2020 RESIDENT POSTER CONTEST

CALIFORNIA ACADEMY OF FAMILY PHYSICIANS
STRONG MEDICINE FOR CALIFORNIA

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2020 Resident Poster Contest

The CAFP Foundation is pleased to support the 7th Annual Resident Poster Contest virtually on the CAFP Community Conversation, Sunday, May 24th at 7:30pm. The purpose of the poster competition is to promote scholarly activity by family medicine residents and to provide a unique opportunity for residents to share their research with a network of family doctors.

Find the posters online at www.familydocs.org/resident-poster-contest.

Eligibility:
- Resident physician at a California Family Medicine Residency Program
- CAFP/AAFP Member

Poster Categories:
1. Original Research: summarize the results of a well-defined research project
2. Case Report: present a clinical case scenario

Additional Information:
- The topic must be of value to family medicine and within the scope of family medicine.
- Accepted entries are invited to display their posters at the Clinical Forum.
- Up to 20 entries are selected for display at the Forum. Of those, the top 10 are invited to give a 2-minute/2-slide oral presentation. The top 2 posters are awarded prizes.
- Each abstract undergoes a blinded review process by family physicians on the Foundation Board of Trustees and other volunteer reviewers.

Evaluation Criteria:
- Clarity in the research and/or clinical question, study design and discussion/conclusion
- Originality of project or question
- Relevance to family medicine
- Impact on future work
- Potential to improve patient care or resident skills, knowledge and performance

Questions? Contact Pamela Mann at pmann@familydocs.org.

Missed Opportunities: Improving Same Day Birth Control Initiation Using the One Key Question Method in an Urban Underserved Population at a Community Health Center

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Family Health Centers of San Diego Family Medicine Residency Program

FAMILY HEALTH CENTERS OF SAN DIEGO

Background

• The average American woman becomes sexually active at age 17, will spend 4 years of her life either pregnant or trying to get pregnant, and 25 years of her life trying to avoid pregnancy.

•45% of pregnancies in the United States are unintended (2011).

•According to the San Diego County Maternal Child and Adolescent Health Community Profile for 2017-18, 17.3% of all women (ages 18-64 years old) delivering a baby did not receive prenatal care beginning in the first trimester of their pregnancy, 30.9% of women gave birth to a second child within 24 months of a previous pregnancy.

•Demographic of City Heights general population: 42.4 percent of City Heights residents are foreign born. City Heights racial/ethnic makeup is as follows: 54 percent Latino, 19 percent Asian or Pacific Islander, 13 percent African-American, 12 percent White, and 2 percent Other.

•The Oregon Foundation for Reproductive Health developed the "One Key Question®" method as a screening tool and conversation starter to discuss a woman's current reproductive intentions. This question, "Would you like to become pregnant in the next year?" opens the discussion for preconception counseling or birth control start and thus aims to give more women control over their reproduction through family planning.

•The CAFP and Interstate Postgraduate Medical Association created a Reproductive Health Care Initiative that includes a quality improvement module to instigate methods for improving women's reproductive care at the clinic level using the "One Key Question ®". The **Family Health Centers of San Diego Family Medicine Residency (FHCSD-FMR)** participated in this initiative and obtained the baseline rates used in our study.

•Our aim is to increase the rates of providers asking the "One Key Question®" to reproductive age women, and increase the rate of same day birth control start in those not desiring pregnancy.

Hypothesis

The use of the One Key Question® by providers will improve the rates of same day birth control initiation in eligible women ages 15-45 years old seen during clinic visits at FHCSD-FMR.

Improve Family Planning! please ask and document:
Does your patient desire pregnancy in next 12 months?
Candidate for same day birth control start? Rx condoms/ECP?
Figure 1

Methods

•Retrospective chart reviews were done on 100 randomly selected charts of female patients age 15-45 years seen by any provider at our FHCSD-FMR for baseline levels (9/1/17-9/1/18), and for each 3 week period of our 2 Plan-Do-Study-Act (PDSA) cycles.
•**Inclusion criteria:** females 15-45 years old.
• **Exclusion criteria:** current pregnancy, h/o hysterectomy, h/o tubal ligation/ Essure, h/o congenital agenesis of uterus or vagina.
•To be counted as same day birth control initiation, the method needed to be documented in the Rx/Med list or documented as nursing administered the same day as encounter.

•Interventions for PDSA Cycle 1 (8/29-9/17/19):
•Display of One Key Question® discussion prompts (Fig 1) at each computer in FMR provider workrooms
•Display of same day birth control initiation algorithm (Fig 2) in each FMR provider workroom
• Project announcement at our Residency Didactics and email announcement to all residents and faculty that see patients at FHCSD-FMR which included the prompt and same day birth control algorithm to reference. Providers were encouraged to ask the One Key Question® to all females 15-45yo at all office visits.

•Interventions for PDSA Cycle 2 (9/18-10/9/19):
•MA/Nursing staff training to include copies of laminated One Key Question® prompts (Fig 1) to the encounter folder given to each provider for any visits for female patients seen at FHCSD-FMR
•Continuation of other interventions started for PDSA Cycle 1
•2nd reminder email sent to all residents and faculty at FHCSD-FMR

Methods

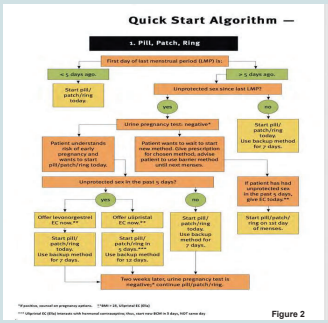
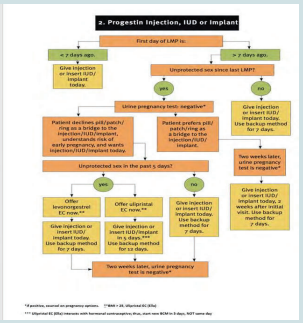


Figure 2



https://www.reproductiveaccess.org/resource/quick-start-algorithm/

Results

Of the 100 charts reviewed (Fig 3):
% Eligible Patients:
Baseline 67% (67/100), PDSA-1 72% (72/100), PDSA-2 72% (72/100).
% Eligible patients asked the One Key Question®:
Baseline 52.2% (35/67), PDSA-1 31.9% (23/72), PDSA-2 41.7%(30/72)
% Same Day Birth Control Initiation rates:
Baseline 48.6% (17/35), PDSA-1 34.8% (8/23), PDSA-2 36.7% (11/30)

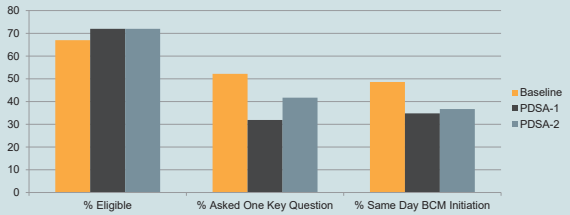


Figure 3

Further analysis done of the PDSA Cycle patient information:
PDSA Cycle 1:
Of the eligible women asked One Key Question®: 21.7% (5/23) desired pregnancy, 21.7% (5/23) reported abstinence/ declined all BCM, 21.7% (5/23) continued their current birth control method, and 34.8% (8/23) started a new birth control on the same day. (Fig 4)
Of the eligible women **NOT** asked the One Key Question® (49/72): 24.5% (12/49) were seen for an acute care/ED/Hospital follow up visit.

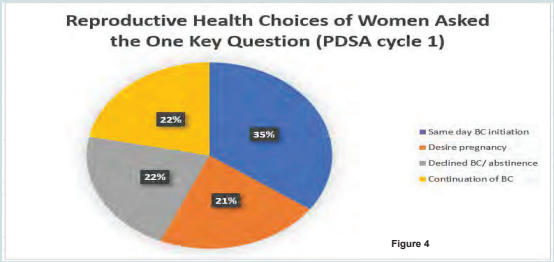


Figure 4

Results

PDSA Cycle 2:
Of the eligible women asked One Key Question®: 10% (3/30) desired pregnancy, 26.6% (8/30) reported abstinence/ declined all BCM, 26.7% (8/30) continued their current birth control, and 36.7% (11/30) started a new birth control on the same day. (Fig 5)
Of the eligible women **NOT** asked the One Key Question® (42/72): 26.2% (11/42) were seen for an acute care/ED/Hospital follow up visit.

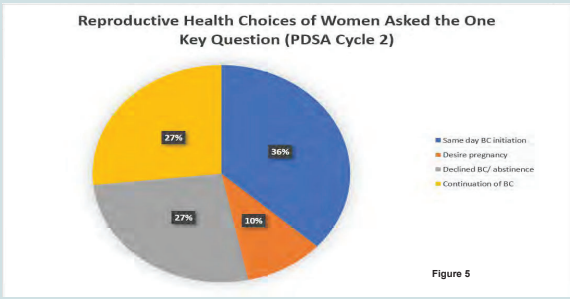


Figure 5

Discussion

•Our interventions lead to a 10% increase in asking the One Key Question® between PDSA cycles but not compared to our baseline levels, and lead to a 2% increase in prescriptions for same day birth control initiation between PDSA cycles but less compared to our baseline values.
•Of the woman asked, a large proportion continue to decline birth control methods or choose abstinence.
•Notably, about ¼ of the visits where the One Key Question® was not asked, were acute care/ED/Hospital follow up visits. These are a large source of missed opportunity to initiate discussion about desired pregnancy. Since many young adults often only present to clinic for acute care visits, this is a key area for future interventions.
•Significant numbers of patients in our diverse underserved population also preferred pregnancy, abstinence, or no birth control method at all. Further evaluation of social and cultural determinants of reproductive health choices would be useful.
•Limitations in our project included that data regarding patients' reproductive health choices may be skewed, as there was a large number of women who were not asked the One Key Question® . There was also a noted lack of MA/nurse participation in placing reminder prompts into patients' encounter folder during PDSA cycle 2 interventions limiting evaluation of data outcomes for that cycle. We also acknowledge that baseline %'s are likely inflated due to use of a 1 year chart review period (and thus more eligible clinic encounters per patient to evaluate) compared with our 3 week intervention cycles (which had typically one encounter per patient to evaluate). Same day birth control rates may also be lower than actual since discussion and initiation of condom use was not counted unless it was documented in the Rx/Med list or dispensed by nursing.

Rare Thromboembolism Following High Risk Pregnancy

POMONA VALLEY HOSPITAL MEDICAL CENTER
FAMILY MEDICINE RESIDENCY PROGRAM

Abraham Vela MD, Naheed Momand DO MPH, Mohamed Elsharkawy MD, MBBCH
Pomona Valley Hospital Medical Center Family Medicine Residency Program

Introduction

Venous thromboembolism (VTE) is one of the many possible complications of pregnancy, especially in the postpartum period. Women who are in the postpartum period have a 5 fold higher increased risk of thromboembolism compared with non-pregnant women (1,2). DVTs can lead to pulmonary embolism which accounts for 9.3% of all maternal deaths in the US (1). Therefore, the importance of preventing, diagnosing and treating DVTs during pregnancy and the post-partum period is of crucial importance.

Case Presentation

HISTORY:
39-year-old G1P0 with BMI of 28 presented to L&D with contractions at 38.3 weeks. Labor failed due to a prolonged second stage of labor and failure to descend. C-section was complicated due to difficulty extracting the baby, and post surgery, the patient was treated prophylactically with antibiotics due to extensive manipulation and possible contamination. Post-op day 2, the patient was transfused 2 units of PRBCs due to symptomatic anemia from acute blood loss. On post-op day four she became febrile. A septic work-up and Zosyn were initiated. Lovenox was started for VTE prophylaxis due to concerns for decreased mobility. There was no identifiable source for fever, endometritis was suspected. Pelvic US ruled out hematoma or abscess. On post-op day 6, the patient remained afebrile for 24 hours and Zosyn was stopped based on infectious disease recommendations. The patient was discharged in stable condition. Two weeks after her C-section, the patient presented to clinic with 3-day history of a painful mass above the right clavicle. The mass presented suddenly and was associated with localized pain causing decreased range of motion and intermittent numbness and tingling of the right upper extremity. She denied fever, chills, night sweats, shortness of breath, bleeding from incision site or vaginal bleeding. The patient was sent to the ER for further evaluation.

PHYSICAL EXAM:
T (C): 36.8, BP: 118/81, HR: 114, RR: 18 SpO2: 100% RA
Exam significant for being unable to passively abduct RUE past 90 degrees due to pain. A 4-5cm mass palpated over the right supraclavicular area of the sternoclavicular joint. Right supraclavicular area was tender to touch. No increased warmth or erythema. No rashes, purpura or petechiae throughout.

Differential Diagnoses: Soft tissue infection (cellulitis, furuncle, abscess), VTE, cyst, lipoma, enlarged lymph node, soft tissue swelling (trauma, fracture)

Labs and Imaging

-WBC: 13.7, **Hb**: 11.5, **Hct**: 36.2, **Plt**: 589, **BUN/Cr**: 5/0.6, **PT**: 14.3, **INR**: 1.2.
-CXR: Patchy infiltrate in RLL and minimal basal atelectasis on left lung
-CT Angio of chest: Extensive DVT in the internal jugular vein, brachiocephalic vein, azygos vein and subclavian vein partially extending to SVC. Possible small pulmonary embolism in a few sub-segmental branches of pulmonary arteries. Soft tissue swelling in the right neck and superior mediastinum.
-Coagulopathy/Autoimmune panel: Beta-2 GPI IgG, IgM, IgA: Neg, Phos Ser IgA, IgG, IgM: Neg, Cardiolipin IgM, IgG: Neg, Cardiolipin IgA: mildly elevated, Lupus anticoag:1 of 2 detected, PTT-LA: High, DRVVT screen: Neg, Protein C Act/Ag: Neg, Protein S Act/Ag: Neg.

Final/Working Diagnosis

Provoked DVT of the internal jugular vein, brachiocephalic vein, azygos vein and subclavian vein, partially extending to SVC, likely triggered by right IV access.

Figure 1. VTE risk during pregnancy and post-partum (6)

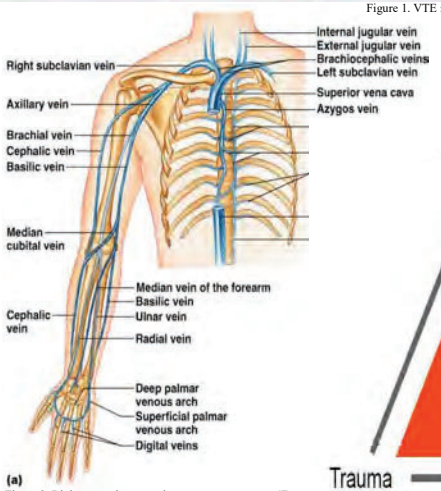


Figure 2. Right arm veins, superior vena cava anatomy (7)

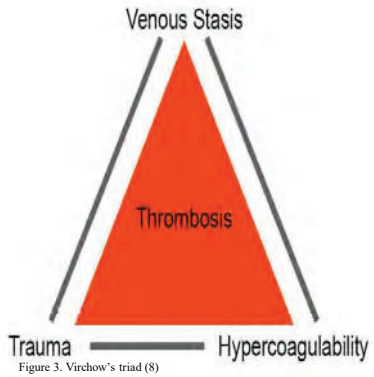


Figure 3. Virchow's triad (8)

Treatment and Outcome

Interventional radiology and vascular surgery were consulted who recommended conservative management (No tPA, no thrombectomy). The patient was started on Warfarin daily and bridged with Lovenox until reaching INR of 2-3 at which point Lovenox was discontinued. Per hematology recommendations, patient will continue anticoagulation with Warfarin for minimum of 6 months with INR goal of 2-3. Patient was discharged home with close follow up.

