



**10th Annual
Student Research and Scholarship
Symposium**

May 2, 2019

**Computational Models in Disease:
Applications and Implications**

Sponsored by:

SHP Office of the Dean

Rutgers School of Health Professions (SHP)

10th Annual Student Research and Scholarship Symposium

Rutgers School of Health Professions (SHP) Student Research and Scholarship Symposium is an event sponsored by the **Office of the Dean** and hosted by members of the **Dean's Research Advisory Committee**. The Research and Scholarship Symposium is a great networking opportunity for students and faculty members from different departments within our school and augments faculty-student interactions through research and scholarship. This year, the symposium will kick off with our Keynote Speaker, Dr. Antonina Mitrofanova, Rutgers School of Health Professions assistant professor, who will speak about *New Frontiers in Predicting Markers of Treatment Response in Cancer Patients*. Students will then present posters supported by their faculty mentor, and in the afternoon, selected students will provide an oral presentation on their research projects. The day will conclude with a presentation by SHP's Department of Rehabilitation and Movement Sciences researcher Dr. Jean-Francois Daneault on his work in *Mobile and Wearable Technology to Assist in the Management of Neurological Disorders*, followed by an award ceremony for best posters.

Theme:

Computational Models in Disease: Applications and Implications

Great Hall & Main Lecture Hall

Robert Wood Johnson Medical School; Piscataway Campus

Acknowledgements for Program Support

Lisa Adams, Marketing and Communications

Alexis Fulks, Marketing and Communications

Michele Sisco, SHP Research Office

Claire O'Connell, DrPH, PA-C, Physician Assistant Program

Dean's Research Advisory Committee (2018-2019)

Laura Byham-Gray - Department of Nutritional Sciences

Judith Deutsch - Department of Rehabilitation and Movement Sciences

Carrie Esopenko - Department of Rehabilitation and Movement Sciences

Jean-Francois Daneault - Department of Rehabilitation and Movement Sciences

Suril Gohel - Department of Health Informatics

Weili Lu - Department of Psychiatric Rehabilitation and Counseling Professions

Antonina Mitrofanova - Department of Health Informatics

James Scott Parrott - Department of Interdisciplinary Studies

Shristi Rawal - Department of Nutritional Sciences

Judy Thompson - Department of Psychiatric Rehabilitation and Counseling Professions

10th Annual Student Research and Scholarship Symposium

Keynote Speaker

Antonina Mitrofanova, PhD

*Assistant Professor, Department of Health Informatics
Rutgers School of Health Professions*

Dr. Mitrofanova is an Assistant Professor in Biomedical and Health Informatics at Rutgers School of Health Professions. She received her PhD in Computer Science from NYU Courant Institute of Mathematical Sciences and post-doctoral training in Computational Cancer Biology from Columbia University Cancer Center. Her main research interests are in developing computational algorithms to elucidate mechanisms of cancer progression and treatment resistance in cancer patients. Dr. Mitrofanova's publications span Cancer Cell, Nature Communications, Cell Reports, Nature Cell Biology, PNAS, and EBioMedicine. She is a recipient of the NSF Computing Innovation Fellowship and a Prostate Cancer Foundation Young Investigator Award. Dr. Mitrofanova received the 2018 Excellence in Research Award from Rutgers SHP.



Faculty Presentation: Jean-Francois Daneault, PhD

Department of Rehabilitation and Movement Sciences

Dr. Daneault obtained his BSc and MSc in Kinesiology at the University of Quebec in Montreal. He then completed a PhD in Neuroscience at McGill University and a post-doctoral fellowship in Physical Medicine & Rehabilitation at Harvard Medical School. His research focuses on better understanding of motor behavior in health and disease in order to improve/optimize movements of individuals with chronic diseases, such as Parkinson's disease, Huntington's disease, dystonia, cerebral palsy, and stroke, through physical therapy and exercise. His laboratory tools include motion capture, wearable sensors, electromyography, brain stimulation, and neuroimaging. The long-term goal is to develop tools based on quantitative evidence to personalize interventions for individuals with neurological disorders.



10th Annual Student Research & Scholarship Symposium

PROGRAM

To listen to speakers via distance: <https://shprutgers.zoom.us/j/875331204>

8:30 - 9:30 a.m.	Poster Setup and Breakfast
9:30 - 9:40 a.m.	Welcome to the 10th Annual SHP Research and Scholarship Symposium Dr. Gwendolyn M. Mahon, M.Sc., PhD, Dean and Professor
9:40 - 10:40 a.m.	Keynote Speaker: Antonina Mitrofanova, PhD Assistant Professor Department of Health Informatics <i>New frontiers in predicting markers of treatment response in cancer patients</i>
10:40 -12:00	Poster Sessions and Judging Authors must be present at their respective posters for a review by judges between 10:40 – 12:00. The judging will be conducted by select SHP faculty.
12:00 -1:30 p.m.	Lunch and Career Fair (Lunch provided for registrants) Students who are presenting posters are encouraged to visit the career fair between 12:00 and 1:30 pm.
1:30 – 3:00 p.m.	Student Presentations <i>Introduced by Suril Gohel, PhD, Department of Health Informatics</i> Crystal Socha Department of Psychiatric Rehabilitation and Counseling Professions <i>Work-Related Interview Skills Training for Persons with Visual Impairment and Blindness</i>

Bryan Ung, Alyssa Rebele, Jasmin Rider, Melanie Rivera
Department of Clinical Laboratory and Medical Imaging Sciences
A Case Study in Histoplasma Capsulatum

Rachael Patusco
Department of Clinical and Preventive Nutrition Sciences
Weight Status is Associated with Health Related Quality of Life among a National Sample of Children with Autism Spectrum Disorder

Katelyn Wisniewski, Jennifer Marin, Nataly Fernandez, and Julissa Santana
Department of Clinical Laboratory and Medical Imaging Sciences
Factor V Leiden Mutation Diagnosis in Deep Vein Thrombosis

3:00 – 4:00 p.m.

Faculty Presentation
Jean-Francois Daneault, PhD
Assistant Professor
Department of Rehabilitation and Movement Sciences
Mobile and Wearable Devices for the Management of Chronic Disorders

4:00 – 4:15 p.m.

Closing Remarks and Winners of Research Poster Awards

List of Abstracts

Abstract titles are listed below.

Undergraduate Case Study

Poster Number	Title	Author	Co-Authors and Faculty Support
1	Detailed analysis of multiple myeloma and effect of Daratumumab In Blood Bank	Aysha Afroz	Bhanderi, Darshna Asif, Aleina, Phan, Toan Ruth Perez
2	Zika Virus and Blood Transfusion	Sharifa Alshabrakah	Gonzalez, Gloria; Jean-Baptiste, Dabby J. Adou, Marie, Ruth Perez MS, MLS (ASCP)
3	Post-Streptococcal Glomerulonephritis	Chris Hill	Ahmed, N. Giordano, A. Hill, C. Zaklama, M, Stephanie Cochrane
4	A Case on Babesia	Ansar Iqbal	Patel, C., Attakorah, S. Lee, S., Stephanie B. Cochrane MS, MLS(ASCP)
5	A Case Study of Autoimmune Lymphoproliferative Syndrome (ALPS)	Patrice Nzangue	Alzate, W, Colon, K, Hines, F, Steven Bellows
6	A Case Study in Histoplasma Capsulatum	Bryan Ung	Rivera, M., Rider, J.; Rebele, A., Dr. Deborah Josko
7	Factor V Leiden Mutation Diagnosis in Deep Vein Thrombosis	Katelyn Wisniewski	Fernandez, N., Marin, J., Santana, J., Dr. Shashi Mehta

Graduate QA/QI Study in Which Original Data Were Gathered and Analyzed

Poster Number	Title	Author	Co-Authors and Faculty Support
8	Bone Quality in Overweight and Obese Older Men and Women	Julia Amariti	Sue Shapses, Yvette Schlusell, Robert Schneider, Hansen, K.
9	pathCHEMO: Uncovering (epi) genomic pathways of chemoresistance in lung adenocarcinoma	Nusrat Epsi	Panja, S., Pine, S., Mitrofanova, A.
10	A Thematic Analysis of Students Perceptions of Working with Older Persons with Serious Mental Illness	Stephanie Santos	Zechner, M.

Graduate Research Study

Poster Number	Title	Author	Co-Authors and Faculty Support
11	Quantify Gray Matter Volume in Alzheimer's, Mild Cognitive Impairment and Healthy Population	Mohamed Ahmed	Suril Gohel
12	Limited long-term recovery of resting-state functional connectivity in older patients after traumatic brain injury	Nicola de Souza	Parker, R., Ryan, J., & Esopenko, C.
13	Feasibility Assessment of a Method to Quantify Cerebral Microbleeds in Collegiate Athletes	Colleen Doherty	Carrie Esopenko PhD, Nicola de Souza
14	The Effect of Depressive Disorder Associated Socioeconomic Factors on Health-Related Quality of Life among Adults with Depressive Disorder in the USA	Nesren Farhah	Dr. Shankar Srinivisan, Carolyn Bazan, John Beninato, Carol Gao, Sunhee Eisenstat, Crystal Socha
15	"Conversing with Others: A Work-related Soft Skills Group for Individuals with Autism Spectrum Disorder	Gbadamosi, Sharon and Meyers Elizabeth	Janice Oursler, Weili Lu, Samantha Herrick and Ni Gao
16	Randomized controlled double blind trial: role of putative α -glucosidase inhibitor on bone turnover and GLP-1 after a mixed meal tolerance test.	Alexandra Kreitman	Hao L, Schneider SH, Schlussek Y, Shapses SA.
17	DiffRseqDB - A web-based portal for the storage, query and analysis of large-scale RNA-seq data	Ahmed Mahmoud	Dr. Antonina Mitrofanova
18	Quantifying lifespan changes in functional connectivity across BOLD signal frequencies.	Sowjanya Mattaparthi	Suril Gohel
19	Trends in Substance Use-Related Emergency Room Visits in the U.S., 2005-2011	Anthony Mayo	Ray, Suchismita, Ph.D.

20	Frequency specific differences in whole-brain graph theoretical properties in patients with schizophrenia	Aaron Ostrovsky	Suril Gohel, PhD
21	Weight Status is Associated with Health Related Quality of Life among a National Sample of Children with Autism Spectrum Disorder	Rachael Patusco	Jane Ziegler, Caroline Coffield, Laura Byham-Gray, Shristi Rawal, J. Scott Parrott
22	A standardized method for assessing neck strength in athletes with exposure to brain trauma	Tara Porfido	Brown, A., de Souza, N., Wagh, S., Gutt, J., Wentworth, C., Viagas, N., Esopenko, C.
23	Work-Related Interview Skills Training for Persons with Visual Impairment and Blindness	Crystal Socha	Janice Oursler, Weili Lu, Samantha Herrick, Adam Zaher

Graduate Student Systematic Review with Narrative Synthesis or Literature Review

Poster Number	Title	Author	Co-Authors and Faculty Support
24	The Efficacy of Educational Interventions at Improving Patient's Compliance with Continuous Positive Airway Pressure Therapy	Delroy Allen	Eric Vidal
25	The effects of supervised exercise programs in people with mild to moderate dementia: a systematic review.	Michael Cascio	O'Shea, K; Ferraro, R; Buzzell, M; Cascio, M; Donegan, J; Sunga, D; Tukachinsky, E
26	Metabolic Changes in Weight Loss and Weight Regain: A Review of the Literature	Kayla Castellitto	Julie O' Sullivan Maillet, PhD, RDN and Rachael Patusco MS, RDN, Clark L, Ozut M, Pereira Y
27	Does maternal diet during pregnancy influence development of allergic diseases in offspring?	Emily Fowler	Julie O'Sullivan Maillet, Rachael Patusco; Corradino, Caitlyn; Pudimott, Chelsea; Ryan, Melissa

