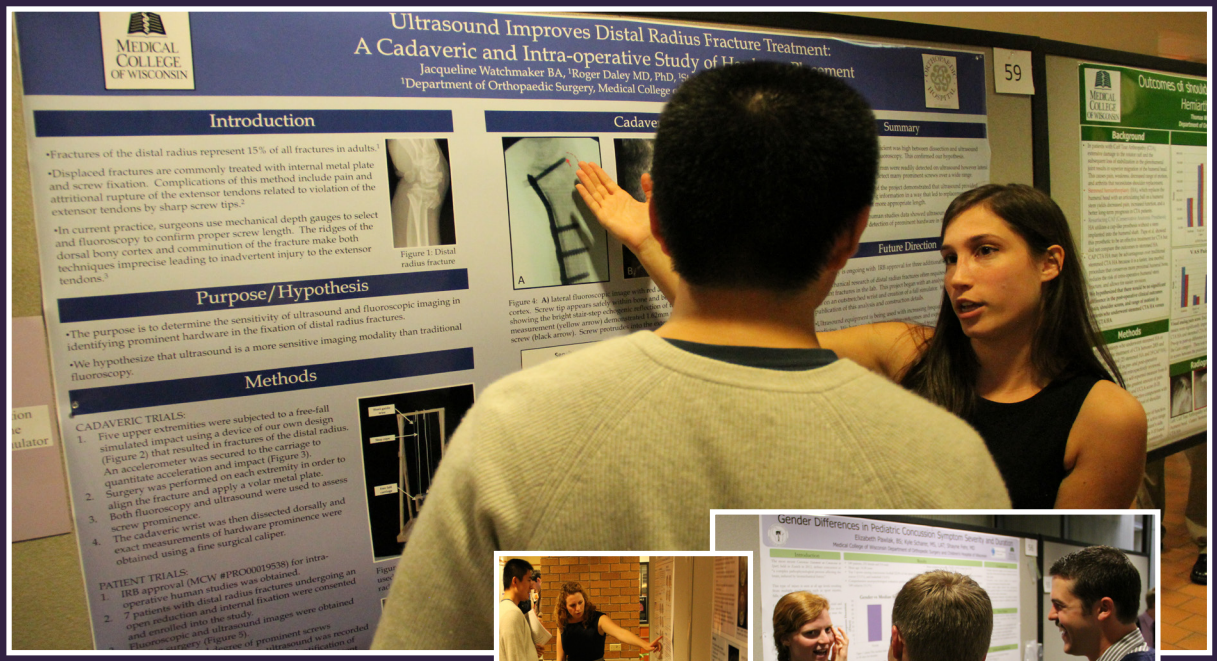
MCW
MEDICAL SCHOOL

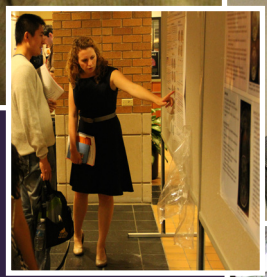
Class of 2016

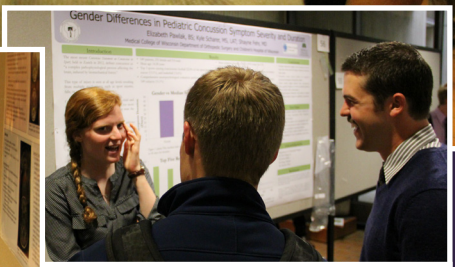
Scholarly PATHWAYS

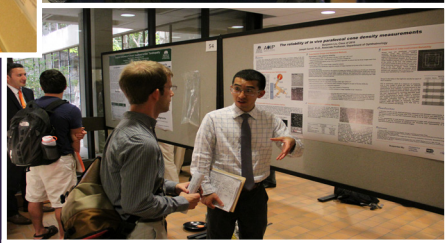
Scholarship Forum

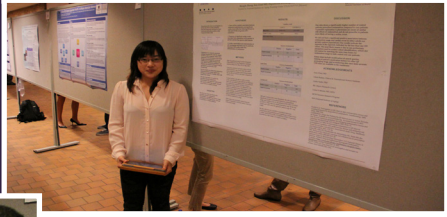
June 25, 2015 1:00-4:45 pm

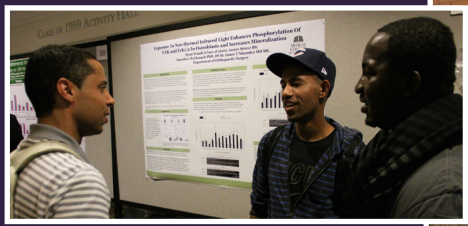


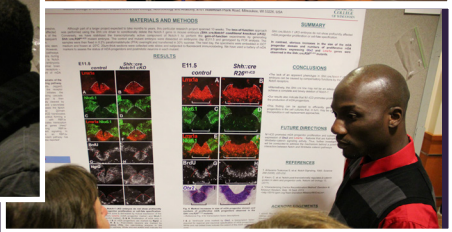












Class of 2016, Medical Student Summer Research Program (MSSRP)

Poster Presentations
October, 3rd, 2013

CLASS OF 2016 SCHOLARSHIP FORUM
THURSDAY, JUNE 25, 2015

1:00 **Convene & Welcome** Linda Meurer, MD, MPH, Urban & Community Health Pathway Director
Opening Remarks Richard L Holloway, PhD, Associate Dean for Student Affairs

1:15 **Podium Presentations—Part I in the KERRIGAN AUDITORIUM**

1. Jessica Meister — Bioethics, page 6
Parental Decision Making & WI Law: Implications for Physicians & Parents

2. Olivia Mac and Gretchen Wagner — Clinician Educator, page 9 + 10
Evaluating Geriatric Education Team Fast Facts and Educational Resources

3. Steven Broderick—Global Health, page 13
The International Adoption Clinic Database Project

4. Ashley Dietrich — Physician Scientist, page 22
Kaposiform Hemangioendothelioma: Long-term Outcomes from a Single Center

5. Matthew Doers —Quality Improvement & Patient Safety, page 42
Feedback to Achieve Improved Sign-out Technique

6. Ahmad El-Arabi and Bryan Johnston — Urban & Community Health, pages 49 + 50
The Food Doctors: A MyPlate-focused Nutrition Education Program

2:25 **Break - Poster Viewing & Refreshments in the ALUMNI CENTER**

3:20 **Reconvene** Ryan Spellecy, PhD, Bioethics Pathway Director
Special Remarks Joseph Kerschner, MD, Dean, Executive Vice President

3:30 **Podium Presentations—Part II in the KERRIGAN AUDITORIUM**

7. Janna Lam and Kirstin Robertson—Urban & Community Health, pages 52 + 54
Improving Access to Vision Care through Eyeglasses Recycling

8. Louise Hillen —Quality Improvement & Patient Safety, page 43
Improving Physician Documentation of Pressure Ulcers in the ICU

9. Jacqueline Watchmaker — Physician Scientist, page 37
Ultrasound Imaging Improves Identification of Prominent Hardware

10. Amy Otuonye and Andrew Mueller — Global Health, pages 16 + 17
Quality Improvement Review in Diabetic Care at Patan Hospital, Nepal

11. Joelle Gabet—Clinician Educator, page 9
Comparison of a Faculty-Taught and Student –Taught Ultrasound Course

4:30 **Summary Remarks** David Brousseau, MD, MS, Physician Scientist Pathway Director

4:40 **Evaluations**

Class of 2016 Scholarly PATHWAYS

Scholarship Forum

June 25, 2015 1:00-4:45 PM

Bioethics

Clinician Educator

Global Health

Physician Scientist
Clinical & Translational Research
or Molecular & Cellular Research

Quality Improvement & Patient Safety

Urban & Community Health

The **MCW Scholarly Pathways** program is a required component of the medical school curriculum. Students selected one of seven areas of concentration through which they enrich and individualize their medical training, while exploring a career path of interest.

Each of the **Scholarly Pathways** features a structured curriculum with core content delivered through monthly didactic and small group sessions, and an experiential component guided by a faculty advisor and Individual Learning Plan (ILP). Students must also complete a project by the end of their M3 year which meets each of Glassick's criteria for scholarship:

The **Scholarly Pathways** culminates with today's **M-3 Scholarship Forum**. The program features a selected number of podium presentations, and poster presentations from students in all pathways. This book includes abstracts for each student project, those who presented today and those presented at the Medical Student Summer Research Program (MSSRP) in fall of 2013.

Congratulations to the Class of 2016 for the creativity and innovation evidenced by the scholarship presented today!

SPECIAL THANKS

The Pathway Directors would like to express their sincere gratitude to the Pathway Advisory Council members, faculty advisors and project mentors, and community partners who have helped our students succeed.

CONTACT INFORMATION

Physician Scientist
Meaghan Hayes, MEd, mehayes@mcw.edu, 414-955-2812

Urban & Community Health and Global Health
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Clinician Educator, Bioethics and Quality Improvement & Patient Safety
Jennifer Kraus, jekraus@mcw.edu, 414-955-2286

Bioethics

Ryan Spellecy, PhD &
Cynthiane Morgenweck, MD, MA

Enables medical students to integrate the knowledge and tools of bioethics as an essential part of his or her career as a physician. Provides medical students the opportunity to develop their ethics skills in a variety of areas, including but not limited to clinical ethics; consultation; research ethics and participation; leadership in institutional ethics committees; ethics consultation; and research ethics.

Hass, Jennifer

COX Inhibition and CD49d+ PMN Frequency in BAL During Viral Illness

Authors: Hass JA, Buell E, Hunter D, Cheung DS, Grayson MH
Project Mentor: Mitchell H Grayson, MD

Development of post-viral atopic disease in Sendai virus(SeV) mouse model depends upon accumulation of CD49d+ PMN, expressing CysLTR1, in the BAL. CysLTR1 block reduces the frequency of these cells in the BAL. We hypothesized COX inhibition would increase frequency of these cells, leading to enhanced atopic disease development. C57BL/6 mice were inoculated intranasally with SeV. Indomethacin given i.p. once (10 mg/kg) or daily (5 mg/kg) on days -1, 0 or 1 post inoculation with SeV. Three days post inoculation the frequency of CD49d+ PMN in BAL was determined by flow cytometry. R: COX inhibition increased the frequency of CD49d+ PMNs in the BAL for both single and daily administrations. Greatest effects were seen with administration one day after SeV for single dose (15.0±1.1% vs 25.5±2.2%; mean±SEM %CD49d+ PMN; vehicle versus indomethacin; p=0.01; n=3) and starting on day 0 for daily dose (16.9±1.2% vs 28.3±1.2%; p=0.01; n=3). C: COX inhibition results in a significant increase in CD49d+ PMNs in the alveolar space with viral infection.

Jaramillo, Carlos—POSTER

The Undocumented Hispanic Immigrant: Journey, Trauma, & Mental Health

Authors: Jaramillo CA, Galletly CL
Project Mentor: Carol Galletly, JD, PhD

Undocumented Latino immigrants comprise a growing and a vulnerable population. Their journey of immigration can be fraught with trauma. Yet, understanding mental health in his population has proven to be particularly complex. Language barriers and linguistic ambiguity; cultural perceptions of illness, doctors, and mental health; social roles and marginalization; trauma exposures; limited sample sizes and study designs; and even a limited understanding of the pathophysiology or the lack of a diagnostic 'gold-standard' complicate the research to date. In this study we survey the current understanding of the kinds of traumatic experiences undocumented immigrants experience, their affect on this population, and the ability of primary care providers to detect trauma-associated mental health issues in this growing population. We find the literature is disparate, data insufficient, and the quality of screening mechanisms available to PCPs questionable. Areas of further research are suggested.

Jojola, Cecilia—POSTER

From Pen to Policy: Differing Opinions of Conscience and Ethics

Authors: Jojola C, Robey T, Halverson P, May T
Project Mentor: Thomas May, PhD

How do we apply concepts of professionalism to conversations about controversial topics? This is the question I address in developing medical society policy for navigating discussion of rights of conscience. Rights of conscience, according to the Encyclopedia of Bioethics, "protect a person from mandatory participation in an activity if the activity in question threatens the fundamental values of an individual person." Medicine has precedents in respecting physician and students' rights of conscience, as when it supports exemption from participation in abortion procedures. Rights of conscience should balance patient and physician autonomy fairly, but what happens when they are in opposition? Physician opinion is evenly divided as to whether medical providers should be mandated to participate in medical interventions that violate their ethical stance (Medscape Ethics Report 2014). Given the divide in opinion, how do we promote discussion? My project explores how to maintain respect and professionalism in these conversations.

Kuemmet, Travis
Ethical Considerations in the Treatment of Transgender Youth

Authors: Kuemmet T
Project Mentor: Andrew Petroll, MD, MS

Gender nonconforming adolescents need specialized healthcare and treatment. Medically delaying the development of secondary sex characteristics is a major issue when treating these patients. The decision for a provider to prescribe and manage this treatment is controversial, and has many ethical implications that need to be considered. Provider competency in this area is complicated by cumbersome treatment guidelines that are nonspecific to adolescents. There are also many difficulties for a gender transitioning patient that can negatively affect care, and finding a provider may be challenging. In this paper, I will examine several scenarios, interventions, and outcomes in treating this group of patients.

PODIUM

Meister, Jessica
Parental Decision Making & WI Law: Implications for Physicians & Parents

Authors: Meister J, Leuthner S
Project Mentor: Steve Leuthner, MD, MA

Should physicians be required to provide life-sustaining medical treatment for children, irrespective of medical standards, patient prognosis, or parental wishes? Medical decision making for children falls within the purview of parental authority, with case and statutory law defining the contours of this right. The WI case of Montalvo v. Borkovec established an unprecedented limitation in holding that no right to withhold or withdraw life-sustaining treatment exists unless a child is in a persistent vegetative state (PVS). Thus, palliative care of a child not in PVS exposes physicians to legal liability. This project included bioethical analysis of Montalvo and development of a structured survey seeking to identify parental wishes and values pertaining to medical decision making and to elicit opinions about the limitations imposed by Montalvo. Raising awareness of these issues may promote evolution of policies that more robustly support the authority of physicians and parents to make medical decisions for pediatric patients.

Schneider, Jamie—POSTER
Advance Care Planning Guide

Authors: Schneider JL, Kuester J
Project Mentor: Jessica Kuester, MD

American medical ethics has seen a shift in the past decades from paternalism to patient autonomy. In response to this, many health care organizations have begun strongly encouraging patients to complete advance care plans and physicians to broach the subject with their patients. Students learn about the principles of advance directives during their preclinical years but have little exposure to their practical application. On the wards the logistics of advance directives are often handled outside of the managing service by groups such as Social Work, Case Management, and Palliative Care, giving students little opportunity to understand the process. This project creates an easy to use resource targeted at physicians-in-training with three purposes: 1) review the basics of advance directives, 2) provide direction on how to ensure a patient's wishes are followed, and 3) list resources for more advanced situations.

Schultz, Brian—POSTER
Setting Vaccination Priorities for Pandemic Influenza Response

Authors: May T, Schultz B
Project Mentor: Thomas May, PhD

Pandemic Influenza results in high levels of morbidity and mortality, moving rapidly between individuals. In these circumstances, resources such as vaccines are not only limited but their irresponsible use can result in increased rates of infectivity as well as public distrust. In the early 2000s, federal and state governments attempted to establish prioritization schemes to prepare for such scenarios but a careful look reveals many of their underlying theories have both practical and moral problems. In this analytical work we attempt to shift the focus of vaccine prioritization schemes from qualities of the specific pathogen or abstract ideas of societal function to those of the social environment. Ultimately, the patterns of social interaction between individuals remains nearly fixed regardless of the status quo and therefore provides an important epidemiological target to reduce overall disease transmission.

The Student–Led Scholarly Project Review Panel

Started in 2012, the Student-Led Scholarly Project Review Panel review any scholarly project proposal that involves people but doesn't have, and will not seek, IRB review. In order to ensure that an IRB review is truly not needed the panel provides a level of ethics review and offers feedback to the student. Students from all Pathways serve on the panel.

Bioethics Pathway student **Heather Kim** presented a podium titled "***The Student-Led Research Review Panel: An Alternative"*** at the American Society for Bioethics and Humanities national meeting in Atlanta, GA on October 25, 2013. This has led to a manuscript which is currently under review.

The Bioethics Pathway would like to say THANK YOU to these students for their dedication and hard work

Students who serve on the panel

- **Affi, Marina**
- **Bishop, Callie L**
- **Bohr, Matthew T**
- **Brennan, Stephen**
- **Briggs, Morgan**
- **Chan, Alvin Y**
- **Damrow, Derek S**
- **Davis, Seth J**
- **Dayal, Anupriya**
- **Dhaliwal, Tarin S**
- **Gehrmann, Rebecca L**
- **Hansen, Sydney J**
- **Hollabaugh, William L**
- **Holman, Nathanael T**
- **Jacobson, Ashley**
- **Johnson, Colin M**
- **Kinzel, Adam J**
- **Lacey, Brian**
- **Lacey, Marcus J**
- **Lin, Lawrence**
- **Loke, Dana E**
- **Mercer, Melanie R**
- **Miksanek, Jennifer**
- **Neeno, Jasmine A**
- **Owen, John M**
- **Patel, Mital K**
- **Patterson, Taylor J**
- **Paul Rajamanickam Eunice S**
- **Perez, Enio T**
- **Placone, Nicholas T**
- **Rich, Trevor M**
- **Schultz, Brian M**
- **Siller, Alfredo**
- **Tabakin, Matthew B**
- **Truong, Connie**
- **Walden, Daniel J**
- **Watchmaker, Jacqueline D**
- **Wirtz, Kennedy M**
- **Yang, Guang**
- **Zarb, Rakel M**

Clinician Educator

Karen Marcdante, MD

The Clinician Educator Pathway is designed for students interested in teaching and learning in medical education. Students will gain skills in teaching in a variety of settings, learn how to apply educational principles to their teaching, and develop a scholarly educational product.
Pathway activities address: Developing skills to teach various audiences; learning about how adults learn and about different styles of learning; developing instruction for students, residents, and other health care practitioners; advising/mentoring; designing evaluation tools; leading groups involved in educational efforts.

Barker, Paul—POSTER
Distracters in Patient Handoffs Based on the Linear Communication Model

Authors: Barker P, Hasan H, Treat R, Webb T
Project Mentor: Travis Webb, MD

INTRODUCTION: An unintended result of the 2003 ACGME duty-hour restrictions was an increase in the number of patient handoffs, resulting in increased potential for error. Our goal was to apply the Linear Communication Model to the handoff process and quantify potential sources of distraction. METHODS: Data was gathered by direct observation of general surgery services handing off patients to the night-float team. Observers gathered data on external sources of distraction and members of the handoff were surveyed on internal sources of distraction and their perception of external distractions. RESULTS: The most frequent external distracter was staff entering/exiting the handoff room; this had a strong negative correlation with perceived quality of the handoff. The most common source of internal distraction is fatigue; however, this did not impact the perceived quality of the handoff. A good working relationship between members of the handoff is a strong positive predictor of the perceived quality of the handoff.

Bluemel, Trevor—POSTER
Community Oncology Elective for Third and Fourth Year Medical Students

Authors: Bluemel T, Johnstone C
Project Mentor: Candice Johnstone, MD, MPH

The purpose of my pathways project was to create a 4-week community oncology elective to provide exposure and training to the processes of cancer treatment to third and fourth year medical students. The goal was to educate students on the surgical, chemotherapeutic, and radiation therapy aspects of oncology through didactic lectures and hands on clinical experiences. The curriculum was created using other medical school models and experts in the field. Textbooks, research articles, and medical reference sites were utilized to create various lectures on the most prevalent forms of cancer. Three students have now taken the elective and the reviews have been overall very positive. Students stated that faculty took a special interest involving the students in surgeries, image reading, and outpatient clinic, which made the educational experience extremely enjoyable and effective. Future development for the elective includes additional locations and greater breadth and depth in lecture topics and readings.

Christiansen, Lyle
Step 1 Study Group Using Concept Mapping of Clinical Vignette Questions

Authors: Christiansen L
Project Mentor: Patricia Lye, MD

This project was based on the work of Dr. John Pelley. He demonstrated a method of group study that uses concept mapping of clinical vignette questions. This project was to implement the method at MCW. The goals were to teach concept mapping, get practice with clinical vignettes and benefit from team based learning. After reviewing Dr. Pelley's online material, I gathered some interested people and setup a demonstration. There were 6 participants. At weekly meetings, we reviewed questions by using concept maps to analyze them. We recorded all the information from the stem. Then, we analyzed the answer options one at a time, adding details and making connections to the stem that could include or exclude them as correct. We mapped about 10 questions per session. The group was analyzed with a pre/posttest. Of the people that continued to the end, all felt more prepared for clinical vignette questions, benefited from team based learning and felt more satisfied with this group than other groups they had studied with.

PODIUM

Gabet, Joelle
Comparison of a Faculty-Taught and Student-Taught Ultrasound Course

Authors: Doxey R, Gabet J, Funk R, Phelan MB, Pace C
Project Mentor: Caroline Pace, MD

Introduction: Ultrasound is not a component of the medical curriculum. We propose medical students can perform a FAST exam via a peer-taught course. Methods: Participating M2s completed online modules, a didactic session, two sessions with standardized patients, and a simulator session. Participants completed satisfaction and confidence surveys, and quizzes. Evaluation consisted of exams on an SP and simulator. Results: 11 students completed the curriculum. Confidence identifying structures and satisfaction with the course increased significantly. In the SP portion, 6/11 adjusted depth, 11/11 adjusted gain, and students identified 16.9/17 structures. In the simulator portion, 10/11 adjusted depth, 8/11 adjusted gain, and students identified 15.4 /17 structures. Average time to completion was 3:56 for the SP and 4:46 for the simulator. Conclusion: After a peer-taught course, M2s can identify anatomy and meet technical criteria for an adequate image. Peer teaching is an effective way to teach with minimal strain on faculty resources.

Hahn, Abigail—POSTER
Improving Healthcare as Students Through Policy Making

Authors: Hahn AY, Meurer JR, Ferda N
Project Mentor: John Meurer, MD, MBA

In 2014, 587 students in the Medical College of Wisconsin and UW-Madison responded to a survey about their knowledge and attitudes about the Affordable Care Act . 65% of students thought more reform is needed to improve the current healthcare system. One of the ways students can reform healthcare is through policy making, which is accomplished by writing resolutions on issues that matter to raise awareness. To equip interested students with the right resources, a lecture was developed to educate about what a resolution is, the process of submitting and passing a resolution, and how to write a resolution using templates. Students will then be encouraged to submit their own resolutions to state and national assemblies. Challenges remain in evaluating the increase in number of resolutions submitted. Future work will include introducing the lecture as a permanent part of the Health Systems Management & Policy core sessions.

PODIUM

Mac, Olivia
Evaluating Geriatric Education Team Fast Facts as Educational Resources

Authors: Mac O, Gretchen W, Brown D, Duthie E, Denson K, Marcdante K, Denson C
Project Mentor: Kathryn Denson, MD; Karen Marcdante, MD

By 2030, the geriatric population will constitute 19% of the U.S. population. Unfortunately, many physicians have little formal training in geriatrics. Multi-disciplinary Geriatrics Education Teams (GET) were developed to improve the care of geriatric patients by creating educational resources to help address areas of limited competence of residents. GETs have created 54 Geriatric Fast Facts (GFFs), brief documents covering important geriatric concepts that are easily accessible online to the public. In order to evaluate the utility and efficacy of GFFs, faculty and residents in different subspecialties at the Medical College of Wisconsin were surveyed. The GFFs were well received by users, and 87% of the respondents would recommend them to others. GFFs were predominantly utilized for patient care, personal study, and teaching. The limitation of GFFs is dissemination, because only one third of survey respondents have accessed GFFs. The current intervention for this issue is having the documents accessible through a mobile website.

Palmer, Brandon
Improving Teaching Effectiveness of Renal Radiology in Medical School

Authors: Palmer BP, Budovec JJ
Project Mentor: Joseph Budovec, MD

Diagnostic Radiology is a continually growing field of medicine utilized in every specialty. While diagnostic radiology continues to grow, teaching methods used to teach radiology to medical students remains fairly static. We examined data from medical students at the Medical College of Wisconsin to identify areas for improvement in the teaching of renal pathology and radiology throughout medical school. Only 7 of 88 students surveyed agreed they felt thoroughly educated on renal imaging. Also, only 35 of 88 students agreed they learned best by attending lectures, while 55 students thought they learned best in a hands-on environment. Our results indicated MCW students feel there is room for improvement in the teaching of renal anatomy on imaging, and other aspects of renal pathology and care. Students expressed a high regard for shoulder-to-shoulder teaching with faculty, while indicating they do not find lectures as useful. Other options for possibilities of teaching renal pathology and imaging should be considered.

Sprick, Chelsea
Applications of Narrative Medicine

Authors: Sprick CM, Stevens MW
Project Mentor: Nancy Havas, MD

Narrative medicine has the potential to impact various facets of healthcare. It develops more effective medical professionals and improves patient outcomes. It facilitates students learning about communication and professionalism. And it provides students and providers with the tools to process their own experiences as medical professionals. Our project sought to provide the MCW community with opportunities to experience benefits of narrative medicine; facets of the project included publishing the Auscult literary magazine and facilitating creative writing workshops. There was enough interest and enough submissions were received to publish Auscult, which was distributed to medical schools across the country. Also, feedback regarding our workshops indicated that attendees felt more comfortable using writing as a tool to help connect with patients after attending the workshops. There is enough application and student interest to warrant giving sudents the option of incorporating narrative medicine into medical education at MCW.

Stevens, Michael
Auscult and Writing Workshops: Humanities and Writing in Medical School

Authors: Stevens MW, Sprick C
Project Mentor: Nancy Havas, MD

Physicians who are aware of the humanitarian side of their patient's disease have a better relationship with that patient. Also, physicians who scored high on the Jefferson scale of empathy had diabetic patients with better controlled blood sugar and cholesterol. However, medical education focuses mostly on the science of medicine and students struggle to explore their humanitarian side or develop empathy. We set out to give medical students the opportunity to incorporate humanities into their education by offering creative writing workshops and reintroducing the literally magazine Auscult. There was enough interest and enough submissions were received to publish Auscult which was distributed to medical schools across the country. Also, feedback regarding our workshops indicated the attendees feel more comfortable using writing as a tool to help connect with patients on an empathetic level. There is enough application and student interest to warrant giving students the option of incorporating humanities into medical education at MCW.

Tang, Annie—POSTER
Hmong Patient Education

Authors: Tang A
Project Mentor: David Bolendar, PhD
Community Partner: Yer Xiong, MD at Asian Pacific American Medical Student Association, Saturday Clinic for the Uninsured

The Hmong community falls among one of the lowest socioeconomic groups in the US. The purpose of this study was to evaluate the socioeconomic, cultural, and healthcare associated barriers among Hmong in Milwaukee and to use these results to provide culturally appropriate patient education and improve patient experience in clinics. Thirty six surveys were obtained assessing socioeconomic and language status of the patient population. Outreach to the population included a Hmong radio station, blood pressure clinic, newspapers and festivals. Kleinman questions were incorporated into a guideline provided for medical students to approach Hmong patients during clinic appointments. A cultural information sheet, appointment guidelines, and health brochures were devised and implemented during appointments. Post appointment surveys showed positive feedback including better understanding of illnesses. We hope that the program lays the foundation for culturally competent medical students to provide patient education to the Hmong community.