Discussion

The frequency of a thrombotic event is about 246 per 100,000 C-sections during the first 6 weeks postpartum (3). Many risk factors for VTE were present in our patient including hypercoagulability due to pregnancy, recent surgery, and immobility, resulting in a provoked DVT likely secondary to IV access. The most important individual risk factor for VTE in pregnancy is a personal history of thrombosis (1). Obesity further increases the risk for VTE and different societies currently recommend to start thromboprophylaxis with low molecular weight heparin 12 hours after cesarean delivery for patients with BMI of 40 or greater (4). There are currently no validated guidelines to start thromboprophylaxis in patients undergoing cesarean delivery with BMI below 40. ACOG recommends to place pneumatic compression devices on all patients not already receiving pharmacologic thromboprophylaxis before cesarean delivery and to remain in place until patient is ambulatory (1,4). Early ambulation is also recommended for all patients.

It is recommended that patients be tested for antiphospholipid syndrome (APS) when they present with unprovoked VTE, arterial thrombosis in young patients (<50yo), thrombosis at unusual sites, late pregnancy loss, or any thrombotic events or pregnancy morbidity in patients with other autoimmune disorders (5). Cardiolipin IgA is not routinely recommended due to lack of specificity but it is part of most laboratory APS panels. If positive APS panel, it is recommended to repeat panel after 12 weeks of initial labs given that most labs have been done after patient has started anticoagulation which can affect results, strong clinical correlation is highly recommended (5). The patient's APS evaluation was negative. She will continue to follow up with hematologist who recommended to continue anticoagulation for at least 6 months. Warfarin was our anticoagulant of choice given that it is safe during lactation and was easily covered by patient's insurance. Other direct oral anticoagulation (DOAC) agents lack human data to assess safety during lactation. No widely accepted risk scoring system has been validated to indicate thromboprophylaxis during pregnancy or post-partum period. Our patient expressed desire to have another pregnancy which will be considered high risk given advanced maternal age and history of post-partum VTE and will likely require thromboprophylaxis during her next pregnancy.

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Psychoeducational Intervention for Spanish-speaking Patients

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Background

The underutilization of mental health services by Spanish-speaking patients is a growing concern in the medical community. Many Spanish-speaking patients referred to a mental health provider do not follow up and have significantly higher rates of premature termination of treatment. A phone questionnaire was provided to nine Spanish-speaking patients with a diagnosis of depression to address the barriers they face in obtaining mental health treatment. The most significant barriers identified by patients included cultural barriers such as fatalism and familism, work constraints and transportation, and cultural insensitivity from providers. Using these results, a psychoeducational intervention was created to address these barriers.

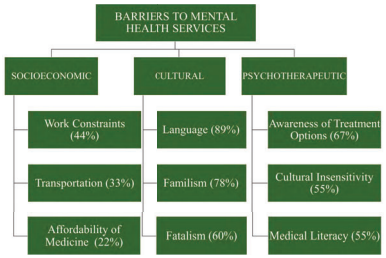

Figure 1: Results from questionnaire addressing barriers to mental health treatment from nine Spanish-speaking patients

Community Partners

Indian Health Center of Santa Clara Valley (IHC) is an organization of FQHCs in Santa Clara County. Its mission is to help ensure the survival and healing of American Indians/Alaskan Natives and the local community providing high quality, comprehensive health care and wellness services.

RotaCare-San Jose is a free clinic located in East San Jose. Their mission is to provide access to healthcare to people unable to pay for primary healthcare. They primarily serve uninsured Spanish-speaking patients. The organization is volunteer-driven and is heavily supported through grants and donations.

RotaCare Bay Area, Inc.
Free Medical Clinics

Methods

I. Created Psychoeducational Intervention

II. Implemented Intervention

Results

I. IHC-Family Medicine Center Continuity Patients: 6 patients attended

	Before session (N=6)	1 month (N=6)	6 months (N=6)	p-value
Medication	16%	66%	66%	0.11
Therapy	0%	0%	0%	1.00
Exercise	16%	66%	66%	0.11
Meditation	0%	16%	16%	0.33

II. IHC-Meridian Non-continuity Patients: 9 patients attended

	Before session (N=8)	3 months (N=8)	p-value
Medication	12%	12%	1.00
Therapy	0%	0%	1.00
Exercise	75%	75%	1.00
Meditation	0%	38%	0.07

III. RotaCare Non-continuity Patients: 18 patients attended

	Before session (N=12)	3 months (N=12)	p-value
Medication	17%	50%	0.10
Therapy	25%	25%	1.00
Exercise	17%	66%	<0.05
Meditation	17%	50%	0.10

IHC-Family Medicine Center Continuity Patient Cohort

- There was a patient-physician relationship before the intervention
- After the intervention, three patients requested to be started on medication
- At one month, there was an increase in starting medication (16% vs 66% p=0.11) and exercise (16% vs 66% p=0.11)
- One patient attended therapy but stopped due to language barriers
- At six months, there was no premature termination of medication

IHC-Meridian Non-Continuity Patient Cohort

- There was no relationship with patients before the intervention
- At three months, there was an increase in starting meditation (0% vs 38% p=0.07)
- There was no increase in starting medication or therapy
- Three patients were interested in starting medication; however, medication could not be offered due to logistical reasons. These patients were instructed to follow up with their primary care provider

RotaCare Non-Continuity Patient Cohort

- This cohort included mainly uninsured patients with no regular primary care provider. There was no relationship with patients before the intervention
- After the intervention, five patients were prescribed medication. At one month, only 20% actually began taking medication. Many started other treatments instead, such as exercise and meditation
- At three months, there was an increase in starting medication (17% vs 50% p=0.10), exercise (17% vs 66% p<0.05), and meditation (17% to 50% p=0.10)
- One patient started attending therapy sessions but stopped due to work constraints

Discussion

Throughout this project, I realized many Spanish-speaking patients want to learn more about mental health. However, many of these patients have poor access to care or have cultural barriers with their current primary care providers. The lack of continuity with patients created a challenge to implementing this intervention at different clinic sites. Medication uptake rates might have been higher for non-continuity patients if medication had been prescribed during the intervention and if follow up with a provider in that same clinic had been arranged. After the intervention, only two patients started therapy sessions but stopped prematurely due to work constraints and language barriers. Many Spanish-speaking patients with depression will be treated for mental health issues solely by their primary care providers. Therefore, I believe it is crucial that PCPs learn basic therapy skills and are trained to be culturally-sensitive when treating Spanish-speaking patients for their mental health. This project with a small sample size of patients nonetheless demonstrated the feasibility of a limited, discrete psychoeducational intervention as a step in addressing the mental health needs of Spanish speaking patients with depression.

Recommendations

- Create class material to train other primary care providers to offer this intervention
- Improve continuity with patients after the intervention
- Create an app to provide culturally sensitive meditation and therapy
- Measure PHQ-9 scores in order to track depression severity

Acknowledgments

I want to thank my community partners, Indian Health Center and RotaCare, for allowing me to offer this intervention to their Spanish-speaking patients.

I want to thank Frances Respicio, LCSW and Lisa Dale Miller, LMFT for teaching me about trauma and its impact on health.

Thank you to the following faculty members for supporting my ideas: Bridget Harrison, MD MPH, Grace Yu, MD, Katherine Mullins, MD, and Andrew Schechtman, MD.

For Further Information

Please contact me at matildef@stanford.edu for more information.

An Extra-pulmonary Complication of Vaping: Pneumomediastinum in a Young Male

Timothy Vu, MD, Samuel Barlow, MD, Deborah Streletz, MD, Alicia Burris, PHD, Napatkamon Ayutyanont, PHD | HCA

Introduction

Pneumomediastinum is defined as the presence of air or other gas in the mediastinum, also known as mediastinal emphysema. [1] It can be caused traumatically or spontaneously by either blunt or penetrating trauma, iatrogenic, or spontaneous air leaks through small alveolar ruptures. This report describes a case of pneumomediastinum associated with vaping in a young adult.

Case History

18 year old male with no significant past medical history who presented with findings of pneumomediastinum after vaping. The patient originally presented with altered mental status, which was thought to be due to drug use. CT head showed air tracking and subcutaneous emphysema which led to performing a CT neck, which showed extension of subcutaneous emphysema into the mediastinum. CT chest showed ground-glass opacities and extensive new pneumomediastinum. (Figure 1) Patient admits to heavy use of marijuana by vaping along with use of cocaine and Xanax.

CT Imaging

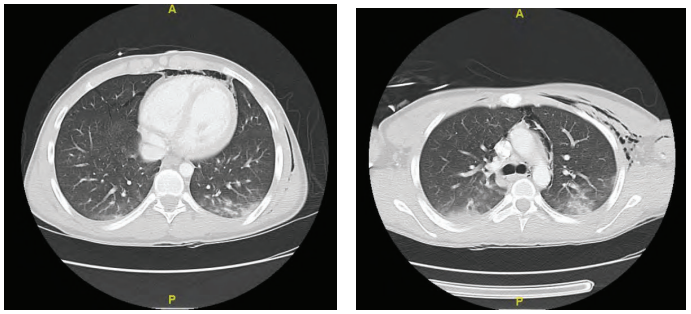

Figure 1. Image stills were created from the CT Chest. Pneumomediastinum present around anterior aspect of pericardium (left) along with anterior aspect of thoracic aorta (right). In addition, subcutaneous emphysema noted on left anterior chest wall (right)

X-Ray Imaging

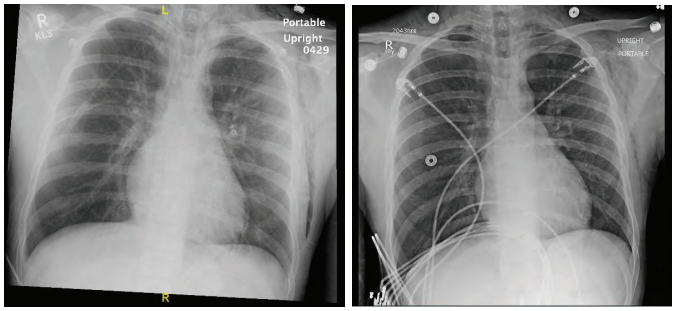

Figure 2. Initial chest x-ray (left) showed extensive pneumomediastinum along with subcutaneous emphysema on the left anteriolateral chest wall. Image on right is the chest x-ray two days later with improvement of the pneumomediastinum

Examination

- Vitals: Afebrile and hemodynamically stable. Initially on supplemental O2 at 2L but titrated off to room soon after admission
- Head/Neck: Atraumatic. Neck was supple and non-tender. Crepitus was noted on the left lateral side on palpation of the skin
- Cardiac: Regular rhythm and rate. No murmurs. Hamman's crunch noted on auscultation
- Respiratory: Aerating well without any distress. Clear to auscultation bilaterally, no wheezes or rhonchi
- Neuro/CNS: Alert and oriented upon examination but did not remember any of the prior events leading up to his hospitalization. CNII-XII grossly intact. No neurological, motor, or sensory deficits. Normal gait
- Esophogram was done to rule out esophageal rupture and was normal without any extravasation.
- Repeat Chest X-ray showed slight regression of the pneumomediastinum and he was deemed stable for discharge on hospital day #3 with oral antibiotics and close follow up.

Final Diagnosis

- Alveolar rupture, E-Cigarette and Vaping Associated Lung Injury

Discussion

The patient was monitored and managed conservatively with the thought that the subcutaneous emphysema/pneumomediastinum should resolve spontaneously without aggressive intervention. A bronchoscopy would be performed if the pneumomediastinum worsened or if the patient's clinical course worsened. He was placed on IV antibiotics empirically for pneumonia and possible aspiration pneumonia. An esophogram was performed which ruled out any esophageal rupture. Repeat Chest X-ray was done which showed slight regression of the pneumomediastinum and vitals were all stable throughout hospital stay. (Figure 2) He was further evaluated with Inpatient Psychiatry and started on an antidepressant. He was deemed stable for discharge on hospital day #3 with oral antibiotics and advised to follow up closely.

Conclusion

Extensive social history should be taken when speaking with young adults. In particular, dangers of vaping along with polysubstance abuse should be counseled. Other instances of spontaneous pneumomediastinum have been reported in young otherwise healthy adults and the risks should be addressed to those who are currently vaping. A small case study in Wisconsin studied 53 cases of E-cigarette associated pulmonary illnesses with 91% of patients having abnormal chest radiographs, 5 cases of pleural effusions, 4 cases of pneumomediastinum, and 1 case of pneumothorax [3] In addition, a similar case was also documented in the Annals of Thoracic Surgery. [4] The amount of additives to E-cigarettes are vast including propylene glycol, glycerol, flavorings, other chemicals, and nicotine. [5] The human health effects of these additives and E-cigarettes are still being investigated and this case is meant to be an additional cautionary tale to highlight the dangers that are associated with it's use, particularly in our youth.

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UCLA Family Medicine Residency
Training the Next Generation of Family Physicians

The "Bruins and the Bees" Program: Sex Ed for Los Angeles High School Students

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INTRODUCTION

- Young people aged 15-24 years in 2017:
  - Made up 17% of the population[3]
  - Accounted for half of all sexually transmitted infections (STIs)[3]
- During 2016-2017:
  - Chlamydia and gonorrhea rates among those aged 15-19 years increased by 7.5% and 15.5%, respectively[3]
- To date:
  - Many sexual education interventions are available
  - Few are taught directly by healthcare providers[4]

STUDY AIMS

- To evaluate the effectiveness of the "Bruins and the Bees" program to increase:
  1. Adolescent perceived knowledge of STIs and contraception
  2. Adolescent intent to use condoms and contraception

METHODS

- **Step 1**: Created curriculum and taught one-hour class to 11th and 12th grade high school students
- **Step 2**: Surveyed students (N=100) from one Los Angeles high school with a 12-item sexual health survey based on the Illustrative Questionnaire for Interview-Surveys with Young People

Table 1. Demographics

Age	N	Race/Ethnicity	N	Gender	N
18	35	Asian	12	Male	35
17	53	Hispanic	34	Female	61
16	12	African-American	21	Other	4
		White	32		
		Other	1		

- **Step 3**: Analyzed data using the Wilcoxon signed rank test with continuity correction.