28	Effects of Probiotics on Adults with Parkinson's disease and Constipation	Emily Ho	Julie O'Sullivan Maillet; Rachael Patusco; Poncio, C; Rant, J
29	Yoga for the reduction of symptoms of anxiety and depression in children and adolescents: A systematic review, preliminary results	Aurora James-Palmer	Dr. Jean-Francois Daneault, Dr. Ellen Anderson, Dr. Lori Zucker ,Daneault, J.F.; Anderson, E.; Zucker, L.; Kofman, Y.
30	Impact of Botulinum Toxin A as Prophylaxis for Adults with Chronic Migraine: A Systematic Review	Victoria Latella	Claire Babcock O'Connell, MPH, PA-C
31	The Effect of Plant vs. Animal Protein Supplementation on Performance and Muscle Function in Adult Athletes	Radwa Nassar	Julie O'Sullivan-Maillet, PhD, RD and Rachael Patusco, MS, RD, CSP, Borba, B., Conover, M., Del Pizzo, N
32	The Efficacy of Telemedicine in the Treatment of Postpartum Depression	Katherine Norfleet	Frank Giannelli, MS, PA-C
33	Effectiveness of Physical or Behavioral Interventions for Management of Chronic Pain in Persons Living with HIV	Christopher Ottstadt	David Kietrys Foster, B McCormick, M Million, ENguyen, A
34	The Use of Music as a Therapeutic Intervention to Address Rehabilitation Outcomes for Adults with Severe Mental Illnesses	Sarah Pitts	Michelle Zechner
35	Sexual intimacy among individuals with psychiatric disorders: A systemized literature review	Dawn Reinhardt-Wood	Dr. Michelle Zechner & Dr. Ann Murphy
38	Lower Extremity Peripheral Artery Disease (PAD): Comparative Efficacy of Drug-eluting Stents (DES) vs. Balloon Angioplasty (BA) in Maintaining Vessel Patency	Allison Tan	Dipali Yeh MS, PA-C,
39	Insomnia: A Dreamer's Nightmare	Alexander Wong	Eric Vidal

Graduate Student Systematic Review with Quantitative Synthesis (e.g., meta-analysis)

Poster Number	Title	Author	Co-Authors and Faculty Support
36	The Effectiveness of Transcutaneous Electrical Nerve Stimulation to Reduce Acute Pain and Opioid Consumption after Cesarean Section Delivery	David Lin	Adrienne Simonds, PHD, PT, James Scott Parrott, PHD, Ed Schrank, PHD, PT, Ball, J; Castro, M; Cenophat, A; Lin, D; Papdemetriou, C.
37	Efficacy of Text Message Based Smoking Cessation Interventions for Adolescents and Young Adults	Meagan McDermott	Melanie Trecartin

Abstracts

Undergraduate Case Studies

Poster Number:	1
Name:	Afroz, Aysha
Faculty Support:	Ruth Perez
List all additional co-authors or co-investigators:	Bhanderi, Darshna, Asif, Aleina Phan, Toan
Title:	Detailed analysis of multiple myeloma and effect of Daratumumab In Blood Bank
Introduction:	Multiple myeloma is known to be the uncontrolled and overwhelming growth of plasma cells inside the bone marrow. Daratumumab is a drug given to patients with multiple myeloma, however it will cause false positives on the antibody panel if the lab is not notified about this drug therapy prior to testing for an unknown antibody.
Case presentation:	The case study presents a patient who's blood group is O positive, and had presented with unclear Blood Bank laboratory results. The results showed panreactivity in vitro when the patient's serum was tested with an antibody panel and enhanced reactivity an enzyme treated ficin antibody panel. Since the laboratory was not notified about the patient's history the appropriate workup was not done to save time and give accurate results. It was later discovered that the patient had started treatment with Daratumumab a month prior. Daratumumab is known to cause interference with routine Blood Bank laboratory tests. Currently DTT (dithiothreitol) treated cells are used to prevent the interference of DARA, which further enables the safe transfusion of blood to DARA treated patients.
Management and Outcome:	The patient's treatment interfered with lab tests which caused a delay in results. Although we are unaware of the patient's prognosis, we assume the delay in lab results may have caused a problem in an emergency situation, if a transfusion was necessary. For example, giving the patient blood with antigens present, for which the antibody could be undetectable may have lead to a transfusion reaction.
Discussion:	If the lab was notified prior to testing the patient's sample, dithiothreitol (DTT) which are treated reagent cells that are used as a reducing agent could have been used to make it easier to detect the underlying antibody in the patient's blood. Thorough communication between the lab and the doctor could have lead to better and more accurate results.

**Poster
Number:** 2

Name: Alshabrakah, Sharifa
Faculty Support: Ruth Perez MS, MLS (ASCP)

List all additional co-authors or co-investigators: Gonzalez, Gloria, Jean-Baptiste,Dabby, J. Adou,Marie

Title: ZIKA VIRUS AND BLOOD TRANSFUSION

Introduction: The Zika Virus is a mosquito-transmitted virus that causing asymptomatic or mild and self-limited illness. The virus is transmitted through pregnancy, intercourse, or transfusion.

Case presentation: A 51-year-old woman with primary myelofibrosis syndrome presented with no symptoms. 6 days after a platelet transfusion and routine pre-transfusion samples obtained were normal. However, 3 days post donation, the donor called to inform the collection facility of her febrile state and developing the illness. Post-transfusion investigations were conducted by the hemovigilance unit and the recipient was contacted. Due to the concerns that the donor brought to attention, a PCR assay was done for the Zika virus. Six days after the platelet transfusion, the 51-year-old woman was positive for Zika virus on PCR assay. When the donor contacted the collection facility, it allowed Zika MAC-ELISA & Zika RT-PCR to be tested on the recipient and following the protocol of the quarantine/ discard of infected units.

Management and Outcome: Six days after the platelet transfusion, the 51-year-old woman was positive for Zika virus on PCR assay. When the donor contacted the collection facility, it allowed Zika MAC-ELISA & Zika RT-PCR to be tested on the recipient and following the protocol of the quarantine/ discard of infected units.

Discussion: The purpose of the case study is to promote awareness of the Zika virus and the steps to take to reduce the spread of Zika virus through transfusion. This case enlightens the weakness of the protocol in place then. Had not the donor called back, how many patients could have been infected? What pivotal steps were needed to prevent blood bank contamination?
It is critical to implement a systematic pre-donation screening of blood donors to protect the blood bank and ensure maximum public safety. Further steps at the governmental level are needed to provide fundings for the quest of a vaccine concurrently with a pro-active campaign to reduce the prevalence of Zika in an endemic area and prevent mosquito infestation of the new area.

Poster Number:	3
Name:	Hill, Chris
Faculty Support:	Stephanie Cochrane
List all additional co-authors or co-investigators:	Ahmed, N., Giordano, A., Hill, C., Zaklama, M
Title:	Post-Streptococcal Glomerulonephritis
Introduction:	This case describes an 8 year old boy who developed post-streptococcal glomerulonephritis after infection by a Streptococcus species.
Case presentation:	An 8 year old boy presented to the emergency department after his parents noticed dark, reddish-brown urine, a decreased appetite, and swelling around his eyes and hands. Three weeks prior, the boy was diagnosed and treated for impetigo after developing a honey crusted rash on his face, hands and legs. The lesions have since healed. Physical examination showed edema of his left lower leg and normal findings from cardiovascular, respiratory and abdominal examinations. Urinalysis results revealed hematuria, proteinuria, and RBCs casts, while hematology and chemistry results revealed an increased white blood cell count and decreased serum albumin respectively.
Management and Outcome:	Correlation between the patient's clinical presentation and laboratory results suggest damage to the glomeruli; representative of the kidneys inability to properly filter waste. In this case, the presence of inflammation caused damage to the glomerular capillaries resulting in a decreased serum albumin with an increased urinary protein output (proteinuria). The patient's clinical presentation and laboratory results, combined with history of a previously diagnosed infection, indicate a current diagnosis of post streptococcal glomerulonephritis.
Discussion:	The patient's symptoms and lab findings correlate with a typical PSGN case. Gross hematuria, hypertension, edema are seen as well as proteinuria and evidence of white blood cells. Impetigo, combined with evidence of renal insufficiency are hallmarks of PSGN. For more definitive diagnosis, histological analysis could be performed along with an ASO titer and C3, C4 measurement.

Poster Number:	4
Name:	Iqbal, Ansar
Faculty Support:	Stephanie B. Cochran MS, MLS(ASCP)
List all additional co-authors or co-investigators:	Patel, C., Attakorah, S., Lee, S.
Title:	A CASE ON BABESIA
Introduction:	The objective of this case study is to present a typical case presentation of a patient with Babesiosis in the U.S. This research aims at sharing relevant information about a Babesia infection to help increase awareness about Babesiosis.
Case presentation:	A 52-year-old woman presented to the emergency room with her husband after multiple syncopal episodes. Upon arrival, the husband explained to the physician that his wife looked pale after the first syncopal episode. He also revealed that his wife had experienced a persistent fever for the last month. Medical history revealed the patient having multiple sclerosis. Upon further enquiries, the husband explained that the couple had gone camping in New York for 6 weeks where she embarked on several outdoor activities. No travel outside the United States was noted. On admission, her vital signs revealed a heart rate of 105 beats per minute, blood pressure 99/63 mm Hg, and a temperature of 37.5°C. Cardiovascular, respiratory and abdominal examination findings are normal. No bilateral CVA tenderness was noted. The patient was alert, somewhat flushed and had normal speech. EKG revealed normal sinus rhythm at 95 bpm, with no ST or T-wave changes. The emergency department physician considered the next steps in the patient's evaluation and treatment.
Management and Outcome:	In most of Babesia cases, patients who are immunocompromised are more symptomatic than healthy individuals. The patient, in this case, has multiple sclerosis which most likely means she is on medications that suppress her immune system. Due to her immunocompromised status, the patient may take longer than expected to recover from the Babesia infection, which can lead to an unfavorable outcome. Therefore, any treatment given to the patient should be monitored closely to avoid complications and counteracting drug effects.
Discussion:	Babesia is an intraerythrocytic, parasitic infection that causes Babesiosis in humans due to a bite from an infected tick, Ixodes scapularis, also known as the deer tick. Presenting as dark staining ring form inclusions on blood smears, Babesia causes red blood cell destruction that often results in hemolytic anemia. In the United States, Babesia microti is typically the species that is identified as being responsible for human Babesiosis. Most cases of infection in the U.S. occur in the Northeast and upper Midwest by the tick (nymph stage) during the summer months in wooded or marshy areas. When the disease manifests, the patient typically suffers from fever, hemolytic anemia, chills and more severe conditions such as disseminated intravascular disease (DIC), severe hemolytic anemia, kidney failure, and death. Since many people with B. microti are asymptomatic, clinical recovery usually occurs. However, the infection can be life-threatening in the immunocompromised, the elderly, and asplenic patients. Babesia infection can typically be treated with atovaquone and azithromycin if the patient is symptomatic. If no symptoms are present, then the disease is usually self-limiting.

Poster Number: 5

Name: Nzanguen, Patrice

Faculty Support: Steven Bellows

List all additional co-authors or co-investigators: Alzate, W., Colon, K., Hines, F.

Title: A Case Study of Autoimmune Lymphoproliferative Syndrome (ALPS)

Introduction: Autoimmune Lymphoproliferative Syndrome (ALPS) is a disease caused by a mutational defect in the FAS pathway that leads to a disruption in lymphocyte apoptosis and to splenic lymphoproliferation. ALPS typically affects children, is slightly more prevalent in males than females, with symptoms of lymphadenopathy, splenomegaly, multilineage cytopenias and an increased risk of lymphoma. Typical laboratory findings with ALPS include increased levels of immunoglobulins, IL-10, vitamin B12, plus autoimmune neutropenia, thrombocytopenia and anemia, and pathognomonic increased percentages of CD4⁺/CD8⁻ “ (double negative T cells).

Case presentation: In our case study, a 2-year-old male initially presented with symptoms of fever, splenomegaly and thrombocytopenia, and over several more years, had frequent hospitalizations for cytopenias, particularly neutropenia and pneumococcal septicemia, and low platelet counts, with recurring splenomegaly. His lymphocyte phenotyping showed increased numbers of double negative T cells (CD3⁺ TCR β ⁺ CD4⁻CD8⁻) of 17.6%, the normal being <1.5%. Molecular testing showed a positive FAS mutation, and PET/CT scans revealed widespread lymphadenopathies that confirmed the diagnosis of ALPS.

Management and Outcome: Treatment consists of IV corticosteroids and IV immunoglobulins, along with a second line of either Mycophenolate Mofetil (MMF), Sirolimus, or Rituximab. For patientsTM refractory to those medications, Hematopoietic Stem Cell Transplant is indicated, or, as a last resort, a full or partial splenectomy is performed, although recurrent cytopenias are common. Our patient was treated with Sirolimus for ALPS and placed on indefinite antibiotic prophylaxis for pneumococcal septicemia. The patient's prognosis was good, has recovered from his cytopenias and has not developed lymphoma.

Discussion: The increased percentage of CD4⁺CD8⁻ T cells and a positive FAS mutation are diagnostic for ALPS. ALPS is increasingly becoming recognized and diagnosed in adolescents, and more drug treatments are being investigated into this illness.

