INNOVATIVE RESEARCH SYMPOSIUM

A CELEBRATION OF INNOVATIVE STUDENT RESEARCH

THURSDAY, APRIL 21, 2022

Fairfield University

Schedule

LOCATION CHART

INNOVATIVE RESEARCH SYMPOSIUM

TIME & LOCATION	GROUP	BOOTH
10 A.M. - 12 P.M. MORNING SESSION		
Dogwood Room	Independent Projects	71-87
Oak Room	Egan Nursing and Health Studies	1-70
12 - 2 P.M. MID-DAY		
BCC Lobby	Apollon Journal (Digital)	121
2 - 4 P.M. AFTERNOON SESSION		
Dogwood Room	Sigma Xi	71-120
Oak Room	Egan Nursing and Health Studies	1-70
BCC Lower Level	Engineering	131-170
BCC Lobby	DNP Nursing (Digital)	125
ALL DAY		
BCC Lobby	Art Exhibit	122-124
Lukacs Gallery, Loyola Hall	Art Exhibit	126-130
BCC Under Tully Stairs	Screening by Theatre Fairfield	
7:30 P.M. EVENING		
Gonzaga Auditorium	Spring Jazz Ensemble Concert	

Welcome and Appreciation

Dear Colleagues, Students, and University Guests:

Welcome to the 2022 Innovative Research Symposium at Fairfield University! We are excited to return to an in-person event! Innovation is a spark of imagination igniting the pursuit of answers to questions that drive our intellectual curiosity. Fairfield students collaborate with faculty mentors to develop creative research projects that extend from the classroom to the world. Whether examining cells under a microscope or documents in an archive, our student research contributes to the understanding necessary to address today's pressing societal issues. This year, environmental sustainability, community engagement, and diversity and inclusive excellence come into focus as three tracks at the symposium around which much of our academic community's research centers.

The Innovative Research Symposium showcases the rich diversity of student research from across academic disciplines. Capstone Nursing and Health Studies projects, research by our Sigma Xi students in the natural sciences, mathematics, engineering, and psychology, and community-based and independent projects are featured. We invite you to engage with the scholarly endeavors of over 400 undergraduate and graduate students that spotlight the wide range of student-faculty research at the core of Fairfield's academic mission. Exploring these innovative projects joins us together in reaching for the Magis, the more, to advance the common good through the pursuit of knowledge.

We celebrate the Innovative Research Symposium's return to the Barone Campus Center with a new look. We also highlight visual and creative arts throughout the day with three different exhibits and a concluding evening performance. We celebrate our students' research and creativity over lunch when participants come together to share research, ideas, and resources. The School of Engineering will host an afternoon session featuring research presentations and community partners in the Lower Level BCC. We conclude the day announcing our Stags' Choice Awards for the best project in each of the four main categories. Be sure to cast your votes! Then, come to the Kelley Presentation Center for the Center for Social Impact's Celebration of Excellence. The 2022 Innovative Research Symposium manifests how our community draws on its commitment to pursuing academic excellence for the resiliency and hope necessary to strive for more and forge ahead.

We are grateful for the generous support of so many from our Fairfield community who contributed to making this event such a success. We offer our appreciation to the many donors whose gifts enable Fairfield University students to pursue their academic goals and take advantage of opportunities arising from collaboration with our outstanding faculty. A special note of appreciation is extended to each faculty mentor who devoted their time and energy to our students. Special recognition goes to Kimberly Baer, Tasha Mehne, Kathy Nantz, Jay Rozgonyi, Debbie Whalley, Bob Hibson, Allison Wade, Casey Timmeny, Rob Bove, Tom DiPirro, Bridget Dalen, Nicolette Massaro, Kristen Nicolia, Matt Dinnan, Amanda Harper-Leatherman, Kraig Steffen, Kim Doughty, Kathy Saracino, Rose Iannino-Renz, Elif Kongar, Melissa Quan, Emily Porter-Fyke, Dayna Cavanaugh, Cindy Russo, Marie-Laure Kugel, Carey Weber, Marice Rose, Lynne Porter, Jo Yarrington, and Silvia Marksans-Sakly

and all those who assisted in making this event possible. Most especially, we thank the students who inspire us every day with their joy for learning.

Congratulations to our student presenters and faculty mentors! Thank you for joining us on this day of academic celebration.

Jocelyn M. Boryczka, PhD
Vice Provost for Scholarly and Inclusive Excellence

The Innovative Research Symposium

Coordinated by the
Office of Scholarly Development

The Office of Scholarly Development's mission is to develop student scholars by mentoring and educating them about opportunities for fellowships and grants that support domestic and international experiences before and after graduation. Opportunities include fellowships for formal degree studies, independent research funding, teaching placements abroad, and support for public service and creative arts projects among many other possibilities.

We coordinate the newly named INSPIRE Fund (formerly known as the Research and Travel Grant Program). Students apply for funding to support faculty mentored collaborative research projects in STEM, the humanities, arts and social sciences. Annual application deadlines are October 15 and March 8.

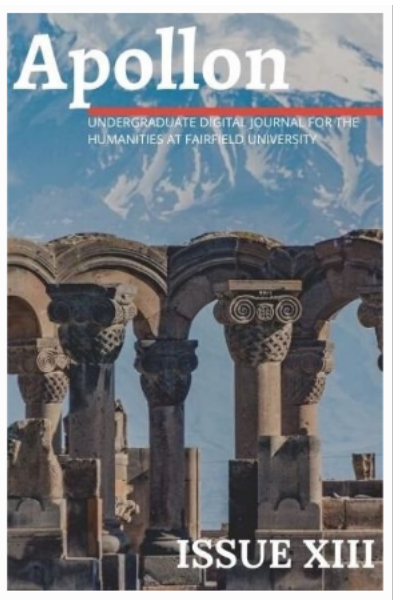
We prepare and guide students who pursue a range of nationally competitive fellowships such as Fulbright, Goldwater, and Gilman that support research and study abroad experiences for undergraduate students and post-graduate opportunities such as the Fulbright. Recipients typically receive funding toward advanced research or graduate studies in their designated field and often at locations outside of the United States. Every Spring semester, we offer a Fulbright Proposal Boot Camp where we meet twice monthly with applicants to help them develop a competitive application.

The annual Innovative Research Symposium showcases Fairfield's outstanding student research and creative accomplishments, many of which the INSPIRE fund supports and lead to nationally competitive fellowships.

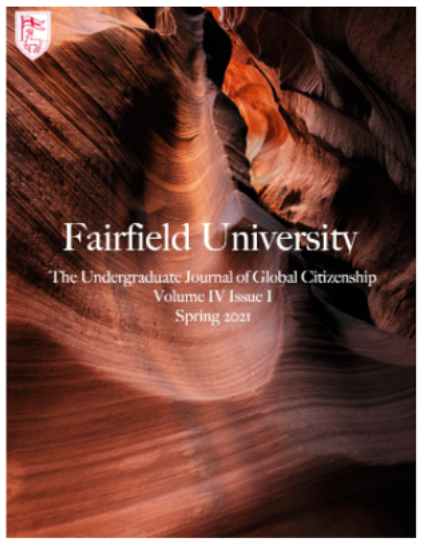
For more information about the Office of Scholarly Development in the Office of the Provost, please contact Program Coordinator Kim Baer at kbaer@fairfield.edu.

Student-Based Journals

Fairfield University proudly hosts two journals showcasing student research and creative projects:



Apollon Digital Journal – apollonejournal.org



Undergraduate Journal of Global Citizenship

Sigma Xi

INNOVATIVE RESEARCH SYMPOSIUM

SIGMA XI
THE SCIENTIFIC RESEARCH SOCIETY

Social Cognitive Deficits as a Risk Factor for Intimate Partner Violence in College Dating Relationships

Lauren Adams, Katherine Samonek, Alexandra Filipkowski

Faculty Mentor: Margaret McClure

Booth: 71, Dogwood Room (PM)

Abstract

College students experience high rates of intimate partner violence (IPV) in their dating relationships, yet detailed social cognition studies into factors of in-the-moment IPV perpetration (IPV-P) and victimization (IPV-V) in this population are insufficient. There is limited evidence that deficits in social cognition, especially in face recognition and interpretation processes, increase the likelihood of IPV in dating relationships. However, these studies often used self-report assessments. We used a well-validated, implicit action activity to compare IPV and social cognition. Study Design/Methods: Participants were undergraduates recruited from Introductory Psychology courses (N=320) at a private, liberal arts university in the northeastern United States. Only participants who had begun dating were included in these analyses (mean age=19.1, SD=1.3 years). Participants completed the Conflict in Adolescent Dating Relationship Inventory (CADRI) and the Approach Avoidance Task (AAT), a validated social cognition assessment. We looked at reaction times to correct trials of each condition as the DV. Results: Participants were classified as experiencing high or low IPV based on CADRI scores. Participants who reported High IPV-V demonstrated social cognitive errors such that they approached angry faces faster (M=679.42 ms, SD=83.84 ms) than those with Low IPV-V (M=750.26 ms, SD=127.79), t(77)=2.12, p=.04. Conclusions/Future Plans: Preliminary data suggest that social cognitive errors are related to IPV-V. Future research is warranted to determine if this is the result of desensitization to anger or if it is a risk factor for IPV-V.

Future Changes in Extreme Precipitation over the Northeast United States

Carissa Agostino, James Vizzard

Faculty Mentor: Robert Nazarian

Booth: 72, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Also Presented at American Geophysical Union, 2022

This Research Was Supported by the NASA Connecticut Space Grant

Abstract

Northeastern United States is a densely populated region that experiences a strong seasonal cycle in both temperature and precipitation. Despite observations showing an increase in extreme precipitation over the region coupled with the area's vulnerability to flooding and high population density, little research has been conducted to examine the change in mean and extreme precipitation over the region in a warming climate. Here, we undertake a regional study to probe the change in extreme, measured through a variety of metrics, and mean precipitation through the end of the century in an ensemble of very high resolution, dynamically-downscaled simulations. The spatial scale of century-scale extreme precipitation changes, regardless of the metric, has a coastal dependence; inland regions will experience the largest increase in the magnitude of individual extreme precipitation events. Additionally, we find that the frequency of extreme precipitation (both extreme dry and extreme wet) events will increase in a warming climate, with the strongest storms twice as likely to occur at the end of the twenty-first century then they are at the end of the twentieth century. We additionally find that, while the regional scaling rate for mean precipitation agrees with global projections (2%/K), the regional scaling rate for extreme precipitation is not in agreement with global projections (7%/K), with the dynamic term playing an outsized role in setting this rate. Additionally, observations are used to truth test the model ensemble. The increase in both the magnitude of individual, extreme precipitation events and the frequency of extreme precipitation events suggests that this densely populated region of the country may require significant adaptation strategies.

Using Papain to Chemoenzymatically Synthesize Oligomers of the Amino Acid α Aminoisobutyric Acid

Karim Alveranga

Faculty Mentor: Matthew Kubasik

Booth: 73, Dogwood Room (PM)

Abstract

Papain is an enzyme known for its ability to hydrolyze amide bonds in a non-specific manner. The non-specificity of papain makes it an ideal protease to use in attempting to form (condense) or break (hydrolyze) amide bonds with the unnatural amino acid, α aminoisobutyric acid (Aib). By adjusting the concentration of product and substrate, the protease can be made to favor the condensation reaction based on Le Chatelier's Principle. Previous literature describes papain successfully polymerizing monomers of tripeptide ethyl esters containing Aib under specific conditions including pH, solvent, and temperature. These experiments were attempted and then run under modified conditions in hopes of success with other Aib containing ethyl and methyl ester monomers. MALDI ToF mass spectrometry and NMR spectroscopy were the primary methods of analysis used.

Quantification of Capsaicin and Dihydrocapsaicin in Peppers Through HPLC Analysis

Katherine Bacchi, Olivia Salem

Faculty Mentor: Matthew Kubasik

Booth: 74, Dogwood Room (PM)

Abstract

If you are anything like us, you have a soft spot for spicy foods. Being a staple in the diets of many cultures, peppers have made their way into the lives of many people around the world. However, have you ever wondered what exactly it is that causes certain peppers' unique kick? The answer is capsaicin! From the Carolina Reaper to yellow bell pepper, all peppers contain some concentration of capsaicin. This study focuses on determining the different concentrations of this fiery chemical in an assortment of peppers that we commonly use, know, and love. Using high-performance liquid chromatography (HPLC), peppers of varying spice levels were analyzed. In this analysis, we quantified their individual quantities of capsaicin, comparing them to their perceived spice level.

Dihydrexidine Improves Verbal Learning and Memory in Patients with Schizotypal Personality Disorder

Jillian Bauknecht, Leif Alino, Kellyn Kuczarski

Faculty Mentor: Margaret McClure

Booth: 75, Dogwood Room (PM)

This Research Was Supported by the National Institute of Mental Health Grant

Abstract

Cognitive impairments, notably in working memory, are the best predictor of functional outcomes in schizophrenia spectrum disorders. The dopamine pathway, especially the D1 receptor, strongly mediates cognition, making this system a primary target for treatment of cognitive impairments. Dihydrexidine (DAR-100A), a full D1 dopamine agonist, yielded promising results in treating cognition in previous animal and human studies. Impairment in schizotypal personality disorder (SPD) closely parallels schizophrenia while maintaining less severe psychotic symptoms, making SPD an ideal disorder to treat to evaluate the effect of DAR-100A on cognition without antipsychotic drug confounds. Using community-recruited participants with SPD (N = 28), we conducted a double-blind, placebo controlled trial using infusions of DAR-100A (15 mg, placebo), and evaluated the effects on cognition using tests of executive function and verbal/learning memory from the MATRICS cognitive battery. Due to treatment side effects, the study experienced high dropouts, restricting analysis between baseline and four days after treatment. When controlling for baseline cognitive performance, we found a statistically significant improvement in verbal learning and memory for drug treatment (M=47.43, SD=12.29) versus placebo (M=40.15, SD=7.12), $F(1,24) = 5.11$, $p = .03$. Results suggest that the D1 receptor is a viable target for treatment and further research should be conducted to produce a more easily administered drug.

If You Give a Monkey an iPad

Rebecca Belmonte, Sabrina Chionchio, Victoria Pellegatto, Madeline Bosse, Zana Imetovski, Peyton Ralph, Anne Mackey

Faculty Mentor: Ashley Byun, Matthew LaClair

Booth: 76, Dogwood Room (PM)

This Research Was Also Presented at the Association of Zoos & Aquariums Conference, 2022 and Connecticut's Beardsley Zoo Lecture Series, 2022

This Research Was Supported by the Mancini Fund

Abstract

Our project examines social learning, cognition, and cognitive enrichment in New World primates at the Connecticut's Beardsley Zoo (CBZ). When caring for animals, a focus on providing physical care is emphasized, but the need for providing environmental enrichment is often overlooked. Lack of mental stimulation for these animals will result in stress-related behaviors such as pacing, excessive self-grooming, and self-injurious behaviors. Touchscreens have already been used in enrichment activities and cognitive testing in institutions including the Lincoln Park Zoo and Toronto Zoo. However, use has been restricted to Old World primates, such as chimpanzees and gorillas. To our knowledge, our project is the first to expand and introduce this technology to New World Primates in a zoo setting. We currently focus on the black-handed spider monkeys (Ateles geoffroyi) and black and gold howler monkeys (Alouatta caraya), two primate species housed at CBZ. Currently, we are collecting behavioral data on all spider and howler monkeys, which involves developing ethograms and conducting daily observations. We will then begin training the monkeys to use a touchscreen so we can begin assessing the effect of the iPads on New World primate enrichment and assessing aspects of primate cognition, such as social learning.

Finding Nemo: Where and When Do Little Fishes Arrive on the Reef?

Rebecca Buonopane

Faculty Mentor: Chelsie Counsell

Booth: 77, Dogwood Room (PM)

This Research Was Supported by the Vincent Rosivach Faculty Student Collaborative Research Fund, Science Institute Grant

Abstract

Many reef fish have a pelagic larval stage in which they drift on ocean currents. Fish are considered new recruits when they settle on reef habitat and become a part of the local fish population. Most adult reef fish do not migrate between reefs, so the arrival of new recruits can have important implications for population dynamics. To document spatial and temporal patterns in reef fish recruitment, we surveyed recruits (< 11 cm in length) at three sites within Kāneʻohe Bay, Hawaiʻi daily or every other day for a lunar cycle (thirty days) in Summer 2021. Spatially, we observed distinct fish communities at each site despite similar locations and habitats. The timing of recruitment pulses can be hard to quantify; our data suggests potential pulses with high site- and species-specific variability. Given our focus on recruits, we used five minute timed swims as our main survey method as this technique enables a careful search for small individuals. To compare this survey technique to the more commonly used belt transect, we paired each set of timed swims with a belt transect (25 m x 2 m). In comparing the data from these two survey methods, we found timed swims observed a greater number of recruits. Overall, our results (1) provide support for the use of timed swims when focused on finding reef fish recruits, and (2) provide insight on the spatial and temporal dynamics of reef fish recruitment in Hawaii.

Investigating the Interactions Between Captive and Wild Ravens (*Corvus corax*)

Alexandra Carlotto, Kyle, Crowell

Faculty Mentor: Ashley Byun

Booth: 78, Dogwood Room (PM)

Track: Environment and Sustainability

Abstract

Our project investigates the interactions between a female raven Azriel (Corvus corax) and wild ravens at the Connecticut's Beardsley Zoo. Due to injuries that prevent Azriel from surviving in the wild, she has lived in an outdoor enclosure at Connecticut's Beardsley Zoo for over seventeen years. Over the years, zoo staff have observed wild ravens visiting Azriel's enclosure, but the nature of this interaction is not well understood. To better understand this behavior, trail-cams were set up to capture any interactions that occurred while we were not on site. We conducted a series of in-person playback experiments to determine whether Azriel was actively seeking out these interactions. Preliminary results show that Azriel and wild ravens are actively engaging in flight behaviors which could be indicative of play or courtship. Furthermore, Azriel has been shown to vocalize more frequently in response to wild raven calls than without them, suggesting that she is actively seeking out those interactions.

Can Feeling Your Joy Help Me to Bear Feeling Your Pain?: Using Positive Empathy to Reduce Burnout

Mary Cassidy

Faculty Mentor: Michael Andreychik

Booth: 79, Dogwood Room, (PM)

Abstract

Previous research has indicated that, among helping professionals, empathizing with the negative emotions of clients and patients (e.g., sadness, suffering) can lead to higher rates of burnout. In this study, we tested whether empathizing with the positive emotions of clients and patients (e.g., hopefulness, relief) could serve to reduce burnout. To do this, we instructed a group of practicing nurses to either make a special effort to empathize with patients' negative emotions, make a special effort to empathize with patients' positive emotions, or to engage in a neutral activity (e.g., focusing on the details of daily events in their own lives). We checked in with the nurses every two weeks for six weeks to assess their level of burnout and job satisfaction while they followed their assigned instructions. Although preliminary results were mixed, we did find that at every point of the study, nurses in the positive empathy condition reported lower levels of negative emotions than nurses in any of the other conditions, and nurses in the negative empathy condition reported higher levels of burnout than nurses in any of the other conditions.

Hyperbolicity in Asymmetrical Lemon Billiards

Kaylee Christie, Courtney Kitchen, Rian Boutin

Faculty Mentor: Mark Demers

Booth: 80, Dogwood Room, (PM)

This Research Was Also Presented at the Joint Mathematics Meetings

This Research Was Supported by the National Science Foundation (NSF) Research Grant

Abstract

Mathematical billiards are important models of dynamical systems from statistical mechanics. This project concerns a class of billiard tables called asymmetrical lemon billiards, which are convex tables formed by two circles of different radii. These billiards exhibit hyperbolicity despite violating the usual defocusing rule for billiards with concave boundaries. By varying two parameters, the radius of the larger circle and the distance between the centers of the circles, we classify different regimes which exhibit nonergodic behavior by proving the existence of elliptic islands. In addition, using a MATLAB simulation, the shape of the elliptic islands and strength of the Lyapunov exponents are analyzed numerically as a function of the parameters. This project was conducted at Fairfield University during Summer 2021 with support from the National Science Foundation.

Polymerization and Analysis of Melamine Formaldehyde: The Magic Behind the Eraser

Madelyn Coogan, Matthias Zagajeski

Faculty Mentor: Matthew Kubasik

Booth: 81, Dogwood Room (PM)

Abstract

Mr. Clean Magic Erasers are considered a very successful cleaning product. Magic erasers are mainly composed of a melamine-formaldehyde-sodium bisulfite copolymer. Melamine-formaldehyde copolymer has high absorbent properties due to its structure. Many consumers have attempted to replicate the Mr. Clean Magic Erasers using a pre-prepared foam consisting of the melamine-formaldehyde copolymer. Therefore, we compare the Mr. Clean product with our own foam synthesis of the melamine-formaldehyde copolymer. We use various instruments such as the MALDI and FTIR to make comparisons between the commercial product and our product. By breaking down each foam, we properly compare any differences in chemical properties that would lead to one product being more effective in terms of its cleaning capabilities.

Preparation and Characterization of Cobalt(II), Nickel(II), and Copper(I) ONO Pincer Complexes

Michael Corbett, Natalia Bertolotti, Abigail Araujo, Connor Padover, Stephanie Coulombe, Emma Mircovich

Faculty Mentor: John Miecznikowski, Olivier Nicaise

Booth: 82, Dogwood Room (PM)

This Research Was Also Presented at the American Chemical Society National Meeting, 2022

This Research Was Supported by the Femia Science Endowment and the Mancini Fund

Abstract

We have developed and synthesized a series of tridentate pincer ligands, each possessing two oxygen- and one nitrogen-donor functionalities (ONO), based on bis-imidazole precursors. The tridentate ONO ligands incorporate a carbonyl-substituted imidazole functionality. We have prepared a more flexible ligand systems by employing the starting material 2,6-(dibromomethyl)pyridine to introduce a methylene linker into the pincer ligand (1a-b). We have metallated these ligand precursors to form nickel(II), cobalt(II), and copper(I) complexes containing the tridentate ligand. A detailed description of the syntheses, and characterization of the ligand precursor and the ONO nickel(II) complex are presented.

Investigation of Wildlife at Connecticut’s Beardsley Zoo

Christina De Angelis, Tristan Correia

Faculty Mentor: Ashley Byun

Booth: 83, Dogwood Room (PM)

Track: Community Engagement

This Research Was Also Presented at the Connecticut's Beardsley Zoo Evening Lecture - MOONLIGHT, MUSIC, ROMANCE AND FRIEND ZONE!?

Abstract

The purpose of the Wildlife Survey Research Project at Connecticut’s Beardsley Zoo (CBZ) is to document the types and abundance of wildlife found on zoo grounds, the frequency of their visits, and determine what they are doing and their interactions with other zoo inhabitants, while at the zoo. This project is part of the Community Engaged Learning Program RIZE (Research, Internships, and Zoo Education) which focuses on research which will enhance the CBZ’s Species Survival Plan (SSP), animal care, and general knowledge about the animals and wildlife at the zoo. This research is extremely important as animal welfare is a priority for any zoo and the information gathered over the course of the semester could help ensure that all the zoo animals are well protected and receiving the food that they have been provided. To document the wildlife found on zoo grounds, motion sensitive camera traps were set up in four different locations on zoo grounds. Locations were selected based on recommendations from zoo staff and specific areas that sparked interest due to the ability of attracting outside animal species, the presence of animal tracks and burrows, and whether there was easy access to zoo inhabitants’ food. We monitored these sites all semester by manual inspection and by downloading captured pictures and videos from camera traps. We used this data to make assessments regarding the frequency of appearances and wildlife diversity at CBZ.

Education and Meritocracy in America: What Does the Data Say?

Brett DeBouver

Faculty Mentor: Laura McSweeney

Booth: 84, Dogwood Room (PM)

Track: Diversity and Inclusive Excellence

Abstract

Education in the United States is claimed to be meritocratic; therefore students who work hard should achieve success in their studies (Liu, p. 385). Inequalities throughout society impede the possibility of this ideology being realistic. This project looks into the relationship between societal challenges that students may face in America and academic performance. The cross-sectional data used for this research came from the “Parent and Family Involvement in Education, 2019” survey conducted by the National Center for Education Statistics. This survey of parents from across the country asks questions relating to their student’s academic performance and demographics; our analysis focused solely on the high school students. This dataset was specifically chosen as it provided the most up-to-date information on young adults without the influence of the COVID-19 pandemic. Results show a moderate, negative correlation between total household income, the parent’s education level, and the child’s grades, and a slightly weaker relationship between the child’s grades and the child’s gender. It was also found that there was a moderate positive correlation between the health of the child and the child’s grades, and a slightly weaker association between two-parent household status and the child’s grades. Other variables of interest were found to not be significantly correlated with the child’s academic performance.