RESULTS

Figure 1. Comparison of Students' Preferred vs. Actual Source for Information on Sex-Related Matters

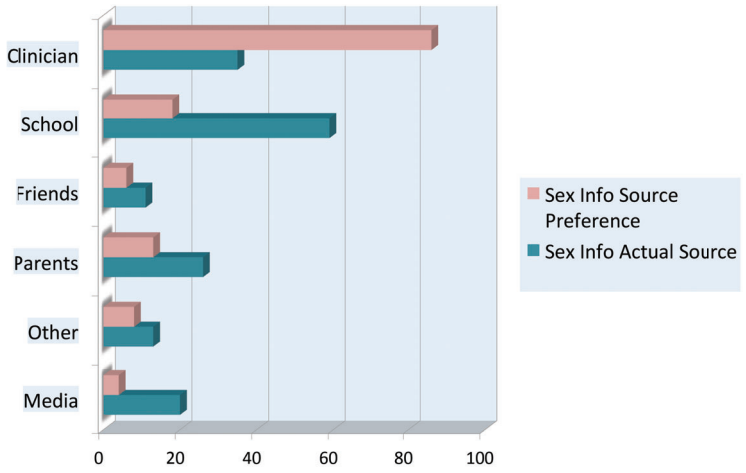
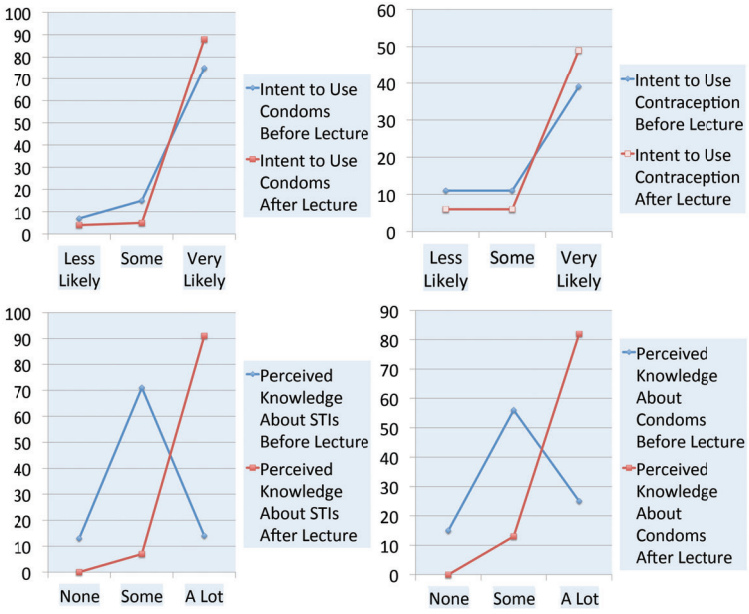


Figure 2. Effect of Clinician-Led Class on Students' Perceived Knowledge and Intent to Use Condoms/Contraception



DISCUSSION

- This intervention program:
  - Provides school-based sexual health counseling to a group of adolescents in as much time as a well-adolescent visit
  - Increased adolescent intent to use condoms and contraception.
- High school students may benefit from sexual education by clinicians in a school setting.
  - There is no single intervention for success in improving adolescent sexual health outcomes
  - Pediatricians and family medicine physicians have the opportunity to provide longitudinal sex education as part of community engagement and preventive health care[1]

FUTURE DIRECTIONS

- Address gaps in research:
  - Lack of replication studies
  - Need for diverse intervention programs to meet unique needs of local communities in Los Angeles
  - Underrepresentation of Latino youth and other high-risk populations[2]
- Engage school communities near UCLA's Mid-Valley Comprehensive Health Center in Van Nuys, California

ACKNOWLEDGEMENTS

- I would like to thank Dr. Loris Hwang for her support and mentorship, the teachers who allowed me the opportunity to teach my curriculum, and Dr. Yohualli Anaya for her helpful suggestions during initial stages.

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Presentation and Management Of Acute Beta Blocker Overdose

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Introduction

Beta blocker toxicity is an easily missed diagnosis because it presents with non-specific symptoms such as bradycardia, hypotension, and altered mental status. Unless the history of beta blocker overdose is discovered, the symptoms of beta blocker toxicity can remain refractory to supportive treatment. This case report illustrates acute beta blocker toxicity that masqueraded as sepsis and resulted in hemodynamic instability until the underlying etiology became known.

What is the epidemiology of beta blocker overdose?

Beta blockers serve as first-line treatment for coronary artery disease, the most common cause of death and inpatient hospitalization in the United States. With 65 million prescriptions filled in 2017 and a narrow therapeutic index, beta blockers have the second-highest rate of inadvertently doubled dose of home medication and the second-most reported cases of adverse side effects in the outpatient setting. Beta blockers are also seen in 22% of overdose cases involving cardiovascular drugs in the emergency department (ED). Clinically, metoprolol is the beta blocker most often involved in fatal and non-fatal cases of overdose but propranolol has the highest odds of exposure. Despite initial concerns, extended-release versions of propranolol and metoprolol are associated with low rates of toxicity.

Agent	Prescriptions Filled in 2017[a]	Deaths in 2017[b]	Odds of Exposure
Metoprolol (XR)	20,970,347	7	0.21
Metoprolol	20,190,175	58	1.78
Carvedilol	14,338,224	19	0.82
Atenolol	9,908,201	10	0.62
Propranolol	**1,667,736**	**17**	**6.31**
Nevibolol	1,485,994	2	0.83
Labetalol	879,531	1	0.70
Propranolol (XR)	612,943	0	0.00
Bisoprolol	535,835	0	0.00

Table 1. Approximately 65 million prescriptions for beta blockers were filled in 2017 in the United States. In the same year, 118 deaths with beta blockers metabolites were verified by autopsy. Metoprolol tartrate contributed 28.6% of filled prescriptions and was associated with 49.1% of overdose deaths. In comparison, propranolol contributed 2.4% of filled prescriptions and was associated with 14.4% of overdose deaths. Standardized odds of exposure are shown where 1.00 is the expected value if listed agents had equal likelihoods of fatality. Extended-release formulations of metoprolol and propranolol were not more likely to be associated with overdose deaths.

[a]Centers for Medicare and Medicaid Services, 2017
[b]American Association of Poison Control Centers' National Poison Data System, 2017

What is the pathophysiology of beta blocker toxicity?

The main pharmacological effect of beta blockers is antagonism of β1 and β2 receptors found primarily in heart muscle and peripheral vascular smooth muscle, respectively. All beta blockers decrease heart rate by antagonizing β1 receptors but some cardio-selective agents also directly decrease blood pressure by antagonizing β2 receptors.

In addition to the effects described above, certain beta blockers possess membrane-stabilizing effects that inhibit myocardial action potentials at supratherapeutic levels. This can result in a widened QRS interval on EKG and subsequently lead to ventricular arrythmia. Other beta blockers are lipophilic and can easily cross the blood-brain barrier, causing effects on the central nervous system (CNS) such as seizures. Propranolol possesses strong membrane-stabilizing effects and lipophilicity and is also the beta blocker most likely to be seen in cases of overdose.

Case Description

A 58-year-old Caucasian woman with a history of depression, hypertension, and hypothyroidism was brought in by ambulance to the ED for altered mental status. Her vital signs were unstable on arrival with temperature of 36.8°C, heart rate (HR) of 57 bpm, blood pressure (BP) of 68/40mm Hg, and respiration rate (RR) of 20 breaths/min. Her Glasgow Coma Scale (GCS) was 13. Initial labs were remarkable for leukocytosis of 14.5 and lactic acidosis of 3.03. She was presumed to be septic and sepsis protocol was initiated with 30mL/kg IV fluid administration and broad-spectrum antibiotics given. A source of infection was searched for which demonstrated a negative urinalysis and chest x-ray with right-sided pleural effusion without evidence of focal consolidation. Urine and blood cultures would later prove to be negative and the effusion would later prove to be transudative and incidental to her presentation. However, she was presumed to have sepsis secondary to pneumonia at the time.

EKG showed sinus bradycardia and mild QTc prolongation to 451ms. Toxic ingestion of substances was considered as part of the differential diagnosis given her altered mental status and unstable vital signs but her urine drug screen was negative for all tested substances, including acetaminophen and salicylates, although her blood alcohol content was measured at 0.235. Hypothyroidism was not considered as it was not documented in past chart review at the time of presentation. Despite receiving 3 liters of IV fluids, she remained hemodynamically unstable with HR of 57bpm, BP of 86/47mm Hg, and GCS 13. Co-ingestion of a prescribed medication was suspected given her acute alcohol intoxication and upon re-examination, the patient admitted to ingesting approximately 2 grams of metoprolol in an act of self-harm. 3mg of glucagon were promptly ordered per treatment guidelines. However, she responded after receiving just 1mg of glucagon with vital signs to HR of 75 bpm, BP of 114/75mm Hg, and GCS of 15 within minutes. The remaining 2mg of glucagon were withheld in favor of placing her on an IV glucagon drip at a rate of 2mg/hr. She received 10 hours of glucagon infusion after which her vital signs remained stable. She was discharged to home after evaluation by a psychiatrist.

Labs and Vitals

T	36.8°C		36.8°C		36.8°C
HR	57bpm*	3L of IVF administration	57bpm*	1mg of glucagon bolus	75bpm
BP	68/30mm Hg		86/47mm Hg		114/75mm Hg
RR	20/min		20/min		20/min
GCS	13*		13*		15
WBC	14.5				10.3
Lactic Acid	3.03				2.0

Figure 1. The patient initially arrived hemodynamically unstable with hypotension, bradycardia, and altered mental status. She received 3L of bolused IVF administration but vital signs remained refractory to treatment. After her ingestion of metoprolol was discovered, she received a bolus of glucagon and responded within minutes. She was presumed to be septic on arrival because of her leukocytosis, lactic acidosis, and right-sided pleural effusion (see figure 2). She also met 2 of 3 qSOFA criteria upon admission and continued to meet sepsis criteria even after appropriate IV fluid administration. Her vital signs stabilized only after glucagon administration which resolved her bradycardia, hypotension, altered mental status, leukocytosis and lactic acidosis.

*Underlined values indicate qSOFA criteria being met with 2 or more criteria indication high mortality rate

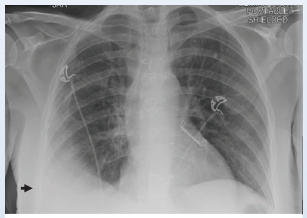

Figure 2. The patient's chest x-ray showed right-sided pleural effusion (arrow) which was likely multifactorial from her history of smoking, alcohol use, and recent mitral valve repair. This was recurrent and incidental to her presentation. It was initially thought to be a sign of infection but fluid analysis later showed it to be transudative.

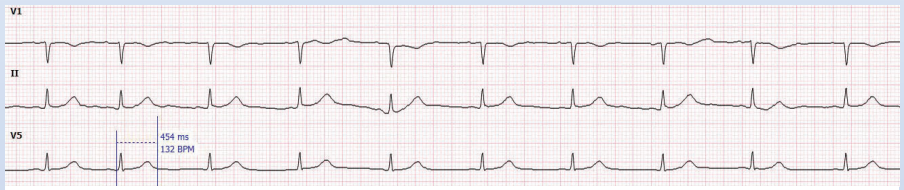

Figure 3. EKG on arrival showed bradycardia with HR of 57bpm on arrival. QRS interval was appropriately narrow at 90ms. QTc was also calculated to be mildly prolonged at 451ms.

Treatment Guidelines

Mild cases of beta blocker overdose without severe bradycardia or hypotension may respond to atropine and IV fluid administration. More severe cases of beta blocker toxicity should be treated as follows:

1. The airway should be secured and advanced cardiac life support provided as necessary.
2. Up to two boluses of 3-5mg IV glucagon can be given 10 minutes apart. If the patient shows an improvement in heart rate or blood pressure, an IV glucagon drip should be started at a rate of 2-5mg/hr titrated to a goal of maintaining mean arterial pressure above 60mm Hg.
3. If the patient is refractory to glucagon, 1U/kg of regular insulin and 0.5g/kg can be bolused.
4. Seizures can result from beta blockers with high lipophilicity, most commonly seen with propranolol. Benzodiazepines should be given in the event of seizures.
5. Arrythmias such as QRS widening and QTc prolongation can occur from beta blockers with membrane-stabilizing effects, which is also commonly seen with propranolol. Sodium bicarbonate should be given for QRS>120ms. Magnesium sulfate should be given for QTc>440ms.

Discussion

Beta blockers as a class are one of the most commonly prescribed medications and subsequently one of the most common involved in overdose. Their main pharmacological target is antagonism of β1 and β2 receptors, which results in negative chronotropism and decreased blood pressure. However, certain beta blockers are more associated with overdose than others with propranolol being an order of magnitude more likely to cause toxicity. Propranolol is predisposed to ventricular arrhythmias and seizures because of its strong membrane-stabilizing effects and lipophilicity but these biochemical properties do not reliably predict toxicity. For example, carvedilol and propranolol both have membrane-stabilizing effects and are strongly lipophilic yet propranolol is 7.69 times more likely to be associated with fatal toxicity than its counterpart, carvedilol.

The non-specific effects of beta blocker toxicity can easily be mistaken for other pathology and this case study demonstrates how easily a patient can be misdiagnosed after acute ingestion of beta blockers. Our patient was initially presumed to be septic after presenting with hemodynamic instability, reactive leukocytosis, lactic acidosis from tissue hypoperfusion, and altered mental status from cerebral hypoperfusion and alcohol intoxication. She remained hemodynamically unstable despite appropriate IV fluid administration and only became hemodynamically stable after her acute beta blocker overdose was addressed.

In the setting of unstable vital signs and a questionable source of infection in a patient that is afebrile and bradycardic rather than tachycardic, a high degree of suspicion for beta blocker toxicity should be entertained. Beta blocker overdose will respond quickly to glucagon administration and this will prevent further complications and ultimately may be lifesaving.

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Universal Screening For Gonorrhea And Chlamydia In Female Patients Ages 15-24

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Purpose

- Neisseria gonorrhea and Chlamydia trachomatis infections are major public health concerns globally and nationally, with increased incidence of both infections since 2009.
- These infections can be silent and result in severe reproductive tract complications, including infertility.
- The CDC and USPSTF recommend screening all sexually active women age less than 25 years and older women at increased risk for gonorrhea and chlamydia.
- However, these STIs are under-screened. Up to 90% of primary care physicians of all specialties do not take an adequate sexual history to identify risk factors for STIs.
- Studies in pediatric emergency departments and school-based programs have demonstrated universal screening to be effective in detecting additional cases of gonorrhea and chlamydia.
- We aim to improve screening and more timely treatment of gonorrhea and chlamydia by providing universal screening in female patients ages 15-24 annually regardless of sexual activity.

Methods

Study design: Prospective cohort study.

Setting: Family Health Center, primary clinic site for 24 residents and 8 attendings.

Population: 371 female patients ages 15-24 who are not pregnant regardless of reported sexual activity.

Interventions: Educating all residents, attendings, and staff by email/meeting reminders and a workshop on how to obtain a sexual history, screen and treat for gonorrhea and chlamydia, while addressing difficulties maintaining confidentiality, especially in adolescents.