PODIUM

Wagner, Gretchen
Evaluating Geriatric Education Team Fast Facts as Educational Resources

Authors: Mac O, Gretchen W, Brown D, Duthie E, Denson K, Marcdante K, Denson C
Project Mentor: Kathryn Denson, MD; Karen Marcdante, MD

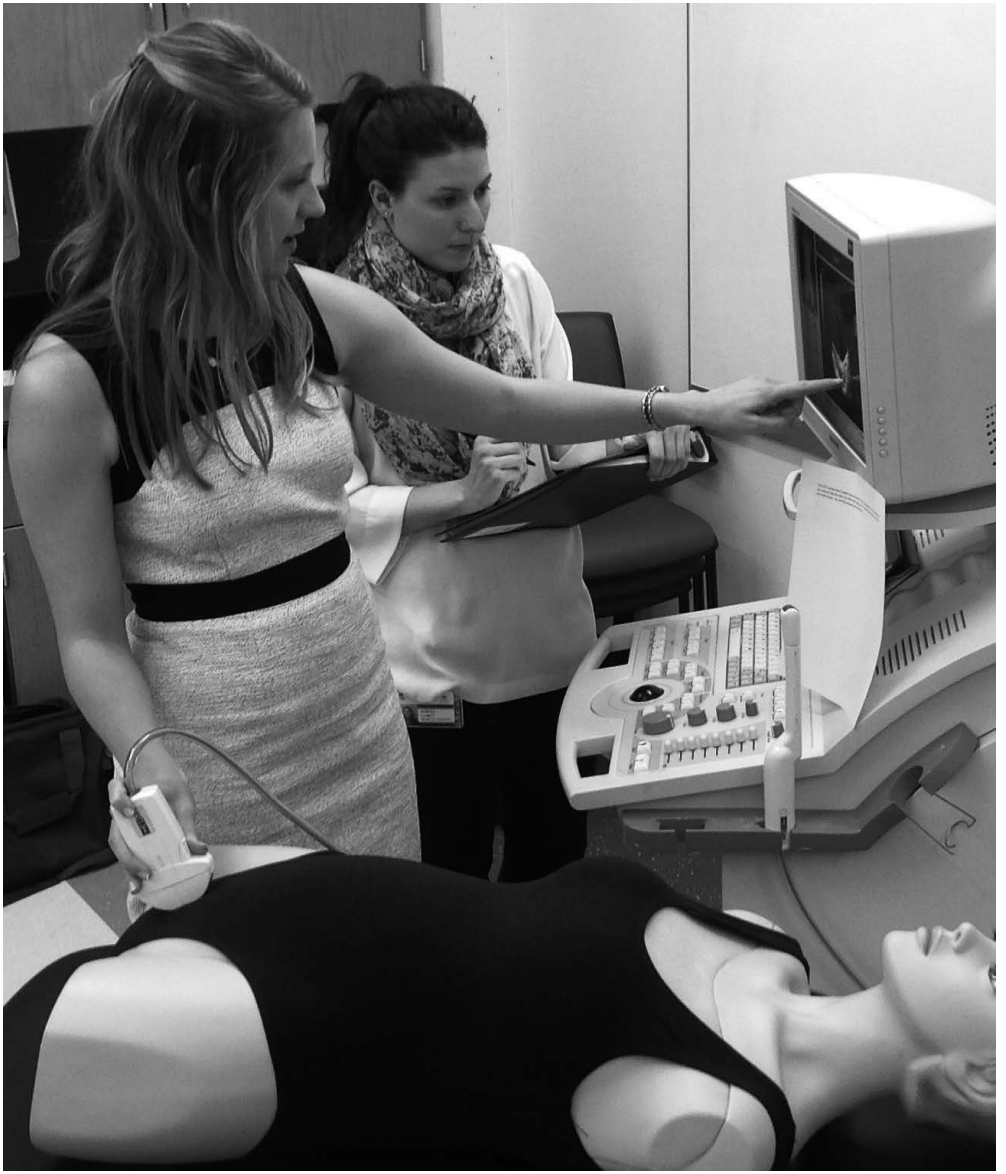
See Mac, Olivia, page 9

Wenzel, Michelle

The Feasibility of an M2 Completing an M3 Family Medicine Clerkship

Authors: Hall DE, Wenzel MK, Bower D, Patterson L
Project Mentor: Douglas Bower, MD

See Hall, Derrick, page 43 (Quality Improvement & Patient Safety)



Global Health

Stephen Hargarten, MD, MPH

Designed for students seeking to understand the causes and in finding the means to provide solutions to the challenges and disparities in health status of people worldwide—from Milwaukee to Moscow to Marrakech.
Selected examples of Core sessions include:

- Disaster management and response in complex environments
- Selected global health sciences including bioethics, medical anthropology and cultural sensitivity
- Global disease epidemiology, prevention and acute care; communicable diseases in multiple environments; non-communicable disease, such as cancer and injury

Students who want to differentiate into global physicians can address healthcare and health challenges in high and low resourced settings

Arce, John—POSTER

Hypertension Education for Filipino Patients at the Philippine Center

Authors: Arce JA
Project Mentor: Zeno Franco, PhD
Community Partner: Violetta Singson, MD, Mario Montalbo, MD the Philippine Cultural & Civic Center Foundation, Inc.
This study examined how Filipino patients with hypertension (HTN) view the disease, barriers that prevent proper self-management of HTN, best practices for education in a culturally-appropriate manner, and explored how the Philippine Center Free Medical Clinic can best use existing resources to educate patients. Semi-structured interviews were performed of Filipino patients and providers, and answers were assessed for themes and summarized. Most patients had a basic understanding of HTN. Major factors affecting self-management of HTN were motivation to maintain healthy lifestyle changes, cultural importance of Filipino food, and common sources of stress. Multiple educational modalities were identified by participants as optimal, provided all were culturally-tailored. The Philippine Center can utilize current resources to provide culturally-appropriate HTN education for its population via pamphlets, video/group presentations, and cooking demonstrations.

Arizmendez, Natalia—POSTER

Asthma Trigger & Morbidity Disparities Between Mexican & Puerto Ricans

Authors: Arizmendez NP, Gilbert, IA
Project Mentor: Ileen A Gilbert, MD
INTRODUCTION: Asthma severity varies amongst Hispanics; Puerto Ricans exhibit greater morbidity than Mexicans. METHODS: To identify triggers related to disease disparities, we performed a retrospective chart review of 164 Hispanic adults presenting to a MCW asthma clinic. Analysis occurred via Chi-square and paired and unpaired T tests; significance $p < .05$. RESULTS: 62 Mexicans and 102 Puerto Ricans did not differ in age, gender, BMI, language, education, or PCP. Puerto Ricans showed greater symptoms, worse lung function, more emergency visits, and less appropriate pharmacotherapy. More Puerto Ricans were born outside the US, smoked, had government insurance, diagnosed with sleep apnea, and reported triggers of allergies, stress, GERD, and sinusitis. Patients reporting stress and sinusitis triggers had greater morbidity. After 1 year, Puerto Ricans remained with more symptoms that were not related to any trigger. CONCLUSION: Appropriate pharmacotherapy decreases disparities, but additional factors perpetuate symptoms in Puerto Ricans.

Arnett, Megan—POSTER

Growth and Iron Intake Monitoring in Chinese Orphans

Authors: Arnett M
Project Mentor: Samantha Wilson, PhD
Community Partner: Peggy Gurrad, MD of the Altrusa Foundation
Children growing up in poverty and/or institutions face a special risk for dietary deficiencies. Of these, micronutrient deficiencies are the most commonly overlooked. Iron is of particular importance in maintaining the normal physical and mental growth of a child. Several studies have shown that iron deprivation at a young age can lead to altered brain metabolism and neurotransmission, ultimately yielding children with poorer mental, motor, and socio-emotional functioning. The main focus of this project is to describe the height/weight/arm circumference (as proxy measurements for growth) of children residing in “out of family” care facilities in China (3 orphanages and 11 foster homes). Growth measurements are compared to iron intake levels to see if there is a growth and/or micronutrient deficiency within resident children. CBC values (collected as part of Altrusa Foundation’s “Chinese Orphanage Project”) were explored to determine the rate of iron-deficiency anemia. The impact of iron supplementation will also be described.

Blau, Ira—POSTER
Fourier Transform of F Waves Differentiates Types of Atrial Fibrillation

Authors: Blau IH, Lee CK, Hwang JA, Kwang WA, Hwang HJ, Choi BI
Project Mentor: Byung-Il William Choi, MD

In this study, we analyzed the amplitude, frequency and complexity of fibrillatory (f) waves to differentiate paroxysmal, persistent, and chronic atrial fibrillation (AF). A total of 224 patients were enrolled: 110, paroxysmal AF; 49, persistent AF; 65, chronic AF. From leads II, V1, and aVL, f waves were analyzed by Fourier Transform. Wilcox two-sample test was utilized for pair-wise comparisons. The following parameters were used: root mean square for amplitude; dominant frequency; Shannon entropy for amplitude spatial distribution; and approximate entropy for complexity. Lead II was found to be the most sensitive in discriminating AF types. In paroxysmal and persistent AF, f wave amplitude was higher and more variable. Compared to persistent AF, paroxysmal AF revealed f waves with lower frequencies. Chronic AF showed f waves with greater complexity than did paroxysmal AF. Thus, f waves in paroxysmal and persistent AF were found to be taller and more polymorphic than those in chronic AF, while those in paroxysmal AF to be coarser.

Bobbs, Melanie
Validating a Need for a Teledermatology Partnership in Southern Belize

Authors: Bobbs M, Bayer M, Vann W, Frazer T, Wilson B, Olasz E, Holland K, Humphrey S, Leib S, Kuzminski J
Project Mentor: Jacquelyn Kuzminski, MD
Community Partner: Hillside Healthcare International, Belize, CA

Hillside Healthcare International (HHCI) is a United States based non-profit organization dedicated to providing health care and community outreach to the Toledo District of Southern Belize, a region with a high incidence of cutaneous diseases and a paucity of dermatologists. The purpose of this study is to characterize and quantify dermatologic disease presentation and disease management by HHCI providers, as well as assess the need for a teledermatology partnership between the Medical College of Wisconsin (MCW) and HHCI. A retrospective review of 279 charts was conducted on the records of HHCI patients having a categorical diagnosis of “rash, unspecified” and “other dermatitis.” These records indicated a large number of nonspecific diagnoses, such as “dermatitis” (6%) and “unspecified rash” (5%), with topical steroids accounting for 25% of all treatments prescribed. This highlights the utility of teledermatology as a modality for diagnosis, treatment, and education of health professionals, both in Belize and Milwaukee.

PODIUM

Broderick, Steven
The International Adoption Clinic Database Project

Authors: Broderick S, Wilson SL
Project Mentor: Samantha Wilson, PhD

International adoption provides stable, long term care to vulnerable children with unique medical and psychosocial concerns. During the pre-adoption process, health information of children awaiting adoption is provided to potential families to aid in their decision-making. Though the quantity and quality of this pre-adoptive information is varied and at times, of suspect validity, it often includes past medical diagnoses, physical exam findings, growth measurements, development milestones, and demographics. The International Adoption Clinic (IAC) is one of about 50 specialty medical clinics in the nation that serves this complex population. It is estimated that the IAC has reviewed the information of over 400 children awaiting adoption over the past decade. However, the range and characteristics of these pre-adoptive medical reviews have not yet been systematically explored. This project describes the creation of an IAC database to support program development within this unique clinic.

Campbell, David—POSTER
Development of Pediatric Curriculum for Refugee Health Educators

Authors: Campbell D, Thomas V, Vitale D, St Clair N
Project Mentor: Nicole St Clair, MD
Community Partner: Christiana Attere, Paulette Bangura and Shakoor Lee, PhD of the Pan African Community Association

Background: The Pan African Community Association (PACA) uses Refugee Health Promoters (RHP) to promote health literacy in the refugee population. PACA has collaborated with MCW to create pediatric curriculum for RHPs. Objective: Develop and evaluate a pediatric curriculum for the RHP program. Methods: Needs assessment, curriculum vetting, and implementation occurred in 2013-14. Surveys and pre/post quizzes were provided to RHP participants. Results: Pre-curriculum data was obtained from 6 RHPs; post-data from 3 RHPs. Survey lowest rating: “I have resources to teach child health topics”=2.8/5; highest: “I would benefit from more training on child health topics”=4.4/5. Quiz scores improved on colds/viruses (33% to 67%) and sleep safety (44% to 67%), while scores on car seat safety decreased (25% to 17%), all with $p>0.05$. Conclusions: Participants feel pediatric curriculum is needed. Colds/viruses and sleep safety sections have been effective. Limitations include participant/researcher availability and sub-optimal quiz administration.

Cercone, Kristen

A Pilot Study Screening for Spiritual Distress in Patients at HAU

Authors: Cercone K, Zirimenya L, Mwebesa E, Johnston B, Frazer T, Visotcky A, Selman L, Wiebe LA
Project Mentor: Lauren Wiebe, MD
Community Partner: Ludoviko Zirimenya of Hospice Africa Uganda

Background: This study aimed to evaluate the use of the "Spirit 8", a previously developed multiple-choice survey, as a tool for assessment of spiritual well-being among patients at Hospice Africa Uganda. Methods: The survey was administered to consenting patients upon admission and at subsequent visits. Potential scores ranged from 8 to 40 with 40 representing the best state of spiritual well-being. Results: 100 patients were enrolled on study and completed the survey at visit one with 61 completing at visit two and 35 at visit three. Initial mean score was 27.48 (±5.9). A fixed effects model was used to compare scores and found no significant difference between visits. Assessment by the study staff of patient understanding yielded an average score of 4.0 (±0.8) out of 5. Conclusions: The Spirit 8 is a feasible screening tool for use in clinical practice at HAU based on the high assessment by study staff of patient understanding and the fact that over half of the patients were able to complete the survey at multiple visits.

Chou, Heather—POSTER

Hepatitis B Education and Barriers to Awareness in the Hmong Community

Authors: Chou HC, Wang TW, Lam JM, Saeian K
Project Mentor: Kia Saeian, MD
Community Partner: Cha Lee, MD, Lee Medical Clinic, Hong Liu, MD Midwest Asian Health Association, Paoi Lor, Hmong ABC Radio, Duachy Vang, Grace Hmong Alliance Church and Pai Yang, Pai Phongsavan Market

Although the U.S. is considered a low endemicity region for hepatitis B and has had low infection rates (0.3%) since the implementation of routine vaccination in 1991, the Hmong population in the U.S. has rates of up to 20%, making hepatitis B one of the greatest ethnic health disparities in this community. In order to assess hepatitis B prevalence and potential barriers (e.g. education level, health insurance status) to awareness in the Milwaukee Hmong community, we held 5 screening and education events where we administered surveys evaluating hepatitis B knowledge. Regardless of factors including education level or health insurance/PCP status, there was no statistically significant difference in hepatitis B knowledge scores. However, there was a significant improvement in scores after participants underwent our educational sessions. These results suggest that hepatitis B knowledge is broadly lacking within the Milwaukee Hmong community, but educational sessions can be an effective method of closing this knowledge gap.

Coogle, Lauren

A Collaboration to Strengthen Physical Exam Skills in Uganda

Authors: Coogle L, Kaminsky M, Umphrey L, Manzi G, Thomas V, Kacumita V, Frazer T, St Clair N, DaSilvia D, Simpson P, Treat R
Project Mentor: Mary Kaminsky, MD

Background. This project emerged from an identified need for physical exam (PE) training in southeastern Uganda, as many practitioners in that area do not routinely use a PE during a patient encounter. Methods. A culturally sensitive educational intervention was developed to teach the PE to Ugandan healthcare workers. A PE curriculum was taught to a Ugandan-trained nurse practitioner equivalent (the Master Trainer) by U.S.-trained pediatricians. The Master Trainer then taught the curriculum to 23 Ugandan healthcare workers. Evaluation of the curriculum included the use of a pre- and post-training test and PE OSCEs which both focused on the trainees' knowledge of the head-to-toe PE. Results. Test-score data was collected from the 23 trainees. Evaluation of the training tests has shown an increase in PE knowledge: median score on the pre-test was 7.0 which increased on the post-test to 12, $p<0.001$. The pre- and post-training OSCE data has not yet been analyzed; we hope that it will also show an increase in the trainees' PE knowledge.

Good, Susan

Medicinal Plant Use in the Alto Mayo Region of Peru

Authors: North P, Kehl S, Good S, Haberman H
Project Mentor: Paula North, PhD

In 2012, a Fogarty International Center GEOHealth Hub Planning Grant was awarded to MCW, the Peruvian NIH, and the Yantalo Peru Foundation. The GEOHealth program is intended to create global regional hubs for collaborative research, training and policy support regarding environmental and occupational health in low- and middle-income countries. This research focuses on assessing indoor and outdoor air quality, water and soil quality, and safety of traditional medicinal plant preparations in the Alto Mayo region of Peru. The region has high infant and maternal mortality rates, possibly the result of environmental contamination. Key informant interviews on traditional plant and agricultural practices use were conducted from July-August 2013 with community members, market vendors, farmers, nature reserve workers and healthcare providers of Alto Mayo region to describe and determine patterns of cultivation, acquisition and use. The goal of this project is to identify commonly used plants in order to sample them for potential contamination.

Gundlach, Ben—POSTER
A Global Partnership: Paving the Way to Better Road Safety in Asia

Authors: Gundlach B
Project Mentor: Peter Layde, MD

Through a long-standing partnership in the global health department, I worked with The Asian Injury Prevention Foundation (AIP), headquartered in Vietnam, to research the current issues in China as it related to road safety. AIP has begun efforts to use their past success of improving road safety in Vietnam, take what they have learned there, and make these improvements in China as well. My work specifically focused on completing a large literature review that highlighted what I thought to be the three areas with the most need for improvement: Traffic Laws, Road Infrastructure, and Education. To start, our focus is on improving the specific Sichuan province area in southern China, where rural populations are experiencing rapid urban encroachment.

Haberman, Holly
Medicinal Plant Use in the Alto Mayo Region of Peru

Authors: North P, Kehl S, Good S, Haberman H
Project Mentor: Paula North, PhD

See Good, Susan, page 14

Hendrickson, Kathryn—POSTER
Cultural Barriers to Termination of Resuscitation by EMS Physicians

Authors: Hendrickson K, Colella RM
Project Mentor: R. Mario Colella, DO, MPH, FACEP

Although strict guidelines have been put in place in the United States to help EMS physicians make decisions about termination of resuscitation in the field, it has been shown that these guidelines are not being followed consistently even though they have been proven effective. This study looks to identify barriers global EMS physicians face to help understand the disconnect with the guidelines. A survey was created and sent to global EMS physicians who have ties to Frodtert and MCW who then forwarded it onto their colleagues. The survey was also sent out to the Froedtert emergency medicine physicians. A big barrier for the non-US physicians was not having guidelines in place, and the ones in place not being adequate. US physicians were more likely to direct termination of resuscitation when a state approved DNR form/bracelet was present. Both groups reported if the patient was not able to advocate for themselves, they would defer to themselves as the physician for decision making about termination of resuscitation.

Koch, Heather
Community, Hospital, and Public Health Integration for Disaster Response

Authors: Koch HA, Franco Z
Project Mentor: Zeno Franco, PhD

Background: Regions face disaster response challenges based on socioeconomic and cultural variation leading to disaster related health risks. In aftermath of failures in Hurricane Katrina, FEMA identified need for “Whole Community” response. Methods: Environmental scan using key-informant interviews and a “world café” with representatives from healthcare, government, and community-based organizations (CBOs). Data analyzed qualitatively using grounded theory. Results: Sectors agreed one-size-fits-all disaster plans are not productive, but recognized limits to CBO planning due to communication and business constraints. Weakest interrelationships reported between CBOs and government. Concerns about authority, information dispersal and community plan adherence. Conclusions: Gaps within “Whole Community” approach in Milwaukee exist. Prioritizing disaster planning is challenge for CBOs. Balance between community specific plans and national template encompassing communication, early planning, and post-disaster business continuity needed.

Lineer, Megan—POSTER

Providers' Experience with Sex Trafficking Victims

Authors: Beck ME, Lineer MM, Melzer-Lange M, Simpson P, Nugent M, Rabbitt A
Project Mentor: Marlene Melzer-Lange, MD

See Beck, Megan, page 48 (Urban & Community Health)

Massoumi, Roxanne

A Comparison of Healthcare in Iraq and Iran During Political Sanctions

Authors: Massoumi R
Project Mentor: Sumana Koduri, MD

Iran and Iraq have both been under sanctions implemented by the U.N. and the U.S.A. Sanctions are intended to alter governmental policies while sparing the average citizen's suffering, however, it is observed that sanctions actually can have a severely negative impact on the healthcare of citizens. I spent 6 weeks working and interviewing physicians in Iran. I then performed a literature review on both Iran and Iraq to gather more information and to compare their healthcare systems under sanctioned times. Iraq and Iran both had a shortage of medicines, instrumental supplies, and access to the global medical community. Iraq is used in this paper, to foreshadow what may be the future for a post-sanctioned Iran. In the decade following the lifting of sanctions, Iraq suffered stagnation in their healthcare system; their system was unable to recover. Awareness now of this possibly bleak post-sanctioned future for Iran may allow early prevention.

PODIUM

Mueller, Andrew

Quality Improvement Review in Diabetic Care at Patan Hospital, Nepal

Authors: Otuonye A, Mueller A, Dhital SM, MacKinney T
Project Mentor: Theodore MacKinney, MD, MPH
Community Partner: Patan Hospital Nepal

See Otuonye, Amy, page 17

Newland, Christopher—POSTER

Universal Health Care in New Zealand - A Model to Emulate?

Authors: Newland C
Project Mentor: Bill Choi, MD

The United States has the highest total health expenditure per capita of any country in the world, yet ranks behind most countries on numerous measures of health outcomes, quality and efficiency. New Zealand spends considerably less of its GDP on health care, (9.7% compared to 17.1% in the US) is fully accessible through a universal health care model and ranks in the top two countries for effective and coordinated care. This project further explores New Zealand's health care model, highlights its strengths and weaknesses, and identifies practical and tangible methods that, if implemented, may improve the quality, efficiency, accessibility and cost of medical care in the US.

Otuonye, Amy

Quality Improvement Review in Diabetic Care at Patan Hospital, Nepal

Authors: Otuonye A, Mueller A, Dhital SM, MacKinney T
Project Mentor: Theodore MacKinney, MD, MPH
Community Partner: Patan Hospital, Nepal

Diabetes mellitus has a rising incidence in Nepal relating to urbanization and lifestyle changes. Quality improvement strategies have shown to advance patient care and decrease inefficiencies in developing health settings. A retrospective chart review of 106 patients cared for at Patan Hospital in June-July 2013 was reviewed. Treatment and outcomes where gauged against the United Kingdom guidelines regarding diabetic care. Blood pressure checks were most consistently performed in diabetic patients (98%) within 12 months of their most recent visit to clinic. Conversely, within that same time period, microalbumin and retinopathy screening were identified as needing the most room for improvement at 19% and 25% respectively. Knowledge deficits were identified among practitioners, including residents and addressed in teaching sessions and through reminders in clinic. As a result of these interventions, future chart review should be completed to elucidate any changes to the quality of care to diabetic patients.

Porter, Anne—POSTER

Pisando Fuerte: Fall Prevention in Elderly Latino Milwaukee Population

Authors: Porter A, Wiche R, Ward M, Hanlin E, Goetsch L
Project Mentor: Stephen W Hargarten, MD, MPH
Community Partner: Militza Bonet-Vazquez, MPH of the United Community Center

Fall injuries is a global health burden affecting all ages, race populations, and socio-economic classes, with the elderly Latino Milwaukee population having higher reported fatal fall injuries. The increased risk for this population is from two distinct issues; lack of effective communication and education targeting the Latino population and the associated dangers of living in "multigenerational" homes. The goal of project is to provide reliable and relevant information in a format the participants choose and on topics they have chosen; Vitamin D, exercises, footwear, home safety. A compilation of take-home newsletters from several interactive presentations held in Spanish at the UCC with a group of 10-15 women will serve as a reference for current participants and future learners. Outcomes show the key to effective communication is the individualized aspect of newsletters and interactive presentations to meet the preferred outline and language requirements for the participants.

Tuliszewski, Robert—POSTER

Fecal Contamination in Malawian Rivers and its Impact on Lake Malawi

Authors: Tuliszewski R, Fisher J, Ngochera M, Tyner E, Mclellan S, Bootsma H.
Project Mentor: Bethany Auble, MD

Fecal pollution in water sources is a health threat worldwide, particularly within Sub-Saharan Africa. To identify contamination we took a cross-sectional survey of major rivers in southern Malawi, an in-depth analysis of the Lilongwe river, and sampled inner lakeshore of Lake Malawi for E coli, Lachnospiracea, and Bacteroides. General trends of elevated E coli were found in urban and agricultural areas, both associated with increased human activity along waterways and population density. Analysis of Lilongwe river illustrated differences between urban and rural and revealed instances where contamination dropped to <100 CFU after seeing dangerous levels of >7000 CFU upstream. Analysis of Lake Malawi showed minimal bacteria counts even with significant contamination noted upstream. To characterize specific human contamination, Lachnospiracea was more specific than Bacteroides as it corresponded to a more narrow range of values, while both were significantly elevated compared to E coli at sites with drastic levels of contamination.

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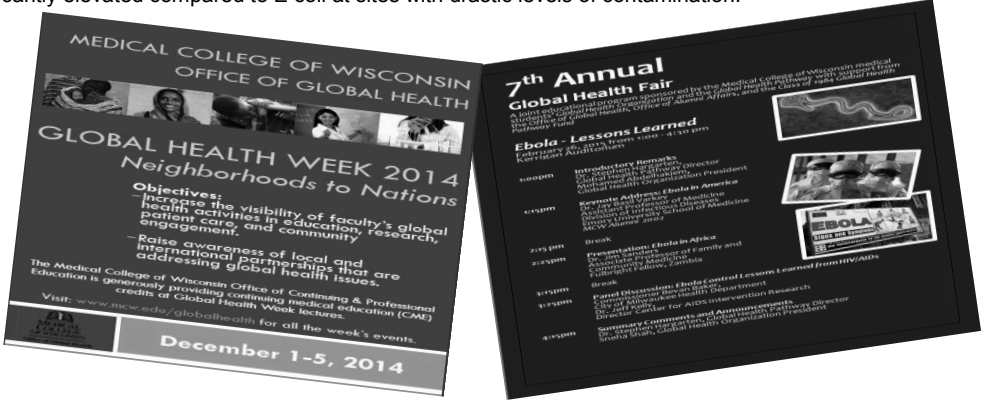
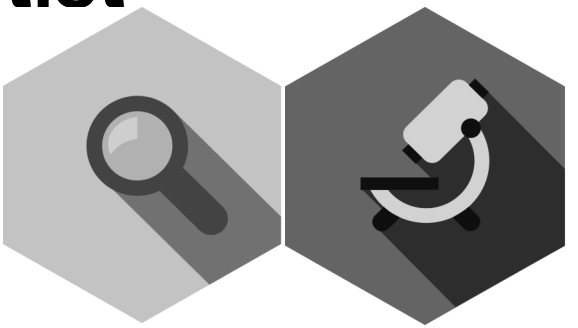


Physician Scientist

David Brousseau, MD, MS & Jennifer Strande, PhD, MD

Uses a hypothesis driven research project to provide the student an individualized research experience allowing for the development of broad research skills.