Poster Number: 6
Name: Ung, Bryan
Faculty Support: Dr. Deborah Josko
List all additional co-authors or co-investigators: Rivera, M., Rider, J., Rebele, A.

Title: A CASE STUDY IN HISTOPLASMA CAPSULATUM

Introduction: Histoplasma capsulatum is a dimorphic fungus that grows as a yeast at 35 - 37°C or as a mold at 25 - 30°C. It is found in soil enriched with bird droppings, chicken droppings, and bat guano. H. capsulatum is endemic throughout North and South America, more commonly seen in the Mississippi River and Ohio River Valley. When contaminated soil is disturbed, fungal spores become aerosolized and inhaled. The fungal infection can either remain localized as pulmonary histoplasmosis or disseminate throughout the body, affecting multiple organs. The purpose of this case study is to effectively diagnose histoplasmosis and administer proper treatment.

Case presentation: Twelve demolition workers were exposed to debris saturated with bat guano from an abandoned city hall in Kentucky. They did not wear protective gear during the demolition process. Some workers inhaled a larger inoculum of fungal spores than others. Those who had direct contact with the contaminated soil experienced flu-like symptoms, such as coughing, prolonged fever, chills, and headache.

Certain laboratory findings including the Giemsa stain, the Sabouraud Dextrose agar (SAB) plate, and complement fixation titers suggested H. capsulatum. The Giemsa stain revealed yeast in the lung biopsy, while the mold morphology on the SAB plate resembled H. capsulatum. The complement fixation test confirmed the presence of H. capsulatum through high antibody titers. In the near future, molecular diagnostic tests will be used to rapidly detect H. capsulatum, compared to standard protocols.

Management and Outcome: Treatment depends on the severity of histoplasmosis. In this case, acute pulmonary histoplasmosis was suspected among the group of workers, which has a more favorable prognosis than disseminated histoplasmosis. Itraconazole, an anti-fungal medication, was administered to those who were symptomatic and continued treatment for approximately three months. Workers who were minimally exposed did not require treatment since histoplasmosis is self-limiting.

Discussion: Precautions should be taken when visiting places such as caves, tunnels, or chicken coops in endemic areas. When handling contaminated soil, proper personal protective equipment (PPE) should be worn. Public health initiatives need to be implemented to inform society about the danger/risk of Histoplasma exposure.

**Poster
Number:** 7

Name: Wisniewski, Katelyn

**Faculty
Support:** Dr. Shashi Mehta

**List all
additional co-
authors or co-
investigators:** Fernandez, N., Marin, J., Santana, J.

Title: Factor V Leiden Mutation Diagnosis in Deep Vein Thrombosis

Introduction: Deep Vein Thrombosis (DVT) is a condition where blood clots form in the lower limbs. These clots can occlude blood circulation resulting in symptoms of pain, tenderness, redness, swelling or discoloration around the affected area. DVT progression due to the coagulation cascade stems from acquired factors and/or inherited Factor V Leiden mutations and can be managed when identified early.

**Case
presentation:** In the presented case, a 42 y/o male with a family history, was diagnosed with DVT. With a damaged right femur 20 years ago and an episode of DVT 5 years ago, his leg pain resulted in DVT that began a week after frequent flying due to his job. The CBC, PT, and APTT were all normal. Doppler ultrasonography revealed full occlusion, the clotting or closing of blood vessels, of the superficial femoral vein, anterior tibial vein, and popliteal vein. A real time PCR assay with TaqMan probes was performed. The two probes utilized were VIC for the wild type allele, and FAM for the mutant (Factor V Leiden) allele.

**Management
and Outcome:** The patient expressed pain behind his right knee with pretibial pitting edema and swelling of the right leg. His right leg measured 36.5cm and his left leg measured 33.5cm. The patient was hospitalized and treated with a heparin drip. The results from the PCR showed an amplification for both the wild type and mutant alleles followed by an allelic discrimination assay demonstrating that the patient is heterozygous for Factor V Leiden.

Discussion: No cure is available for DVT; treatment is by therapeutic intervention with anticoagulants like heparin, vitamin K antagonists, and direct oral anticoagulants. This patient can benefit from other treatment options to manage his disease. Factor V Leiden has been determined to be present, he should employ risk reduction strategies to lower his probability of recurring DVTs.

Graduate QA/QI Study in Which Original Data Were Gathered and Analyzed

Poster Number:	8
Name:	Amariti, Julia
Faculty Support:	Sue Shapses, Yvette Schluskel, Robert Schneider
List all additional co-authors or co-investigators:	Hansen, K.
Title:	Bone Quality in Overweight and Obese Older Men and Women
Background:	Bone mineral density (BMD) in the overweight/obese population tends to be higher yet fracture risk is not consistently lower, possibly due to poor bone quality. It is possible that BMD is artificially elevated due to vertebral abnormalities, so, excluding these defects along with examining lumbar spine (LS) trabecular bone score (TBS) may be a more sensitive indicator of fracture risk in this population.
Purpose:	How does obesity impact bone quality and estimating fracture risk?
Methods:	Retrospective examination of BMD and TBS in older overweight/obese subjects who participated in previous weight loss studies. Exclusion criteria was evidence of osteoporosis or osteoporosis medications. To control for artifacts, we assessed dual energy x-ray absorptiometry LS images for defects and used vertebral exclusion criteria.
Results:	Eighty-eight men and women (57.8 ± 4.4 years of age with BMI 32.0 ± 5.2 kg/m ² , 68% female) had baseline TBS of 1.36 ± 0.09 . We found that majority had a normal TBS, but 37.5 % of the participants had a partially degraded TBS and 4.5% had a degraded TBS. L1-L4 BMD was 1.19 ± 0.18 g/cm ² , when abnormalities were excluded, L1-L4 decreased to 1.15 ± 0.17 g/cm ² . The presence of vertebral abnormalities was 52%. There was no significant relationship between BMI with either TBS or LS-BMD.
Conclusions:	About half of the population had degraded or partially degraded TBS and half of the population had evidence of vertebral abnormalities. This was not necessarily the same individuals with abnormalities of TBS and the vertebrae. These factors may contribute to underestimating vertebral fracture risk based on BMD in the older overweight/obese population.

Poster Number: 9

Name: Epsi Nusrat

Faculty Support: Antonina Mitrofanova

List all additional co-authors or co-investigators: Panja, S., Pine, S., Mitrofanova, A.

Title: pathCHEMO: Uncovering (epi) genomic pathways of chemoresistance in lung adenocarcinoma

Background: Despite recent advances in discovering a wide array of novel chemotherapy agents, identification of patients with poor and favorable chemotherapy response prior to treatment administration remains a major challenge in clinical oncology and cancer management.

Purpose: We have developed a generalizable genome-wide computational framework to uncover an interplay between genomic and epigenomic mechanisms that elucidate the complexity of chemotherapy response in cancer patients.

Methods: Our approach integrates genomic (i.e., mRNA expression) and epigenomic (i.e., DNA methylation) patient profiles to uncover molecular pathways with significant alterations on genomic and epigenomic levels that can distinguish favorable from poor treatment response.

Results: We have tested our approach on patients with lung adenocarcinoma who received a carboplatin and paclitaxel combination chemotherapy (i.e., carboplatin-paclitaxel), a standard-of-care for treating advanced lung cancer. Our integrative approach identified seven molecular pathways with significant (epi) genomic alterations that distinguish favorable from poor carboplatin-paclitaxel response, including chemokine receptors, mRNA splicing, G alpha (s) signalling events, and immune network for IgA production. We have demonstrated that these pathways can classify patients based on their risk of developing carboplatin-paclitaxel resistance in an independent patient cohort (log-rank p-value = 0.0081) and that their predictive ability is independent of and is not affected by (i) signatures of overall lung cancer aggressiveness and (ii) commonly utilized covariates, such as age, gender, and stage at diagnosis (adjusted hazard ratio = 14.0). To demonstrate generalizability of our approach, we have applied our algorithm across additional chemotherapy regimens (i.e., cisplatin-vinorelbine, oxaliplatin-fluorouracil) and cancer types (i.e., lung squamous cell carcinoma and colorectal adenocarcinoma); and have demonstrated our method's ability to accurately predict patients' treatment response.

Conclusions: We propose that our approach can be utilized to identify (epi) genomically altered pathways implicated in primary chemoresponse and effectively classify patients who would benefit from specific chemotherapy regimens or are at risk of resistance, which will significantly improve personalized therapeutic strategies and informed clinical decision making.

Poster Number: 10
Name: Santos, Stephanie
Faculty Support: Michelle Zechner, PhD, LSW
List all additional co-authors or co-investigators: Zechner, M.

Title: A Thematic Analysis of Students Perceptions of Working with Older Persons with Serious Mental Illness

Background: Older people with serious mental illness (SMI) are a quickly growing population, which is expected to double by 2030 (Pratt, et al., 2008). It is crucial that mental health professionals and students learn to tailor services to the unique needs of this population (Bartels et al. 2004; Pratt, Mueser, Bartels, & Wolfe, 2013). However, there is limited research on the perceptions of students on working with older adults with SMI.

Purpose: This qualitative study aims to identify student perceptions of working with older adults with SMI during a fifteen-week Psychiatric Rehabilitation course.

Methods: Undergraduate (n=13) and graduate (n=3) forum responses from an online course in psychiatric rehabilitation were gathered at two time points (Week 1 and Week 5) to explore perspectives of working with older adults with SMI, and possible changes. De-identified responses were aggregated. Conventional content analysis approach was used. Two researchers manually coded aggregated information, and met to reach consensus regarding identification of themes. Data will be entered into NVivo for the development of tables representing content, and word counts.

Results: Preliminary content analysis suggests the following themes for weeks 1 and 5: feelings towards older adults, personal experiences with older adults, cultural views of aging, attitudes about aging, and generational differences. Additional themes for week 5 include strategies and barriers to working with older adults.

Conclusions: Students' individual perceptions of older adults varied, from week 1 to week 5 forum responses. A longer duration of exposure and other modalities, such as in-person exposure, may be needed to change perceptions. Students may have an increased understanding of older adults unique needs and interventions to address those particular needs following four weeks of coursework.

Graduate Research Study

Poster Number: 11
Name: Ahmed, Mohamed
Faculty Support: Suril Gohel
List all additional co-authors or co-investigators: Gohel, S

Title: Quantify Gray Matter Volume in Alzheimer's, Mild Cognitive Impairment and Healthy Population

Background: Alzheimer's disease is a progressive, age related, irreversible brain disorder characterized by dementia, changes in behavior and personality as well as a decline in critical thinking abilities. In this study, we aim to compare decline in grey matter (GM) density in groups of Alzheimer's disease patients (AD), mild cognitive impairment patients (MCI) and healthy volunteers (CN).

Purpose: To compare and contrast longitudinal changes in GM density in AD, MCI and CN population.

Methods: Pre-processed data for a total of 30 subjects (10 CN, 10 AD and 10 MCI) (12 female) was obtained from ADNI repository. For each of the subject, anatomical MPRAGE images were obtained for 3 distinct sessions (S1, S2, S3). Mean GM density time series were obtained for 4 regions of interest (ROIs) - posterior cingulate cortex (PCC), medial prefrontal cortex (MPFC), and left and right lateral parietal cortices (LLP and RLP) belonging to default mode network. Group level two-sample t-test performed to compare GM density between study groups for each of the sessions.

Results: We observed significantly higher GM volume in CN group (mean: 0.3246, 0.3213, and 0.3221 for sessions 1, 2 and 3 respectively) versus AD group (mean: 0.2747, 0.2646, and 0.2577 for sessions 1, 2 and 3 respectively) in the RLP ($p < 0.05$). We also observed trend toward significantly higher GM density in LLP region ($p = 0.0728$, 0.0823 and 0.0801 respectively) for first, second and third sessions in CN group (mean: 0.3968, 0.3904, and 0.3868 for sessions 1, 2 and 3 respectively) compared to MCI group (mean: 0.3450, 0.3413, and 0.3328 for sessions 1, 2 and 3 respectively).

Conclusions: We conclude from the result that GM volume significantly decrease in subjects with Alzheimer's disease when compared to normal subjects and MCI group.

Poster Number: 12
Name: de Souza, Nicola
Faculty Support: Dr. Carrie Esopenko
List all additional co-authors or co-investigators: Parker, R., Ryan, J., & Esopenko, C.