Measures/ Main Outcomes/Analyses: After implementing the new screening practices, we conducted a chart review of the electronic medical record and Staying Healthy Assessment forms to determine how many patients are sexually active, screened for gonorrhea and chlamydia, and screen positive and appropriately treated.

Results

Additional chart review shows no significant difference

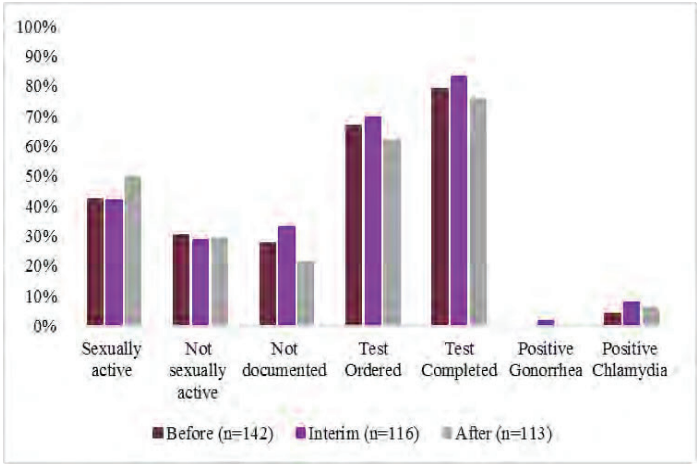

Figure 1. Documentation of sexual activity, and gonorrhea and chlamydia testing, before, during interim analysis, and after implementing new screening practices.

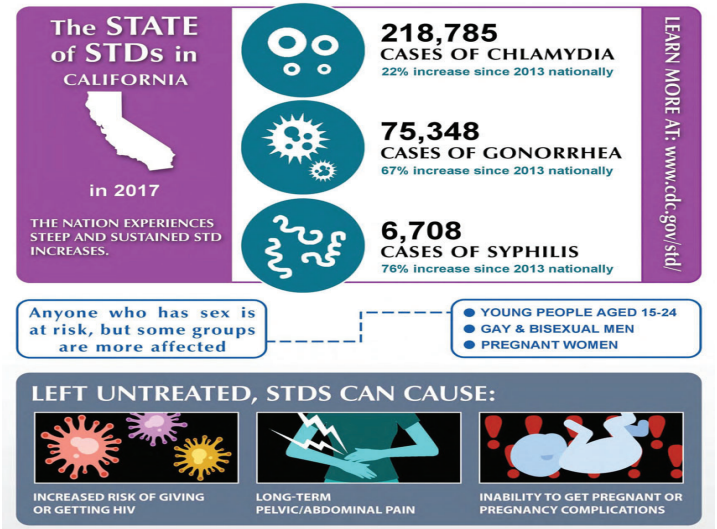

Figure 2. The State of STDs in California. Infographic adapted from the CDC website[1].

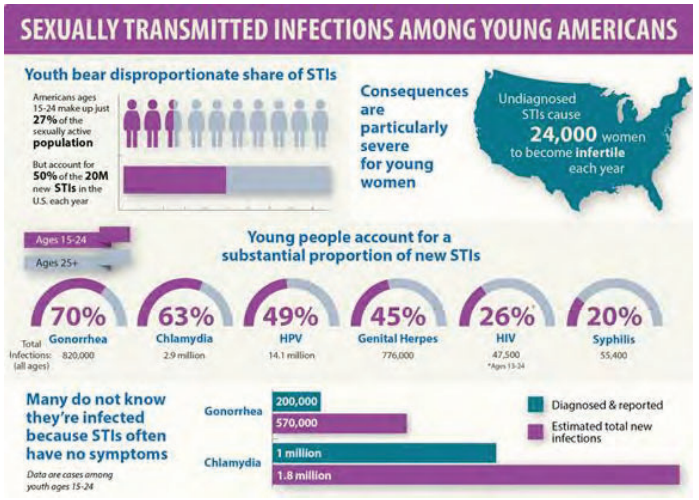

Figure 3. Sexually Transmitted Infections Among Young Americans. Infographic adapted from the CDC website[1].

Discussion

- Our study showed that less than 50% of patients are documented to be sexually active in this cohort in our clinic, in contrast to the CDC's statistic that 55% of adolescents have sex by age 18.
- Many barriers exist for universal screening, including documenting sexual histories, provider and patient/parent comfort/stigma with universal screening, time, and confidentiality.
- Additional education and implementation of a standardized workflow may help improve sexual history-taking and screening.
- A larger sample size would help to determine how many additional gonorrhea and chlamydia infections can be detected and treated with universal screening, with additional analysis for cost-effectiveness.

References

1. Infographics (2017). CDC Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. Accessed April 2019.
Link: https://www.cdc.gov/std/products/infographics.htm

To Bee or Not to Be: The Story of a Rare Cause of Ischemic Stroke

Megan Baikie MD, Nancy Armanious MD, Aimmee Chin MD, MaryJo Groves MD

Introduction

Hyperlipidemia, hypertension, cardiovascular disease, and diabetes are common risk factors contributing to ischemic strokes. There are few cases documenting an inflammatory process leading to ischemic stroke, however. There are only 7 documented cases of pro-inflammatory ischemic strokes due to insect bites; it has been suggested that vasoconstriction and platelet aggregation caused by the release of inflammatory mediators and exogenous adrenaline may contribute to acute ischemia in the brain.

Case Presentation

63-year-old male with a PMH of controlled type 2 diabetes, hypertension and hyperlipidemia who presented to the Eisenhower Health Emergency Room complaining of swelling of his face and bilateral upper extremities after sustaining 100-200 bee stings. He worked as a gardener and was cutting down bushes at a local hotel when he accidentally stepped onto a bee hive. The patient was suddenly attacked by over one hundred bees, ultimately sustaining injuries to his face, left eye and upper body. On route to the ED, he was given a dose of intravenous Benadryl.

On initial presentation, patient's vitals were within normal limits. Physical exam showed multiple erythematous lesions on his face with swelling. He was alert and oriented without any focal neurological deficits. His lungs were clear to auscultation. Cardiac exam showed regular rhythm without murmurs or extra heart sounds. He was given a dose of intravenous Solumedrol, started intravenous Benadryl and fluids. He was admitted to for further monitoring due to concern for development of anaphylactic shock.

Hospital Course

Two hours after admission, the patient's daughter noted that the patient's speech had become slowed and slurred. On re-exam, he was newly disoriented to place with a new facial droop. The remainder of his neurologic exam was insignificant. A stat CT head (figure 1) was negative.

Approximately twelve hours later, a rapid response was called due to the patient's worsening mental status. He was drowsy with a persistent facial droop. A stat MRI brain (figure 2) was significant for multiple, acute infarcts within the midbrain, pons, posterior left occipital lobe, and both cerebellar hemispheres. He was outside of the tPA window. Patient was transferred to the ICU in which his neurologic status continued to decline with a GCS of 7 and a dilated left pupil. He was intubated for acute respiratory failure due to encephalopathy from acute ischemic strokes. A TTE and TEE were negative. He was followed by stroke neurology who started aspirin and high-dose Lipitor. After 7 days in the ICU, the patient was extubated and transferred to the floor. At this time, he was noted to be nonverbal with right hemiplegia, which persisted throughout hospitalization.

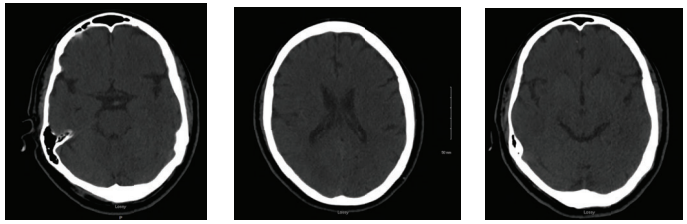

Figure 1: CT head negative for stroke.

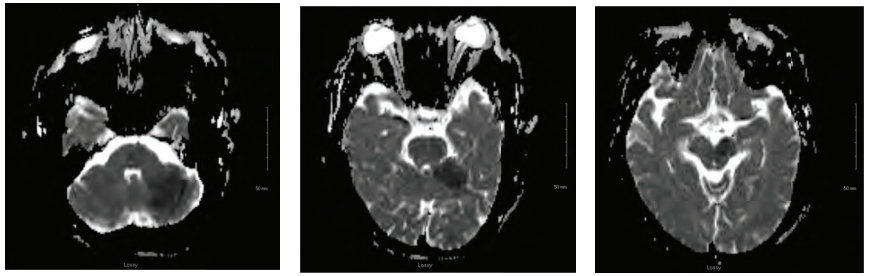

Figure 2: MRI brain w/wo contrast showing acute infarcts within midbrain, pons, posterior left occipital lobe and both cerebellar hemispheres.

Discussion

According to a case report published in 2012, although not definitely known, there appears to be two pathophysiologic mechanisms behind stroke after hymenoptera stings. First, hypotension in the presence of an anaphylactic reaction can certainly induce ischemia leading to stroke. This, however, was not likely documented in our case given patient's persistently stable vital signs. Secondly, however, vasoconstriction secondary to mediators released after the sting, aggravated by exogenous adrenaline and platelet aggregation, may very well contribute to the acute development of cerebral ischemia. Furthermore, it has also been proposed that bee venom itself contains vasoactive mediators, thereby worsening the acute inflammatory process. More specifically, wasp venom contains inflammatory and thrombogenic peptides, including histamine, leukotrienes, thromboxane and allergenic proteins such as phospholipases. All of these elements ultimately induce an IgE response, resulting in mast cell activation and causing a systemic immune mediated reaction consisting of vasoconstriction and pro-thrombosis, ultimately increasing the risk of ischemic stroke.

While this remains a rare event and treatment options are not clear, awareness of possible links between pro-inflammatory states and ischemic stroke is important as management may include timely control of inflammation. In addition, awareness of potential stroke risk after exposure to high levels of venom should be evaluated closely along with the timing of the exposure, particularly those exposed to more than one hundred stings. We thought it might be useful for other physicians to be aware of this potential link and the unusual ramifications from a high burden of venom, even in the absence of anaphylactic shock.

References

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Dietary Sugar in a California Public High School Meal Program: Are We Contributing to Lifelong Obesity?

EISENHOWER HEALTH

Anna Askari, MD, MSBS; Charles Lee, MD; Vasily Rozenbaum, MD; Joseph Scherger, MD, MPH; Jason Tate, B.S. Ed Biology

Introduction

The standard American school diet is heavily concentrated around refined sugars, the primary driver of weight gain among children. Obesity is an epidemic threatening the future of public health. It is linked to multiple chronic diseases such as metabolic syndrome and type II diabetes mellitus that ultimately affect quality of life and lifespan. The Coachella Valley (CV) of California has among the highest rates of childhood obesity in the state[1], especially among children of the lowest socioeconomic status. Unfortunately, our federal school meal programs are based on antiquated nutritional recommendations centered around processed carbohydrates as the main source of calories. The 2015 WHO nutritional guidelines recommend less than 10% of total energy intake from "free sugars", which is equivalent to 50g for a person of a healthy body weight consuming about 2000 calories per day[2].

Hypothesis

The purpose of this study is to investigate a U.S. government funded food program at multiple high schools within one of three school districts in the CV and evaluate its macronutrient content. We hypothesize these children are being fed a proportion of calories heavily skewed towards excess carbohydrates linked with promoting childhood obesity and multiple metabolic disorders.

Methods

The school district's nutrition director provided nutritional facts with macronutrient breakdown accounting for a 5-day school week in mid-January 2018 (Table 1). This included breakfast, lunch, and afternoon snack options. Some information was gathered through the manufacturers' website.

Results

The 5-day data collected from this government subsidized program shows that a typical student in a Southern California high school receives an average of 230g of carbohydrates per day. Of that, at least 65% (150g) of the carbohydrates are comprised mostly of refined or "free" sugars (Figure 3). This is approximately 750 grams of carbohydrates in one school week. This further equates to 61 pounds or 28 kg (Figure 1) of sugar in one school year. Over the course of four years in high school, a student could potentially consume 244 pounds or 111 kg (Figure 2) of processed sugar following this school meal program.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	TOTAL
Total Fats	23 g	51 g	77 g	34 g	69 g	254 g
Total Carbs	145 g	266 g	314 g	187 g	238 g	1,150 g
***Glucose**	101 g	193 g	229 g	116 g	181 g	820 g
***Fructose**	44 g	73 g	85 g	71 g	57 g	330 g
Proteins	44 g	70 g	146 g	60 g	105 g	425 g

Table 1. The macronutrient intake in the food program at the high school for one week

FIG 2. Sugar in 4 years of high school (~244 lbs)

FIG 1. Sugar in 1 school year (~61 lbs)

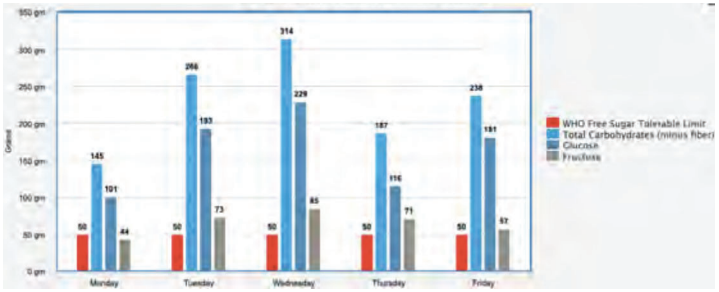

FIG 3. Sugar Content in Food of High School Subsidized Meal Program

Discussion

62% of CV children live at or below the 200% federal poverty level[1], which is 19% more than the rest of California at 43%[3]. Children in the CV suffer from 30% obesity rates[1], nearly double the national average of 18.5%[4]. Based on our data, CV high school children are consuming at least 3 times the daily recommended amount of sugar per day. This does not include meals consumed at home. Children are being fed excess calories in the form of processed sugars, which is contributing to an increase in obesity rates among out nation's youth. This is one of many government funded meal programs, which promotes obesity and subsequently a lifetime struggle with obesity-related diseases. While meals provided at school are only one contributor to the childhood obesity epidemic in this country, it is an area that needs improvement via advocacy and public policy.

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Acknowledgements

We would like to thank our mentors, Mr. Jason Tate and Dr. Joseph Scherger, for allowing us to work with them on this project. We share your passion that children, especially those who live in poverty, be provided healthy and nutritious meals rather than ones with toxic amounts of sugar. We would also like to thank our program director, Dr. Scott Nass, for his continued support and for reading over our abstract and providing feedback.

Premature Thelarche Secondary to Lavender Exposure

UNIVERSITY of CALIFORNIA SAN DIEGO MEDICAL CENTER

Elizabeth G. Sophy, MD and Jennifer J. Wu, MD, MSEd.

Introduction

Background

Premature thelarche refers to isolated breast development before the age of three in females. [1]

We describe a case of premature thelarche, an example of reversible of benign or non-progressive precocious puberty that differs from true precocious puberty.

Precocious puberty refers to the early onset of secondary sexual characteristics.