Personality Correlates and Childhood Trauma's Relation to Comorbid EDs among PD Patients

Ashlyn Delaney

Faculty Mentor: Margaret McClure

Booth: 85, Dogwood Room (PM)

Abstract

There is a high comorbidity between personality disorders (PDs) and eating disorders (EDs), suggesting that those diagnosed with a PD are at a higher risk of also having an ED than those without personality pathology. Research greatly varies but in samples of ED patients, anywhere between 27-93% also have a PD, with borderline personality disorder (BPD) being the most prevalent (Grilo, 2002). Furthermore, Anorexia Nervosa (AN) has much higher correlation with Obsessive-Compulsive Personality Disorder (OCPD), whereas Bulimia Nervosa (BN) has much higher rates of comorbidity with BPD, although there is some crossover (Sansone & Sansone, 2011; Diaz-Marsa et al., 2000). This is hypothesized to be due to similar mechanisms of personality and core features found in each PD and ED. More recent research has looked at specific personality traits, rather than a PD diagnosis as a whole, and suggest that a dimensional approach to looking at personality pathology and its relation to disordered eating behaviors may give a more accurate clinical picture. Studies show that more severe affective dysregulation and impulsivity in particular is correlated with more severe bulimic eating pathology, and perfectionism and compulsivity is significantly correlated with restrictive eating pathology found in AN (Solomon-Krakus et al., 2020; Schaumburg et al., 2020; Gaudio & Dakanalis, 2017). Furthermore, studies that analyze specific personality traits as opposed to PD diagnosis have been better in predicting clinical outcomes of ED patients (Wildes & Marcus, 2013). Childhood abuse is also seen to be a risk factor for developing both EDs and PDs and may play a role in this comorbid relationship. In fact, some studies show a significant interaction between childhood emotional abuse and BPD to predict binging and purging behaviors (Spiegel et al., 2019). Childhood abuse can lead one to have more negative affect and difficulties regulating emotions, which often is seen in both those with ED and PD diagnoses. Childhood trauma may lead one to develop maladaptive coping mechanisms in response to difficult emotions, which may exhibit itself as disordered eating behaviors (Schaich et al., 2021; Rai et al., 2019). However, this relationship is complex, as AN and BN behaviors have different underlying mechanisms and interact differently with experience of abuse. Predictors of AN and BN and its relationship to personality factors is complex and warrants further investigation. The current study looks at the association between PD, AN, and/or BN diagnosis, and specific personality factors and their association with ED diagnosis. Furthermore, this study will analyze the role that childhood abuse plays in this relationship. An exploratory re-analysis of the data was conducted using a sample of participants from a large ongoing study at Mount Sinai's Mood and Personality Disorders Lab. All participants were diagnosed with at least one personality disorder and an ED (AN, BN or both). Independent samples t-tests were run to assess the

association between ED diagnosis, PD diagnosis, and various self-report measures of personality factors that measure impulsivity (BIS-II), emotion regulation (ERQ and DERS), affective lability, compulsivity, rejection, stimulus seeking (DAPP), and childhood trauma (CTQ). A multiple regression analysis was conducted to assess the interaction between childhood trauma, personality variables and ED diagnosis.

Determining the Origin of Aggression in Brook Trout Fingerlings

Tomas,Di Leo

Faculty Mentor: Ashley Byun, Murray Patterson and Danushka Bandara

Booth: 86, Dogwood Room(PM)

Abstract

Brook trout (*Salvelinus fontinalis*) are native to the eastern United States. Because brook trout need high-quality water and are sensitive to low oxygen, pollution, and changes in pH, they are often considered an indicator species of the health and overall water quality of lakes, rivers, and streams. However, due to their requirement for high water quality levels, they have begun to disappear from their native range. To aid in their recovery, Connecticut's Beardsley Zoo receives and rears around 50-150 brook trout fingerlings, which are eventually released into the wild to help bolster the population numbers of native brook trout. In the past, we had been notified by zoo staff that they were observing instances of aggression between the brook trout fingerlings. Initially, we were interested in minimizing this aggression; however, more recently, we began focusing on discovering the origin of this aggression. Specifically, we are interested in determining the effects of food availability and brook trout growth over time on aggression. In addition to this, we are interested in creating a stable framework that future researchers can use to produce data that can be compared to data collected in previous years. To do this, we set out to create a detailed ethogram defining each of the aggressive behaviors of brook trout, to develop a strict set of rules when it comes to taking observations of aggression, and to create a recognition software ("Fishial Recognition") to be used to more closely study the behavior of individual fish to determine if there are certain individual/group behaviors that promote aggression in brook trout fingerlings.

The Infield Shift: Hoax or Strategy

Julianna Gentile

Faculty Mentor: Shawn Rafalski

Booth: 87, Dogwood Room (PM)

Abstract

The infield shift is a baseball phenomenon in which the defense realigns itself to protect against hits. The shift has been used in Major League Baseball intermittently for select pull hitters since the 1920s. However, in 2006, the shift was permanently installed and remains an important part of the sport today. Since then, the world of baseball has been divided on whether the shift actually stops hits. This study was conducted to provide insight into the usefulness of the shift in the sport today. To get a better idea of the effectiveness of the shift, it is important to look at both the number of hits given up by pitchers and the total number of bases taken by hitters. For the pitchers, a 2-Sample z Test with H0: $\mu B \geq \mu A$ and Ha: $\mu B < \mu A$ was utilized, where μB is the average ratio for pitchers before the shift and μA is the average ratio for pitchers after the shift. The results demonstrated that the number of hits given up before the shift was higher than the number of hits given up after the shift. For the hitters, a 2-Sample z Test with H0: $\mu B \geq \mu A$ and Ha: $\mu B < \mu A$ was utilized, where μB is the average ratio for hitters before the shift and μA is the average ratio for hitters after the shift. This test revealed that the number of bases taken before the shift was lower than the number of bases taken after the shift. Therefore, this study concluded that when the shift is used, it does stop hits, but hitters are more likely to get extra-base hits on balls in play.

The Stability of IQ Performance Against Rumination and Anxiety

Alexandra Goetz, Lauren Adams

Faculty Mentor: Kerry Cannity

Booth: 88, Dogwood Room (PM)

Abstract

Intelligence, though considered stable across the lifespan, can be negatively impacted by factors including depression and negative mood. However, the relationship among anxiety, rumination, and IQ is less clear. It seems that cognitive interference during IQ testing could arise from positive or negative emotions, physical symptoms, or even anxiety. We hypothesized that trait anxiety, rumination, and math anxiety would have a negative impact on performance across subtests of the Wechsler Adult Intelligence Scale (WAIS-IV) intelligence test. Healthy undergraduates (n=77) were randomly assigned to receive either a rumination or distraction exercise and then completed eight subtests of the WAIS-IV. We found significant positive correlations between rumination and trait anxiety, and between total math anxiety, math learning anxiety, and math evaluation anxiety. However, neither trait anxiety nor rumination was related to IQ performance whether participants were in the rumination or distraction conditions. Notably, individuals with high math anxiety showed poorer performance on an arithmetic subtest compared to those with lower math anxiety. IQ performance appears robust against effects of emotional factors such as anxiety and rumination. Future research would benefit from greater understanding of why some factors, such as depression or math anxiety, can cause interference with IQ performance, while other factors, such as anxiety, do not.

Observing Near-Inertial Waves in a Submarine Canyon

Jordan Hamilton

Faculty Mentor: Robert Nazarian

Booth: 89, Dogwood Room (PM)

This Research Was Also Presented at the Ocean Sciences Meeting 2022

This Research Was Supported by Hardiman Scholars and Femia Science Endowment

Abstract

The breaking of internal waves support the ocean's overturning circulation and sustain a number of transport processes along and across the continental slope. While internal tides have received significant attention, less attention has been given to wind-forced internal waves (i.e., near-inertial waves; NIWs). We investigate the lifecycle of NIWs in a coastal environment (a submarine canyon) and their relative role in inducing mixing within the canyon. Specifically, we look at the Mendocino Ridge/Eel Canyon system to conduct an analysis of the relative impact of NIWs for coastal processes. We use the 2012 observations of this system (see Musgrave et al., 2016 and Waterhouse et al., 2017), during which a storm generated NIWs, to conduct our analysis. Following the storm, we observe high shear in the upper third of the water column, and use this to track the propagation of the waves. Both the vertical wavelength and frequency of the fitted waves, as well as the upward phase propagation and downward energy propagation of the waves, imply that NIWs were generated during the storm and propagated through the canyon. We performed rotary spectral analysis at various depths in the water column to probe the presence and depth of both NIWs as well as internal tides. Results indicate the presence of both NIWs and internal tides, albeit with different dynamics over the extent of the observations. With the presence of NIWs established, we present an analysis of the NIWs' dynamics in the canyon, the relative importance of these waves in inducing mixing, and the larger mesoscale structure that establishes the vertical extent of these waves. We also present an analysis of the generation of these NIWs and the degree to which they are generated at Mendocino Ridge or locally within the canyon. We seek to identify the relative importance of NIWs within the larger umbrella of coastal processes, particularly the role that they play in driving transport processes along the coast.

Gender Differences in Borderline Personality Disorder: Alcohol as a Potential Mediator

Lindsay Jamieson

Faculty Mentor: Margaret McClure

Booth: 90, Dogwood Room (PM)

Abstract

Borderline Personality Disorder (BPD) is a clinical disorder characterized by tumultuous interpersonal relationships, emotion dysregulation, unstable self-image, and impulsivity (Herpertz et al., 2017). Comorbidity with substance abuse disorders is common. However, this link has not been explored as thoroughly as it can be in the research literature, even though the comorbidity can lead to worse treatment outcomes. The current study sought to capture the relationship between alcohol misuse and BPD symptoms, for individuals of both genders, by assessing anger levels in a community-recruited sample of treatment naïve individuals with BPD. A statistically significant relationship between gender and aggression was found; men were significantly more likely to have higher anger levels than women ($p=.001$). In addition, those with alcohol use disorder had different anger levels than those with BPD who did not have a diagnosed alcohol use disorder, $p=.001$. No statistically significant difference was found for alcohol use disorders between genders, $p=.123$. Overall, men are more likely to have comorbidity of BPD and a substance use disorder. This can inform treatment options as men are less likely to seek out mental health treatments compared to women, which is especially relevant given the long-standing trend of men underutilizing mental health services.

The Effect of Punicic Acid on MCF-7 Breast Cancer Cells and MCF10a Human Breast Epithelial Cells

Hannah Klausner, Oluwafemi Gbayisomore

Faculty Mentor: Shelley Phelan,,

Booth: 91, Dogwood Room (PM)

Track: Community Engagement

This Research Was Also Presented at the American Association for Cancer Research

This Research Was Supported by the Mancini Fund

Abstract

One of the main components of pomegranate seed extracts (PSOs) is punicic acid, a fatty acid capable of inhibiting breast and prostate cancer cell proliferation, although the mechanisms of action are not yet known. In order to further understand its potential anti-cancer properties, we investigated the effect of punicic acid on proliferation and viability of human MCF7 breast cancer cells. Cells were treated with various concentrations of punicic acid for up to 72 hours, and various endpoints were measured including cell proliferation, cytotoxicity, and apoptosis. We found that all doses led to a significant reduction in cell viability based on an MTS assay. We also found an effect of punicic acid on cytotoxicity, as measured by an LDH release assay. Cell death was confirmed to be, at least in part, due to apoptosis, as detected by Annexin V and propidium iodide fluorescence. Since many of the peroxiredoxin (Prdx) family of antioxidant proteins are known to be involved in cancer cell survival, we examined the effect of punicic acid on Prdx expression. We found members of this gene family to be significantly elevated within 24 hours of punicic acid treatment. Altogether, our data demonstrates anti-cancer properties of punicic acid, and its ability to regulate antioxidant gene expression in these cells. This research has important implications in the field of natural products as therapeutic options for cancer treatment, as opposed to conventional chemotherapy.

The Effect of Salience on Warnings' Ability to Reduce the Impact of Misinformation

Matt LaGanza

Faculty Mentor: Jessica Karanian,,

Booth: 92, Dogwood Room (PM)

This Research Was Supported by The Magis Grant and the Kathleen B. Trainor Grant

Abstract

Human susceptibility to misinformation has long been studied, most practically in eyewitness identifications in criminal cases and by Elizabeth Loftus' famous 1978 study. Dr. Jessica Karanian began building on research that studies how warnings about potential misinformation can actually reduce people's susceptibility to the misinformation. This study focuses on testing whether increasing the level of saliency of the warnings that Dr. Karanian studied will affect the warnings' ability to reduce participant's susceptibility to misinformation. 120 participants watched a silent video and after completing a distractor task along with an initial test on the contents of the video, they are presented with an audio narrative of the video. The audio narrative contains either consistent, neutral, or misleading information. Participants are also randomly assigned to one condition: no warning, pre-warning, post-warning, or double-warning. The warnings are presented in a video form. After the audio narrative, participants complete an identical test to the first one. We predict that participants in the double warning condition will have the highest rates of accuracy across the trials and select the fewest number of misleading answers.

Defects to Dynactin Affect Sperm Function in the Nematode Worm *C. elegans*

Kaitlin Levangie

Faculty Mentor: Anita Fernandez

Booth: 93, Dogwood Room (PM)

This Research Was Also Presented at the 23rd Annual International C. elegans Conference

This Research Was Supported by the McGuinness Mentorship Program

Abstract

Dynactin is a protein complex that connects microtubule motors dynein and kinesin to their cargo and is essential for intracellular transport in animal cells. To study the role of dynactin in *C. elegans* fertility, we analyzed worms homozygous for dnc-1(or404ts), a temperature-sensitive mutation impacting the p150 Glued subunit of dynactin. dnc-1 mutants have a significantly decreased brood size and produce many unfertilized oocytes, suggesting a problem with the sperm. To test this, we crossed dnc-1 mutant males and wild-type males to *C. elegans* feminized mutants that were wild-type with regard to the dnc-1 gene. We observed smaller brood sizes and a higher percentage of unfertilized oocytes in the females crossed with dnc-1 mutant males, suggesting dnc-1 mutant male sperm is less effective than wild-type sperm. We also performed sperm competition tests in which dnc-1 mutant males or wild-type males were crossed to wild-type hermaphrodites. We found that normal male sperm outcompetes normal hermaphrodite sperm, but dnc-1 mutant male sperm does not. Measurements of sperm size indicate that wild-type males produce larger sperm than dnc-1 mutant males. Lastly, we showed that a strong loss-of-function defect to the mel-28 gene, which encodes a component of the nuclear pore, partially rescues the sperm defects that we identified in the dnc-1 mutants. These results suggest that defects to dynactin cause sperm problems partially eased by mutations to a nuclear pore component.

Feeling Your Joy Helps Me to Bear Feeling Your Pain: Focusing on the Positive Emotions of Those Who Are Struggling (yet Hopeful) Reduces Burnout-Related Emotions

Taylor Lewis

Faculty Mentor: Michael Andreychik

Booth: 94, Dogwood Room (PM)

This Research Was Also Presented at the Association for Psychological Science, Chicago

This Research Was Supported by McGualey Family Faculty Student Research Fund

Abstract

Burnout has become exceedingly detrimental for individuals in many professions but especially so in helping professions and high stress lines of work. This state of emotional and psychical exhaustion has been linked to job dissatisfaction and can interfere with one's job performance. As such, identifying potential risk or protective factors is critical to reduce burnout and improve job satisfaction, overall life satisfaction as well as quality of one’s work. Previous research demonstrates considerable support for empathy being an influential factor in burnout rates. Specifically, negative empathy, that is, connecting with the negative emotions of others has been linked to an increased risk of burnout. Conversely, positive empathy, that is connecting with the positive emotions of others, has been linked to lower burnout rates. Previous research on this link has been largely correlational. Therefore, the current project is aiming to discover causal evidence on the link between various forms of empathy and burnout by instituting manipulation in a laboratory setting. To do so, I will bring participants into the lab and have them view an emotionally evocative video in which a woman discusses some painful life experiences but also how she was able to grow from those experiences. Prior to watching the video, I will manipulate whether participants focus just on the woman’s negative emotions, just on her positive emotions, or try and ignore her emotions and remain detached as they watch. After the video participants will report the degree to which they experienced burnout-related emotions as they watched and will also be given an ostensible opportunity to help the woman. My key prediction is that whereas participants in both the negative and positive empathy conditions will report a willingness to help the woman, those in the negative empathy condition will also report greater burnout-related emotions than those in the positive empathy or neutral conditions.","Burnout has become a widespread problem for individuals in many professions. Those in helping professions and high stress lines of work are uniquely vulnerable to burnout's detrimental effects. This syndrome, characterized by physical and emotional exhaustion, has been linked to job dissatisfaction, poor mental health outcomes, and interference with one's job performance. As such, understanding potential risk or protective factors is critical to reduce burnout and improve job satisfaction, overall life satisfaction, and the quality of one’s work. Previous research suggests that empathy for others’ positive emotions and empathy for

others' negative emotions yield differentiated influences on burnout. Specifically, positive empathy has been shown to decrease reported burnout rates while negative empathy has been linked to an increase in reported burnout rates. However, previous research has been largely correlational. In light of this, we created a laboratory experiment which asks participants to report on burnout related emotions after being exposed to an empathy manipulation and an emotionally evoking video. Participants were also ostensibly provided with an opportunity to help the individual seen in the emotionally evoking video. We predicted that while participants in both the positive empathy and negative empathy conditions will report a willingness to help, those in the negative empathy condition will report greater rates of burnout-related emotions than those in the positive empathy or neutral conditions.

Assessing Human-Bear Interactions in Alaska to Determine How Individuals Defend Themselves

Grace MacCallum

Faculty Mentor: Tod Osier

Booth: 95, Dogwood Room (PM)

Abstract

In Western North America, where brown or grizzly bears are common, many individuals who work and recreate in the bear country worry about the possibility of a bear attack. Although the risk of injury or death from such an attack is considered low, negative interactions with bears are fairly common for niche groups of people. These interactions are increasing as bear populations grow and expand in the Rocky Mountain West. It is important to understand how user groups such as hunters face different challenges than hikers, since hunters manage meat from the taken game which attracts bears. Those that work and recreate in bear country can choose a bear spray or a firearm as an active means of protection from a bear attack. Information on the efficacy of bear spray and firearms exists in several published studies. However, due to the methodology employed by these studies, they are often biased. Very little is known about how those that work or recreate in bear country use the information available to help decide how to protect themselves when in bear country. We worked on a survey project looking at Human-Bear interactions. Our goal is to survey those that work and recreate in Alaska, where brown or grizzly bears are well-established, in order to understand how different individuals make personal decisions on how to protect themselves. We hope to evaluate the current patterns of usage and efficacy of the various means of protection from bears.

Microfluidic Paper-Based Analytical Devices for Ion Detection

Kelsie MacFadyen, Amanda Nowak

Faculty Mentor: Amanda Harper-Leatherman

Booth: 96, Dogwood Room (PM)

This Research Was Also Presented at the National Conference of Undergraduate Research

Abstract

Microfluidic paper-based analytical devices are a technology that can be used to run reactions in order to test for certain analytes. These devices have extensive fibrous networks that make it possible for reagents to be dropped without spreading across the entire paper due to the wax barriers designed within the devices. Microfluidic paper-based devices have many advantages such as fast experimental time, versatility, low cost, and portability. For the detection of chloride, researchers have previously developed a distance-based paper analytical device. Development of this device stems from the importance of chloride detection in environmental and food analysis. In order to expand on previous research, we determined the chloride content in a number of bottled drinks after first optimizing all the experimental parameters needed for paper-based chloride detection. We also experimented with testing for other analytes such as citrate, phosphate, sulfate, bromide, and iodide. We are working to verify these results with another independent method.

Constructing an Emergent Constraint for Mid-Latitude Precipitation

Brody Matijevic, Luke Brown

Faculty Mentor: Robert Nazarian

Booth: 97, Dogwood Room (PM)

Track: Environment and Sustainability

Abstract

In a warming climate, scientists observe an increase in the magnitude and frequency of flooding and severe storms due to extreme precipitation. While such changes have been observed over the past several decades, it is unclear how extreme precipitation will continue to increase in the future. To better understand these historical changes and predict future changes, we undertake a hybrid study of simulated and observed extreme precipitation. Using the CMIP6 ensemble, we calculate the future trends in extreme precipitation over the mid-latitudes, and preliminary calculations show significant inter-model spread. In order to minimize this spread, we construct an emergent constraint for mid-latitude extreme precipitation using a number of observational products. We present our initial constraint and an analysis of the degree to which this constraint can be applied over the mid-latitudes. Such a constraint can help provide information to regional stakeholders and planners to best prepare for future changes in extreme precipitation and associated flooding.

Can People Predict Their Gut Reactions?: More Evidence for Awareness of Implicit Attitudes

Kelly-Ann McAlice, Logan Mascia, Gabi DiGioia

Faculty Mentor: Michael Andreychik

Booth: 98, Dogwood Room (PM)

Abstract

Implicit attitudes are inferred indirectly from performance on measures such as the Implicit Association Test (IAT), while explicit attitudes are measured directly through self-report. Past research assumes that people lack awareness of their implicit attitudes. However, recent research suggests that people are able to predict their performance on the IAT, indicating that they may be aware of their implicit attitudes. We build upon this research by attempting to replicate these findings on another measure of implicit bias, the Affect Misattribution Procedure (AMP). Participants were asked to predict their scores on a number of AMPs assessing their gut reactions towards different social groups, before completing them. We predict that people will be accurate at predicting their performance. These results would support the idea that people are aware of their implicit attitudes across a variety of measures. Awareness of implicit attitudes may enable individuals to positively change them.

Seeking for the Puurfect Pitch

Cristian Navarro, Emma Kramer

Faculty Mentor: Ashley Byun, Murray Patterson

Booth: 99, Dogwood Room (PM)

Abstract

The cat family *Felidae* originated 10.8 million years ago in the region now known as Southeast Asia. With just under 40 recognized species, *Felidae* is one of the most successful carnivore families, found on all continents except Antarctica. Felid communications widely vary from discrete calls (i.e. spit, hiss) to graded calls (i.e. mew, growl). These calls vary in three major structural domains: loudness (amplitude), time (duration), and pitch (frequency) with considerable variability in other features such as harmonic structure. By analyzing these calls, we reconstruct the ancestral call of all felid ancestors, including the very first felid that lived 10.8 million years ago. Before doing this work, however, we had to develop two algorithms to assist in our evolutionary reconstructions: a) FELIDETECT, a machine learning approach which identifies vocalizations according to call type and species as well as extracts the most predictive acoustic features in each of these vocalizations, and b) PARCOURS (PARsimonious CO-ocCURrrenceS) an approach that identifies all significantly correlated pairs of characters across all parsimonious solutions for each character. Using these algorithms, we identify the unique acoustic features of calls and use them to reconstruct ancestral calls of ancient felids. We will also better understand the evolutionary relationships between acoustic features and specific aspects of the felid habitat, morphology, and behavior.

Estimation of Left Ventricular Mass Using the Devereux Equation

Kenneisha Norford

Faculty Mentor: Shelley Phelan, Harold Sanchez

Booth: 100, Dogwood Room (PM)

Abstract

In response to stress and disease, the left ventricle (LV) has remarkable adaptability, a response known as cardiac remodeling. Cardiac remodeling is the interstitial, molecular, and cellular changes that lead to clinically observable changes in the geometry of the heart. Within a certain range, the resulting geometrical changes in the heart are adequate for the metabolic and functional demands of the heart. Beyond these limits, however, systolic performance of the LV deteriorates, and remodeling becomes pathological. In clinical studies, LV remodeling and hypertrophy have been associated with major cardiovascular events such as sudden death and congestive heart failure (Levy et al., 1990). Cox regression analysis shows that the LV concentric remodeling is an independent predictor of cardiovascular events. These findings suggest that LV geometry can be used as a stratification tool for potential risk for these events. In this study, we used the Devereux and colleagues equation to determine left ventricular mass. Our goal was to determine if this equation would be an accurate tool to determine LV mass, and predict a patient's potential health risk. Our findings show that the Devereux equation is a good tool for predicting LV mass and relative wall thickness, but further work needs to be done to predict cardiac geometry and potential health risks.

Thermal Impacts on Fish Jaw Musculature Performance

Lauren Olczak, Will Robinson

Faculty Mentor: Shannon Gerry

Booth: 101, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Also Presented at the Society for Integrative and Comparative Biology

Abstract

The sternohyoideus and adductor mandibulae are the main jaw opening and closing muscles in fishes. While critically important to the success of fishes, the contraction kinetics of these two muscles is rarely addressed. We described the contraction kinetics of the sternohyoideus and the adductor mandibulae in response to changing water temperatures. In addition, we used the primary aerobic locomotor muscle of labrid fishes, the abductor superficialis, as a baseline comparison to previous studies. Using cunner (*Tautogolabrus adspersus*) captured from Long Island Sound, we analyzed in-vitro muscle performance using a muscle ergometer. We tested all three muscle types at 7, 15 and 22 °C. Contraction time and time to relaxation were similar among all muscles, while jaw musculature produced more relative force compared to locomotor musculature. We found that, despite distinct fiber type composition, differences in fiber performance was remarkably similar. Cold temperatures limited contraction performance but all three muscles responded to temperature changes similarly. While we expected comparable results for muscle contractions at the cold temperature treatment, the contraction performance similarities among muscles were surprising. We conclude that differences in fiber types are not enough to amount to single twitch and tetanic contraction differences. Perhaps if more sustained movement was required of the muscle, greater contraction dynamic differences may become apparent.

Characterization of Emergent Catalytic Properties of Self-Assembling Nucleopeptides

Sarah O'Neill, Katie Bacchi

Faculty Mentor: Jillian Smith-Carpenter

Booth: 102, Dogwood Room (PM)

This Research Was Also Presented at the American Chemical Society Fall 2022 Conference

This Research Was Supported by Hardiman Scholars

Abstract

The Smith-Carpenter lab has developed short, self-assembling peptides that have been modified on the N-terminus with guanosine. These systems combine the self-assembling properties of short peptides and the hydrogen bonding along the Hoogsteen face of guanosine to form nanofibers with differing higher-order guanosine architectures dependent on their C-terminus chemistry. The inclusion of higher-order guanosine architecture, such as G-quartets or G-ribbons, led us to test the emergent catalytic potential of these self-assembling nucleopeptides. Previous studies show that G-quadruplex containing structures can interact with a hemin cofactor in the presence of hydrogen peroxide and catalyze the oxidation of 2,2′-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS). Our lab used this ABTS assay to characterize the catalytic potential of the nucleopeptide hypothesized to form G-quartets and compare it to other G-quadruplex containing higher order assemblies.

Are People Aware of Their Implicit Biases Toward the Mentally Ill?

