 scheduled medications between 2200-0400. Ten of the top 20 medications were selected for planned intervention. This data was also be used to guide the protocol and EMR optimization plan.**

Inclusion Criteria:
- All CHNw inpatient hospitals
- Due times between 2200 – 0400
- Date range: 5/1/2021 to 5/31/2021

Exclusion Criteria:
- Continuous infusions
- PRN medications
- One time doses
- Maternity/NICU units
- Vancomycin and aminoglycosides

Top Ten Medications for Intervention



Protocol and EMR Optimization Implementations

- **CHNw has an existing protocol to guide standard administration times, but this protocol excludes anti-infective agents and many of the standard administration times fall within 2200-0400.**
- **Therefore, the existing protocol was updated to include antibiotics, add proper re-timing recommendations, and guide standard administration times to avoid 2200 – 0400 (*Pharmacy & Therapeutics Committee approved*).**
- **Implementation of this new protocol into the EMR was done by adding the corrected frequency hot buttons that will default to the recommended schedule.**

Current Frequency Hot Button	Proposed Hot Button Changes
Q6H	Q6H SCH: 0400 – 1000 – 1600 – 2200
Q8H	Q8H SCH: 0600– 1400 – 2200
Q12H	Q12H SCH: 0900 – 2100
Q24H	Q24H: 0900 or 2100

- **Medications within order sets were aligned to reflect the new standard administration times within the updated protocol.**
- **Education on the updated protocol and EMR optimization specified above was provided to physicians, nurses, and pharmacists at all network sites.**

Results

- **As of May 9, 2022, the percent of medication administered between 2200 and 0400 has been reduced by ___ %.**

Disclosure

- **Authors of this study have nothing to disclose regarding possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject of this presentation.**

References

1. Medrzycka-Dabrowska W, Lewandowska K, Kwiecien-Jagus K, et al. Sleep Deprivation in the Intensive Care Unit – Systematic Review. *Open Med.* 2018; 13:384-393.
2. Bartick MC, Thai X, Schmidt T, Altaye A, Solet JM, Sleep Disruptions and Sedative Use. J. Hosp. Med 2010;3;E20-E24. doi:10.1002/jhm.549
3. Heavner MS, Nguyen NK, Knauert MP, et al. Survey of clinical pharmacist perceptions and practices in promoting sleep in intensive care unit patients. *JACCP.* 2018; 2(1):46-52.
4. Flannery AH, Oyler DR, Weinhouse GL. The Impact of Interventions to Improve Sleep on Delirium in the ICU: A Systematic Review and Research Framework. *Crit Care Med.* 2016; 44(12):2231-2240.

Tuesday, May 10th, 2022

Community Health Network, Indianapolis, Indiana

Implementation of a Pharmacy Protocol and Electronic Medical Record Optimization to Reduce Overnight Medication Administrations in a Health System

Jacklyn Gries, PharmD; Sarah Cocke, PharmD, BCPS; Natalie Madere, PharmD, BCCCP, BCPS; Nicole Willer, PharmD
Pharmacy Department, Community Health Network, Indianapolis, IN

Community Health Network

Objective

Decrease overnight medication administrations in order to:

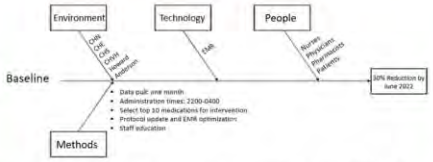
Background

- **Sleep is critical to a patient's recovery process. Sleep disruptions in the hospital have been hypothesized to cause delirium and contribute to sleep disorders after discharge.[1]**
- **Multiple studies found that delirium worsens patient outcomes and extends hospital length of stay (+10 days). By limiting nighttime sleep disruptions from hospital staff, delirium was significantly decreased.[2,3,4]**
- **A 2018 study found that sleep deprivation in the intensive care unit (ICU) was associated with increased morbidity rates. In this study, 100% of the ICU pharmacists said yes when questioned whether patient sleep should be assessed. On the contrary, only 9% of those pharmacists reported having sleep protocols in place at their hospital.[3]**

AIM Statement

- **The primary aim of this quality improvement project is to reduce overnight medication administrations between the hours of 2200 – 0400 ("quiet hours") by 30% in Community Health Network's hospitals by June 2022.**

Methods

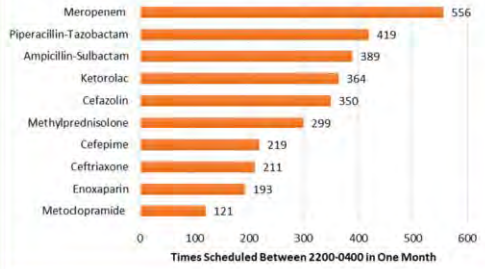


- **A report was ran from the electronic medical record (EMR) to gather the top 20 scheduled medications between 2200-0400. Ten of the top 20 medications were selected for planned intervention. This data was also be used to guide the protocol and EMR optimization plan.**

Inclusion Criteria:
- All CHNw inpatient hospitals
- Due times between 2200 – 0400
- Date range: 5/1/2021 to 5/31/2021

Exclusion Criteria:
- Continuous infusions
- PRN medications
- One time doses
- Maternity/NICU units
- Vancomycin and aminoglycosides

Top Ten Medications for Intervention



Protocol and EMR Optimization Implementations

- **CHNw has an existing protocol to guide standard administration times, but this protocol excludes anti-infective agents and many of the standard administration times fall within 2200-0400.**
- **Therefore, the existing protocol was updated to include antibiotics, add proper re-timing recommendations, and guide standard administration times to avoid 2200 – 0400 (*Pharmacy & Therapeutics Committee approved*).**
- **Implementation of this new protocol into the EMR was done by adding the corrected frequency hot buttons that will default to the recommended schedule.**

Current Frequency Hot Button	Proposed Hot Button Changes
Q6H	Q6H SCH: 0400 – 1000 – 1600 – 2200
Q8H	Q8H SCH: 0600– 1400 – 2200
Q12H	Q12H SCH: 0900 – 2100
Q24H	Q24H: 0900 or 2100

- **Medications within order sets were aligned to reflect the new standard administration times within the updated protocol.**
- **Education on the updated protocol and EMR optimization specified above was provided to physicians, nurses, and pharmacists at all network sites.**

Results

- **As of May 9, 2022, the percent of medication administered between 2200 and 0400 has been reduced by ___ %.**

Disclosure

- **Authors of this study have nothing to disclose regarding possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject of this presentation.**

References

1. Medrzycka-Dabrowska W, Lewandowska K, Kwiecien-Jagus K, et al. Sleep Deprivation in the Intensive Care Unit – Systematic Review. *Open Med.* 2018; 13:384-393.
2. Bartick MC, Thai X, Schmidt T, Altaye A, Solet JM, Sleep Disruptions and Sedative Use. J. Hosp. Med 2010;3;E20-E24. doi:10.1002/jhm.549
3. Heavner MS, Nguyen NK, Knauert MP, et al. Survey of clinical pharmacist perceptions and practices in promoting sleep in intensive care unit patients. *JACCP.* 2018; 2(1):46-52.
4. Flannery AH, Oyler DR, Weinhouse GL. The Impact of Interventions to Improve Sleep on Delirium in the ICU: A Systematic Review and Research Framework. *Crit Care Med.* 2016; 44(12):2231-2240.

Tuesday, May 10th, 2022

Community Health Network, Indianapolis, Indiana

Community Health Network

Comparison of Antibiotic Strategies for the Prevention of Cardiovascular Implantable Electronic Device Infection

Amanda Schoettmer, PharmD; Brian Lindvahl, PharmD, BCPS, BCCP; Lisa Kingdon, PharmD, BCPS, CPE

Background

The use of cardiovascular implantable electronic devices (CIEDs) is becoming more prevalent. With an increased use of CIEDs, a higher incidence of post-procedure CIED infection has been observed, commonly caused by Staphylococcal speciecs.[1,5,6]

Current evidence demonstrates benefit in the use of periprocedural antibiotics to prevent CIED infections, which contributes to decreased morbidity and mortality, length of hospital stay, and associated healthcare costs.[2-8]

Guidelines from the American Heart Association and the Heart Rhythm Society recommend prophylactic antimicrobial therapy with a single pre-procedure dose of a parenteral antibiotic with in vitro activity against staphylococci.[5,6]

Clinical guidelines recommend against the use of post-procedure prophylactic antibiotics. There is insufficient evidence to support routine use of antimicrobials following CIED implantation, and its use is associated with a higher risk of adverse drug reactions, selection of drug-resistant microorganisms, and cost.[5,6]

Need For Study

Post-procedure prophylactic antibiotics following CIED placement is not recommended in clinical guidelines, and little supporting data exists.

Current practice trends are variable and inconsistent within Community Health Network (CHNw) regarding periprocedural antibiotics following CIED placement.

Results of this study can contribute to providing a more standardized process for CIED infection prophylaxis.

Outcomes

Primary

- Number of CIED infections when receiving pre-procedure and post-procedure antibiotics versus a single pre-procedure dose

Secondary

- Antimicrobial used periprocedurally
- Type of CIED
- Classification of device infection
- Incidence of CIED infection in those with comorbidities present prior to CIED implantation compared to those without comorbidities*

Comorbidities*

- Diabetes mellitus (DM)
- Chronic obstructive pulmonary disease (COPD)
- Coronary artery disease (CAD)
- Atrial fibrillation
- Ejection fraction ≤ 40%
- Active malignancy
- Human immunodeficiency virus (HIV)
- Long-term corticosteroid use

Methods and Design

A retrospective cohort study was performed. Patients were divided into groups using the following algorithm:

CIED implantation
- CHNw hospital between January 1, 2015 and June 30, 2021
- Age 18 to 89 years old

Exclusion Criteria
- Pregnant or incarcerated
- Surgery within 30 days prior to CIED implantation
- Treatment of infection within 30 days prior to CIED implantation
- Concomitant antibiotics for another indication at the time of CIED implantation

- **At least 579 patients were needed to power the study according to power calculation.**
- **Treatment groups were divided using a 2:1 ratio: 200 patients received pre-procedure antibiotics only and 400 patients received pre- and post-procedure antibiotics.**

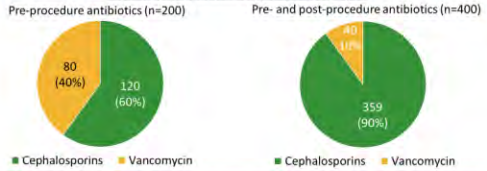
Pre-procedure antibiotic prophylaxis only

Pre- and post-procedure antibiotic prophylaxis

Results

Baseline characteristic	Pre-procedure antibiotics (n=200)	Pre- and post-procedure antibiotics (n=400)	p-value
Presence of beta-lactam allergy, n (%)	76 (38%)	36 (9%)	<0.05
With anaphylaxis/hives, n (%)	23 (12%)	11 (3%)	

Pre-Procedure Antimicrobial Utilized, n (%)



Results (continued)

CIED infections within 6 months of CIED placement, n (%)

Variable	Number of CIED infections, n (%)	p-value
Pre-procedure antimicrobial		
Cephalosporins	8/479 (1.7%)	0.998
Vancomycin	2/120 (1.7%)	
Type of CIED		
CRT	4/207 (1.9%)	0.213
ICD	4/128 (3.1%)	
PPM	2/265 (0.8%)	

Discussion and Conclusion

- No difference exists in the number of CIED infections with use of pre-procedural cephalosporins or vancomycin.
- Those with CIED infection were more likely to have atrial fibrillation (n=7/10), heart failure (n=6/10), DM (n=5/10), or renal insufficiency (n=5/10).
- Placement of an ICD was associated with a higher number of CIED infections.
- More patients in the pre-procedure antibiotic group had a documented beta-lactam allergy, thus more patients within this group received prophylaxis with vancomycin instead of cefazolin. Among patients in this group who developed a CIED infection, two patients were given vancomycin. These patients had a documented beta-lactam allergy without hives or anaphylaxis.
- **No differences exist in the number of CIED infections among patients receiving pre-procedure antibiotic prophylaxis compared to patients receiving both pre- and post-procedure prophylaxis.** This data will be used to educate CHNw electrophysiologists to help lower use of post-procedure prophylactic antibiotics which could contribute to fewer potential adverse drug reactions, improvements in antimicrobial stewardship, and lower-healthcare-associated costs.