- 2 to 2.5 standard deviations below the mean age of onset of puberty
- before age of eight in females and nine in males warrants workup, though there is controversy about the lower limit of normal pubertal development[2]
- most cases are benign or classified as idiopathic
- less common cases: pituitary and ectopic human chorionic gonadotropin hormone secretion or exogenous sources of sex steroids

Evaluation

History	Physical	Labs	Imaging
• onset of symptoms • age of puberty in family members • headache • vision changes • behavior changes • seizures • abdominal pain • previous CNS disease or trauma • exposure to exogenous steroids	• height • weight • height velocity (cm/year) • visual fields • Café-au-lait spots • Tanner staging	• basal luteinizing hormone • follicle stimulating hormone • either estradiol or testosterone • if unclear, gonadotropin releasing hormone and luteinizing hormone response	• radiographic age of bone measurement • all males with central precocious puberty: MRI brain • Females <6 years old: brain MRI • Males with peripheral: testicular ultrasound • Females with peripheral: ovarian ultrasound • Both genders with peripheral: adrenal imaging • Benign: bone age only

Types of Precocious Puberty

Central

Etiology
- CNS tumors
- Malformations
- Idiopathic

Pathophysiology:
Early activation of hypothalamic-pituitary-gonadal axis

Diagnosis:
- May have headache, behavioral change, vision changes if CNS lesion
- GnRH secretion → ↑FSH, ↑LH
- Bone age is increased
- Basal LH levels are usually elevated into pubertal range (greater than 0.2 to 0.3)
- Pathologic in up to 40-70% in boys and up to 10-20% in girls. [1]

Peripheral

Etiology:
- testicular, ovarian, adrenal tumors secreting sex hormones
- congenital adrenal hyperplasia
- exposure to exogenous steroids
- autonomic gonadal activation i.e. McCune Albright syndrome, familial male-limited precocious puberty
- germ-cell tumor producing human chorionic gonadotropin

Pathophysiology:
Excess steroid production, independent of hypothalamic-pituitary-gonadal axis

Diagnosis:
- May have abdominal or adrenal symptoms based on etiology
- Estradiol or testosterone
- Bone age is increased
- Basal LH normal

Benign/ Non-progressive

Etiology:
- non progressive or intermittently progressive puberty
- **premature thelarche**
- premature adrenarche
- isolated premature menarche

Pathophysiology:
Unknown but not associated with full hormonal axis activation

Diagnosis:
- Usually isolated symptoms
- Not associated with full activation of hypothalamic gonadal pituitary axis
- Laboratory evaluation may not be necessary
- Close follow-up is recommended as some patients will turn out to have progressive precocious puberty

CNS: central nervous system
FSH: follicle stimulating hormone
LH: luteinizing hormone
GnRH: gonadotropin releasing hormone

Case

A 2 year + 5-month-old female presented with her parents to clinic with premature breast development. Parents reported at that time bilateral breast growth slowly over the previous five months. On history, patient had no growth acceleration, no acne or pubic hair, no vaginal bleeding, developmental milestones and behavior appropriate. Denied headaches. Exam and vitals were unremarkable except for bilateral Tanner stage III breast development and normal stage I axillary hair, no apocrine hair.

Past medical history:
The patient was born at term born via cesarean section for failure to progress and chorioamnionitis (for which she received intrapartum antibiotics). Pregnancy was complicated by mother with medication-controlled Graves' disease. Patient was clinically asymptomatic and was evaluated after admission by pediatric endocrinology with both labs and in-person follow up and cleared.

Patient had brief NICU stay for moderately increased work of breathing; with negative infectious workup, etiology thought to be most likely due to retained fetal lung fluid.
During admission, she was also noted to have low resting heart rate in the 70-80s with normal perfusion and level of alertness, which responded appropriately to stimuli. EKG showed sinus bradycardia and echocardiogram showed patent ductus arteriosus, bicuspid aortic valve, and patent foramen ovale. Patient was seen multiple times by pediatric cardiology and repeat echocardiogram at age 9 months showed small atrial communications including a patent foramen ovale which per cardiology was unlikely to require future intervention.

At birth, R-sided 6x6cm nonpalpable, telangiectatic abdominal skin with arrested growth noted on exam. Patient was seen multiple times by pediatric dermatology and diagnosed as infantile hemangioma with minimal or arrested growth which did not require further follow up or intervention.

Past Surgical History: none

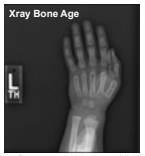
Family History: Father has lipomas and mother has Graves' disease and hypertension. Schwannoma, stroke, peripheral neuropathy and cardiovascular disease in maternal grandfather; maternal grandparents with hypertension.

Social History: Lives in San Diego with parents. No siblings. Father is high school teacher and mother is a pastry chef. No smokers in the home.

Medications: None
Allergies: None

Initial diagnosis: premature thelarche, rule out precocious puberty (central or peripheral)
Workup:

Lab Name	Patient Result	Reference Value
Luteinizing Hormone	0.02 mIU/mL	3-7 years < or = 0.26 mIU/mL 8-9 years < or = 0.69 mIU/mL 10-11 years < or = 4.38 mIU/mL 12-14 years 0.04-10.80 mIU/mL 15-17 years 0.97-14.70 mIU/mL
Follicle Stimulating Hormone	4.63 mIU/mL	0-4 years: Not established 5-9 years: 0.72-5.33 mIU/mL 10-13 years: 0.87-9.16 mIU/mL
Estradiol	3 pg/mL	1-9 years: < or = 16 pg/mL 10-11 years: < or = 65 pg/mL 12-14 years: < or = 142 pg/mL 15-17 years: < or = 283 pg/mL



Impression: Bone age within normal limits.

Treatment + Outcomes:
Initially parents reported no known exposures to lavender, tea tree, or essential oils. Given she had growth without other signs of puberty, suspicion was for benign precious puberty. However, parents noted possible slight persistent breast growth suggesting ongoing estrogen exposure. After visit, parents went home and examined the products they were using for patient and realized the lotion they had been using contained lavender.
They stopped using this and other products and breast tissue resolved.

Final diagnosis: premature thelarche, a form of benign/non-progressive precocious puberty, secondary to lavender exposure

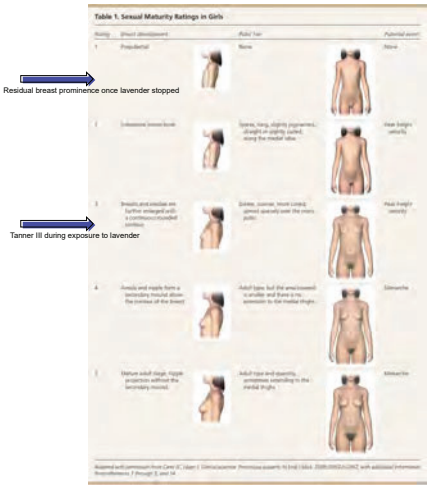
The products used:
- •Earth Mama Calming Lavender Baby Lotion
- •EO hand soap
- •Earth Mama Diaper Balm

Discussion

Lavender is a common additive to many personal home and hygiene products for consumers of all ages. In primary care, we often recommend lavender to promote relaxation or combat anxiety. However, the literature reports that topical application of tea tree oil and lavender containing products can cause prepupertal gynecomastia in males and premature thelarche in females both in the setting of normal endogenous steroids.[3, 4] Studies have also demonstrated that that these oils have estrogenic and anti-androgenic activities on human cell lines.[4] It is important to understand the potential effects of such readily available products on our patients.

There is increasing evidence demonstrating endocrine disruption of estrogen affects related to common cosmetic and body products. As primary care providers, we must take careful histories and include these products in differential when appropriate. Overall, precocious puberty is uncommon so it may be reasonable to hold off on hormonal testing and imaging in girls and follow in a primary care clinic unless rate of tissue growth increases rapidly and/or associated with growth acceleration.[6]

Take Home Points:
- Lavender and tea tree containing products have been associated with premature puberty in males and females
- If no other concerning features on history/exam to suspect central or precocious puberty, can stop exposure and closely monitor symptoms



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Graphics:
Left column: Based on Harrington J, Palmert MR, Hamilton J. Use of local data to enhance uptake of published recommendations: an example from the diagnostic evaluation of precocious puberty. Arch Dis Child 2014; 99:15.
Right column: Klein DA, Emerick JE, Sylvester JE, Vogt, KS. "Disorders of Puberty: A Guide to Diagnosis and Management." Am Family Physician 2017. Nov 1; 96;(9)590-599.

Integrated Community Medicine: Elevating Resident Confidence & Teen Health at a School-Based Clinic

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[1] Emanate Health Family Medicine Residency Program

BACKGROUND

- A significant portion of adolescent health issues are diagnosed clinically by means of direct and open communication. [1]
- Community Medicine curricula with an integrated resident-led School Based Clinic (SBC) program have demonstrated improvement in overall reproductive health access and medical resident confidence in adolescent medicine.[2]

OBJECTIVES

A Community Medicine curriculum with an integrated SBC program will assist in:

- improving reproductive health access
- improving the practice of medical skills in adolescent medicine which will result in strengthening of resident medical knowledge and level of confidence

RATIONALE

- In 2018, at an Emanate Health-based hospital located at West Covina, CA it was found that 88.7% of total births were to Latinas 14-19 years of age.
- To address the need, Emanate Health applied for a grant which by awarded by the AAFP Foundation in 2019.
- The guidelines developed by Healthy People 2020 were utilized to establish a school-based adolescent clinic in Pomona Valley.

METHODS

Goals set out by Healthy People 2020

At least 50% of adolescent females aged 13 to 19 years who received formal contraceptive counseling will opt to use a most effective / moderately effective method

To identify chronic diseases and other psychosocial factors that prevent the adolescent from accessing care

To increase access to medical care for teens

- Each clinic was run by dedicated clinic staff – 1-2 residents during their Community Medicine rotation, a preceptor, a Certified Health Worker, and an assigned medical assistant
- Residents completed online and live educational modules on reproductive health, minor consent services, and youth law.
- Resident knowledge will be followed and measured by ACGME Family Medicine milestones (PC-3, SBP-3,PBL1-3,MK-2,C-1) and qualitative data on a bi-annual basis.

RESULTS

Resident component

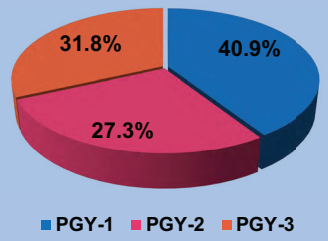

Figure 1. Resident pre-clinic participation survey

- Assessment on basic contraception concepts was administered to the residents (N=22) prior to their participation at the clinic.
- A resident post-clinic participation survey will be provided to residents after their Community Medicine rotation.

Patient/Teen component

Learning point	Pre-visit survey	Post-visit survey	Knowledge
Nexplanon	25%	33.3%	⇧
Image of an IUD	58.3%	66.7%	⇧
Contraceptive method efficacy	8.3%	55.6%	⇧
Oral contraceptives	41.7%	55.6%	⇧

Table 1. Patient pre- and post-visit survey

- At each visit, pre- and post- visit surveys were administered (N =32).
- The post visit showed improved knowledge on contraceptive concepts.

CONCLUSION

- The implementation of the SBC demonstrated efficacy in advancing knowledge of teen reproductive health; elements that can continue providing a teen -friendly and empowerment space for their well-being.

IMPLICATION

- Effective implementation of such SBC programs can serve as a model for other SBC projects to empower adolescent health and their surrounding communities.

RESOURCES

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Hammering Pain: A Case Study on Dorsal Wrist Pain

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History of Present Illness:

A 47 year old, right-hand dominant, male presents to Family Medicine clinic with 3-year history of chronic right wrist pain, worsening over the past year. Patient has worked in construction for the past 30 years and believed that the pain was arthritis or aches from wear and tear due to manual labor. Patient described aching and numbing pain with intermittent sharp, shooting pain. The pain is constant at baseline with frequent exacerbations during increased use of his right hand/wrist. No history of major injury or trauma to the right wrist and no improvement with use of OTC analgesics, OTC wrist splints. Pain was reduced with rest from physical labor. Due to his inability to meet work expectations, he was laid off from his job. Pain reduced with rest, however, he continues to have pain when grabbing things and frequently drops items. Patient denies associated fevers, night sweats, weight loss, rashes, joint swelling, and other joint pain.

Physical Exam:

Vitals: BP 114/80 (R-Arm, seated) | Pulse 55 | T 97.6 °F (36.4 °C) | Resp 15 | Ht 1.778 m (5' 10") | Wt 75.1 kg (165 lb 9.6 oz) | SpO2 97% | BMI 23.76 kg/m²
Constitutional: Well developed, well nourished, NAD, appears stated age.
Cardiac: Normal S1 and S2, RRR, no murmurs.
Respiratory: Clear to auscultation bilaterally without wheezes, rales, or diminished breath sounds. No use of accessory respiratory muscles.
Musculoskeletal:
-General: No gross joint or muscle abnormalities in all 4 extremities. No edema
-Right Wrist: ROM: Normal pronation, supination. Normal flexion and extension but with pain. **Tenderness to palpation of mid dorsal aspect of the hand carpal bones.** Skin intact with negative upper extremity swelling.
Neurology: Right wrist Sensations intact. Negative Tinel's test. Right wrist grip strength: initially 5/5 but not sustainable due to pain. Wrist extension/flexion strength: 5/5
Skin: Normal skin coloration and turgor without rashes or lesions.
Neuropsychology: Alert and oriented x 4 with dysphoric mood. Tearful.

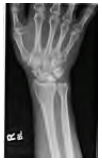
Differential Diagnoses:

Wrist Sprain
Scapholunate instability
Lunate-Triquetral instability
Tenosynovitis
Arthritis (Rheumatoid, Inflammatory/Autoimmune), OA
Stress fracture
Synovial Cysts
Avascular Necrosis

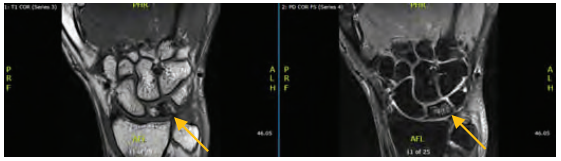
Testing:

Labs studies:
Citrullinated Peptide Antibody: Negative
Rheumatoid Factor: Negative

Imaging:
- X-ray Right Wrist: Stable sclerosis of the lunate compatible with avascular necrosis without collapse at this time.
- MRI Right Wrist: Mixed scattered cystic/edema-like changes with patchy sclerosis of the lunate, compatible with avascular necrosis (Kienbock's disease). No cortical irregularity related to the lunate bone. No fracture was seen.



Xray of Right Wrist



MRI of Right Wrist

Final Diagnosis:

Kienbock's Disease - Stage 2

Staging & Treatment per Lichtman Classification:

Stage	Description	Treatment
Stage 1	No visible changes on X-ray, changes seen on MRI.	Immobilization, NSAIDs
Stage 2	**Sclerosis of lunate**	Joint leveling procedure (ulnar negative patients), Radial wedge osteotomy or scaphotrapeziotrapezoid (STT) fusion (ulnar neutral patients), Distal radius core decompression, Revascularization procedures.
Stage 3A	Lunate collapse, no scaphoid rotation.	See Stage 2
Stage 3B	Lunate collapse, fixed scaphoid rotation	Proximal row carpectomy, STT fusion, or scaphocapitate (SC) fusion.
Stage 4	Degenerated adjacent intercarpal joints	Wrist fusion, proximal row carpectomy, or limited intercarpal fusion.