Title: Limited long-term recovery of resting-state functional connectivity in older patients after traumatic brain injury

Background: There is growing support for the use of resting-state functional connectivity (rsFC) as a tool to monitor impairment and recovery of brain function after traumatic brain injury (TBI; Hayes et al., 2016). Altered connectivity has been found in the default mode network (DMN) in the acute (Iraji et al., 2015) and chronic phase after injury (Mayer et al., 2011; Rigon et al., 2016). However, few studies have assessed how age at the time of injury affects long-term recovery of brain function following TBI.

Purpose: To better understand the effect of age of injury, we compared changes in whole-brain functional connectivity in younger and older patients from anterior and posterior seeds in the DMN at 10-days and 18-months post-TBI.

Methods: Resting-state functional magnetic resonance imaging scans (rsfMRI) were obtained from the Federal Interagency Traumatic Brain Injury Research (FITBIR) database [DOI: 10.23718/FITBIR/1503293]. Twenty younger (age=25.80; Glasgow Outcome Scale Extended [GOS-E]=6.69, SD=1.70) and 19 older (age=59.63; GOS-E=5.53, SD=1.70) patients with mild to severe TBI completed rsfMRI scans at 10-days (acute) and 18-months (long-term) post-injury. Seed-to-voxel analyses assessed rsFC from anterior medial prefrontal cortex (aMPFC) and posterior cingulate cortex (PCC) seeds in the DMN as a function of age at injury.

Results: Different patterns of DMN rsFC were found dependent on age at 18-months post-injury. Younger patients showed widespread increases in rsFC from the aMPFC and increased rsFC from the PCC to frontal regions. However, older patients demonstrated limited recovery of rsFC at 18-months post-injury. Importantly, no age differences in GOS-E were noted at 10-days and 18-months post-injury suggesting that age differences in rsFC were not due to injury severity.

Conclusions: Age at the time of injury significantly impacts long-term recovery of brain function following TBI. Future studies should also examine the association between rsFC with cognitive and behavioral symptoms.

Poster Number: 13

Name: Doherty, Colleen

Faculty Support: Carrie Esopenko PhD

List all additional co-authors or co-investigators: Nicola de Souza

Title: Feasibility Assessment of a Method to Quantify Cerebral Microbleeds in Collegiate Athletes

Background: The detection of cerebral microbleeds (CMBs), which consist of hemosiderin deposits, occurring due to sports-related concussion is limited. However, detection is significant as hemosiderin deposits affect tau phosphorylation long-term; a key characteristic of chronic traumatic encephalopathy.

Purpose: A newly developed semi-automated imaging analysis pipeline was used to examine the location, size, and frequency of CMBs in collegiate athletes.

Methods: Male and female collegiate athletes (N = 52) participating in contact (n = 18; soccer) and limited/non-contact sports (n = 34; tennis, volleyball, basketball) completed high-resolution neuroimaging during preseason assessments. We used susceptibility weighted Imaging, an MRI sequence that differentiates between the paramagnetic susceptibility of blood and blood products and the diamagnetic susceptibility of calcium. CMB detection was performed using an algorithm developed by the LupoLab-UCSF. CMB Detection steps included a 2D Fast Radial Symmetry Transform, vessel mask screening, 3D region growing, 2D geometric feature extraction, and volume segmentation via local thresholding. Candidate regions of interest as true or false positive for CMB were then classified. Independent t-tests were used to examine differences in contact/limited-non-contact athletes at preseason.

Results: The algorithm was sensitive to detecting CMBs in collegiate athletes. The average number of CMBs identified was 3.34 with a standard deviation of 2.19. However, there were no differences in the number of CMBs between contact and limited/non-contact athletes ($p < .05$) at the preseason assessment.

Conclusions: Our results suggest that semi-automated analysis pipeline is an efficient method of detecting and quantifying CMBs. Although no differences in CMB frequency were detected in contact and limited/contact athletes, this is expected as these analyses were completed using pre-sport participation data. Further studies in our lab will examine changes in pre- and post-season as well as pre- and post-injury CMB numbers.

Poster Number: 14
Name: Farhah, Nesren
Faculty Support: Dr. Shankar Srinivisan
Title: The Effect of Depressive Disorder Associated Socioeconomic Factors on Health-Related Quality of Life among Adults with Depressive Disorder in the USA

Background: Depressive disorder is a significant public health problem that is related to higher rates of chronic disease, increased health care utilization, and impaired functioning [1] . Previous studies of health-related quality of life and depressive disorder have relied on measuring the score of health-related quality of life (HRQoL) among patients with depressive disorder. This research expands upon the previous work and designed to define the impacts of socioeconomic factors associated with depressive disorder on HRQoL among adults with depressive disorder. This study would acknowledge the researcher and the patient with the significant effects of socioeconomic factors on HRQoL among adult patients who are suffering from depressive disorder.

[1] Katon WJ. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry* 54(3):216-26. 2003.

Purpose: This study aims to determine the significant effect of depressive disorder associated socioeconomic factors which include education level, marital status, employment status, and income level on HRQOL outcomes that include activity limitation, physical health, and mental health among adults with depressive disorder in the United States.

Methods: The data used in this study was obtained from 2014 Behavioral Risk Factor Surveillance System (BRFSS). The sample size consists of 88,233 patients including male and female aged 18 and older. Statistical Analysis System Software (SAS) 9.4 was employed to analyze the data. First, descriptive analysis was preformed to clearly visualize the data. Then, inferential analysis (Chi-Square test) was used to examine the association between the studied variables. Furthermore, predictive analysis, which is logistic regression, was conducted to predict and define the relation between the socioeconomic factors and HRQoL outcomes.

Results: The result demonstrated that there is a statistically significant association between socioeconomic factors and health-related quality of life among depressive disorder patients. Moreover, this study found that depressive disorder patients with higher education level have 51% chance of having mental health compared to those with lower education level. Also, depressive disorder patients with divorced status have 55% higher chance of having activity limitation than patients who are members of unmarried couples. The depressed patients with low income level have 63% higher chance of having physical health problem than those patients with high income level. Depressive disorder patients with employments for wages status have 31% less chance of having mental health than those who are unable to work.

Conclusions: There is a dramatic relationship between depressive disorder and poor health-related quality of life. This relation comes from the impact of depression on individual's satisfaction with life and well-being. Measuring and assessing the association between these depressive associated socioeconomic factors and health-related quality of life would be effective for the clinical trial, important for improving patients' quality of care, and for providing information for the policymaker.

Poster Number: 15

Name: Gbadamosi, Sharon and Meyers Elizabeth

Faculty Support: Janice Oursler, Weili Lu, Samantha Herrick and Ni Gao

List all additional co-authors or co-investigators: Carolyn Bazan, John Beninato, Carol Gao, Sunhee Eisenstat, Crystal Socha

Title: "Conversing with Others: A Work-related Soft Skills Group for Individuals with Autism Spectrum Disorder"

Background: In the last few decades, there has been an increase in prevalence of children with autism spectrum disorder (ASD). These children are now young adults in need of competitive integrated employment. Most individual's with ASD have either indicated that they have never worked before or have short intermittent histories of employment (Wehman, Brooke, Brooke, Ham, Schall, McDonough, Lau, Seward, & Avellone, 2016). Individuals with ASD often have limited communication and social skills, which can become barriers to competitive employment. In most cases adults with ASD are often under-employed, have limited work hours, and have limited responsibilities than their educational backgrounds and hard skills, or specific measurable and teachable abilities, would specify (Connor et al., 2019). Recent research has demonstrated that transition-aged youth with ASD recognize the need for additional training and support in not only finding employment, but also maintaining employment, with work related social skills training (Connor et al., 2019). Work related social skills, or soft skills are implementers to employment acquisition and central to long term workplace success (Connor et al., 2019).

Purpose: The purpose of the study was to evaluate the feasibility of integrated Soft Skills at Work training (SSW), an intervention targeted at transition-aged youth with disabilities (specifically youth with ASD) receiving vocational services to achieve the functional goal of employment.

Methods: This pilot study gave support to the effectiveness of a Skills Training approach for teaching the skill of Conversing with others, a soft skill likely to be useful for transitional youths within employment settings. The 22 Participants included transition age youth as well as adults with Autism Spectrum Disorder (ASD). These individuals participated in 4-session groups facilitated by Rehabilitation Counseling graduate students at various agencies serving individuals with disabilities. Conversing with others is a four module curriculum that teaches the following behaviors to transitional age youths participating in the study: Choosing topics for conversation, Demonstrating interest in what others are saying, Changing a topic, and concluding a conversation. Using a Direct Skills Teaching curriculum for employment related interpersonal "soft" skills, rehabilitation counseling graduate students at various agencies serving individuals with disabilities facilitated groups for individuals with ASD. Demographic information, pre and post questionnaire and evaluation of the group was collected and analyzed.

Results: Groups were found to be helpful for participants with ASD in terms of researching topics to talk about during their lunchtime. Feasibility of conducting manualized group with no facilitator training was supported as well as further review of the Pre and Post questionnaire to measure validity.

Conclusions: After further research, the implementation of the group curriculum possibly being used at rehabilitation services agencies. The use of a larger sample and different population (people with various disabilities) when conducting future research. As well as gathering qualitative data on participant's family member's evaluation after groups.

Poster Number: 16

Name: Kreitman, Alexandra

Faculty Support: Hao L, Schneider SH, Schluskel Y, Shapses SA.

List all additional co-authors or co-investigators: Hao L, Schneider SH, Schluskel Y, Shapses SA.

Title: Randomized controlled double blind trial: role of putative α -glucosidase inhibitor on bone turnover and GLP-1 after a mixed meal tolerance test.

Background: The botanical, Salacia, has α -glucosidase inhibitor properties that attenuates postprandial glucose concentrations and may increase secretion of glucagon-like peptide (GLP-1). Evidence also indicates that GLP-1 alters bone turnover.

Purpose: This study was conducted to investigate whether Salacia Chinensis, would elevate GLP-1 and predict changes in markers of bone turnover.

Methods: Twenty-three overweight and obese adults (< 60 years) were included (40% men). Fasting participants received either placebo or treatment with Salacia (500 mg) with a breakfast meal in a cross over design. Blood was taken before and at 30, 60, 90, 120, and 180 min after the meal with Salacia. Serum GLP-1, glucose, and bone markers, C-terminal telopeptide of type 1 collagen (CTX) and osteocalcin (OC) were analyzed.

Results: The mean age was 34 ± 14 years, and body mass index was 29.0 ± 3.8 kg/m². Serum glucose was 86 ± 10 mg/dL and peak concentrations were attenuated with Salacia compared to placebo ($p < 0.05$). The repeated measures analysis of variance indicated an interaction (time x treatment) for GLP-1 ($p < 0.05$) that was higher at 60 min for Salacia compared to placebo. The integrated area under the curve for CTX was negative and larger with treatment compared to placebo ($p < 0.01$), and changes from baseline were significantly lower at multiple time points ($p < 0.01$) with treatment. Serum OC did not differ significantly between groups until 180 min. when it was lower for Salacia than placebo ($p < 0.001$). There was an inverse correlation between GLP-1 and CTX in the treatment group at baseline ($r = -0.59$, $p < 0.01$), and at nearly all time points after the meal ($r > 0.48$; $p < 0.05$). Serum GLP-1 did not correlate with OC at the same time points with or without treatment, but baseline GLP-1 was inversely correlated with OC after the meal (90, 120 and 180 min; $p < 0.05$) in the treatment group.

Conclusions: This study shows that Salacia, known to decrease glycemic indices, also markedly decreased postprandial bone resorption and may shift the balance in favor of formation over resorption. Since it has previously been shown that GLP administration decreases bone resorption, the rise in GLP-1 with Salacia may play a role in attenuating postprandial bone turnover.

Poster Number: 17
Name: Mahmoud, Ahmed
Faculty Support: Dr. Antonina Mitrofanova
List all additional co-authors or co-investigators:

Title: DiffRseqDB - A web-based portal for the storage, query and analysis of large-scale RNA-seq data

Background: Recently large-scale molecular datasets have experienced significant expansion in size due to advancements in Next Generation Sequencing (NGS) technologies along with their integration into the clinical settings for diagnostic and prognostic analyses.

Purpose: To address critical needs for Big RNA-seq Data utilization, we have developed DIFFerential Rna-seq DataBase (DiffRseqDB), designed to act as a web-based scalable multi-functional portal for data query, comparative analysis, and hypothesis generation utilizing several Application Programming Interfaces (APIs) for up-to-date gene, pathway and publication information retrieval as well as R integration for statistical analysis and plot generation.