References

1.Sreenivasan AI, Patel JD, Lau E, et al. 15-year trends in the infection burden for pacemakers and implantable cardioverter-defibrillators in the United States 1993 to 2008. J Am Coll Cardiol. 2011;58(10):1001-6.
2.Polyzos KA, Konstantelias AA, Falagas ME. Risk factors for cardiac implantable electronic device infection: a systematic review and meta-analysis. Europace. 2015;17(5):767-77.
3.Sohail MR, Henrikson CA, Braid-Forbes MJ, Forbes KF, Lerner DJ. Mortality and cost associated with cardiovascular implantable electronic device infections. Arch Intern Med. 2011;171(20):1821-8.
4.Darouiche R, Mosier M, Voigt J. Antibiotics and antiseptics to prevent infection in cardiac rhythm management device implantation surgery. Pacing Clin Electrophysiol. 2012;35(11):1348-60.
5.Kusumoto FM, Schoenfeld MH, Wilkoff BL, et al. 2017 HRS expert consensus statement on cardiovascular implantable electronic device lead management and extraction. Heart Rhythm. 2017;14(12):e503-51.
6.Baddour LM, Epstein AE, Erickson CC, et al. Update on cardiovascular implantable electronic device infections and their management: A scientific statement from the American Heart Association. Circulation. 2010;121(3):458-77.
7.Bertaglia E, Zerbo F, Zardo S, Barzan D, Zoppo F, Pascotto P. Antibiotic prophylaxis with a single dose of cefazolin during pacemaker implantation: incidence of long-term infective complications. Pacing Clin Electrophysiol. 2006;29(1):29-33.
8.Oliveira JC, Martinelli M, D'Orio Nishioka SA, et al. Efficacy of antibiotic prophylaxis before the implantation of pacemakers and cardioverter-defibrillators: results of a large, prospective, randomized, double-blinded, placebo-controlled trial. Circ Arrhythm Electrophysiol. 2009;2(1):29-34.

May 10, 2022

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

Evaluation of a Penicillin Allergy Testing Pilot in a Health System

Nathan Bradley Doctor, PharmD; Kellianne Webb, PharmD, BCPS; Eric Lis, PharmD, BCPS, Joseph Stoldt, PharmD, BCPS; Sarah Lackey, PharmD, BCPS

Community Health Network

Background

Penicillin is a common allergy reported by patients. Data suggests 90% of patients reporting penicillin allergies are penicillin tolerant

Consequences of a Penicillin Allergy

- Suboptimal antibiotic selection
- Multi-drug resistant infections
- Increased risk of adverse effects

Penicillin allergy testing has been used in literature to reduce false penicillin allergies and to optimize antibiotic use

Objective

Establish and evaluate a pharmacist-driven pilot penicillin allergy delabeling program to determine its viability and effectiveness for Community Health Network

Methods

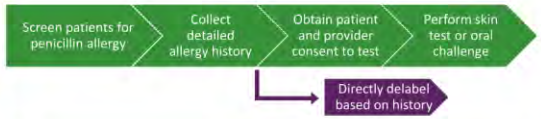
- Conducted a penicillin delabeling pilot from January through March 2022
- Patients tested through a skin test or an oral challenge based on risk of allergic reaction
- Patients were delabeled if test results were negative or patient had past history of penicillin use and tolerance

Primary Aim:
Delabel penicillin allergies from 75% of all interviewed patients

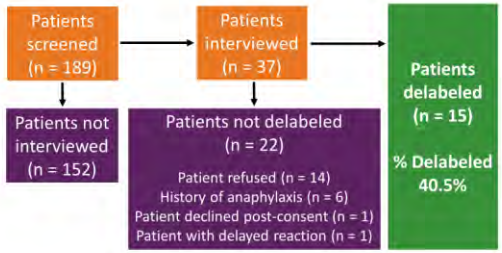
Process/Outcome Measures:
Number of patients delabeled
Amount of time taken per consult
Number of patients interviewed/tested
Number of patients prescribed a beta lactam post delabeling

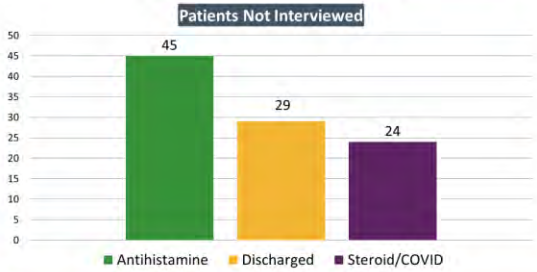
Safety Measure:
Number of patients who required emergency medication for a reaction

Methods (Continued)



Results





Considerations for Implementation

- **Timing:** COVID surge limited initial testing
- **Logistics:** challenges in testing supply acquisition
- **Team Coordination:** adequate education for providers/nursing
- **Patient Buy-in:** reinforcing low allergy risk and testing benefits
- **Inclusion Criteria:** expanded testing population = larger benefit

Discussion and Conclusions

- **Majority of patients screened could not be tested**
- **Did not meet primary aim mostly due to patient refusal**
- **Oral challenges had 100% success rate**
- **Most patients were delabeled via chart review alone**
- **Pilot successfully delabeled patients and identified barriers for future implementation/expansion**

References

1. Joint Task Force on Practice Parameters; American Academy of Allergy, Asthma and Immunology; American College of Allergy, Asthma and Immunology; Joint Council of Allergy, Asthma and Immunology. Drug allergy: an updated practice parameter. Ann Allergy Asthma Immunol. 2010;105(4):259-273. doi:10.1016/j.anai.2010.08.002
2. Chen JR, Tarver SA, Alvarez KS, Tran T, Khan DA. A Proactive Approach to Penicillin Allergy Testing in Hospitalized Patients. J Allergy Clin Immunol Pract. 2017;5(3):686-693. doi:10.1016/j.jaip.2016.09.045
3. Jones BM, Bland CM. Penicillin skin testing as an antimicrobial stewardship initiative. Am J Health Syst Pharm. 2017;74(4):232-237. doi:10.2146/ajhp160233
4. Englert E, Weeks A. Pharmacist-driven penicillin skin testing service for adults prescribed nonpreferred antibiotics in a community hospital. Am J Health Syst Pharm. 2019;76(24):2060-2069. doi:10.1093/ajhp/zxz237
5. Zhang BY, Paquette V, McClymont E, et al. Implementing a penicillin allergy delabeling service for the obstetric population. J Allergy Clin Immunol Pract. 2021;9(6):2501-2502.e2. doi:10.1016/j.jaip.2021.01.023

Community Health Network

Delayed hypersensitivity to GLP-1 agonist – Case Report

C. Clawson, DO, C. McNeill, DO, A. Packard, PharmD
Community South Osteopathic Family Medicine
Greenwood, IN

INTRODUCTION

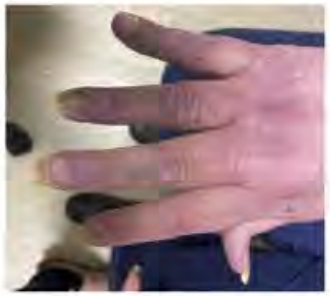
- Hypersensitivity reactions to medications are rare due to drug molecules being too small to illicit an immune/inflammatory reaction.
- Delayed hypersensitivity happens when they drug molecules bind to proteins or immune complexes and later, stimulate a response.
- "Delayed" can be anywhere from hours to weeks after repeated exposure

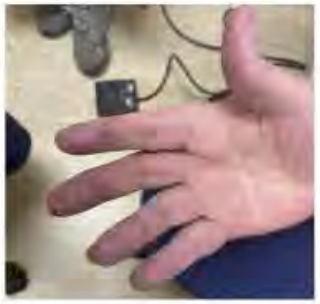
TIMELINE

- 65 year old female with past medical history of Type 2 Diabetes mellitus and rheumatoid arthritis began dulaglutide (June)
- She developed intractable nausea and emesis and therapy was discontinued (treatment for approximately 5 weeks)
- Months later, patient was started on liraglutide (February)
- After 4 weeks of therapy patient began exhibiting onycholysis, peripheral ischemia, and painful peripheral vesiculopustular dermatosis on her hands.
- Patient seen in ED (April) due to intensity of eruption and pain. Complete workup was done and patient was sent home.
- Less than a week later patient was seen in PCP office for ED follow up when symptoms had not improved. PCP discontinued liraglutide and symptoms resolved within days.

WORK UP

- CBC, CMP, TSH
- ANA, RF
- Protein electrophoresis, CK, ANCA Vasculitides, ESR
- CRP elevated at 1.1
- Blood cultures





GLP-1 RECEPTOR AGONISTS

- Glucagon-like peptide 1 (GLP-1) acts by stimulating glucose-dependent insulin release, slowing gastric emptying, prevent post-meal glucagon release, and reduce food intake.
- GLP-1 receptor agonists are becoming mainstay in diabetes mellitus type 2 treatment due to its significant improvement in glycemic control and significant reduction in longterm cardiovascular risk as well as promoting weight loss without substantial increased risk of hypoglycemia.
- Common side effects of GLP-1 agonists include, but not limited to, nausea, vomiting, diarrhea. May also increase risk of pancreatitis and renal impairment.

LITERATURE REVIEW

- Literature review shows cases with different but rare cases of different reactions to GLP-1 agonists
- More common dermatologic reaction is drug site reaction rather than systemic/peripheral presentation
- One case involving exenatide, showed both local dermatologic reaction with systemic involvement being pruritus and shortness of breath that resolved with steroids and antihistamines

DISCUSSION

- As opposed to the literature review, our case's symptoms manifested with peripheral dermatologic involvement several weeks after starting liraglutide
- Patient had thorough workup, which was largely unremarkable
- This case displays the importance of awareness in rare side effects and understanding of the pathophysiology of a hypersensitivity reaction.
- Education on this rare side effect may help providers more easily recognize unusual symptoms in relation to the timing of initiating GLP-1 agonist.

REFERENCES

1. Alan J. Garber; Long-Acting Glucagon-Like Peptide 1 Receptor Agonists: A review of their efficacy and tolerability. *Diabetes Care* 1 May 2011; 34 (Supplement_2): S279–S284. https://doi.org/10.2337/dc11-s231
2. Carvalho, A., Silva, C., Gastaminza, G., & D'Amelio, C. M. (2020). Delayed Hypersensitivity Reaction to Liraglutide: A Case Report. *Journal of investigational allergology & clinical immunology*, 30(5), 367–369. https://doi.org/10.18176/jiaci.0521
3. Dungan, K., & Desantis, A. (n.d.). *Glucagon-like peptide 1 receptor agonists for the treatment of type 2 diabetes mellitus*. UpToDate. Retrieved February 1, 2022, from https://www.uptodate.com/contents/glucagon-like-peptide-1-receptor-agonists-for-the-treatment-of-type-2-diabetes-mellitus?search=glp1+agonist&source=search_result&selectedTitle=2~100&usage_type=default&display_rank=1#H619400
4. Gomes S.R. Eva *, Marques L. Maria and Regateiro S. Frederico , Epidemiology and Risk Factors for Severe Delayed Drug Hypersensitivity Reactions, Current Pharmaceutical Design 2019; 25(36) . https://dx.doi.org/10.2174/1381612825666191105115346
5. Filippatos, T. D., Panagiotopoulou, T. V., & Elisaf, M. S. (2014). Adverse Effects of GLP-1 Receptor Agonists. *The review of diabetic studies : RDS*, *11*(3-4), 202–230. https://doi.org/10.1900/RDS.2014.11.202
6. Pichler, W. (n.d.). *Drug hypersensitivity: Classification and clinical features*. UpToDate. Retrieved February 1, 2022, from https://www.uptodate.com/contents/drug-hypersensitivity-classification-and-clinical-features?search=hypersensitivity+reaction&source=search_result&selectedTitle=1~1508&usage_type=default&display_rank=1
7. Steveling, E. H., Winzeler, B., & Bircher, A. J. (2014). Systemic Allergic Reaction to the GLP-1 Receptor Agonist Exenatide. *The Journal of pharmacy technology : JPT : official publication of the Association of Pharmacy Technicians*, *30*(5), 182–186. https://doi.org/10.1177/8755122514539462

Opening Opportunities for Patients: A Family Medicine Residency Initiative to Address Social Determinants of Health

K. Morlan, DO, C. McNeill, DO, E. Justus, DO, W. Long, DO, K. Fields, DO, T. Burch, RN, K. Smith, CMA, M. Bradley, CMA, N. Ruddick, FOC, P. Tucker, CPC
Community South Osteopathic Family Medicine Residency Program
Greenwood, IN

Community Health Network

INTRODUCTION

- The World Health Organization's Commission on the Social Determinants of Health (SDOH) has defined SDOH as "the conditions in which people are born, grow, live, work and age" and "the fundamental drivers of these conditions."
- Social determinants commonly illuminate the physical access to health care when in fact data suggests these determinants are much larger than this; including income, wealth, and education.
- Data has also indicated that many family physicians feel it is our role to identify these disparities and advocate for our patients in this avenue as well.
- We endeavored to increase screening in our FM practice to at least 10% by utilizing the EMR patient portal and standardizing an in clinic paper screening process.
- By screening for SDOH areas of need, we as primary care physicians can begin to address these disparities which will in turn not only likely lead to better outcomes for patients, but will better facilitate growth and trust in the critical physician-patient relationship that can be jeopardized by previously unseen variables.