Discussion and Patient Management:

It is prudent to expand on differential diagnoses in Primary Care if a patient is not improving with standard level of care and treatment. Kienbock's Disease is avascular necrosis of the lunate carpal caused by lack of blood supply to the lunate bone, eventually leading to progressive collapse of the lunate. While mechanisms of developing Kienbock's Disease is unclear, it involves disruption of blood supply to the lunate carpal by means of repetitive trauma or undiagnosed fractures of the lunate carpal. Patients often present with wrist pain with repetitive use, limited mobility due to pain, decreased grip strength, tenderness directly over the lunate bone, swelling of the wrist, and eventually stiff wrist which can lead to arthritis.
Treatment plan:
- Conservative management with 8-week wrist splinting and immobilization.
- Referral to orthopedic surgery for further evaluation.
- Orthopedic Surgery treatment plan following failure to improve with conservative methods: radial shortening osteotomy surgical procedure.
- Patient successfully placed on disability during treatment and recovery with positive prognosis and anticipated return to construction work after 3 years of pain.
- Family Medicine team addressed all psychosocial issues with whole person care approach.

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Art of Cryotherapy – Treatment for Basal Cell Carcinoma

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Objective

To encourage more use of cryotherapy in outpatient setting for treatment of skin cancer, especially basal cell carcinoma.

Background

Basal cell carcinoma (BCC) is most common malignancy of skin, constituting approximately 90% of skin cancers in United States. It occurs in all races, more commonly in white populations. Risk factors contributing to BCC includes sun exposure, tanning beds, phototherapy, radiation exposure, and family history. Most common types of BCC are superficial, followed by nodular and morpheaform/infiltrative. Diagnosis can be made clinically using dermoscope or taking biopsy of the lesion. First line standard treatment of BCC is surgical excision called Mohs. During Mohs surgery, thin layer of cancer containing skin are progressively removed until cancer free tissue remains. This technique affectively removes skin cancer but often leaves patients with obvious scarring, infection, pain, prolonged wound care and subsequent plastic surgery. This is also expensive procedure. Average cost is in between $1000-$2000 per lesion depending on the size of the cancer.

Alternative method to treat skin cancer is cryotherapy. Traditionally, cryotherapy has been used to treat various benign skin conditions such as seborrheic keratosis. The idea behind this technique is using liquid nitrogen to kill cells, causing disruption of cell wall, release of cell contents activating immune modulators for repair and regeneration. This can be used to treat superficial tumors like BCC. It can easy performed in outpatient setting and is highly affective in treating BCC.

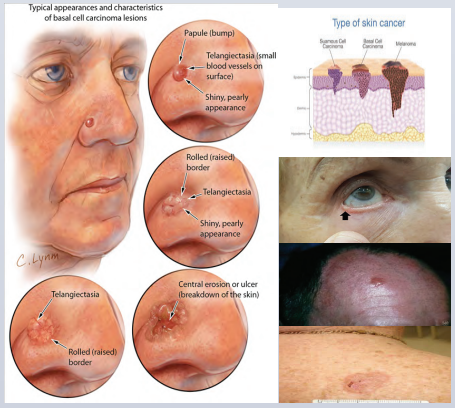

Figure 1. Types of skin cancer and characteristics of BCC

Case Report

History and Physical Examination: 69-year old Caucasian male with history of basal cell carcinoma of left posterior shoulder came in for annual full body skin check. Patient has no other medical history. He was first diagnosed with basal cell carcinoma of the left shoulder in 2017. Punch biopsy was done and pathology came back as BCC. Patient was treated with surgical excision at that time. During this visit, patient endorsed lesion on his right earlobe and on his right lower leg. He denied any pain or drainage from the lesions. Patient noted history of extensive outdoor activities under the sun. Denied use of any sun block cream. Vital signs were within normal limits. Generally, patient appeared well without any signs of distress and no signs of head trauma. No lesions noted underneath his eyelids. There was ill-defined destruction at the right helix. Size was approximately 1 cm in diameter. Margin was rolled up without any surrounding erythema. No drainage noted. Patient denied any pain. No lymphadenopathy noted. Another ill-defined lesion noted at right anterior mid-tibia with 1.5 cm diameter. Pinkish in coloration. Crusts and erythema the lesion noted. Patient was alert and oriented x4.

Differential Diagnosis: Basal cell carcinoma, squamous cell carcinoma, actinic keratosis, sebaceous hyperplasia, seborrheic keratosis, Bowen's disease.

Tests and Results: No biopsy performed for any of these lesions. Dermoscopic exam done confirming BCC

Final Diagnosis: Basal Cell Carcinoma.

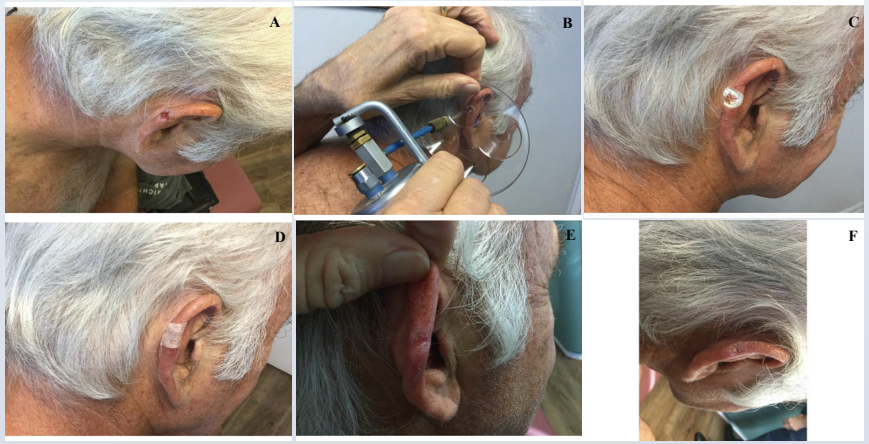

Figure 2: Treatment stages of right helix lesion.
A-C: Initial presentation. E: Second visit s/p 1st tx. F: Third visit s/p 2nd tx

Treatment: Lesions on right helix and right lower leg were treated with liquid nitrogen for 10-15 seconds. The lesions were thawed for 5 minutes. The same process was repeated twice. The lesions were covered with micropore tape and patient was followed up in 3 weeks. Same procedure was done in subsequent visits.

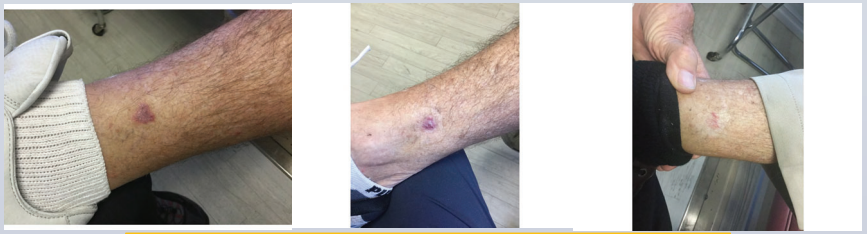

Figure 3. Treatment stages of right tibial lesion.

Results/Conclusion

Patient endorsed little to no pain during and post treatment. BCC of right helix and right tibia healed well. Patient endorsed feeling well and had no complaints at the procedure site. Patient was sent home with recommendation to follow up every 6 months for another full body skin check. SPF 15 or higher was recommended for all outdoor activities.

Discussion

Basal cell carcinoma is easily recognizable and often can be diagnosed clinically without biopsy. This patient had history of BCC in the past who newly developed two superficial BCC. Patient was only treated with cryotherapy in outpatient clinic, three times with three-week interval, and showed complete resolution of BCC without any complications. Patient endorsed minimal to no pain during the procedure and required no prior anesthesia.

When primary care physicians refer patients to dermatology clinic for BCC, patients often go through biopsy and multiple rounds of Mohs procedure as this is standard care for BCC these days. Mohs procedure is expensive, requires multiple visits and wound care, and might require subsequent plastic surgery. This will be especially problematic for patients with compliance issues or those without health insurance. Moreover, this procedure is painful often requiring pain medications for days to weeks.

Cryotherapy is available in most of outpatient primary care clinic. It is time efficient, easy to perform, cost effective and most importantly, safe for patients. Proven in this case report, uncomplicated BCC can be treated in outpatient setting with the use of liquid nitrogen. Biopsy is often not necessary. This needs to be utilized more in family medicine clinic - to better recognize and treat patients with skin cancer.

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Acute Acalculous Cholecystitis in a Child with Primary EBV Infection

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INTRODUCTION

Acute acalculous cholecystitis (AAC) is rarely associated with Epstein Barr Virus (EBV) infection with majority of cases occurring in the adult population. AAC is typically managed conservatively in the pediatric population due to AAC not being the primary problem, but the consequence of an underlying disease etiology. Our report focuses on a 6-year-old female who presented with abdominal pain in the setting of URI symptoms and was diagnosed with EBV associated AAC.

CASE PRESENTATION

A 6-year-old female was admitted with a 4-day history of progressively worsening epigastric abdominal pain associated with 1-day history of fever (101 F). She also complained of 4 days history of sore throat, nasal congestion, itchy eyes and swollen eyelids. She had visited a local urgent care clinic prior to presentation and was prescribed with Amoxicillin-Clavulanate for bronchitis. She had no history of abdominal trauma, abdominal surgery, hepatitis or autoimmune conditions.

Physical Exam:
Vital Signs: BP 90/75, HR 100, RR 20, Temp. 98.3 F
General: + fatigued.
EENT: + swelling of eyelids, +rhinorrhea. - Scleral icterus. - Pharynx injection; - bilateral tonsillar hypertrophy
Cardiopulmonary: Regular rhythm, Clear to auscultation bilateral lungs
Abdomen: + epigastric abdominal tenderness to palpation. Liver and spleen were 3 and 2 fingerbreadths beneath the ribcage, respectively. Soft and non-distended. Murphy's sign was negative.

Significant Labs: Leukocytosis with >50% lymphocytic predominance and thrombocytopenia, elevated liver enzymes and total bilirubin. Mono Test +. Smooth muscle antibody + with 1:80 titer. EBV panel showed elevated viral capsid antigen (VCA) IgM > 160.0 U/mL and EBV DNA PCR 261,252 copies/mL. Of note, VCA-IgG and EBA IgG were negative (Table 1).

Pertinent Negative Labs: viral hepatitis panel, cytomegalovirus IgM, HSV IgM, HIV Ag/Ab, ANA, Anti liver-kidney IgG, and ferritin level. A urine drug screen and Acetaminophen toxicity level were both unremarkable.

Imaging: Abdominal CT and ultrasound showed gallbladder wall thickness 6.9 mm, common bile duct at 2.3 mm, pericholecystic fluid, and absent gallstones. Abdominal CT showed hepatosplenomegaly (Fig.1 and Fig.2).

LABORATORY RESULTS

Table 1.

Hospital Day	Day 1	Day 2	1 Week Post Discharge
Platelets	125	118	381
PT/INR	14.6/1.2	15.5/1.3	11.2/1.0
AST/ALT	189/347	17/289	56/80
Total bili/direct bili (mg/dL)	1.6/1.1	0.8	0.4
Gamma-glutamyltransferase (U/L)	263		75

IMAGING

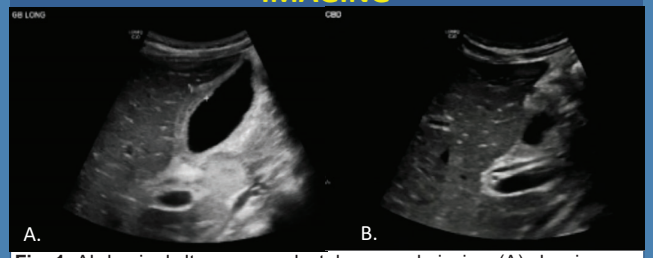

Fig. 1. Abdominal ultrasonography taken on admission. (A) showing gallbladder thickening of 6.9 mm without any definite echogenic stone and pericholecystic fluid, (B) showing common bile duct measures 2.3 mm in porta hepatis.

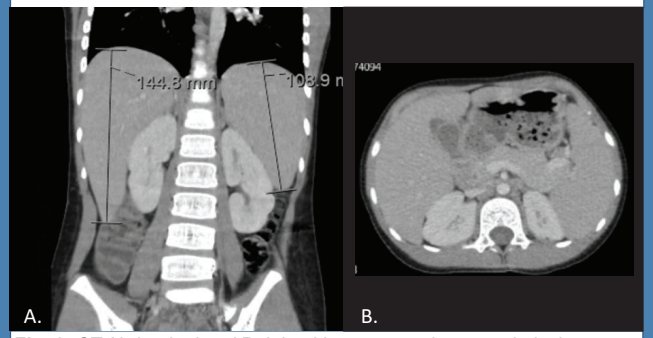

Fig. 2. CT Abdominal and Pelvis with contrast taken on admission. (A) shows hepatosplenomegaly; (B) shows pericholecystic fluid, gallbladder with no echogenic stones.

FINAL DIAGNOSIS/TREATMENT COURSE

Her abdominal pain was attributed to Acute Acalculous Cholecysitis (AAC) due to primary EBV infection.

- **Primary EBV infection:** elevated VCA-IgM and EBV DNA PCR.
- **AAC:** 2 major criteria on imaging (gallbladder wall thickness > 3.5mm and pericholecystic fluid) and absent gallstones.

She was managed conservatively, and her abdominal pain resolved 2nd day of admission at which point the patient was discharged home. She was given precautions not to participate in strenuous activities or contact sports given hepatosplenomegaly. Thrombocytopenia and elevated transaminases were monitored by her Pediatrician which had resolved 1-week post hospital discharge (Table 1).

DISCUSSION

To date, only 12 cases of EBV-associated AAC have been reported. AAC has also been attributed to infectious etiologies such as viral (EBV), bacterial (*Salmonella*) and parasitic (*Ascaris lumbricoides)* as well as systemic diseases including Kawasaki's, Hemophagocytic Lymphohystiocytosis, Leukemia and Autoimmune Diseases.

Patients often present with generalized symptoms (eg. fever, weight lost, night sweats) in addition to symptoms of cholecystitis.

LEARNING POINTS

- Acute Cholecystitis is a rare disease in the pediatric population. Its incidence in infancy, childhood and adolescence has been reported to be between 0.15% and 0.22%
- Physicians and allied health professionals who care for children should be aware that AAC attributable to EBV is a diagnosis of exclusion.
- Pediatric patients with incidental findings of AAC may benefit from additional workup to rule out other underlying causes, such as, but not limited to Kawasaki's, Hemophagocytic Lymphohystiocytosis, Macrophage Activating Syndrome, Malignancy, Autoimmune Disease and HIV.
- Unlike surgical management of AAC in the adult population, AAC is managed conservatively in the pediatric population.