Megan Paterson

Faculty Mentor: Michael Andreychik

Booth: 103, Dogwood Room (PM)

Track: Diversity and Inclusive Excellence

Abstract

This study determines whether people have awareness of their implicit attitudes toward the mentally-ill population. Although it is often assumed that implicit attitudes are completely unconscious and individuals are unaware of them, recent research suggests that people do have some awareness of their own implicit attitudes with respect to certain social groups. I expand on this recent scholarship by examining whether people also show awareness of their implicit attitudes toward the mentally ill. A convenience sample of undergraduate students enrolled in a general psychology course was obtained. Participants were first asked to make predictions of their scores on the Brief Implicit Association Test (BIAT), which is designed to measure implicit attitudes toward people with mental illness. Then participants actually completed the BIAT. I predict that participants will demonstrate some awareness of their implicit attitudes by showing accurate predictions of their scores on the BIAT. These results would bolster the emerging evidence that people do have some awareness of their implicit attitudes, an insight that has important implications for what strategies might be most effective at changing implicit biases.

Gender Differences in Individuals with Borderline Personality Disorder

Bailey Plew, Kelsey Vu, Maya Kapur, Elizabeth Beaulieu, Kellyn Kuczarski, Enaea Sahloul

Faculty Mentor: Margaret McClure

Booth: 104, Dogwood Room (PM)

Track: Community Engagement

This Research Was Also Presented at the North American Society for the Study of Personality Disorders

Abstract

Borderline Personality Disorder(BPD) is characterized by marked impulsivity, irritability, and aggression. Patients experience impairments in interpersonal relationships, unstable self-image, and negative affect. BPD is commonly diagnosed at a 3:1 ratio of women to men. This study examined gender differences in psychopathology in a community sample of 260 female and 224 male participants with BPD as part of a larger study on personality pathology. Participants were administered semi-structured clinical interviews in addition to self-report assessments of childhood trauma, negative affect, impulsivity, and aggression. Independent sample t-tests were performed to determine significant differences between the genders of participants. Results indicate that the rates of diagnosis for males and females were comparable, but statistically significant symptomatic differences were found. Female participants reported higher intensity of negative affect and higher levels of overall childhood trauma (all ps<.05). Females were significantly more likely to meet criteria for chronic feelings of emptiness, fear of abandonment, impulsivity, and dissociation (ps <.05). Male participants reported higher levels of lifetime history of aggression, impulsivity, and anhedonia, and they were more likely to be diagnosed with unstable sense of self and comorbid APD, NPD, SPD, and alcohol use disorders (all ps<.05). These results suggest apparent gender differences in symptoms for male and females with BPD.

Investigating Differences in Morphology and Maneuverability of Juvenile Bluegills

Caroline Potter, Vincent Gadioma

Faculty Mentor: Shannon Gerry

Booth: 105, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Also Presented at the Society for Integrative and Comparative Biology

Abstract

Bluegill sunfish (*Lepomis macrochirus*) are typical freshwater fish found in lakes and ponds. Previous research has shown that adult bluegills diverge in their body shape and swimming ability based on habitat. Littoral fish have deeper bodies with larger fins to aid in maneuverability, while pelagic fish have more streamlined bodies for steady swimming. Adults of each ecomorph nest in the littoral zone, but it is not known what causes some juveniles to move to the pelagic habitat. The goal was to induce morphological divergence by rearing fish in two habitats - simulated littoral and simulated pelagic - and test for differences in their morphology and maneuverability performance. We hypothesized that juveniles raised in a littoral habitat would be comparable to adults, in that they would be better at navigating an obstacle course and have deeper bodies and broader fins than pelagic fish. The snout and center of mass of each fish were tracked to determine velocities and accelerations and individuals were photographed for morphological analysis. Neither morphology nor performance differed between ecomorphs ($P > 0.05$). Therefore, morphological divergence and performance were not induced by rearing juvenile bluegills in two different habitats.

How Well Do You Know Yourself: Are People Aware of their Implicit Attitudes? (Part 1)

Michelle Randall, Megan Paterson, Mary Cassidy

Faculty Mentor: Michael Andreychik

Booth: 106, Dogwood Room (PM)

Abstract

Our study investigates whether people are aware of their implicit attitudes. Traditional assumptions of implicit and explicit attitudes suggest that explicit attitudes are conscious whereas implicit attitudes are unconscious. However, prior research suggests that there is no evidence to support the idea that implicit attitudes are unconscious (Gawronski et al., 2019). A study conducted by Hahn et al., in 2014, using an Implicit Association Test (IAT), found that people are fairly accurate at predicting their implicit attitudes towards social groups. While this evidence could support the idea that people are aware of their implicit attitudes, an alternative explanation for these results could be that people are just good at figuring out how the IAT works. The purpose of our study was to use another measure of implicit attitudes, the Evaluative Priming Task (EPT), to provide further information about people's awareness of their implicit attitudes. Participants predicted their scores on an EPT for five different social groups before completing EPT assessing their implicit attitudes toward the groups. Our results demonstrated strong correlations between participants' predictions and their actual scores on the EPT, which, coupled with the evidence from Hahn et al., suggests that people are likely aware of their implicit attitudes.

Optimizing Cell Growth Conditions For Corneal Epithelial and Cardiomyocyte 3-D Organ Printing Models

Cassandra Reilly, Kenneisha Norford, Elizabeth Ricci

Faculty Mentor: Shelley Phelan

Booth: 107, Dogwood Room (PM)

Abstract

Mammalian cell culture is an important application used to study and examine cell properties in an in vitro environment. The physiological significance of such studies to tissue functioning is limited, however, due to the added structural complexity of the 3D tissue or organ. In recent years, the advancement of 3D printing and its use in cell printing is creating a new approach for the study of tissue and organs in vitro. 3D bioprinting can be a powerful tool used to precisely place biologics, such as living cells, nucleic acids, drug particles, proteins, and growth factors, into tissue anatomy. We collaborated with faculty and students from the School of Engineering to establish growth conditions for the use of 3D printing for two tissue types: corneal epithelial cells and cardiomyocytes. Our experiments were split into two parts. First, we acquired knowledge on how to grow and maintain human cells under normal conditions using the MCF7 breast cancer cell line as a model. We examined the effect of serum on the growth and viability of MCF7 cells. In the second phase of our work, we applied this knowledge to culture and maintain corneal epithelial cells and cardiomyocyte cell lines and subsequently tested these cell lines in 3-D printing models. These experiments will continue through the summer and into next year with the goal of eventually printing and sustaining viable and physiologically functioning cornea and heart models in vitro.

Determining Cell Growth Rate Using Non-Invasive Endogenous Fluorescence Imaging

Margaret Rodgers

Faculty Mentor: Shelley Phelan

Booth: 108, Dogwood Room (PM)

This Research Was Supported by National Science Foundation (NSF) Research Grant

Abstract

Cell growth rate is a crucial factor in cancer cell aggressiveness. Accurately measuring aggressiveness is of utmost clinical importance. However, most methods of measuring growth rate require time-consuming, complex, and expensive biopsies. This collaborative NSF-funded research is designed to develop a non-invasive technique to categorize cancer cells using autofluorescence of native endogenous chromophores FAD and NADH, which are altered with cancer cell aggressiveness. The research first focused on developing a cell model using the MCF10a cell line, a normal breast epithelial line. We grew cells in normal and serum-deprived conditions and measured cell number with an MTS assay. We then used Keyence fluorescence microscopy to detect autofluorescence of FAD and NADH in these cells. To determine if this autofluorescence correlates with cell growth properties, we used fluorescence cellular assays that measure mitochondrial activity, cell cycle stage, and nucleolar structure. The MTS assay showed an increase in cell density with longer serum stimulation. We also found that assays for mitochondrial activity and nuclear structure produced strong, specific fluorescence. We optimize experimental conditions for these assays to compare results to the endogenous autofluorescence, and will then conduct similar experiments in the MCF10AT breast cancer cell line. Ultimately, this work aims to establish a non-invasive clinical approach for early cancer detection in patients.

Presence of Microplastics in Captive Penguins Measured via Fecal Analysis

Gabriel Rodrigues

Faculty Mentor: Brian G. Walker

Booth: 109, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Supported by Vincent Rosivach Faculty Student Collaborative Research Fund and Corrigan Scholars Fund

Abstract

Every year, approximately 8 million metric tons of plastic waste are added to the ocean. Of this waste, microplastics - plastics under 5 mm in length - are ubiquitous and have been found in the Arctic, the Antarctic, and everywhere in between. Microplastics can be directly manufactured small particles or they are formed by the fragmentation of larger plastics. The long-term health effects of ingesting these microplastics are still relatively unknown; however, the potential for these particles to carry toxins introduces growing concern for the health of wildlife. To add to the documentation of the presence of microplastics in wildlife, this study examined captive penguins from the Mystic Aquarium and Central Park Zoo, where penguin fecal samples were collected from the various penguin species. In the lab, fecal samples were digested in hydrogen peroxide, intended to remove all organic material. The remaining content was then filtered and microplastics were identified and categorized based on their length, color, and appearance, then photographed. Subsequently, the polymer type was identified utilizing an FTIR spectrophotometer in conjunction with an online polymer database. Of the 71 fecal samples studied so far, 81 microplastics have been found, measured, photographed, and identified. Results from the remaining samples will be presented for a complete assessment of microplastics in these captive penguin species.

Complex Coral Reefs: Developing Metrics to Quantify the Quality of Coral Reef Habitat from Photographs

Jillian Ryan

Faculty Mentor: Chelsie Counsell

Booth: 110, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Supported by Vincent Rosivach Faculty Student Collaborative Research Fund

Abstract

Across ecosystems, the quality of available habitat impacts the diversity and species identity of animals living there. While this may feel intuitive, developing metrics to effectively quantify habitat quality can be rather challenging. To help define parameters of habitat quality, we surveyed coral reefs in Hawai‘i and carefully observed the various colors, morphologies, and identities of algae, coral, and other benthic cover types. Ultimately, we used this firsthand knowledge of the ecosystem to develop a protocol for quantifying habitat quality from benthic photographs of Hawaiian coral reefs. Our protocol incorporates commonly used methods to quantify relative abundance from benthic photographs, and adds in a measure of habitat complexity estimated by viewing each photo in the lens of both small (e.g., crabs) and large (e.g., parrotfish) reef inhabitants. The metrics curated include percent benthic cover of each living and non-living component, the number of coral species present, and two estimations of habitat complexity. To date, we used this method to process 220 photos from 22 sites around 6 islands in Hawai‘i. By quantifying reef habitat quality, we can now begin to analyze how the described metrics influence the composition of cryptic reef communities. Furthermore, the metrics can be compared to localized human impacts that may be driving spatial differences in reef habitat quality.

Determination of Vanilla Flavoring Compounds in Both Natural and Synthetic Vanilla Using GC-MS

Nicholas Richardson, Katherine Eighmy, Sarah Murphy

Faculty Mentor: Matthew Kubasik

Booth: 111, Dogwood Room (PM)

Abstract

Vanilla flavoring can be achieved through various compounds obtained from both natural and synthetic sources. These compounds are not specified on labeling for certain brands, leaving consumers unclear on the contents. This project analyzes various store brand and natural vanilla extracts for vanillin, coumarin, and other common synthetic vanilla compounds. Methods for determination of these compounds have been developed using Gas Chromatography Mass Spectrometry and a set of standards present in vanilla extracts. Utilizing a SPME headspace extraction technique with a poly(acrylate) fiber and a 40-minute sampling time, we determine the exact compounds and distribution of each within the given extract.

Aptamer Synthesis for Orthogonal RNA Tagging

Margaret Rzucidlo, John Godwin, Christina Carucci, Sarah Murphy

Faculty Mentor: Aaron Van Dyke

Booth: 112, Dogwood Room (PM)

Abstract

Aptamers are single-stranded ribonucleic acids (ssRNAs) that bind to ligands. Vitamin B12, a water-soluble vitamin, is an aptamer ligand and when attached to a fluorescent molecule can be used to study the presence and location of ssRNA. This strategy is termed Riboglow. We describe progress towards the total synthesis of a Riboglow probe composed of vitamin B12 and ATTO590, a fluorophore. Our route converted vitamin B12 to a mesylate, and then performed nucleophilic substitution with sodium azide. A tetraglycine linker was prepared and appended to the vitamin B12 derivative. Reactions were confirmed by proton and carbon nuclear magnetic resonance (NMR). Future experiments will covalently link the ATTO590 to the functionalized vitamin B12 to yield the Riboglow probe, allowing us to determine how aptamers contribute to cellular function.

Chemical Reactivity on the Surface of Self-Assembling Peptides

Philip Scali, Katherine Eighmy

Faculty Mentor: Jillian Smith-Carpenter

Booth: 113, Dogwood Room (PM)

This Research Was Also Presented at the National Meeting of The American Chemical Society

This Research Was Supported by Mancini Fund

Abstract

Self-assembled peptide nanofibers are important biomaterials that have applications in fields from tissue culture to drug delivery. As these applications continue to grow, the need to expand methods to control the reactivity of nanofiber surfaces also grows. Previously, our lab published a report on a thiol-thioester exchange reaction on the nanofiber surface and subsequent post-assembly modification with thiol chemistry. Going forward, our current studies seek to expand the available types of dynamic-covalent chemistry that can modify the surfaces of peptide nanofibers to include hydrazone condensation reactions. We have characterized a thiazolidine unmasking reaction on the surface of our peptide to reveal an α-glyoxyl, which then reacts with nicotinic hydrazide in a condensation reaction to form a hydrazone on the surface of the peptide. Currently, we are optimizing the condensation reaction using different pH conditions and buffers. Our work will help advance the field of biomaterials by allowing multiple modifications to be made, from dyes to other biomolecules, on the surface of assembled peptide nanofibers.

Characterization of Fertility Defects in *C. elegans Nematodes* with Defects in Dynein and mel-28

Julia Stobierska

Faculty Mentor: Anita Fernandez

Booth: 114, Dogwood Room (PM)

This Research Was Supported by Science Institute

Abstract

We study how dynein, a minus-end directed microtubule motor, and MEL-28, a protein required for the nuclear pore, interact to affect fertility in *C. elegans*. Weak defects in dhc-1, the gene that encodes the large subunit of dynein, has minimal impact on fertility. A mutation that destroys the mel-28 gene product has no effect on fertility. The dhc-1; mel-28 double mutant has a severely reduced brood size. This suggests that dynein and MEL-28 act in parallel to promote fertility in *C. elegans*. An egg laying experiment showed that as the double mutant hermaphrodite ages, the egg-lay rate slows down significantly more than in the single mutants. To study defects to the gonad architecture, we generated animals that express a cell membrane component fused to mCherry and a GFP-tagged chromatin marker. We used fluorescence microscopy and these markers to characterize phenotypes in dhc-1 single mutants, mel-28 single mutants, normal animals, and the dhc-1; mel-28 double mutants. The single mutant gonads look very similar to the wild type suggesting that defects to just dynein or just mel-28 do not substantially affect the gonad's appearance. In the double mutants, the gonads show variety of mutant phenotypes, such as rounded oocytes, no chromatin, conglomerated chromosomes, and others. This suggests that double disruption of dynein and MEL-28 causes disruption to the proper formation of the oocytes, which could explain the infertility phenotype.

Assessing Mating Compatibility Between White-Naped Cranes at the Connecticut's Beardsley Zoo

Julia Stobierska, Nicolette Kogut, Nicole Capasso

Faculty Mentor: Ashley Byun

Booth: 115, Dogwood Room (PM)

Track: Community Engagement

Abstract

White-naped cranes (*Antigone vipio*) are native to the wetlands of northern Asia. Unfortunately, human activities such as unsustainable land use and exploitation have resulted in significant habitat loss. Due to their rapid and ongoing population decline, the white-naped crane is currently listed as Vulnerable on the IUCN red list. To protect this species, the white-naped crane is part of the Species Survival Plan (SSP), a global breeding program. There are two cranes at the Connecticut's Beardsley Zoo: a 36 year old, long term resident male named McDuffy, and a 2 year old female named Cora who arrived in January 2021. Despite the age difference, these two individuals have been recommended to be a SSP breeding pair. Over the course of the semester starting from January 25, 2022, the interactions between a 36-year-old male white-naped crane, McDuffy, and a 2-year-old female white-naped crane, Cora, were studied and recorded to assess their compatibility. The behaviors of the white-naped cranes were recorded in five-minute intervals and their locations relative to each other were recorded in ten-minute intervals. This was done in order to determine how they interacted with each other and whether a pair bond was being formed. We observed behaviors, such as alternate calling, which are indicative of a bonded pair. This suggests that there is most likely a connection between the two individuals and a strong chance they could mate in the upcoming mating season.

Ocean Mixing Simulations for Eel Canyon

James Vizzard

Faculty Mentor: Robert Nazarian

Booth: 116, Dogwood Room (PM)

Track: Environment and Sustainability

This Research Was Supported by Hardiman Scholars

Abstract

Ocean mixing is important for the climate system and ocean circulation, yet it is often neglected in climate models despite this significant impact. A particular region in which enhanced mixing exists is in submarine canyons (Nazarian et al., 2021); the uneven topography has been shown to induce the transport and dissipation of energy, nutrients, and heat. One process by which this mixing and transport occur, which we are investigating in this project, is the mixing due to internal waves generated by the tidal oscillation of water over uneven seafloor topography (MacKinnon et al., 2017). To conduct this study, we use the Massachusetts Institute of Technology global circulation model (MITgcm), which is frequently used for investigating coastal oceanographic processes. We use it to simulate the generation and propagation of internal waves in and around Eel Canyon (located off the coast of California), and analyze how the simulated mixing compares to existing observations. There are two immediate applications for our results. First, we compare the mixing from our simulation with observations from our collaborators at Scripps Institute of Oceanography. The degree to which our simulations agree with observations illustrate the physical processes that drive mixing. Second, the vertical structure of mixing that we analyze in our simulations is of interest to the larger ocean modeling community, and may be useful for informing improvements in ocean models.

Characterization of Intracellular Trafficking Events in in dhc-1; mel-28 *C. elegans* Double Mutants

Anna Weissenberg

Faculty Mentor: Anita Fernandez

Booth: 117, Dogwood Room (PM)

Abstract

Dynein is a multi-protein molecular motor that ferries cargo within cells. MEL-28 is a protein with roles in the nuclear pore and in chromosome segregation. We study genetic interactions involving dhc-1, which encodes the largest subunit of dynein, and the mel-28 gene, which encodes a multifunctional protein. Compared to the wild type and to single mutants, dhc-1; mel-28 double mutants have significantly reduced brood sizes. In order to test whether this defect is associated with the activity of coelomocytes during endocytosis, we crossed a myo3::ssGFP transgene to the double mutants and to both single mutants. Animals with this transgene express GFP from muscle cells released into the pseudocoelom, or body cavity. In normal animals this secreted GFP is then endocytosed by the coelomocytes, which are scavenger cells that remove debris from the pseudocoelom. We also crossed a YP170::GFP transgene to the double and single mutants to study the effect of the double mutant on trafficking of yolk protein from the intestine to the *C. elegans* oocytes. The ratio of GFP fluorescence in coelomocytes versus the pseudocoelom was measured for dhc-1 single mutants, mel-28 single mutants, wild-type animals, and dhc-1; mel-28 double mutants. Overall, there was no significant difference in the coelomocytes' endocytosis ability amongst the strains, suggesting that the reduced overall brood size in double mutants is unrelated to the activity of endocytosis by coelomocytes.

The Effects of Different Sounds and Music Genres on Tiger and Turkey Vulture Behavior

Sydney Youd, Dominika Mis, Rosa Badolato

Faculty Mentor: Ashley Byun

Booth: 118, Dogwood Room (PM)

Track: Community Engagement

Abstract

Acoustic enrichment has been shown to restore habitats in coral reefs, guide fish, and other aquatic species to their necessary destinations through manmade infrastructure obstacles, and enhance community development among species. Our objective is to use acoustic enrichment in the form of naturalistic sounds and different genres of music in order to observe the consequent behaviors in a Changbai, an Amur tiger (*Panthera tigris altaica*) and Meatball, a turkey vulture (*Coragyps atratus*) at the Connecticut's Beardsley Zoo (CBZ). We do this by playing recordings of different communicative sounds of the respective species, as well as rock and classical music, while assessing animal behavior and position within the habitat. We will analyze the change in behaviors and routines in addition to the location the animals spend most of their time in and compare it to baseline observations when no experimental sound is playing. This will be done by comparing proportions of time spent doing behaviors that have been noted as typical and comparing proportion of time spent in different areas of the enclosures. We hope that our results will assist CBZ in providing information about the effectiveness of acoustic enrichment on zoo animals.

Oxytocin Effects on Anxiety and Social Behaviors in a PTSD Animal Model

Hannah Zanon, Tushi Patel

Faculty Mentor: Shannon Harding

Booth: 119, Dogwood Room (PM)

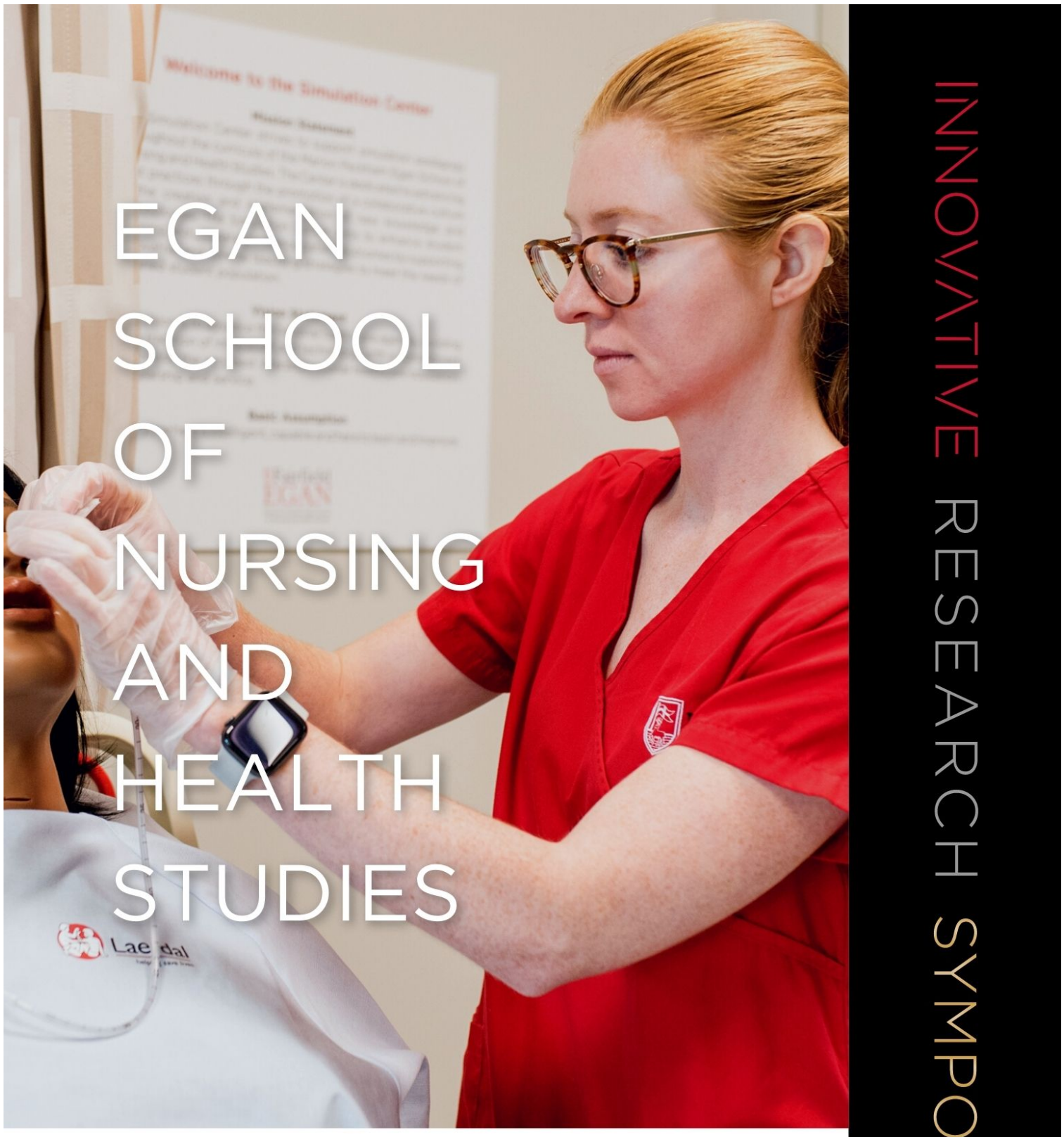
This Research Was Also Presented at the NEURON Conference

This Research Was Supported by CT NASA Space Consortium Faculty Research Grant

Abstract

Our lab has recently reported that intranasal oxytocin (OT) has anxiolytic effects on male rats exposed to valproic acid during development (Harding, Masters, D'Agata, Rivera, Smith, 2021). The present study examined the effects of intranasal OT on anxiety and social behaviors in male rats socially isolated during adolescence. Male rats were assigned to group housed (GH: 4 rats/cage) or socially isolated (SI: 1 rat/cage) conditions beginning on postnatal day 28. Five weeks later, three experimental groups were formed: GH-Sal (n=12), SI-Sal (n=12), and SI-OT (n=12). All rats received intranasal saline or OT (0.8IU/kg body weight) 30-60 minutes prior to behavioral tests for anxiety (open field and elevated plus maze) and social behaviors (sociability and a novel prosocial behavior task). SI males showed increased anxiety-like behaviors on the open field task, but no differences were found on the elevated plus maze test and prosocial behavior task. All groups showed a preference for rats compared to objects in the sociability test, although only the GH entered the rat chamber more often. The data suggests that social isolation in adolescent males may enhance anxiety and impair social behaviors, however this dose of intranasal OT was ineffective.