- Basic epidemiologic and statistical principles
- Scientific writing and presentations
- Ethics of research
- An individualized, mentored research project



Aba-Omer, Omer—POSTER

Clinical Characteristics of HFpEF Subjects

Authors: Aba-Omer O, Karagodin I
Project Mentor: Jennifer Strande, PhD, MD

Renal insufficiency (RI) is associated Heart Failure with preserved Ejection Fraction (HFpEF), however it is unknown whether RI is a cause or an effect. The goal of this study is to determine whether RI precedes the development of HFpEF in patients with diastolic dysfunction. This study included 565 subjects with diastolic dysfunction. Transthoracic echocardiograms were screened until the earliest documented evidence of diastolic dysfunction was identified. The subjects were then divided into two groups: Group 1 included subjects who were known to progress to HFpEF and Group 2 included subjects who remained asymptomatic. Renal function was recorded when all subjects had asymptomatic diastolic dysfunction. Group 1 had increased incidence of RI compared to Group 2 (72.1% vs. 27.9%, $p<0.0001$). All HFpEF patients with RI developed RI before HFpEF (100% vs. 0 %, $p<0.0001$). Our study showed RI may contribute to the progression of HFpEF in patients with diastolic dysfunction.

Abbas, Ashraf

Assessment of KIM-1 as an Acute Biomarker of Ischemic AKI

Authors: Abbas A, Langenstroer P, Regner K, Lee J
Project Mentor: Peter Langenstroer, MD

KIM-1 is a transmembrane protein found in the proximal tubule whose expression is up-regulated during instances of acute damage to the kidney, and within 8-12 hours post insult its concentration peaks in a patient's urine. This prospective repeated measures study aimed to pilot the novel study of KIM-1 levels as a result of a prerenal ischemic AKI, simulated by a population of patients undergoing partial nephrectomy at the study institution. KIM-1 values were compared to established biomarkers like creatinine and NGAL. Urine samples were collected pre and post op and then every six hours until discharge. Biomarker levels in urine samples were assessed in triplicate using respective ELISAs. Early statistical analysis shows that KIM-1 is the only biomarker to spike immediately post-op, suggesting there may be an acute relationship. Further study with a larger sample size is required to tease out effects of the many variables in the study.

Allawirdi, Grace

Vascular Impairment from Whole Body Vibration

Authors: Allawirdi G, Yan JG, Zhang L, Agresti M, Matloub H
Project Mentor: Ji-Geng Yan, MD, PhD and Hani Matloub, MD

Truck drivers are exposed to whole body vibration (WBV) from prolonged travel on rough roads. Extended vibration exposure has been shown to cause fatigue, impaired judgment, and chronic vascular damage. This damage has not been fully investigated. Experiment purpose is 1) validate acute WBV induces physical and mental impairment and 2) to investigate the mechanism of this impairment. Two rat groups: one exposed to WBV 4 hrs/d, 5 d/wk for 2wks at 30Hz and 0.5g acceleration and one without exposure. After 2 weeks, the rats were tested through various behavioral, physiological, and histological methods to measure any mental, physical, and cellular deficits. Our results showed that short-term exposure (2-weeks) to vibration does indeed cause impaired judgment. It also causes vasoconstriction of blood vessels and endothelial cell damage in the rats. There is great potential for clinical application of understanding the mechanism of the WBV impairment to allow future development of preventative treatment of chronic vascular injuries.

Bakeman, Anna—POSTER
Scoring System May Decrease Incidence of "Missed Appendicitis"

Authors: Bakeman A, Somers K, Browne L, Ertl A, Schultz J, Cassidy L, Arca M
Project Mentor: Marjorie Arca, MD

Appendicitis is the most common non-traumatic surgical condition in pediatric patients. Despite how frequently children present with appendicitis, evaluation of these patients continues to be challenging, leading to excessive resource utilization and compromised outcomes. To examine the effect of an appendicitis scoring system on outcomes and imaging use, a single-institution retrospective review was conducted on pediatric patients who underwent appendectomy for appendicitis between 1/1/2008 and 12/31/2012. We compared the rates of missed diagnosis of appendicitis and resource utilization over the two years before and after implementation of a Pediatric Appendicitis Scoring Tool (PAST) in 2010. Though there was no significant change in the rate of perforated appendicitis with the implementation of the PAST, the rate of missed diagnosis of appendicitis dropped significantly from 5.5% to 2.9%. There was a trend of decreased use of CT and increased use of ultrasound, but overall use of imaging increased with the scoring system.

Barron, Adam
Automating Fiber Bundle Clustering Using High Resolution DTI

Authors: Barron A, Humphries C
Project Mentor: Colin Humphries, PhD

Diffusion Tensor Imaging (DTI) is an MRI method that can be used to define the spatial extent of white matter tracks in the brain. Current techniques for identifying major white matter fiber bundles in individual subjects are based on either: (1) Fiber tracking from predetermined seed regions, which can suffer from bias based on the method used to define the seed region, or (2) Defining tracks from a group atlas, which is less sensitive to individual differences. Our goal was to circumvent these limitations with an automated and novel mapping technique. We developed an accurate, nonbiased, and reproducible method of identifying fiber bundles in individuals utilizing iterative MRtrix whole-brain tracking, a unique distance algorithm, and hierarchical clustering in Matlab to grow the bundles. This method was trialed on 18 subjects and successfully produced tract bundles in a non-biased manner. Further research will use this method for group-level morphometry comparison across subjects.

Bernard, Jonathan
Combination Therapies for Type 1 Diabetes in Non-obese Diabetic Mice

Authors: Bernard JD, Ciecko AE, Chen YG
Project Mentor: Yi-Guang Chen, PhD

Introduction: Autoimmune type 1 diabetes (T1D) results from T-cell mediated destruction of insulin-producing pancreatic beta cells. There are two main immunotherapy strategies used to try to achieve T1D remission: antigen specific and antigen nonspecific therapies. Aims: To determine if a combination of antigen specific and nonspecific treatments can reverse T1D in NOD mice more successfully than a single therapy. Methods: Once determined to be diabetic, mice treated with one or two of: αCD3, insulin coupled splenocytes, CD137L, Il6R and their controls. Flow cytometry performed to determine T cell populations from spleen and pancreatic lymph node after five consecutive days of being injected with 50μg of IgG or 50μg of αCD3 3 or 7 days later. Results: Mice treated with combination therapies were not significantly better than the single therapy. Conclusions: The partial depletion of CD8 and CD4 T cells along with the induction of Tregs is likely important in the remission induction.

Bigley, Tarin—POSTER
Insights into Cytomegalovirus Antiviral Resistance

Authors: Bigley TM, Reitsma JM, Terhune SS
Project Mentor: Scott Terhune, PhD

Cytomegalovirus (CMV) is a member of the herpesvirus family. During infection, CMV proteins manipulate the host cell cycle. CMV protein, pUL27 increases levels of the cyclin-dependent kinase (CDK) inhibitor p21CIP1 and is necessary for the full antiviral activity of the pUL97 viral kinase inhibitor, maribavir (MBV). We observed that pUL97 promoted the phosphorylation of pUL27 and disrupted pUL27-mediated induction of p21CIP1. Overexpression of p21CIP1 restored MBV activity against a pUL27-deficient virus while disruption reduced activity against wild-type virus. We provided evidence that the functional targets of p21CIP1 in the context of MBV activity are CDKs. One CDK-like activity of pUL97 is to phosphorylate nuclear lamin A/C resulting in increased viral egress. We found that CDK-mediated lamin A/C alterations may be associated with MBV-resistance. Overall, our results demonstrate an antagonistic relationship between pUL27 and pUL97 activities centering on p21CIP1 and demonstrate that CDK activity contributes to antiviral resistance.

Bodager, Jonathan
Adrenal Responsiveness to ACTH in Neonatal Rats

Authors: Bodager J, Gessert T, Bruder ED, Gehrand A, Raff H
Project Mentor: Hershel Raff, PhD

A coordinated hypothalamic pituitary-adrenal axis response is important for the survival of newborns during stress. We have shown that prior to postnatal day (PD) 5, neonatal rats exposed to hypoxia (common stressor) exhibit a large corticosterone response with a minimal increase in plasma ACTH and no detectable increase in adrenal cAMP content (critical 2nd messenger). To further explore this, we investigated the adrenal response to exogenous ACTH in the normoxic neonatal rat. Rat pups at PD2 and PD8 were injected with ACTH at low, moderate, or high doses. Blood and adrenal glands were collected at baseline and 15, 30, or 60 min after the injection. ACTH stimulated corticosterone release in PD2 and PD8 pups. Low and moderate ACTH doses produced a large corticosterone response in PD2 pups without a change in adrenal cAMP content. We conclude that physiological increases in plasma ACTH may stimulate adrenal steroidogenesis in PD2 pups through a non-cAMP mediated pathway.

Boehm, Lucas
A Systematic Review of Hepatic Artery Therapies for Unresectable ICC

Authors: Boehm L, Jayakrishnan T, Miura J, Turaga K, Johnston F, Tsai S, Gamblin TC
Project Mentor: T Clark Gamblin, MD, MS

Introduction: Hepatic artery based therapies (HAT) are offered for patients with unresectable intrahepatic cholangiocarcinoma (ICC). The present study is a systematic review of the comparative effectiveness of hepatic arterial infusion (HAI), transcatheter arterial chemoembolization (TACE), drug-eluting bead TACE (DEB-TACE), and Yttrium90 radioembolization (Y90). Methods: Primary outcome was median overall survival (OS), and secondary outcome was tumor response to therapy (RECIST). PROSPERO protocol - CRD42013004830. Results: Twenty articles met inclusion criteria (n=627). Complete tumor response was reported in two patients. Partial response to therapy was highest with HAI (41.3%, n=63) vs. DEB-TACE (32.4%, n=34) vs. Y90 (26.4%, n=121) vs. TACE (12.6%, n=333). Highest median OS (months) was observed for HAI (21, 11-31) vs. Y90 (14, 9-22) vs. TACE (13, 6-16) vs. DEB-TACE (12, 12-13). Conclusion: For patients with unresectable ICC, hepatic arterial infusion offers best outcomes in terms of tumor response and overall survival.

Bric, Justin
Proficiency Training on a Virtual Reality Robotic Skills Curriculum

Authors: Bric J, Connolly M, Kastenmeier A, Goldblatt M, Gould, J
Project Mentor: Jon C Gould, MD

Introduction: The clinical application of robotic surgery is increasing. We sought to determine if novice robotic surgeons could achieve expert proficiency levels on a virtual reality (VR) robotic curriculum, and if this would result in improved performance on the actual daVinci Surgical System™. Methods: 28 medical students with no prior robotic surgery experience performed 2 FLS tasks 3 times each using the daVinci Surgical System™ docked to a video trainer box. Subjects then trained to expert proficiency on the VR simulator before completing a post-training assessment of the 2 FLS tasks. Results: There was significant improvement in performance on the FLS tasks following completion of the VR curriculum. Subjects reached proficiency on all VR tasks in an average of 71 (± 21.7) attempts. Conclusions: Novice robotic surgeons are able to attain expert proficiency levels on a VR simulator. Training to proficiency on a VR simulator leads to improved performance in the actual daVinci surgical platform on simulated tasks.

Bugenhagen, Scott—POSTER
The Role of Metabolic Dysfunction in Heart Failure

Authors: Bugenhagen SM, Beard DA
Project Mentor: Joseph Barbieri, PhD

Heart failure is associated with changes in substrate pools for ATP synthesis, and theoretical modeling studies have revealed that such changes result in a loss in the available free energy of ATP hydrolysis. Since a variety of cellular processes in the heart depend critically on ATP, it is conceivable that alterations in ATP hydrolysis potential could result in mechanical dysfunction at the level of the cardiac myocyte ultimately resulting in heart failure. In order to investigate the effects of cardiac energetic failure on mechanical function independently of the effects of structural remodeling associated with heart failure, a multiscale computational modeling approach is adopted integrating cardiac energetics with cell and organ level models of cardiac mechanics and whole body cardiovascular dynamics. Simulations reveal that the effect of altered metabolite pools on cross-bridge force generation alone may contribute directly to impaired cardiac performance during situations involving increased cardiac workload.

Carter, Valerie

Cardiorenal Syndrome: The Role of MicroRNA-21 in Ventricular Remodeling

Authors: Carter V, Kriegel A

Project Mentor: Alison Kriegel, PhD

Cardiorenal syndrome type IV represents the interplay between the physiology and pathology of cardiovascular disease (CVD) and chronic kidney disease (CKD). It was observed that modest reductions in renal function correlate with increased CVD morbidity and mortality. MicroRNAs are important regulators of cardiovascular related phenotypes. They are small noncoding RNAs involved with the posttranscriptional regulation of the 3'UTR region of protein coding mRNAs. MiR-21 has been suggested to be important in ventricular remodeling. The present study examined the time dependent changes of the levels of miR-21 in the left ventricle, kidney and plasma as related to left ventricular function. This experiment was performed using a mice model of CKD and measuring levels of miR-21 in the kidney, heart and plasma . It was shown that miR-21 was upregulated at different time points and histological sections revealed that the upregulation of miR -21 was focused on perivascular regions, suggesting its involvement in pathology relating to fibrosis.

Cumpston, Evan—POSTER

Esophageal Impedance Testing for Laryngopharyngeal Reflux

Authors: Cumpston EC, Blumin JH, Bock JM

Project Mentor: Jonathan Bock, MD, FACS

Objective: Describe dual pH multichannel intraluminal impedance (pH-MII) as a method to evaluate patients with laryngopharyngeal reflux (LPR) symptoms. Methods: This retrospective chart review presents our combined experience with objective data in the management of 101 patients with 24-hour dual pH-MII studies for patients with LPR symptoms. Outcomes describe positive, negative, or equivocal studies, and variation in interpretation. Results: 40.6% of all studies were interpreted as positive for evidence of significant LPR, 40.6% were negative, and 18.8% were equivocal. There was significant variability in the rate of positive interpretation between individual physicians. Conclusion: Over 40% of patients with symptoms of LPR demonstrate objective evidence of LPR on dual pH-MII testing and DeMeester scores correlate well with rates of positive LPR findings on pH-MII testing analysis. Significant variation exists between practitioners, suggesting a need for better standardization of pH-MII data evaluation and interpretation.

Deeb, Andrew-Paul

The Impact of Leukocyte - Depleted RBC Transfusion in Colon Cancer Surgery

Authors: Deeb AP, Monson JRT, Khorana AA, Fleming FJ

Project Mentor: Fergal J Fleming, MD; Patrick Foy, MD (MCW)

Purpose: Periop transfusion rates are high in colon cancer due to profound anemia in this population. Allogeneic RBC transfusions are reported to induce immunomodulatory effects contributing to adverse infectious and oncologic outcomes. The study institution thus implemented universal leukocyte-depletion. The aim of this study was to analyze leukocyte reduction and outcomes in colon cancer surgery. Methods: Patients with stage I-III colon cancer were selected. Endpoints were predictors of transfusion, factors associated with infectious complications, and the impact on survival. Results: Of 294 patients, 22% received a transfusion. Factors associated with transfusion were large tumor size, major complications, and preop hematocrit < 30% ($p<.0001$). After adjustment, transfusion proved an independent predictor of infectious complications and diminished overall ($p=0.005$) and disease-free survival ($p<.0001$). Conclusion: Preoperative optimization of anemia may help reduce the need for transfusions and thereby improve postop outcomes.

DeVries, Anthony

Adaptive Replanning in Boost Irradiation for Lumpectomy Cavity Change

Authors: Chen X, Qiao Q, DeVries A, Li W, Currey A, Kelly T, Bergom C, Wilson F, Li A

Project Mentor: Allen Li, PhD

Radiation therapy following lumpectomy is a well-established strategy for breast conserving treatment. It is known that the lumpectomy cavity can change significantly in volume and shape during radiation therapy mainly due to seroma accumulating and shrinking in the lumpectomy cavity. Consequently, the boost plan generated before whole breast irradiation may become less optimal. To resolve the concern on the subsequent deviation in dosimetry, an image guided radiation therapy (IGRT) region was defined. This region included 2/3 of cases, which were adequately addressed by IGRT repositioning. However, adaptive radiation therapy (ART) replanning was desirable or necessary for the remaining 1/3 of cases to improve target coverage and/or breast tissue sparing.

Dietrich, Ashley

Kaposiform Hemangioendothelioma: Long-term Outcomes from a Single Center

Authors: Dietrich AM, Bayer ML, Siegel DA, Drolet BA, Kelly ME
Project Mentor: Dawn Siegel, MD

Introduction: Kaposiform hemangioendothelioma (KHE) is a rare vascular tumor associated with a consumptive coagulopathy, Kasabach-Merritt phenomenon (KMP). Previous reports highlight variability in clinical presentation and treatment of KHE with little data on long-term treatment outcomes. Methods: Retrospective chart review of biopsy-confirmed KHE at CHW between 2003-2013. Data included presentation, clinical course, treatment, and outcomes defined as complete resolution, improved, stable, or progressive disease. Results: 19/20 patients with KHE (0-7 years) met criteria. 5 lesions required no therapy. 14 patients received therapy due to lesion growth, pain, or thrombocytopenia. 11/14 patients had a residual mass. 8/11 patients were followed for a 25-97 months; 7 stable, 1 progressive. Conclusions: Not all patients with KHE require therapy. Symptomatic KHE often responds to therapy with resolution of symptoms, but residual tumor persists. The main goal of therapy is symptomatic treatment, not complete resolution of lesions.

Dietrich, Peter

The Relationship Between MTBI & PTSD in Civilian Trauma Survivors

Authors: Dietrich PN
Project Mentor: Terri deRoon-Cassini, PhD, Karen Brasel, MD, MPH

INTRODUCTION: Posttraumatic stress disorder (PTSD) in civilian trauma survivors significantly affects quality of life. In these patients, mild traumatic brain injury (mTBI) is often overlooked. The goals of the present study were to establish the missed rate of mTBI and determine the relationship between mTBI and PTSD. METHODS: Trauma patient's PTSD Checklist-Civilian version (PCL-C) score 6 months post injury were reviewed. A score of >44 is highly correlated with PTSD. mTBI was defined using WHO criteria of loss of consciousness or neurological symptoms and a Glasgow Coma score ≥13. RESULTS: Of 347 trauma patients, 31 had clinically recognized mTBI and 48 had a missed mTBI. Patients with a clinical and missed mTBI (n=79) reported significantly higher PCL-C scores (p=.001) and significantly higher incidence of PCL-C score >44 (p=.019, RR=1.58) than those without an mTBI. CONCLUSION: mTBI is under diagnosed and diagnosis predicted clinically significant PTSD scores and increased the relative risk of screening positive for PTSD symptoms.

Dillman, Sam

IAP Lowers Intestinal Permeability Prior to NEC by Stabilizing Claudin-1

Authors: Dillman S, Heinzerling N, Fredrich K, Fawley J, Gourlay DM
Project Mentor: David Gourlay, MD

An increase in intestinal permeability precedes NEC. Enteral IAP has shown to decrease the severity NEC. In the neonatal intestine, claudins are essential in creating a functional epithelial intestinal barrier. We hypothesize that IAP decreases intestinal permeability prior to the development NEC through modification of CL-1. One day preterm rat pups were fed formula for three days. Intestinal permeability was measured through a FITC flux protocol. Dam-fed wild-type and IAP KO rat tissue was also harvested. CL-1 was measured by RT-PCR on all ileal intestinal homogenates. Supplemental, enteral IAP significantly decreased intestinal permeability. Evaluation of ileal intestinal homogenates showed a significant decrease mRNA levels for CL-1 IAP fed rats. In the knockout rats, CL-1 showed an increase mRNA expression compared to wild-type. These data suggest IAP has a direct effect on expression and stability of CL-1 in the neonatal intestinal epithelial cell that is a novel mechanism by which IAP may function to protect newborns from NEC. symptoms.

Duong, William

Estrogen Receptor Alpha 36 in Trip Negative Breast Tumors

Authors: Duong W, Zhao B, Huang J, Miao RQ
Project Mentor: Robert Q Miao, PhD

Estrogen receptor alpha (ERα) is a mixture of full length ER-α66 and spliced short forms, such as ER-α36 and ER-α46. ERα-negative breast tumors do not respond to hormone therapy and have a worse prognosis. Understandably, much of what we call ERα-negative breast tumors may still express short forms of ERα66. Our goal is to investigate these short forms, particularly ER- α36. Examination of ER-α36 expression in ER-α66-negative breast tumors revealed that 50% of the tumor samples (n=88) express ER-α36. As well, other spliced forms were detected by western blot and qPCR in ER-α66-negative breast cancer cell lines. Finally, preliminary studies of ER-α66 and ER-α36 in breast cancer cell lines suggested that that ER-α36 and ER-α66 may regulate each other at the post-transcriptional level, without directly changing gene expression. These results have implications in the approach to treatment, as ER-α36 and other spliced forms may be a source of future targets for treating ER α-negative breast cancer tumors.

Eisenbrown, Katie

Variation in ED Management of Children with Sickle Cell Disease

Authors: Eisenbrown K, Badaki O, Ellison AM, Nimmer M, Brousseau DC
Project Mentor: David C Brousseau, MD, MS

This study aims to identify significant practice variation in the care of children with SCD presenting with fever to the ED. Retrospective cross-sectional chart review of children with SCD presenting to the ED with fever ≥ 38.5°C at one of three sickle cell centers between 1/1/2008 and 12/31/2012. Outcomes abstracted included chest x-ray, blood culture, complete blood count (CBC), urinalysis, electrolytes, antibiotic treatment, and hospital disposition. The percent of children with each outcome was compared among sites. The final study population included 1251 febrile visits. Analysis revealed a CBC, blood culture, and antibiotic treatment were obtained at 98% of visits, with no differences among sites. There is significant variation in the proportion of children who receive a chest x-ray, urinalysis, electrolytes, and hospital admission. These examples of practice variation represent opportunities to better define best care practices for children with sickle cell disease presenting to the ED for fever.

Eslami, Mehdi

Kidney Injury in Infants After Correction of Congenital Heart Defects

Authors: Eslami M, Hehir D, Scott J
Project Mentor: David Hehir, MD

Acute kidney injury (AKI) is common following cardiopulmonary bypass (CPB), and may result in increased morbidity and mortality. In infants with transposition of the great arteries (TGA) undergoing the arterial switch operation, we investigated the impact of post-operative hemodynamics on AKI. 19/98 patients met AKI criteria. Infants with AKI spent more time with RPP < 30 mmHg (p=.002), and a VIS score > 30 (p=.034). In multivariate analysis, lower urine output (cc/hr) (OR 0.82 {0.7, 0.97}; p=.018) and hours of RPP < 35 (OR 1.18 {1.05, 1.34}; p=.006) were associated with AKI, while younger age at surgery (p<.0001), and hours with DarSO2 > 35 (p=.006) were associated with higher peak creatinine. Physiologic indices associated with acute kidney injury include lower urine output, lower renal perfusion pressure, and a wider arterial -somatic saturation difference. These data provide potential therapeutic targets for the prevention and treatment of AKI in neonates post-CPB, and help refine definitions of renal injury in this population.

Gertel, Alexander

Identification of Filamentous Fungi Using MALDI-ToF Mass Spectrometry

Authors: Gertel A, Sheth N, Riebe K, Buchan B, Ledeboer N
Project Mentor: Nathan Ledeboer, PhD

Identification of molds in the clinical laboratory relies largely on phenotypic morphology. Its accuracy depends on the expertise of the technician and genetic sequencing is expensive and is not available at many labs. Matrix-assisted laser desorption/ionization time-of-flight (MALDI-ToF) mass spectrometry is an inexpensive and rapid tool for the identification of bacteria and yeasts. This study aims to verify its application for molds cultured in liquid broth and to evaluate the performance of the Bruker Filamentous Fungi Library v1.0. Ninety-nine filamentous fungi samples were analyzed using MALDI-ToF MS and by traditional microscopy. Discrepancies were resolved by DNA sequencing. Concordance between MALDI-ToF and phenotypic ID was 70.7%. Concordance between MALDI-ToF and DNA sequencing was 82.8%. MALDI-ToF MS following growth in liquid broth is a viable method for identifying filamentous fungi in the clinical laboratory. However, its success depends on the continued development of a comprehensive library of fungal spectra.

Gorse, Egal

Roles for CXCL12 in the Metastasis of Pancreatic Ductal Adenocarcinoma

Authors: Gorse E, Roy I
Project Mentor: Michael B Dwinell, PhD

Metastasis is the leading cause of mortality in cancer patients, accounting for 90% of cancer related deaths. The biochemical mechanisms underlying cancer metastasis remain largely unresolved, making the process a focus of cancer research. Pancreatic ductal adenocarcinoma (PDAC) is an aggressively metastatic cancer with a 6% 5 year survival rate. Chemokines have been implicated in mediating cancer metastasis. In particular, the CXCL12/CXCR4 chemokine receptor pair presents a promising therapeutic target. This study characterized PDAC cell lines obtained from tumor explants and murine models for expression of CXCR4 and CXCL12, and explored the functional role of the CXCR4/CXCL12 axis in PDAC metastasis using in vitro and in vivo models. We demonstrated murine PDAC cell lines are phenotypically similar to human PDAC tissue previously characterized; both express CXCR4, variable CXCR7 and contain epigenetically silenced CXCL12. Future studies include evaluation of the metastatic potential of CXCR4 and CXCR7 positive cells.

Graf, Ryan

Impact of IUGR on Cardiac Surgical Outcomes and Resource Utilization

Authors: Graf RM, Ghanayem NS, Hoffmann R, Dasgupta M, Kessel M, Mitchell ME, Tweddell JS, Woods RK
Project Mentor: Ronald K Woods, MD, PhD

Background: We sought to evaluate congenital heart surgery (CHS) outcomes and resource utilization in patients with intrauterine growth restriction (IUGR). Methods: This was a retrospective matched case control study of 41 consecutive patients with IUGR matched 1:2 with a comparison cohort of 82 contemporaneous patients without IUGR who underwent CHS during the interval of 1/1/2000 to 1/1/2012. Results: The study group demonstrated several significant differences in median total length of stay, postoperative days of mechanical ventilation, postoperative cardiopulmonary arrest, and postoperative infection. Median charge for the study group was nearly double that of the control group. Conclusions: IUGR is associated with substantially increased length of stay, postoperative morbidity, and resource utilization. These findings are relevant to risk stratification, prognosis, and potentially to contracting and reimbursement. IUGR merits further attention as an important independent risk factor in congenital heart surgery.

Guenther, Mitchell

Adiposity Distribution Affects Adiponectin Levels in Obesity

Authors: Guenther M, James R, Marks J, Zhao S, Szabo A, Kidambi S
Project Mentor: Srividya Kidambi, MD, MS

Adipose tissue is the primary source of adiponectin, an adipokine with insulin-sensitizing properties. Lower adiponectin levels are seen in obese individuals at risk for cardiovascular disease. Our goal was to determine whether abdominal adiposity distribution influences plasma adiponectin level. Subjects were recruited from "TOPS" weight loss club. Demographics and anthropometrics were obtained, and CT scan was performed to quantify subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT). Measurements included plasma glucose, lipid panel, and adiponectin. Age and gender adjusted correlation analyses showed that adiponectin levels negatively correlated with BMI, waist circumference, and VAT. SAT-to-VAT ratios were significantly associated with adiponectin. The best positive predictors for plasma adiponectin were found to be SAT-to-VAT ratios and gender. Abdominal adiposity distribution is an important predictor of plasma adiponectin and individuals with higher SAT-to-VAT ratios may have higher adiponectin levels.