DIFFERENTIAL DIAGNOSIS

Viral hepatitis (CMV, HSV, HIV, EBV)
Autoimmune hepatitis
Hemophagocytic Lymphohistiocytosis, Drug toxicity, Sepsis and Malignancy

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Impact of Rapid Response Team Education on Ward Code Blues

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INTRODUCTION

In-hospital adverse events are estimated to affect up to 17% of hospitalized patients and to cause up to 98,000 patient deaths per year in the United States. Unexpected codes in hospitalized patients are one of the most significant adverse events, carrying a risk of death that is reported to range from 50% to 80%[1]. PIH Health Hospital Downey (PHH-D) has nearly double the rate of cardiopulmonary arrests compared to that of surrounding hospitals. Therefore, PHH-D implemented a Rapid Response Team (RRT) protocol in 2017. The RRT is a multidisciplinary team comprising of a critical care nurse, who has been specifically trained in the RRT protocol, as well as a respiratory therapist. The RRT immediately responds once a floor nurse activates a rapid response with the goal of triaging patients: recognizing and activating immediate interventions vs. immediate transitioning to the ICU before the patient has a Code Blue on the floor.

The objective of this study is to assess the effect of RRT protocol education on Ward Code Blues, i.e. the number of Code Blues in admitted patients outside of the ICU. To do this, Code Blue events over 2018 and 2019 fiscal years were analyzed. Each code was reviewed to evaluate if the patient met at least 1 of the 14 RRT criteria in the 24 hours leading up to the event, which would have prompted an earlier assessment by the RRT with possible transitioning to the ICU before the event occurred. Frequently missed RRT criteria in 2018 became additional educational points for the nursing staff training in 2019.

METHODOLOGY

In order to determine the impact of RRT on Code Blues at PHH-D, an ongoing prospective cohort study was implemented. PIH Downey is a non-profit hospital that serves the LA county region with its 199-bed facility.

All non-ICU cardiopulmonary arrests from October 2017 - June 2019 were reviewed. The cases were separated into two groups based on PHH-D's fiscal year, which runs from October to September, i.e. October 2017 - September 2018 and October 2018 - June 2019 (currently ongoing as we are in the 2019 fiscal year). Each Code Blue and Rapid Response called throughout the hospital was recorded, including a description of the event and where the event occurred. Each case was evaluated 24 hours prior to the activation of Code Blue to determine if the patient met any RRT criteria. The RRT criteria is listed in Table 3.

The data for 2018 were analyzed to ascertain the rate of Code Blues in the hospital and the most commonly missed RRT criteria. The missed criteria were further emphasized during RRT protocol training for the floor nursing staff prior to October 2018. The data for 2019 are similarly being analyzed for further training purposes. The data from both years were compared with the chi-square test. ICU Code Blues were recognized and omitted from analysis.

DATA

	2018	2019
Total Code Blues	83	81
ICU Code Blues	58	51
non-ICU Code Blues	25	30
Code Blues that met RRT criteria in the preceding 24 hours	22	22
Ward Code Blues per Bed Days	8.8%	12.6%
Ward Code Blues per 1000 admissions	3.0%	4.4%

Table 1. Number of true Code Blues that occurred in the sample population

Rapid Response Criteria	2018	2019
Primary nurse having clinical concern of patient deteriorating	3	4
Positive sepsis screen	3	1
Acute change in HR<50 or >130	8	6
SBP<90 or >200 or DBP>110 with new symptoms	7	4
Change in respiratory rate <8 or >30	5	1
Acute change in pulse oximetry <90% despite O2 or progressive increase in O2 requirements	12	10
Acute change in urine output to <50 mL in 4 hours without history of renal dysfunction	2	0
Acute change in level of consciousness	6	4
Signs and symptoms of a stroke	0	1
New, repeated, or prolonged seizures	0	2
Uncontrolled bleeding or large acute blood loss	3	1
Uncontrolled pain	3	4
Unexplained agitation for >10 minutes	0	2
Patient is in distress and the physician is not responding within 10 minutes	1	1

Table 2. Number of instances which patients met criterion for Rapid Response which was not called in the 24 hours leading up to the Code Blue.

RESULTS

In 2018, total Ward Code Blues per 1000 admissions was 3.0%. There were a total of 390 Rapid Responses in which 25 became Code Blues and of those, 22 met RRT criteria. It was found that the top three commonly missed RRT criteria were acute changes in pulse oximetry <90% despite O2 supplementation, blood pressure changes, and acute change in HR. These were reinforced in the RRT protocol training education for floor nursing staff prior to the 2019 fiscal year.

As of June 2019, total Ward Code Blues per 1000 admissions was 4.4%. There has been a total of 316 Rapid Response in which 30 became Code Blues and of those, 22 met RRT criteria. The most commonly missed RRT criterion so far is still acute change in pulse oximetry <90% despite O2 supplementation or progressive increase in O2 requirements.

Comparing the proportions of Code Blues meeting RRT criteria against non-ICU Code Blues between the 2 years, 2018 showed 88.0% of Code Blues meeting RRT criteria while 2019 was 73.3%. The chi-square test = 1.8, with a difference of 14.7% with p=0.18.

CONCLUSION

PHH-D data analysis between the two fiscal years reveals that despite addressing missed criteria in RRT education, there is an increase in the percentage of Code Blues. The data from this small sample size are non-significant, indicating that there is not much difference between the two years. Of note, the percentage of Code Blues meeting RRT criteria declined by 14.7% indicating that there were more cardiac arrests with fewer patients meeting RRT criteria prior to the event. Since 2017 to 2019, there has been an increase in number of Rapid Responses called from 18 RRT/mo to 35 RRT/mo, which led to appropriate immediate patient interventions. From 2018 to 2019, rates show that there is a 0.64% increase in the number of RRT called that prompted transfer to the ICU as well as a 2.35% increase in the number of patients who were appropriately intervened to prevent physiological decline.

FURTHER INVESTIGATION

Our team encountered several questions in our analysis of the impact of RRT protocol on Code Blues at PHH-D.

The biggest question was why there was an increase in Code Blues despite increased RRT education on Rapid Response protocol. One possibility could be the influx of new nurses with frequent turnover at PHH-D over the past two years. PHH-D is one of the main hospitals that accept nursing graduates with no prior experience, which can impact the inability to recognize early signs of patient clinical decompensation. Another explanation can also be in the changing demographics of the Downey community since PIH recently has taken over a previously community hospital and is currently transitioning into a stroke center.

With the decrease in the number of Code Blues meeting RRT criteria, there is a possibility that the RRT criteria were entirely missed or the patient did not show any signs/symptoms. Given these results, this year PHH-D has implemented a high-risk simulation with emphasis on the top three missed RRT criteria to train the floor nursing staff. This will help to increase awareness and recognition of patient's acute physiological decline, leading to timely RRT calls for immediate interventions preventing the progression to Code Blues on the floor. Furthermore, there were situations where RRTs rapidly progressed to Code Blues in a matter of minutes, which begs the question as to whether or not there would have been a difference in patient outcomes if a Code Blue had been initially called instead of a RRT.

One of the limitations of our study was that our review was dependent on chart records. In other words, our analysis was limited to what was documented in the EMR. At this time, we will continue to emphasize the importance of accurate documentation to all healthcare providers.

This is an ongoing Quality Improvement Project being followed by residents of PIH Health Family Medicine Residency Program under the supervision of Critical Care/Pulmonology specialist Dr. Yasmeen Shaw. It is to be noted that the data available in this study only included a portion of the 2019 fiscal year in comparison to that of the entire 2018 fiscal year. We will continue to analyze the present data and incorporate the data from the remainder of the fiscal year.

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Harnessing the potential of the EHR in support of I-PASS protocols can improve the resident care transition experience

Natividad MEDICAL CENTER

Purpose

The aim of this effort was to explore how the native Electronic Health Record (EHR) assets could be leveraged to support the standardization, fidelity, and efficiency of verbal resident care transition sign out.

Background

The Natividad Medical Center (NMC) Family Medicine (FM) Residency is based in a high volume 170 bed public hospital

As the sole residency program at NMC, the FM residents provide the foundation of physician care across the spectrum of settings and specialties offered at the hospital

Resident led day/night care transitions involve 40-65 patients and 7 different care teams (Surgery, ICU, Pediatrics, Family Medicine, MedSurg 1 & 2, and Night Float)

Keeping track of and effectively translating the salient care issues during verbal care transitions in such a high volume setting was frequently noted as a source of resident anxiety and stress

Natividad Medical Center (NMC) uses MediTech as the EHR system

Based on the input of stake holders throughout the hospital ecosystem, a dedicated patient report was created within the EHR framework to automate the aggregation and presentation of relevant clinical information in a written format designed to complement the verbal I-PASS protocol in an effort to promote the standardization, fidelity, and efficiency of verbal care transitions

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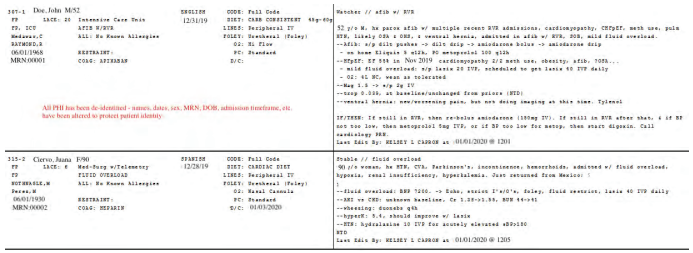
Discolsures: The authors have no actual or potential conflict of interest in relation to the information presented herein

Written Sign Out Document Example



The figure above provides an example of 2 patients (among 52 total) on the care transition document for a chosen day-to-night care transition.

The left column is automatically generated from the EMR and reflects the instantaneous state of the EHR database at time of printing.

The right column is generated by the responsible day team care provider. and reflects salient clinical information to help orient the receiving provider. The provider generated information persists and is updated as needed.

During sign out, the receiving provider (Night Float in this case) has the written information in hand to reinforce the verbal sign out provided by the day team care provider

The receiving provider commonly makes notes directly on the printed document for use during the overnight shift

I-PASS BETTER HANDOFFS, SAFER CARE.

I	Illness Severity	• Stable, "watcher," unstable
P	Patient Summary	• Summary statement • Events leading up to admission • Hospital course • Ongoing assessment • Plan
A	Action List	• To do list • Time line and ownership
S	Situation Awareness and Contingency Planning	• Know what's going on • Plan for what might happen
S	Synthesis by Receiver	• Receiver summarizes what was heard • Asks questions • Restates key action/to do items

Verbal sign out is modeled on the I-PASS protocol

Methods

Following a trial period, starting in summer of 2018 the NMC FM Residency adopted the integrated EMR written sign-out protocol described above in support of the verbal I-PASS protocol that was already in use by the FM residents.

Over the next 18 months resident competencies were periodically evaluated and scored by senior residents and faculty using standardized checklists (I-PASS Study Group Children's Hospital Boston 2011) in combination with Likert scale assessment.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Results

Significant improvement in hand-offs was reported in ACGME CLER Site Visits.

In 2017, prior implementation of the protocol, "none of the residents in the observed hand-offs employed a read-back technique."

In 2019 "the CLER team observed.... these hand- offs were consistent....using standardized written templates, contingency planning and synthesis by the receiver that included asking questions and confirming the plan of care."

The Faculty/R3 evaluations showed resident scores consistently above 4 on a Likert scale of 1-5 (Never to Always) in verbal and written I-PASS protocols.

Qualitative comments included "less stress", "less worry about patients" whereas residents in 2017 reported more anxiety and concern over the safety of handoffs in which they participated.

Discussion

I-PASS is among the most utilized validated tools used by residents during care transition "hand-offs".

Despite its virtues, implementing the verbal I-PASS protocol consistently over a large patient census involving multiple stake-holders can be challenging.

To help address these challenges, we designed an approach to care transitions that leverages inherent strengths of the EHR, such as automation, patient tracking, and universal access to the same information, to promote more effective integration and standardization of written and verbal aspects of the I-PASS protocol during verbal hand-off

The resulting improvements in census management, quality, and efficiency have had a notable positive impact on resident views with regard to patient care, satisfaction, and well-being.

As a consequence these process improvements have been adopted as standard practice for care transitions across the spectrum of in-patient services covered by the residents (Medsurg / Family Medicine / ICU / Surgery / Pediatrics).

Isolated and In Labor:
Managing active respiratory tuberculosis in pregnancy and across the U.S.-Mexico border

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Introduction

Scripps Mercy Family Medicine Program is based in a community hospital approximately 9 miles from the U.S.-Mexico border. The program serves a largely Latino underserved community. With such proximity to the border, it is evident to witness the impact that binational movement has on public health, particularly considering TB is endemic in Mexico. Though overall prevalence of TB is improving in both countries, in 2018, the incidence of respiratory TB in San Diego County was 6.8 per 100,000 compared to 57 per 100,000 in Baja California. Tijuana, Mexico has one of the highest rates of TB (approximately 3 times the national average) than other border cities.

Patient Presentation

29 year old G4P2 presented to Maternal Child Health Center for routine prenatal care at 26+6 weeks gestational age. Previous prenatal care was obtained in Mexico.

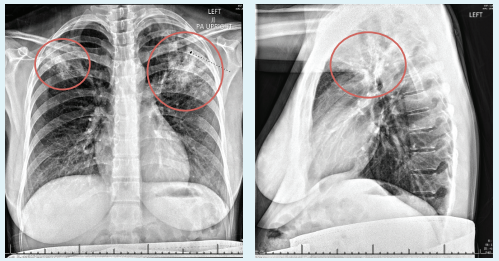
1/29/18
Presented to clinic for her first OB visit. Quantiferon Gold was drawn, which resulted positive.

3/3/18
Was lost to follow up, but returned for routine OB visit. No symptoms reported. Was encouraged to get chest x-ray that day, but left without it getting done.

4/10/18
Returned for OB visit and did not report any current symptoms (but per patient hindsight did report cough 2-3 months ago). Exam was notable for poor weight gain (net +3 lbs.). Chest x-ray done this day showed bilateral upper lobe infiltrates, one of which (left) appeared cavitary. Multiple attempts were made to contact the patient. San Diego Department of Public Health was notified.

4/17/18
Presented for OB visit now at 38+0 weeks gestational age. Was referred immediately to Scripps Hospital Chula Vista emergency room for TB evaluation.