Egan School of Nursing and Health Studies



FairfieldEGAN

Electrochemical Characterization of Short Amyloid Peptides and Nucleopeptides

Annelisse Zara, Mohamed Kourdassi

Faculty Mentor: Amanda Harper-Leatherman, Jillian Smith-Carpenter

Booth: 120, Dogwood Room (PM)

This Research Was Also Presented at The National Conference on Undergraduate Research 2022

This Research Was Supported by McGualey Family Faculty Student Research Fund

Abstract

Peptide and nucleopeptide based materials can be synthesized and self-assembled. Self-assembled peptides have been found, through previous studies, to have different useful applications in the biomedical field as well as in nanoelectronics. Even though applications have been found, many more studies are still needed to fully characterize all of the properties of these interesting self-assemblies. Our research involves using electrochemical methods to investigate the conductive properties of four self-assembling peptides. Studies done by previous students in our laboratory showed that changing the peptide sequence within the four self-assembling peptides to include tryptophan instead of phenylalanine led to increased electrochemical signal when sensing for uric acid and hexaammineruthenium (III) chloride. The electronic properties of the amino acid, tryptophan compared to phenylalanine may account for these electrochemical results and could lead to new avenues for synthesis of different self-assembling peptides. We use two new methods to study the four assembled peptides to build off of the previous results and to increase our understanding of these self-assemblies. One method is to use interdigitated electrodes to get a direct measurement of the conductivity of each peptide. The second method is to incorporate the peptides into a sol-gel at the surface of an electrode to study how the self-assembled peptides affect the electrochemistry of encapsulated analytes.

Student Perceptions of COVID-19: Prevention and Mitigation Measures on Fairfield's Campus

Isabel Johnson

Faculty Mentor: Jennifer Schindler-Ruwisch, Kimberly Doughty

Booth: 2, Oak Room (AM)

This Research Was Supported by the Lawrence Family Fund

Abstract

The purpose of this research study was to investigate students' perceptions and feelings about mask wearing, social distancing, daily health surveys, and COVID-19 testing on campus. It also gather information about students' perceptions of their own susceptibility to COVID and the severity of their symptoms if they were infected. This research started in January 2021 and concluded in June 2021. A survey was sent out to various residence halls on campus to gather a substantial sample of students. The results were shared with the Public Health Advisory Team on campus to help them make decisions regarding the Fall 2021 semester COVID mitigation strategies. I will continue this research with a modified purpose and population as my capstone project.

Breast Cancer Knowledge and Awareness among Female University Students

Kaleigh MacDonald

Faculty Mentor: Kimberly Doughty

Booth: 3, Oak Room (AM)

Abstract

In the United States (US), approximately one in eight women will be diagnosed with invasive breast cancer during their lifetime. Breast cancer awareness is key to early detection because poor awareness may lead to inadequate screening and delayed diagnosis. Previous studies outside the US show that female university students have low knowledge and awareness of the signs and symptoms of breast cancer, but few, if any, studies have been conducted in a US university student population. The study's purpose is to assess breast cancer knowledge and awareness among female graduate and undergraduate university students and to determine whether field of study and family history of breast cancer are associated with breast cancer knowledge. The target number of participants for this research project is one hundred female students. Each participant completed an online breast cancer knowledge and awareness questionnaire via Qualtrics. The two primary exposures assessed include each participant's field of study and family history of breast cancer. Participants were asked their general field of study (Business, Art/Film/Communication, Health Studies/Medicine, Social Sciences, Other) and if their mother, sister, aunt, or grandmother had ever been diagnosed with breast cancer. The questionnaire included an 11-item breast cancer knowledge test, which included questions about signs and symptoms, risk factors, and screening guidelines. The questionnaire also assessed participants' opinions about the value of increased health education about breast cancer for university students.

Fairfield University Students' Perceptions of Mental Health

Michael Mello

Faculty Mentor: Kimberly Doughty

Booth: 4, Oak Room (AM)

Abstract

The project's primary goal is to understand Fairfield University students' perceptions of mental health. College students are under an immense amount of stress and pressure in a various ways. Sources of stress can include finances, social stress, course load, grades, and stress about the future. A stigma toward mental illness may deter students from seeking treatment when they need it. Objectives of this research were to describe students' perceptions of stressors and the level of stigma they have toward mental health issues, and to identify predictors of students' likelihood of seeking out mental health care on- or off-campus. Participants included undergraduate students from different schools on campus and different races and ethnicities who completed an online Qualtrics survey.

Nutrition In College

Karishma Parekh

Faculty Mentor: Kimberly Doughty

Booth: 5, Oak Room (AM)

Abstract

Nutrition is an important part of an individual's health and it is vital for college students to get adequate nutrients in their diets. College students are more likely to consume insufficient amounts of nutrients such as protein, vitamins, and minerals. If not planned accordingly and without access to proper food options in college, vegetarians can have a difficult time incorporating these nutrients in their diets. This research project explores how satisfied undergraduate Fairfield University students are with their meals in the Tully and whether satisfaction differs between vegetarian and non-vegetarian students. I recruited participants by asking them to voluntarily complete a survey as they exited the dining hall. The survey was administered through Qualtrics. The survey assessed respondents' perspectives on healthful eating in general and food options in the Tully Dining Commons specifically. Respondents indicated the extent to which they felt that meals in the Tully provided enough protein and other nutrients, and the extent to which they were satisfied with the taste, quality, variety, and cultural appropriateness of food options.

COVID-19 Booster Rates Among Staff and Infection Rates among Nursing Home Residents in Connecticut

Anthony Silvestrone

Faculty Mentor: Kimberly Doughty

Booth: 6, Oak Room (AM)

Abstract

One group most affected by the COVID-19 pandemic is the growing population of elderly individuals who live in nursing homes. Nursing homes have seen higher case and mortality rates compared to the normal population in many cases. Residents and staff of nursing homes make up nearly half of the deaths from COVID in the United States. Policies have been developed to help protect these at-risk populations. The booster mandate among staff in Connecticut's nursing homes, put in place by Governor Lamont, was enacted to do just this. This study's purpose is to determine whether there was a correlation between nursing home staff booster rates that were not yet mandated and COVID-19 cases among nursing home residents between November 28, 2021, and January 30, 2022. To answer this question, data on COVID-19 vaccination and infection rates at the 208 nursing home facilities in Connecticut were obtained from the Centers for Medicare and Medicaid Services and analyzed.

Intentions to Breastfeed and Co-sleep or Bed-share among United States Pregnant Women

Rosa Casale

Faculty Mentor: Kimberly Doughty, Jennifer Schindler-Ruwisch

Booth: 7, Oak Room (AM)

Abstract

This research builds on a previous study titled ""Sleeping Like a Baby,"" which investigated co-sleeping and breastfeeding intentions and behaviors among mothers and infants during the COVID-19 pandemic. For this study, co-sleeping is defined as parents sharing the same room, but not the same bed as their infant, and bed-sharing is defined as parents sleeping in the same bed with their infant. Co-sleeping is very controversial because of conflicting evidence regarding bed-sharing safety among mothers and infants. Bed-sharing is discouraged by the American Academy of Pediatrics (AAP) because it has been linked to Sudden Infant Death Syndrome (SIDS) in newborn infants. However, the AAP also suggests that parents should co-sleep to facilitate breastfeeding. Bed-sharing has also been shown to facilitate breastfeeding and protection against hypothermia. This study's aim is to describe pregnant women’s attitudes toward breastfeeding, co-sleeping and bed-sharing to assess whether intention to breastfeed is associated with the intention to co-sleep and/or bed-share. Another aim is to look at discussions health care providers have with pregnant women regarding their intention to breastfeed and co-sleep. Eligible participants were women eighteen years of age or older in any trimester of pregnancy. Participants were recruited through Qualtrics, which identified and enrolled eligible participants based on the study enrollment criteria.

Transformative Learning and Social Change: Community-Engaged Learning and Bachelor of Social Work Education During a Pandemic

Brigid Belger Ibelkis

Faculty Mentor: Tanika Eaves

Booth: 8, Oak Room (AM)

Track: Diversity and Inclusive Excellence, Community Engagement

This Research Was Supported by the Lawrence Family Fund

This Research Also Presented at the Council on Social Work Education's Annual Program Meeting

Abstract

This project was facilitated through a Community-Engaged Learning Social Work course, "Research in Social Work Practice." A needs assessment survey was conducted with a local community agency's Permanent Supportive Housing (PSH) program which supports chronically homeless members of the community. The topics highlighted were education level, social services benefits, COVID impact, ability to pay rent, and accessibility to medical services using telehealth. The survey was voluntary, with an informed consent form, and a small incentive. This survey was translated into Spanish. To administer this survey, case managers read clients an introductory script, which briefed the participants on the survey's purpose. Participants then filled out the survey by hand, or their case manager read them the questions and wrote down their responses. After surveys were collected and analyzed, results were presented to the community site administrators and faculty mentor.

Relieving Pain and Anxiety in Mechanically Ventilated Patients Utilizing Integrative Medicine

Amy Akerley

Faculty Mentor: Genevieve DaFonte

Booth: 9, Oak Room (AM)

Abstract

Many patients in the ICU experience pain and anxiety related to mechanical ventilation. In the hospital, it is standard to relieve these symptoms using pharmaceuticals, yet the incidence of significant pain at rest in the ICU remains 50% or higher (De Jong, 2017). Integrative medicine is a holistic approach to healing that combines medicine with alternative therapies. This combination not only amplifies pain relief and anxiety reduction, but also empowers patients or families by offering choices. In this project, a Q&A handout on integrative medicine was created, presented to nurses in the Bridgeport SICU, hung in a visible area, and patient/family education was provided. This project's purpose is to increase the visibility and accessibility of integrative therapies in the ICU. Promoting awareness of safe alternative therapies in conjunction with pharmacological agents is a simple and cost-effective way to reduce pain and anxiety in mechanically ventilated patients.

Acupressure Alternative Therapy for Pain Relief During Labor

Lauren Barrett

Faculty Mentor: Rose Iannino-Renz

Booth: 10, Oak Room (AM)

Abstract
Pain is a subjective perception in health care. Labor is notorious for being a painful experience. Pain management during the labor process is often associated with the use of pharmacologic interventions. The majority of the pain management techniques offered on the labor and delivery unit at Bridgeport Hospital involve the use of drugs. Many patients express that they would rather not use pharmacologic interventions for their pain, but are only offered limited alternatives for the management of their labor pains. One of role an RN can provide is patient-centered care, giving patients their desired interventions. With limited alternative therapy education, various staff members also recognized the lack of alternative pain management options on the unit. The evidence-based literature in this project addresses an alternative approach to pain management that is non-invasive, but requires staff education. Acupressure is a system “based on Chinese medicine of meridians throughout the body [that aims] to treat illness and ease discomfort by stimulating acupuncture points” (Sanders & Lamb 2017). Educating health care professionals on the use of an alternative pain management therapy that is not present in their unit allows for more patient treatment options when the use of drugs is not desired. A formal presentation was conducted to describe the process, benefits, and limitations of acupressure therapy to further educate staff about alternative therapy options for pain during the labor process.

Managing Nursing Burnout Through Self-Care and Stress Management

Kayla Beckman

Faculty Mentor: Majeda Basilio

Booth: 11, Oak Room (AM)

Abstract

This capstone project addresses nursing burnout and the importance of self-care and stress management for nurses to minimize experiencing burnout. Nurses, especially since the COVID-19 pandemic and recent staff shortages, are constantly faced with stressful situations in work that contribute to alarmingly high rates of burnout. Burnout leads to job dissatisfaction, low morale, and high stress levels among nurses causing poor performance, a decrease in patient care and nursing turnover. Nurses need to understand methods and strategies to combat burnout. This will allow them to minimize the negative effects on patient care and their personal lives. On the Yale New Haven Health Verdi 2 South Observation Unit of Saint Raphael's campus, burnout among the nurses is high due to a lack of education and understanding of how to minimize and manage this burnout. Therefore, a nurse burnout resource was created containing a burnout questionnaire along with self-care, stress management strategies, and helpful hotlines for nurses to use to reduce burnout. This resource was distributed to the nurses on Verdi 2 South to increase awareness and to help manage burnout. As a result, nurses will better manage burnout and experience an increase in their career satisfaction, which will allow patients to receive safe and effective care.

Promoting Mother-Infant Bonding in the NICU via Telehealth During the COVID-19 Pandemic

Caitlin Bombard

Faculty Mentor: Linda Roney, Erin Orozco

Booth: 12, Oak Room (AM)

Abstract

Connecticut Children's Medical Center's (CCMC) NICU treats infants born prematurely or with medical challenges using advanced medical technologies for complex diagnoses. Amidst the persisting COVID-19 pandemic, the NICU at CCMC faced challenges in providing combined maternal infant care. The major issue that COVID-19 presented to the NICU is preventing proper maternal-infant bonding when mothers have the virus. In premature infants, parent-child bonding is crucial, for it allows for significant development, both emotionally and physically. It is crucial that mothers understand ways in which they can bond with their infants when they are unable to physically be with them, especially during the pandemic. If critical periods for bonding are missed, both infant and mother can experience major consequences. This project educates mothers through an interactive brochure about how to facilitate bonding with their newborn infants through telehealth when they are unable to be together physically.

Combating Compassion Fatigue in Oncology Nursing Through the Mindfulness Melody

Jennifer Bonifazio

Faculty Mentor: Kelsey Burke

Booth: 13, Oak Room (AM)

Abstract

As the COVID-19 pandemic posed a serious global health threat, the hospitals and healthcare systems of our nation were severely tested. As cases of COVID-19 continued to spike, patient volume increased, death rates rose, and resources became limited; the pressure placed on hospital staff was unmatched. Nurses' compassion fatigue was at an all time high, forcing them to put their mental, physical, spiritual, and emotional well-being as a last priority. As these stressors have now become persistent and indefinite, self-care for nurses has become more important than ever. Since oncology nurses work on a unit that is characterized by continuous exposure to high stress and poor patient prognosis, it is crucial that interventions are actively implemented and specifically tailored towards reducing oncology nurse burnout. The practice of mindfulness as a solution to combat compassion fatigue was shown to reduce the perceived stress and emotional tension from nurses' daily contact with patients in a delicate state of health while simultaneously improving nurses' personal well-being in return (Ortega-Campos et al., 2019). Through my creation of The Mindfulness Melody, a gentle and relaxing harmony played throughout the entire hospital during change of shift, nurses' professional and personal quality of life can be improved while simultaneously producing better care and better health outcomes for patients.

The Importance of Spirituality in the Neonatal ICU

Margaret Breitenbach

Faculty Mentor: Kelsey Burke, Eileen O'Shea

Booth: 14, Oak Room (AM)

Abstract

Spiritual care is an essential aspect of the patient experience that can bring peace to patients and their families during a hospital stay; however, it is used infrequently. Throughout my clinical experience, I noticed a lack of emphasis on spiritual care in the clinical setting due to uncertainty of staff about these services, lack of time, and lack of knowledge about assessment tools and interventions. In the neonatal intensive care unit (NICU), families, especially parents, can benefit from these interventions. Parents with a child in the NICU navigate difficult and uncertain times. Many do not expect to spend time on this unit and can benefit from extra support. Spiritual care can provide these family members with a sense of control and support them through the decision-making process. Spiritual care can include therapeutic conversations, nursing presence, referrals to pastoral care, among countless other interventions. When nurses provide a positive presence and give a space for the parents or family members to express their emotions and voice their burdens or concerns, it can be an effective coping mechanism and allow families to find peace and meaning. Increasing education to nurses on spiritual care techniques can greatly improve the mental health of parents and promote their sense of hope during such a difficult hospital stay.

Communication with Families of End-of-Life Patients

Erika Breitfeller

Faculty Mentor: Evanica Rosselli

Booth: 15, Oak Room (AM)

Abstract

A patient transitioning to comfort care is a mentally difficult task. On top of the grief of losing a loved one, families of these patients face many hardships. While observing the NP 12 Unit at Smilow Cancer Hospital, many patients had comfort care orders and there was no protocol regarding discussion with their families. One-third of families felt that an improvement was needed in the ways that healthcare providers explain their family member's death (Mori et al., 2018). To facilitate communication between families and healthcare workers, a checklist was created. The checklist is meant to be easily used and readily available, making nurses 3.6 times more likely to use it (Kelly et al., 2021). It contains education about end-of-life, medications, consults, and ensuring availability to answer questions. This must be discussed with the patient's family within twenty-four hours of comfort care orders. Using an organized checklist will help families navigate this difficult time and allow them to focus on their loved ones.

Quality of Life and Medical Marijuana

Emma Brodigan

Faculty Mentor: Michelle Saglimbene

Booth: 16, Oak Room (AM)

Abstract

The 6th floor at Stamford Hospital is an oncology unit that consists of adult patients experiencing different cancer diagnoses. These patients go through long and strenuous treatments that alter their physical and mental status. Cancer patients experience pain, neuropathy, nausea, vomiting, appetite loss, weight loss, and many other symptoms that make it hard to get through every day. Cannabis is illegal in the United States under federal law, but the use of marijuana for medical reasons is legal in many states, including Connecticut. Whether a patient is going through treatment or living with a chronic illness, the medical use of cannabis is a remedy found to comfort the patient by relieving pain and anxiety. While physically smoking inside of a hospital is forbidden, it would be beneficial to think about ways patients could safely use the remedy of medical marijuana, such as an edible form. By introducing an edible form of medical cannabis, patients would have the option to use it for their benefit throughout their hospital stay. While medical marijuana is a controversial topic in society, it is important to consider how this remedy can better the quality of life for patients with cancer in the hospital.

Effectiveness of Distraction Techniques to Treat Pain, Fear, and Anxiety in Pediatric Patients

Clare Calabro

Faculty Mentor: Erin Orozco, Jenna LoGiudice

Booth: 17, Oak Room (AM)

This Research Also Presented at the National Student Nurses Association Conference

Abstract

Pediatric patients are vulnerable to experiencing pain while in the healthcare system due to their ongoing developmental process, lack of knowledge and rationale for medical procedures, severity of diagnosis, and emergency room commotion. Further, having to stay in the hospital with all the medical equipment around them can trigger their brains to become more fearful and uncomfortable. This research project focuses on the effectiveness of distraction techniques during various medical procedures, with a focus on the pediatric population. The evidence-based research included in this project highlights the effectiveness of different distraction techniques such as soap bubbles, music therapy, vibration tactics, virtual reality, and colorful flashlights to reduce the pain, fear, and anxiety that these patients experience. This project educates all nursing staff who take care of pediatric patients on how to use these non-pharmacological distraction techniques. Through the (hypothetical) age specific boxes filled with these various distraction techniques that I organized, nurses will be able to offer choices to their patients and assess whether one technique is more appropriate than the next if a choice cannot be made by the patients themselves. These nurses will be able to make decisions on these distraction techniques to see if they will be beneficial to their plan of care, and then they will implement the chosen techniques safely.

Providing Quality Nursing Care to Nonverbal Patients

Caitlin Campbell

Faculty Mentor: Jessica Marraffa

Booth: 18, Oak Room (AM)

Abstract

Patients can be nonverbal for a number of reasons, including surgery such as wiring a jaw shut, or a disease process such as Guillain Barre where a patient loses their motor function and ability to communicate verbally. In both cases, patients require some alternative form of communication to make the hospital staff aware of their needs. At Stamford Hospital, one patient was diagnosed with Adrenoleukodystrophy, a genetic condition that damages the myelin sheath covering the nerve cells in the brain and spinal cord leaving the patient with quadriplegia and the inability to speak or communicate. His mother remained with him at the bedside throughout his entire hospital stay, helping the nurses understand what each minor change in the patient's facial expression or cough meant in terms of what he needed. Other patients left unable to communicate may not have a primary caregiver to help the staff understand the patient's specific needs. To help nurses and hospital staff provide quality care to nonverbal patients, a communication board was developed. The board can be printed out and laminated for bedside use, or scanned and uploaded to Stamford's GetWellNetwork so that it can be brought up on the TV in any patient room at any time. The communication board can be translated into multiple languages and customized to fit the needs of specific patient populations. The sample board addresses needs, including toileting, repositioning, oral care, pain levels, contacting family, turning lights on or off, increasing or decreasing temperature, blankets, and needing a letter board to spell out specific instructions. The nonverbal patient can use a thumbs up or down, nodding, or blinking once for yes and twice for no to communicate with the staff member holding the chart.

Improving Patient Confidence and Understanding with Video Discharge Instructions in the Post-Operative Patient

Caroline Costa

Faculty Mentor: Majeda Basilio

Booth: 19, Oak Room (AM)

Abstract

On the surgical floor at St. Raphael's Hospital, patients discharged following a hospitalization require many points of education. The RN ensure that patient education has been received to facilitate a smooth transition to the next stage of care. To help meet this patient need, hospitals provide discharge paper instructions for the patient to take home. On the unit, patients and family members present for discharge education admit feeling overwhelmed and underprepared for what lies ahead. The evidence-based literature included in this project addresses the effect of video discharge instruction on surgical patient understanding and confidence as a tool to promote a smoother transition to at-home care. Overall, the video discharge method made instructions easier to understand, and many patients stated that it improved their knowledge and confidence about caring for their condition following hospitalization (Holloway and Martin, 2022). A pamphlet was created with QR codes leading to YouTube video playlists regarding specific patient care needs.

The Impact of COVID-19 Pandemic on Nursing Burnout

Grace Couillard

Faculty Mentor: Genevieve DaFonte

Recording: https://drive.google.com/file/d/1cnHDhVu3irrf_Kimx8qPXhVRZobasu0t/view

Abstract

Nursing burnout is prevalent nationwide, especially since the beginning of the COVID-19 pandemic that has caused extreme increases in high-demanding and stressful work environments for nurses. The emotional and physical well-being of nurses has been particularly challenged as they are at the front-line of the pandemic, having close contact with Covid positive patients and the fear of unknown consequences of the virus. These nurses also experience isolation and loneliness for fear of spreading the virus to their loved ones at home. Nurses face concerns of insufficient amounts of personal protective equipment and short staffing issues, increasing their fear for safety and exhaustion from being overworked with the increasing number of high acuity patients. A number of factors can lead to burnout, including increased workload, higher job demands, inadequate materials, working in high risk environments, and low social support. Nurses dealing with symptoms of burnout experience emotional exhaustion, depersonalization, and low personal accomplishment leading to feelings of depression, anxiety, and low motivation to give high quality care to patients. As a result of these intense feelings, many nurses have left the field or the bedside and have an increased risk for suicidal ideation. Burnout also affects the patients as they are not receiving the high quality care to which they are entitled. Overworked nurses in high demanding work environments are more likely to make errors that can greatly affect their patients. This evidence-based research supports the idea of nurses taking care of themselves first so that they are can give high quality care to their patients. It is also important for healthcare organizations to implement support systems for their staff by providing counseling services, therapy programs, adequate amounts of PPE and supplies, and mental health screenings to identify health care workers at risk.

Non-Pharmacological Aromatherapy for Patients with Nausea

Carleigh Dalton

Faculty Mentor: Rose Iannino-Renz

Booth: 21, Oak Room (AM)

Abstract

This project focuses on non-pharmacological interventions for patients with nausea, with a focused setting in the Emergency Department. A significant number of patients present to the Emergency Department with nausea or vomiting each day. Nausea is a common issue that staff nurses encounter each shift. Many of these patients are treated with Ondansetron (Zofran), an antiemetic used to decrease nausea and vomiting. It is important to note that this is a pharmacological treatment. The evidence-based literature describes how pharmacological treatments such as these antiemetics create issues for patients and the unit. Some issues include decreased patient satisfaction, and increased length of hospital stay, patient sedation, and hospital costs for patients. Evidence-based research explains that aromatherapy is a non-pharmacological intervention that is a cost-effective and non-invasive option for patients who struggle with nausea. Aromatherapy is generally well tolerated, has few to no adverse effects, and promotes relaxation. It can be used alone or in combination with antiemetics to provide the highest relief from nausea. Educating the nursing staff and patients on the unit about the benefits of aromatherapy can significantly decrease the severity and prominence of nausea in the Emergency Department. A handout discussing the benefits and uses of aromatherapy was created for the nursing staff to use and to give to their patients.

Understanding the Importance of Sepsis Education

Maeve DeGennaro

Faculty Mentor: Genevieve DaFonte

Booth: 22, Oak Room (AM)

Abstract

This project began with noticing that the care of patients who fit the necessary criteria for the creation of sepsis pathways was not being discussed with the healthcare team. All team members have the responsibility to recognize and communicate all concerns they may have for patients under their care. It is important to thoroughly understand recognition of sepsis and how to efficiently initiate treatment because the earlier it is caught, the better the patient outcomes. If it is missed completely or not caught soon enough, tissue death with potential need for amputation, organ failure, and death can occur. To improve understanding of sepsis, I created an educational presentation on ways that educators can further develop their staff's comprehension of sepsis. It is essential to educate both novice and seasoned nurses on what to look for when suspecting sepsis. Through education and reminders posted throughout the unit, it is possible to decrease the number of sepsis cases that progress in severity.

Importance of Teaching Nurses about Palliative Care

Gabriella DeSantis

Faculty Mentor: Patricia Lamb

Booth: 23, Oak Room (AM)

Abstract

Incorporating palliative care education into nursing practice can immensely benefit nurses, students, patients, and professional relationships. Teaching nurses and administrators can help to improve nursing attitudes towards difficult conversations about life-limiting conditions. Patient-centered care is the core of the nursing profession, addressing all aspects of care. Research has shown that education benefits communication, relationships, and perspectives. Palliative care integrates support from physical, mental, emotional, and spiritual aspects. However, it is challenging to communicate because support varies for every patient, making it difficult to articulate and put into action. The development of this literature review and project brings crucial awareness to the importance of palliative care education in practice. Overall, incorporating palliative care training is pivotal for providing holistic support, perspectives on complex situations, and patient communication.

NICU Newborns: How to Improve Mother-infant Bonding

Lauren Dierks

Faculty Mentor: Stephanie Welsh

Booth: 24, Oak Room (AM)

Abstract

Mother-infant bonding is the emotional relationship established between a mother and her newborn. Newborns are entirely dependent on others for their care and are extremely sensitive to their surroundings. Their mothers provide them with comfort for 9 months, so newborns are especially dependent on their mothers to provide them with continued comfort after birth. When a newborn is placed in the NICU, this can interrupt the mother-infant bond formed because the mother and newborn are separated. Mothers visit their newborns in the NICU and typically stay for however long they like, but not all mothers - especially first-time mothers - know this. To improve this problem and prevent this separation from occurring, I created a poster to be placed in each postpartum mother's room that offers a reminder to them that if their newborn is in the NICU, they can see them anytime and stay for however long they like.