Hansen, Colin

Genetic Dissection of Hypertension on Rat Chromosome 12

Authors: Hansen C, Prisco S, Flister M, Sarkis A, Hoffman M, Lazar J, Jacob H
Project Mentor: Howard Jacob, PhD

Previous studies have mapped blood pressure quantitative trait loci to rat chr12, and have shown transferring 6.1 Mb of salt-sensitive (SS) chr12 onto the consomic SS-12BN background elevated mean arterial pressure in response to an 8% NaCl diet. From the 6.1-Mb region, we generated three overlapping sub-congenic strains (Ca, Cb, Cc). The Ca strain had significantly elevated MAP on 8% NaCl diets compared to the SS-12BN control, as well as increased albuminuria and proteinuria. Histology results showed the Ca strain had elevated protein casting, tubulointerstitial fibrosis, and glomerular sclerosis scores compared to SS-12BN. By exclusion mapping, we narrowed the BP locus by 86% and prioritized an 830-kb genetic region unique to the Ca strain, containing 14 genes. We examined expression of these 14 genes in tissues involved in BP regulation: renal cortex, renal medulla, and mesenteric vessels. Seven genes were significantly differentially expressed between Ca and SS-12BN: Chst12, Iqce, LOC679924, Elfn1, Brat1, Grifin, and Ftsj2.

Hanson, Aaron

A Qualitative Study of the At-home Pain Experience for Children

Authors: Hanson A, Drendel A
Project Mentor: Amy Drendel, DO, MS

Most children treated in the Emergency Department (ED) with painful conditions are discharged home. There is growing evidence that at-home pain management is inadequate. Our objective was to explore the child's perspective on the pain experience after ED discharge. We performed semi-structured interviews with children ages 4-14 years discharged from the ED with an arm fracture. Interviews were recorded and transcribed verbatim. The data was analyzed via a framework analysis. A total of 30 children were interviewed. There were three distinct themes regarding the pain experience: 1) deficits in communication between children and their parents regarding pain management, 2) deficits in communication between children and ED healthcare personnel, and 3) misconceptions of children regarding pain and pain medication. Communication is a critical barrier to optimizing the at-home pain experience. This novel information can be used to develop innovative interventions directed at the child to improve the at-home pain experience.

Hilt,Torey

Generation of CD19+ EL4 Cells as a Target for NK-cell CAR Therapy

Authors: Malarkannan S, Rajasekaran K, Abel A, Dixon K, Best B, Schuldt K, Berg Luecke L
Project Mentor: Subra Malarkannan, PhD

Chimeric antigen receptors (CARs) are composed of the single chain variable region of monoclonal antibodies, and act as receptors for tumor antigens. CARs upon binding to tumor antigens, initiate an intracellular signaling pathway activating NK-cells, and enabling efficient killing of tumors cells. CD19, a cell surface biomarker located exclusively on B-cells is a vital receptor in B-cell signal transduction and activation. mCherry, a fluorescent protein, is a reporter used to measure protein expression. Fusion proteins are constructs of two proteins genetically-engineered to be controlled by one start and stop codon. Using CD19 and mCherry, a fusion protein construct was created and transformed via electroporation into EL4 cells. CD19+ EL4 cell expression was quantified by measuring mCherry signal intensity via fluorescent microscopy and flow cytometry. EL4 cells expressing the CD19/mCherry fusion protein will act in future experiments as a target for activation of anti-CD19 NK cell CARs.

Hwe, Christopher

NIR-induced Cardioprotection Under Normal and Diabetic Conditions

Authors: Keszler A, Baumguardt S, Hwe C, Bienengraeber M
Project Mentor: Martin Bienengraeber, PhD

Near-infrared light (NIR) protects against myocardial ischemia and reperfusion injury (I/R). We hypothesize that protection against I/R is dependent on NO release from heme proteins, and that this mechanism may be preserved in diabetic animals. Indeed, NO was released from HbNO and MbNO isolated from the blood of normal and diabetic mice in the presence of NIR. When normal and diabetic mouse hearts were subjected to I/R, NIR applied during reperfusion caused similar dose-dependent reductions of infarct size. After application of a nitrosylated hemoglobin-based oxygen carrier in the isolated heart model, NIR induced an increase in NADH, suggesting inhibition of mitochondrial respiration by NO. Additionally, NIR irradiation of isolated cytochrome c oxidase solutions resulted in increased reoxygenation rates, suggesting enhancement of NO-mediated Complex IV inhibition. NIR applied during reperfusion protects myocardium against I/R in a NO-dependent, mitochondrion-targeted manner, a mechanism that is conserved in diabetic conditions.

Hyland, Heather

A Comparison of Wisconsin's Hepatitis C and HIV Provider Workforces

Authors: Hyland HA, Westergaard RP, Fangman J
Project Mentor: Ryan P Westergaard, MD, PhD, MPH; John Fangman, MD

Introduction: Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) treatments improve patient outcomes, but sufficient numbers of accessible treatment providers are essential. This descriptive study investigated the number and geographic distribution of HCV and HIV treatment providers in Wisconsin (WI) and compared these workforces with HCV and HIV prevalence. Methods: Using a WI prescription drug database, we identified providers who prescribed HCV direct-acting antiviral and HIV antiretroviral drugs during 2012. We estimated HCV and HIV prevalence using public health surveillance data. Results: While there are almost five times as many people in WI living with HCV than HIV, there are almost 29 times as many prescribers per HIV case than prescribers per HCV case. Of the 72 WI counties, 52 had no HCV prescribers and 24 had no HIV prescribers. Conclusions: WI's smaller HCV workforce coupled with the lack of prescribers in most counties is likely insufficient to provide HCV care to those needing treatment.

Jarman, Joshua

Intervertebral Disc Height: A Marker for Changes During Degeneration

Authors: Jarman JP, Arpinar VE, Baruah D, Klein AP, Maiman DJ, Muftuler LT
Project Mentor: L Tugan Muftuler, PhD

PURPOSE: Quantitative MRI techniques were utilized to study intervertebral disc degeneration. Main focus was to develop a novel approach to quantify disc height loss. METHODS: T2 weighted images were used to obtain disc height index (DHI). Each disc was given a score based on standard deviations from the mean DHI of healthy discs. Diffusion Weighted MRI was used to assess morphological changes. Conventional Pfirrmann classification was used as the gold standard. RESULTS: At deviations of up to 1.5σ below normative disc height, levels of apparent diffusion coefficient (ADC) and normalized T2 intensity were maintained. Once disc compression reached 1.5σ, there was a massive drop in ADC and normalized T2 intensity. Pfirrmann degeneration scores also increased after the 1.5σ mark. CONCLUSIONS: Combined information from DHI, ADC and T2 images construct a set of novel biomarkers that could be used to identify degenerating discs and possibly intervene before major pathologic changes occur.

Katchko, Karina

Outcomes of a FastTrack Pathway for Urgent Laparoscopic Cholecystectomy

Authors: Trevino C, Katchko K, Verhaalen A, Bruce M, Webb T
Project Mentor: Travis Webb, MD

Acute Care Surgery has increased interest in management of emergent surgeries. We hypothesized that a fast-track protocol for urgent laparoscopic cholecystectomy would reduce length of stay (LOS), maintain patient satisfaction, complication and readmission rates. We reviewed urgent laparoscopic cholecystectomy cases comparing historical (PRE) and post-implementation (POST) cohorts. POST was divided into fast-track patients who achieved (FTC) and failed (FTF) pathway completion. Average LOS, readmission, post-op complications, and satisfaction scores were compared. Age, day of surgery, and medication were evaluated for prediction of completion. Readmissions and post-op complications were similar. LOS was reduced 1.95 to 1.5 days (p=.06). Within the POST cohort, the LOS difference between FTC and FTF was significantly reduced 1.01 to .42 days. Use of Tylenol/NSAIDS predicted completion of protocol. Urgent laparoscopic cholecystectomy patients can be managed with a fast-track protocol for shorter LOS, similar outcomes, and satisfaction.

Krepline, Ashley

VTE During Neoadjuvant Therapy for Localized Pancreatic Cancer

Authors: Krepline AN, Christians KK, George B, Ritch PS, Erickson BA, Tolat P, Evans DB, Tsai S
Project Mentor: Susan Tsai, MD, MHS

Purpose: Describe rates of venous thromboembolism (VTE) in patients (pts) with pancreatic cancer (PC) during neoadjuvant therapy (neotx).Methods: Retrospective cohort study including pts with localized PC receiving neotx between 2009-2014. Factors associated with VTE were evaluated using multivariable logistic regression.Results:254 pts were identified, 107 resectable and 147 borderline resectable (BLR) pts. At diagnosis, prevalent VTEs were detected in 16(6%)pts. Incident VTEs occurring between the start of neotx and date of surgery were detected in 34pts(14%), 12(12%)resectable and 22(16%)BLR. Of the 34 incident events, 4(12%) were pulmonary embolisms, 10(29%) were extremity deep venous thromboses, 10(29%) had complicated VTE with visceral or cerebral thrombus and 10(29%) had multiple VTEs. In a multivariate logistic regression, Rh positivity was associated with decreased risk of incident VTE(OR:0.37, 95%CI:0.15-0.93;p=0.04).Conclusions: Pts with PC who receive neotx are at significant risk of VTE and thromboprophylaxis may be warranted.

La, Justin

Effects of Parathyroidectomy on Sleep in Primary Hyperparathyroidism

Authors: La J, Wang TS, Burgardt L, Doffek K, Yen TW
Project Mentor: Tina W Yen, MD, MS

Eighty percent of primary hyperparathyroidism (pHPT) patients are considered 'asymptomatic' although they commonly report neurocognitive deficits, sleep disturbances, and lower quality-of-life. In this prospective study, we assess improvements in sleep quality after parathyroidectomy with the Pittsburgh Sleep Quality Index (PSQI) and compare with thyroidectomy controls. The parathyroidectomy patients (N=82) scored significantly poorer on the PSQI than thyroidectomy (N=29) patients preoperatively (7.7 ± 4.3 vs. 5.3 ± 2.5; p=0.006). The parathyroidectomy cohort had significant improvements in PSQI scores 1- and 6-months post-operatively (6.0 ± 3.8; p=0.01 and 5.2 ± 3.8; p=0.001), while the thyroidectomy cohort change significantly. Additionally, more pHPT patients improved from poor sleep quality (>5) to good sleep quality (≤5) after surgery when compared to controls (p=0.05). Our preliminary results demonstrate that pHPT patients have substantial sleep disturbances and curative parathyroidectomy seems to mitigate these symptoms.

LaRoy, Jennifer

Port Placement Cost & Morbidity Analysis: IR Suite vs Operating Room

Authors: LaRoy JRL, White SB, Jayakrishnan T, Dybul S, Ungerer D, Turaga T, Patel PJ
Project Mentor: Parag J Patel, MD, MS

Complications and cost of chest port (CP) insertions for interventional radiology (IR) vs. surgery (OR) were compared. 478 charts were retrospectively queried on consecutively placed IR and OR CPs between 10/10 and 2/13 to determine chest port related complications. Univariate and bivariate analysis identified risk factors for complications. Operative and pharmacy cost on 100 IR and 49 OR consecutive Medicare outpatients with CP insertions between 3/12-2/13 was obtained. Non-parametric tests for heterogeneity were performed using Kruskal-wallis method. Early complications occurred in 9.2% of IR vs. 13.4% of OR patients. Overall mean costs for chest port insertion were significantly higher in the OR, both in room and pharmacy costs ($p < 0.0001$). Average cost to place chest ports in an OR setting was almost twice that of placement in the IR suite. Hospital costs to place a chest port was significantly lower in the IR suite while radiology and surgery patients did not have a statistically different rate of complications/infections.

Liu, Benjamin
The Reliability of in Vivo Parafoveal Cone Density Measurements

Authors: Liu B, Tarima S, Pechauer A, Cooper R, Landsem L, Wilk M, Godara P, Makhijani V, Sulai Y, Syed N, Yasumura G, Garg A, Pennesi M, Lujan B, Dubra A, Duncan J, Carroll J
Project Mentor: Joseph Carroll, PhD

Background: The adaptive optics scanning laser ophthalmoscope (AOSLO) enables photoreceptor quantification. Since multi-center studies may need to employ separate AOSLO instruments and different graders, it is important to assess how the reliability is influenced by each of these two potential sources of error. Methods: Inter-observer: 30 subjects were imaged. 10 graders identified the cones in each image, repeated 3 times for each image. Inter-instrument: 20 subjects had eight corresponding parafoveal locations recorded on 2 AOSLOs. 1 user identified the cones in each image. Results: The inter-observer study's largest contribution to variability was the subject (95.57%). For the inter-instrument study, an average cone density ICC of .955 was calculated. Conclusion: Reliable results can be obtained between observers and between instruments. In the inter-observer study, any difference in cone density greater than 4.5% is likely due to real differences. For the inter-instrument study, 4.5% of total variability was due to the devices.

Lois, Alex
Gastrojejunostomy Technique Correlates with Anastomotic Complications

Authors: Lois AW, Frelich MJ, Goldblatt MI, Wallace JR, Gould JC
Project Mentor: Jon Gould, MD

Hand-sewn anastomoses (HSA) and circular-stapled anastomoses (CSA) are both common techniques of gastrojejunostomy used in the laparoscopic Roux-en-Y gastric bypass (LRYGB). We hypothesized that the CSA was associated with a greater incidence of anastomotic complications. Methods: This is a retrospective review of primary LRYGB patients treated at MCW from January 2010 to December 2011. Clinical information was collected up to one year following surgery. Results: A total of 190 subjects (135 HSA and 55 CSA) underwent LRYGB during the study interval. CSA patients suffered higher rates of anastomotic stenosis ($p<0.01$), marginal ulcer ($p=0.04$), wound infection ($p=0.03$), postoperative bleeding ($p<0.01$), and reoperation ($p<0.01$). Length of stay and long-term weight loss did not differ between techniques ($p=0.6$ and $p=0.21$, respectively). Conclusions: The CSA technique is associated with a higher rate of non-life-threatening complications than the HSA technique. Length of stay and long-term weight loss are equivalent between techniques.

Lumbard, Derek
Attitudes & Perceptions of Nurses Toward Emergency Clinical Research

Authors: Lumbard DC, Aufderheide TP
Project Mentor: Tom P Aufderheide, MD, MS, FACEP, FACC, FAHA

Conducting research in an emergency setting is challenging and requires the successful collaboration and coordinated efforts of both a research and clinical team. We investigated the attitudes and perceived barriers to implementing emergency clinical research in critical care nurses. An anonymous, voluntary survey was distributed to nurses in the CVICU, SICU, NICU, and MICU at Froedtert Hospital. The response rate was 35%. Preliminary analysis demonstrated that 82/113 (72.6%) strongly agreed that clinical research advances the knowledge within the medical field, 70.8% felt that research is necessary to ultimately improve patient care, and 76.1% strongly agreed that academic institutions should participate in clinical research. However, only 38.0% respondents strongly felt it was their responsibility as a member of an academic institution to participate in research. When ranking five potential barriers to participating in clinical research, time commitment, workload, and patient care were the most significant barriers for nurses.

Mattes, Abbey
Phrenic Nerve Injury in the Single Ventricle Population

Authors: Mattes A, Florence N, Dreger N, Krolikowski M, Pelech A
Project Mentor: Andrew Pelech, MD

Patients who undergo three-stage palliation for single ventricle physiology are at high risk for long-term complications including death. Previously, we determined phrenic nerve injury (PNI) was a significant risk factor for transplant or death. We further evaluated variables that may be confounding and validated existing data. Method: A retrospective chart review of staged single ventricle palliation patients between 1/1999 and 5/2012 at Children's Hospital of Wisconsin. Results: Imaging confirmed 13 of 19 PNI patients sustained injury to the right hemidiaphragm, 6 to the left. Six of 19 sustained vocal cord paralysis. Protein losing enteropathy (PLE) was not reported, plastic bronchitis (PB) occurred in 1. Conclusion: We previously determined 73.7% of PNI patients sustained this injury after the Norwood. Our finding that right-sided injuries are more frequent is unique. Increased mortality/morbidity in the PNI group is not explained by PLE and PB. Vocal cord injury must be considered in treatment given its high incidence.

Meyer, Nathan
Preclinical Assessment of the Effects of Mild TBI on Drug Addiction

Authors: Meyer N, Lim Y, Clancy P, Budde M, Stemper B, Olsen C
Project Mentor: Christopher Olsen, PhD
Community Partner: Matthew Budde, PhD and Brian Stemper, PhD, Zablocki Veterans Affairs Medical Center

Mild traumatic brain injuries (mTBI) are common in both the civilian and military populations. Current hospital imaging (MRI and CT) only allows visualization of more severe brain injuries, however Diffusion Tensor Imaging (DTI) is an imaging modality that tracks water movement in tissues and can spot physical changes in the brain after mTBI. Inducing mTBI in anesthetized rats with a pneumatic cannon (calibrated to 450 kPa) and giving them access to cocaine will allow a direct method to study the neurological affects of mTBI on drug addiction. DTI data shows enduring (>30 days) alterations after mTBI in the prefrontal cortex, an area involved in drug addiction. We hypothesized that damaged sustained from blast induced mild TBI will strengthen the reinforcing affects of cocaine in rats undergoing self administration, which will increase their drug seeking behavior and/ or reinstatement potential (relapse potential). The aim of this research is to determine the effect of mTBI on drug reward, drug seeking and drug relapse.

Miksanek, Jennifer—POSTER
The Role of Active Demethylation in Enhancer Activity

Authors: Miksanek J, Pulakanti K, Rao S
Project Mentor: Sridhar Rao, MD, PhD

Enhancers regulate transcription and are defined by different epigenetic marks and protein binding events. Two subsets of highly active enhancers, one produces enhancer transcribed RNAs (eRNAs) and another termed super-enhancers, both exhibit DNA hypomethylation. Hypomethylation occurs by active demethylation, whereby the Tet family of proteins oxidizes the methylated cytosine ultimately leading to an unmethylated cytosine. We hypothesized that highly active enhancers would use active demethylation to maintain their hypomethylation. Using computational methods, we queried mouse embryonic stem cell enhancers. Our hypothesis was not supported except for super-enhancers, which showed twice the level of demethylation as non-super-enhancers. Therefore, active demethylation may only play a role at the most highly active enhancers, super-enhancers and a subset of eRNA+ enhancers. Our next step is to examine eRNA production at super-enhancers within human disease contexts.

Mohorek, Matt
Improving Documentation of End-of-Life Discussions After Elderly Trauma

Authors: Mohorek M, Webb TP
Project Mentor: Travis Webb, MD, MHPE

Physician led discussion of end-of-life topics (code status [CS], health care power of attorney [HCPOA], care goals) are frequently delayed leading to undesired treatment. Our Level 1 trauma center developed/implemented a protocol to improve documentation of these discussions. This study's objective was to determine if said protocol has been successful. We performed a retrospective, case-control study using a historic cohort of injured geriatric patients (≥65) who died during hospital stay. Historic cohort was divided into pre and post protocol groups. Demographic data and presence of CS, HCPOA, and care goal documentation was collected. Protocol implementation improved CS (78% vs. 94%), HCPOA (62% vs. 75%), and care goals (73% vs. 93%) documentation (CS, care goals statistically significant). We conclude that effective protocol development/implementation can improve documentation of end-of-life topic discussions for geriatric trauma patients who ultimately die as a result of their injury.

Naze, Sawyer
Surgical Outcomes of Chronic Insertional Achilles' Tendinopathy

Authors: Naze SA, Marks RM
Project Mentor: Richard Marks, MD

Chronic insertional Achilles' tendinopathy results from the pathological degeneration of the collagen structure of the tendon. If conservative treatment fails to relieve a patient's symptoms, surgical intervention to repair the tendon is appropriate. For individuals with less severe Achilles' degeneration, Haglund's resection with debridement and secondary repair has proven effective in symptomatic relief. If greater than 50% of the Achilles' is resected, augmentation with the Flexor Hallucis Longus (FHL) tendon transfer is recommended. Long term outcomes of patients undergoing surgical treatment for chronic insertional Achilles' tendinopathy has yet to be established. This study evaluated 78 patients and determined that surgical debridement of the Achilles' tendon with Haglund's resection with either reattachment or FHL tendon transfer provides improvement in pain relief, level of function and quality of life for patients with chronic Achilles' tendinopathy. Both procedures showed similar patient satisfaction rates and outcomes.

Neitzel, James
Dynamic Analysis of the Hindfoot and Arch: Barefoot vs. Single Rocker

Authors: Mchenry B, Neitzel J, Harris GF
Project Mentor: Gerald F Harris PHD PE

Weight bearing stationary X-ray photography paired with clinical observation has historically been the gold standard for accessing ambulatory function and complex bony motion. This study utilized a real-time videofluoroscopic imaging technique with novel modeling to demonstrate the potential utility of using established static orthopedic measures in a dynamic setting. It was hypothesized that significant kinematic differences between the two ambulatory conditions (barefoot vs. shod foot) would be observed. Results demonstrated the shod condition to effectively linearize both parameters of Calcaneal Pitch and Height to Length Ratio throughout stance. These expected differences between conditions suggest that previously established static measures may be appropriate for dynamic modeling. Future research is needed to verify and standardize parameters for such modeling, which is yet in its infancy. Such accurate modeling can have vast implications for orthopedic evaluation, orthotics development, Sports Medicine and beyond.

Ostergaard, Peter
Long-term Efficacy of Endoscopic Cyclophotocoagulation in Glaucoma

Authors: Ostergaard PJ, Freedman M
Project Mentor: Mark Freedman, MD

PURPOSE: Investigate the long term efficacy of endoscopic cyclophotocoagulation (ECP) in glaucoma treatment. METHODS: Conducted a retrospective analysis of 130 patients (196 eyes) with visually significant cataract and glaucoma that underwent phacoemulsification and ECP. Surgeries were performed between June, 2002 and May, 2014. Follow up data was available for 9 years with a mean of 52.45 + 31.09 months. RESULTS: Preoperative IOP was 19.52 + 4.85 mm Hg and glaucoma drop use was: 1.66 + .94 drops. Postoperative IOP and glaucoma drop use at 5, 6, 7, 8 and 9 years follow up were: 5yr- IOP: 15.21 + 3.905 mmHg (P <.0001) Drops: .72 + .83 drops (P <.0001); 6 yr- IOP: 14.57 + 3.78 mmHg (P <.0001) Drops: .92 + .92 drops (P <.0001); 7 yr- IOP: 14.73 + 3.45 mmHg (P <.0001) Drops: 1.06 + .81 drops (P = .0005); 8 yr- IOP: 13.75 + 2.83 mmHg (P = .0002) Drops: 1.04 + 1.04 drops (P = .0109); 9 yr- IOP: 13.91 + 5.08 mmHg (P = .0326) Drops: .52 + .79 drops (P = .0421). CONCLUSION: ECP is an effective procedure for long-term management of glaucoma.

Otto, Bradley
A Kinetic Model of the Cardiac Mitochondrial VDAC1 Protein

Authors: Otto B, Tewari S, Kwok WM
Project Mentor: Wai-Meng Kwok, PhD

Dysfunction of mitochondria has been implicated in a wide range of pathology, including neurodegenerative and cardiac diseases, and various types of cancer. Studies show that abnormalities in the voltage-dependent anion channel (VDAC) can lead to mitochondrial dysfunction. In particular, post-translational modifications (PTMs) of VDAC1 (the must abundant isoform) have been reported in a variety of diseases. However, the impact of PTMs on VDAC1 function and subsequently on mitochondrial and cellular functions has not been comprehensively delineated. Studies demonstrate that phosphorylation of VDAC1 increases the frequency of the channel's low-conduction state and that S-nitrosylation effects are dependent on the concentration of nitric oxide (NO) present. This study provides a Markov model that illustrates the activity of VDAC in the low-conduction phosphorylated and high-conduction nitrosylated states.

Parker-McGill, Katelyn Leigh
Increasing Incidence of Cystic Fibrosis in WI

Authors: Parker-McGill KL, Nugent M, Bersie R, Hoffman G, Rock MJ, Farrell PM, Baker M, Simpson P, Levy H
Project Mentor: Hara Levy, MD

Although cystic fibrosis(CF) is the most common life-limiting autosomal recessive disorder in the non-Hispanic White population (1:2,500), it is also prevalent in other racial groups. The large heterogeneity in mutations among racial populations has presented challenges in optimizing the sensitivity of testing within newborn screening programs to encompass minority populations. We evaluated the incidence of CF as reported by WI's newborn screening program for 1994-2011 (n=285), and compared these race-related data to previously reported incidence studies. We detected a trending increase in CF cases, homozygous p.Phe508del cases, heterozygous p.Phe508del cases, and cases with no p.Phe508del mutation per 10,000 births. Both the number of cases with no p.Phe508del mutation per year and the number of no p.Phe508del cases per 10,000 births significantly increased (p=0.05) from 1994 to 2011. These trends suggest that the racial composition of the CF cohort is changing in WI, possibly influencing disease detection, care, and outcome.

Philpot, Brittany

Alterations of the Pulmonary Circulation in PPHN of the Newborn

Authors: Philpot B, Eis A, Michalkiewicz T, Teng RJ, Konduri GG
Project Mentor: Girija Ganesh Konduri, MD

Introduction: Oxidative stress contributes to vascular dysfunction in PPHN. NADPH oxidase (NOX) and eNOS use NADPH as a substrate and are important sources of ROS in the pulmonary arteries in PPHN. G6PD is the rate-limiting step in the pentose phosphate pathway and determines the amount of NADPH in the cell. HeK2 is required for glycolysis and may play a role in increased proliferation in PPHN. Results: G6PD mRNA and activity levels were not different in hypertensive samples. G6PD protein levels in hypertensive lung tissue and vascular smooth muscle were increased, while there was no significant change in pulmonary artery tissue or endothelial cells. HeK2 protein levels were increased in all hypertensive samples. Conclusions: Increased G6PD in hypertensive tissue suggest increased NADPH with potential to generate increased ROS in PPHN. Elevated HeK2 expression in hypertensive samples indicates increased production of glucose-6-phosphate. This may contribute to increased proliferation of vascular smooth muscle observed in this model.

Powers, Bethany R

Impaired Cerebral Angiogenesis in Persistent Pulmonary Hypertension

Authors: Powers BP, Lerch-Gaggl A, Teng RJ, Konduri GG, Cohen SS
Project Mentor: Susan Cohen, MD

Persistent pulmonary hypertension (PPHN) in the newborn reflects a failure of the pulmonary vasculature to relax at birth and is associated with an increased risk of neurodevelopmental impairment. We simulate a known cause of this disease through prenatal constriction of patent ductus arteriosus in late-gestation fetal sheep. We hypothesize that capillary vessel formation in the brain is decreased in PPHN. Cerebral angiogenesis was examined in PPHN lambs and their twin controls. Immunohistochemistry results: capillary density significantly decreased in animals with PPHN (Glut-1, isolectinB-4 and factor VIII, $n=6$, $p<0.05$). Western blot results: HIF-1α and VEGF were decreased in cortical cell lysate of PPHN lambs. Angiopoetin-1 and the Tyrosine kinase receptor-2 were increased, while angiopoetin-2 was decreased ($n=6$, $p<0.05$). Our studies are among the first to examine altered angiogenesis in the fetal brain exposed to PPHN. These data suggest that PPHN results in decreased cortical capillary density and impaired cerebral angiogenesis.