Methods: DiffRseqDB was built to address several deficiencies in other similar visualization tools such as the ability to accommodate a wide spectrum of datasets and RNA-seq analysis tools as well as the inclusion of genome-wide mRNA alternative splicing analysis, which has become increasingly valuable for elucidating mechanisms of oncogenesis and therapeutic response all within a platform requiring minimal system administration and command line skills.

Results: The efforts to develop this application have led to a versatile scalable application for RNA-seq analysis.

Conclusions: A sample implementation of DiffRseqDB is available at <http://142.93.204.216>.

Poster Number:	18
Name:	Mattaparthi, Sowjanya
Faculty Support:	Suril Gohel
List all additional co-authors or co-investigators:	Gohel, S
Title:	Quantifying lifespan changes in functional connectivity across BOLD signal frequencies.
Background:	Changes observed in human brain function and cognitive abilities with life-span are often attributed to the segregation of brain into specialized functional networks and interactions among them.
Purpose:	In the current study, we used a pre-processed largescale multi-center resting-state fMRI data (n = 665, ages: 8-85 years) to study life-span trajectories of resting state functional connectivity (RSFC) across BOLD signal frequencies.
Methods:	In this study, we used pre-processed resting-state fMRI data acquired from 665 healthy subjects at a higher sampling frequency of 1.5 Hz to assess the presence of resting-state functional connectivity (RSFC) across multiple frequency bands: (1) slow-5 (0.01â€”0.027 Hz), (2) slow-4 (0.027â€”0.073 Hz), (3) slow-3 (0.073â€”0.198Hz), and (4) slow-2 (0.198â€”0.5Hz). 22 region of interest (ROIs) time series belonging default mode network (DMN), left fronto-parietal network (L-FPN), right fronto-parietal network (R-FPN), salience network (SN) and dorsal attention network (DAN) were extracted. Pearson's correlation was calculated between mean time series of each of the ROI pairs and converted in to Fisher's z-values. Mean z-transformed values was calculated to derive within and between networks connectivity. Regression analysis was used to estimate the developmental trajectories for network specific connectivity where age and age ² were used as dependent variables and RSFC as an independent variable. Akaike's information criterion (AIC) was used to determine the best fit between linear and quadratic age effect.
Results:	Positive quadratic (i.e., U-shaped) relationship between age and RSFC was observed in DMN across all frequency bands, while DAN showed U-shaped trajectory at only slow-5 and slow-2 frequency bands. All of the other intra brain networks showed a positive quadratic (i.e., U-shaped) relationship between age and RSFC.
Conclusions:	We demonstrated a frequency specific differences in intra and inter network RSFC that exhibits differential age-related changes across the lifespan.

Poster Number: 19

Name: Mayo, Anthony

Faculty Support: Ray, Suchismita, Ph.D.

List all additional co-authors or co-investigators: Mayo, Anthony, M.B.A, M.P.M

Title: Trends in Substance Use-Related Emergency Room Visits in the U.S., 2005-2011

Background: Public funding for medical education anticipates that funded research will deliver quantifiable treatment milieu resulting in measurable health outcomes. While the study of substance addiction appears more difficult to define than traditional medical outcomes, examining indicators related to various types of substance abuse trend data can provide a tranche of information about patient demographics, varieties of substance triggers, substance misuse indicators, treatments, outcomes, comorbidity and mortality. Whereas, exclusively relying upon social reporting of substance indicators may handicap efforts to quantify substance related outcomes, modeling and empirically testing data models utilizing medical, demographic and social information gleaned from public registries can prove invaluable to investigational studies.

Purpose: Both nationally and regionally, there is a recently documented increase in the rates of substance use-related emergency room (ER) visits (Moore et al., 2017). We discuss these trends in this research report.

Methods: Substance-related ER visit records from 2005 – 2011 were culled from 205 Primary Sampling Units (PSUs) across the U.S. (Ns > 268,128). Data were drawn from the public-access Drug Abuse Warning Network (DAWN) data set, which contains patient demographics, substance(s) involved, and toxicology tests results for all ER visits that were either precipitated by or involved at least one legal or illicit drug. For each ER visit the DAWN data set provided five substance-related indicator variables: (1) all substance abuse, (2) alcohol-related, (3) non-alcohol related, (4) all pharmaceuticals, and (5) non-medical use of pharmaceuticals. For each PSU at each year we computed the proportion of cases coded “yes” for each indicator variable. We then merged data for each year and conducted a Repeated Measures Analysis of Variance (RM ANOVA) that tested for both linear and nonlinear trends.

Results: Distributions of proportions were approximately normal, and Mauchly's sphericity test was not significant for 4 of the 5 dependent measure, indicating that the basic assumptions for RM ANOVA had been met in 4 of the 5 dependent measures. We found a significant linear effect in four of five tests, and, notably, a significant nonlinear effect in all five. For all substance abuse (M proportion from .50 to .64) and non-alcohol (M proportion from .27 to .38) cases, we observed a downward followed by an upward trend with an inflection point in the year 2009. Non-medical pharmaceuticals (M proportion from .21 to .24) showed a similar pattern except that the upward trend began in 2007. A reverse pattern was seen in pharmaceutical cases (M proportion from .64 to .75), with an upward turning to a downward trend in 2009. Finally, alcohol cases (M proportion from .27 to .38) demonstrated a steady decline that flattened at approximately .20 in 2009.

Conclusions: These results will lead to further research in identifying trends specific to substances, such as opioid and cocaine regionally and nationally.

Poster Number: 20

Name: Ostrovsky, Aaron

Faculty Support: Suril Gohel, PhD

List all additional co-authors or co-investigators: Gohel, S.

Title: Frequency specific differences in whole-brain graph theoretical properties in patients with schizophrenia

Background: Schizophrenia is defined as a chronic and severe mental disorder that impacts a person's behavior and cognitive processing. Recently, applying graph theory to human brain function has contributed to the ability to study connectivity differences in brain regions.

Purpose: To understand the frequency specific differences in graph theoretical properties in patients with schizophrenia in comparison to healthy control subjects.

Methods: Pre-processed time series data was obtained from 50 healthy control subjects and 31 patients with schizophrenia across 47 brain regions-of-interest (ROIs). A sparsity range of 0.01-0.5 was used for each of the frequency bands; slow-4 (.027â€“.073 Hz), slow-3 (.074â€“0.198 Hz) and slow-2 (0.199â€“0.25 Hz). Local efficiency and global efficiency were calculated to examine the topological properties of the brain network. Whole brain global efficiency and local efficiency were derived from calculating the mean of 47 ROIs for sparsity values ranging from 0.2 to 0.45. A two-sample t-test was performed comparing control subjects and patient with schizophrenia for both global and local efficiency at both the ROI level and whole brain level.

Results: On average, the control subjects showed higher local efficiency than patients with schizophrenia at all frequency bands. Global efficiency was not significantly different between the groups. The patients with schizophrenia had a lower local efficiency for the superior frontal gyrus at slow-2, the right cingulate gyrus, right superior frontal Gyrus, right insula and left insula/left BA 47 at slow-3; and the right inferior frontal gyrus/right BA 45 and left subcallosal Gyrus /left BA 34 at slow-4.

Conclusions: The lower local efficiency in the frontal region in patients with schizophrenia aligns with previous studies.

Poster Number: 21

Name: Patusco, Rachael

Faculty Support: Jane Ziegler, Caroline Coffield, Laura Byham-Gray, Shristi Rawal, J. Scott Parrott

List all additional co-authors or co-investigators: Ziegler J., Coffield C, Byham-Gray L, Rawal S., Parrott JS.

Title: Weight Status is Associated with Health Related Quality of Life among a National Sample of Children with Autism Spectrum Disorder

Background: Associations between weight status and health related quality of life (HRQOL) have not been explored in Autism Spectrum Disorder (ASD). Identifying factors associated with HRQOL can facilitate targeted interventions for this population.

Purpose: To examine the relationship between weight status and HRQOL among a national sample of children with ASD.

Methods: This was a retrospective, cross-sectional analysis of 4,703 children with ASD. HRQOL was measured using the Pediatric Quality of Life Inventory (PedsQL® 4.0 Generic Core Scores). Associations of weight status (category, body mass index (BMI) as a percentage of the 95th percentile (%BMIp95), and BMI z-score) and PedsQL total score with select demographic, clinical, and behavioral characteristics were conducted to identify potential covariates for inclusion in the separate univariate general linear models. Possible non-linear relationships were explored post-hoc using quadratic terms.

Results: The sample was largely non-Hispanic (91.5%), Caucasian (81.6%) males (83.5%) aged 2 – 7 years (73.0%) (range 2-17.4yrs). There was a significant relationship for weight status category ($p < 0.001$) and %BMIp95 ($p < 0.001$) with total PedsQL score, each with modest effect. Children with normal weight or overweight, compared to those with obesity, had a 4-5 point unit increase in PedsQL total scores (both $p < 0.001$), suggesting better HRQOL. Likewise, children without obesity or with moderate obesity, compared to those with severe obesity, had a 5-7 point unit increase in PedsQL total scores ($p < 0.001$, $p = 0.02$, respectively). No linear or quadratic relationship was detected between BMI z-score and PedsQL total score.

Conclusions: Weight status is independently associated with HRQOL among children with ASD. Children with obesity have worse HRQOL than those who were normal or overweight and children with severe obesity have worse HRQOL than those with moderate or no obesity. Addressing weight status through prevention and/or treatment in this population may result in positive influences on HRQOL.

Poster Number: 22

Name: Porfido, Tara

Faculty Support: Carrie Esopenko, Allison Brown

List all additional co-authors or co-investigators: Brown, A.
de Souza, N.
Wagh, S.
Gutt, J.
Wentworth, C.
Viagas, N.
Esopenko, C.

Title: A standardized method for assessing neck strength in athletes with exposure to brain trauma

Background: Greater neck strength and symmetry have been identified as factors that can decrease the linear and rotational head accelerations that cause sports-related concussions. However, to-date there is not standardized method to collect and analyze neck strength.

Purpose: The aim of this study was to develop a method to comprehensively assess neck strength in athletes who are at risk of experiencing a sports-related concussion

Methods: Male and female Division III collegiate athletes (n=85; 60% female) participating in contact and limited/non-contact sports were recruited. Measures of isometric neck strength were collected in six positions (extension, flexion, left/right rotation, left/right flexion in rotation) using hand-held dynamometry. To assess the sensitivity of our protocol, differences in neck strength were examined between male versus female athletes, contact versus limited/non-contact athletes, and athletes with versus without a history of sports-related concussion. Paired t-tests were used to examine neck strength symmetry between opposing muscle groups

Results: Our neck strength testing method took approximately 15 minutes to complete. As expected, our results showed distributed variability in neck strength amongst all participants. In line with previous research and clinical expectations, male athletes demonstrated greater neck strength relative to female athletes across all motions assessed (p 's<0.005). No significant differences in neck strength dependent on sport contact risk or sports-related concussion history were noted. However, differences in neck muscle strength asymmetries dependent on sex, sport contact risk, and sports-related concussion history were shown.

Conclusions: Our protocol can be feasibly implemented and is sensitive to identifying group differences in neck strength as well as neck strength imbalances between opposing muscle groups. Both of these factors affect the stability of the head and are important to measure to understand the protective role of neck strength in sports-related concussion. Future research can use our method of assessing neck strength to characterize this relationship.

Poster Number: 23

Name: Socha, Crystal

Faculty Support: Janice Oursler, Weili Lu, Samantha Herrick

List all additional co-authors or co-investigators: Crystal Socha & Adam Zaher

Title: Work-Related Interview Skills Training for Persons with Visual Impairment and Blindness

Background: Persons with visual impairments or blindness face many difficulties in obtaining employment. Despite high levels of education, this group has a high unemployment rate. The rate of employment for working-age people with visual impairments (age 16-64) is 32.3% versus 72.2% for people without a disability. Employment challenges facing people with visual impairment continue to exist despite a higher educational level compared to people with other disabilities. Common employment related barriers for people with visual impairment identified by employment seekers, employers, and rehabilitation providers include negative employer attitudes, transportation, lack of employment preparation/skills and issues of print access. By improving individuals' ability to present themselves during an interview, they may experience a better opportunity to be chosen for a position and show overall increased rates of employment.

Purpose: Research suggests that job search skills can be taught, and people with disabilities can learn these skills. For example, social skills training related to employment has been found to increase the likelihood of finding a job among adults with intellectual disabilities and adults with psychiatric disabilities in rehabilitation orientated programs. This study aims to evaluate the feasibility of using an intervention targeted towards presenting qualifications on a job interview for individuals with visual impairments and blindness.