Importance of Person-Centered Care versus Patient-Centered Care in the Oncology Patient

Danielle Doleva

Faculty Mentor: Vanna Guarino

Booth: 25, Oak Room (AM)

Abstract

Patient-centered care can be described as having patient/provider interactions during visits or centers around the management of disease, and is concerned primarily with the evolution of patients' diseases. Person-focused care refers to interrelationships over time, considers episodes as part of life-course experiences with health, views body systems as interrelated, and is concerned with the evolution of people's experienced health problems and their diseases. Patient-centered care focuses on the now, whereas person-focused care looks at the whole person and their whole treatment. When treating chronically ill patients with a cancer diagnosis, an important aspect often missed is, in fact, looking at them as a person, not as a textbook case-study. Therapeutic relationship building with patients and treating them as a human can help decrease stress in their care, while also building more trust in the professionals taking care of them. The relationships and communication between patients and healthcare professionals are also very important factors in a patient's ability to cope with cancer, as are building trust, being more comfortable with asking questions, and understanding advice given. Patients' trust in their physician is crucial for desirable treatment outcomes, such as satisfaction and adherence. In oncology, trust is possibly even more essential due to the life-threatening nature of cancer. When nurses use efficient communication, either verbally or nonverbally, they enable patients to participate in decision-making and specific care related to the disease, aiming for dignified treatment. Overall, trust and communication are important in the care of the oncology patient, to make every individual feel like a person rather than a patient, and to help improve their care.

Benefits of Aromatherapy in Caring for Oncology Patients

Moira Dougherty

Faculty Mentor: Marian Villaflor

Booth: 26, Oak Room (AM)

Abstract

This project focuses on the benefits of aromatherapy in caring for oncology patients. Clients with cancer who are undergoing cancer treatment often experience unpleasant symptoms such as nausea, vomiting, sleep disturbances, and anxiety. Oftentimes, patients are offered pharmacological treatment methods; however, this is not always preferred or effective. It was identified that oncology patients could benefit from receiving information on the use of nonpharmacological methods, such as aromatherapy, in treating or reducing these symptoms. “Different individual studies have shown that the aromatherapy of cancer patients has been used to improve the complications of fatigue, depression, pain, sleep disturbances, stress, anxiety, nausea and vomiting, and increase their quality of life” (Farahani et al., 2019). Through the use of an infographic, oncology clients and nurses can be informed of the benefits of aromatherapy in common symptom management and reduction.

Care for Yourself First: Preventing Burnout in Critical Care Nurses

Grace Fallon

Faculty Mentor: Amara Ferreira

Booth: 27, Oak Room (AM)

Abstract

Burnout is a phenomenon that has plagued nurses for decades and only been magnified by the COVID-19 pandemic. Burnout can be described as feeling hopeless, or like one's efforts do not matter or are under appreciated. These feelings can arise for many reasons, but high patient loads, lack of support, and poor management all contribute. As a result, many nurses are leaving the bedside and changing their career paths. This can lead to worse staffing, poorer patient outcomes, and higher costs for hospitals. This project sought to examine nursing burnout in the critical care setting, including exploration of risk factors, manifestations, and preventative measures. A literature review was conducted, and the findings were compiled to create an infographic to teach nurses about burnout. It is easily accessible on a nursing unit and offers suggestions for how to combat burnout. The hope is that if nurses are aware of the signs of burnout, they can recognize it in themselves and make a change in their practice to mitigate the effects and increase their job satisfaction.

Use of Exercise to Combat Cancer-Related Fatigue in Adult Oncology Patients

Jane Frawley

Faculty Mentor: Evanica Rosselli

Booth: 28, Oak Room (AM)

Abstract

The 12th floor of Yale's Smilow Cancer Center is an adult medical oncology unit filled with patients of varying diagnoses. No matter what cancer diagnosis a patient has, they are at risk for a debilitating symptom: cancer-related fatigue. Cancer-related fatigue is the sustained physical and emotional sense of exhaustion in oncology patients that interferes with their usual functioning (Javeth, 2021). One of the most effective ways to combat cancer-related fatigue is through daily exercise. This project explores the various benefits of implementing exercise into the routine of an adult oncology patient. From there, information was gathered on appropriate exercise regimens for patients of varying fitness abilities. The research collected was condensed into an informative handout to be given to patients upon admission to Smilow's NP12 unit to help minimize the effects of cancer-related fatigue throughout their cancer journey.

Benefits of Implementing Guided Imagery for Oncology Patients

Kelly Gaffney

Faculty Mentor: Evanica Rosselli

Booth: 29, Oak Room (AM)

Abstract

This research project focuses on increasing the implementation of guided imagery (GI) in the oncology setting to help reduce symptoms experienced by patients and improve their overall quality of life. Cancer diagnosis and treatment can stimulate fear, stress, depression, and lead to other symptoms including anxiety, fatigue, difficulty sleeping, and pain. Additionally, patients receiving chemotherapy treatment often experience side effects, including nausea, vomiting, pain, loss of appetite, anxiety, and concentration difficulties (Mahdizadeh et al., 2019). On the Medical Oncology Unit at Yale New Haven Hospital, patients often experience these symptoms, significantly impacting their physiological and psychological well-being. Studies have shown that GI can help reduce symptoms and improve the quality of life for oncology patients. Patients should be educated by healthcare professionals about the benefits of GI and how this easily accessible intervention can be helpful to them. A poster was created for the Medical Oncology Unit as a resource to enlighten the nursing staff about the benefits of GI and how they can use it to help implement this intervention with their patients.

Reducing Noise Levels in the NICU

Emily Greer

Faculty Mentor: Jolis Jean

Booth: 30, Oak Room (AM)

Abstract

Babies born preterm or with medical issues are brought to the neonatal intensive care unit (NICU) after birth. It is imperative for this environment to be calm with minimum stimulation to promote rest and healing of these babies. In the NICU at Greenwich hospital, increased levels of noise on the unit triggered a stress response from the neonatal patients. The American Academy of Pediatrics states that 45 dBA (decibels adjusted) is the upper safe range of sound for a NICU setting. Numerous studies cite noise levels in the NICU reaching up to 120 dBA with an average close to 70 dBA. Increased noise mostly occurs from human and machine sounds. The direct correlation between increased decibels of noise in the NICU and activation of the sympathetic nervous system response in neonates has a detrimental effect on their condition and healing process in the NICU. Decreased noise levels in the NICU will improve the condition of the babies, families, and unit staff (Casavant et al., 2017). This research presentation cites the evidence regarding unsafe noise levels in the NICU and discusses interventions performed in multiple studies to decrease noise levels and promote rest for NICU patients. An informational poster was created to be placed on the walls and hallways of the NICU reminding staff and families that it is important to keep noise down.

Utilizing Video Conferencing Platforms for Caregivers during Discharge Teaching

Daphne Gutch

Faculty Mentor: Kathleen Piqueir

Booth: 31, Oak Room (AM)

Throughout the COVID-19 pandemic, many hospitals and health institutions implemented visitor restriction policies in response to the pandemic. This greatly affected the caregivers' ability to be present during hospital stays or attend appointments. While patients are at the hospital or appointments, critical information and instruction can be provided surrounding the patient’s health. Caregivers are often involved in health-related information and serve an important role in providing for the overall health of a patient. Evidence-based research has shown that caregiver roles are often integral to compliance and proper execution of activities relating to health. Patient education and discharge teaching help patients understand their conditions, what has been done for them, and the plan of treatment. This is a critical piece in patient outcome and satisfaction. Caregivers can help with understanding and adherence to the discharge plan. While observing discharge teaching on Stamford/HSS fifth floor, patients were unable to have visitors present during the time of stay because of visitor restrictions. This caused certain information and post-operative instructions to be disregarded when relayed to caregivers. Evidence-based research has shown how essential discharge instructions are for post-operative patients. In connection to evidence-based literature, the idea of using technology and video platforms during discharge teaching was proposed to enable caregivers to be present during the time of patient education.

Corneal Abrasions in the Perioperative Period

Claire Haggerty

Faculty Mentor: Michele Lecardo

Booth: 32, Oak Room (AM)

A person's experience throughout the perioperative period is filled with lots of emotions such as fear, worry, confusion, and hope. Throughout my time in the Stamford Hospital Post Anesthesia Care Unit, I noticed that most patients would come out of surgery and be confused when waking up as to why they were unable to touch their eyes, especially when they just had surgery on a part of their body unrelated to their eyes. Although the patients were unaware, the nurses were just trying to prevent them from getting a corneal abrasion, one of the most common postoperative complications. By creating a patient handout used during the preoperative period, patient knowledge about potential complications can be increased, confusion that arises following surgery can be eased, and the potential for positive patient outcomes post operatively increases. This decreases unnecessary medical costs. My patient handout includes information on what a corneal abrasion is and what causes one, how a corneal abrasion can be prevented before and after surgery, and symptoms of a corneal abrasion and what treatment is used in the event that a person develops a corneal abrasion.

Importance of Judicious Independent Double Checks During Medication Administration

Felicia Horn

Faculty Mentor: Megan Collins

Booth: 33, Oak Room (AM)

Abstract

The health-care system in the United States is riddled with medical errors, with thousands of Americans affected by this leading cause of death. Particularly, errors during medication administration are high risk as they are associated with patient injury and adverse events. Prevalence of medication errors calls for a particular focus on fixing the flaws within the administration process. This project focuses on using independent double checks and providing an educational tool to practitioners within the VA Connecticut Healthcare System's Medical Surgical Unit (6E). Independent double checks have a long history of intercepting medication errors during the preparation and administration of high risk medications, and its effectiveness is positively regarded by practitioners. Despite the affirmative attitudes around independent double checks, research finds these double checks are misused and improperly executed in practice. Because of the variability in the conduct of independent double checks, the process's reliability and safety have been questioned. This project addresses these irregularities and provides education that helps practitioners properly conduct an independent double check. My research has led me to develop several conclusions about the proper conduct of these checks that aid in educating practitioners. First, a proper double check should be done independently and separately by a second qualified individual. Second, practitioners should not devote sole reliance on the independent double check because even the most trusted individuals are fallible. Finally, the independent double check should only be used for selective high risk medications, with practitioners cognizant of what error they are trying to catch. Through the selective and thorough use of independent double checks, practitioners can play an integral role in reducing medication administration errors and providing consistent patient safety.

Music Therapy to Decrease Stress and Agitation in Dementia Patients

Kaelyn Jadul

Faculty Mentor: Jessica Marraffa

Booth: 34, Oak Room (AM)

Abstract

Stamford nurses identified that there is not good instruction on how to access the music channels on the televisions at Stamford Hospital. Additionally, there was little knowledge of the benefits of music therapy, specifically in the Dementia population. This project aims to educate nurses on how to use the music channels, and educate them on the benefits of music therapy to decrease stress and agitation in dementia patients during their inpatient hospital stays. Stress and agitation are two common physiological responses that dementia patients experience, and these negatively impact patient outcomes. Music therapy provides a non-pharmacological intervention to promote relaxation and distraction while in the hospital. A teaching tool was created to give step-by-step instructions on how to use the music channels at Stamford, and provide staff with quick facts about the benefits of this intervention.

Educating Nurses on Use of the Buzzy Device to Reduce Pain Associated with Needle Procedures in Pediatric Patients

Jean Johnson

Faculty Mentor: Kelsey Burke

Booth: 35, Oak Room (AM)

Abstract

Anxiety around needle procedures can be observed in all age groups, especially among pediatric patients. The Pediatric Short Stay Unit at Yale New Haven Hospital performs many needle procedures including IV insertion, phlebotomy, fingersticks, and injections each day. Needle anxiety has been associated with decreased adherence to the recommended childhood vaccination schedule (Eeden et al., 2014). The Buzzy device is an evidence-based tool proven to reduce pain and anxiety associated with needle procedures. Buzzy was developed based on the Gate Control Theory of Pain (Benjamin et al., 2016). The device uses vibration and cool packs to block the pain sensations caused by the needle procedure. Buzzy is a noninvasive, non-pharmacological intervention that can be used on all children over twenty-eight days of age. These devices are inexpensive and reusable, making them a cost effective intervention. This teaching project is designed to educate the Pediatric Short Stay Unit nurses about the benefits of the Buzzy device and importance of pain management during needle procedures.

Interventions to Combat Covid-19 Related Burnout, Stress, and Depression in Nurses

Robyn Jutras

Faculty Mentor: Jessica Marraffa

Booth: 36, Oak Room (AM)

Abstract

The Covid-19 pandemic has had an incredible impact on health care, especially for nurses providing patient care during times of heightened stress and uncertainty. Many nurses and healthcare workers have experienced emotional distress, anxiety, depression, insomnia, and other negative psychological effects related to the pandemic. The highly stressful, traumatic environments that many nurses found themselves in contribute to feelings of burnout among nurses and other health care staff (Jang et al., 2021). These psychological symptoms are not only harmful to the wellbeing and health of staff members, but can also affect patient outcomes and experience. This research project identifies interventions and strategies developed to combat the negative psychological effects of the Covid-19 pandemic on nurses. These focus on building resilience, proper stress management, mindfulness, and strengthening protective factors available to nurses. A pamphlet was created to connect nurses easily to resources for self-care during high stress in order to promote healthy coping among healthcare workers.

Importance of Breastfeeding Premature Infants in the NICU

Samantha Klee

Faculty Mentor: Michele Lecardo

Booth: 37, Oak Room (AM)

Abstract

It is crucial for infants born prematurely to receive breast milk during the first months of their life. Due to their prematurity, breast milk is the optimal nutrition to protect them from illnesses and infections to which they are vulnerable. Although breastfeeding has many benefits to a premature infant, rates of breastfeeding in NICU settings across the world are proven to be low. These low rates of breastfeeding are due to many obstacles that mothers face postpartum, one being a lack of education. It was identified in the NICU at Stamford Hospital that many mothers struggle with breastfeeding, specifically due to low breast milk production. By educating mothers on interventions to increase their milk production, it is possible to improve breastfeeding outcomes. Providing a handout to NICU mothers explaining breastfeeding benefits and how to increase milk production allows mothers to be more educated on how they can provide the best possible nutrition for their infants.

Effectiveness of Patient Discharge Education

Alyssa Korn

Faculty Mentor: Kathleen Jaramillo

Booth: 38, Oak Room (AM)

Abstract

Hospital readmissions and complications can be prevented through the use of effective quality discharge education. The quality of discharge education impacts patient understanding and effectiveness. Hospital readmissions can lead to negative hospital experiences, adverse events, and increased rates of stress on the patient and family members. Hospital readmissions can also be financially costly on hospitals. It is essential for nurses to measure the patient's ability to care for themselves before providing education. Additionally, nurses should measure the patient’s and/or family members' capabilities of understanding discharge instructions. While providing discharge education, nurses should use the teach-back method to demonstrate a proper understanding of care. Various studies use different tools and checklists for discharge planning and education. Each hospital or hospital system should adopt a discharge planning and education checklist policy. I created a checklist that includes key points in the discharge process. Nursing staff can use this checklist to ensure that they take time to slowly review discharge information in simple terms and ensure patient understanding. This checklist should be kept in hospitals to promote the importance of discharge education.

Importance of Capnography Education in Sedated Patients

Ashley Lampros

Faculty Mentor: Majeda Basilio

Booth: 39, Oak Room (AM)

Track: Community Engagement

Abstract

Many doctors and physicians use sedation as a method of easing the patient into surgery as it has been proven a way of lessening the pain and discomfort in many procedures. It is the nurse's responsibility to oversee the administration of these medications and check for possible complications that may arise as a result of them. In the Interventional Radiology unit at St. Raphael Hospital, sedation is often used and monitored by nurses using pulse oximetry, respiration rates, blood pressure, heart rate, patient responsiveness, and end-tidal CO2 monitoring. Nurses on this unit expressed to me an interest in learning more about indications of respiratory distress through capnography since it is a fairly new addition to procedural monitoring. Monitoring and documentation is a large part of how we avoid certain adverse events related to procedural sedation. Evidence-based literature in this project addresses the effectiveness and improvement of safety that end-tidal CO2 monitoring provides in detecting catastrophic events in sedated patients. Capnography provides information on perfusion, ventilation, and metabolism, and reflects cardiopulmonary blood flow. This kind of monitoring is capable of recognizing airway obstruction, hypoventilation, bronchospasm, and apnea faster than any other form of monitoring we have had before. With the many benefits EtCO2 monitoring provides in improving patient safety, I created an infographic for each OR room including the kinds of waveforms that nurses should be aware of in order to detect respiratory distress. The RNs on the unit demonstrated their willingness to use this as a tool to improve the safety of their patients during operations. This education will allow both nurses and physicians to be better equipped and work more efficiently when in the OR.

Bedside Handoff

Kathryn Magennis

Faculty Mentor: Kathleen Piqueira

Booth: 40, Oak Room (AM)

Abstract

Stamford Hospital’s 5th floor was purchased by The Hospital for Special Surgery and is used as a haven for all things orthopedic, but with a focus on surgeries involving the hips, knees, shoulders, and spine. They also occasionally take overflow patients or traumas from the emergency department. Repetition of the services provided on this floor makes for a good workflow and very knowledgeable nurses. However, this also led to a decrease in use of the hospital's bedside handoff tool. Bedside handoff is used as a way to allow the patient and family to participate actively in their care and play a larger role in providing any necessary information. It also allows these parties to ask and answer questions freely. Nurses giving shift reports at the bedside allow both the outgoing and incoming nurse to double check everything regarding that patient, including, but not limited to dressings, running infusions, and pain assessments. This project resulted in creating a more comprehensive, yet concise SBAR sheet and utilization of Stamford’s GetWell Network to further include the patient in their care.

Improving Communication with Mechanically Ventilated Patients in the ICU

Samantha Mancini

Faculty Mentor: Cara Tietjen

Booth: 41, Oak Room (AM)

Abstract

The SICU of Bridgeport Hospital consists of critically ill adult patients. Although the conditions vary from patient to patient, many of them end up requiring mechanical ventilation due to the severity of their illnesses and inability to breathe on their own. While on mechanical ventilation, many patients are still conscious enough to be aware of everything going on around them. Despite their consciousness, these patients are unable to communicate with staff and be involved in their care. Due to intubation, patients are not able to ask questions about their care, voice their concerns and fears to healthcare providers or have their needs met. This inability to speak often induces stress and anxiety for patients, which only further delays their healing journey. Little to no communication strategies of any sort were utilized on this floor nor was any attention given to manage this issue. Research studies have tested the benefits of using different communication techniques such as white boards and computerized speaking devices. Research demonstrates that implementation of these strategies simplified nurse-patient interactions, which, in turn, increased patient satisfaction and improved patient outcomes.

Prevention and Interventions for Deep Vein Thrombosis (DVTs) in all Patients

Leddy McDugall

Faculty Mentor: Daphney Anicette

Booth: 42, Oak Room (AM)

Abstract

Venous Thromboembolism (VTE) is a disorder that includes deep vein thrombosis (DVT) and pulmonary embolism (PE). A DVT occurs when a blood clot forms in a deep vein, typically in the lower legs. If a DVT is not treated, part of the clot can break off and travel to the lungs. This is called a PE. PEs are a medical emergency and may cause death in some patients. Blood clots are a leading cause of preventable hospital deaths in the United States and are the third most common cause of vascular mortality worldwide. There is a general lack of education regarding prevention methods and specific signs and symptoms of a DVT. Also, although interventions such as anticoagulant medications and intermittent pneumatic compression devices are implemented in hospitals, it is difficult to maintain compliance among patients due to their lack of education and understanding of the purpose of these preventative measures. This project educates patients and assists them in better understanding their risk factors and how to specifically prevent DVTs from occurring. My informational handout enhances patients' knowledge of DVT so that they gain a feeling of empowerment and their overall health improves.

Nurse Burnout and How it Affects Patient Care

Kate McHenry

Faculty Mentor: Genevieve DaFonte

Booth: 43, Oak Room (AM)

Track: Community Engagement

Abstract

Nurse burnout became even more prevalent in the past couple of years due to the Covid-19 pandemic. Nurses worked more hours than ever before and in conditions completely unsafe, reusing PPE for weeks, obtaining little to no sleep, and facing countless deaths each and every day that they walked into their hospitals. There is no doubt that this has caused a great amount of stress on nurses, and managing that newly developed stress is not easy. While on the NE7 unit at Bridgeport Hospital, I noticed that many nurses struggled to get their work prioritized, and then care for their patients became depersonalized. The evidence-based literature used to support this project addresses the burnout nurses face and how to mend the associated stress. With this, many ideas for alleviating the stress such as getting exercise like going for a walk or biking, focused breathing exercises, aromatherapy, and meditation helped nurses on my unit.

Benefits of Mental Health Resources upon Discharge

Madison McSherry

Faculty Mentor: Megan Collins

Booth: 44, Oak Room (AM)

Abstract

Many United States Veterans struggle with mental health disorders that often go untreated due to lack of knowledge regarding treatments and resources. Because most of the Veteran population being treated in hospitals is elderly, many of these patients are not accustomed to the new online mental health resources available. While at the VA of West Haven, Connecticut, I found that many patients did not fully understand the mental health resources available to them upon discharge from the hospital. For many struggling with mental health disorders, these resources can be crucial to their outcomes, and an understanding of the resources is important. I designed a “pocket card” filled with different online resources that the Veteran patients can use to learn about or treat different mental health disorders. The patients can be given this card upon discharge and keep it in their pockets to always have on hand when needed.

Benefits of Massage and Related Therapies for the Oncology Patient

Mia Melao

Faculty Mentor: Evanica Rosselli

Booth: 45, Oak Room (AM)

Abstract

Yale New Haven Hospital's North Pavilion 12 is a medical-oncology unit of adult patients with varying degrees of solid tumor cancers. These patients have unique needs due to the physical, emotional, and social effects of their diagnosis and treatment. Anxiety and depression are common diagnoses as oncology patients confront the unknown. Patients are medicated for chronic pain, but the medications are not enough to make them feel comfortable. Massage is a non-invasive, non-pharmacological way to safely and effectively reduce the pain, anxiety, depression, and other side effects of cancer and its treatments. Yale already has massage therapy on staff, but the services are widely underutilized. This project educates the staff on the benefits of massage to help lessen the burden of disease faced by their patients. Through this educational project, I hope that more oncology patients will utilize massage therapy to improve their mental health and pain levels.

A Simple Guide to Postoperative Mastectomy Care

Samantha Merry

Faculty Mentor: Patricia Lamb

Booth: 46, Oak Room (AM)

Abstract

Thousands of mastectomy patients are discharged home each year with the responsibilities of pain management, drain care, incision care, and infection prevention. These tasks are often overwhelming and improper homecare can lead to serious complications and a poor quality of life. “A Simple Guide to Postoperative Mastectomy Care” was developed as a comprehensive and user-friendly guide for these patients. It includes charts to record drainage color and amount, tips on incision and drain care, infection warning signs, and a pain management guide and recording tool, with the goal of being printed and distributed at the time of discharge. The tool was developed by interviewing nurses and postoperative mastectomy patients on the Greenwich Hospital Surgical floor, and by reviewing peer reviewed nursing journals. Overall, postoperative mastectomy patients require a concrete discharge tool to guide their care at home and the described tool is an intervention to meet this learning need.

Benefits of Complete Electronic Charting Versus Partial Paper Charting

Sara Middlebrook

Faculty Mentor: Erin Orozco

Booth: 47, Oak Room (AM)

Abstract

The rise in technology introduces a new question for healthcare of whether to fully incorporate electronic medical record systems into their current ones. Though many hospitals and doctors offices are hesitant to do so, electronic records provide positive effects compared to complete paper charting or a mix. On 6E, a med/surg floor at the VA, paper charting is used for logging vital signs and other measurements via a specific binder by the rooms. Electronic charting provides an improvement in patient care and outcomes due to a shared knowledge by everyone on the interdisciplinary team. Also, there may be predictions made on medication adherence, or lack thereof, which allows for early intervention and an increase in patient safety. Doctors and nurses contributed to the evidence that demonstrates that they are ready to convert fully to electronic charting, but availability of such methods was the sole issue. Paper charting contributes to discrepancies in charts, and is unnecessary due to the effectiveness of electronic charting alone.

Vasovagal Syncope Episodes in the PostOp Orthopedic Surgical Patient

Shannon Middleton

Faculty Mentor: Kathleen Piqueira

Booth: 48, Oak Room (AM)

Track: Community Engagement

Abstract

The tenth cranial nerve, the vagus nerve, is suppressed by anesthesia during surgery. The vagus nerve controls the parasympathetic nervous system: regulation of the heart and digestive system. This is why in the PACU, patients become nauseous and have sudden drops in heart rate and blood pressure, which can lead to fainting episodes called vasovagal syncopes. In Stamford on the Hospital of Special Surgeries floor, vasovagal episodes are the most common complication when a patient wakes up from surgery. Many patients and even some care providers knew nothing about these syncopes and ways to prevent them. Brochures have been proven to improve health outcomes by encouraging patients and families to have an active role in caregiving. With visuals and layman's terms, it is easy for patients to understand and simple for them to navigate. It is important that this information be shared with patients and families in visits prior to surgery. The earlier in the surgical process that the patient learns about vasovagal episodes, the easier it will be for them to identify the signs and warn their nurse before the syncope. These brochures can also help providers who need more education or a refresher on vasovagals in their patients. Strong evidence supports salt supplementation about a month prior to surgery to reduce the chances of vasovagal episodes post op, but this must be discussed with a doctor and the patient must qualify for this alternative therapy. With this education being implemented into hospital teaching, the hopes are to decrease the number of vasovagal syncope episodes in the PACU.