Prisco, Anthony—POSTER

TNFα Regulates Endothelial Progenitor Cell Migration via CADM1 and NF-kB

Authors: Prisco AR, Hoffmann BR, Kaczorowski CC, McDermott-Roe C, Stodola TJ, Exner EC, Greene AS
Project Mentor: Andrew Greene, PhD

Shortly after the discovery of endothelial progenitor cells (EPCs) in 1997, many clinical trials were conducted using EPCs as a cellular based therapy with the goal of regenerating damaged organ function by inducing growth of new blood vessels. Results were anticlimactic as regenerative mechanisms were not understood. In this study, EPC migration was studied in response to tumor necrosis factor (TNFα), a pro-inflammatory cytokine, because organ damage observed in ischemic diseases induces an inflammatory signal. In this study, EPC migration was measured using an in vitro tracking assay. It was found that TNFα treatment to EPCs increased migration towards vessel-like structures. Using a combination of genomic and proteomic studies, it was proposed that TNFα treatment increased EPC migration through CADM1 transcribed by NF-kB. This mechanism was directly tested and confirmed via inhibition studies. These results will increase mechanistic knowledge of EPC-mediated angiogenesis that will result in better designed clinical trials.

Prisco, Sasha—POSTER

Narrowing Genetic Regions on Rat Chromosome 12 Involved in Hypertension

Authors: Prisco SZ, Priestley JRC, Flister MJ, Sarkis AB, Hoffman M, Lazar J, Lombard JH, Jacob HJ
Project Mentor: Joseph Barbieri, PhD

A third of U.S. adults over the age of 20 have hypertension. Unfortunately, substantial progress has not been made in the treatment and prevention of hypertension, partially due to its genetic complexity. Several rat studies have mapped blood pressure (BP) quantitative trait loci to rat chromosome 12 (RNO12). We previously identified a rat congenic strain containing a 6.1-Mb segment of salt-sensitive (SS) RNO12 on the SSBN12 consomic background that had significantly higher mean arterial pressures and renal damage compared to SSBN12. The goal of the present study was to further reduce the candidate region on RNO12 and use sequence and expression analysis to nominate novel candidate genes for salt-sensitive hypertension. Collectively, this study nominated two novel genes, Grifin and Chst12, for hypertension and renal disease, in addition to implicating the resistance vasculature and the renal system as contributors to the elevations in BP observed in our congenic strains.

Raphael, Roseanne
Biomarkers for Heart Failure with Preserved Ejection Fraction

Authors: Raphael R, Gastonguay C, Chesnik M, Reiter M, Strande J
Project Mentor: Jennifer Strande, MD, PhD

Introduction: Heart Failure with Preserved Ejection Fraction is found in half of all patients with heart failure. The underlying mechanisms of this disease remain elusive. With the understanding that platelets change their protein composition in cardiac disease states, we hypothesize that biomarkers associated with HFpEF will be reflected in the platelet proteome. Methods: Over 12 weeks, 477 subjects were screened resulting in the enrollment of 17 patients. Blood samples were obtained during the initial hospitalization (symptomatic HFpEF group) and 6-8 weeks later (asymptomatic HFpEF group). Results: Analysis of the platelet proteome from the 3 groups: symptomatic HFpEF, asymptomatic HFpEF, and control subjects identified 6102 unique proteins with 10 scans with peptide probabilities of ≥0.85. 165 are present only in symptomatic patients, 78 in asymptomatic HFpEF patients, and 157 proteins are unique to the control group. Conclusion: Our research has shown that there is a platelet protein signature associated with HFpEF.

Rettenmaier, Christopher
CSI Predicts Complications After Component Separation for Hernia Repair

Authors: Rettenmaier CR, Frelich MJ, Abston ED, Gould JC, Xiang K, Pruszynski J, Goldblatt MI
Project Mentor: Matthew Goldblatt, MD

Purpose: To determine the clinical utility of the Component Separation Index (CSI) following hernia repair using the component separation technique (CST). Methods: This is a retrospective review of patients undergoing CST from August 2009 to January 2013. Data were collected to 30 days after surgery. The CSI is defined as the angle of diastasis divided by 360°. Results: Thirty-nine patients underwent CST. Nine (23.1%) experienced complications before discharge. Fourteen (35.9%) experienced complications after discharge. There were three recurrences (7.7%). A smaller CSI correlated with a greater rate of total complications ($p=0.05$), post-discharge complications ($p<0.01$), and post-discharge wound complications ($p=0.02$). A larger CSI predicted hernia recurrence ($p=0.05$). A larger WD predicted pre-discharge complications ($p=0.04$). Conclusions: CSI is a valid predictor of 30-day complications. Unexpectedly, those a lower CSI has more complications. This is not reproduced with WD. Larger CSI correlates with a greater recurrence rate.

Ritchie, David
Discrimination of Musical Stimuli in Cochlear Implant Users

Authors: Ritchie DJ, Friedland D, Runge C
Project Mentor: Christina Runge, PhD

Cochlear implants (CIs) are auditory prostheses that electrically stimulate the auditory nerve from electrodes surgically placed in the cochlea. They are an effective treatment option for patients with severe sensorineural hearing loss who do not benefit from hearing aids. CI users show significant benefits in speech perception abilities, but they are often unable to adequately perceive and appreciate music. Results from our lab have shown that, compared to the normal hearing (NH) population, CI users are poorer at perceiving timbre, a musical attribute that distinguishes instruments. Therefore, the objective of this study was to investigate the perceptual effects of removing harmonics for subjects with CIs and NH. Fifteen adult CI users and five NH adult listeners participated in a same-different discrimination task between native and harmonically-modified instrument stimuli. CI users showed poorer discrimination performance than NH subjects across all conditions, with significant differences for 5 of 9 trials.

Rodgers, Matthew—POSTER
The Role of Rv1812c in the M. Tuberculosis Response to Hypoxia

Authors: Rodgers M, Bretl D, Penoske R, Zahrt T
Project Mentor: Thomas Zahrt, PhD

M. tuberculosis is an ancient human disease, responsible for approximately one million annual deaths worldwide. The organism is believed to encode three distinct NDH-2 enzymes. One of these, Rv1812c, is known to be co-regulated by the crucially important MprAB and DosRST regulatory systems, but has itself yet to be directly studied. Here, we employ recombinant techniques to determine which of the three NDH-2's from M. tuberculosis can functionally complement the essential gene ndh in M. smegmatis. We further show that Rv1812c is the only NDH-2 in the M. tuberculosis genome to be significantly upregulated in response to hypoxic conditions. Finally, we utilize a rapid anaerobic dormancy model to show that a ΔRv1812c deletion mutant has a delayed aerobic recovery phenotype following 80 days of hypoxia. The role of Rv1812c in the M. tuberculosis response to hypoxia, described here, raises intriguing possibilities for future drug development.

Rolsma, Stephanie—POSTER
Chimeric PcrV Proteins as Vaccines for Pseudomonas Aeruginosa Infections

Authors: Rolsma SL, Thomas LM, Frank DW
Project Mentor: Dara Frank, PhD

Pseudomonas aeruginosa is an opportunistic pathogen associated with infections that are difficult to treat because of antibiotic resistance. The type III secretion system (T3SS) of P. aeruginosa is an important virulence factor that targets innate immune responses. Countering T3SS may result in a beneficial immune response that limits cellular damage, however an efficacious vaccine may also need to promote clearance. To test this hypothesis, I constructed chimeric vaccines based on the protective antigen, PcrV, combined with OprF. Antibodies to OprF may mediate clearance. To test the vaccine, an aerosol model of acute lung infection was developed. Passive administration of anti-PcrV protects mice from a lethal infection. Active immunization with PcrV is partially protective. Immunization with PcrVoprF chimera and PcrV plus OprF also resulted in partial protection. Understanding the mechanism of protection of PcrV vaccines will aid in development of vaccines against extracellular pathogens or antibody therapies for human populations.

Roy, Ishan—POSTER
Exploiting Chemokines to Regulate Pancreatic Cancer Metastasis

Authors: Roy I, McAllister DM, Gorse E, Dixon K, Piper CT, Zimmerman NP, Getschman AE, Tsai S, Engle DD, Evans DB, Volkman B, Kalyanaraman B, Dwinell MB
Project Mentor: Michael Dwinell, PhD

The vast majority of patients with pancreatic ductal adenocarcinoma (PDAC) eventually succumb to metastatic disease. Yet, the underlying mechanisms that regulate PDAC cell movement and metastasis are poorly understood. Our prior work demonstrated that the chemokine Cxcl12 gene is silenced in human PDAC tumors, and when re-expressed, suppresses malignancy. Chemokines regulate movement in a biphasic concentration pattern. We tested the hypothesis that biphasic migration induced by CXCL12 could be exploited to block PDAC metastasis. PDAC cells showed decreased oxidative phosphorylation and glycolytic capacity and increased energy stress signaling following stimulation with CXCL12. Non-migratory CXCL12 locked myosin light chain into a phosphorylated state, which in turn decreased F-actin polymerization, and prevented cell migration. Finally, mice treated with recombinant CXCL12 had decreased PDAC dissemination in two preclinical models, suggesting chemokine biased agonist signaling could provide a novel avenue for therapeutic intervention.

Saphner, Elizabeth
New Method for Reliable Esophageal Mucosal Impedance Measurement

Authors: Saphner E, Babaei A, Jiao H, Shaker R
Project Mentor: Reza Shaker, MD

BACKGROUND: Esophageal intraluminal impedance has been used as marker of disease conditions; however, impedance recorded from resting esophageal lumen is subject to a variety of events. Here we describe the impedance measurement from within the peristaltic contraction zone that alleviates these influences. METHODS: We studied swallows in seven healthy volunteers. Maximum impedance was measured, called the Contractile Segment Impedance (CSI). RESULTS: Average CSI variance ranged 7-17%. Average variance for luminal non-contractile impedance ranged 11-38%. For luminal impedance measured five sec. prior to UES opening (Pre-CSI) variability in the distal esophagus was significantly higher compared to that of proximal esophagus (*p=0.033). This variability was also significantly higher than that of variability of impedance measured from within the contractile segment (CSI) (**p=0.046). CONCLUSIONS: Impedance measured from within a peristaltic segment is significantly less variable than that measured from non-peristaltic lumen.

Schlauderaff, Abraham
Von Willebrand Factor 1399H Mutation Decreases Type IV Collagen Binding

Authors: Schlauderaff AC
Project Mentor: Veronica Flood, MD

Von Willebrand factor (VWF) plays a key role in hemostasis. VWF deficient mice received via hydrodynamic tail vein injection a WT or mutant 1399H construct. Twenty-four hours later inferior vena cava blood draws were performed. A VWF:Ag ELISA assessed vector reception. Type IV and VI collagen binding (CB) was measured with VWF:CB ELISAs. VWF multimer analysis was performed by gel electrophoresis. Perfusion assay was performed with VenaFlux. Mean VWF:Ag were 5.57 and 5.63 for WT and 1399H, respectively. When compared to WT, 1399H exhibited a significant 84% and 78% reduction in binding to types IV and VI collagen respectively. Multimer distribution was equal in WT and 1399H. When compared to WT, 1399H platelet adhesion was significantly decreased by 78% of WT surface coverage. These data show that the VWF A1 loop 1399H sequence variation leads to decreased binding to types IV and VI collagen, which may clinically alter thrombogenesis.

Segal, Eric
Comparison of HCT Outcomes in Adults with Acute Lymphoblastic Leukemia

Authors: Segal E, Saber W, Wang H, Brazauskas R, Martens M
Project Mentor: Wael Saber, MD, MS

Allogeneic hematopoietic cell transplantation is a potentially life-saving treatment for patients suffering from acute leukemia, lymphoma, and other hematologic diseases. Siblings with matching HLA are the preferred donor source, but only about one-third of patients have an HLA matched related donor (MRD). If a MRD is not available, a matched unrelated donor (MUD) is sought out. HCT from a MUD has been associated historically with higher incidence of graft failure, more graft versus host disease, and lower survival than MRD transplants. However, more recent data have shown that survival rates for MUD HCT have improved significantly, with an increase in two-year survival rates for MUD recipients with acute lymphoblastic leukemia (ALL). This study will compare MRD versus 8/8 HLA matched MUD versus 7/8 MUD in patients with B-cell lineage ALL to determine the impact of donor source on outcomes. Data has been collected and analysis is underway.

Shariat-Madar, Bahbak
Surgical Management of Obstructive Peritoneal Carcinomatosis

Authors: Shariat-Madar B, Jayakrishnan, Gamblin TC, Turaga KK
Project Mentor: Kiran Turaga, MD, MPH

Background: Due to poor prognosis, treatment for malignant bowel obstruction (MBO) due to peritoneal carcinomatosis (PC) emphasizes improved quality of life and symptom relief. Currently, the value of surgery to treat obstructive PC is unclear. Methods: A prospectively registered search strategy (PROSPERO) utilized specific key words to find peer-reviewed, English language articles published in PubMed (2003-2013). Primary outcomes of interest were median overall survival (OS) and complications. Results: Of 730 articles screened, 64 were selected for full-text review and 5 were analyzed quantitatively. This comprised 338 patients with MBO, of which 324 (95.8%) presented with PC. OS for all patients was 6.8 months (2.8-19.6, n=180). OS for patients that underwent bypass, resection, and colostomy was 8.7 months (2.8-9.5, n=78), 5.5 months (4.9-19.6, n=95), and 3.4 months (n=7), respectively. Conclusions: This study supports surgical bypass over resection to treat obstructive PC, as it offered better overall survival with fewer complications.

Sharif-Sidi, Khalid
Extracellular ATP Efflux in Primary Tenocytes

Authors: Rosenthal A, Gohr C, Mitton-Fitzgerald E, Sharif-Sidi K
Project Mentor: Ann Rosenthal, MD

ATP is known for its role as an intracellular energy substrate. Recently, however, ATP has been implicated as an extracellular ligand for purinergic receptor signaling. In this study, we investigated whether ATP efflux was sensitive to osmotic stimuli in tenocytes and began to elucidate the mechanisms involved in tenocyte ATP transport. The patellar tendon was extracted from adult pig legs and tenocytes were enzymatically digested with collagenase to isolate them from the surrounding matrix. They were then treated under iso/hypo-osmotic conditions and extracellular ATP levels were measured. After a 24 hour incubation period and hypotonic challenge, tenocytes robustly released ATP in concentrations that increased uniformly with the degree of hypotonicity. Extracellular ATP levels returned to baseline at 1 hour and remained at baseline thereafter. The preliminary results reveal that changes in osmolarity stimulate ATP efflux in tendon cells.

Sharma, Ashish
Whole Thorax Irradiation Induces Hypoxic Respiratory Failure with CHF

Authors: Medhora M, Gao F, Glisch C, Narayanan J, Sharma A, Strande J, Harmann LM, Snyder L, Fish B, Down J, Moulder J, Jacobs ER
Project Mentor: Meetha Medhora, PhD

Purpose: To determine the role of the heart and pleural effusions in lethal pneumonitis following radiation to the thorax, as may occur in a radiological terrorist attack or nuclear accident. Materials/Methods: WAG/RijCmcr (Wistar) rats were treated with 15 Gy to the thorax and followed for 42 days. Lung function was measured with breathing rates and arterial oxygen saturation. Lung and cardiac structures were evaluated by histology and echocardiography respectively. Pleural effusions were then assessed and characterized. Conclusions: Lethal radiation to rat lungs leads to hypoxia, congestive heart failure and pulmonary infiltration of immune cells resulting in edema and pleural effusion. These data suggest that morbidity from radiation pneumonitis is attributable to pulmonary vascular injury and alterations in oxygenation, with secondary changes in heart structure and function. Analyses of relevant cardiac parameters in other species are needed to confirm if similar mechanisms occur, in order to identify new targets for therapy.

Sharma, Avishkar—POSTER
Role of Falciform Ligament & Ligamentum Teres Hepatis Resection in HIPEC

Authors: Jayakrishnan TT, Sharma A, Zacharias A, Gamblin TC, Turaga K
Project Mentor: Kiran Turaga, MD, MPH

Background: Routine resection of falciform ligament and ligamentum teres hepatis (FL-LTH) during cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS+HIPEC) has been advocated but may be associated with increased complications. We aimed to study the role of FL-LTH resection at the time of CRS+HIPEC. Methods: Retrospective review of patients who underwent CRS+HIPEC from January 2010 to April 2013. Results: CRS-HIPEC was performed in 71 patients. The sensitivity and specificity of visual examination were calculated as 97.4% and 75.0%, respectively. Visual examination falsely classified 1/33 cases as disease free. False-positive resection was not associated with increased complications (0/6). The recurrence in porta-hepatis was lower in the resected group vs. non-resected. Conclusions: Visual examination during CRS+HIPEC may miss disease at the falciform ligament. A policy of routine resection is not associated with increased complications and should be considered.

Shirel, Tyler
Neonatal Abstinence Syndrome in Sickle Cell Disease

Authors: Shirel T, Shah R, Rankin A, Koch K, Sheth D, Uhing M, Jones C, Field J
Project Mentor: Joshua Field, MD, MS

Infants born to women with Sickle Cell Disease (SCD) who require opioids during pregnancy may be at risk for Neonatal Abstinence Syndrome (NAS), a collection of findings resulting from opioid use. Our objective is to determine whether mean daily opioid dose during pregnancy is associated with NAS in infants born to women with SCD. We performed a retrospective cohort study of women with SCD ≥ 18 years of age who received obstetric care and delivered at Froedtert Hospital between 1/1/2008 and 1/1/2015. NAS was classified as none, mild, or severe. Thirty-five women with SCD were examined. Mean oral morphine equivalent dose during pregnancy was 57 mg/day. Oral morphine for severe NAS classification was 416 mg/day compared to 140 mg/day for mild NAS. Pregnancies without NAS were approximately 4 mg/day. Significant difference between no NAS to mild NAS was noted. We concluded that increased daily opioid use during pregnancy is associated with a higher rate and severity of NAS in infants.

Strobel, Katie
Impact of Age at Diagnosis on Obesity in Pediatric Brain Tumor Survivors

Authors: Strobel K, Simpson P, Donohoue PA, Firat S, and Jogal S
Project Mentor: Sachin Jogal, MD

Obesity is a stable morbidity for pediatric CNS tumor survivors. Hypothalamic involvement (HI) also increases the risk. BMI normally declines until adiposity rebound (AR), after which it increases. We hypothesized HI and diagnosis before AR would lead to greatest BMI z-scores at follow up. Brain tumor survivors diagnosed from 2001-2011 at Children's Hospital: chart review extracted BMI z-score at diagnosis and two-year follow-up. Children were categorized into six groups, based on age at diagnosis and presence/absence of HI. Ages were classified as "before AR", "during AR" and "after AR". Children diagnosed pre-AR and post-AR with HI had higher BMI z-scores at two-year follow up than at diagnosis. No group without HI had increased BMI z-score at two year follow up. The before AR and during AR cohort with HI had a higher BMI z-score at two-year follow up then those without HI. Tumor survivors with HI have increased BMI compared to those without involvement. Diagnosis before AR is associated with a greater follow up BMI z-score.

Sturich, Adrian
LPA's Effects on Autophagy in Tumor Associated Endothelial Cells

Authors: Sturich A, Ren B, Silverstein R
Project Mentor: Roy Silverstein, MD

Introduction Obesity increases breast cancer (BC) risk but direct link and mechanisms by which obesity promotes BC progression remain obscure. Obesity causes increased serum levels of the ligand phospholipid metabolite, lysophosphatidic acid (LPA). LPA stimulates angiogenesis in tumor associated endothelial cells (TAECs) by down-regulating the anti-angiogenic CD36 through the PKD-1 signaling pathway. We have also shown LPA to decrease the oxygen consumption rate of TAECs. Defects in autophagy are associated with increased tumorgenesis. Hypothesis Obesity-derived LPA attenuates autophagy in tumor associated endothelial cells. Methods TAECs were treated with LPA before induction of autophagy. Autophagy activity was assessed via western blotting of autophagic markers (LC3B, Beclin-1). Results No significant changes in autophagy were seen in TAECs pretreated with LPA before autophagy induction. Conclusion LPA's role in regulation of autophagy is not promising but further elucidation of LPA's known role in BC progression is still warranted.

Tadokoro, Kent
NgBR Protects Pulmonary Artery Smooth Muscle Cell (PASMC) from ER Stress

Authors: Tadokoro KS, Ujala R, Jing X, Eis A, Konduri GG, Miao, QR, Teng RJ
Project Mentor: Ru-Jeng Teng, MD

Enhanced PASMC growth is found in pulmonary vasculature of persistent pulmonary hypertension of the newborn (PPHN). We showed that NgBR in PASMC is decreased, leading to smooth muscle layer thickening. NgBR distributes to the ER and ER stress can lead to cell death. We hypothesize that NgBR modulates PASMC function in response to ER stress. PASMC were obtained from fetal lambs with PPHN induced by intrauterine ductus arteriosus constriction or matched control. NgBR were either overexpressed or knocked down. Dihydroethidium staining quantified ROS formation. Binding immunoglobulin protein (BiP) indicated ER stress, which was induced by Tunicamycin (TM). BiP levels increased and NgBR levels decreased in PPHN. NgBR knockdown increased BiP levels whereas NgBR overexpression decreased BiP levels. TM treatment increased the BiP levels, DHE staining, and NgBR expression. ER stress-induced NgBR expression prevents the development of PPHN phenotype. Overexpression of NgBR protects against ER stress, as appreciated in the decreased BiP levels.

Teijido, John
Quantifying Sections of the Rat Brain After Rotational Injury

Authors: Teijido J, Budde M
Project Mentor: Matthew Budde, PhD

Understanding the molecular mechanism of TBI has promising research and clinical value. This study proposes to develop a methodology of quantifying pathologic responses in coronal sections of the rat brain comparing control, single, and double TBI groups. This study utilizes a rotational injury model developed by the Neurosurgery Department at the Clement J. Zablocki VA Medical Center. The methodology normalizes brain sections and quantifies astrocytic and microglial gliosis for the purpose of comparing control, single rotational injury, and double rotational injury groups. This method of quantifying brain sections stained for astroglia and microglia was effective for astroglia stains comparing control and single injury groups and was effective for microglia stains comparing control and double injury groups.

Thayer, Jacob
Use of Integra Biologic in Complicated Craniotomy Wounds with Exposed Dura

Authors: Thayer J, Yan JG, Zhang LL, Havlik R, Agresti M
Project Mentor: Ji-Gheng Yan, MD, PhD

Background: Coverage of craniotomy wounds for brain tumors or trauma may be difficult to achieve. We report the treatment of neurosurgical patients with full thickness scalp wound complications from craniotomy that underwent closure with Integra® as definitive coverage, or as a bridge to definitive flap coverage.
Methods: A case series of 6 patients who underwent Integra placement for dehisced or infected craniotomy incisions between 2010 and 2013 at Froedtert Hospital was conducted.
Results: Craniotomy indications included brain tumor (n=5) and trauma (n=2). Wound beds needing closure had exposed dura (n=7), were complicated by infection (n=6) or sterile dehiscence (n=1). Integra served as a bridge to free flap transfer for an average of 39 days (range= 4-168) in 6 of 7 patients, and as definitive closure in 1 patient.
Conclusions: Integra was successful in serving as a bridge or definitive closure in complicated craniotomy wounds in our case series of patients. This provides a reasonable option for neurosurgeons to treat such wounds.

Tittman, Sarah
Effects of Geographic Isolation and Social Support on Women's Health

Authors: Tittman SM, Harteau C, Beyer KMM
Project Mentor: Kirsten M M Beyer MPH, PhD, MS
Community Partner: Christy Harteau, Wisconsin Rural Women's Initiative

Social disconnectedness and perceived isolation are known to be negative predictors of physical health; however, the direct effects of geographic isolation and social support on overall health have not been well elucidated. A cross-sectional survey of women (n=113) participating in Wisconsin Rural Women's Initiative programming was conducted which included measures of geographic isolation, social support, and overall health. Geographic isolation was shown to be a negative predictor of belonging support (p=0.0064) and tangible support (p=0.0349), and a strong and direct relationship was observed between social support and self-perceived health status among this population of Wisconsin women. The relationship between social support and overall health demonstrated here stresses the importance of developing and maintaining social support networks, and rural support groups have the unique ability to assist rural residents in fostering social support systems and achieving a greater sense of well-being.

Traudt, Ryan
NIR Light Enhances Phosphorylation Of FAK And Erk1/2 in Osteoblasts

Authors: Traudt R, Struve J, Weihrauch D, Ninomiya J
Project Mentor: James Ninomiya, MD

Fractures and disuse osteoporosis are major causes of morbidity and mortality, commonly leading to long term disability and financial burden. We hypothesized that the formation of focal adhesions and the upregulation and phosphorylation of focal adhesion kinase (FAK) as well as activation of the downstream signal transduction pathways by MAP kinases like ERK ½ would be increased by exposure to NIR light. We found that a single dose NIR light (670nm, 4J) increased the ratio of phospho FAK to FAK and also resulted in the immediate increase of the ratio of phosphorylated ERK ½ to ERK1/2. We also demonstrated that the onset of RUNX-2 upregulation was delayed and RUNX-2 expression was prolonged. These findings suggest that exposure to NIR light leads to a delay in focal adhesion formation and downstream signaling cascade which results in a net increase in mineralization. Taken together, exposure to NIR light may provide a potential new therapeutic modality for the enhancement of fracture healing and the prevention of bone loss.

Trebelhorn, Jack
Sphingolipids and Telomerase Regulation of Flow Mediated Dilation

Authors: Beyer A, Gutterman D, Trebelhjorn J
Project Mentor: Andreas M Beyer, PhD

Cardiovascular disease causes issues for thousands. One contributing factor is endothelial dysfunction. Blood flow stimulates the release of vasodilator factors from the endothelium. This flow mediated dilation (FMD) is largely regulated by Nitric Oxide (NO) in healthy humans. In aged or disease states, reactive oxygen species (ROS), such as hydrogen peroxide (H2O2), have an increased role in FMD. These ROS lead to endothelial dysfunction. Increased ceramide and reduced telomerase have a role in this transition of FM. We hypothesize that ceramide is a novel regulator that decreases telomerase causing increased mitochondrial ROS (mtROS) production. We studied the effect ceramide has on NO and mtROS and the relationship between ceramide and telomerase and its effect on mtROS. Changes in nitric oxide synthase and telomerase were measured and H2O2 levels were quantified. Cells treated with ceramide showed increased H2O2 levels with decreased levels of telomerase. These data show that ceramide increases ROS while decreasing telomerase.

Udom, Sterling
Control of Kidney Development By Perinatal Environmental Changes

Authors: Udom SEE, El-Meanaway A
Project Mentor: Ashraf El-Meanaway, MD, PhD

We previously developed and characterized a mouse model of premature birth to investigate extra-uterine kidney development in an environment of maintained estrogen levels. It was our aim to determine the effects of estrogen and "incomplete" estrogen effect on kidney growth in culture. Organ cultures of harvested meta-nephric kidneys of preterm mice were incubated in the presence of G1, estradiol (E2), and absences of extrinsic hormone. Meta-nephric kidneys cultured in G1 (incomplete estrogen mechanism) were compared to those cultured with estradiol. Kidneys were stained with fluorescent ureteric bud marker and observed under microscope. We compared relative kidney budding and branching qualitatively. We determined that G1 is able to sustain kidney development by stimulation of ureteric bud branching compared to "complete" E2.