Methods: This pilot study evaluated whether students could deliver a Direct Skills Teaching approach (DST) for persons with visual impairments and blindness, resulting in better preparation for job interviews. Five graduate students completing internships in a master's program in rehabilitation counseling at various agency internships were trained in "Presenting Qualifications", a four-session-curriculum, based on the DST approach, and they delivered this to 26 participants in five group settings. "Presenting Qualifications" means explaining to an interviewer the reasons the organization should hire an individual. The four behaviors that were taught throughout the sessions included describing major accomplishments, identifying key transferable and self-management skills, preparing for the interview and describing your qualifications. Careful examination of descriptive statistics and the distributional form of all variables preceded statistical analysis. Paired sample t-tests were used to examine the simple treatment effects at each post-treatment assessment point.

Results: At the end of the group, most participants moved from "not sure" or "agree" to "agree" and "strongly agree" when asked how prepared they assessed themselves for going on job interviews. Out of 10 questions, nine achieved p values smaller than .01, and results were significant overall. The average effect size for study participants was approximately .82, indicating a large effect size and a large intervention effect. Results indicate that the intervention demonstrates further acceptability, i.e., positive acceptance, by clients, as demonstrated from answers on the post-group satisfaction survey.

Conclusions:

The results indicate that individuals with visual impairments and blindness can be taught to deliver the skill, "Presenting Qualifications" in a job interview scenario. Favorable responses were received from the 26 participants in this group intervention based on a pre-planned curriculum. Most participants reported increased preparedness and confidence about going on employment interviews. Some study limitations include that students were required to complete this curriculum for their internship and may not be representative of professional rehabilitation counselors at the sites. Second, the students were highly motivated and although participants self-reported improvements in skills related to job interviews, neither their performance in future real-world interviews nor the outcomes of their job search were evaluated. Despite these limitations, this study supports the feasibility of enhancing the skill level of participants with visual impairments or blindness in presenting qualifications on job interviews.

Poster 23 (end)

Graduate Student Systematic Review with Narrative Synthesis or Literature Review

Poster Number:	24
Name:	Allen, Delroy
Faculty Support:	Professor Eric Vidal
Title	The Efficacy of Educational Interventions at Improving Patients' Compliance with Continuous Positive Airway Pressure Therapy
Background:	<p>Obstructive Sleep Apnea (OSA) is chronic condition that can increase the risk of hypertension, coronary artery disease, arrhythmias, heart failure, and stroke. It is therefore very important that this condition be managed continuously to prevent potential complications. The first-choice option is the continuous positive airway pressure (CPAP) device. It uses a continuous flow of air at a particular pressure to maintain patency of the upper airway. Patients are complaint with CPAP therapy if they average four hours of CPAP aided sleep per night and can significantly improve the symptoms associated with OSA. Even with these benefits the compliance rate to recommended CPAP therapy is very low.</p>
Purpose:	To evaluate whether selected educational interventions are effective for improving patient's compliance with the continuous positive airway pressure (CPAP) device.
Methods:	<p>This research analyzed six studies centered on educational interventions that aim to improve patient compliance with the CPAP machine. The studies chosen, focused on six different formats of administering the intervention. These were in the form of a video, telemedicine along with telemonitoring, graphical representation of sleep study data, audio recordings combined with music, motivational interviewing and brief motivational enhancement.</p> <p>Studies selected for this research were those with adult patients, 18 years of age or older, diagnosed with obstructive sleep apnea and prescribed a CPAP treatment for the first time. The studies chosen also sought to evaluate the compliance rates of patients prescribed a CPAP and who also received some form of educational intervention aimed at improving compliance with the CPAP treatment. There was no limitation regarding the format in by which the intervention was provided. All studies included were randomized controlled trials.</p> <p>Studies excluded were those where the participants were children, less than 18 years old or the intervention was not based on education or the treatment was not a CPAP device. Studies were also excluded if they were published more than 20 years ago. Initially, studies older than 10 years were excluded but due to limited number of newer studies the limit was extended to 20 years. Additionally, studies with patients previously diagnosed with OSA and already receiving treatment were not included. Studies which were not randomized control trials and not in the English language were also excluded from this research.</p>
Results:	Four of the interventions showed positive results while 2 interventions showed no statistically significant improvement in compliance rates. The interventions that had some degree of success were, telemedicine along with telemonitoring, the audio recording combined with music, motivational interviewing and brief motivational enhancement.
Conclusions:	There are several educational interventions that show great promise. Namely, interventions which incorporate motivational interviewing and telemonitoring. It is important these topics be thoroughly researched to find the best intervention or combination of interventions which will most significantly improve adherence to CPAP therapy. Achieving this goal will go a far way reducing the major consequences associated with improperly treated obstructive sleep apnea.

Poster Number: 25

Name: Cascio, Michael

Faculty Support: Dr. Richard Ferraro, Dr. Katie O'Shea

List all additional co-authors or co-investigators: O'Shea,K.; Ferraro,R.; Buzzell,M.;Cascio,M.;Donegan, J.; Sunga, D.; Tukachinsky, E.

Title The effects of supervised exercise programs in people with mild to moderate dementia: a systematic review.

Background: Dementia is linked to a decline in both cognitive and motor function that can decrease a person's independence in ambulation and ADLs. This associated decrease in independence has become a public health priority with significant financial burden on the healthcare system. Current pharmacologic interventions slow the decline of aspects of dementia such as memory and executive functions without addressing the associated physical impairments. Increasing overall physical activity level is recommended because physical activity and motor function tends to decrease in this population compared to similar aged adults without dementia. The research to date has taken many approaches to mitigate the functional impairments in mobility seen in people with dementia (PWD) including preventing and rehabilitating gait disorders, increasing general strength and aerobic capacity, and addressing falls risk.

Purpose: The purpose of this review was to determine the effects of different structured exercise programs on people with mild to moderate dementia.

Methods: A comprehensive search was performed using PubMed, CINAHL, and Ovid Medline databases. Search terms included combinations such as: "Dementia" AND "Physical Activity", "Dementia" AND "Exercise", and "Dementia" AND "Fall Risk". The initial search produced 137 articles. To further refine our search, we targeted the mild to moderate dementia population. Twenty-one articles were identified and Sackett (2000) ratings were used for initial inclusion and assessing article eligibility. Based on Sackett ratings and relevance to research question, seven articles were identified and then scored for internal validity by at least two reviewers using the Cochrane Risk of Bias tool (0-14 point scale). Discrepancies in scores were reviewed by all authors to achieve consensus for a final score.

Results: Seven articles met our standards for inclusion in this systematic review (level of evidence: 7 articles= 1b). Cochrane scores ranged from 7/14 to 12/14, with a mean of 9.5/14. The literature reviewed suggests that strength, endurance, gait characteristics, balance, and neuropsychiatric all demonstrate signs of improvement with various forms of structured exercise. Studies find that supervised exercise programs increase daily physical activity experienced by patients with dementia, while reducing their fall rate. Combining both aerobic and strength training improves outcomes more than any one mode of exercise or passive therapy. A common factor in all structured exercise in the literature reviewed is supervision of these programs. Findings of this review suggest that it is crucial to monitor intensity levels and carefully progress treatment at regular intervals as the patient advances.

Conclusions: Due to the progressive nature of dementia, gains from temporary exercise programs do not last and require continued participation in a program that is structured, individualized, and supervised by a qualified individual. Traditionally, exercise is prescribed to people with dementia to maintain their abilities, but current research suggests exercise can improve function and alleviate cognitive symptoms of the disease. Structured exercise is a more affordable and sustainable method of preventative care compared to reactive treatments and the evidence suggests it should be initiated earlier and more frequently in this population. The onus is on clinicians to advocate for supervised exercise interventions for patients with mild to moderate dementia to improve their physical function, mental health and overall quality of life.

Poster Number: 26

Name: Castellitto, Kayla

Faculty Support: Julie O'Sullivan Maillet, PhD, RDN and Rachael Patusco MS, RDN

List all additional co-authors or co-investigators: Clark L., Ozut M., Pereira Y.

Title METABOLIC CHANGES IN WEIGHT LOSS AND WEIGHT REGAIN: A REVIEW OF THE LITERATURE

Background: Weight loss (WL) causes a decrease in energy expenditure resulting in changes to resting metabolic rate (RMR). An assessment of how short-term WL contributes to changes in RMR favoring weight regain (WR) allows clinicians to better help patients maintain a healthy weight.

Purpose: To explore if overweight/obese patients with short-term intentional WL through diet and exercise (D/E) have changes in metabolism encouraging WR.

Methods: In February 2019, a systematic review was performed to identify primary research articles published 2008-2019. Three databases, search/MESH terms, and inclusion/exclusion criteria were used to identify articles. The Academy of Nutrition and Dietetics' Evidence Analysis Library Quality Criteria Checklist (QCC) was used to assess the final articles' quality.

Results: Thirty articles were identified through database searches, 5 were retained for final review and all were rated positive. Populations studied were overweight/obese, aged 30-70. Four articles demonstrated WL is associated with lower RMR. RMR increased with WR, but remained below baseline. Two articles showed higher baseline T3 hormones predicting greater WL at 6 months, but greater WR after 24 months. Three articles supported improved insulin utilization with WL with regression to baseline with WR. Triglycerides and leptin decreased with WL and increased with WR in two articles.

Conclusions: RMR is positively correlated with weight. Short-term WL contributes to metabolic changes in RMR, T3, and insulin resistance all encouraging WR. Clinician should consider this when discussing WL with patients. Further research is needed to determine the long-term sustainability of WL through D/E and psychological factors affecting metabolism.

Poster Number: 27

Name: Fowler, Emily

Faculty Support: Julie O'Sullivan Maillet, Rachael Patusco

List all additional co-authors or co-investigators: Corradino, C., Pudimott, C., Ryan, M.

Title Does maternal diet during pregnancy influence development of allergic diseases in offspring?

Background: Development of childhood allergic diseases is influenced by both genetic predisposition and environmental exposures including maternal diet during pregnancy.

Purpose: This literature review evaluates components of maternal diet during pregnancy which may impact the development of allergic disease in offspring.

Methods: A literature review utilizing two database search engines was conducted in February 2019 to include original research published within the last ten years using the MeSH terms: pregnancy, diet, dietary supplements, allergy, and hypersensitivity. Studies outside of pregnancy were excluded. Five of the 111 resulting articles met inclusion criteria and were assessed using the Quality Criteria Checklist from the Academy of Nutrition and Dietetics.

Results: All five articles individually received positive quality ratings. Reductions in allergic disease in offspring in mid-childhood were associated with mothers who had higher intakes of peanuts, milk, or wheat during early and mid-pregnancy, and in offspring at one year whose mothers had higher dietary vitamin C or copper intake throughout pregnancy. Probiotic, beta-carotene, vitamin E, zinc, fish oil, and high-dose vitamin D supplementation have not shown statistically significant reductions in the development of allergic disease in offspring.

Conclusions: Changes in the maternal diet during pregnancy have been associated with lower incidence of allergic disease, which may have clinical and public health implications. Conclusions are limited by heterogeneity among studies and lack of statistical significance in existing research. Additional research is critical to determine allergic disease outcomes relating to intake of these and other dietary components; specifically examining quantity and timing of intake.

Poster Number: 28
Name: Ho, Emily
Faculty Support: Julie O'Sullivan Maillet and Rachael Patusco
List all additional co-authors or co-investigators: Poncio, C and Rant, J
Title Effects of Probiotics on Adults with Parkinson's disease and Constipation
Background: Parkinson's disease (PD) is a neurodegenerative disease, characterized by loss of dopaminergic neurons. Constipation is a common symptom which can decrease quality of life, alter availability of drugs, and lead to serious complications.

Purpose: To assess the effects of probiotics on patients with Parkinson's disease who experience constipation.

Methods: We conducted a literature review using PubMed, CINAHL, and Cochrane, with the MeSH terms: Probiotics, Constipation and Parkinson Disease. Original studies published from 2009-2019 that assessed the use of probiotics on adults with PD and constipation were included. Articles were assessed for quality using the Academy of Nutrition and Dietetics Quality Criteria Checklist (QCC).

Results: Fifty-eight studies were identified and three met the inclusion criteria. All three studies, including one randomized controlled trial and two observational studies received a positive QCC rating. The use of probiotics for 1-3 months was found to improve gastrointestinal symptoms in patients with PD, including constipation, abdominal pain, and bloating. Improvements in stool consistency, sensation of incomplete emptying, and decreased need for laxatives were also observed. These findings were both statistically significant and clinically relevant.