METHODS

- Starting in January 2022, Epic MyChart launched an SDOH questionnaire to CSOFM patients who are >18 years of age and are scheduled for a preventative care visit
- Categories of preventative care visits are as follows: Commercial AWV, Medicare AWV, Physical, Physical w/Medicare, Virtual AWV, Physical w/ Medicare Wellness, TCM (Virtual), TCM (In person), MyChart Physical, or MYC Medicare Annual Wellness.
- If a patient does not have MyChart access or did not complete the questionnaire, they are given the opportunity to fill out a paper version of the questionnaire in office.
- After a patient's SDOHs are recorded, if they idtentify a high priority need (Housing, Food, Finance, or Transportation) a best practice alert is triggered to create a care plan under the guidance of social work.
- Each month we pull data from the PowerBi SDOH dashboard as aggregate data on how many patients have completed the SDOH documentation during a preventative visit.
- For the purposes of this project, SDOH data itself will not be collected, but completion percentage (what percentage of our patient population has completed the SDOH questionnaire) is monitored.

Social Determinants of Health

REFERENCES

- Am Fam Physician. 2019 Apr 15;99(8):476-477. Andermann A; CLEAR Collaboration. Taking action on the social determinants of health in clinical practice: a framework for health professionals. CMAJ. 2016;188(17-18):E474-E483. doi:10.1503/cmaj.160177
- Braveman P, Gottlieb L. The social determinants of health: it's time to consider the causes of the causes. Public Health Rep. 2014;129 Suppl 2(Suppl 2):19-31. doi:10.1177/00333549141291S206
- Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved 02/02/2022, from https://health.gov/healthypeople/objectives-and-data/social-determinants-health

DATA

- As this is a new endeavor in a much larger ongoing project, our data is limited, but as of 04/28/2022, approximately 14% of all eligible patient contacts completed the SDOH screening questionnaire.
- Approximately 36% of the total collected data was from clinic collection via paper questionnaire, while about 64% was collected via MyChart. This represents a significant improvement in screening collection.
- However, only 1% of these patients had an active care plan. A positive response in a core SDOH area (Housing, Food, Finance, Transportation) should prompt a referral to Social Work so that a care plan can be created for that patient.
- Currently, however, there is an issue with this process, resulting in a relatively low frequency of referrals for positive responses.
- Community's IT department is aware of this issue and is working on a solution, which will likely significantly impact referral and care plan implementation going forward.

DISCUSSION

- This project, part of a much larger initiative by Community Health Network to collect SDOH data from our patients, serves to illustrate the importance of social determinants of health as they pertain to all facets of the care of our patients.
- It is the goal of this project to serve as a foundation for standardizing collection of this data, as well as a model upon which to continually build and improve with regards to increasing access to care for our patients.
- Plans are in place for this to become a legacy project within our clinic as we grow and better understand how to best convert this data to positive outcomes in our community. Further work can be done to facilitate easier collection of this data, such as streamlining or reducing the length of the questionnaire for better patient participation.

Off the Tracks: Social Determinants of Health and a Man Stranded Far From Home

Community Health Network

Kyle Morlan, DO, PGY3, Holly Wheeler, DO

INTRODUCTION

- The WHO has defined Social Determinants of Health (SDOH) as "the conditions in which people are born, grow, live, work and age, and the wider sets of forces and systems shaping the conditions of daily life" (1). They are omnipresent and profoundly impactful on a patient's healthcare outcomes, and yet often go unrecognized.
- A 29 y.o. morbidly obese male w/ no PMH was admitted to the hospital with COVID-19 pneumonia. His care was complicated by both medical and SDOH factors outside his own control.
- SDOH, in this patient's case, significantly prolonged his hospital course and made discharge complicated, impacting both the quality of care given to the patient as well as the costs to the healthcare system.
- This case is important because it exemplifies just how significant SDOH can be in our patients' care, and how not screening for these factors can significantly impact not only patient care, but also healthcare delivery and cost efficiency.
- More emphasis on screening for SDOH is needed in medicine, and programs emphasizing the importance of addressing these needs will serve only to benefit our healthcare system and its patients.

SDOH Graphic courtesy of the CDC (1)

References

1. Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved [date graphic was accessed], from https://health.gov/healthypeople/objectives-and-data/social-determinants-health
2. Stafford A, Wood L. Tackling Health Disparities for People Who Are Homeless? Start with Social Determinants. *Int J Environ Res Public Health*. 2017;14(12):1535. Published 2017 Dec 8. doi:10.3390/ijerph14121535
3. Saab D, Nisenbaum R, Dhalla I, Hwang SW. Hospital Readmissions in a Community-based Sample of Homeless Adults: a Matched-cohort Study. *J Gen Intern Med*. 2016;31(9):1011-1018. doi:10.1007/s11606-016-3680-8
4. Health Research & Educational Trust. (2017, November). *Social determinants of health series: Transportation and the role of hospitals*. Chicago, IL: Health Research & Educational Trust. Accessed at www.aha.org/transportation

CASE SUMMARY

- A 29-year-old morbidly obese Hispanic male with no known medical history presented to the ED with a chief complaint of shortness of breath for two days.
- Upon arrival, he was febrile, tachycardic, and tachypneic, and required 6L of supplemental oxygen to maintain saturation. He was subsequently diagnosed with COVID-19. Chest CT showed patchy ground-glass infiltrates and consolidations throughout both lungs. He was started on Remdesivir and dexamethasone, was given albuterol breathing treatments, and was admitted for acute hypoxic respiratory failure.
- He was subsequently diagnosed with type 2 diabetes which complicated his hospital course, as his high-dose steroid treatments made glucose control difficult.
- The patient's recovery was prolonged and supplemental oxygen weaning attempts were made unsuccessfully. Ultimately it was determined the patient would need supplemental oxygen indefinitely, but his discharge was complicated by social situations beyond his control.
- He had travelled from California to Indiana with all his possessions to be with a woman he had met online.
- The relationship quickly deteriorated, and he was subsequently left homeless and had no ties to family back home.
- Due to this unique situation, arranging the patient's medications and transportation via train arranged proved difficult and significantly lengthened his hospital stay. In total the patient spent 35 days hospitalized before being discharged.

DISCUSSION

- This case illustrates how SDOH can impact not only a patient's hospital course and treatment plan, but also contributes to increasing medical costs both to the patient and to healthcare.
- Homelessness is a major SDOH factor, (2) and complicated this patient's discharge planning, adding to his hospital stay and to costs to healthcare. Readmission rates are significantly higher among homeless patients as well (3).
- The patient also had no access to transportation, a major SDOH factor. Improving transportation access improves patient outcomes, compliance, and decreased healthcare costs (4).
- More care and focus are needed to identify and address patients' unique SDOH to facilitate cost-effective, equitable, and appropriate healthcare, and more funds should be allocated to initiatives focusing on these factors.

Diabetes Outcomes in Patients with Limited English Proficiency: A Retrospective Chart Review

Matthew Fisch, PharmD; Chauntae Reynolds, PharmD, BCACP, CDCES; Erin Weber, PharmD, BCACP

Community Health Network

Introduction

Limited English Proficiency (LEP) in Type 2 Diabetes Mellitus is associated with worse outcomes, poor glycemic control, and increased hospitalizations

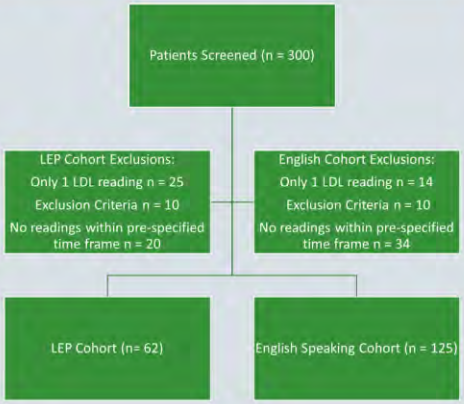
There is a need to analyze Community Health Network's performance with this patient population

Objective: Compare T2DM related outcomes in LEP vs English speaking patients

Methods

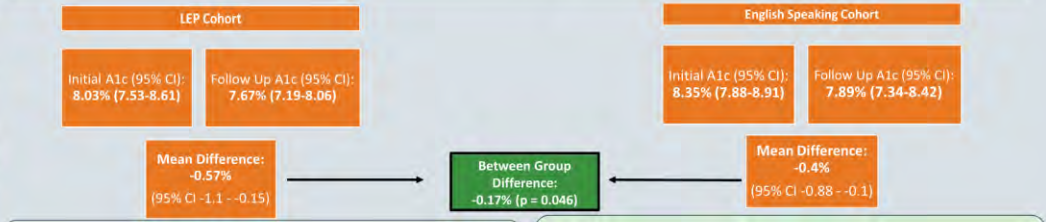
Retrospective cohort study

July 1st 2020 – June 30th 2021



Results

Primary Outcome: A1c Change Between Groups



Secondary Outcome: LDL Change Between Groups

	Mean LDL (mg/dL) Difference (95% CI)	Between Group Difference (mg/dL)
LEP Cohort	-1.4 (-6.5 – 7.2)	
English Speaking Cohort	-6.1 (-10.5 – 1.2)	4.7 mg/dL (p = 0.24)

Secondary Outcome: Percentage of Patients Meeting BP Goals

Pharmacist Subgroup Analysis

	LEP Patients Managed by Pharmacists (n = 6) Adjusted Mean (95% CI)
Average A1c (%) change	-2.41 (-0.92 – -3.9)

Comorbidities Between Groups

	HTN	HLD	CKD	Obesity	HF	ASCVD
LEP Cohort *n* (%)	41 (66.1)	46 (74.2)	7 (11.3)	25 (40.3)	2 (3.2)	5 (8.1)
English Speaking Cohort *n* (%)	107 (85.6)	114 (91.2)	17 (13.6)	85 (68)	18 (14.4)	48 (38.4)

Discussion

Key Takeaways:

- Patients with LEP and T2DM are receiving standard of care treatment at CHNw and are achieving clinically significant diabetes outcomes
- Ambulatory care pharmacists can play a key role in improving outcomes in patients with LEP and diabetes

Study Limitations:

- Retrospective, study size, unclear interpreter methods, cohort characteristics/comorbidities not optimally matched

Future considerations:

- Larger cohort, development of long-term complications of diabetes, and identifying outcomes of LEP patients who follow with language-concordant providers

Evaluating Cultural Competency of Pharmacy and Pre-Pharmacy Students at a Private Academic Institution

Primary author: Brian Wenger, PharmD | PGY2 Pharmacotherapy Resident at Butler University College of Pharmacy and Health Sciences/Community Health Network
Co-authors: Tracy Costello, PharmD, BCPS; Andrew Schmelz, PharmD, BCACP; Veronica Vernon, PharmD, BCPS, BCACP, NCMP; Nick Taylor, PharmD Candidate Class of 2023

Background

A cross-sectional survey administered by Crawford et al discovered that both knowledge and skills in cultural competency improved as students progressed through each professional year of the PharmD curriculum[2]

Doroudgar et al found, through a similar survey, that second-year pharmacy student participants could easily recognize cultural competency elements, but struggled more with skills and knowledge of those elements[3]

DEI-related concepts are gaining significant traction in the pharmacy research community, and pharmacy-focused journals and organizations are encouraging paper submissions

Need for Study

Butler University has never formally assessed cultural competency of pharmacy students enrolled in pre-professional and professional years of study

Students can self-reflect on their own confidence and experience, and the college can utilize results to identify areas for improvement in the curriculum

Several recent studies on similar topics have survey a wider variety of students identifying as non-white; Butler University has a larger percentage of white students

Study Objectives

Primary objective

- To evaluate the cultural competency of pharmacy and pre-pharmacy students within 4 domains (knowledge, skills, encounters, and attitudes) and to identify potential opportunities for curriculum improvement

Secondary Objectives

- To evaluate the impact prior experiences (such as work, education, and personal) have on student cultural competency
- To assess the importance of current year in the pharmacy curriculum on cultural competence

Methods and Design

- Anonymous, electronic survey will be sent out to pharmacy and pre-pharmacy students in February 2022
- Survey will contain questions related to one of four domains of cultural competency
- Template developed from the Clinical Cultural Competency Questionnaire – Modified Pharmacy (CCCQ-MP) with permission from author

Informed consent

- Survey will be sent out with informed consent on page 1

Method of survey distribution

- Electronic student newsletter
- QR codes linked to survey posted around academic building
- Verbal encouragement in various classes

Statistical analysis

- Descriptive analysis
- Microsoft Excel

- Inclusion criteria: all pharmacy and pre-pharmacy students who sign informed consent
- Exclusion criteria: students < 18 years old or students who revoke informed consent at any time
- Survey will be open to submissions from students for one month
- Reminder emails to be sent out at halfway point

Data Collection

Age	Gender	Race
Ethnicity	Non-English proficiency	Year in pharmacy program
Previous DEI training	Previous work experience	Experience with different cultures

Results

- Data collection to occur in Spring/Summer 2022 following survey administration
- Author plans to seek publication in academic pharmacy journal

Full Disclosure

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

References

1. Butler L, Chen AMH, Borja-Hart N, et al. Assessment of a multi-institution integration of cultural competency activities. *Curr Pharm Teach Learn*. 2020;12(5):517-523. doi:10.1016/j.cptl.2020.01.007
2. Crawford SY, Awé C, Tawk RH, Simon Pickard A. A Cross Sectional and Longitudinal Study of Pharmacy Student Perceptions of Readiness to Serve Diverse Populations. *Am J Pharm Educ*. 2016;80(4):62. doi:10.5688/ajpe80462
3. Doroudgar S, Dang B, Nguyen H, Matsumoto RR. Assessment of Cultural Competence in Pharmacy Students Prior to Advanced Pharmacy Practice Experiences. *Am J Pharm Educ*. 2021;85(4):7928. doi:10.5688/ajpe7928
4. Echeverri M, Brookover C, Kennedy K. Assessing pharmacy students' self-perception of cultural competence. *J Health Care Poor Underserved*. 2013;24(1 Suppl):64-92. doi:10.1353/hpu.2013.0041
5. Echeverri M, Dise T. Racial Dynamics and Cultural Competence Training in Medical and Pharmacy Education. *J Health Care Poor Underserved*. 2017;28(1):266-278. doi:10.1353/hpu.2017.0023

5/10/22

Racial Disparities with PRN Medication Usage in Inpatient Psychiatric Treatment

Peter Karalis, MD; Gabriel Martinez, DO; Anita Panjwani, PhD; Taline Aydinian; Aaron Whiteman, DO; Magdoline Daas, MD; Areef Kassam, MD; Vanessa Enos

Community Health Network

Problem Statement

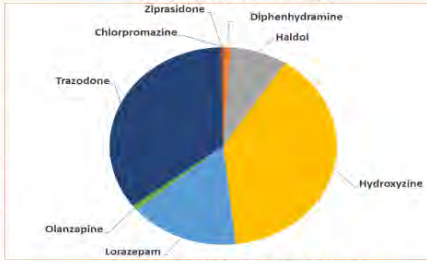
The extent of systemic racism in the healthcare system has not been adequately evaluated to-date. There is little guidance for designing and implementing effective workplace interventions to decrease bias in medical decision-making. To our knowledge, there is a lack of research evaluating inpatient psychiatric medication administrations in regards to potential racial disparities. Our aim is to look at possible behavioral health care racial disparities, specifically with the administration of as needed medication (PRN) for inpatients admitted to Community Health Network Behavioral Health Pavilion during 2019 and 2020.

Methods

All inpatient encounters from 2019-2020 were pulled and analyzed by race, further narrowing data analysis for Black and White patients due to small sample size of other races. All PRN medication administrations were also pulled and analyzed by race and medication category. Primary outcomes included likelihood of receiving a PRN during an inpatient admission, and comparisons across PRN medication class including all antipsychotics vs non-antipsychotics, all antipsychotics vs hydroxyzine, and all antipsychotics vs. lorazepam.

Data Figures

DISTRIBUTION OF PRN MEDS



DESCRIPTIVE STATISTICS - PER ADMISSION

		Antipsychotic PRN		
n (%)	Total (N=14,616)	No (N=11,055)	Yes (N=3,561)	P-value
Age, mean (SD)	35.8 (17.1)	36.9 (17.9)	32.2 (13.9)	<0.001
Sex				<0.001
Male	7,457 (51.0)	5,434 (49.1)	2,023 (56.9)	
Female	7,151 (49.0)	5,621 (50.9)	1,530 (43.1)	
Race				<0.001
White	11,494 (78.6)	8,973 (81.2)	2,521 (70.8)	
Black	3,122 (21.4)	2,082 (18.8)	1,040 (29.2)	
Ethnicity				0.29
Non-Hispanic	14,192 (97.7)	10,729 (97.6)	3,463 (97.9)	
Hispanic	338 (2.3)	264 (2.4)	74 (2.1)	
Psychotic disorder				
No	11,896 (81.3)	9,661 (87.4)	2,208 (62.1)	<0.001
Yes	2,739 (18.7)	1,394 (12.6)	1,345 (37.9)	

ANTIPSYCHOTICS (PRN) VS. NON-ANTIPSYCHOTICS (PRN)

Model 1 (N=64,872)	Odds Ratio	p-value
Race		
White	(reference)	-
Black	**2.41 (2.29, 2.54)**	**<0.001**
Model 2 (N=64,872)		
Race		
White	(reference)	-
Black	**2.23 (2.11, 2.35)**	**<0.001**
Model 3 (N=64,872)		
Race		
White	(reference)	-
Black	**1.65 (1.56, 1.74)**	**<0.001**

Model 1: univariate model with race
Model 2: adjusted for patient age and age
Model 3: further adjusted for psychotic disorder dx

Hydroxyzine

Model 2 (N=30,102)		
Race		
White	(ref)	-
Black	**2.88 (2.70, 3.06)**	**<0.001**
Model 3 (N=30,102)		
Race		
White	(ref)	-
Black	**2.15 (2.02, 2.30)**	**<0.001**

Lorazepam

Model 2 (N=30,102)		
Race		
White	(ref)	-
Black	**2.88 (2.70, 3.06)**	**<0.001**
Model 3 (N=30,102)		
Race		
White	(ref)	-
Black	**2.15 (2.02, 2.30)**	**<0.001**

Results

Admission Data Set

- With PRN utilization, 77.8% were White patients and 22.2% Black patients
- Without PRN utilization, 80.4% and 19.6% respectively (p<0.001)

PRN Medications Data Set

- Antipsychotics v. Non-antipsychotics
  - Antipsychotic (N = 6,631) 62.5% (White) and 37.5% (Black)
  - Non-antipsychotics (N=58,241) 80.1% (White) and 19.9% (Black). p<0.001
- Antipsychotics v. Lorazepam
  - Antipsychotics as above v. Lorazepam (N= 9,082) 76.9% (White) and 23.1% (Black). p<0.001
- Antipsychotics v. Hydroxyzine
  - Antipsychotics as above v. Hydroxyzine (N=23,471) 84.1% (White) and 15.9% (Black). p<0.001

Discussion

These findings provide novel data regarding racial disparities with PRN medication usage. There were statistically significant differences in PRN exposure comparing admission data, and probabilities of antipsychotics over other PRN medications for Black patients, even when controlling for sex, age, and diagnosis. This information provides a basis for further investigation and uncovers disparities in patient centered data arising from implicit bias.

References

1. Smith KM. Discrimination and racism in the history of Mental Health Care [Internet]. National Alliance on Mental Illness. 2020 [cited 2021Nov9]. Available from: https://www.nami.org/Blogs/NAMI-Blog/July-2020/Discrimination-and-Racism-in-the-History-of-Mental-Health-Care
2. Davis K. 'blacks are immune from mental stress' [Internet]. Psychiatric News. American Psychiatric Association; 2018 [cited 2021Nov9]. Available from: https://psychnews.psychiatryonline.org/doi/10.1176/appi.pn.2018.5a16
3. Mental Health Act Statistics, Annual Figures: 2016-17, Experimental statistics [Internet]. National Health Service. Mental Health Act Statistics, Annual Figures: 2017 [cited 2021Nov10]. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-act-statistics-annual-figures/mental-health-act-statistics-annual-figures-2016-17-experimental-statistics
4. Schwartz RC, Blankenship DM. Racial disparities in psychotic disorder diagnosis: A review of empirical literature. World J Psychiatry. 2014 Dec 22;4(4):133-40. doi: 10.5498/wjp.v4.i4.133. PMID: 25540728; PMCID: PMC4274585.
5. Connolly A, Taylor D. Does race affect prescribing for acute psychosis? Evaluation by a case vignette. Ther Adv Psychopharmacol. 2016 Jun;6(3):172-7. doi: 10.1177/2045125316638051. Epub 2016 Mar 18. PMID: 27354905; PMCID: PMC4910401
6. Aggarwal NK, Rosenheck RA, Woods SW, Sernyak MJ. Race and long-acting antipsychotic prescription at a community mental health center: a retrospective chart review. J Clin Psychiatry. 2012 Apr;73(4):513-7. doi: 10.4088/JCP.11m07161. PMID: 22579151; PMCID: PMC3685178.
7. McGuire TG, Miranda J. New evidence regarding racial and ethnic disparities in mental health: policy implications. Health Aff (Millwood). 2008 Mar-Apr;27(2):393-403. doi: 10.1377/hlthaff.27.2.393. PMID: 18332495; PMCID: PMC2928987.
8. Nash KA, Tolliver DG, Tawfik RA, Calhoun AJ, Auerbach MA, Venkatesh AK, Wong AH. Racial and Ethnic Disparities in Physical Restraint Use for Pediatric Patients in the Emergency Department. JAMA Pediatr. 2021 Sep 13:e213348. doi: 10.1001/jamapediatrics.2021.3348. Epub ahead of print. PMID: 34515764; PMCID: PMC8438617.
9. Schnitzer K, Meredeth F, Macias-Konstantopoulos W, Hayden D, Shtasel D, Bird S. Disparities in Care: The Role of Race on the Utilization of Physical Restraints in the Emergency Setting. Acad Emerg Med. 2020 Oct;27(10):943-950. doi: 10.1111/acem.14092. Epub 2020 Aug 24. PMID: 32691509.
10. Vidal C, Reynolds EK, Pragliowski N, Grados M. Risk Factors for Seclusion in Children and Adolescents Inpatient Psychiatry: The Role of Demographic Characteristics, Clinical Severity, Life Experiences and Diagnoses. Child Psychiatry Hum Dev. 2020 Aug;51(4):648-655. doi: 10.1007/s10578-020-00983-0. PMID: 32026261.