How Enhanced Recovery After Surgery Protocols Improves Patient Outcomes in Cardiac Surgical ICU

Rees Miller

Faculty Mentor: Marian Villaflor

Booth: 49, Oak Room (AM)

Abstract

Enhanced recovery after surgery (ERAS) protocols are a set of evidence-based best practices shown to improve surgical outcomes for patients in ICU settings through shortening hospital stays, reducing medical expenditures, engaging patients as active participants in care, eliminating overuse of long-acting opioids, and decreasing the incidence of other medical complications. Even though ERAS protocols are clearly outlined and supported by research, many cardiac surgical ICUs fail to fully implement and incorporate these practices into the care of postoperative cardiac patients. This project educates critical care nurses on these specific guidelines and their purpose and provides an organizational tool that allows nurses to ensure adherence to ERAS protocol in high-stress environments. Critical care nurses can benefit from implementing ERAS protocols due to increases in bed capacity in an overburdened healthcare system, which reduces workload and burnout for healthcare providers.

Aromatherapy as an Alternative Treatment of Postoperative Nausea and Vomiting

Abigail Morrill

Faculty Mentor: Kathleen Piqueira

Booth: 50, Oak Room (AM)

Abstract

Stamford Hospital's 5th floor is occupied by Hospital for Special Surgery (HSS) and is a collaboration between HSS and Stamford Health. Here, patients are prepped for and undergo orthopedic surgeries, recover in the PACU, and are potentially admitted to the inpatient surgical unit. Given the nature of these surgeries and the need for anesthesia, many patients experience postoperative nausea and vomiting (PONV). Though a common occurrence, PONV is not completely understood and, therefore, a multimodal approach is recommended for its treatment. Recent studies deem aromatherapy effective in reducing PONV, and the need for antiemetic medication administration. This project educates nurses on how to alternatively treat PONV using aromatherapy. Through a visual analog scale, nurses will be able to assess and monitor nausea severity in postoperative patients to determine the effectiveness of aromatherapy and need for antiemetics.

Importance of Providing Veteran-Specific Care at Non-VA Facilities

Anabelle Murphy

Faculty Mentor: Amara Ferreira

Booth: 51, Oak Room (AM)

Track: Diversity and Inclusive Excellence

Abstract

This project summarizes the literature on the importance of Veteran-specific nursing care in non-VA facilities. The specific conditions and types of care needed for these patients are described. While working as a student nurse on 8T at Danbury Hospital, I noticed how often our patients were part of the Veteran population. Nurses often seemed to get frustrated when working with these patients, which could be avoided with small practice changes and altered assessments for the needs of these patients. This project describes real-life challenges experienced by new and experienced staff nurses across all units and hospitals. Implementing a few small practice changes when caring for this patient population will greatly improve personal patient satisfaction as well as overall diagnosis and health outcomes.

Importance of Pre-Operative Education on Post-Operative Pain

Jasmine Nguy

Faculty Mentor: Daphney Anicette

Booth: 52, Oak Room (AM)

Track: Community Engagement

Abstract

This project focuses on the importance of pre-operative education about post-operative pain. There is a misconception that after surgery, patients will be at a 0 pain level, but that is not the case. Nurses will medicate a patient's pain with small doses if it is moderate to prevent the increase to severe pain, which decreases the total amount of pain medication patients receive. Every single shift, I heard PACU nurses say, "The goal is not 0 pain; it is tolerable pain" to their patients. Educating patients while they are still on anesthesia and after having already gone through surgery is not the way a patient should learn about pain management goals. Pain is different for every single person so they should be educated beforehand about what to expect postoperatively. Nurses use a combination of the number scale, vital signs, and how patients present themselves, to determine how to medicate a patient. If a patient is asleep, vital signs are stable, and he or she does not wake up to you calling their name, would you believe that they are in 10 out of 10 pain like they reported? This makes the nurses' judgement a key component in how they medicate their patients. Treating pain is extremely important in how the patient recovers from surgery, so I made an educational pamphlet given to the patients preoperatively to supplement the verbal education that they receive from the staff.

COVID-19 Impacts on Connecticut Nursing Homes

Jasmine Nguy

Faculty Mentor: Alison Kris

Booth: 53, Oak Room (AM)

Abstract

Institutionalized older adults have suffered disproportionate mortality from COVID-19. In Connecticut specifically, 58.82% of COVID-associated mortality to date has occurred in nursing homes. Yet among nursing homes, there was an unequal distribution of both cases and deaths. Using statewide databases, we evaluated the impact of profit status, social vulnerability, and staff positivity on nursing home residents on COVID-19 infection and death in nursing home residents. Independent samples t-tests were used to examine the impact of institutional profit status and social vulnerability on infection and death rates. While high rates of social vulnerability were not associated with resident infection or death rates, profit status was a significant predictor of rates of infection and death among nursing home residents. Residents in for-profit nursing homes had higher rates of infection (t (142) =3.49).

Improving Parent Education of Pediatric ICU Patients

Samantha Oris

Faculty Mentor: Erin Orozco

Booth: 54, Oak Room (AM)

Abstract

Having a child in an ICU can be one of the scariest situations for a parent. Parent education is a crucial aspect of both the child's stay and discharge home, but it can be difficult to retain education given in a short span of time, with many worries running through the parents' heads. When only about twenty minutes is spent for patient and family education, time is squeezed to cover every aspect of care, and it is challenging to address other conditions (Zimlich, 2019). Utilizing an educational resource accessible anytime and anywhere is beneficial for those who care for a child in the ICU. Infographics are a great example of such a resource. Infographics are beneficial for almost any type of education and are particularly helpful when it comes to educating parents on managing complex conditions. They are helpful in reiterating verbal points, and in saving time while improving education (Zimlich, 2019). Although it is hopeful that a child will go home with no further care, that is simply not realistic when it comes to discharge from an ICU. Oftentimes, the child needs further care at home, and it is important that those caring for the child at home understand the condition and its treatment to the best of their ability. By providing an infographic with information of some common devices/treatments provided to children in a pediatric ICU, hopefully it proves as a helpful educational tool for parents to better understand their child's condition and treatment.

Transgender Community in Pregnancy

Nairi Ostayan

Faculty Mentor: Rose Iannino-Renz

Booth: 55, Oak Room (AM)

Track: Diversity and Inclusive Excellence

Abstract

This project focuses on the improvement of communication between healthcare workers and the LGBTQ+ community during pregnancy. There is a significant disconnect between the LGBTQ+ community and care given to them. This disconnect results in the LGTBQ+ community's hestitancy to seek care, and when care is sought out, they are more likely to become uncomfortable in the care setting. Evidence-based practice suggests that the education of the nursing team and healthcare workers is a cost-effective way to better the experience of the LGBTQ+ community in pregnancy. It has been proven that the education of the healthcare team with defining words such as sex, transgender, cisgender, and nonbinary helps to improve communication. An inservice for labor and delivery, postpartum, and maternal special care floors will be created as a mechanism of action for nursing staff to improve each interaction with the members of this community.

Improving Parent Education in the Neonatal ICU

Meghan Pagliuca

Faculty Mentor: Majeda Basilio

Booth: 56, Oak Room (AM)

Abstract

Admission of a child to the NICU is often unexpected and traumatic. “Parents are innocently unaware of what takes place within the walls of a NICU, and they are unfamiliar with the many medical complexities premature and ill infants face” (Mosher 2017). While working in level IV NICU in CT, many parents voiced to nurses that they were unfamiliar with certain aspects of the NICU, felt as though they did not know how to care for their children, and often were not involved in their children’s care. Many of the staff agreed that parental education and involvement in care was not prioritized in the way that it should be. “Medical experts and NICU parents agree that educating families is a key component to a parent’s involvement in his or her infant's care while in the NICU and his or her subsequent ability to care for his or her infant post discharge” (Gehl 2020). The evidence-based research shows that “appropriate educational interventions can reduce parenting stress and raise child rearing confidence” (Yu 2021). Having information about the NICU environment, their child’s condition, and basic infant care available to parents in an online database would make it easier to access and for continued education to occur. Increased availability of such educational information would help get parents involved in the care of their child while enhancing patient safety. Online access would also decrease parental stress of remembering so much information and make it easier for the nurses to direct parents to a place to find the best information.

Improving Orientation Among New Graduate Nurses in Specialties

Sophia Peterson

Faculty Mentor: Michele Lecardo

Booth: 57, Oak Room (AM)

Abstract

With the extreme shortage of nurses currently facing healthcare, New Graduate Nurses (NGN) are expected to help fix the staffing crisis. Orientations are formative sets of time, ranging from a few months to a year, for the NGN to transition to an RN. NGNs are also accepted into specialty nursing roles unlike before, making the orientation time even more crucial within these specialties. In an Emergency Department in Massachusetts, NGNs' orientations were unacceptable. NGNs were asked to take on unsafe patient loads, had little guidance under an RN, and felt alone and overwhelmed. This nationwide problem needs resolution. NGNs in specialties need better training to provide quality patient care to their specialized populations. Staff agreed that NGNs were suffering and changes needed to be made to improve orientations and patient outcomes. An e-learning tool with graphics was created, reflecting feedback from NGNs about orientations and how staff can improve the experience.

Strategies to Decrease Nursing Burnout at the Bedside During the COVID-19 Pandemic

Sophia Prinos

Faculty Mentor: Jessica Marraffa

Booth: 58, Oak Room (AM)

Abstract

The overwhelming number of patients coming into the hospitals during the COVID-19 pandemic has overrun the nursing staff with a large and difficult workload. Hospital units have hit and surpassed capacity limits and nurses have been put in the difficult situation of caring for too many patients, many of whom require high acuity care. Many hospitals are not willing to increase their funds to create safe nurse-patient ratios, the root cause of nurse burnout. Nurses must take matters into their own hands to care for themselves to prevent overwhelming levels of stress and anxiety, causing them to burnout. Nursing burnout at the bedside is not only unsafe for nurses, but unsafe for the patients requiring care. When nurses exhibit emotional exhaustion and stress, medical errors are more likely to happen. It is important for nurses to find strategies that they can perform themselves to avoid nurse burnout. Self-care strategies and relaxation techniques that are accessible for nurses at work and can be implemented outside of work can greatly reduce stress and anxiety that leads to nurse burnout. At Stamford Hospital, many nurses express feelings of stress, anxiety, and emotional exhaustion in many forms, and this is true for many nurses in all hospitals who worked throughout this pandemic. To help nurses and hospital staff prevent burnout and alleviate the stress and anxiety brought on by bedside nursing during the COVID-19 pandemic, an infographic was developed. The infographic can be given as a handout to nursing staff to use as a tool and take home with them. The handout can also be posted in common areas where nurses can see it during their shift, such as the bathroom, break room, and nursing station. During a nursing shift, if a nurse feels overwhelmed and stressed, they can take a moment to perform one strategy and technique outlined in the infographic to immediately relieve feelings of stress, and improve their performance. These strategies include breathing techniques, hydration, talking to a friend or family member on a break, and going for a walk. Self-care strategies that can be done outside of the workplace are socializing with someone, physical activity, and spending time outdoors.

Effects of Preoperative Opioid and Pain Management Education on Postoperative Outcomes in Orthopedics

Margaret Racicot

Faculty Mentor: Katherine Saracino, Kathleen Piqueira

Booth: 59, Oak Room (AM)

Abstract

As a patient undergoes orthopedic surgery, there is often a disconnect between the patient and medical staff when it comes to proper opioid and pain management education. This lack of education, confusion, and fear often leads to increased and unnecessary pain, delayed ambulation and physical therapy sessions, and prolonged stays in the hospital. On Stamford's HSS floor, there were varied discrepancies in preoperative patient knowledge on pain medication regimens. The literature shows how proper education in the preoperative period will positively affect subsequent rates of pain medication administration during the postoperative period and beyond, thereby improving patient outcomes. In order to facilitate this educational transition, a formal infographic has been created that can be provided to all patients on the floor. This will allow each patient to make a clear, informed consent about the way that they choose to manage their pain and approach their discharge and healing process.

Importance of Promoting Patient Safety Through Positioning in the Perioperative Process

Lila Ritter

Faculty Mentor: Michele Lecardo

Booth: 60, Oak Room (AM)

Abstract

One priority objective of the circulating nurses in the operating room is always sterility, and, more often than not, patient positioning is forgotten or overlooked. Although the aseptic technique should be focused on preventing infections, the safety of the patient always should be first. By promoting the importance of patient safety through positioning in the perioperative process, patients are at decreased risk of pressure injuries and nerve damage. In the ambulatory operating room at the Stamford Tully Center, it was imperative that the nurses and surgical staff had an increased awareness for patient positioning, as more patients came in complaining of joint pain and other complications following previous procedures. Upon observation and speaking with staff, it was apparent that they needed better positioning equipment, an assessment tool for determining the types of interventions for each specific patient, and a way to document that proper positioning and attentiveness for the patient were taken. The patients most at risk for these complications were those placed in lithotomy position, side-lying, prone, supine, and sitting. They were found to be in longer surgical procedures which required them to be in those positions and bony prominences were affected. Also, patients who were obese or larger than the regular OR table size were at risk of complications due to interventions not fitting their needs. Based on these findings, by implementing these necessary positioning devices, such as latex-free wraps for the arms to avoid damage of the brachial plexus, surgical risk assessment tool, and documentation through time-outs, the nurse would be able to improve safe patient positioning and demonstrate their compassion by going the extra mile. This would then decrease the risk of pressure injury and nerve damage. By providing an in-service for staff, there will be a promotion of patient safety, patient outcomes and satisfaction will increase, hospitalization rates will decrease, reimbursement rates will occur, and the unit will meet their quality-of-care goals.

Increased COVID-19 Protocols in the Immunosuppressed, Post-Transplant Community

Olivia Robichaud

Faculty Mentor: Majeda Basilio

Booth: 61, Oak Room (AM)

Abstract

In light of the COVID-19 pandemic, the CDC has implemented many new protocols and changes to our daily lives, including new vaccines, mask wearing, and increased sanitation measures. For many, these changes have been an inconvenience; however, for the immunosuppressed community, these new rules and regulations have completely changed the way that they live and interact with individuals around them. Because of the immunosuppressive and anti-rejection drugs that these individuals must take each day to avoid organ rejection, their immune systems provide them with very little protection against diseases and infections. As a result, this population is unable to interact with society and must remain isolated from the world until they are at least six months post transplant. It is incredibly important for these individuals to receive the coronavirus vaccine prior to their transplants; however, within this community, most individuals are unaware of the importance of the vaccine and the protocol for isolation after infection and transplant surgery. By creating an educational pamphlet for this community that includes information on importance of vaccination, vaccination schedule and doses, isolation periods, and the effect that coronavirus can have on a newly transplanted organ, this community will better understand the importance of protecting themselves against COVID-19. Having this information distributed at places such as dialysis centers where many patients are awaiting transplant could increase the likelihood of patients being fully vaccinated prior to transplant, and will overall increase the success of organ transplants.

Early Mobilization in the Pediatric Intensive Care Unit

Victoria Selverian

Faculty Mentor: Rose Iannino-Renz

Booth: 62, Room (AM)

Abstract

The project reviews and provides a report on the recent literature on the impact of early mobilization in the Pediatric Intensive Care Unit (PICU). The association between early mobilization and its impact on the measures of function and quality of life for severely ill children in a pediatric intensive care unit are described. Investigation will determine if activity interventions by nurses impact patient care outcomes. Challenges to optimization of musculoskeletal function were investigated. Nurse-based daily screening for medical readiness was explored. It was found that routine screening as a lone intervention did not significantly reduce time to commencing mobility within the PICU setting. Concerns for patient safety when implementing early mobilization were explored. It was found that mobilization within seventy-two hours of PICU admission was safe and feasible. In the study by Simpson et al., (2022) of 71 children in a PICU, there were no adverse events with early mobilization. Barriers to early mobilization and negative outcomes were identified. It was found that immobility during severe illness contributed to thrombotic events, decreased protein synthesis, decreased muscle mass, and increased risk of death. Immobility during critical periods of a disease may contribute to neuromuscular, metabolic, cognitive, and psychological challenges in the future. Further research is needed to provide evidence-based guidance to nurses as we conduct early mobilization of PICU patients in an effort to minimize adverse outcomes.

Journaling to Non-Pharmacologically Treat Anxiety and Depression

Molly Silvestri

Faculty Mentor: Michele Lecardo

Booth: 63, Oak Room (AM)

Abstract

The psychiatric in-patient unit at Stamford Hospital admits adult patients with schizophrenia, bipolar, severe depression, and anxiety disorders. The average length of stay after a patient is admitted onto the unit is seven days, while patients have been on the floor for as little as three and as long as eighty days. Throughout their stay on the unit, patients consult with members of the healthcare team to alter medication regimens, oftentimes getting discharged with higher doses of their current medications on top of newly prescribed medications. The stress that comes with new medication prescriptions along with being contained on a locked unit often exacerbates patients' anxiety and depression. Oftentimes patients get discharged from the unit and are not consistent with their new medication regimen, causing patients to be readmitted multiple times. Journaling during and after patient admission on an inpatient psychiatric unit has been studied and proven to be effective in significantly reducing the psychological symptoms of depression and anxiety in patients of all ages. Journaling is a simple, low-cost, and safe tool that decreases negative emotions and stress levels, increases perspective and clarity, and creates a space to articulate feelings privately. This project educates patients and nursing staff on inpatient psychiatric units about the significance and impact of journaling on patients to non-pharmacologically treat anxiety and depression. Through the educational session delivered to nurses, there will be improved understanding of the impact that journaling can have on patients struggling with anxiety and depression. This will empower nurses to properly educate their patients about this non-pharmacological option to manage symptoms on and off the unit.

The Golden Hour: Skin-to-Skin Contact and Breastfeeding

Lauren Smith

Faculty Mentor: Katherine Saracino

Booth: 64, Oak Room (AM)

Abstract

The Golden Hour, which is the first sixty minutes after birth, is a significant time for a mother and her newborn to experience skin-to-skin contact and breastfeeding. Evidence-based literature shows that skin-to-skin contact promotes the release of oxytocin, the hormone responsible for breast milk letdown. It has been proven that skin-to-skin contact, compared with separation in the first hour after birth, increases breastfeeding success and supports lactation initiation. These key components of the Golden Hour help reduce neonatal morbidity and mortality. A department sign, letter, and door place card were created to educate and bring awareness of the importance of skin-to-skin contact and breastfeeding to patients, families, and nursing staff. These effective forms of communication emphasize the Golden Hour period, and how the mother and newborn need this time solely for themselves.

Promoting Hand Off Reports Between RNs and NAs

Lindsey Spencer

Faculty Mentor: Michelle Saglimbene

Booth: 65, Oak Room (AM)

Abstract

The hand off report at the beginning of one’s shift is one of the most important tasks in a nurse and nursing assistant's day. One’s report will set the status of a patient and can have significant impacts on overall safety and quality of care received. Nursing assistants (NA) are a vital part of the team and assist registered nurses (RN) with increasing demands of direct patient care, so it is important that they receive an accurate depiction of their patient population for the day. Adverse effects are often tied to breakdown in communication between RNs and NAs and patient safety outcomes significantly improve when nurses provide direct hand off reports for nursing assistants. Nurse to nursing assistant hand off sheets allow for proper and vital information to be passed from shift to shift, and ensure that nursing assistants receive a full report from nurses themselves. The evidence-based literature addresses the ways in which nurses and nursing assistants can improve their communication strategies to provide patients with the highest quality of care. Overall, the use of hand off sheets, designed per unit needs, have a positive effect on overall patient care and satisfaction. An example handoff sheet was created for nurses that includes sections with the most vital patient information for easy organization and hand off reports.

Importance of Nutrition in Mental Health Patients

Amanda Toole

Faculty Mentor: Cara Tietjen

Booth: 66, Oak Room (AM)

Abstract

Bridgeport Hospital's Geriatric Psychiatry unit on Northeast 8 consists of patients of varying psychiatric disorders. Nutrition is often neglected and not considered when it comes to caring for mental health patients. There is a correlation between the gut microbiome and mental health. Gut dysbiosis has been found in patients with depression, other mental health disorders, and even autism. The standard American diet causes inflammation in the body and brain. Neuroinflammation negatively affects brain function, contributing to mood disorders and behavioral issues. Since 95 percent of serotonin is made in the gut, it is important to maintain a healthy gut microbiome. Diets full of antiinflammatory foods, foods containing probiotics, and whole unprocessed foods led to healthy gut flora and a decreased prevalence of mental health disorders. Tryptophan-rich diets boost serotonergic neurotransmission, resulting in mood regulation and enhanced mood. Changes in diet may help in the treatment of mood disorders without the unwanted side effects of pharmaceuticals. This project educates nurses and doctors caring for mental health patients, who can then educate patients on the importance of the food that they put into their bodies and how it can affect their mental health.

Purposeful Activity in the Setting of Dementia

Mia Trafecante

Faculty Mentor: Mary Murphy

Booth: 67, Oak Room (AM)

Abstract

The project summarizes the literature on the meaning of purposeful activity for patients with dementia. Being involved in meaningful activity and the perception of significance will be described. Taking place at a high reliability organization at VA Connecticut, this investigation determines if activity interventions promote a culture of safety and improved patient care outcomes of individuals with dementia. Researchers utilize various non-pharmacological interventions with in-patient dementia patients, with a particular focus on meaningful activities. Meaningful activity is considered as any social, spiritual, physical or leisure activity tailored to the patient's individual needs or preferences. Playing cards, folding laundry, attending mass, walking, or reading a book are just few of the interventions utilized in these studies. Researchers evaluated the patient's responses for the remainder of their stay, auditing the number of falls, behavior outbreaks (aggressiveness, forgetfulness), refusal of treatment, etc. Researchers compared their findings to the data collected prior to the implementation of these interventions. An evidence-based approach showed a direct correlation between purposeful activity and an improvement in patient safety, healthcare outcomes, and managed behaviors in dementia patients. Researchers determined that meaningful activity facilitated feelings of pleasure, improved involvement, and promoted a sense of self identity. By spending more time focusing on certain activities, patients were distracted and less likely to wander and more compliant to care. This project involves realistic challenges faced by novice nurses when entering the nursing career. The perspective of a newcomer to the profession may provide insight into a situation that requires updating. Implementing use of a standard guide to promote a sense of purpose may increase staff nurse perceptions of a culture of safety that updates nurse knowledge, impact practice, and can improve outcomes.

Emotional Intelligence in the Healthcare Field: Improve Outcomes and Relieve Burnout

Jacey Zeug

Faculty Mentor: Margaret McClure, Michele Lecardo

Booth: 68, Oak Room (AM)

Abstract

During my clinical rotation at Stamford Hospital, I observed a strong need for improved emotional awareness with patients and emotional intelligence among nursing staff. I created an emotional assessment tool for patients to fill out to allow the nurse and healthcare staff to more effectively adhere to the patient's needs with resources and therapeutic communication. I also created two brochures to explain the concepts of emotional health for the patient and emotional intelligence for the nurse in an effort to improve health outcomes and interpersonal relationships among patients and staff, and to lessen the feeling of burnout. Burnout among hospital staff has been a major issue for many years, and the effects of COVID-19 cause these improvements to be more vital than ever. After doing this clinical observation and reading several research articles on this topic, I hope that staff and patients together can collaborate to improve the outcomes of care beyond the physical wellbeing of the patient.

How To Recognize Children or Adults That Were Sexually Abused as Children

Caroline Bellissimo

Faculty Mentor: Rose Iannino-Renz Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271IStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649174448000

Abstract

Bridgeport Hospital units serve children who come from different backgrounds. These backgrounds can either be filled with bad or good experiences, which shape these children and the ways that they interact with people and society. The patients that have suffered from sexual abuse often suffer from anxiety, depression, and other mental health and emotional well-being consequences. As a result, they often become unstable and try to block out the memory of the incident. When this happens, patients often become isolated and uncomfortable with physical contact that comes with interaction with people when the hospital staff tries to perform exams to determine the reason for their admittance to the hospital. In these situations, most medical staff do not know how to recognize the signs of sexual abuse, which leads to the staff not treating the patients in an effective manner. Through the application of a training program, nurses will be able to provide the proper care for these patients, creating better plans of care, and safely and effectively implementing that care.

Reducing the Impact of Operating Room Waste

Julia Benewiat

Faculty Mentor: Sarah Hirx

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649170296000

Track: Environment and Sustainability

Abstract

The operating room creates large amounts of waste that is often necessary to keep equipment sterile, prevent patient infection, and ensure adequate patient care. There are not many initiatives in place at this time to reduce the amount of waste needed to perform a procedure, but there are actions proposed to minimize how much of the materials create waste. Programs for recycling, repurposing, and reprocessing equipment and supplies are just the beginning towards lessening the carbon footprint that the operating room creates. This project explores “greening” the operating room to reduce waste, energy use, and the supply cost created by the operating room.

Surgical Smoke Health Hazards and How to Prevent Health Complications

Catherine Bernhart

Faculty Mentor: Sarah Hirx

Recording: https://Fairfield.zoom.us/rec/share/51sI9z_0HDhR51wYmm-kbHwdK_vUKo0kdp966GnRpsRu_6QCiNMdhbohTB5WJLT6.HxNWi1GUAuTpu6Fh?startTime=1649087901000

Abstract

Surgical Smoke is produced during surgical procedures that use electrocautery devices to stop bleeding or create incisions in the body. These devices cause the tissues of the human body to reach a boiling temperature, specifically 100 degrees Celsius or 212 degrees Fahrenheit. The surgical smoke is simply the vaporization of the human tissue. The most notable toxic compounds include benzene, toluene, and hydrogen cyanide. It can contain viruses such as HPV, which has been documented to transmit through surgical smoke to the surgical team, as well as cancer cells. The acute health risks of surgical smoke are eye, nose and throat irritation, headaches, cough, nasal congestion, and asthma or asthma-like symptoms. As an RN who works within the perioperative setting, specifically the intraoperative areas, it is important to understand the equipment and the safety risks associated with all instruments used throughout surgery. This study focused on the surgical team members, which include RNs, Certified Surgical Technicians, Surgeons, Residents, and Medical Representatives. This education allows the surgical team to understand the importance of utilizing methods to reduce smoke inhalation and the health risks to each team member. This research includes information about smoke evacuation systems, which act as a suction device to pull smoke out of laparoscopic areas to prevent it from entering the free air. Another method for preventing surgical smoke inhalation is the use of N95 respirators while in the operating room when electrocautery devices are utilized.