Conclusions: Among older adults with Parkinson's disease, the use of probiotics may provide constipation relief by increasing the number of bowel movements, improving stool consistency, and decreasing abdominal pain and bloating. Further research regarding use of different strains, dosage, frequency, and the use of prebiotics are warranted to inform clinical practice.

Poster Number: 29

Name: James-Palmer, Aurora

Faculty Support: Dr. Jean-Francois Daneault, Dr. Ellen Anderson, Dr. Lori Zucker

List all additional co-authors or co-investigators: Daneault, J.F.; Anderson, E.; Zucker, L.; Kofman, Y.

Title Yoga for the reduction of symptoms of anxiety and depression in children and adolescents: A systematic review, preliminary results

Background: Symptoms of anxiety and depression negatively impact school performance and quality of life in children and adolescents through abundant worrisome thoughts and excessive feelings of sadness, respectively. Associated stigma, along with limited compliance, responsiveness, and access to gold-standard treatments warrants the need for alternative approaches. Yoga has been proposed to positively impact mental health in children and adolescents.

Purpose: To evaluate the evidence of the implementation and effectiveness of yoga for the reduction of symptoms of anxiety and depression in children and adolescents.

Methods: Databases were searched up to November 2018 for studies assessing changes in symptoms of anxiety and/or depression in children and adolescents following yoga interventions. Studies obtained in the initial search were screened and reviewed for inclusion in the review. Studies were included if 1) participants were ≥ 18 years-old, 2) an intervention of physical yoga poses was implemented, 3) an outcome measure assessed symptoms of anxiety and/or depression, and 4) the study was published in English. Included studies were appraised for quality of evidence, and pertinent information was extracted and synthesized.

Results: The initial database search revealed 1,114 references, with a total 740 references remaining after duplicates were removed. Following the title and abstract screen, 135 references remained. After the full article review, twenty-seven articles published between 2006-2018 were included for analysis. Eleven studies assessed anxiety and depression, eleven assessed anxiety, and five assessed depression. Nineteen of these studies showed improvements in symptoms of anxiety and/or depression, however, overall methodological quality of the evidence was weak.

Conclusions: The implementation and effectiveness of yoga to reduce symptoms of anxiety and depression in children and adolescents is generally supported, although the available evidence is of weak to moderate quality. This indicates a positive potential for yoga interventions while there is a definite need for improvement in methodological quality of future studies.

Poster Number: 30

Name: Latella, Victoria

Faculty Support: Claire Babcock O'Connell, MPH, PA-C

Title Impact of Botulinum Toxin A as Prophylaxis for Adults with Chronic Migraine: A Systematic Review

Background: Over 12% of the world population(1) is affected with migraines, and over 11 million Americans experience significant headache-related disability(2). Chronic migraine (CM) affects approximately 2.2% of the world population(3) and is noted to be more disabling than other migraine classes(4). A diagnosis of CM is based on a patient's report of 15 or more headaches per month over a 3-month period with at least 8 headaches meeting migraine criteria(3, 4). The use of oral migraine prophylactic medications (OMPM) burdens clinicians to find the appropriate drug class and dosing regimen per patient, while burdening the patient with adherence to daily dosing and potential undesirable adverse effects. OMPMs have poor adherence and persistence in CM patients, worse with cycling through various drugs(3, 5). The impact CM has on patients' quality of life supports the quest to determine adequate preventive treatment options. Botulinum neurotoxin serotype A (BoNT-A) was FDA approved for CM use in October 2010(6, 7), after being found safe and effective by the PREEMPT study(6). The real-life impact of BoNT-A on CM patients needs to be further investigated.

Purpose: To provide an evidenced-based analysis of current literature regarding the real-life impact of BoNT-A as prophylaxis for chronic migraine patients regarding disability, psychosocial factors and quality of life.

Methods: A systematic search of Academic Search Premier, CINAHL Full Text, Biomedical Reference Collection: Comprehensive databases, and the Medline database was conducted on 26May2018 within EBSCOhost and Ovid platforms, respectively, to identify recent studies that utilized validated screening tools to investigate the impact of BoNT-A as prophylaxis for chronic migraine.

Results: A total of 438 articles were identified using the search criteria, 149 of which were studies/trials. Six cohort studies met the inclusion criteria for this review. Sample sizes ranged from 27 to 230 with a mean n value of 101. Studies evaluated adults (34.73-48.7 years old) diagnosed with CM. Subjects were predominantly female, 84.88%. All studies followed the PREEMPT injection/dosing paradigm but varied in evaluation intervals and assessment tools. All studies investigating migraine outcomes found a statistically significant improvement after treatment with BoNT-A. Migraine frequency improved 11.4-75.7%. Migraine severity decreased significantly ($p=0.017$) as did the duration of attacks by 27.7% (days) and 90% (headache hours). The number of analgesics used decreased significantly in all studies by 32.5-87% with a 42-49% improvement in medication days. Migraine-related disability also improved, indicated by 27-82% improvement in MIDAS scores, 0.6-1.5 standard deviation improvement of SF-36 and 1.9 SD improvement of HIT-6. Sleep quality was not significantly affected by BoNT-A treatment. Data on psychological impact was suggestive of improvement; two studies found a significant improvement while two found improvement, not statistically significant. DASS-21 scores remained relatively unchanged, BDI scores improved by 3.8-52.4%, and BAI improved by 7%. Healthcare resource utilization decreased significantly by 53-56%.

Conclusions: Findings of this review were suggestive of improved disability, quality of life, emotional state and functionality. BoNT-A has proven to be safe and efficacious in the prevention of CM(8) and demonstrated a positive impact on CM patients' lives in this review.

Poster Number: 31

Name: Nassar, Radwa

Faculty Support: Julie O'Sullivan-Maillet, PhD, RD and Rachael Patusco, MS, RD, CSP

List all additional co-authors or co-investigators: Borba, B., Conover, M., Del Pizzo, N

Title The Effect of Plant vs. Animal Protein Supplementation on Performance and Muscle Function in Adult Athletes

Background: Protein consumption is known to stimulate muscle protein synthesis. Protein ingestion and supplementation is a common practice among athletes to enhance performance due to its effect on muscle preservation, muscle function and recovery.

Purpose: To assess the effect of plant protein versus animal protein supplementation on the performance and/or muscle function of athletes.

Methods: In February 2019, a systematic review of the literature was performed using PubMed, CINAHL and Cochrane using search key and MESH terms including athletes, plant protein, animal protein and performance. Inclusion criteria was primary research within nine years using healthy adult athletes. Final studies were evaluated using the quality criteria checklist from the Academy of Nutrition and Dietetics.

Results: Of 677 articles retrieved, four primary articles were retained. Two were rated positive and two were rated neutral. Two articles demonstrated that plant protein is comparable to that of animal protein supplementation on performance. Although two articles did not directly compare plant vs. animal protein, one study found that beef protein supplementation preserved and increased muscle mass compared to whey protein and carbohydrate supplementation. The other study found that whey protein decreased fat mass compared to carbohydrate supplementation.

Conclusions: Both animal and plant proteins appear to contribute to increased muscle thickness and increased strength. Secondary outcomes include decreased body fat and increased lean body mass. Further research is needed to confirm these findings.

Poster Number: 32

Name: Norfleet, Katherine

Faculty Support: Frank Giannelli, MS, PA-C

Title The Efficacy of Telemedicine in the Treatment of Postpartum Depression

Background: Postpartum depression (PPD) affects approximately 15% of women, and as many as one third of cases go untreated. Many treatment options exist for women suffering from PPD; however, barriers to receiving care including transportation challenges and lack of childcare during physician consultations decrease accessibility. Telemedicine is a modality that can be used to administer Cognitive Behavior Therapy (CBT) and Interpersonal Psychotherapy (IPT) while reducing barriers to care. Therefore, the use of telemedicine to deliver CBT and IPT has the potential to offer mothers an effective and accessible option to treat PPD.

Purpose: The purpose of this study was to systematically review studies that investigated the efficacy of telemedicine in the treatment of PPD.

Methods: A systematic search of peer-reviewed studies using the databases Medline using OVID, CINAHL, and PsycINFO initially yielded 146 results. Using specific inclusion and exclusion criteria, the results were purposefully reduced to the five studies included in this review.

Results: All five studies demonstrated statistically significant improvement in depressive symptoms in patients that engaged in CBT and IPT via telemedicine that was not inferior to standard in person therapy.

Conclusions: This review offers support in favor of treating women with PPD with CBT or IPT via telemedicine. Further investigation into the duration and platform of telemedicine (internet vs telephone) is needed to better understand its role as therapy. However, overall findings from this review support the notion that telemedicine is not inferior to current standard of care in the treatment of depressive symptoms in postpartum women.

Poster Number: 33

Name: Ottstadt, Christopher

Faculty Support: David Kietrys

List all additional co-authors or co-investigators: Foster, B ., McCormick, M., Million, E., Nguyen, A

Title Effectiveness of Physical or Behavioral Interventions for Management of Chronic Pain in Persons Living with HIV

Background: For persons living with HIV (PLHIV) who are adherent to antiretroviral therapy (ART), HIV has been transformed from a fatal disease to a chronic condition with increased life expectancy. Concurrent with longer lifespans, PLHIV may experience physical and/or psychological comorbidities and/or side effects of ART. Chronic pain may occur in up to 85% of PLHIV. Opioids have been commonly prescribed to PLHIV who have chronic pain, despite limited evidence for their effectiveness. Because of this, non-pharmaceutical measures for management of chronic pain should be explored.

Purpose: To systematically review the literature regarding effectiveness of physical or behavioral interventions for management of chronic pain in persons living with HIV (PLHIV).

Methods: The initial search of Medline, CINAHL, and PubMed included terms HIV or AIDS or HIV/AIDS; those results were combined (AND) with Chronic Pain or Pain, and was limited to English, Humans, and randomized controlled trials (RCTs). Articles were excluded if they did not include pain as an outcome or if they were not a RCT. A hand search of reference lists from relevant articles was performed, and a secondary search using keywords associated with behavioral or physical interventions was conducted. Articles included in the review were assessed with the Cochrane Risk of Bias Tool by a consensus of 6 authors, and a Sackett rating was ascribed to each article. Key data regarding pain outcomes were extracted by the team of authors. Meta-analysis was not feasible due to clinical heterogeneity of the studies under consideration.

Results: The initial search yielded 749 articles. When duplicates were removed, 322 articles remained; 317 of those were excluded (because they did not measure pain or did not use a physical or behavioral intervention or were pilot studies), yielding 5 articles for inclusion in this review. The hand search and the secondary search did not yield any additional articles. Cochrane risk of bias scores ranged from 9/16 to 12/16. Each study explored a different intervention. Use of night splints resulted in a clinically meaningful decrease in pain (within group), but was not superior to control; vibratory stimulus resulted in clinically meaningful decrease in pain (within group; immediate effects), but was not superior to control; aerobic or strengthening exercise was superior to control, but did not result in within group clinically meaningful decreases in pain; exercise combined with education resulted in a clinically meaningful decrease in pain (within group), but was not superior to education alone; education alone resulted in a clinically meaningful decrease in pain (within group) and was superior to usual care.

Conclusions: Night splints, vibratory stimulus, exercise, education, or combined exercise/education may be helpful in the management of chronic pain in PLHIV. Factors such as practitioner training, resources, and patient preferences should be considered when selecting behavioral or physical interventions for management of chronic pain in PLHIV. More studies are needed to confirm the findings reported here and to assess long term outcomes.

Poster Number: 34

Name: Pitts, Sarah

Faculty Support: Michelle Zechner

Title The Use of Music as a Therapeutic Intervention to Address Rehabilitation Outcomes for Adults with Severe Mental Illnesses

Background: Creative arts therapies, including music therapy, have been an integral part of mental health treatment for many years. The use of complementary and alternative therapies to address rehabilitation needs for individuals with severe mental illnesses represents a shift to a recovery-based model. Currently, there is limited research on how clinicians are using music and music therapy to address these outcomes with individuals who have severe mental illness.

Purpose: The purpose of this literature review is to identify what music interventions have been used to address rehabilitation outcomes with adults who have severe mental illnesses.

Methods: Database searches of PubMed, PsychInfo, Academic Search Premier, and CINAHL were conducted as well as individual journal searches for articles in which music interventions were used to address rehabilitation outcomes for adults with severe mental illnesses. Data from the studies was extracted into an Excel spreadsheet and then analyzed through qualitative synthesis.