Community Health Network

MENDing People At Home –Novel Program Building at CHNw and Quality Improvement

Shelley O'Connell, MBA; George Hoyek, MD; Kim Jule, MHA; Jereana Miller, NP

INTRODUCTION/ BACKGROUND

Early in the pandemic it became imperative, to create an innovative program that could help relieve some of the pressure that hospitals were facing; by allowing patients to transition earlier to the comfort of their homes while they continue to *MEND*. It was postulated that there was a subset of hospital-based patients that would typically be ready for discharge but may be kept an extra 24-48 hours in the hospital to monitor and ensure the patients remain stable for return to home. That subset of patients could be well served with a highly coordinated transitional approach.

METHODS

To facilitate early dismissal hospital-to home for stable patients, a taskforce was convened to discuss, evaluate, design and deploy a solution.

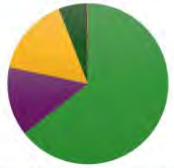
MEND stands for **M**anage patient care needs after hospital/ED discharge or acute episode and **M**onitor patient treatments and daily vitals. **E**ducate patients to promote independence in self-care and **E**nhance the in-home care experience. **N**avigate the connections patients need to obtain the resources necessary to complete the home recovery plan, and to **D**eliver exceptional care that assures and sustains results.

As patients transitioned home, three key programs provide the care components for MEND at Home. Remote patient monitoring utilizes the digital vitals monitoring system Health Recovery Solutions (HRS), Robust Home Health support, including daily visits the first week, and Community ProCare at Home, CPN's House-call provider practice provides 2 home visits the first 5-7 days post hospital discharge.

In addition, patients receive a "care-kit" that includes educational zone materials about their condition, "who to call" poster, remote home monitoring instructions setup, pulse oximeter, digital thermometer, masks, hand sanitizers and wipes. Additional items are provided based on the patient's chronic condition(s) to be monitored.

Patient Demographics	
Average age of accepted patients	59.93
Gender – Male 122	47.84%
Gender – Female 133	52.16%
Mortality rate 30-days post discharge – accepted pts. patients	.784%
Mortality rate 30-days post discharge – declined pts.	5.926%

Referrals by hospital:



RESULTS: DEMOGRAPHICS & TRENDS

As patients are identified to be appropriate candidates for the program by the hospital provider team or case manager; a home health liaison is contacted for evaluation and admission to the program.

The program launched in mid-December 2020 and to date we have had 390 patients referred to MEND at Home with a total of 253 patients meeting minimum criteria to be enrolled into the program once discharged home. The participant demographics are as follows: average age 59.6 years old (26-96 years old); 48% male, 52% female; primary discharge diagnosis Covid+ patients.

Since inception of the program, we have had 64.87% of patients identified as potential for the program and admitted into MEND at Home. Of the patients that enrolled into the program we had had a 7% readmission rate with in the first seven days post discharge and 10.58% readmission rate within 30-days post discharge, and a mortality rate at 30-days post- discharge of .79% compared to those that declined the program at 5.92%.

We have six hospitals within the CHNw system in central Indiana, and the majority of the referrals to date have come from Community Hospital North (65%), Followed by Community Hospital South (15%), and Community Hospital East (14%).

Patient Referrals	
Total of total patients referred to date	390
Total Patients accepted and enrolled into the program (Accepted= Patient agreed to Home Care and ProCare, and had at least 1 virtual visit completed)	255
Conversion Rate to accepted patients	65.38%
Accepted patient hospital readmission rate	10.588%
Total patient readmitted within 7 days post discharge	18
Total patients readmitted between 7-30 days post discharge	9
Average length of stay for hospital readmissions	9.6 days
Declined patients' hospital readmission rate	11.111%
Total patient readmitted within 7 days post discharge	9
Total patients readmitted between 7-30 days post discharge	6
Average length of stay for hospital readmission	8.438

Primary Diagnosis for MEND at Home Accepted Patients	
COVID+ No Oxygen	113
COVID+ With Oxygen	139
COVID+ with Infusion	1
CHF	1
Pneumonia (not COVID Related)	1

CONCLUSION

This program continues to evolve and early results have been very promising, with lower readmission rates and ED utilization, and lower mortality rates.

REFERENCES

Sitemmagari K, et al, insights from rapid deployment of a "virtual hospital" Ann Intern Med 2021; 174:1188
Chou SH et al, Factors associated with risk for care escalation Among patients with COVID19 Receiving Home-based hospital care. Ann Intern Med 2021; 174:1188
Ohannessian R. Telemedicine: Potential application in epidemic situations. Eur Res Telemed 2015;4:95

Community Health Network

Browns Tumor due to Hyperparathyroidism A Case Report

Amber Wolverton, DO

Introduction

This case reports outlines the diagnosis, clinical course, and treatment of Browns Tumor, which is a rare manifestation of hyperparathyroidism.

Case description

A 34 year old female presented to the emergency department for acute onset of chest pain and shortness of breath. A CTA was performed to rule out pulmonary emboli but instead showed lytic bony lesions in several of her ribs and bilateral scapula. She was found to have hypercalcemia with a calcium of 13.2. Per chart review, she had mildly elevated calcium for many years that had never been worked up. She was admitted and started on treatment for her hypercalcemia. A CT abdomen/pelvis showed multiple expansile bony lesions in her pelvis. Her parathyroid hormone was elevated to 285. After her calcium was corrected, she was discharged with an oncology referral for possible multiple myeloma.

Diagnosis and treatment

Her outpatient workup for multiple myeloma was negative but a bone marrow biopsy revealed giant cell-rich lesions consistent with browns lesions secondary to her hyperparathyroidism. An ultrasound showed a nodule within the left cervical thymus consistent with an abnormal parathyroid gland, and a parathyroid scan showed increased uptake concerning for right lower parathyroid adenoma. She was referred for a parathyoidectomy and had her right inferior parathyroid gland removed. Post-op she was placed on a course of calcitriol and calcium carbonate. Her following labs showed normal calcium.

References:

- Xu, B., Yu, J., Lu, Y. et al. Primary hyperparathyroidism presenting as a brown tumor in the mandible: a case report. BMC Endocr Disord 20, 6 (2020). https://doi.org/10.1186/s12902-019-0480-2
- Panagopoulos, A., Tatani, I., Kourea, H.P. et al. Osteolytic lesions (brown tumors) of primary hyperparathyroidism misdiagnosed as multifocal giant cell tumor of the distal ulna and radius: a case report. J Med Case Reports 12, 176 (2018). https://doi.org/10.1186/s13256-018-1723-y
- Achmad Fauzi Kamal, Putri Amalia Isdianto, Ali Abdullah, Evelina Kodrat, Brown tumors of hyperparathyroidism misdiagnosed as multifocal Giant Cell Tumors of bone: A case report, Human Pathology: Case Reports, Volume 21, 2020, 200385, ISSN 2214-3300

Discussion

The majority of hyperparathyroidism cases are due to parathyroid adenomas. Osteitis fibrosa cystica is the late and physical manifestation of hyperparathyroidism in the bones. It is clinically characterized by bone pain. Radiographically, findings include bone resorption in the middle phalanges, thinning and tapering of the clavicles, bone cysts, "salt and pepper" appearance of the skull, and browns tumors. Browns tumors, named such due to hemosiderin deposition, are caused by an increase in osteoclast activity leading to bone demineralization. OFC is rare occurring in <2% of patients with hyperparathyroidism and usually seen in severe disease.

Conclusion

- Browns Tumor is a rare initial presentation of primary hyperparathyroidism
- Browns tumor should be included in the differential diagnosis of lytic lesions
- Elevated calcium should not be ignored and warrants a workup even in young, healthy patients.

Determining the Effects of Pitching Volume and Fatigue on Self-Reported Pain in High School Softball Pitchers

Jochum JE, Jones ER, Hogan AT, Rufenacht JM, Schiffli KK, Seawright BA, Wood BB, University of Indianapolis, Indianapolis, IN

UNIVERSITY of INDIANAPOLIS
Krannert School of Physical Therapy

Introduction

- Pitch volume and fatigue have been shown to play a role in the onset of injury for adolescent throwing athletes. While a vast amount of data has been reported for baseball, less attention has been given to softball.
- Compared to baseball, softball teams carry a smaller number of pitchers on their team, and thus, these athletes experience a higher pitching load.
- To our knowledge, there is no literature available that monitors pain and fatigue in softball pitchers over the course of an entire softball season.

Purpose

- The purpose of this study was to determine and quantify the prevalence of pain in high school softball pitchers as it correlates to pitching volume, as well as subjective and objective measures of fatigue.

Vert Accelerometer

- The device used to measure height of vertical jumps

Methods

This was a prospective, repeated-measures quantitative study of high school female softball pitchers.

- 16 female softball pitchers, over an 18 week season
- Data collected on a weekly basis
  - Pain levels using the Numeric Pain Rating Scale (NPRS),
  - reported pitch counts
  - Vertical jump height measurements, using the Vert accelerometer device
  - Reported fatigue using the Hecimoviche Peiffere Harbough Exercise Exhaustion Scale (HPHEES) and the Perceived Recovery Status Scale (PRS).
- Correlations between pitching volume, pain, fatigue scales, and vertical jump height using Spearmin's Rho rank correlation coefficient tests.
- The significance level was set at p<0.05 for all analyses.

Results

- Survey results yielded increased pain with lower recovery scores on the Perceived Recovery Scale throughout the season (week 2: r=-0.905, p=0.005; week 8: r=-0.887, r=<0.001; week 16: r=-0.689, p=0.027). See figure 1.
- Increased pitching volume was associated with greater participant fatigue, as demonstrated by lower vertical jump scores at the middle (week 8: r=-0.693, p=0.01) and end of the season (week 16: r=-0.641, p=0.05). See figure 2.
- Survey found that pain was associated with higher HPHEES scores throughout the season (week 2: r=0.764, p=0.05; week 8: r=0.832, p<0.001; week 16: r=0.779, p=0.001). See figure 3.
- Participants that experienced increased pain during the final weeks of the season also reported an increase in pitching volume (weeks 14-17: r=0.752 to r=0.892, p=0.01 to 0.05). See figure 4.

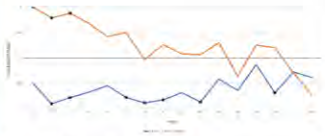


Figure 1: Correlation of PRS with pain and pitching volume

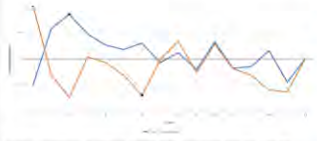


Figure 2: Correlation of average vertical jump height with pain and pitching volume

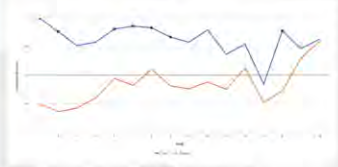


Figure 3: Correlation of HPHEES with pain and pitching volume

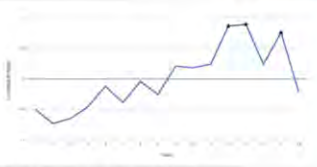


Figure 4: Correlation of pain and number of pitches

Table 1: Hecimoviche Peiffere Harbough Exercise Exhaustion Scale (HPHEES)

How recovered do you feel?
How energetic do you feel?
How refreshed do you feel?
How easily can you run?
How physically drained do you feel?
How easily can you replicate your last game, event, or competition?
How easily could you train some more?
How weak do your legs and/or arms feel?
How much do your muscles ache?
How mentally sharp do you feel?
How relaxed do you feel?
How mentally drained do you feel?
How easily can you walk?
How mentally cloudy do you feel?