Hospital Course



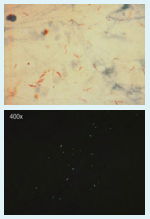
- **Hospital Day 1**
  - Presented to the ED: physical exam was unremarkable—including lungs/chest—but repeat CXR was consistent with prior (pictured above).
  - *M. tuberculosis* PCR resulted positive.
  - Admitted and placed in airborne isolation.
- **Hospital Day 2**
  - First AFB smear resulted positive (4+) without drug resistance to rifampin.
  - ID and Pulmonology services were consulted, and patient was started on rifampin (RIF), isoniazid (INH), ethambutol (EMB), and pyridoxine. Pyrazinamide (PZA) was held off at this time.
- **Hospital Day 3**
  - Perinatology service was consulted, who recommended expectant management of third trimester pregnancy. Induction not indicated given the risk of vertical transmission is low. Intermittent fetal heart rate monitoring.
- **Hospital Days 4-6**
  - Patient remains stable, asymptomatic, and tolerating medications. No symptoms of labor.
- **Hospital Day 7**
  - Patient starts feeling uterine contractions at 02:30. She progressed to complete and delivered a viable male infant weighing 3000 grams via NSVD at 03:11 at 38+6 WGA inside a negative pressure room.
  - Infant was taken immediately to Scripps Chula Vista Level 2 Nursery for evaluation and then transferred to Rady Children's Hospital to start INH and RIF, per Neonatology and Pediatric ID recommendations. Placenta was sent to pathology, which measured 10[th] %ile in growth.
- **Hospital Day 8-16**
  - PZA was added to antibiotic regimen.
  - Routine postpartum course. Patient remained in isolation and encouraged to breast pump, however patient declined and preferred to formula feed.
  - Repeat AFB smears starting at day 14 still positive (2+).
- **Hospital Day 17**
  - Cleared by San Diego Dept. of Public Health to safely discharge home to Tijuana under these conditions: must live alone, follow up with Mexican Dept. of Public Health in 2 weeks; adhere to RIPE therapy daily, and wear mask in public at all times.

Learning Objectives

- Define the diagnosis of TB and therapeutic management in pregnancy.
- Review RIPE therapy, particularly how these medications affect pregnancy and breastfeeding.
- Identify necessary public health efforts and hospital protocols for successful infectious disease control.

Diagnosis of Pulmonary Tuberculosis

- Chest XR
- Microbiological testing
  - Sputum AFB smear
    - Recommended 3 serial specimens in order to improve sensitivity.
  - Mycobacterial culture (gold standard)
    - Both liquid and solid cultures are recommended.
  - Induced sputum sample is recommended over bronchoscopic sampling.
- Molecular testing: NAAT
  - Include rapid molecular drug susceptibility testing for RIF +/- INH.
- Urine antigen detection in patients with co-morbid HIV infection.



(Top) Ziehl-Neelsen sputum stain.
(Bottom) Fluorochrome sputum stain.

RIPE Treatment and Safety

	Rifampin*	Isoniazid	Pyrazinamide	Ethambutol
Length of Treatment	Daily for 2 months, then daily or twice weekly for 7 months	Daily for 2 months, then daily or twice weekly for 7 month	Daily for 2 months	Daily for 2 months
Pregnancy Category	C Possible risk of dose-dependent teratogenicity based on animal data	C Possible risk of fetal harm at twice the recommended dose	C Controversial evidence regarding theoretical teratogenicity.	B
Breastfeeding Safety	No known risk Drug concentrations in breast milk are not sufficient to treat infants *May cause orange discoloration of milk			
Other Considerations	Consider Vitamin K supplementation	Vitamin B6 supplementation; obtain baseline LFTs +/- at 4 weeks postpartum		May discontinue after 1 month if RIF + INH susceptibilities are in favor

Discussion

1. Pregnancy presents a substantial opportunity to screen, detect, and treat TB.
2. A Quantiferon Gold or PPD should be performed on all pregnant women at high risk of TB.
3. Positive screens should be evaluated with a chest x-ray and microbiological testing if there is high suspicion.
4. Early treatment is key. In general, RIPE therapy is safe in pregnancy, although PZA may be held until postpartum.
5. RIPE medications do not cross the placenta very well and are not found in high concentrations in breast milk, thus proving relatively safe for the fetus and infant. For this reason, infants at risk must be treated individually.
6. Isolation during the antepartum and postpartum phases is recommended for infection control of aerosol transmission.

Public Health Impact

- TB is a reportable communicable disease that prompts quick management to minimize risk of contagion.
- In the immediate postpartum period, mother and infant should be separated and evaluated individually, but need not stay separated during the outpatient treatment phase.
- Patients with active TB are recommended to stay at home as much as possible and wear a (simple face) mask to decrease the risk of airborne transmission during the treatment period.
- Labs (both inpatient and outpatient) are required to report positive *M. tuberculosis* tests to the provider and to the department of public health.
- Departments of public health subsequently notify potential contacts and investigate the effect of infection on the community.
- Departments of public health also have access to screening for contacts as well as resources for treatment adherence for patients.
- A cross-border collaboration of public health agencies is crucial in order to avoid interruption of treatment and ensure public safety from the spread of infection.

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A Multi-dimensional Approach to Diabetes Control
Effects of participation in Comprehensive Diabetes Group Clinic on HBA1C in Type 2 Diabetes Mellitus

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Background

- Diabetes Mellitus (DM) is one of the most prevalent metabolic diseases in the world. In the US, 9.7% of the population have diabetes, which is associated with $327 million billion in direct medical costs and reduced productivity in 2017. SJ county has 11% prevalence of DM.
- Obtaining a euglycemic state and maintenance of an optimal Hb A1C in patients with type II diabetes mellitus is crucial in the prevention of diabetic complications.
- Approaches based on modern and innovative Chronic Care Models have been used in the management of chronic illnesses and have shown efficacy in attaining an optimal glycemic state in diabetic patients.

Hypothesis

- The comprehensive approach of Comprehensive Diabetes Group Clinic(CDGC), will increase compliance, and influence lifestyle changes that will have a positive effect on the health of the patient. It can lead to tighter glycemic control, which will substantially lower the Hb A1c of the patients.
- Therefore leading to a reduction of diabetes associated complications, and healthcare costs. The intent of this study is to validate that participation in CDGC will substantially reduce the Hb A1c, lipid profile and Body Mass Index (BMI) in all involved participants

Methods

- Retrospective chart review of patients who attended the CDGC between 06/1/2018 and 06/30/2019.
- Inclusion criteria: A1c greater than 7, Minimum of two visits, 109 participants
- Exclusion criteria: Type1 DM, less than 2 visits
- Primary endpoint: Reduction in HbA1C, Secondary endpoints: Change in HDL, LDL, TG and BMI
- Patients were in group sessions that included, pharmacist, physician, diabetes educator, dietitian, registered nurse and medical assistants
- Once Data was collected, it was analyzed using Analysis of Variance (ANOVA), Shapiro Wilk test and Wilcoxon test to test change between A1c and BMI

Results

- 78 were included in the study, 31 were excluded due to not completing 2 visits or lost to follow up
- There were 37 male and 41 female
- Average age for male was 53.41, female were 54.90
- 56.41% Hispanic, White 7.79%, Asian 8.97%, African American 11.54%, American Indian 1.28%, other 14.10%
- Using ANOVA to analyze the data, it was found that there was a significant reduction in HbA1c from pre-CDGC and post CDGC of **2.47**, with a p value of 0.00
- Shapiro Wilk test and Wilcoxon test were both used to confirm the statistical significance of the decrease, p value of 0.00
- There was also a statistically significant reduction in BMI of 4.7

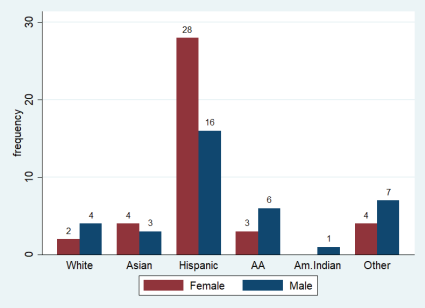

Fig 1. Demographics by race and gender

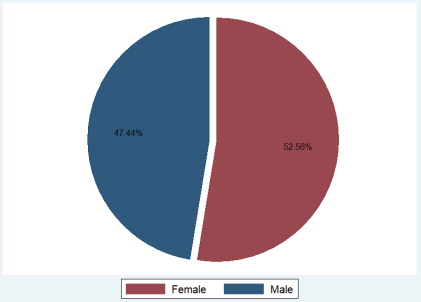

Fig 2. Demographics by gender

Variable		Pre	Post	
A1C levels				
	Mean (SD)	11.2 (2.6)	8.8 (1.9)	P < 0. 05*
	Min - Max	5.8 – 18.2	5.7 – 14.5	
BMI				
	Mean (SD)	32.5 (7.4)	27.8 (4.9)	P < 0.05*
	Min – Max	19.3 – 51.5	23.2 – 47.2	

Fig 3. Pre and Post A1c and BMI of participants

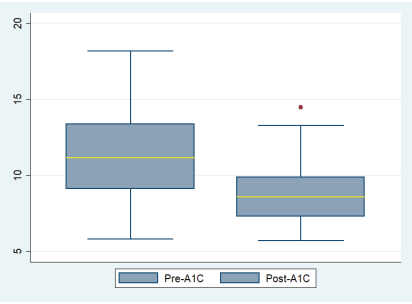

Fig 4. Plot of pre and post A1c

Discussion

- Diabetes Mellitus is one of the most prevalent diseases worldwide, with prevalence in San Joaquin County being 11%
- Managing this disease and its complications have been challenging
- Those enrolled in the study had a mean starting HbA1c of 11.24
- With a reduction of approximately 2.5, the group approach appears to be effective
- There was a reduction in BMI, as well, but it is unknown if there were other confounding factors
- Complications rate is yet to be seen, and will need to be continuously monitored

Conclusions

- Patients with lower SES, medically underserved, may have a propensity to default to their own understanding of treatment and pathogenesis of T2DM
- These challenges led to creation of different ways to improve clinical outcomes by implementing an effective care model
- There is a role for CDGC in reducing HBA1c and decreasing the rate of complications from T2DM
- Further studies need to be performed in order to evaluate improvement in LDL, HDL, and TG
- Next step is to compare patients who reached goal in our clinic to a similar diabetes clinic in our hospital
- Increasing the amount of patients enrolled in CDGC can greatly impact our patients health and reduce the overall cost burden on healthcare

A Case of Atypical Wernicke's Encephalopathy: Suspicion Trumps All

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INTRODUCTION

Thiamine plays a significant role in cerebral metabolism, requiring 80% of the total thiamine in nervous tissue to process glucose as the primary energy source (**Figure 1**). Risk factors for thiamine deficiency include diminished intake, increased metabolic demand, and resuscitation with intravenous glucose-containing fluids. Thiamine deficiency can manifest in multiple clinical syndromes such as dry beriberi with peripheral neuropathy, wet beriberi with cardiomyopathy, and Wernicke-Korsakoff syndrome.

Commonly associated with chronic alcoholism, textbooks diagnose Wernicke's encephalopathy as a triad of symptoms: encephalopathy, gait ataxia, and oculomotor dysfunction. However, recent meta-analyses only note one-third of patients presenting with all three clinical features.

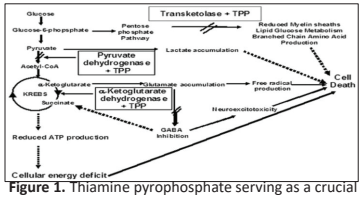

Figure 1. Thiamine pyrophosphate serving as a crucial enzyme at multiple steps for energy metabolism

CASE DESCRIPTION

HPI: 60-year-old male with medical history of transient ischemic attack (2015), hypertension, and type 2 diabetes, presented to the ED with 24-hour history of worsening disequilibrium after a seizure-like episode one day prior. At that time, patient reported 5-minute episode of sudden-onset weakness and tremors, which was attributed to hypoglycemia. The next day, patient reported worsening left-sided weakness and difficulty ambulating.

Of note, patient previously admitted in recent years for hypoglycemia and for alcohol withdrawal symptoms. At present, patient reports minimal alcohol use, with last drink of two servings of vodka two nights prior to admission.

PHYSICAL EXAM:
Vitals: Afebrile, BP 166/97, HR 79, RR 13, O2 100% on room air
Neurological - drowsy, **slowed speech,** cranial nerves II through IX intact except **pupils L reactive but R minimally constricts with light,** , strength 5/5 RUE/RLE, **4/5 LUE,** +5/5 L LLE, **gait unstable, finger-to-nose test negative B/L heel-to-shin test negative B/L, rapid alternating hand movements intact**

CLINICAL COURSE

PERTINENT LABS:
Glucose: 209, CK 190, Ethyl alcohol <3, UDS negative
Urinalysis: trace protein, 3+ blood

IMAGING:
CT angiography head neck with stroke protocol: revealed no hemodynamically significant stenosis, occlusion ,or aneurysm. Stable atherosclerotic plaque noted in bilateral common carotid artery.

MRI brain revealed no acute infarcts, or hyper intensities around mammillary bodies, periaqueductal region of the midbrain, or thalamus (**Figure 2**).

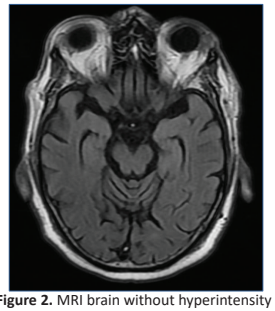

Figure 2. MRI brain without hyperintensity noted around mamillary bodies or midbrain, only noted with less than 20% of patients

DIFFERENTIALS:

- **Acute ischemic cerebellar stroke**
- **Mixed hypoglycemic episode vs seizure**
- **Vestibular neuritis**
- **Chronic alcohol use disorder**

Due to concern for potential cerebellar stroke, patient kept on permissive hypertension for the first 24 hours and started on clopidogrel and atorvastatin. Patient had no post-ictal state and normal glucose levels.

Neurology consult recommended oral prednisone due to suspicion of vestibular neuritis. Despite therapy, patient continued to have persistent disequilibrium and truncal gait difficulties. On hospital day #3, patient developed new right-beating nystagmus with subjective diplopia; differential included vestibular nystagmus due to oculo-vestibular dysfunction. Patient was started on intravenous thiamine with resolution of nystagmus and mental drowsiness.

After intense inpatient rehabilitation course, patient returned to normal gait and function. Due to persistent dizziness, patient required wheelchair on discharge with plan for continued outpatient physical therapy.

DISCUSSION

In this case, there was low suspicion for Wernicke's encephalopathy given clinical history, physical exam findings, and labs. Patient's reported history of chronic alcohol use disorder in setting of any acute neurologic changes should arouse need for thiamine supplementation. As thiamine is both concentration-dependent and transportation-dependent, intravenous thiamine replacement is preferred.

Oral thiamine is noted to have poor absorption in the setting of chronic alcohol use or other intestinal deficits. Given its low risks, all individuals suspected to have low thiamine (due to both alcoholic and non-alcoholic causes) should receive thiamine followed by glucose and magnesium supplementation.

CONCLUSION

Given the deleterious consequences of undertreating thiamine deficiency and cost versus benefit, parenteral replacement therapy needs to be prioritized for high-risk patients - alcoholics and individuals at risk for malnutrition.

High risk individuals for thiamine deficiency should be redefined as two of the following four signs:

1) dietary deficiencies or vomiting
2) eye signs
3) cerebellar dysfunction
4) altered mental status or mild memory impairment

Based on bioavailability and prior clinical-pathological studies, expert consensus for dosing recommendations are parenteral thiamine 500mg three times daily for at least two days, followed by 250mg daily for an additional five days.

- High thiamine levels are non-toxic to the body.
- Important to also co-administer magnesium.

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