Non-Narcotic Post Operative Pain Management in Orthopedic Patients

Henry Brenkert

Faculty Mentor: Sarah Hirx

Recording: https://Fairfield.zoom.us/rec/share/51sI9z_0HDhR51wYmm-kbHwdK_vUKo0kdp966GnRpsRu_6QCiNMdhbohTB5WJLT6.HxNWi1GUAuTpu6Fh?startTime=1649089967000

Abstract

Today, the opioid epidemic is at an all-time high. People become addicted to more narcotics at a faster rate than ever before, many due to hospitalizations. This project finds ways to reduce post-operative pain effectively while staying away from narcotic use. Through research, I have found effective ways to treat post-operative pain while keeping narcotics out of the body. Some of these practices have already been implemented in our current hospital systems and with supporting data; I believe more will do the same.

Preventing and Combating Nursing Burnout

Lauren Carroll

Faculty Mentor: Sarah Hirx

Recording: https://Fairfield.zoom.us/rec/share/51sI9z_0HDhR51wYmm-kbHwdK_vUKo0kdp966GnRpsRu_6QCiNMdhbohTB5WJLT6.HxNWi1GUAuTpu6Fh?startTime=1649089289000

Abstract

Burnout is an obstacle engulfing the nursing profession. Burnout occurs when a person struggles to manage the effects that long-term stress has had on their emotional, physical, and mental well-being. In a high-intensity profession that provides life-altering care, nursing is at the forefront of professionals experiencing burnout syndrome. It is characterized by a person's emotional exhaustion, depersonalization, and lack of personal accomplishment. Burnout syndrome negatively impacts brain structure and cognitive functions, leading to poor job performance, which directly corresponds with poor patient satisfaction and can lead to increased infection rates and decreased error recognition. It is of the utmost importance that baccalaureate programs utilize up-to-date research and teach nursing students how to manage stress before entering the workforce, and that hospitals utilize their resources to educate staff on strategies to cope in current conditions. By managing stress before and during work on the unit, nurses will experience less burnout and, thereby, directly lower the rates of adverse patient events. Research has shown that self-reflection is imperative to decreasing stress and increasing self-awareness and competency. If we can teach this to students before they step onto the unit, they will be well-equipped to combat stress leading to burnout. For nurses already immersed in stress and approaching burnout, it is imperative that hospitals intervene with exercises and training that improve resiliency. Evidence-based research highlights that some of the most influential exercises include mindfulness, meditation, writing exercises, and conflict-resolution training. Learning sessions with this information will directly impact not only the lives of healthcare workers, but also the environment of the unit, patient safety, and patient satisfaction.

Influence of Vitamin D on the Immune System

Elizabeth Clark

Faculty Mentor: Mary Murphy

Recording: https://Fairfield.zoom.us/rec/share/De2cJb-3fPEYjCeAfGNu8WDUCcXua2sFqSA1aWDt9UcoMmO-ep_pOcX0a13sO2gr.VsOMrDLk286NiJlb?startTime=1649340061000

Abstract

This project reviews the recent literature and provides a report on the impact of Vitamin D as a supplement to support the immune system during the COVID-19 pandemic. The association between Vitamin D deficiency and its impact on measures of disease severity are described. The literature highlights the extent of health status uncertainty due to the COVID-19 pandemic. Individuals sought to find ways to support the immune system and protect their health. The initial actions of wearing a face mask, social distancing, and later, vaccine recommendations, left individuals with chronic disease seeking additional layers of protection. The research question is: Is there evidence to suggest that supplementing with Vitamin D can benefit an individual during the COVID-19 pandemic?. Adequate levels of Vitamin D are associated with less severe patient outcomes. The literature reflects that a high proportion of hospitalized patients with COVID-19 had Vitamin D deficiency. Those requiring critical care admission for treatment of moderate to severe COVID-19 symptoms were also associated with Vitamin D deficiency. This project reviews the literature on the realistic challenges faced by the community during the COVID-19 pandemic. Low serum Vitamin D levels factor into negative outcomes for individuals with symptomatic COVID-19 infections. This project communicates a clear message on the beneficial impact of Vitamin D. Reviewing the literature on this relevant topic contributes to nurse knowledge, allows for patient education that is evidence-based, and improves outcomes.

Use of the ERAS Protocol to Prevent Surgical Site Infections

Hope Femia

Faculty Mentor: Katherine Saracino, Sarah Hirx

Recording: https://Fairfield.zoom.us/rec/share/s0GsSQB1IfTSTC9qvPLvoBbk_L7zyOQlAZqqZFaTfSHL-7u30pQ-JhiNOoS118c_.P7zx6ROnPgbUgWC7?startTime=1648833970000,https://Fairfield.zoom.us/rec/share/KLO0qiNVX21Ndte2nemNGWb7A37UWCGcATRPbcf9rW9LNJaQDLNXcRRcITj98q7z.MpNO8NMz-YnCTT4I?startTime=1648838708000

Abstract

Surgical site infections are unfortunately very common in the operating room setting due to lengthy exposure of the abdominal cavity to open air. Although all operating rooms practice sterile and aseptic techniques before, during, and after surgery, there is an obvious need for evidence-based intervention to decrease rates of infection and promote patient overall health and safety. This project examines how the ERAS protocol can be used to prevent surgical site infections, specifically through using silver-based dressings over wounds and allowing them to heal by primary intention, performing laparoscopic surgeries when possible, completing pre-op shower and skin prep, administering pre-op and post-op antibiotics for prophylaxis, ensuring the surgical team takes extra precautions with patients that have a higher BMI, and monitoring for elevated albumin levels during surgery. This will result in not only a decreased rate of surgical site infections in the abdominal cavity, but also a shorter recovery process for the patient and decreased costs for the healthcare facility.

Music Meets Medicine in the Operating Room

Megan Ferguson

Faculty Mentor: Majeda Basilio, Denise Morais

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649167276000

Abstract

McGivney Surgical Center provides same-day surgery, specializing in hip and knee replacements, and other outpatient surgery and treatment. In many operating rooms around the world, music has traditionally been present. Playing music offers multiple benefits not only to the healthcare workers, but to the patients as well. Many patients during the preoperative period of a surgery struggle with stress and anxiety. Any surgery situation is difficult for the patient because they have no direct influence on the course of surgery and it is out of their control. However, studies show that playing music in the operating room has a positive effect. Patients that listen to the music of their choice peri-operatively experience less stress, and more relaxing music can have a salutary effect on anxiety and pain before or during surgery. It is important to reduce stress and anxiety because it can impact every system in your human body causing negative effects. When we go into surgery, it is common to experience these two emotions, but poor outcomes can often occur if they are not managed. Music is an inexpensive resource that has the power to improve a patient's experience without adding to the already expensive cost of maintaining an operating room. It can also help surgeons experience less stress and increase their accuracy with performing the surgery. Although these two art forms are completely different, bringing them together can have a positive influence on patient outcomes.

Education of Pallative Care for Patients and Families

Hannah Filipe

Faculty Mentor: Erin Orozco

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649171483000

Abstract

At the end of a patient's life, when medically there is no curative treatment for the healthcare provider to give, patients may turn to palliative care. Palliative care prepares patients for end of life physically, emotionally, and spiritually. Palliative care often causes confusion within the patient and their families because of the lack of education and the preconceived notion of it meaning death. This can cause some distress in regards to the patient's end of life care. Recent studies show that proper education on what palliative care means not only improves the patient's end of life, but the families' experiences as well. Palliative care uses a team approach to look at the whole patient and find ways to ensure that the end of life is a more comfortable experience instead of being dominated by denial and fear. Conclusions of this study show that continuing treatment can even prolong survival in some cases. Palliative care is a highly recommended form of comfort for patients who are ill and have fatal diagnoses.

Importance of Nutrition and Documentation for Newborns

Cali Francis

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/s0GsSQB1IfTSTC9qvPLvoBbk_L7zyOQlAZqqZFaTfSHL-7u30pQ-JhiNOoS118c_.P7zx6ROnPgbUgWC7?startTime=1648830832000

Abstract

Keeping accurate records of all feedings for newborns is essential in the first few days of a baby's life. Systems that allow for missed information can concern staff and create gaps in understanding the neonates' nutritional journey. The current system on a maternity floor at a community hospital in Connecticut was that of using a white board to keep track of feedings. This process had flaws as it only allows room for two feedings. There is also a need to get a new mother to remember the last feeding and provide more detail as to how the feeding went. This project created a more efficient and effective system for charting of neonatal feedings for both the nurses and parents.

Importance of Preventing Intraoperative Hypothermia

Brooke Hernon

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649169646000

Abstract

Intraoperative Hypothermia refers to a patient's core body temperature dropping below 36.0 C during surgery. Factors that produce this are mostly attributed to the use of anesthetic drugs, along with operating room temperature, duration of surgery, and the use of fluids or blood products. Intraoperative hypothermia can cause bleeding, cardiac arrhythmias and ischemia, poor wound healing, surgical site infections, decreased drug metabolism, and other deleterious effects (Int. J. Environ. Res. Public Health 2021). Poor outcomes due to this cause increased stay time in the hospital for patients, pain, and costs. While observing and interacting in the pre-op, operating rooms, and PACU for transition, which took place in Jefferson Building Fourth Floor at Hartford Hospital, I observed a lack of emphasis on the prevention of Intraoperative Hypothermia. Prevention is key for these patients, and can be achieved by using active and passive warming techniques, such as bear huggers, properly adjusting operating room temperatures, warm blankets, etc. “The biggest barrier to preventing perioperative hypothermia is not having the best option that fits the patient” (AORN 2019). Proper preventative strategies were not utilized, regardless of being present and available. When warmers were used, they were applied very shortly before the surgery began, which decreases their effectiveness, as there is not enough time provided for the patient to be properly warmed. Evidence-based practice literature shows that prevention is possible for IH, and when used correctly, poor outcomes can be lessened and avoided for these patients. To better emphasize the importance of the prevention of intraoperative hypothermia, a handout was created to use as a checklist for preop, OR, and PACU staff to remind them of how to prevent this, and the tools available for use.

Implementing Fall Prevention Tools to Limit Falls in Postoperative Total Knee and Hip Arthroplasty Patients

Allison Krekoska

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/s0GsSQB1IfTSTC9qvPLvoBbk_L7zyOQlAZqqZFaTfSHL-7u30pQ-JhiNOoS118c_.P7zx6ROnPgbUgWC7?startTime=1648832278000

Abstract

This project researched the importance of fall risk education to postoperative patients following total knee or hip replacement surgery. This research indicated the need to provide patient education on why they are a fall risk and how to prevent falls through different methods. A teaching poster was created to explain why the patient is at a fall risk and to serve as a reminder to call for assistance before getting out of bed on their own. This poster is to be placed on a bed rail, close to the patient's line of vision. It is to be used as a tool for staff nurses to educate patients, as well as a tool for patients to serve as a reminder as to why they are at a greater risk for falls. This project emphasizes the importance of primary prevention in order to prevent harm or injury from a fall.

Music Therapy in Comatose Patients

Caroline Lanzillotta

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/51sI9z_0HDhR51wYmm-kbHwdK_vUKo0kdp966GnRpsRu_6QCiNMdhbohTB5WJLT6.HxNWi1GUAuTpu6Fh?startTime=1649088677000

Abstract

After caring for a comatose client whose family requested that music be played 24/7, I decided to look into the therapeutic effects of music on comatose patients. Some staff were unhappy with the noise that came from the room, and questioned whether or not it was necessary to keep the music playing while the patient was unresponsive. According to the research, music helps improve the Glasgow Coma Scale score in patients who are comatose, not necessarily waking them from the coma, but helping them become more reactive. To take this research further, I created an educational handout to be posted by the nurse's station informing the nursing staff about the effects of music on both comatose and awake patients. The learning need this serves is to explain to the staff how music can be stimulating and results in better patient outcomes when played in the patient's room.

Discharge Teaching to Prevent Readmission Related to Surgical Site Infections

Ana McDonough

Faculty Mentor: Rose Iannino-Renz

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271IStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649173876000

Abstract

When a patient is sent home without proper discharge teaching, the rate of readmission related to surgical site infection increases. This project focuses on the importance of discharge teaching to prevent readmission due to surgical site infections. This project specifically focuses on evidence-based teaching tools such as the Patient Education Materials Assessment Tool (PEMAT) to improve continuity in discharge teaching. The PACU at the Helmsley Ambulatory Surgical Center consists of a wide patient population undergoing a variety of surgical procedures. The evidence-based literature addresses the negative impacts ineffective discharge teaching can pose, which include: poor patient outcomes, readmission to the hospital, increased use of resources, and increased costs to the patient. The role of the Registered Nurse is to provide patients with the discharge materials that they need and present them in a way that is clear and understandable. Continuity in patient education by implementing an assessment tool such as the PEMAT empowers the nurse to provide discharge teaching that is clear and ultimately decreases post discharge surgical site infections.

Paternal Postpartum Depression

Bridget Morrissey

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/51sI9z_0HDhR51wYmm-kbHwdK_vUKo0kdp966GnRpsRu_6QCiNMdhbohTB5WJLT6.HxNWi1GUAuTpu6Fh?startTime=1649090819000

Abstract

Postpartum depression is a common occurrence recognized in mothers, but the mental health concerns of fathers and co-parents are understudied and underdiagnosed. In recent decades, paternal figures have begun playing a more active role in raising children. The healthcare system has not adapted to our current culture with increased paternal involvement. Addressing the mental health concerns exhibited in fathers can protect family safety. Screening for maternal postpartum depression is commonplace at American hospitals prior to discharge. This protects maternal health by allowing new mothers to consult with social workers and other services that ease the transition to motherhood. Creating a screening tool that targets the most common symptoms that men experience during depressive episodes will help recognize emotional and behavioral changes that can lead to postpartum depression. This early intervention screening sheet will guide nurses to direct fathers to resources that can best address their symptoms. In addition to the screening tool, a brochure was created as an educational device. The majority of postpartum depression manifests between three and six months after discharge (Scarff, 2019). Providing a written guide that contains definitions, symptoms, and resources is a way to continue supporting patient families throughout the first year of their newborn's life. Including the screening tool and brochure in medical practice will improve the safety of fathers and newborns as they adjust to the role of parenthood.

Beneficial Use of Music Therapy in Decreasing Anxiety Experienced During Cesarean Delivery

Katelyn Murphy

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/KLO0qiNVX21Ndte2nemNGWb7A37UWCGcATRPbcf9rW9LNJaQDLNXcRRclTj98q7z.MpNO8NMz-YnCTT4I?startTime=1648838134000

Abstract

Cesarean delivery is the most commonly performed surgical procedure worldwide, which may either be planned or conducted for medical reasons. Meanwhile, anxiety is an increasingly common psychological response experienced related to the stressors of the procedure. Anxiety not only impacts mothers psychologically, but also creates adverse health effects for both the mother and infant. It is part of the role of maternity nurses to assess and intervene when feelings of anxiety become apparent among their patients during the procedure. Evidence-based literature shows that utilizing music therapy can decrease anxiety in the operative room for women who deliver via Cesarean section. This project focuses on how the development of a tool for patients to easily access calming music can positively impact their experience in the operative room both physically and emotionally.

Education on Prevention of Foot Wounds in Diabetic Patients

Caroline Murray

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271IStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649168927000

Abstract

A leading issue very prevalent and devastating in healthcare is the noncompliance of patients to diabetes management, leading to profound health effects. Educating diabetic patients on the significance of managing blood sugar levels can reduce the risk of infection and amputation while improving quality of life and decreasing health care costs. Diabetic foot ulcers are a major threat to the health of millions in the United States and can cause severe discomfort, impairment, infection, and ultimately amputation. Without proper education and management, this condition can become life altering. In the United States, diabetic foot ulcers are the leading cause of non-traumatic foot amputations; however, it is preventable. Educating patients on controlling their type 2 diabetes is the first step. Patients must be educated on the cessation of smoking, managing stress, getting exercise, eating a healthy diet, and maintaining a healthy weight. In educating and getting ahead of the problem, we can provide better patient outcomes in the long run. For this project, I created a learning pamphlet that patients can take home to review, highlighting ways that people can manage their diabetes. A printout that clearly and concisely lists important management skills enables clients to reference the information in order to make a change. Education and early intervention is most important in diabetic patients to prevent diabetic foot ulcers and further debilitating health deteriorations.

Use of FaceTime to Mitigate Feelings of Loneliness and Isolation in the Elderly

Kelly Norman

Faculty Mentor: Katherine Saracino

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271IStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649172611000,Abstract

The COVID-19 pandemic targets those with compromised immune systems and elderly adults. A majority of the individuals in the elderly population have comorbidities or impaired immune systems which increases the stress and fear already associated with COVID-19. Being in the hospital can be a challenging and overwhelming experience to begin with, but before this pandemic, many patients relied on the compassion and support of family and friends to get through their struggle. The pandemic took away this outlet and people were left to isolate and deal with this experience alone. Evidence-based literature examines just how much the eldery in particular were effected by this disease as a high-risk population, many of whom passed away alone and afraid. Technology has been used to facilitate communication long before this pandemic, however the pandemic emphasized the importance of face-to-face communication when you cannot actually be face-to-face. As many patients deal with feelings of loneliness and stress during isolation, FaceTime allows them to speak and see their family and friends, which would help ease their fears and anxieties. While some may not have access to FaceTime on their own mobile phones, it would be helpful if iPads or iPhones could be set up to allow patients with COVID-19 to speak to those outside the hospital, as for some it may be the last time. This could be implemented the same way that many hospitals utilize iPads as translators; we could download the FaceTime app and use the contact numbers typically received upon admission.

Improving Patient Handoff Between Procedural and Floor RNs

Cynthia Patsos

Faculty Mentor: Michele Lecardo, Rebecca Mularick

Recording: https://Fairfield.zoom.us/rec/share/s0GsSQB1IfTSTC9qvPLvoBbk_L7zyOQlAZqqZFaTfSHL-7u30pQ-JhiNOoS118c_.P7zx6ROnPgbUgWC7?startTime=1648833021000

Abstract

Patient handoff plays a significant role in a nurse's change of shift and transfer of care. As a healthcare provider taking on the role of caring for a new patient, it is important for nurses to be informed of their patient's current status in order to provide high-quality care. Effective communication is not only important, but necessary to better patient outcomes and to properly care for one's patient. This research was geared to aid the nursing staff, specifically new graduates, in providing more effective communication and education during handoff. A uniform method of handoff is needed to ensure that the transfer of care is appropriate, up-to-date, and effective. Countless medical errors and unintentional injuries arise due to the receipt of incorrect verbal or written information. Through the creation of a standardized procedural checklist, nurses can work to increase patient safety during and after handoff, while also educating floor nurses on Vascular Interventional Radiology operations, procedural needs, and expectations of returning patients. This checklist, which can be uploaded to the hospital's electronic medical record, can allow members of the patient's healthcare team to remain informed of updates, procedural status, and necessary interventions.

Educating Nurses on the Prevalence of Blood Transfusion Reactions in Chemotherapy Patients

Cara Pieretti

Faculty Mentor: Rose Iannino-Renz

Recording: https://Fairfield.zoom.us/rec/share/KLO0qiNVX21Ndte2nemNGWb7A37UWCGcATRPbcf9rW9LNJaQDLNXcRRclTj98q7z.MpNO8NMz-YnCTT4I?startTime=1648838926000

Abstract

Smilow Outpatient Infusion Center at Greenwich Hospital cares for many patients with a vast number of different cancer diagnoses. Throughout treatment, patients may be treated with various chemotherapy drugs and given many blood products based on the type of cancer diagnosis. For chemotherapy patients, blood transfusions are often given a number of times throughout the course of treatment and can be very scary since transfusion reactions are extremely common. When a patient is given a blood transfusion, nurses at this facility give a brief description of what may happen if there were to be a transfusion reaction. However, the nurses at this facility feel that there should be a learning tool in place to remind the staff of the prevalence of such transfusion reactions. With this tool, the staff and I believe that fewer transfusions will occur because the staff will be more likely to increase the amount of education given to patients and they will then better understand what may occur. With this tool in place, it will empower and remind nurses to provide more information to patients regarding blood transfusions, and, as a result, if any reaction is to occur, patients will promptly notify the nurses and other staff members.

Stress Reducing Techniques for Staff Nurses

Kerry Root

Faculty Mentor: Genevieve DaFonte

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649173313000

Abstract

Evidence-based research shows that one in every five new nurses leave their job within one year due to secondary job stressors that they experience in the workplace (Calisi, 2017). With hospitals facing significant influxes of patients as COVID-19 surges continue, bedside nurses have been placed under tremendous pressure and stress. Nursing burnout, a phenomenon that occurs when an individual is unable to cope with workplace stressors, has increased drastically since the start of the COVID pandemic. Nurses are leaving the profession entirely as a result. With increased turnover rates come staffing shortages, longer hours, and heavier workloads. Increased nurse stress also directly impacts the quality of patient care and incidence of adverse events. Action must be taken to educate and promote mental and physical wellness for floor nurses to subsequently improve patient care outcomes and the overall wellbeing of staff. However, nurses are busy and seldom have time to implement restorative and stress-reducing techniques. This project resulted in creating an infographic to be distributed to Bridgeport hospital floor nurses that gives various simple stress-reducing techniques to implement into a hectic workday. Methods include mindfulness and meditation apps, aromatherapy, breathing, and stretching exercises. Each intervention takes no more than ten minutes to complete, and when they are completed each shift, they reduce stress and anxiety for nurses. Devoting even small periods of time to relaxation can lead to considerable reductions in anxiety and stress for staff nurses.

Effectiveness of Sleep Hygiene and Positive Patient Outcomes

Caitlin Wood

Faculty Mentor: Erin Orozco

Recording: https://Fairfield.zoom.us/rec/share/s0GsSQB1IfTSTC9qvPLvoBbk_L7zyOQlAZqqZFaTfSHL-7u30pQ-JhiNOoS118c_.P7zx6ROnPgbUgWC7?startTime=1648831601000

Abstract

This project summarizes the literature on optimizing recuperative rest when hospitalized. The association between quality sleep and its impact on patient outcomes is described. Continuing the pursuit as a high-reliability organization at VA Connecticut, investigation is made to determine if implementing sleep hygiene practices supports Veteran perceptions of a culture of safety and patient care outcomes. Background on the complexity of sleep problems is described. Comparison is made between what was learned from the sleep hygiene literature to current system actions to support restorative sleep. An evidence-based approach to conducting a sleep hygiene intervention is described. A standardized approach to documentation of sleep hygiene is described. Results from the literature are shared. This project involves realistic challenges faced by novice nurses when entering the nursing career. Implementing use of a sleep hygiene program may increase staff nurse perceptions that promote a culture of safety, update nurse knowledge, and improve patient care outcomes.

Importance of Early Recognition of Stroke Symptoms

Rebecca Patti

Faculty Mentor: Erin Orozco

Recording: https://Fairfield.zoom.us/rec/share/u8O2QWZEmOIFgMXQE_fpY0qJ5pcDSKgfz1GQEu77yIs5eZyl5v271lStSjRwWUCY.PnqMpBbvIgS2cFem?startTime=1649170888000

Abstract

In the medical emergency room at the Veterans Affair Memorial Hospital, it is possible for patients to come through the doors by ambulance or by their own merit presenting with signs and symptoms of a stroke. If not treated, it can lead to paralysis, difficulty swallowing and talking, balance problems, memory loss, changes in behavior, fatigue, and emotional changes that can greatly impact the patients' quality of life. By effectively recognizing signs and symptoms of a stroke early, and transporting patients down to CT scan as fast as possible, the patient receives treatments that can greatly reduce the complications from a stroke. It is important to be able to recognize the onset of stroke symptoms because many of these treatments have time restraints on them. This research focuses on the education of signs and symptoms of strokes and the different treatment options for acute ischemic strokes pending which timeframe they may be in and contraindications they may have. After speaking with my preceptor and nurses on the unit, I concluded that there is a need for providing an infographic with this information on it. Evidence-based research was collected to be presented to nurses in the emergency department and emergency medical services so they can have a better understanding of stroke symptoms to be able to recognize them as quickly as possible. An infographic was developed to pass out to the medical emergency room and emergency medical services that drop patients off, which includes the signs and symptoms of strokes and the different treatment options for acute ischemic strokes.

Complementary and Alternative Medicine for Oncology Patients

Hannah Adams

Faculty Mentor: Michelle Saglimbene

Booth: 2, Oak Room (PM)

Abstract

Complementary and alternative medicine (CAM) therapies are methods used to reduce and manage the symptoms of cancer and effects of traditional cancer treatment. The therapies aid in reducing anxiety, nausea, pain, fatigue, and stress, effects of cancer, and the pharmacological treatments. These therapies help to boost mood, improve quality of life, and promote emotional well-being. Helpful CAM therapies include yoga, meditation, reiki, music, and art therapies. Since the therapies are new and being integrated into healthcare, patients need to be educated on the options as an addition to their treatment. While being a part of the 6th floor oncology unit at Stamford Hospital, I worked with patients fighting cancer and struggling through the effects of their diagnoses and treatments. Integrating CAM therapies would be helpful to improve the overall well-being of these patients. The literature included in this project looks at the effectiveness of CAM therapies for oncological patients. An infographic was created for the oncological healthcare workers to use as a guide and gentle reminder regarding CAM therapies.