Wagner, Thomas
Outcomes of Shoulder Replacements for Deficient Rotator Cuffs

Authors: Wagner TR, Eggert DC, Grindel SI
Project Mentor: Steven Grindel, MD

The purpose of this study was to compare the outcomes of patients with cuff tear arthropathy (CTA) who underwent stemmed hemiarthroplasty (HA) versus hemiarthroplasty with a cap-like prosthesis (CAP-HA). 22 stemmed HA and 19 CAP-HA patients between were included. Visual analog pain scale, Constant score, UCLA score, American Shoulder and Elbow Surgeons score, and range of motion were used to compare the procedures. Both procedures resulted in significant postoperative improvement in all measurements. There were no significant differences pre- or postoperatively between the procedures in any of the outcomes examined. There were no intraoperative complications and three patients required revision, two with CAP prostheses and one with a stemmed prosthesis. CAP-HA resulted in significant improvements in pain and shoulder function that did not differ stemmed HA. CAP-HA should be considered in place of stemmed HA because it lowers the risk of intraoperative fracture, conserves more humeral bone, and allows for easier revision.

Wahl, Geneva

EET Analog Mitigated Kidney Injury in Rat Model of Radiation Nephropathy

Authors: Wahl GM, Hye Khan MA, Fish B

Project Mentor: John Imig, PhD

This study investigated the ability of an epoxyeicosatrienoic analog, EET-A, in mitigating radiation nephropathy caused by total-body irradiation (TBI). Four groups of rats, control, TBI+vehicle, TBI+EET-A and TBI+captopril were studied 2 days post-TBI up to 12 weeks. Kidney, plasma, and urine samples were collected to assess renal injury. Vehicle TBI rats had higher systolic blood pressure (SBP) and impaired renal afferent arteriolar endothelial function compared to control. EET-A and captopril treatments mitigated elevated SBP and improved renal afferent arteriolar function. There was a 3-fold higher BUN level and 94-fold increase in albumin/creatinine ratio in vehicle rats compared to control. EET-A and captopril decreased BUN levels by 40-60% and albumin/creatinine ratio by 60-90%. Renal interstitial fibrosis, tubular and glomerular injuries were present in vehicle TBI rats, and lessened by EET-A and captopril. Overall, this study demonstrates a novel EET-analog based strategy to mitigate kidney injury in radiation nephropathy.

Wanner, JP

Development of a Trauma-Specific Quality of Life Measurement

Authors: Wanner, JP, deRoon-Cassini T, Kodadek L, Brasel K

Project Mentor: Karen Brasel, MD

Complex, disease-specific factors determine post-traumatic quality of life, but current practice utilizes outcomes generated from the general population. This study sought to develop a reliable trauma-specific quality of life measure. The trauma-specific QoL questionnaire (T-QoL) was administered to trauma patients (n=394) and a factor analysis was conducted. The validity of the final T-QoL measurement tool was assessed (n=111) using the SF-36v2 and the PCL-C. A 5-component structure using 43 items appeared to best represent the data. All subscales correlated negatively with the PCL-C ($p<.01$), demonstrating that as T-QoL increases, the likelihood of PTSD decreases. The T-QoL physical well-being subscale correlated significantly with the SF-36v2 physical component score as did the emotional well-being subscale with the SF-36v2 mental component score ($p<.05$). This study utilized the experiences of trauma victims to develop a five-component, 43-item questionnaire that can be used to impact research efforts and clinical care.

PODIUM

Watchmaker, Jacqueline

Ultrasound Imaging Improves Identification of Prominent Hardware

Authors: Watchmaker J, Daley R, Watchmaker G, Grindel S

Project Mentor: Roger Daley, MD, PhD

Fixation of distal radial fractures with volarly applied internal plates has become increasingly common. The accuracy of current techniques to select and confirm proper screw length can be limited by dorsal fracture communition. The purpose of our study was to compare the accuracy of ultrasound (US) to fluoroscopy in the detection of dorsally prominent screws and extend this prospectively into the clinical setting. Distal radius fractures were created in five fresh cadaveric arms and then internally fixated with volar locking plates. In the prospective clinical trial, ten patients with distal radius fractures were enrolled. Both cadaveric and clinical studies demonstrated that ultrasound could detect dorsally prominent screw tips not visible on fluoroscopy. In conclusion, ultrasound examination after volar plate fixation of distal radius fractures improves detection of dorsal screw prominence. Intra-operative use of US may help reduce post-operative tendon complications following fracture fixation.

Wilson, Jacob

Targeted inhibition of the AKT Pathway in Cholangiocarcinoma by MK2206

Authors: Wilson JM, Kunnimalaiyaan S, Kunnimalaiyaan M, Gamblin TC

Project Mentor: T Clark Gamblin, MD, MS; Stuart D Wilson, MD

INTRODUCTION: Cholangiocarcinoma (CCA) is an aggressive disease with limited treatment options. The PI3K/Akt/mTOR pathway is often dysregulated in CCA and we hypothesized that MK2206, an Akt inhibitor, would impact CCA viability. METHODS: Post treatment (MK2206; 0-2 μM) viability was assessed in CCLP-1 and SG231 (human CCA cells) using MTT assay. Apoptotic markers were examined using Western blot analysis. The effect of survivin depletion was also examined. RESULTS: CCLP-1 and SG231 viability was significantly reduced at MK2206 concentrations of 0.5, 1, and 2μM by 44%, 53%, and 64% (CCLP-1; $p=0.01$) and 32%, 32%, and 42% (SG231; $p<0.00005$) respectively. Western analysis revealed a decrease in AKTSer473, pro-caspase3, and pro-caspase9. Cleaved PARP and survivin had increased expression. Survivin siRNA further enhanced the antitumor activity of MK2206. CONCLUSIONS: By blocking phosphorylation of AKTSer473, MK2206 reduces CCA growth via apoptosis induction. Survivin and AKT inhibition may represent a viable synergistic treatment strategy.

Winter, Mark

Celecoxib Toxicity in Head and Neck Cancer is Mediated by Free Radicals

Authors: Bock J, Winter M, Broniowska K, Corbett J
Project Mentor: Jonathan Bock, MD

Celecoxib is a selective cyclooxygenase-2 (COX-2) inhibitor with antineoplastic activity in several human cancers including squamous cell carcinoma of the head and neck (SCCHN). For years this toxicity was assumed to be related to COX inhibition, but recent work shows celecoxib induces G1 arrest and inhibits RNA levels of DNA repair pathway proteins, suggesting it acts through other pathways to alter cell cycle mechanics and induce apoptosis. We hypothesized that celecoxib acts separate from COX-2 inhibition through induction of reactive oxygen species (ROS) formation. To evaluate this, we assessed ROS generation in SCCHN lines using HPLC detection of 2- hydroxyethidium (2-OH-E). ROS generation was confirmed with fluorescent staining for DHE, a surrogate of ROS production. Our results show celecoxib does induce ROS in SCCHN cells in a dose-dependent fashion within hours of administration, suggesting that this is a crucial step in is mechanism of action against head and neck cancers.

Zacharias, Anthony

Hepatic Artery Therapies for Unresectable Colorectal Liver Metastases

Authors: Zacharias A, Jayakrishnan T, Rilling W, Thomas J, George B, Johnston F, Gamblin TC, Turaga K.
Project Mentor: Kiran Turaga MD, MPH

Background Unresectable Colorectal Liver Metastases (CRLM) are increasingly being managed using Hepatic Artery Based Therapies(HAT), including Hepatic Arterial Infusion(HAI), Radioembolization(RE), and Transcatheter Arterial Chemoembolization(TACE). We hypothesized that outcomes of survival and toxicity were equivalent across the three strategies. Methods Meta-analysis was performed in Pubmed(2003-2013). Primary outcome was median overall survival(OS). Results Of 491 studies screened, 91 were selected – 52 HAI, 24 RE, and 14 TACE. Median OS(95% CI) in first-line HAT were RE 29.4 vs. HAI 21.4 vs. TACE 15.2 months. For patients failing at least one line of prior systemic therapy median OS was TACE 21.3(20.6-22.4) vs. HAI 13.2(12.2-14.2) vs. RE 10.7(9.5-12.0) months. Grade 3-4 toxicity was 40%, 19% and 18% in HAI, RE and TACE groups, respectively. Conclusion HAI, RE, and TACE are equally effective in patients with unresectable CRLM with marginal differences in survival.

Zajdel, Nicholas—POSTER

Evaluation of Laminin-332 Expression in Squamous Cell Mohs Samples

Authors: Zajdel N, Schock A, Duncan N, Olasz E, Lazarova Z
Project Mentor: Zelmira Lazarova, MD

Introduction: Mohs micrographic surgery (MMS) is currently accepted as the gold standard for treatment of cutaneous squamous cell carcinoma (cSCC) of the face. The success of MMS depends largely on the accurate interpretation of histopathologic sections. Here we evaluated the use of laminin-332 immunostaining in MMS samples of cSCC. Methods: Ten cSCC tissue samples and ten normal skin samples were processed by immunofluorescence studies for laminin-332. Pictures were taken to document expression of laminin-332 in tumor and surrounding stroma. Staining intensity was measured and compared. Results: In all 20 samples analyzed, there was a statistically significant difference between the fluorescence intensity of the tumor or basement membrane and the surrounding stroma ($p < 0.01$). Conclusions: Laminin-332 staining distinguishes cSCC tumor cells from normal stroma; therefore, there is the possibility of its use as an adjuvant stain during MMS. Next steps include conjugating this antibody for immunohistochemical analysis.

Zhang, Kun

SES Does Not Modify the Effect of Education Interventions on BP Control

Authors: Zhang K, Whittle J, Eastwood D
Project Mentor: Jeffrey Whittle, MD
Community Partner: Clement Zablocki Medical Center

Background: Educational interventions improve chronic disease self-management; it is unknown if persons with less education benefit equally. Methods: We compared changes in systolic blood pressure (SBP), weight, physical activity, and fruit and vegetable intake among 403 hypertensive veterans with <12 years, 12-15 years, or >16 years of education (college graduates) who were randomly assigned to two types of educational interventions- peer-led vs professional led. Results: At baseline, college graduates had greater health literacy, self-efficacy, and income. Baseline levels and changes in SBP, weight, and physical activity were similar across education levels; college graduates consumed more fruits & vegetables at baseline and increased intake more after the intervention (+0.4 versus -0.1 and -0.1, p=0.0142). The two types of educational interventions had similar effects. Conclusion: Educational interventions may improve SBP, weight, and health behaviors, but may not reduce socioeconomic disparities in health.

Zhang, Mengda

Association between Ondansetron and Significant Cardiac Events

Authors: Zhang M, Szabo A, Gummin DD, Zosel AE
Project Mentor: Amy E Zosel, MD, MSCS

Background: Ondansetron is an antiemetic linked to QTc prolongation, increasing the risk for sudden cardiac death. The aim of this study was to determine the association between ondansetron and cardiac events, specifically those requiring CPR. Methods: In this case-control study, case inclusion criteria included adult patients suffering significant cardiac event during their hospitalization, excluding those presenting with cardiac arrest. Controls were matched to case patients by admission diagnosis. Charts were reviewed for ondansetron administration 24-hours prior to the case patient's cardiac event. Results: 230 cases and 1,059 controls were identified. 20% of the cases and 11% of the controls received ondansetron. A significant positive association between ondansetron use and significant cardiac events needing CPR (OR 1.67, 95% CI 1.1-2.5) was found. Conclusion: We found a positive association between ondansetron administration and significant cardiac events needing CPR in both adult and geriatric patients.

Zhao, Diana

Parathyroidectomy's Impact on Bone Density in Primary Hyparathyroidism

Authors: Zhao DW, Yen TW, Doffek K, Evans DB, Wang TS
Project Mentor: Tracy Wang, MD, MPH

In the US, about 1.5 million fractures occur annually due to osteoporosis, of which 1/3 are due to low-impact fall among the community-dwellin elderly. Primary hyperparathyroidism increases osteoclast activity, thereby decreasing bone density, putting on at risk for fractures. The effect of parathyroidectomy on bone mineral density in elderly patients have not been studied in the past. We divided our cohort into 3 different age groups, and compared the bone density at the hip, spine, and radius for our patients before and after parathyroidectomy. Results showed that elderly patients had lower increases in bone density whereas the younger patients had clinically significant increases in bone density after parathyroidectomy. We found that clinically significant increase in bone mineral density may occur more frequently after parathyroidextmoy in younger patients. Further analysis is required to determine if decreased bone density should remain an indication for parathyroidectomy in elderly patients.

Zilisch, Joseph

BACTH Assays to Elucidate PspA Signaling in MTB Stress Responses

Authors: Zilisch J
Project Mentor: Thomas Zahrt, PhD

Mycobacterium tuberculosis (MTB) is the etiological agent of the respiratory disease tuberculosis which is responsible for significant morbidity and mortality worldwide. In the clinically latent stage of MTB infection, the bacilli persist in a non-replicating state via major changes in gene expression in response to relatively harsh conditions at the site of infection. PspA is known to help maintain membrane integrity in Escherichia coli during times of membrane stress, but the role of a structurally similar protein in MTB (Rv2744c or MTB PspA) is currently undefined. My research involved studying the protein-protein interactions that MTB PspA has with other MTB proteins using BACTH screening assays, in an effort to better understand the regulation and effector functions of MTB PspA in clinically latent tuberculosis.

Thank you to the generous faculty that served as small group facilitators & instructors.

Jonathan Bock, MD	**Rebekah Gundry, PhD**	**Nicole Lohr, MD, PhD**
Amanda Brandow, DO, MS	**Keri Hainsworth, PhD**	**Hang Nghiem-Rao, MD**
Laura Cassidy, MS, PhD	**Bryon Johnson, PhD**	**Jeannette Vasquez-Vivar, PhD**
Amy Drendel, DO, MS	**Jennifer Knight, MD**	**Kevin Regner, MD, MS**
Allison Ebert, PhD	**Joanne Lagatta, MD**	**Richard Robinson, PhD**
Dara Frank, PhD	**Michael Lawlor, MD, PhD**	**Daisy Sahoo, PhD**
Mary Eapen, MBBS, DCH, MRCPI, MS	**E. Brooke Lerner, PhD**	**Monica Thakar, MD**
Julie Panepinto, MD, MSPH	**Michael Levas, MD**	**Nathan Thompson, MD**
Jon Gould, MD	**Scott Levick, PhD**	**Tom Zahrt, PhD**

Quality Improvement & Patient Safety

Geoffrey Lamb, MD & Catherine Ferguson, MD

Provides students with the core principles and skills necessary to understand and analyze the systems-based aspects of patient care, to actively engage in quality improvement work, and to enhance patient safety with the goal of achieving the best possible health outcomes for patients.

- Optimization of systems of care.
- Functioning as a member of the healthcare team.
- Principles of safety and medical error.
- A mentored quality improvement project.

Ajayi, Oluseun

Notch-1 Signaling in Parkinson's Disease: The Embryonic Loss of Notch-1

Authors: Ajayi O, Schmidt M, Hillmer R, Milan J
Project Mentor: Milan Joksimovic, PhD

Theoretically, neurons derived from embryonic stem cells can be used in midbrain dopaminergic (mDA) cell replacement therapies for Parkinson's disease. Since the Notch signaling system is critical for normal brain development, we hypothesize that one of the Notch receptors, Notch-1, is essential for the proper development of mDA neurons. We used the Sonic hedgehog (Shh)::cre driver to conditionally delete the Notch-1 gene in mouse embryos (Shh::cre,Notch1 conditional knockout (cKO)). Conversely, we stabilized the transcriptionally active component of Notch-1, Notch-1 IntraCellular Domain (N1-ICD), to generate Shh::cre,R26N1-ICD mutant embryos. Results showed increases in the mDA progenitor domain in the Shh::cre,R26N1-ICD mutants. Our results indicate that the N1-ICD promotes proliferation and the production of mDA progenitors. This finding can be applied to efficiently generate mDA progenitors in the cell cultures that, in turn, may be used as PD therapeutics in cell replacement approaches.

Amrhein, Jonathan—-POSTER

Increasing Effectiveness of the Emergency Department Team

Authors: Ferguson C, Amrhein JB
Project Mentor: Catherine Ferguson, MD

The use of imaging in the pediatric emergency department is a useful tool that must be balanced against the harms of use, which includes radiation, cost and resource availability. In early 2013 it was noted that the utilization of x-ray imaging at Children's Hospital of Wisconsin for children with bronchiolitis was 24%, well above the national benchmark goal set in literature. Therefore, a study was designed to test the effectiveness of feedback and an educational module for ED providers at CHW. Interestingly, data analysis showed that prior to beginning interventions, the rate of x-rays orders had dropped well below the intended goal of 15%. This led to a further analysis of imaging use in various pediatric respiratory illnesses such as bronchiolitis, pneumonia, and asthma at CHW and the impact of various departmental initiatives in reducing utilization.

Atchison, Taylor—POSTER

A Mobile-Health Tool for Food Allergy Anaphylaxis School Emergencies

Authors: Eldredge C, Atchison T, Ahsan G, Chiu A, White B, Patterson L, Ahamed S
Project Mentor: Christina Eldredge, MD, MS

The prevalence of school-aged children with food allergies is rising. During an anaphylactic episode, prompt recognition and treatment with injectable epinephrine is essential for survival. The aim of this project was to test the usability of a caregiver mobile health decision support application. Four teachers piloted the application through two food allergy case scenarios and provided feedback regarding its strengths and weaknesses. Teachers were observed for ability to identify anaphylaxis and correctly administer epinephrine. Results of the study showed that all participants correctly made the decision of whether or not to inject the epinephrine, but three out of four teachers failed to administer the epinephrine correctly in the first case scenario. In response to these results, several changes were made to the instruction screen that displayed pictures on how to correctly administer an epinephrine auto-injector. Future studies using the newly revised mobile application will be tested on more teachers with more case scenarios.

Benson, Kristine

Decreasing the Use of Filshie Clips for Postpartum Sterilization

Authors: Benson K, Klatt T
Project Mentor: Timothy Klatt, MD

INTRODUCTION: We learned that a few of our patients became pregnant after postpartum sterilization performed with Filshie clips. Recent literature shows a higher failure rate with this method (2). METHODS: We collected baseline data on our Filshie clip usage. A letter was drafted to send to faculty members who used Filshie clips after the intervention's start, 12/1/13. This letter summarized the recent literature and asked why they chose this method. Details of this project, including plans to publicly present only group data, were announced at a faculty meeting. We monitored progress monthly by reviewing billing data. RESULTS: Between 8/1/13 and 11/30/13, 20% (8/40) of postpartum sterilizations were performed with Filshie clips. The rate fell to 0% (0/31) between 12/1/13 and 3/31/14 (p=0.008). This 0% rate has been maintained to date. DISCUSSION: Our project decreased the use of Filshie clips for postpartum sterilization at Froedtert Hospital: a meaningful improvement in the quality of care we deliver.

Best, Benjamin

Use of Operative Measures for Evaluation of Proficiency in Neurosurgery

Authors: Best BJ, Sharma A, Wang MC
Project Mentor: Geoffrey Lamb, MD

Background: In the context of rapidly evolving graduate medical education, we evaluated the relationship of resident level of training, operative time, estimated blood loss (EBL), and perioperative complications in elective cervical spine surgery to better understand proficiency of neurosurgical residents throughout their training. We hypothesized that operative time and EBL would be inversely proportional to level of resident training and that there would be no difference in perioperative complications. Methods: Analysis of resident level of training, procedure time, and EBL among adult patients enrolled in a prospective observational study of health outcomes after elective cervical spine surgery for degenerative changes. Results: We found a higher level of resident training is associated with shorter operative times, however no differences in complications or EBL were observed. Conclusion: Unlike EBL and complications, operative time may serve as a potential metric to consider when evaluating proficiency.

Bodendorfer, Victoria—POSTER

Advanced Topics Mandated Reporter Training Module Project

Authors: Bodendorfer V, Sheets LK, Shah S
Project Mentor: Lynn K. Sheets MD, FAAP
Community Partner: WI CAN Leadership Team, DCF

See Shah, Seema, page 46

Bozeman, Jared

Controlling Clostridium Difficile at Froedtert: A Multifaceted Project

Authors: Bozeman J, Graham MB
Project Mentor: Mary Beth Graham, MD

Nosocomial infection with Clostridium difficile presents a clear and present challenge for Quality and Infection Control Departments around the world. The organism flourishes with conditions common in hospitals, including high antibiotic use, immunosuppression, and lax compliance with correct hand hygiene protocols. Froedtert Memorial Lutheran Hospital (Froedtert) has not been exempt from this challenge. Over the past year, I have worked with Froedtert's Infection Control team to evaluate measures to decrease the transmission of this pathogen. These studies reinforce the importance of sanitation for controlling C. diff. Thus, future work to limit C. diff will focus on cleanliness of patient rooms and the hands of healthcare providers. This will include both high tech sterilization tools as well as low tech measures to increase staff compliance with best practices.

Cheng, Doris—POSTER
Impact of Clinical Decision Support on CT Pulmonary Angiography

Authors: Cheng D
Project Mentor: Cesar A Lam, MD

Hospitals at the forefront have been adopting clinical decision support (CDS) into electronic medical record (EMR) in recent years. CDS is a sophisticated software that filters person-specific data in the EMR and analyzes it with best-practice guidelines to alert clinicians in real-time to make an informed decision. This is very attractive due to the massive amount of information that clinicians encounter. In December 2014, Froedtert Hospital implemented CDS in the Emergency Department (ED). Given that evidence-based imaging guidelines for suspected pulmonary embolism (PE) exist, and the common use of computed tomographic pulmonary angiography (CTPA) for the diagnosis of PE in the ED, we decide that it is an excellent target for evaluating the impact of CDS. We believe that optimal use of CTPA already existed in our ED before CDS, so we hypothesize that there is no significant difference in the number of CTPA ordered and no significant difference in the yield of CTPA positive for acute PE after implementation of CDS.

Croix, Michael
Recording Mental Status in Written Sign-outs

Authors: Croix M, Miller D, Whittle J, Singh S, Schapira M, Carnahan J, Kuester J, Kallio C, Framberg S, Fletcher K
Project Mentor: Kathlyn Fletcher, MD, MA

BACKGROUND: Delirium in hospitalized patients is associated with poor outcomes. Recognition of altered mental status allows for timely treatment. It is important that the care team is aware of mental status. Our objective was to evaluate mental status documentation in written sign-outs. METHODS: A retrospective cohort study of general medical patients. Participants included patients with and without mental status changes. Outcome measures 1) proportion of patients with mental status recorded in sign-outs; and 2) the proportion of patients with known mental status changes whose change in mental status was recorded. Results: Patients with mental status changes were more likely (37.3% versus 17.2%, $p<0.05$) to have mental status recorded in sign-outs than patients without mental status changes. Only 25% of patients with mental status changes had a change reflected in sign-outs. Conclusion: Recording mental status in written sign-outs is rare. Patients with mental status seldom had sign-outs reflecting mental status changes.

Davies, Jennifer—POSTER
Frequency of Steroid Stress Dosing to Adrenal Insufficiency Patients

Authors: Davies J, Maas D
Project Mentor: Diana Maas, MD

In patients with chronic adrenal insufficiency (AI), early treatment with stress doses of steroid is indicated in times of acute physiologic or emotional stress in the effort to avoid adrenal crisis. We aimed to evaluate the frequency, dosage, and timing at which stress doses of steroid are administered to patients with chronic AI in the ED and before invasive procedures at FH&MCW over a 57-month period through retrospective chart review. Overall, the stress dosing frequency was found to be 38% for all causes, all encounters (ED and procedural). Of ED encounters, 21.7% were stress-dosed, with an average arrival-to-administration time of 2.42 hours. Of patients presenting with vomiting or diarrhea, 43.2 % were given stress dosing; of patients presenting with fever, 39.5% were stress-dosed. Invasive procedures were stress-dosed 79.4% of the time. This data suggests that further QI interventions are warranted to promote more consistent and adequate treatment of patients with chronic AI. This data will assist to focus future interventions.

PODIUM

Doers, Matthew
Feedback to Achieve Improved Sign-out Technique

Authors: Doers ME, Beniwal-Patel P, Kuester J, Fletcher KE
Project Mentor: Kathlyn Fletcher, MD, MA

To maximize the quality of sign-out documents within our internal medicine residency, we developed and implemented a quality improvement intervention. We collected written sign-outs from general medicine ward teams and graded them using an 11-point checklist. We then gave in person feedback directly to the teams. Documentation of many of the 11 elements improved: mental status (22% to 66%, $p<0.0001$), decisionality (40% to 66%, $p<0.0001$), lab/test results (63% to 69%, $p<0.0001$), level of acuity (34% to 50%, $p<0.0001$), anticipatory guidance (69% to 82%, $p<0.0001$), future plans (35% to 38%, $p<0.0005$). The use of vague language declined (41% to 26%, $p<0.0001$). The mean total scores improved from 7.0 to 8.2 out of a possible 11 ($p<0.0001$). As new housestaff rotated onto the services, improvement over time was sustained with one feedback session per team per month. Similar interventions could be made in other programs and other institutions.

Grahl, Michael

Improving Time to First and Third B-Agonist for Asthma Exacerbations

Authors: Grahl M, Gray MP, Keeney G, Spahr C
Project Mentor: Matthew P Gray, MD, MS

According to national guidelines, all children presenting with an acute asthma exacerbation to the emergency department should receive up to three b-agonist (albuterol) treatments within the first hour of care. Prior to this study, our mean time in the Emergency Department for first b-agonist was 69 minutes and time to third was 132 minutes. Our aim was to decrease both times by 15%. The Model for Improvement and Plan-Do-Study-Act cycles were used to identify areas for improvement. Outcomes were continuously tracked on Statistical Process Control Charts and tools for special cause variation were used to identify improvement. Median time to first b-agonist decreased from 68 minutes to 35 minutes (33 minute decrease, -48.5%). Median time to third b-agonist decreased from 119 minutes to 93 minutes (26 minute decrease, -22%). We are still not at our goal of three b-agonist treatments within 1 hour. Meaningful improvement has occurred but further work is needed to meet national guidelines.

Hall, Derrick

The Feasibility of an M2 Completing an M3 Family Medicine Clerkship

Authors: Hall DE, Wenzel MK, Bower D, Patterson L
Project Mentor: Douglas Bower, MD

To address primary care physician shortages, the Medical College of Wisconsin Department of Family and Community Medicine is developing an accelerated MD program for Family Medicine (FM). The goal of this project was to determine if medical students could successfully complete the FM clerkship after only one year of medical school. Two rising M2 students piloted an early FM clerkship. Their success was evaluated using reflection essays, clinical field notes, exam scores, OSCE scores, and team-based learning session scores. The student fellows successfully completed all coursework and passed all examinations. Based on these results, we were able to conclude that it is feasible to complete the FM clerkship after only one year of medical school as part of an accelerated curriculum. To ensure the success of accelerated students, a preparatory course on the top 20 diagnoses in FM, as well as a clinical skills workshop should be implemented as part of the accelerated curriculum.