Results: Nineteen studies were identified and included in the review. While most studies were completed by music therapists, other clinicians are also using music interventions within a variety of mental health treatment settings. However, there are no consistent interventions used by all practitioners and no consistent outcomes that were identified as more important to address through music. Recommendations for future research and limitations of studies were also discussed.

Conclusions: While there have been previous reviews of the use of music with individuals with severe mental illnesses, no authors have investigated the use of music in relation to rehabilitation outcomes as opposed to symptom-based outcomes. Considering the current shift of mental health systems to a more recovery-based model, future researchers will need to continue to investigate how music interventions may assist with addressing outcomes consistent with this model.

Poster Number: 35

Name: Reinhardt-Wood, Dawn

Faculty Support: Dr. Michelle Zechner & Dr. Ann Murphy

Title Sexual intimacy among individuals with psychiatric disorders: A systemized literature review

Background: Intimate relationships are a valued and positive experience in the lives of adults. Much of the research thus far among individuals with psychiatric disorders has focused on sexual dysfunction and sexual risk behaviors, with less known about the intimacy experience.

Purpose: The purpose of this project was to examine current literature related to satisfaction with sexually intimate relationships among individuals with psychiatric conditions.

Methods: A systemized literature review strategy was followed. Five university databases were searched including Cochrane, CINAHL, PsychINFO, Scopus, and Dissertations & Theses Global. Based on pre-established inclusion criteria, 22 articles were included in the review and ultimately themed.

Results: Five major thematic categories emerged: sexual intimacy as related to recovery and wellness; provider or systems issues; self-efficacy, self-esteem, and mastery; physical aspects of sexual functioning; and internalized stigma. Findings suggest that individuals with psychiatric disorders desire sexually intimate relationships despite barriers; individuals with psychiatric disorders often feel unsupported in this life domain by service providers; and, evidence suggests a possible bi-directional relationship between intimacy and psychiatric recovery.

Conclusions: Future studies should explore this experience among individuals enrolled in enhanced community settings, such as Supportive Housing or Assertive Community Treatment, which fall outside the settings of outpatient and inpatient, and where additional "rules" and perceived stigma may serve as barriers to achieving satisfaction with sexual intimacy. Additionally, efforts should be made to increase provider comfort with discussing sexual or romantic relationship topics with service recipients. Finally, education to increase knowledge about sexually transmitted infections and reproductive health should be a part of any program supporting the physical health of individuals with psychiatric conditions.

Poster Number: 38

Name: Tan, Allison
Faculty Support: Dipali Yeh MS, PA-C

Title: Lower Extremity Peripheral Artery Disease (PAD): Comparative Efficacy of Drug-eluting Stents (DES) vs. Balloon Angioplasty (BA) in Maintaining Vessel Patency

Background: Peripheral artery disease (PAD) is a branch of arterial diseases with substantial global impact, characterized by occluding vessels outside of the coronary vasculature. Commonly caused by the buildup of plaque, also known as atherosclerosis, these plaques partially and sometimes completely, block vessels carrying blood to and from appendages. By blocking the access of blood to a limb, these plaques can hinder the normal functionality of a limb. To date, PAD currently affects about 8 million individuals in the U.S. and almost more than 200 million worldwide (McDermott, 2015). Affecting such a large population, PAD has shown to accrue an average of \$11,553 annually in healthcare costs compared to the \$4219 patients without PAD would be expected to accrue annually (Scully, et al. 2017). This has led to a total of \$21 billion spent annually within the U.S. population alone in treating PAD (Norgren, et al. 2010). With less invasive interventions available today, practitioners are able to minimize these costs and need for future interventions in this patient population.

Purpose: To compare the efficacy of drug-eluting stents (DES) vs. balloon angioplasty (BA) in successfully resolving patency issues in symptomatic, lower extremity peripheral artery disease (PAD) patients.

Methods: Using online databases and key terms, studies with similar inclusion and exclusion criteria were produced for analysis. With a PICO and study requirements to sort through the results generated by the databases, a final list of studies was analyzed for the results of their trial or study in maintaining patency. This was organizationally done through the use of a note matrix seen in Table 4.

Results: Based on the reported findings from final list of studies, DES showed to have a significantly greater percentage in maintaining patency in patients with PAD. With significant p values of $p \leq 0.05$ calculated within all studies analyzed, primary patency was maintained successfully in majority of patients after undergoing DES procedures, showing the level of efficacy of DES compared to BA. Studies were also duplicated in other countries to show the consistency of DES in maintaining patency in different populations affected by PAD. Data from post-operational appointments supported these claims by adhering to AHA/ACA Guidelines for treating PAD. Studies were also found making comparisons with specific types of DES, showing the dynamic nature of the world of research for effective and efficient endovascular interventions.

Conclusions: With medical data and analytics supporting the superiority in the efficacy of DES in maintaining patency, researchers are being encouraged to perform more long-term studies to further bolster these findings. By doing so, DES and more specific types of DES have the potential to become primary endovascular interventions of choice for patients with PAD. With the sustained ability in maintaining patency, especially in long-term cases, DES has the potential to decrease or delay the progression to more invasive surgical interventions or amputations, which brings hope for clinicians to be able to provide a treatment with a brighter outcome for the future.

Poster Number: 39

Name: Wong, Alexander

Faculty Support: Erich Vidal, PA-C

Title: Insomnia: A Dreamer's Nightmare

Background: Melatonin is the hormone that is secreted from the pineal gland. It is known for its influence on the circadian rhythms/sleep wake cycles. Autism spectrum disorder is a neurological and developmental disorder that is seen early in childhood and lasts throughout a person's life. It affects how these individuals interact, communicate and learn. A common feature includes repetitive behaviors and restricted interests. Insomnia is characterized by having difficulty falling asleep and/or staying asleep. Common problems include waking up often during the night or having difficulty falling back asleep. Many factors contribute to insomnia.

Purpose: This systematic review sought to evaluate the efficacy of exogenous melatonin as an intervention for children with comorbid autism spectrum disorder and insomnia.

Methods: PubMed and Medline searches were conducted using keywords: insomnia, intervention, melatonin, and autism. Studies were limited to randomized control study or clinical trial, full text, English, medication naïve. Studies including children with disorders other than autism were excluded. Five studies were evaluated.

Results: Children with comorbidities of autism spectrum disorder (as diagnosed via DSM-IV) and insomnia were subjected to varying treatments to examine the correlation of sleep quality/quantity and its relation to exogenous melatonin. A different study was included to show the relation between the metabolite (6-sulfatoxymelatonin) of nocturnal melatonin and its relationship with sleep architecture in children with ASD. Sleep difficulties, mainly insomnia occur in about 50-80% of children with ASD. Outcomes were measured using various methods such as the Composite Sleep disturbance Index, sleep diaries, polysomnography, actigraphy, parent-reported surveys and questionnaires. Differing lengths of intervention, mg of exogenous melatonin, lengths of baseline establishment and control of bias were noted in the studies. It was found that there was a positive correlation between exogenous melatonin and sleep duration. Also, the effects of cognitive behavior treatment in combination with melatonin magnified the synergistic effects and its impact. While there were significant findings in the sleep quality and duration, in some studies, a decrease in night-wakenings wasn't found.

Conclusions: Targeted interventions to alleviate this stress caused by the child's insomnia would be beneficial for both the child and the parents while also easing some of the symptoms of autism spectrum disorder. There is always the potential for bias when reporting via surveys or questionnaires, as these outcome measures can be subjective. Pre-screening with polysomnography before taking part in the intervention wasn't done. Further research is needed to support the use of exogenous melatonin use since the long-term effects have not been thoroughly studied. Exogenous melatonin offers low-risk, minimal tolerance, improved sleep quality, broad availability and cost-effective option for this population.

Graduate Student Systematic Review with Quantitative Synthesis (e.g., meta-analysis)

Poster Number: 36

Name: Lin, David

Faculty Support: Adrienne Simonds, PHD, PT, James Scott Parrott, PHD, Ed Schrank, PHD, PT
List all additional co-authors or co-investigators: Ball, J; Castro, M; Cenoplat, A; Lin, D; Papdemetriou, C.

Title: The Effectiveness of Transcutaneous Electrical Nerve Stimulation to Reduce Acute Pain and Opioid Consumption after Cesarean Section Delivery

Background: Over 1.2 million women undergo Cesarean Section (CS) delivery each year in the United States, accounting for approximately 30% of deliveries. Women are prescribed opioids for pain management in both the inpatient stay and upon discharge home following CS delivery in the United States. Non-pharmacological therapies for pain, such as TENS, may be effective to reduce the quantity of opioids provided to new mothers after birth to manage post-operative pain after CS.

Purpose: The purpose of this review was to determine the effectiveness of TENS to decrease pain and opioid consumption after CS.

Methods: A literature search was conducted from September 2017 to January 2018 using PubMed, CINAHL, EBSCO databases and Google Scholar. Search terms included: "TENS", transcutaneous electrical nerve stimulation", "electrical stimulation", "Cesarean". "analgesia", "incisional pain", "postpartum." Studies in English, with human subjects and with TENS compared to usual care were included. Exclusion criteria were animal studies, those not in English and non-intervention studies. Included studies were critically appraised by 2 reviewers using the Centre for Evidence-Based Medicine (CEBM) Levels of Evidence and the Cochrane Risk of Bias Tool. A third reviewer was utilized to resolve differences.

Results: The search yielded 36 studies. Twenty-six studies were excluded. Ten studies were retained for review investigated TENS to reduce pain in women with acute CS incisional pain between 24 and 72 hours. Nine of the 10 studies were Randomized Controlled Trials (RCTs), ranging in quality from CEBM Level 1b to 2b. RCTs comparing TENS plus usual care to usual care alone found statistically significant reductions in pain ($p < 0.05$) and opioid consumption ($p < 0.05$). A reduction in initial time to breastfeed ($p < 0.001$), reduced maternal sedation and improvements in physical function ($p < 0.05$) were also identified in TENS plus usual care groups compared to usual care alone. Electrode placement consisted of two or four electrodes placed within 5 cm of the CS incision. High frequency TENS (> 75 Hz) was more effective to reduce pain than low frequency TENS. TENS was provided continuously for 3 days or at 20-minute intervals.

Conclusions: Conclusions: The addition of TENS to usual care resulted in statistically significant reductions in both pain and opioid consumption after CS delivery during the first 72 hours postpartum. High frequency TENS delivered at 20-minute intervals or continuously during the inpatient stay may be effective to reduce opioid consumption in new mothers after CS delivery.

Clinical Relevance: The opioid epidemic in the United States has promoted an increased awareness to prescription of opioids to post-surgical patients. Given the prevalence of CS delivery and prescription of opioid medications in usual care postpartum, non-pharmacological therapies to reduce pain, such as TENS and physical therapy, are critically needed.

**Poster
Number:** 37

Name: McDermott, Meagan

**Faculty
Support"** Melanie Trecartin

Title: Efficacy of Text Message Based Smoking Cessation Interventions for Adolescents and Young Adults

Background: Smoking is a dangerous and harmful habit that young adults practice. Without effective smoking cessation methods, they will face numerous health burdens later on in life.

Purpose: Will text message based smoking cessation methods be an effective way to assist young adults in quitting smoking?

Methods: Randomized control trials, which utilized text message as a means to deliver smoking cessation aide were examined. Those which assessed the effects of text message based interventions by measuring smoking abstinence and a reduction in the mean number of cigarettes smoked were included. Four out of five, (80%) of the studies compared the treatment group to a control group who also received text messages containing health improvement information. Four out of five (80%) also designed text messages according to what stage in the quitting process participants were in at the time of the study. Data was reported as percentage of participants who achieved smoking cessation, and odds ratios were calculated using a 95% confidence interval. 5 Randomized control trials were evaluated to include 1,746 participants in total. All studies utilized self report to obtain data which introduces the possibility of participant bias in the findings

Results: Overall, just one study yielded statistically significant data to suggest that text message based interventions may be effective amongst African American male adolescents and young adults $F(1,55) D=4.39, P<.01, n^2=0.17$. However, the use and acceptability of the text message based interventions were rated highly amongst all study participants. Text message based interventions for smoking cessation seem to have had the greatest impact on male participants and those lacking higher education.

Conclusions: Findings from this analysis indicate the utility of text message based interventions as a future treatment option.

NOTES



RUTGERS

School of Health Professions

#1 IN THE NATION

BEST U.S. COLLEGES
FOR HEALTH
PROFESSIONS
COLLEGE FACTUAL