Table 2: Perceived Recovery Scale (PRS)

10	Very well recovered/Highly energetic
9	
8	Well recovered/Somewhat energetic
7	
6	Moderately recovered
5	Adequately recovered/Adequately recovered
4	Somewhat recovered/Somewhat recovered
3	
2	Not well recovered/Somewhat tired
1	
0	Very poorly recovered/Extremely tired

Conclusion

Increased softball pitching volume is associated with:

- increased fatigue,
- increased pain,
- lower vertical jump scores

Study Limitations

- Weekly participation from pitchers
- Outcome measure is not validated for use in adolescent softball pitchers
- Numeric Pain Rating Scale (NPRS) "no pain" option

Future Research

Future studies regarding pitching volume, fatigue, and pain in softball pitchers should include larger populations of athletes to increase the power of the statistical findings. The scope of the data collection process should consider the incorporation of school-based leagues in addition to the interplay between travel leagues and the effects of the volume of year-long pitchers. There may be a correlation between further increased pitch volume of those who transition between summer softball leagues and school-based competition without a marked period of rest between seasons that this study was not able to capture due to the limited time frame of data collection.

Acknowledgments

We would like to thank the high school student athletes who agreed to participate in this study. Additionally, we want to express our gratitude to the athletic trainers who assisted in the data collection process.

References:

1. Hecimovich MD, Peiffer JJ, Harbaugh AG. Development and psychometric evaluation of a post exercise exhaustion scale utilising the Rasch measurement model. *Psychol Sport Exerc*. 2014;15(6):569-579. doi:10.1016/j.psychsport.2014.06.003
2. Laurent CM, Green JM, Bishop PA, et al. A Practical Approach to Monitoring Recovery: Development of a Perceived Recovery Status Scale. *J Strength Cond Res*. 2011;25(3):620-628. doi:10.1519/JSC.0b013e3181c69ec6
3. Skillington SA, Brophy RH, Wright RW, Smith MV. Effect of pitching consecutive days in youth fast-pitch softball tournaments on objective shoulder strength and subjective shoulder symptoms. Am J Sports Med. 2017;45(6):1413-1419. doi:10.1177/0363546516688657
4. Watkins CM, Barillas SR, Wong MA, et al. Determination of vertical Jump as a Measure of Neuromuscular Readiness and Fatigue. *J Strength Cond Res*. 2017;31(12):3305-3310. doi:10.1519/JSC.0000000000002231
5. Yung JS, Stepan JG, Dvoracek L, Wright RW, Brophy RH, Smith MV. Fast-pitch softball pitchers experience a significant increase in pain and fatigue during a single high school season. HSS J Ser York. 2016;12(2):111-118. doi:10.1007/s11420-016-9499-3

Outcomes of an Injury Prevention Program Implemented with Female High School Basketball Athletes

Jochum JE, Jones ER, Colliver RN, Wagner AM, Lee AM, George HD, Spangler GM, Wood DL:
University of Indianapolis, Indianapolis, IN

Introduction

- Girl's high school basketball has a high rate of lower extremity injury.[1]
- Decreased neuromuscular control, hip and core strength, and the unique female anatomy increases risk of injury in high school female athletes.[2]
- The Hip-focused Injury Prevention (HIP) program was implemented in collegiate female basketball players, resulting in decreased injury incidence.[3]

Purpose

The purpose of this study is to:

- examine the feasibility of implementing the HIP program into female high school basketball practice,
- assess the effect of the HIP training program on injury incidence, hip and core strength, and neuromuscular control.

Component	Exercise
Jump Landing w/ Band	Rebound Jump w/ Ball Catch
	180° turn w/ Ball Catch
	Front-Back Jump (both legs)
	Side Jump (both legs)
Strengthening	Hip ER with weak level band
	Side Bridge
	Bridge
	Russian Hamstring Curls
	Standing hip ABD w/ weak band
Balance on BOSU	Bilateral Squat
	Single Leg Balance & Dribble

Table 1: Phase 1, HIP Protocol [3]

Figure 1: Participants performing HIP protocol at practice

Methods

- Participants (n=24) underwent preseason and postseason testing for hip extensor, abductor, and external rotation strength via Handheld Dynamometry, and neuromuscular coordination via the YBT-LQ and YBT-UQ.
- The HIP program was implemented within team practices by the coaches 3 days/week for 12 weeks (Table 1).
- The HIP program consisted of 3 phases, each lasting ~ 4 weeks, with each phase getting progressively more challenging (Table 1).
- Lost time injuries were tracked during the season by team athletic trainer.

Results

- Participants who completed the HIP program (n=22) had decreased lost-time injuries compared to previous seasons (Figure 2).
- Individuals with >4 cm reach asymmetries side-to-side on YBT-LQ decreased after the intervention for all 3 directions (Figure 3).
- Maximal hip abduction strength (p_L=.013, p_R=.430) improved following intervention (Figure 4), but external rotators and extensors did not.
- YBT-UQ composite scores improved bilaterally (Figure 5).

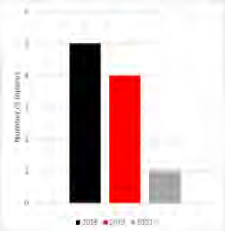


Figure 2: Lost-Time Injuries

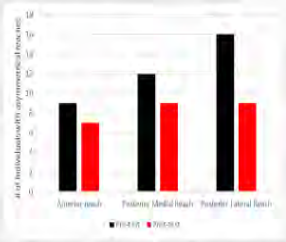


Figure 3: Participants with asymmetries >4 cm on YBT-LQ

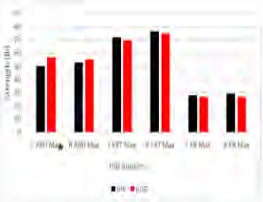


Figure 4: Maximal Hip Strengths
**: significant*

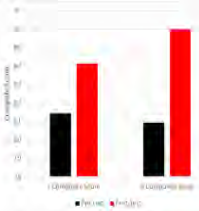


Figure 5: YBT-UQ Composite Scores

Conclusion

- The implementation of HIP program for high school female basketball players is feasible and resulted in decreased lost-time injuries compared to previous seasons.
- Improvements in core and hip abductor strength, as well as symmetry of postural control, are likely contributing factors to decreased injury rates.
- Future research needs to further investigate the exact mechanisms to help refine injury prevention programs for this population.

Acknowledgements

Thank you to the Meghan Partenheimer and sports medicine and coaching staff at Franklin Central High School for their cooperation and implementation of the HIP protocol.

References

1. RIO™ Study Reports. Accessed February 22, 2021. https://www.nationwidechildrens.org/research/areas-of-research/center-for-injury-research-and-policy/injury-topics/research-projects/no/no-study-reports
2. Robbins CT. ACL injury risk factors & injury reduction programs in female football players. JASC. 2019;27(4):65-69.
3. Omi et al. Effect of hip-focused injury prevention training for anterior cruciate ligament injury reduction in female basketball players: A 12-year prospective intervention study. *Am J Sports Med*. 2018;46(4):852-861. doi:10.1177/0363546517749471

Community Health Network

Double Ouch! 14 Year Old Multisport Athlete with Bilateral Knee Pain

Mary Apiafi Moore, MD; Theodosis Chronis, OMS-3; Christopher Gasaway, DO

Case History:

- 14-year-old male presented with one-year history of bilateral knee pain, worse on the left
- No known mechanism of injury or instability
- Pain of lateral knees was gradual but progressed to constant
- Pain worsened with weight-bearing and knee-flexion activities
- Achieved minimal relief with rest and activity modification

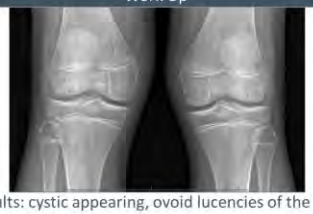
Physical Exam:

- Bilateral genu valgus. Bilateral lateral femoral condyle tenderness, left worse than right. No limb length discrepancy. No knee effusion. Gait normal.
- Right knee: Painful crepitus over lateral compartment with ROM and McMurray testing. ROM 3° of recurvatum to 140° flexion. No popliteal discomfort.
- Left knee: Crepitus over lateral compartment with McMurray. Tenderness of lateral joint line and lateral gastrocnemius. ROM 3° of recurvatum to 145° flexion.

Differential Diagnoses:

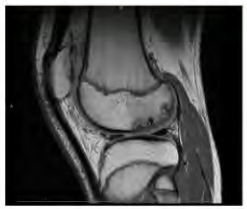
- Symptomatic discoid meniscus
- Iliotibial band syndrome
- Popliteus tendinopathy
- Osteochondritis dissecans
- Osteochondral dysplasia

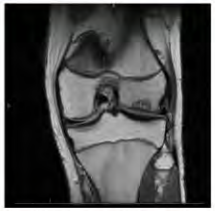
Work Up

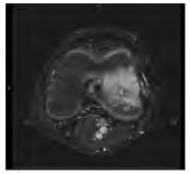


- Xray results: cystic appearing, ovoid lucencies of the lateral femoral condyles
- Activity modification
- Bilateral knee MRI ordered

Diagnostic Imaging:







- Left knee MRI without contrast showed large, 4.0 x 3.0 cm osteochondral lesion at posterior weight-bearing lateral femoral condyle with fluid/delamination undermining the chondral surface concerning for instability
- Right knee MRI without contrast showed large, 4.0 x 2.5 cm osteochondral lesion at posterior weight-bearing lateral femoral condyle. No displaced chondral defect seen
- Areas of contour flattening and cystic change were seen bilaterally

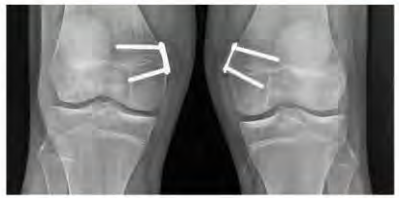
Final Diagnosis:

Bilateral knee osteochondritis dissecans of the lateral femoral condyles

Treatment/Outcome:

- Underwent bilateral knee distal medial femoral hemi-epiphysiodesis and left knee diagnostic arthroscopy
- Supplemental Vitamin D to address deficiency
- Completed non-weightbearing period with successful progression in rehabilitation
- Adequate interval radiographic healing of osteochondral lesions
- Progressed to low impact activities
- Continued rehabilitation with plan to return to sport in 1-2 months

Final Imaging:



Discussion:

- Patients with a prolonged presentation that do not respond to conventional therapy warrant further workup.
- The incidence of osteochondritis dissecans (OCD) in the general population is 9.5 per 100,000
- Risk of developing OCD is 3.3 times more common in boys than girls
- Bilateral joint imaging should be considered during workup as OCD is bilateral in roughly 15% of cases.
- Most common location for OCD is the lateral surface of the medial femoral condyle. Lesions of the lateral femoral condyle and patella are rare.
- Stable lesions that fail nonoperative treatment can be considered for arthroscopic drilling.
- Unstable lesions have several different options for treatment including internal fixation, bone grafting, autograph osteochondral plug fixation, or salvage techniques of autologous chondrocyte implantation and osteochondral allografts.
- Rehabilitation starts with non-weightbearing and averages 4-6 months before return to activity.

References:

- Accadbled F, Vial J, Sales de Gauzy J. Osteochondritis dissecans of the knee. *Orthopaedics & Traumatology: Surgery & Research*. 2018;104(1):S97-S105. Published 2018. doi:10.1016/j.otsr.2017.02.016.
- Filho JS, Garms E, Sayum J, et al. BILATERAL OSTEOCHONDRITIS DISSECANS OF THE KNEE IN A BASKETBALL PLAYER: CASE REPORT. *Rev Bras Ortop*. 2015;47(2):257-259. Published 2015 Dec 6. doi:10.1016/S2255-4971(15)30096-3.
- Jeong JH, Mascarenhas R, Yoon HS. Bilateral osteochondritis dissecans of the femoral condyles in both knees: a report of two sibling cases. *Knee Surg Relat Res*. 2013;25(2):88-92. doi:10.5792/ksrr.2013.25.2.88.