PODIUM

Hillen, Louise

Improving Physician Documentation of Pressure Ulcers in the ICU

Authors: Hillen L, Scanlon M
Project Mentor: Matthew Scanlon, MD, CPPS

Pressure Ulcers (PUs) are a serious, expensive and preventable injury that commonly occurs in the Pediatric Intensive Care Unit (PICU). Physician decisions regarding medications, nutrition and patient activity influence the development of PUs. Prior data shows a <10% rate of physician PU documentation and major discrepancies with nurse documentation. The aim of this study was to evaluate a Patient Safety Assessment Tool (PSAT) in the electronic health record (EHR) as a way to improve physician awareness of PUs as measured by physician documentation. Results of this study show that use of the PSAT in the EHR can improve physician documentation of patient skin status to 80%. Of 20 patients with known pressure ulcers, 100% were screened. Of those screens, 75% had accurate pressure ulcer status documented, and 70% had a correct assessment. Therefore, this tool leads to improved documentation of patient skin status, which may lead to improved patient care.

Le, Anh Vu—POSTER

Value Stream Mapping to Improve Diabetes Care

Authors: Meurer J, Pejsa P, Wiggins J, Le AV, Azam L, Kuehn E, Cui C, Garcia D, Guo M, Li L, Vanden Wymelenberg C, Knudson P
Project Mentor: John Meurer, MD, MBA

As the number of Americans coping with diabetes continues to grow, there is increasing pressure on clinicians to provide timely and effective services to these patients requiring intensified care. This project was intended to introduce value stream mapping (VSM) to medical and graduate students to enhance patient experiences and reduce waste in care processes. Seven medical and graduate students performed clinic observations of 28 adult patient visits for diabetes services in primary care clinics. Students, clinicians, and researchers collaborated to identify waste in care processes. After 2-3 months of VSM improvements, results of the Consumer Assessment of Health Providers & Systems survey demonstrated improved patient satisfaction exceeding 97%, better provider communication above 90%, timely access to care improved 68% to 80%, and staff courtesy and respect increased to 81%. This pilot QI project resulted in new, more efficient processes that enhanced patient experiences, which proved to be a useful learning experience for medical and graduate student collaboration.

Li, Luyuan—POSTER

See Le, Anh Vu, page 43 (above)

Lin, Christina
Informed Consent: How We Can Improve Patient Comprehension

Authors: Lin C, Montenero D, Stadler M
Project Mentor: Michael Stadler, MD

In current clinical practice, there is no standardized process established for obtaining informed consent (IC) from patients undergoing surgical procedures. We conducted a pilot study from May-July 2013 at an outpatient cancer center. 20 patients undergoing head and neck surgery agreed to a phone questionnaire about their IC experience and understanding of the proposed procedure. Intervention: we created surgery-specific checklists with the risks, alternatives, and post-op expectations and they were placed in all patient rooms. The surgeons were instructed to use them when consenting patients. Results: Surgeons covered 100% of the checklist vs. 76% of the checklist pre-checklist. Patient comprehension increased by 33%. We then did a literature review on if checklists have been used at other places and effectiveness of read back, printed handouts, or media on improving understanding. Conclusion: checklists are a novel concept that needs further studying since the other methods show only a modest positive effect on patient understanding.

Lofgran, Jeffrey
Preventing Infant Abusive Head Trauma: Assessing Compliance with Act 165

Authors: Lofgran J, Bretl D, Rabbitt, A
Project Mentor: Angela Rabbitt, DO

BACKGROUND: Abusive head trauma (AHT) in infants (Shaken Baby Syndrome) carries a mortality rate of up to 30%, with the majority of surviving infants suffering permanent neurological impairment. Prevention through parent education has been shown to reduce rates of AHT by 47%. Wisconsin's Prevent Violence Against Children Act (Act 165) requires all caretakers of children to receive education on the effects of AHT. AIM: Evaluate Children's Hospital of Wisconsin (CHW) compliance with Act 165 with documentation of AHT education for parents of all hospitalized infants 7 days of age or younger from September 2009 to August 2010. METHODS: Data collected from interdisciplinary teaching sheets and analyzed for documentation of AHT education (offering Health Facts written material and Period of PURPLE Crying® DVD). RESULTS: Of 237 eligible infants, 54% of parents received written materials and 54% were offered a DVD in the hospital. 43% took the DVD home. CONCLUSION: Compliance with Act 165 at CHW has improved from previously documented rates.

Loke, Dana
Implementation of a Standard ED Admission Assessment and Handoff

Authors: Loke D
Project Mentor: Christopher Spahr, MD

INTRODUCTION: The purpose of this project is to develop a standard emergency department (ED) to inpatient hand-off process. It is hypothesized that a standard assessment and communication process will result in higher quality handoffs and fewer unanticipated transfers to a higher level of care. METHODS: Baseline admission process and outcome measures, including timing and completeness of pre-admission assessments and staff ratings of handoff quality, were obtained and analyzed. RESULTS: At baseline, a standard pre-admission assessment was performed for only 2.1% of patients, while communication between the ED team 15 minutes prior to the nursing care handoff was documented for 35.7% of patients. DISCUSSION: There are large opportunities for improvement in standardizing the pre-admission assessment and communication. To accomplish this and positively impact outcomes, two interventions were identified and implemented: an ED Care Handoff Report for nurses and providers and a redesigned admissions workflow in the electronic health record.

Loranger, Austin—POSTER
Improving Acute Stroke Care at an Academic Medical Center (AMC)

Authors: Loranger A, Smeltzer B
Project Mentor: Edmund Duthie, MD

AMC ER data collection demonstrated a failure to meet acute stroke specific goal times (GT). The desired GT begins at onset of stroke symptoms (0 min) to the stroke team evaluation (10 min) and to the onset of CT (27.5 min). The AMC average time to the stroke team evaluation was 21 min and the average time to onset of CT was 65 min. For further exploration, a 5 question survey was developed and sent to the IM residents asking them about their familiarity with acute stroke care. Over 50% responded as being not familiar. The failure to meet GT and the responses to the survey established the needs assessment to develop and implement educational interventions, including an acute stroke simulation. To date, with 3 simulation runs the average time to stroke team evaluation was 8.25 min and onset to CT was 10.3 min. Targeted education can improve clinical outcomes.

Mabey, Sean—POSTER
Determining OR Traffic and Measures to Decrease It

Authors: Mabey SC
Project Mentor: Brian Law, MD

OR traffic has been shown to increase bacterial counts in the OR and presumably surgical infections as well; surgical infections make up a large portion of health care expenditures annually and lead to increased frustration, loss of work hours and morbidity for patients. My project monitored OR traffic to determine what OR personnel traffic in and out the most from incision time to close; and determined measures to minimize traffic. Hopefully these measures will lead to decreased traffic and infection rates if implemented.

Mirhoseini, Mina—POSTER
Novel Coding System to Classify 30-day Readmissions of Injured Patients

Authors: Mirhoseini MF, Milia D
Project Mentor: David Milia, MD and John Weigelt MD, DVM, MMA

BACKGROUND: Hospital readmissions are used as a quality metric supported mostly by research in chronic disease populations. Injury represents an acute event and reasons for readmission may differ and not be related to quality of care. METHODS: Thirty-day readmissions data were collected on discharge disposition, time to readmission, readmission location, and reason for readmission then coded using our novel system. RESULTS: Our data showed a readmission rate of 6% over 22 months. The most common reason was planned procedure (26%). Unplanned readmissions were primarily new medical problems (25%) and procedure-related complications (21%). Most patients were readmitted through the ED (47%) followed by clinic (13%). CONCLUSION: Hospital readmissions after injury should be used with caution as a quality metric. A coding system may assist in characterizing readmissions and offer guidance in lowering these rates.

Morey, Ben
Reducing Defects via Lean Principles in an Outpatient Cancer Clinic

Authors: Morey BP, Charlson JA
Project Mentor: John A Charlson, MD

The increasingly large patient load at the Froedtert and Medical College of Wisconsin Cancer Center has led to an upturn in defects. In the Breast Care Clinic, unsigned chemotherapy orders are a particular problem. This is largely due to the fact that patients who are visiting the Day Hospital to receive chemotherapy following their appointment can be delayed. In an effort to reduce unsigned orders, a “huddle” was designed whereby providers could meet in the morning and review the agenda for that day's clinic. The aim was that this “huddle” would allow fewer errors to go unnoticed. The number of unsigned orders was collected via chart review for a period of 8 weeks before, and 6 weeks after this intervention. The average number of unsigned orders per week declined from 3.88 to 1.83 following the implementation of the “huddle.” This reduction in chemotherapy order issues demonstrates the successful application of lean principles to an outpatient cancer clinic, and facilitates the relief of unnecessary patient and provider stress.

Nix, Kathryn—POSTER
Physician and Patient Perceptions of Clinical Trial Enrollment Barriers

Authors: Nix KA
Project Mentor: John Burfeind, MD

Clinical trials assess the safety and efficacy of potential treatments and represent an important treatment option for cancer patients. However, participation is low, possibly due to multiple factors at the level of the institution, physician, and patient. To assess local factors impeding trial participation, a survey of 19 physicians was conducted, followed by a focus group of 7 patients recruited from cancer center clinics. Physicians viewed lack of logistical challenges and patient awareness and interest to be the most common barriers to trial enrollment, and cited the need for increased physician awareness of trials and new tools to facilitate easier trial identification prior to an initial office visit. Code mapping of recurrent themes from the focus group showed similar perspectives among patients. Patients cited the strong influence of the doctor-patient relationship in decision-making, need for more user-friendly materials to educate patients, and need for access to feedback from patients who have participated in trials.

Potratz, Laurie—POSTER
Contributors to Inpatient Workload: A Focus Group Study

Authors: Simonds L, Schmidt J, Asan O
Project Mentor: Kathlyn Fletcher, MD

Physician workload is most commonly defined as patient census. However, there are many other important factors that are not considered when using this definition. The goal of this study was to identify additional factors that influence workload and to organize them into a conceptual model. We conducted five focus groups with a total of 15 internal medicine residents and interns using a semi-structured interview guide to identify contributors to workload. Focus groups were transcribed and coded in two ways. First we used an inductive (open-coding) strategy. These codes were then grouped into larger categories. Second, we used deductive coding to assign text to a previously described model, the Systems Engineering Initiative for Patient Safety model (SEIPS model). After analysis, 88 codes were identified, and these were grouped into 18 different categories. Each code also fit into SEIPS model. Combined, these codes give an accurate representation of the factors that contribute to the workload of inpatient physicians.

Ratto, Dominic
RBC Membrane Damage upon Injury by Washing & Centrifugation of Blood

Authors: Larson MC, Ratto DS, Burdge AL, Hillery CA, Punzalan RC, Hogg N
Project Mentor: Neil Hogg, PhD

Washing donor blood removes plasma/hemolysate. However, washing may damage RBCs. In this study, we characterized the effects of washing and centrifugation of blood on membrane integrity. Newly outdated donor units were washed per standard protocols, and morphology, phosphatidylethanolamine (PE) externalization, and cell-free hemoglobin examined as measures of membrane damage and frank hemolysis. The effect of centrifugation or dilution alone was also observed. Washing newly-outdated donor units immediately altered RBC morphology, increased PE exposure, and resulted in increased hemoglobin release by 18 hours after. Centrifugation alone altered cell morphology and caused hemoglobin release. Dilution alone was associated with hemoglobin release after 18 hours. These findings of bilayer derangement and hemoglobin release after washing/centrifugation were confirmed in fresh whole blood. Washing potentially mitigates the benefits of hemolysate removal, with cell-free hemoglobin reaching or exceeding pre-wash levels 4 to 18 hours after wash.

Schwerin, Ashton
Physician Documentation of Central Line Reason for Use

Authors: Schwerin A, Scanlon M
Project Mentor: Matthew Scanlon, MD

Central venous lines (CVL's) are a necessary part of medicine yet they are associated with risk of infection, thrombolytic and mechanical complications (McGee and Gould 2003; Polderman and Girbes, 2002). A gold standard for reason for use (RFU) of CVL's does not exist, so the aim of this study is to identify reasons for CVL use in a cohort of pediatric patients. This was a retrospective chart review of the 46 most recent patients without blood stream infection (BSI) in addition to the 10 most recent patients with BSI with known CVL use and removal as of July, 2013. In absence of a gold standard, categories for RFU found in literature were selected and searched for in procedure and daily progress notes. We found that 77/363 (21.2%) of line days had no identified RFU, suggesting that these line days may be unnecessary.

Shah, Seema—POSTER
Advanced Topics Mandated Reporter Training Module Project

Authors: Bodendorfer V, Sheets LK, Shah S
Project Mentor: Lynn K Sheets MD, FAAP
Community Partner: WI CAN leadership team, DCF

One in 10 of all U.S. children experience child maltreatment each year. Currently, health care professionals under-report suspicions of child maltreatment for multiple reasons including a lack of confidence and training. Although many states offer basic training modules for mandated reporters, most do not address the complexity of decision-making regarding reasonable suspicion and challenging cases. The threshold for reporting is "reasonable suspicion," yet interpretation of this is highly variable and contributes to confusion about when to report. Our module was developed to address the concept of reasonable suspicion and provide challenging scenarios to improve the decision-making capacity and confidence of health care professionals. A randomized trial is being conducted comparing the Wisconsin basic module alone versus the basic plus advanced module with medical students, Pediatric residents, and Pediatric fellows. We hypothesize that our module will improve confidence and decision making in regard to reporting child maltreatment.

Shepherd, Shanta—POSTER
Outcome of Congenital Diaphragmatic Hernia with Late Repair

Authors: Shepherd ST, Kim UO, Khmour AY, Malik H, Basir MA
Project Mentor: Mir Abdul Basir, MD

Background: Pulmonary changes in the first postnatal week support non-emergent repair of congenital diaphragmatic hernia (CDH). However, prolonged mechanical ventilation and delayed enteral nutrition are associated with increased neonatal morbidity. Objective: To determine whether infants undergoing late repair [≥8 days] will have worse pulmonary and gastrointestinal outcomes than similar infants undergoing early repair [≤7 days]. Methods: Inclusion criteria: intubation within 24 hours of life and surgical repair. Exclusion criteria: birth weight <2 kilograms, extracorporeal membrane oxygenation use, and anomalies. Results: Infants repaired late were more likely to have longer post-operative ventilation days, require oxygen on discharge, and take longer before taking full enteral feeds post-operatively. Conclusions: Infants with late repair had worse pulmonary and gastrointestinal outcome than similar patients who were repaired. The impact of longer mechanical ventilation preoperatively and delayed enteral feedings should be considered.

Shumpert, Stephen
Intraoperative Antibiotic Re-dosing Standardization at FMLH

Authors: Shumpert S, Wiedenhoeft C, Mann D, Zimmanck R, Kuo C
Project Mentor: Catherine Kuo, MD

Introduction: The timing of intraoperative antibiotic redosing at FMLH is currently inconsistent among providers. We sought to improve redosing practices by creating standardized resources for anesthesia providers. Appropriate redosing will decrease infection rates and avoid patient exposure to excess medication. Methods: We evaluated current redosing practices by surveying providers and analyzing medical records. We made up-to-date redosing guidelines easily available, encouraged their utilization, and then measured for improvement. Results: Medical record data analysis revealed an improvement of clindamycin redosing rates from 54% to 65% (n=185). Our survey of providers suggests a more unified knowledge of appropriate redosing intervals. The utilization of the resources we created has expanded to include additional important perioperative materials. Conclusions: Our project resulted in the improvement of appropriate antibiotic redosing rates. The reference materials we created are currently being effectively utilized.

Yip, Derek—POSTER
Reducing Froedtert ED Diversion Rates with Pre-Divert Status

Authors: Yip D, Rubin J
Project Mentor: Jonathan Rubin, MD

The rate of ambulance diversion by Froedtert Emergency Department has significantly increased in the past one year. A new pre-divert status was created in an attempt to reduce diversion. Pre-divert is declared by the shift flow coordinator when any one of several conditions occurred and would then initiate a specific action based on the triggering condition. This project implements Lean principles to evaluate the use and effectiveness of the pre-divert status. A process map has been created to depict the triggers and standard work of pre-divert and divert statuses. Paper forms were given to shift flow coordinators to document ED conditions when either status was triggered. Current results demonstrate that the number of times divert status has been declared is greater than that of pre-divert status. Many diverts were not preceded by pre-diverts, indicating pre-divert status criteria may need possible revision to better anticipate diversion.

Urban & Community Health

Linda Meurer, MD, MPH, and Rebecca Bernstein, MD, MS

Links education with community needs and assets to prepare students to effectively care for patients in urban communities, promote community health & reduce health disparities. UCH emphasizes:

- Balance between biologic and non-biologic health determinants
- Health conditions that disproportionately affect urban, underserved communities
- Community engagement principles and practice
- Cultural humility and the impact of bias on health care outcomes

Beck, Megan—POSTER
Providers' Experience with Sex Trafficking Victims

Authors: Beck ME, Lineer MM, Melzer-Lange M, Simpson P, Nugent M, Rabbitt A
Project Mentor: Marlene Melzer-Lange, MD

Objective: Sex trafficking (ST) victims have unique medical and psychological needs and are difficult to identify. We sought to evaluate knowledge gaps of providers, to demonstrate the importance of provider training to meet a ST victim's specific needs, and to identify barriers to the care of victims. Methods: A survey was sent to 500 providers in various specialties throughout the Milwaukee metropolitan area. Results: Response rate was 37%. 63% had previous ST training and were significantly more likely to report ST as a major problem locally, to have encountered a victim in their practice, and to have greater confidence in their ability to identify victims ($p \leq 0.001$). The greatest barriers to identification of victims were a lack of training (34%) and awareness (22%). Conclusion: Providers demonstrate minimal knowledge and awareness of ST that correlate with their limited experience. Training is crucial to improve the identification and care of victims.

Blonsky, Sarah—POSTER
Fostering Interest in Health Careers at James Madison Academic Campus

Authors: Blonsky S, McMillan D, Stewart R, Meurer L
Project Mentor: Linda Meurer, MD, MPH
Community Partner: Dasmond McMillan of Milwaukee Area Health Education Center's Youth Health Service Corp; Roosevelt Stewart of James Madison Academic Campus

Purpose: To increase minority student interest in health careers. Methods: MCW medical students partnered with Milwaukee Area Health Education Center's Youth Health Service Corps (YHSC) and James Madison Academic Campus (JMAC) to lead monthly sessions to increase health career knowledge. Sessions included medical case studies, jeopardy, college prep, and hands-on simulations. JMAC students evaluated sessions on satisfaction and learning (scale: 1-5). YHSC post-tests measured attitudes toward college, knowledge of health careers and accomplishment of personal goals. Results: 16 JMAC students attended at least one session (15 African American, 1 white). They rated sessions highly for enjoyment (4.4) and learning (4.6), and favored hands on activities. Students were able to name more health careers after the program, and reported meeting their personal goals. Participant attendance and engagement varied. Conclusions: This program nurtures minority student interest in healthcare careers. Evaluations will inform program improvements.

Browning, Keely—POSTER
Promoting Health Literacy in SET Ministry Health Education Curriculum

Authors: Browning KB, Burns EA, Whittle J
Project Mentor: Edith Burns, MD
Community Partners: Susan Yee, CSW, Sandra Smith-Dill,LCSW, Carolyn Giersch, CSW of SET Ministry, Highland Grdns

Rationale: One barrier to patient self-management is low health literacy. To improve community health knowledge, medical students have been presenting monthly health topics for 4 years to clients of SET Ministry living at Highland Gardens. SET administration expressed concerns about comprehensibility of presentations. My project aims to accommodate low health literacy participants. Methods: I designed presentation guidelines for students and conducted a survey to collect community input on presentations. I designed a workshop in which students help SET clients improve collaborative decision-making skills for healthcare. A health literacy assessment and post-workshop survey are being conducted to evaluate workshop success. Results/Discussion: Data collected from SET clients will be described. It is anticipated that the workshop evaluation will reveal a correlation between health literacy and self-reported likelihood to use collaborative decision-making skills at future health appointments.

Chapman, Kayla—POSTER

Wisconsin Physician Survey on Provider Opinions About Obesity Management

Authors: Chapman K
Project Mentor: David Nelson, PhD, MS
Community Partner: George L Morris III, MD; Maharaj Singh, PhD of Aurora Health Care

Although obesity screening and interventional recommendations exist to guide clinicians, the diagnosis of obesity is frequently omitted from a patient's problem list and weight related counseling is oftentimes not provided. The purpose of this study was to determine the frequency in which obesity is placed on the problem list, to identify resources available for the referral of patients with obesity, and to discover physician beliefs about the adequacy of obesity training. Thirty percent of respondents reported always adding obesity to the problem list when present. The availability of weight consultation referral sources was reported by 64%, but only 2% reported always providing referrals. "Significant" (Likert scale = 5) training in obesity counseling during medical school and residency was reported by 2% and 3% of respondents, respectively. Further steps need to be taken to develop potential solutions to improve the outcomes of patients with obesity.

Cui, Chen

Population Health Improvement: Focus Groups for Type II Diabetes

Authors: Cui C, Young S, Meurer J
Project Mentor: John Meurer, MD, MBA

Introduction: Diabetes care is a growing burden on Wisconsin, negatively impacting health outcomes and increasing health care costs. With the goal of improving diabetes control, the Population Health Improvement project utilized focus groups to help understand the preferences for diabetes care of patients and employees with diabetes. Methods: A total of eight facilitators conducted 21 patient focus groups interviewing 115 participants representing 11 sites including primary care, internal medicine, bariatric surgery, and employees. Participants were questioned about their diabetes care, self-care strategies, and barriers to ideal self-care. Results/Conclusion: Analysis of interview transcripts generated themes of health education, costs and finances, and communication and coordinated care. These results will be used to create validated surveys rating participants' priorities in improving patient care.

DeValk, Jessica—POSTER

Addressing Obesity Through Fitness, Nutrition and Medical Clinic Garden

Authors: DeValk J, Helm R, Ovide J
Project Mentor: Robin Helm, MD
Community Partner: Jenny Ovide, RN of Wheaton Franciscan Healthcare All Saints, Barton Elementary School

Introduction: The Fitness and Nutrition Club (FAN Club) program began in 2009 through a partnership between Wheaton Franciscan Family Care Center and Barton Elementary School. A curriculum of six, half-hour lessons was developed for third graders. Session topics include basics of metabolism, food groups, exercise, and gardening. Students participate in a field trip to the clinic to plant vegetable gardens and return the following fall to sample produce. Objective: To assess the effectiveness of the clinic visits and FAN Club program curriculum. Methods: Student questionnaires were developed to address the above objectives. Results: Questionnaires showed 64% of students calculated calories in a three-serving soda, 67% reported exercise balances calorie intake, 87% of students brought their tomato plant home, 83% planted it and 68% grew tomatoes. Conclusions: Questionnaire data suggest that students retained key concepts taught during FAN Club lessons. Gardening activities are beneficial as most students grew tomatoes.

PODIUM

El-Arabi, Ahmad

The Food Doctors: A MyPlate-focused Nutrition Education Program

Authors: El-Arabi AM, Johnston B, Tuomela K, Nelson DA
Project Mentor: David Nelson, PhD, MS
Community Partner: Jim Flint of Lake Valley Camp; Jamie O'Sullivan of Milwaukee Academy of Science

INTRODUCTION: There is need for effective nutrition education especially in underserved communities where health disparities are greatest. The purpose of this project is to determine the effectiveness of *The Food Doctors* (TFD), a MyPlate-focused nutrition education intervention, to improve nutrition knowledge in children. **METHODS:** TFD consists of 3-one hour lessons, where students cover key components of MyPlate and learn tools to differentiate nutritious from less nutritious foods. Participants were surveyed at the start and end of each session to evaluate knowledge gains. **RESULTS:** 83 students participated in the study and showed an improved understanding of many MyPlate-centered nutrition topics including knowledge of MyPlate having 5 food groups and ability to identify those 5 food groups. **CONCLUSIONS:** There is currently little research determining the effectiveness of the MyPlate guide as a nutrition education tool for elementary schoolers. *The Food Doctors* program is an effective tool to teach MyPlate-focused topics.

Ellsworth, Allison—POSTER

Corner Store Projects in Review: Common Challenges and Lessons Learned

Authors: Ellsworth AK
Project Mentor: Staci Young, PhD
Community Partner: Jesse Tobin of Lindsay Heights Neighborhood Health Alliance; JoAnne Sabir of Walnut Way Conservation Corporation

In an effort to respond to the nationwide obesity epidemic and gross disparities in food access, healthy corner store (HCS) projects have gained much popularity in recent years. Although detailed reports are abundant, further analysis and review of national efforts is lagging, missing a critical opportunity to learn from common challenges and successful strategies of completed projects. In this report, five healthy corner store projects from cities across the country have been analyzed in order to identify successful strategies that may guide current or future corner store projects. HCS Projects were chosen based on the thoroughness and completeness of the project reports and the diversity of scale and implementation strategies. Results showed that common problems for HCS projects involved supplying stores with produce in a cost-effective and sustainable way, whereas common lessons learned included the importance of community support, educating store owners, and aggressively marketing fresh produce to customers.

Harvey, Julie

Impact of CPAP Therapy on Quality of Life in Patients with OSA and COPD

Authors: Harvey JF, Eastwood D, Antonescu-Turcu A
Project Mentor: Linda Meurer, MD, MPH

Overlap syndrome, chronic obstructive pulmonary disease (COPD) and obstructive sleep apnea (OSA) in the same patient, is a condition causing more morbidity and mortality compared to either disease alone. We hypothesized continuous positive airway pressure (CPAP), a treatment for OSA, may improve COPD-associated symptoms. We recorded the effects of CPAP on health-related quality of life (HR QoL) in patients with overlap syndrome and OSA alone to determine the benefit of CPAP between those groups. We demonstrated a strong reduction in HR QoL associated with both OSA and overlap syndrome and the ability of CPAP to improve HR QoL in both sets of patients. However, there was no significant improvement in overlap patients when compared to OSA only. The lack of difference between the groups may be attributable to small sample size and poor compliance. Further studies are needed for conclusive results.

Johnson, Kali

High Risk Crack Use & HIV: A Community-based HIV Prevention Intervention

Authors: Johnson K, Dickson-Gómez J, Bodnar G
Project Mentor: Julia Dickson-Gómez, PhD
Community Partner: Gloria Bodnar of FUNDASALVA

Introduction: Crack users in San Salvador, El Salvador are at high risk for HIV due to risky sexual behaviors. Globally, few HIV prevention interventions target crack users. Specific Aims: Examine HIV prevention workshop implementation in San Salvador for crack users facilitated by former crack users. Workshops were one component of a multi-level, community-based intervention. Methods: Took field notes on facilitator training and workshops. Coded notes with MAXQDA Qualitative Data Analysis Software to explore themes. Results: Codes demonstrated facilitation style influenced quality of participation and sharing of experiences with drug use and risky sex, allowing exploration of harm reduction. After workshops, participants reported intention to change high-risk behaviors. Conclusions: Results highlight importance of qualitative observation to evaluate intervention implementation. While all facilitators were former crack users, varying styles influenced participation in intervention, a crucial tool to reinforce harm reduction.