Community Health Network

Chatting up the MCHAT: Improving autism screening in a family medicine residency clinic

Jessica Uhler, MD; Kelsey Kennedy, DO; Melody Jordahl-Iafrato, MD
Community Hospital East Family Medicine Residency, Community Health Network, Indianapolis, IN

Introduction

- The USPTSF states there is insufficient evidence regarding the benefits and harm of autism screening in children in whom there is no concern raised. Currently, they do not recommend for or against screening. However, studies show that those that participate in ASD screening were identified with developmental delays and referred to interventions earlier than those that did not participate. [1]
- According to the CDC, the prevalence of autism is increasing. In 2018, about 23 per 1,000 children were diagnosed compared to 6-7 per 1,000 in 2000. Thus, PCPs are likely to provide care to children with ASD and should be aware of valid screening tools and early intervention programs in their area. [2]
- The Modified Checklist for Autism in Toddlers Revised with Follow up (MCHAT-R/F) is a validated screening tool that is performed twice between 16-30 months. [3] Patients are initially screened using the MCHAT-R. Scores 0-2 require no follow up. Scores 3-7 require administration of the follow-up. Scores higher than 7 require referral for evaluation and intervention.
- The primary objective of this project is to improve performance regarding MCHAT-R/F use and increase MCHAT-R/F screening rates in a family medicine residency clinic.

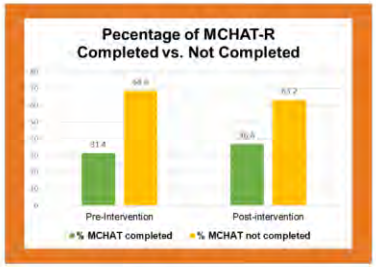
Methods

A short presentation about the purpose of the MCHAT-R/F, appropriate MCHAT-R/F use, and how to enter the information into the electronic health record (EHR) was given to all staff and providers during a clinic all-staff meeting.

Clinic workflow was modified: Copies of the MCHAT are given to well child visits (ages 16-30 months) by the front desk workers. Parents/guardians are instructed to complete the form on their own prior to the provider entering the room. The provider reviews the results during the visit, recommends appropriate follow up, and inputs the results under the MCHAT flowsheet in the EHR.

MCHAT-R/F documentation rates from before the intervention (10/19/2020 - 4/19/2021) and after the intervention (10/19/2021 - 4/19/2022) were collected.

Results



- Prior to our intervention, our clinic completed MCHATs on 31.4% of well child visits aged 16-30 months.
- After our intervention, our clinic completed MCHATs on 36.8% of well child visits aged 16-30 months.
- Using a standard McNemar's test, p-value was <0.01.

Discussion

- Overall, implementing this workflow modification was beneficial in improving rates of MCHAT-R/F being entered into the EHR. We may need to periodically reinforce this workflow in the future to make sure new providers and staff are informed.
- A limitation of our study is the small data set. Overall, we have a small number of well child checks that are performed in our clinic.
- More MCHATs may have been completed than our data reflects. Currently, our providers use different well child note templates. Some templates include the MCHAT within the note and therefore not entered into the correct location in EHR. A next step would be to implement set well child templates for all providers that includes a reminder statement to document the MCHAT screening into the EHR flowsheet.

Disclosure

- Authors of this study have nothing to disclose.

References

1. Guevara JP, Gerdes M, Localio R, et al. Effectiveness of Developmental Screening in an Urban Setting. Pediatrics. 2013;131(1):30-37. doi:10.1542/peds.2012- 0765

1. Johnson CP, Myers SM, Council on Children with Disabilities. Identification and Evaluation of Children With Autism Spectrum Disorders. Pediatrics. 2007;120(5):1183-1215. doi:10.1542/peds.2007-2361

1. Robins DL, Casagrande K, Barton M, Chen C-MA, Dumont-Mathieu T, Fein D. Validation of the Modified Checklist for Autism in Toddlers, Revised With Follow-up (M-CHAT-R/F). Pediatrics. 2014;133(1):37-45. doi:10.1542/peds.2013-1813

Introduction of longitudinal teams to teach quality improvement in a family medicine residency patient centered medical home

Courtney Clawson, DO; Anne Packard, PharmD; Kaitlyn Wong, RD; Taylor Bachert, DO; Gursharan Singh, DO; Rachel Shockley, DO; Julie Stenger, RN, BSN; Carrie Leblanc, MA Leah Chamberlain, MA; Kyle Sparks, BA;
Community South Osteopathic Family Medicine Residency Program; Greenwood, IN

INTRODUCTION

The Accreditation Council for Graduate Medical Education requires family medicine residents to participate in inter-professional quality improvement activities.[1] Multidisciplinary longitudinal teams were created at a family medicine residency. The goal was to improve diabetic quality metrics, to have 80% of the clinic's diabetic patients achieve a hemoglobin A1C less than 8%.

	Q1 '21	Q2 '21	Q3 '21	Q4 '21	YTD
Hemoglobin A1c Testing	69	78	82	94	94
Hemoglobin A1c Control	56	56	59	65	69
Blood Pressure Measurement	100	94	94	100	100
Blood Pressure Control	63 %	56 %	65 %	71 %	75 %
Foot Exam	94	83	81	94	93
Eye Exam	0	0	6	0	31
Microalbumin Testing	63	67	71	94	94
Statin Therapy	100 %	100 %	100 %	100 %	100 %

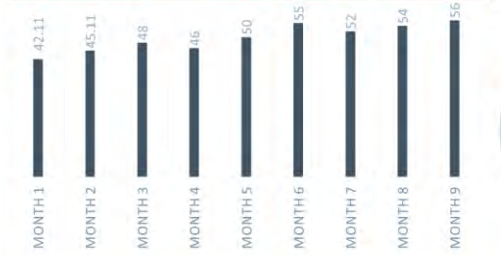
DISCUSSION

The first intervention resulted in approximately 14% improvement from baseline. We hope for continued improvement and to achieve the goal. Another goal is teaching quality improvement to residents utilizing a novel approach to improving hemoglobin A1C levels. Ideally, residents will use these skills moving forward and implement quality improvements later in their careers.

METHODS

A prospective observational study design and Lean Six Sigma methodology guided the interventions. A multidisciplinary team with a pharmacist, dietitian, social worker, nurse manager and physician obtained a Lean Six Sigma yellow belt. The percentage of patients with a hemoglobin A1C above 8% was measured. Physicians set aside clinic time to evaluate diabetes registry monthly with faculty physician. Patients were then identified with elevated or due for hemoglobin A1c; staff contacted them for follow-up and to schedule an appointment with their provider and with the pharmacist and dietitian for medication adjustments and lifestyle changes if their A1C was above 8%. The percentage of patients with hemoglobin A1C levels below 8% was assessed monthly. This project will continue over the academic year or until we reach and sustain our goal.

Percentage of Patients with A1c < 8%



RESULTS

The initial goal was improving percentage of patients with a hemoglobin A1C less than 8% from 42% to 80% over a 6-month time period. The percentage of patients meeting this goal was 42.11% at baseline, followed by 46% at month four when the first intervention was implemented, and finished with 56% at month nine.

FUTURE PLANS

Include goals of improving other diabetic measures including: foot exams, eye exams, microalbumin/creatinine ratios

Apply same methodology to other registry metrics like blood pressure, pap smears, etc

Determine plan for sustainability for project given turnover

REFERENCES

1. Common Program Requirements; effective July 1, 2019. Accreditation Council for Graduate Medical Education Web site. http://www.acgme.org/acWebsite/reviewComment/CommonPRs_R&C.pdf. Accessed January 2, 2019.
2. Fellner AN, Pettit RC, Sorscher J, Stephens L, Drake B, Welling RE. Chronic disease management: a residency-led intervention to improve outcomes in diabetic patients. Ochsner J. 2012;12(4):323-330.
3. Devkota BP, Ansstas M, Scherrer JF, Salas J, Budhathoki C. Internal medicine resident training and provision of diabetes quality of care indicators. Can J Diabetes. 2015;39(2):133-137.

NICU Gratitude Huddle: Building a Culture of Gratitude

Community Health Network

Beth Buckingham, PhD, HSPP ; Kimberlie Wells, DO; Heinrich Bruno Aurnhammer, OMS-IV

Introduction

Work morale, job satisfaction, and well-being among health care workers appear historically low, a phenomenon seen across the United States, as well as within Community Health Network. Gratitude, the quality of being thankful, is associated with enhanced personal and professional well-being. Research indicates that practicing gratitude at work increases resilience to stress, job satisfaction and overall happiness. Grateful people are more active, compassionate, and have reported increased life satisfaction. Conversely, research studies show that workplaces lacking gratitude may produce cultures that foster negativity, exploitation, and entitlement. This research study aimed to evaluate whether voluntary NICU huddle gratitude practices positively impacted the social and emotional well-being of the NICU staff.

Methods

This study utilized an evidence-based gratitude intervention developed at the University of California, Berkley, through the Greater Good Science Center (GGSC). The intervention was implemented during huddles with registered nurses, respiratory therapists, and patient care technicians at Community Health Network's Level III NICU. For the intervention, NICU staff were encouraged to voluntarily express one experience they were grateful for at work or one experience they appreciated about working with a NICU colleague. Staff were informed of this study via a presentation at one of the multidisciplinary staff meetings. Information included definitions of gratitude, ways to build a culture of gratitude, the NICU huddle gratitude script and the Gratitude Questionnaire-Six Item Form (GQ-6). A nursing manager requested via email that staff complete an anonymous survey with the GQ-6 prompts prior to the start of the NICU gratitude huddle. Pre-assessment results from 80 NICU staff members were then collected. This gratitude intervention was implemented for three months. At the completion of the study, staff who filled out the pre-assessment survey were again asked to fill out the GQ-6 anonymously.

The Gratitude Questionnaire – Six Item Form (GQ-6)

The Gratitude Questionnaire-Six-Item Form (GQ-6) is a six-item self-report questionnaire designed to assess individual differences in the proneness to experience gratitude in daily life.

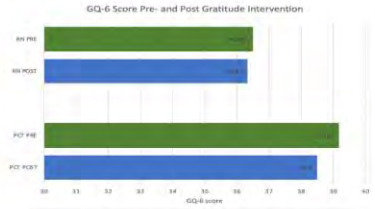
McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. Journal of Personality and Social Psychology, 82, 112-127.

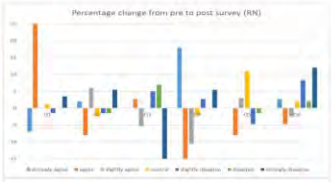
Instructions: Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

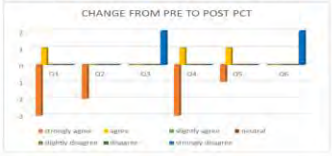
1 = strongly disagree
2 = disagree
3 = slightly disagree
4 = neutral
5 = slightly agree
6 = agree
7 = strongly agree

___1. I have so much in life to be thankful for.
___2. If I had to list everything that I felt grateful for, it would be a very long list.
___3. When I look at the world, I don't see much to be grateful for.
___4. I am grateful to a wide variety of people.
___5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.
___6. Long amounts of time can go by before I feel grateful to something or someone.

Scoring: Compute a mean across the item ratings; items 3 and 6 are reverse-scored.







Results

6 PCTs, 63 RNs and 12 RTs filled out the pre-intervention GQ-6. However, only 4 PCTs and 36 RNs completed the post-intervention GQ-6. No RTs completed the post-intervention questionnaire. Thus, only PCT and RN results were analyzed. Starting with the pre-intervention GQ-6, all PCTs felt that they had a lot to be grateful for, could appreciate various people and experiences, and felt grateful frequently in everyday life. Results for the RNs' pre-intervention GQ-6 were like the PCTs, though there were some outliers who felt like they had less to be grateful for overall. For the post-intervention GQ-6 PCT and RN responses were similar in that gratefulness seemed to decrease slightly.

Discussion

Although quantitative data has yet to be analyzed, qualitative data does not suggest that participating NICU staff significantly benefited from gratitude huddle as measured by GQ-6 in this study. Because the data is aggregated and de-identified, it is difficult to draw further conclusions. Future considerations would be to expand qualitative data versus quantitative data to get a more robust picture of how the intervention affected staff members. This pilot project helps investigate gratitude in various healthcare settings and will serve as a launching pad for a future study involving graduate medical education residents and faculty.

References

1. Suttie, Jill. "Can Practicing Gratitude Boost Nurses' Resilience?" *Greater Good Science Center*, 10 May 2021, https://greatergood.berkeley.edu/article/item/can_practicing_gratitude_boost_nurses_resilience. Accessed 15 Jan. 2022.
2. Fox, Glen. "What Can the Brain Reveal About Gratitude?" *Greater Good Science Center*, 4 Aug 2017, https://greatergood.berkeley.edu/article/item/what_can_the_brain_reveal_about_gratitude. Accessed 15 Jan. 2022.
3. Allen, Summer. "The Science of Gratitude", May 2018, https://ggsc.berkeley.edu/images/uploads/GGSC-JTF_White_Paper-Gratitude-FINAL.pdf. Accessed 17 Jan. 2022.

Community Health Network

An Atypical Case of HELLP Syndrome

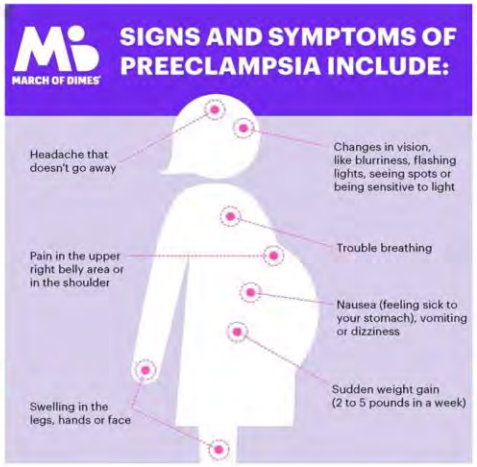
Sagi Mathew MD, Adam Klem MD, Morgan Rhodes MD

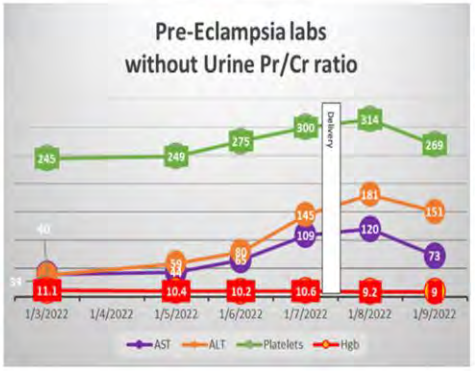
Introduction

HELLP Syndrome (Hemolysis, Elevated Liver function tests (LFTs) and Low Platelets) is a subset of pre-eclampsia with severe features. The spectrum of pre-eclampsia disorders are common and result in a large percentage of maternal and perinatal morbidity. HELLP is seen in 10% of the cases of severe pre-eclampsia and approximately 50% of eclampsia. Classical presentation is hypertension and proteinuria >20 weeks gestation. Atypical cases are those that might present < 20 weeks, with signs and symptoms but no hypertension or proteinuria, or just subtle lab abnormalities. Looking at the case reports in literature, atypical cases are noted, but we were not able to find one with just elevated LFTs and blood pressure (BP) that normalized.

Case Presentation

19yo G1P0 who came to the clinic at 37w2d gestation with mildly elevated BP and no symptoms to indicate pre-eclampsia. Patient was sent to the Labor & Delivery (L&D) for labs to rule out pre-eclampsia and HELLP. Patient's BPs were normal, LFTs and the urine protein/creatinine ratio were only mildly elevated but not meeting criteria for pre-eclampsia, so she was sent home. She returned to clinic 2 days later and had elevated BPs up to 160/94. She was sent to L&D and noted to have normal BPs and no symptoms. Blood and urine studies showed a mild increase from 2 days prior but still not meeting criteria for pre-eclampsia. At this time, given BPs in the clinic, patient met criteria for gestational hypertension, an indication for induction of labor given she was >37 weeks. Her BP, platelets, and urine protein remained normal, hemoglobin was slightly low without hemolysis, but her LFTs continued to climb. The day of her induction, LFTs were almost twice the upper limit of normal, but she had not quite met criteria for atypical HELLP. The next morning of the induction, her LFTs tripled as BPs, renal function, urine protein, hemoglobin, and platelets all stayed normal without any symptoms. Patient did now meet criteria for atypical HELLP, she was started on magnesium sulfate for eclampsia prophylaxis, and her labs were followed closely. Aggressive efforts were made to have a vaginal delivery with AROM and Pitocin. However, patient reported a headache that afternoon and stat labs showed LFTs even more elevated from the morning. So, decision was made to deliver by c-section for worsening HELLP. Patient delivered a viable baby. LFTs continued to increase that night but by morning they had started to downtrend.





Discussion

Main presenting symptoms in HELLP syndrome are abdominal pain, malaises, nausea, and vomiting. A few case reports were noted in the literature to show atypical presentations of HELLP, but in many cases some symptom was present initially. Our case was challenging due to the absence of symptoms, normal BPs in the hospital but elevated in the clinic, and minimal elevation of one parameter in HELLP (elevated LFTs). This case shows that we need to have a high index of suspicion for HELLP with any patient presenting with unexplained lab abnormalities of HELLP despite absence of symptoms or elevated BPs in the hospital.

References

1. ACOG Practice Bulletin #202- Gestational Hypertension and Preeclampsia. Obstetrics and Gynecology, Vol 133 (1) e1-e25. January 2019
2. Caroline L. Stella, MD; Khurram M. Malik, MD; Baha M. Sibai, MD (2008). HELLP syndrome: an atypical presentation-Case Report. American Journal of Obstetrics and Gynecology e6-e8. May 2008
3. Iven Renee Hansen* and Mohammed R Khalil z(2019). Postpartum HELLP syndrome with atypical features. Journal of Pregnancy and Child Health. Vol 6: Issue 5, September 2019
4. Daigo Ochiai, Kei Miyakoshi, Youhei Akiba, Toshimitsu Otani, Tadashi Matsumoto, Mamoru Tanaka (2017). Atypical HELLP syndrome secondary to uteroplacental insufficiency. Hypertension Research in Pregnancy 4: 106-107. January 2017

Postpartum Iron Infusions: Impact of anemia on maternal-infant outcomes

Kaleigh Bachus, MSN, RN, AGCNS-BC, RNC-OB
Hubert Dolubizno, DO

Community Health Network

BACKGROUND

It is estimated that postpartum anemia affects up to 50% of women in well-resourced countries and is associated with maternal morbidities such as depression, fatigue, and impaired cognition which can all have a negative impact on maternal-child bonding and impair the ability of the mother to care for the newborn (Sultan, et al., 2019). Identification and treatment of anemia is important not only to the physiological function of the mother but also to prevent further risk of postpartum depression which impairs the natural bonding between mother and newborn.

RESEARCH AIM

The aim of this study is to determine if administering intravenous iron before postpartum discharge in patients at high risk for anemia in the postpartum period impacts breastfeeding, postpartum hemoglobin, and Edinburgh scores using the PDSA framework.

FRAMEWORK

CRITERIA FOR INFUSION

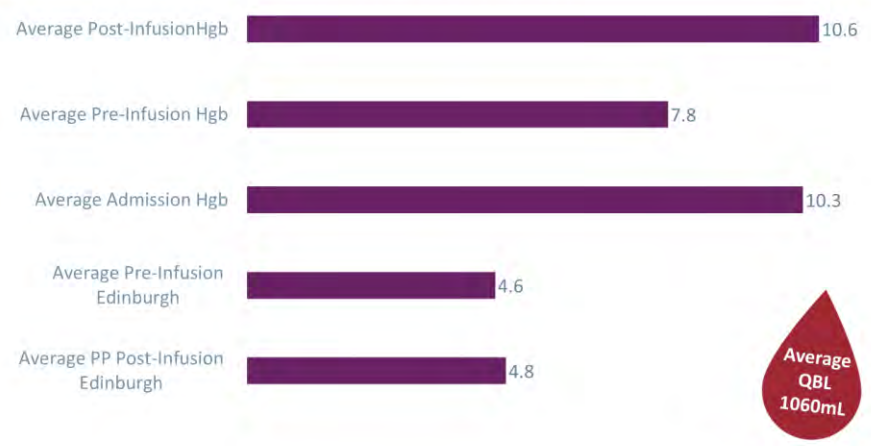
- Postpartum Women:
- Postpartum Hgb < 8g/dL or <10g/dL with additional indications such as PPH (>1L blood loss by QBL)
- Iron deficiency noted on admission:
  - Ferritin < 100ng/mL during pregnancy without correction
  - Intolerance to oral iron
  - Lack of response to oral iron
- Significant social determinants of health that prevent replacement after discharge such as transportation, inability to afford oral iron or iron rich foods, homelessness

NEXT STEPS/DICUSSION

IRB approved retrospective chart review

Statistical analysis for significance

INTERVENTION RESULTS



ORGANIZING COMMITTEE

Brown, Valerie, CPS
Burch, Tina, RN
Burget, Kaylee, BS
Campbell, Nancy, RN,MS,BC
Carter, Jeff, MS
Compton, Kathy, PT
Cunningham, E. Ann, DO
Gushrowski, Barb, MLS
Jessie, Jacquelyn, DNP, MSN, RN
Jones, Ed, PT, DHS, OCS
Kivisto, Katie PhD, HSPP
Lackey, Sarah, PharmD, BCPS
Lee, Randy, MD
Lisby, Mark, MD
Lyons, Deb, MSN, RN
Miller, Catherine DNP, RN, CNE
Morris, Toni, DNP, MSN, RN
Myers, Jaclyn, PharmD
Robinson, Kate, JD, CIP
Ruekert, Laura, PharmD, BCPP, BCGP
Wakeford, Yvonne, PhD
Wright, Elizabeth, MLS
Zoppi, Kathy, PhD, MPH, DIO

REVIEWERS

Arthur, Amy, PhD, NP, HCME, FACHE
Boake, Gregory W., DPM
Bordeaux, Allison, PsyD, HSPP
Borkes, Janel, MSN, RN, RN-BC
Brougher, Andrew, MD
Collins, Jennifer, PharmD
Compton, Kathy, PT
Dooley, Paige
Gupta, Sandeep, MD
Gushrowski, Barb, MLS
Hern, Tricia, MD
Jessie, Jacquelyn, DNP, MSN, RN
Jones, Ed, PT, DHS, OCS
Knight, Clif, MD, CPE, FAAFP
Lackey, Sarah, PharmD, BCPS
Lee, Randy, MD
Lisby, Mark, MD
Maxwell, Jackie, PsyD, HSPP
Mian, Taimur, MD
Miller, Catherine, DNP, RN, CNE
Moore, Dawn, PharmD, MS, FACHE
Morris, Toni, DNP, MSN, RN
Papineau, Emily, PharmD
Ruekert, Laura, PharmD, BCPP, BCGP
Simpson, Brittany, DO
Wakeford, Yvonne, PhD
Wright, Elizabeth, MLS

EVENT DAY TIMEKEEPERS

Benoit, Cindy
Carter, Jeff, MS
Craft, Jeana, BS
Hamilton, Jan, AS
Sparks, Kyle
Wathen, Susan, BS
Whitaker, Marc

EVENT DAY TECHNICAL SUPPORT

Allspaw, Kathleen
DeArmond, Mary, BA, Credentialed Trainer
Giere, Kris, MA
Johnson, Kristin, Sr. Credentialed Trainer
Elaina Mellott, Credentialed Trainer
Nicole Russell
Vuskalns, Christine, BA, Sr. Credentialed Trainer

INDEX TO PRESENTERS/CONTRIBUTORS

Oral Presentations = O

Poster Presentations = P