PODIUM

Johnston, Bryan

The Food Doctors: A MyPlate-focused Nutrition Education Program

Authors: El-Arabi AM, Johnston B, Tuomela K, Nelson DA
Project Mentor: David Nelson, PhD, MS
Community Partner: Jim Flint of Lake Valley Camp; Jamie O'Sullivan of Milwaukee Academy of Science

See El-Arabi, Ahmad, page 49

Joshi, Neerja
The Affordable Care Act and Specialty Access for the Uninsured Program

Authors: Joshi N, Stadter G, Neuner J, Fangman J
Project Mentor: Joan Neuner, MD, MPH
Community Partner: Milwaukee Health Care Partnership

Introduction: SAUP patients at Froedtert Hospital (FH) achieved high insurance gains during the first ACA enrollment period. This project compared gains in public insurance by SAUP patients to the uninsured populations of Milwaukee County and Wisconsin to determine whether access to highly coordinated care impacted insurance gains. Methods: Health insurance data from the 2013 American Community Survey and Wisconsin's Forward Health Portal was compared to an internal analysis of insurance gains by SAUP patients. Results: 81% of SAUP patients at FH had insurance by March 31st, 2014 with 96% having public insurance. Only 17% of the uninsured population of Milwaukee County could have gained public insurance by the March deadline; only 7% of the uninsured in Wisconsin made similar gains. Implications: Access to coordinated care may have led to greater insurance gains for SAUP patients. This highlights opportunities for institutional expansion of community benefit beyond charity care, such as care for undocumented patients.

Keyes, Julia
Community Assets Supporting Health in African American Women

Authors: Keyes J, Burns E, Topp R, Harris A, Horner-Ibler B, Salas-Harris K, McKinney E, and Nelson D
Project Mentor: David Nelson, PhD, MS
Community Partner: Barbara Horner-Ibler, MD of The Bread of Healing Clinic

Background: Asset-based community development (ABCD) is a model to help understand a variety of contexts by offering insight into existing strengths, allowing communities an opportunity to solve problems and build supportive networks to facilitate health. The purpose of this project is to understand individual and community assets that support healthy eating and active living for African American women. Methods: Individual, semi-structured interviews were conducted with six women, members of a community advisory board for a research project. Interviews lasted 60-75 minutes, were audio- recorded, transcribed, and coded for major themes. Results: Various themes emerged that encompass both individual and community assets including knowledge about healthy eating and active living, social support, role modeling, and community experts. Implications: Identification of community assets has the potential to facilitate community development and chronic disease prevention, especially in areas thought to be lacking in resources.

Kim, Brian—POSTER
Epidemiologic Study of Cardiac Deaths & Socioeconomic Status in Milwaukee

Authors: Kim BT, Choi BW, Ahn KW, Rein LE
Project Mentor: Byung-il Choi, MD
Community Partner: Milwaukee Medical Examiners Office

Milwaukee is one of the most racially segregated cities in the nation. In Milwaukee Health Report 2012 written by Center for Urban Population Health demonstrates the close relation between socioeconomic status (SES) and health behaviors that affect mortality outcome. A summary report of deaths from year 2008 to 2012 was provided by the Medical Examiner's Office. Only deaths due to cardiac origin were included. Mortality rate was calculated with population data from Census 2010. In 2008, lower, middle and higher SES groups had significantly different rates of sudden cardiac death; 7.0, 8.4 and 5.6 per 10,000 person years respectively with P-value of 0.0019. The rates for lower and middle SES continuously decreased until 2012 to 5.1 and 5.7 and the difference compared to higher SES of 4.8 was no longer statistically significant. This study shows overall reduction in rates of sudden cardiac deaths mainly in lower and middle SES groups in city of Milwaukee from 2008 to 2012. I hypothesize that this is due to decrease in uninsured rate.

Klotz, Kelly
Foster Care Patients: 30-Day Visit Diagnoses and Referrals

Authors: Klotz K, Zetley L
Project Mentor: Lisa Zetley, MD

INTRODUCTION: Every child that is newly entering foster care requires a comprehensive health assessment within 30 days of being removed from their home. This project tracks diagnoses and referrals made at the 30-day visit, focusing on behavioral health needs. METHODS: A chart review of 65 foster care patients was conducted at one primary care clinic. Acute issues for each patient were recorded as well as mental health referrals. REDCap was used to enter and analyze the data. RESULTS: Preliminary data shows that 40% of patients had some form of behavior concern documented as an acute issue or diagnosis. However, of the patients where mental health counseling was deemed applicable, 13 charts had no documentation of this issue being addressed. CONCLUSIONS: Youth in foster care have complex medical needs. Mental health counseling, individualized education planning and birth-to-three services must be considered at every 30-day visit. A template should be created to ensure that these topics are being discussed and documented in the chart.

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Kuhn, Peter—POSTER
Identifying Health Concerns in Urban LGBT Youth

Authors: Kuhn PB, Petroll AE
Project Mentor: Andrew Petroll, MD, MS
Community Partner: Jasmia Goss, Diana Shaw and Carla Peña of MKE LGBT Community Center

LGBT youth experience numerous psychosocial challenges and health disparities. While these problems have been consistently identified by previous research, the self-identified health concerns of LGBT youth have received less attention. This project sought to elicit the health-related concerns and priorities of urban LGBT youth. We conducted five focus groups with youth ages 13-24 at the MKE LGBT Community Center. Each session addressed a different health topic chosen by youth at a prior meeting. Focus groups were recorded and analyzed to identify common themes. Major concerns include: 1) healthy dietary choices; 2) fear of HIV infection and distrust in sexual partners; 3) coping mechanisms; 4) depression, suicide, and violence in their community. Frequently cited health disparities of LGBT youth represented only part of the concerns commonly identified by participants in our sample. Designing programs to address issues most important to youth may provide opportunities to engage them in health promotion activities and healthcare.

PODIUM

Lam, Janna
Improving Access to Vision Care Through Eyeglasses Recycling

Authors: Robertson K, Lam J, Robertson W, Bernstein R
Project Mentor: Rebecca Bernstein, MD, MS
Community Partner: Debbie Minsky-Kelly, MSW, LCSW of Repairers of the Breach; Bronze Quinton, ABOC of Bronze Optical; The Milwaukee Women's Center

See Robertson, Kirstin, page 54

Lewis, Marissa—POSTER
Cell Phone Application Use to Aid in Patient Compliance

Authors: Lewis M
Project Mentor: Stuart Berger, MD

The term Sickle Cell Disease (SCD) is used to describe various conditions associated with sickled red blood cells. The current recommendation for many individuals with SCD includes hydroxyurea therapy; unfortunately the SCD population has demonstrated low compliance. This project aims to determine if existent free cell phone applications are helpful for improving compliance in people with chronic conditions such as SCD. Cell phone applications were chosen based on several factors including cost, ease of use, alarm capability, and access without Internet. Two adult research participants with SCD piloted the chosen applications for one month each and reviewed their experience using a standardized questionnaire. The result of the study showed that the applications were minimally beneficial to the participants. None of the applications were determined to be useful long term. Future studies with a larger participant pool and improved applications may help better identify the potential role technology could have in patient compliance.

McKenna, Edward—POSTER
Determining Health Literacy Needs and Interests Among Homeless Men

Authors: McKenna EM
Project Mentor: Sabina Diehr, MD
Community Partner: Guy Tymorek of The Guest House

Rationale: Greater than 23,000 residents in Wisconsin were homeless in 2012, the vast majority residing in urban areas. Health literacy and access to resources are challenges faced by many homeless individuals. The aim of this project was to establish a partnership with a community homeless shelter and allow the residents to determine the areas of health literacy they deem most beneficial. Through a partnership with The Guest House of Milwaukee a needs assessment survey was distributed and analyzed to define the health literacy topics reported as most desired by the residents. A secondary aim was to determine the effectiveness of small group discussion at improving knowledge in the desired health literacy topics. Results: 47 homeless men responded to the survey; information on drug and alcohol abuse, smoking, and mental health were the most requested topics. Follow up surveys demonstrated the effectiveness of small group discussion on improving health literacy.

McLaren, Hillary
Youth Health Service Corps Evaluation

Authors: McLaren HE, Lettelier S, McMillan D, Cargile T
Project Mentor: Linda Meurer, MD, MPH
Community Partner: Suzanne Letellier of the Milwaukee Area Health Education Center

The Milwaukee Area Health Education Center's Youth Health Service Corps (YHSC) is a pipeline program to increase racial/ethnic minorities in health careers. This project evaluated how well YHSC is meeting its goals of increasing: member and community partner engagement, gender diversity, awareness of/interest in health careers, and preparation for enrollment in post-secondary education. Data included: participant demographics and academic markers; process measures (attendance and volunteer hours); end-of-program attitudes and career plans, and results of a member focus group. In 2012-2013, 37% of 147 members completed the survey. Of all members, 88% are female and 52% are black. Meeting attendance varied widely among schools. Most participants reported that as a result of the program, they feel responsible for helping others, get better grades, and learned about health careers. About 90% plan to pursue a health career in college. The evaluation shows the program is meeting its goals and suggests areas for continued improvement.

Moral, Francesca—POSTER
Engaging Adverse Childhood Events in the Family Unit

Authors: Moral F, Johnson S
Project Mentor: Sheri Johnson, PhD
Community Partner: Leah Jepson and Luke Chojnacki of SET Ministry, Inc.

Research has shown that ACEs (Adverse Childhood Events) result in poor developmental and health outcomes and that early intervention is key in prevention of these outcomes. SET Ministry's PEACE Program is a school-based, trauma-informed preventive service that has been shown to help school-aged children manage stress and negative emotions related to ACEs in non-violent, productive manners. Two years ago, family nights were created to strengthen the program by engaging the family unit instead of just the child. A survey was developed and distributed to the target population. From the collected results, it was determined that families were mostly concerned with education and prevention of chronic disease, smoking cessation and how to find safe family activities.

Narloch, Tyler—POSTER
Pain Assessment Tools for Children with Special Needs

Authors: Narloch T, Gordon J
Project Mentor: Gordon John, MD
Community Partner: Tracy Sparrow of Milwaukee Center for Independence

Self reporting is the gold standard of pain identification. Children with severe special needs are a specific patient population that does not have the ability to actively report their pain, so an alternative method must be used. The Milwaukee Center for Independence (MCFI) special needs pediatric skilled nursing program faces this challenge. Their nurses currently use the Face Legs Activity Cry Consolability (FLACC) scale, which has shown to have reasonable inter-rater reliability and validity for children with special needs. However, consensus among the nurses was that it offered little value over their own clinical judgment. In depth literature review revealed other pain assessment tools specifically designed for children with special needs. Of those, the revised FLACC (r-FLACC) showed the most clinical utility when directly compared with some of the other scales. Based on the potential benefits of having an improved way assessing pain, incorporation of the r-FLACC has begun at MCFI.

Ondusko, Devlynne—POSTER
Those Who Forget the Past are Doomed to Repeat It

Authors: Ondusko D, Wright N
Project Mentor: Ileen Gilbert, MD

Big tobacco has overtly and covertly advertised to targeted audiences - youth, minorities, and women - for decades to influence the transition and maintenance from non-smoker to smoker. Targeted strategies and heavy advertising in areas predominated by these groups ensure that the tobacco companies' messages are seen disproportionately by vulnerable populations. This raises into question the extent targeting ultimately has on smoking rates and what can be done to stop the continuation of coercive advertising. These issues are particularly concerning with the advent of the electronic cigarette, as similar tactics are being employed to lure vulnerable populations to this new product. Unfortunately, the federal public health and judicial reactions have been slow, reminiscent of past missteps. This literature review highlights advertising strategies used to increase the visibility and desirability of combustible cigarettes and devises comparative timelines of the regulatory action taken towards combustible versus electronic cigarettes.

Pawlak, Elizabeth
MCW/FAM Allies Asthma Management Program at La Causa Charter School

Authors: Quale C, Pawlak E, Grayson M, Lee E, Nitschke J
Project Mentor: Mitchell Grayson, MD
Community Partner: Erin Lee, MA of Fight Asthma Milwaukee (FAM) Allies; Jennifer Nitschke, RN BSN of La Causa Charter School

Introduction: Approximately 17% of students at La Causa Charter School in Milwaukee have asthma, which is nearly double the national average. Purpose: The goals of our project are to increase asthma self-efficacy at La Causa and develop lasting community partnerships. Methods: MCW students taught the FAM Allies Asthma Smarts curriculum in small groups to a total of 35 third through eighth grade students at La Causa. Four students were chosen to participate in a peer-teaching program, at the end of which they assisted in teaching to a classroom of 23 of their peers. Three students completed a self-efficacy survey before and after our intervention. Results: No significant difference was found in the three students' overall pre and post survey data. However, there was a positive trend in their answers to: "How sure are you that you can control your asthma so that you will not have to go to the hospital?" Discussion: The programming was well received by all involved. The evaluation is ongoing and will direct the future of the project.

PODIUM

Robertson, Kirstin
Improving Access to Vision Care Through Eyeglasses Recycling

Authors: Robertson K, Lam J, Robertson W, Bernstein R
Project Mentor: Rebecca Bernstein, MD, MS
Community Partner: Debbie Minsky-Kelly, MSW, LCSW, of Repairers of the Breach; Bronze Quinton, ABOC of Bronze Optical; The Milwaukee Women's Center

Visual impairment disproportionately affects the health and function of the poor. A common and correctable cause of visual impairment is refractive error. We developed an eyeglasses recycling program to meet an unmet need for visual correction in the homeless community. Donated glasses were labeled by strength by a local partnering optician. A field method for visual acuity approximation allowed participants to be matched closely to donated eyeglasses. From November 2013-February 2015, 75 individuals attended our eyeglasses clinics at homeless resource centers. Sixty-one percent (n=46) expressed need for distance correction and of these, 40 received eyeglasses. Mean composite scores from our surveys administered prior to vision correction suggest that the overall visual quality of life in this population is poor. Eyeglasses recycling was well-received by the homeless population, and we hope this model can be replicable for other low-income communities that do not have access to basic vision correction.

Rogers, Brookley—POSTER
Bun in the Oven: A Nutritional Education Series for Pregnant Women

Authors: Rogers B, Schubbe M
Project Mentor: Beth Damitz, MD
Community Partner: Jenny Ovide, RN of Wheaton Franciscan All Saints Clinic

Obesity is a risk factor for pregnancy complications including pre-term birth, miscarriage, gestational diabetes, and hypertension. Studies have shown that pregnant women may be more receptive to lifestyle intervention. We developed a nutritional education series with interactive cooking classes held monthly at a family medicine clinic in Milwaukee. Focus was on making healthy substitutions to favorite recipes that were inexpensive and easy to recreate at home. Additional goals included improving nutritional quality and reducing the cost of previously catered meals for group prenatal visits. We administered a pretest month one and an identical posttest month five to assess knowledge of the nutrients covered at each educational session. Results: There was a positive correlation between the number of group visits attended and correct response rate on the posttest. Our meals had an average of 297 calories per meal compared to 686 calories in a catered meal. Cost savings amounted to a total of $607.03 over the course of the project.

Rotter, Samuel—POSTER
Fostering Futures Online Annotated Bibliographies

Authors: Rotter SL
Project Mentor: Lynn Sheets, MD

Many children will experience neglect, abuse, and other negative events, which are Adverse Childhood Experiences (ACEs). Almost two-thirds of all people have experienced at least one ACE and a fifth have experienced three or more. ACEs are directly related in a dose-dependent way to future risk of negative health outcomes such as mental health disorders, obesity, diabetes, some cancers, and ischemic heart disease. With this knowledge, Fostering Futures, a community-academic partnership, was created to translate scientific knowledge on ACEs and trauma informed care into communities and practices that affect Wisconsin children and families. The student role, in partnership with the Fostering Futures team, was to select published literature on ACEs, trauma informed care, and promising interventions, then summarize those findings into an annotated bibliography resource for the FF website. The FF website will become public in early 2015 and will disseminate information and resources for child-welfare advocates and community stakeholders.

Samlowski, Erika

Girls on the Run: Community Engagement at the Site and Regional Level

Authors: Samlowski E
Project Mentor: Linda Meurer, MD, MPH
Community Partner: Jody Rhodes of Neulife CLC; Tina Jones of Girls on the Run.,

Obesity is an epidemic in children, particularly among young girls belonging to minority or low socioeconomic groups. Girls on the Run is a physical activity-based, positive youth development program that aims to reduce obesity in this vulnerable population. The program uses a multi-pronged approach of exercise, nutrition and psychosocial learning modules to encourage healthy habits in elementary school aged girls. The goal of this project was to create a new academic-community partnership with the Girls on the Run program at a local urban site (Neulife Community Resource Center) and assist with program evaluation at a regional level through the Greater Milwaukee Area regional board. Through participant observation, I examined social barriers to a healthy lifestyle that 3rd to 5th grade girls experience, specifically at a minority, low socioeconomic status site, and evaluated the effectiveness of the program in community engagement and cultural competency at the local site and regional level.

Sanders, Matthew—POSTER

Evaluating Investigator Utilization of CTSI Translational Research Units

Authors: Sanders MD, Mueller M, Connors E
Project Mentor: John Meurer, MD, MBA

Translating scientific insights of research to practice has been identified as a major stumbling block in science, medicine, and public health. The Clinical and Translational Science Institute (CTSI) of Southeast Wisconsin seeks to provide the infrastructure that accelerates the translation of research discoveries into new and improved interventions, while improving the health of Wisconsin citizens. One way it attempts to achieve this goal is by providing investigators with access to facilities, equipment and services via translational research units (TRUs) in the Participant and Clinical Interactions Resources (PCIR) program. By surveying investigators who participated in CTSI TRUs, this study seeks to evaluate whether or not various outcomes have been achieved such as increased availability and capacity to conduct research, increased quality of research, improved academic morale, and level of impact on community health. Results from this study will help direct future evaluation methods and guide program refinement.

Schubbe, Morgan—POSTER

Bun in the Oven: A Nutritional Education Series for Pregnant Women

Authors: Rogers B, Schubbe M
Project Mentor: Beth Damitz, MD
Community Partner: Jenny Ovide, RN of Wheaton Franciscan, All Saints Clinic

See Rogers, Brookley, page 54

Steffen, Bradley—POSTER

Wisconsin Acute Care Hospital Antidote Stocking

Authors: Steffen BJ, Zosel AE
Project Mentor: Amy E Zosel, MD, MSCS

Poisoning was the fourth leading cause of both injury hospitalizations and injury deaths in Wisconsin from 2007-2009, accounting for 8020 hospitalizations and 1525 deaths. Treatment of poisonings often involves the rapid administration of an antidote. In 2009, an expert panel released a set of consensus recommendations for antidote stocking in hospitals providing emergency care. Despite these recommendations, numerous published reports document insufficient antidote stocking across the United States. This project was conducted to assess Wisconsin's preparedness to rapidly treat poisonings. Surveys inquiring about the amount of each antidote currently in stock were sent to Wisconsin acute care hospitals and compared against the consensus recommendations. Based on this analysis, we detected a widespread discrepancy between current and recommended antidote supplies. We discuss the implications this discrepancy has for statewide poisoning management and assess barriers to compliance with expert consensus recommendations.

Tan, Hannah
United Latino Caregivers of Dementia Patients

Authors: Tan H, Guse C, DeNomie M, Bonet M, Castro A, Franco Z
Project Mentor: Zeno Franco, PhD
Community Partner: Al Castro of the United Community Center,

Los Cuidadores Unidos is a pilot intervention program in partnership with the United Community Center in Milwaukee that offers support to Latino caregivers of dementia patients. Though many intervention techniques are utilized, this project focuses on behavioral activation, which focuses on outward, attainable goals and contextual factors as determinants of levels of positive reinforcement. Results: After conducting five interviews and beginning the process of thematic analysis, the following cultural nuances and themes were observed: -Familismo: Family orientation and connectedness -Marianismo: Female Gender Role -Espiritualismo: Strong sense of spirituality and religiosity -Dignidad: Any stigma associated with mental issues such as depression Conclusions: Based on interviews with the Los Cuidadores Unidos' family care workers, cultural adaptations to behavioral activation are important in providing a more effective intervention for Latino Caregivers.

Wang, Timothy—POSTER
Hepatitis B Education and Barriers to Awareness in the Hmong Community

Authors: Chou HC, Wang TW, Lam JM, Saeian K
Project Mentor: Kia Saeian, MD
Community Partner: Cha Lee, MD of Lee Medical Clinic, Hong Liu, MD of Midwest Asian Health Association, Paoi Lor of Hmong ABC Radio, Duachy Vang of Grace Hmong Alliance Church and Pai Yang of Pai Phongsavan Market

See Chou, Heather, page 14 (Global Health)

Wong, Lori—POSTER
Teen Dating Violence Education in a Pediatric Emergency Department

Authors: Wong LJ, Melzer-Lange M
Project Mentor: Marlene Melzer-Langer, MD

Teen dating violence is a significant problem that can lead to worse health outcomes. This study's goals are to reinforce the importance of healthy relationships and compare two different educational interventions in a pediatric emergency department. Recruited 13-17 year old subjects were separated into 2 groups: one received a pamphlet and the other received a discussion with pamphlet. We assessed healthy relationship knowledge before and after intervention, if they read the pamphlet, and if they shared information with others. 14 subjects in the pamphlet arm and 15 in the discussion arm completed follow-up. In both arms, majority answered the knowledge questions correctly. The discussion arm had more subjects read the pamphlet and share information. This study showed that teens were knowledgeable about healthy relationships. There was no statistically significant difference in knowledge or information sharing between groups. Recruiting a larger subject population and improved knowledge questions would assess differences better.

Wright, Nicholas—POSTER
Those Who Forget the Past are Doomed to Repeat It

Authors: Ondusko S, Wright N
Project Mentor: Ileen Gilbert, MD

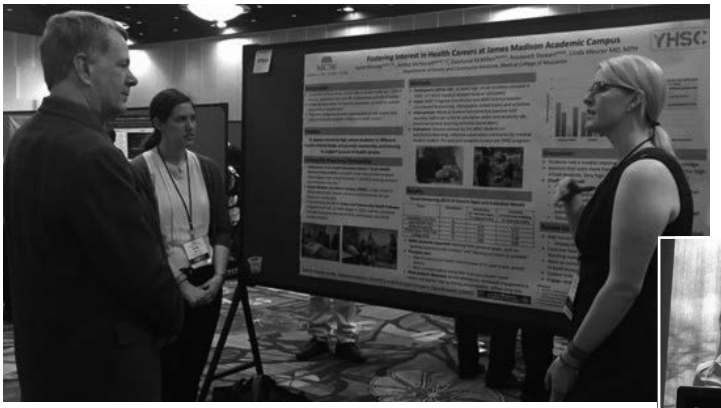
See Ondusko, Devlynne, page 53

Wynne, Brianna

Implementation of Personal Health Records with Homeless Patients

Authors: Wynne B, Hughes P, Diehr S
Project Mentor: Sabina Diehr, MD
Community Partner: Cindy Krahenbuhl and Guy Tymorek of The Guest House

Introduction: Previous studies have found that when a homeless individual seeks care, that individual likely has an overall complex general health, and lacks available medical records. We aim to implement the use of free, web-based Personal Health Records (PHR) to assist homeless men in managing a current health history. Methods: We met individually with 5 residents of the Guest House, a homeless shelter in Milwaukee, and assisted these men in the creation of an online PHR. Each participant received a wallet-sized card with directions about how to access the PHR website. Each participant completed an initial survey after making a PHR and will be given surveys at 3-month intervals up to 1 year. Results: 4/5 participants said the setup time for a PHR took less than 30 minutes and they felt comfortable updating the PHR. All participants perceived the PHR as being helpful and reported they would use their card. Conclusion: Participants have a thorough, portable health record that will provide some semblance of continuity of care.



Sarah Blonsky and Ashley Verhasselt present their Milwaukee AHEC/JMAC Tiered Mentoring Program at the Society of Teachers of Family Medicine Meeting in Orlando, FL.

Bryan Johnston, Ahmad El-Arabi and Krista Tuomela receive the President's Community Engagement Award for their "Food Doctors" project with Lake Valley Camp and the Milwaukee Academy of Science.

Jessica DeValk celebrates the harvest with kids from Clarence Barton Elementary School who planted a Salsa Garden at the All Saints Family Medicine Residency.

Community Engagement and PATHWAYS

Pathway students serve the community around MCW while learning how to connect future patients to supportive community resources, and partner with local agencies to promote health.

Site Visits

Students visit organizations that provide health care, resources and social service programs to underserved communities. Visits include a tour and overview of the services/programs provided by the host agency and often the chance to meet and hear from people served.

Off-Campus Core Sessions

Some Pathway sessions are held at a community site and include tours and presentations on services from the host agency.

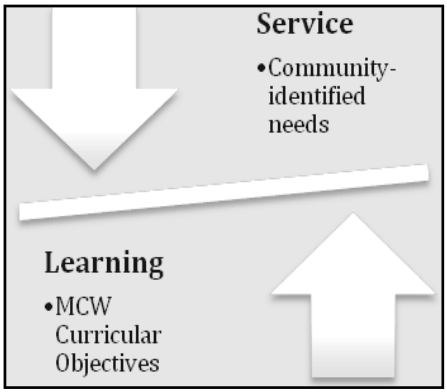
Inter-Professional Education (IPE)

Community partners collaborate on planning, teaching and facilitating core sessions addressing social and environmental health barriers and assets. Each year, MCW and the MATC Medical Interpreter students learn together through a case-based simulation experience on working with Low English Proficient (LEP) patients.

Al Castro and Marcia Villa from UCC (above) and Rodney Ramos Jnr, Rodney Ramos and Dr Richard Ammon from MATC (top) at the Core Session on "Working with Medical Interpreters."

Service Learning

"*A structured learning experience that combines community service with preparation and reflection. Students engaged in service-learning provide community service in response to community-identified concerns and learn about the context in which service is provided, the connection between their service and their academic coursework, and their roles as citizens and professionals*." (LCME IS-14-A)



Community partners provide service learning and community-engaged scholarship opportunities that help stimulate critical thinking, civic engagement and cultural understanding.

Key features of MCW Service Learning include:

- It is curricular and results in academic credit
- It places equal value on community-defined service objectives, and curricular learning objectives
- It is planned and implemented in a three-way partnership among the student, faculty member and site-based community staff

At MCW, Pathways staff support service learning by facilitating partnership development among students, faculty and community partners.

Special Thanks to our Community Partners

Altrusa Foundation
Archdiocese of Milwaukee, Office for Schools
Aurora Health Care
Barton Elementary School
Bread of Healing Clinic
Bronze Optical, Milwaukee
Fight Asthma Milwaukee (FAM) Allies
FUNDASALVA
Girls on the Run
Grace Hmong Alliance Church
Hillside Healthcare International, Belize, CA
Hmong ABC Radio
Hospice Africa Uganda
James Madison Academic Campus
La Causa Charter School
Lake Valley Camp
Lee Medical Clinic
Lindsay Heights Neighborhood Health Alliance
Marquette Computer Science Labs
MATC Medical Interpreter Training Program
Midwest Asian Health Association
Milwaukee Academy of Science
Milwaukee Area Health Education Corps, Youth Health Service Corps
Milwaukee Center for Independence
Milwaukee Health Care Partnership
Milwaukee LGBT Community Center
Milwaukee Medical Examiners Office
Neulife CLC
Pacific Interpreters
Pai Phongsavan Market
Pan African Community Association
Patan Hospital, Nepal
Philippine Cultural & Civic Center Foundation Inc.
Repairers of the Breach
Saturday Clinic for the Uninsured
SET Ministry, Inc.
The Guest House
United Community Center
UWM- Zilber School of Public Health
Walnut Way Conservation Corp.
Wheaton Franciscan Healthcare All Saints
WI CAN leadership team, DCF
Wisconsin Rural Women's Initiative
Zablocki Veterans Affairs Medical Center