Decreasing Feelings of Isolation in Elderly Patients During Covid-19

Sofia Aguiar

Faculty Mentor: Mary Murphy

Booth: 3, Oak Room (PM)

Abstract

This project focuses on reviewing the recent literature on identified social isolation among older adults throughout the COVID-19 pandemic. Over the past two years, the community has experienced the largest pandemic in over one hundered years. This virus has generated a public health crisis that has led to many challenges for those with a compromised immune system. The first remedy to limit transmission of the virus was to maintain social distance and wear a face mask whenever in public. Evidence-based research addresses the important role that nurses play in an older adult's care by assessing for early signs of mental or behavioral changes as well as communicating and collaborating with the patient in order to reduce feelings of isolation (Berg-Weger & Morley, 2020). I answer the question: Does social isolation during a pandemic have a negative impact for older adults? I learned that the older adult population is the most vulnerable and at risk group for negative impacts of social isolation due to COVID-19. I discovered that social isolation was associated with an approximately 50% increased risk of developing dementia, a 29% increased risk of incident coronary heart disease, and a 32% increased risk of stroke (Wu, 2020). Visitor restrictions, prolonged isolation, and social distancing from friends and family significantly effected the older population over the past two years. Each client has been effected by COVID-19 differently and healthcare workers provide evidence-based care tailored to each client's specific needs. Nurses have an ongoing responsibility to screen for social isolation and other home-based challenges when providing care to a hospitalized patient. When home-based challenges are identified, the nurse should facilitate and encourage meaningful conversations in order to identify feelings of isolation and loneliness. Peer support groups via social media, zoom, or text messaging can enhance the effects of evidence-based professional support. Providing technology-based interventions can facilitate social connection for the older population. A form was created to gain a better understanding of the patients' needs and feelings during their time in the hospital.

Benefits of Music Therapy in Neonatal Intensive Care Units,

Olivia Alessandro

Faculty Mentor: Daphney Anicette

Booth: 4, Oak Room (PM)

Abstract

Being admitted to the Neonatal Intensive Care Unit (NICU) can be an overwhelming way to begin an infant's life. The physical stress of the intensive care unit and the environment can negatively affect the premature infant's growth and development. Studies have qualitatively concluded that mothers and fathers experience increased anxiety and depression when their infant is in the NICU (Ettenberger & Ardila, 2018). To combat these physical and emotional consequences, the evidence-based literature in this project provides the benefits of using music therapy for infants and parents. For improved outcomes, it is essential to educate parents and NICU nurses on the ways this can be implemented and what resources are available to provide music therapy. Based on my experience in the Greenwich Hospital NICU and research on music therapy, I have created a brochure for parents and NICU nurses to have as a reference to initiate music therapy with infants.

Importance of Bedside Report in Nursing Patient Handoff

Caroline Antell

Faculty Mentor: Mary Murphy

Booth: 5, Oak Room (PM)

Abstract

Medical error is a national concern that leads to an average of fifty-thousand deaths per year in the United States. About eighty-percent of serious medical errors occur during provider handoffs. This project focuses on the importance of bedside reports in nursing patient handoffs. Nursing shift reports often occur outside of the client's room, in a secluded setting away from the patient. The evidence-based literature included in this project concludes that conducting handoffs without the patient present increases inconsistencies in communication and care. Research shows that bedside reports increase patient satisfaction, patient-nurse relationships, and completion of documentation. Common conclusions in these studies include that the bedside shift report is associated with a decrease in medical errors, patient falls, and report length. Discussing patient care with the client present at change-of-shift also promotes nursing accountability and work effectiveness. Both the Joint Commission and the World Health Organization suggest transitions to nursing bedside shift reports within hospital settings. Major barriers associated with implementing a bedside report include nursing staff resistance to change, possible confidentiality concerns, and nurses becoming distracted with patient care during the report.

Utilizing the Teach-Back Method During Discharge Teaching in the Emergency Department

Mackenzie Boyle

Faculty Mentor: Michele Lecardo

Booth: 6, Oak Room (PM)

Abstract

Patients often have great confusion surrounding discharge instructions. Studies show that patients only recall half of the medical instructions provided to them. Almost half of what patients can recall is incorrect. In the emergency department (ED), patients have especially poor comprehension of discharge information (Hodges et al., 2021). In the Stamford Hospital ED, patients were returning shortly after discharge because they were unsure of what to do regarding their health. A learning need was identified to improve the quality of discharge teaching among nurses in the ED. The teach-back method is a proven and effective learning strategy that can be utilized during discharge teaching. Patients are asked to verbalize in their own words what they have just learned. Nurses can assess for patient comprehension and decrease misunderstandings before patients leave the ED. The teach-back method is associated with increased recall of information, increased understanding of teaching, and reduced hospital readmissions (Anderson et al., 2020). A reference card describing the teach-back method and its steps was created for nurses in the Stamford Hospital ED to attach to their badge reels. The goal of the reference card was to provide nurses with a quick tool to reference before giving discharge instructions to patients. When nurses regularly use the teach-back method, they can increase patient understanding and help decrease ED readmissions.

Ambulation Documentation and Informational Tool for Post-Operative Patients

Mikaela Annette Bravo

Faculty Mentor: Kathleen Jaramillo

Booth: 7, Oak Room (PM)

Abstract

Stamford Hospital's 10th floor admits surgical or orthopedic patients. Physical therapists frequent the floor and provide vital information regarding the patients' ambulatory ability. Despite providers emphasizing the importance of ambulation, there are only a few patients who regularly ambulate. Ambulation should be a part of the patients' health to assess frequently, similar to vitals. Without an accessible place to document or quantify the ambulation, it can be difficult for nurses to remember to promote ambulation. This tool educates and empowers the patients and nursing staff on Stamford's 10th floor. Nurses benefit from an easily visible place of documentation, and a reminder to maintain updated information and reinforce education. Patients benefit by understanding the positive outcomes of frequent ambulation. The nurse-driven support and education should increase the patient's self-motivation, ambulating longer or more frequently, improving their outcomes.

Parental Education on Fever Management to Help Decrease Revisits to the ED in the Pediatric Population

Tahlia Brown

Faculty Mentor: Jessica Marraffa

Booth: 8, Oak Room (PM)

Recording: https://fairfield.zoom.us/rec/share/gMxfrjmcEzXXf9vYkjZxdVOnuOk8vNgGo8Ny1CtrOoJ9GCviUxC8lK5Q-l3lKhKZ.BjcCRz_0BNgcJda2?startTime=1649857640000

Abstract

Going to the emergency department can be a stressful event for parents with children experiencing a fever. A fever is defined as a temperature greater than 100.4 degrees Fahrenheit and is associated with infection. During my time in the emergency department, it came to my attention that parents were unaware of the correct dosage recommended for their child and when to show concern about the temperature reading. My objective is to educate parents of the pediatric population and to develop confidence in managing their child's fever. The tool that I created will educate parents on fever management in the home setting. It provides information explaining the definition of fever, signs and symptoms of fever, when to call the doctor or go to the emergency room, how to treat the child's fever, and how to take the child's temperature. Providing education on fever management will limit the number of emergency department revisits for young adolescents as it is vital for parents of the pediatric population to understand fever management.

Prevention Strategies for Sudden Infant Death Syndrome: A Look Into Safe Sleep in Newborns

Emma Bruton

Faculty Mentor: Katherine Saracino

Booth: 9, Oak Room (PM)

Abstract

This project focuses on the importance of education for safe sleep of a newborn and Sudden Infant Death Syndrome. During a hospital stay, specifically within the maternity unit, there is so much information listed on documents for the parents of newborns to retain before discharge. Sudden Infant Death Syndrome, also known as “SIDS,” is “defined as the sudden death of an infant less than one year of age without an immediately apparent cause” (Vilvens, 2019). In order to stress the importance of Sudden Infant Death Syndrome, nurse education and the teach back method is one of the better ways to educate parents on this specific topic. The research is intended for parents of newborns and nurses. The benefit of a diagram tool is increasing the knowledge and protection of safe sleep for newborns. Regardless of whether a person is a first or fourth-time parent, safe sleep education is necessary during each stay in the maternity unit. The education should not only take place before discharge because it does not properly stress how important safe sleep is during any occasion. Creating a diagram that shows correct and incorrect examples was a necessary tool to help provide a clear picture for parents.

Caring For Families Experiencing Stillbirth

Sarah Cassidy

Faculty Mentor: Patricia Lamb

Booth: 10, Oak Room (PM)

Abstract

Stillbirth is ten times more prevalent than sudden infant death syndrome, but it is talked about much less in society due to stigmatization. Nurses and healthcare providers may lack knowledge or act improperly when caring for a family experiencing stillbirth, leading to feelings of isolation and the creation of negative memories surrounding the event. Nurses have a large impact on how families remember the birth of their stillborn baby. By increasing the knowledge surrounding proper care of these families and by giving the families access to resources such as support groups and other programs, the families will have more positive outcomes. I created a pamphlet for families at discharge to connect them with support groups and programs, and to help them memorialize their baby. Through providing this information, the nurse will be more apt to provide quality, competent care.

Creating a Quality Care Environment of Teamwork and Communication in the ED

Gianna Catalano

Faculty Mentor: Amara Ferreira

Booth: 11, Oak Room (PM)

Track: Community Engagement

Abstract

This project focuses on the benefits of effective communication to improve patient safety and prevent nurse burnout. A mandatory training such as TeamSTEPPS can be implemented on all hospital floors to facilitate effective interprofessional communication among the healthcare team. With coronavirus present for almost three years now, the need for nurses has increased tremendously. The number of patients visiting the emergency department has risen, which can result in overcrowding. Communication and teamwork between all levels of healthcare members is essential to facilitate a safe and effective environment in the emergency department at Danbury Hospital.

Skin-to-Skin Contact: Cesarean Section

Elizabeth Chiulli

Faculty Mentor: Stephanie Welsh

Booth: 12, Oak Room (PM)

Abstract

This project educates nurses of the Women, Infants, and Children (WIC) unit at St. Mary's Hospital, and other health care workers, about the importance of skin-to-skin contact, why it should be used post C-section, barriers to implementation, and how staff may overcome these barriers to provide this intervention. This project will use an educational presentation to inform the unit and future nurses on how they may make changes to provide this next step of care for their patients. St. Mary's Hospital's Women, Infants, and Children (WIC) Unit is an LDRP floor that provides care for laboring persons, postpartum persons, and newborns. In addition to vaginal births, there are both scheduled and non-scheduled C-sections that take place in the unit's operating rooms. Through observation and interviews, it was confirmed that this specific unit does not incorporate skin-to-skin contact between the birthing person and newborn post C-section. However, the incorporation of skin-to-skin contact after delivery, whether vaginal or Cesarean, is proven to have various benefits for both newborn and birthing persons, including many physical and psychological benefits. Skin-to-skin contact is a regularly implemented practice throughout the normal vaginal delivery process, and is not only possible but recommended for births via C-section.

Importance of Nurse Education on Advocacy for Intersex Infants and Families

Claire Clark

Faculty Mentor: Patricia Lamb

Booth: 13, Oak Room (PM)

Track: Diversity and Inclusive Excellence

Abstract

For many years, the medical community failed to provide the proper resources and education about intersex people. In turn, this has led to an alarmingly high rate of medical/surgical treatments of infants born with various degrees of intersexuality, which is dangerous and often leads to poorer overall health outcomes. Nurses can play a large role in the care of intersex infants by ensuring that the family is fully informed about all treatment options. In order for nurses on maternity and pediatric units to be truly helpful to these families, they must first have a solid understanding of what it means to be intersex and what the potential treatment options include. Creating an educational in-service for nurses on maternity and pediatric units to learn about the importance of how they can serve as advocates for intersex children and their families will improve communication, ensure informed consent, and lead to better life-long physical and psychological outcomes in patients.

Educating ICU Nurses on Extracorporeal Membrane Oxygenation,

Genevieve Connelly

Faculty Mentor: Cynthia Bautista

Booth: 14, Oak Room (PM)

Abstract

The COVID-19 pandemic has created an influx of critically-ill patients on ECMO devices. The rate at which COVID patients are placed on ECMO is higher than the ECMO training ICU nurses are receiving. The limited number of ECMO certified RNs can cause staffing problems, as they may have to take on a higher patient load to compensate for their team's lack of education. This could lead to nursing burnout and risk for inadequate patient care. On the CTICU at Yale New Haven, the nursing staff was no stranger to such challenges, as many of the RNs were not ECMO certified. In an effort to review key measures in patient safety to ECMO certified RNs, and to facilitate the learning of newly trained nurses, a poster was created highlighting some of the most common ECMO complications. The infographic contains a mnemonic checklist for easy memorization, and can be utilized in individual patient rooms and on the general hospital floors. Evidence from peer-reviewed articles and educational research studies suggests that better patient outcomes are highly correlated to improved communication. This poster communicates ECMO safety to help ICU nurses provide the best care for their critically ill patients.

Holistic Care of Ostomy Patients

Abigail Crofts

Faculty Mentor: Patricia Lamb

Booth: 15, Oak Room (PM)

Abstract

This project explores a holistic care approach for gastrointestinal ostomy patients. The purpose is to address the diverse needs of this patient population beyond medical management of their stoma. It utilizes a multidisciplinary approach to promote comprehensive patient care with two teaching tools included. One tool is intended to help nursing staff identify priority nursing diagnoses pertinent to ostomy patients and lists interventions to help address these needs. The second tool is a resource for patients, as it provides important tips to guide patients through this difficult life transition and also connects them with resources that promote ostomy empowerment. The need for this project originates from the lack of resources available for ostomy patients in the hospital. These tools will help to implement patient-centered care into the hospital setting and also empower ostomy patients.

Importance of Post Op Prophylactic Measures in Preventing Venous Thromboembolisms (VTEs)

Mackenzie Cusack

Faculty Mentor: Amara Ferreira

Booth: 16, Oak Room (PM)

Abstract

Surgical patients during the post op period lack knowledge pertaining to the importance of prophylactic measures that nurses encourage them to use in order to prevent complications, specifically venous thromboembolisms. For the healing process to be smooth for patients following surgery, there is a need for them to better understand the importance of early ambulation, being compliant with wearing SCDs and not refusing lovenox injections. As these measures work to prevent unnecessary complications, the probability of a shorter hospital stay increases as well as a lesser incidence of hospital readmission if patients become compliant with these interventions. By producing infographics, one of which is an ambulation checklist, and the other being a flyer with importance of SCD compliance and FAQs regarding these devices, patients actively play a role in their recovery. Both infographics can be used at a time, or just one depending on individual patient needs.

Patient Perception and Misconception of Opioid Use for Pain Management

Audra Dachowski

Faculty Mentor: Kathleen Jaramillo

Booth: 17, Oak Room (PM)

Abstract

Many patients fear developing opioid addiction and subsequently refuse opioid pain medications, despite experiencing severe pain that could be better managed with opioids. Nurses frequently do not have enough knowledge specifically related to the patients concern of dependence with which they can respond and further educate the patient. In addition, many nurses are unaware of their own bias towards patients taking opioids and the implications that can have on their practice. In an effort to address this learning need, a pamphlet was created to provide nurses with a quick reference of information for some of the most common patient concerns with suggested responses. This pamphlet was designed to further educate nurses to enable them to be more conversational regarding the topics of opioids and dependence, and to better prepare them as both patient educators and advocates.

Empowering Patients Through Informed Pain Management

Natalie D'Onofrio

Faculty Mentor: Amara Ferreira

Booth: 18, Oak Room (PM)

Abstract

The ortho/trauma unit located in Danbury hospital consists of various cases related to elective/non-elective orthopedic surgeries, abdominal surgeries, and urology surgeries. All the patients admitted to the floor are on pain regimens in order to promote comfort and healing. Often the pain management schedule is unknown to the patient or confusing due to the medical jargon associated with it. Some of the confusing jargon can include, but is not limited to PRN, TID, PO, or IV. Another barrier to understanding pain schedules is not describing analgesics in layman's terms or appropriate terminology for the patient to understand. The last barrier observed on this unit was the lack of patient education regarding important side effects and dosing schedules. The intervention proposed in this project is writing pain medications and next scheduled dose time on the whiteboard each admission or with changes, then encouraging nurses to utilize appropriate terminology regarding administration and side effects. When utilizing this intervention, there was decreased patient anxiety and breakthrough pain. Despite there being evident positive effects for the patients, it was difficult to implement due to the extreme patient ratios on this unit.

Effects Of Aromatherapy in Reducing Pain and Anxiety for Labor Patients

Caitlin Dreher

Faculty Mentor: Katherine Saracino

Booth: 19, Oak Room (PM)

Abstract

Laboring patients are beginning to find alternative or complementary ways to reduce pain, discomfort, and anxiety during the early, active, and transition stages of labor. Many patients today start to form “birth plans,” in which they want to use different treatment modalities in order to get through the painful, yet rewarding experience of childbirth. Many complementary therapies available are safe and effective for both the laboring mother and the baby during pregnancy and as labor occurs. For example, the use of essential oils has been studied for their effectiveness in reducing discomfort for mothers in labor. According to evidence-based literature, there is a supported link between the use of aromatherapy and decreased pain and anxiety in labor patients. It is important for both labor patients and medical professionals to feel informed of options for pain and anxiety management. Many essential oils prove to be safe during pregnancy and therefore can be used during labor for their beneficial effects. For the education of the patient and medical professionals, a poster was created to explain the benefits of six different essential oils during labor and their forms of administration.

Nursing Patient Needs Checklist

Riley Eaton

Faculty Mentor: Majeda Basilio

Booth: 20, Oak Room (PM)

Abstract

Yale SP 6-4 trauma unit often faces patients frustrated that nurses do not attend to their needs, when in reality the nurses are rounding frequently. The disconnect is due to the fact that patients are often sleeping during rounds. Unless it is crucial, nurses refrain from waking patients to allow rest. The consequence is that patients feel forgotten and not cared for properly if they do not see their nurse as often as they would like. Evidence-based literature shows that tension between nurses and patients leads to worse outcomes on the patients' behalf and lawsuits. Nurses have high work volumes and there is a need for a system to show patients that nurses have checked on them to avoid this tension. My suggestion is a laminated sheet for patients to fill out and leave on their bedside tables for nurses to read. This sheet system contains columns which are food/drink needs, pain meds, a blanket/pillow, questions, wake me up, or other. If the patient needs something that is not an instant need, they can fill this sheet out. The nurse can then check the sheet when rounding, attend to that need, and erase it. Evidence-based research also indicates that patients' call bells are a frequent stressor that alter nurse and PCA care routines. With this checklist, patients' needs will be met more frequently and the use of call bells will be less frequent. This will improve satisfaction for nurses and patients, patients will feel better cared for, and nurses will avoid tension and experience fewer workflow interuptions due to call bells.

Emphasis of NIH Stroke Scale Use by Nurses on Neurology and Stroke Units

Priscilla Estevez

Faculty Mentor: Cara Tietjen

Booth: 21, Oak Room (PM)

Abstract

This project focuses on the need to emphasize the use of the NIH Stroke Scale among nurses working with stroke patients. The National Institutes of Health Stroke Scale (NIHSS) is an assessment tool used by healthcare providers, especially nurses during bedside rounding, to rapidly determine the severity of stroke in a patient. In a specific study when interventions, including staff education, emphasis on NIHSS assessment during interdisciplinary rounds, and use of pocket cards were implemented, NIHSS assessment increased from 12% to 69% (Richardson et al, 2006). At Norwalk Hospital's Orthopedic/ Neurology unit, 7W, nurses tended not to follow correct implementation of the NIHSS, which is supposed to be done every four hours with patients who have experienced a stroke or are being ruled for stroke. This is due to the fact that the tool is not easily accessible for nurses electronically, thus potentially leading to decreased use of the scale and increased harm to patients if not assessed properly. Patients being assessed for strokes would have pockets on their doors, like Covid patients, to remind their nurse to assess them correctly every time they go into the room and would contain a paper form of the tool and picture tests.

Benefits of Early Ambulation in Postoperative Patients

Kaylee Fantoli

Faculty Mentor: Rose Iannino-Renz, Daphney Anicette

Booth: 22, Oak Room (PM)

Abstract

The Greenwich Hospital Surgical Floor is made up of adult patients recovering from surgery. Patients have varying surgeries performed, affecting how they ambulate in a multitude of ways. Following surgery, many patients experience anxiety or pain with ambulating, resulting in many patients refusing to get up and move. The benefits of early ambulation following surgery are supported through countless studies and experiments. Early ambulation greatly improves postoperative recovery times and decreases the risk for side effects associated with limited movement, such as pneumonia, pressure injuries, and deep vein thrombosis. The physical and mental benefits associated with early ambulation make it a very important aspect in the immediate postoperative period. With increased risk for infection and other complications following surgery, it is important to implement early ambulation as soon as possible following the procedure. The goal of this project is to further inform the nursing staff of Greenwich Hospital's surgical floor on the importance of educating patients on the benefits of early ambulation. It is also important for nurses to understand the root cause of why so many patients refuse to ambulate such as anxiety and pain following procedures. With education and pain management, a patient's pain and anxiety can be greatly diminished, resulting in positive health outcomes.

Making Women Feel Welcomed at Veteran Hospitals

Rachel Florence

Faculty Mentor: Megan Collins

Booth: 23, Oak Room (PM)

Abstract

After attending several clinical rotations at the West Haven VA, I noticed that the hospital catered more towards the care of men than women. Bringing attention to this issue with staff members will have the greatest overall effect on the care provided to women, from inpatient stays to outpatient services. Providing an educational in-service for all healthcare workers at veteran hospitals is an effective way to discuss methods to better support women throughout their visits. Ensuring adequate availability of feminine products, providing resources targeted towards women, and accommodating the environment of the patient are all ways that staff members can enhance the experience of female veterans at veteran hospitals.

Improving Patient Hand Hygiene

Gwyneth Gaynor

Faculty Mentor: Evanica Rosselli

Booth: 24, Oak Room (PM)

Abstract

Healthcare-associated infections cause many complications, including longer hospital stays and increased costs, and they have the potential to be lethal. Handwashing is proven to decrease the spread of healthcare-associated infections. Usually the emphasis on handwashing has belonged to healthcare workers, but patient hand hygiene is finally being recognized to be just as important. A literature review determined the multidrug-resistant organisms present on the hands of patients and in their rooms, and how patient hand hygiene helps to prevent the spread of disease. My preceptor and the nurses on NP 12 at Smilow Cancer Hospital identified a need to improve patient hand hygiene. The improvement of patient hand hygiene is especially important for oncology patients who are immunocompromised. This project includes a poster to be displayed in patient bathrooms to remind patients to wash their hands, and to educate patients on the proper way to wash their hands.

Importance of Oral Care in the Critical Care Setting

Ryan Gillis

Faculty Mentor: Amara Ferreira

Booth: 25, Oak Room (PM)

Abstract

Danbury Hospital's 10E Stepdown Unit (PCU) consists of patients in the critical care setting with a variety of diagnoses that require continuous monitoring in a critical care setting. These patients are still extremely ill and many have been on ventilators, BiPAP, tracheostomy tubes, suction, and other life saving devices that both are invasive and non-invasive of the airway. Many of these patients are total care and rely on staff to complete their ADLs. Due to the critical state of the patients and lack of staff, many members of the team are extremely busy throughout the day and focused on the stability of their patients and, therefore, oral care is something that is overlooked. The importance of oral care has become a lower priority for the nursing staff during stressful times in the critical care setting. Additionally, the life saving airway devices in critical care settings cover the mouth and oral care is then easily forgotten. Oral care in the critical care setting is extremely important and when not performed, it can lead to pneumonia and infections. This can worsen patient conditions and require them to need more critical care. Educating the nursing staff on daily oral care several times can reduce the risk of these infections and provide the patients with an overall better well being in short and long term care.

COVID-19 Impact on the Pediatric Population's Mental Health in Low-Income Populations

Colette Hanrahan

Faculty Mentor: Katherine Saracino

Booth: 26, Oak Room (PM)

Abstract

During the COVID-19 pandemic, there was an increase in mental health issues in the pediatric population. Children who live in low-income populations were disproportionately impacted due to lack of resources and knowledge surrounding the topic. As a result of school closures and social distancing, many children lacked interaction between classmates and friends, which affected their mental health. Similarly, many children who were of low socioeconomic families relied on school for two meals a day, support for their mental health, and playgrounds for physical activity. Without these resources, their mental health and well-being suffered. “Between March and October 2020, the percentage of emergency department visits for children with mental health emergencies rose by 24% for children ages 5-11 and 31% for children ages 12-17"" (Ray, 2022). A brochure was created to help educate patients and families regarding how mental health is affected by COVID-19, to offer coping strategies for children negatively affected by the pandemic, and to provide resources covered by Husky insurance if needed. The goal of this project was to offer information and resources to patients and families in order to improve mental health outcomes of the pediatric population during the pandemic. The information is provided in a clear and concise way so families of all education levels are able to understand.

How Nurse Call Light Technology Helps Decrease Staff Response Time and Promote Patient Safety in the Acute Setting

John Healy

Faculty Mentor: Michelle Saglimbene

Booth: 27, Oak Room (PM)

Abstract

After experiencing several hospitals with different call light technologies, I noticed some hospitals lack current technology, which puts patients' safety at risk and creates stressful environments. Patient safety is one of the top nursing priorities. Several factors affect patient safety, some being response time to alarms, patient acuity, and nonreactive to noise. I explored the research that studies how call light technology improves patient safety and decreases staff response times.

Educating Registered Nurses on the Benefits of Utilizing Licensed Practical Nurses in the Hospital

Micaela Johnson

Faculty Mentor: Amara Ferreira

Booth: 28, Oak Room (PM)

Abstract

Amid the COVID-19 pandemic, the nursing community is burnt out and overwhelmed. Nurses are the backbone of the healthcare system, and without proper staffing, patients will have poorer outcomes. With nurse shortages and unsafe staffing levels country-wide, utilizing Licensed Practical Nurses can be beneficial to the acute care setting and patient safety. We now see hospitals struggling greatly with nurse shortages and beginning to re-introduce LPNs back into their hospitals. With this trend, education is needed for the staff of units now hiring LPNs. Many RNs are unfamiliar with their scope of practice. According to the state of Connecticut, LPN scope of practice is defined as “performing of selected tasks and sharing of responsibility under the direction of a registered nurse” (Kasprak, 2004). This definition may be too broad to understand an LPN's role. By educating RNs on the specifics of the LPN's scope of practice, units will find a way to help resolve their unsafe staffing problems.

Increasing Incentive Spirometer Compliance

Katherine Kelley

Faculty Mentor: Megan Collins

Booth: 29, Oak Room (PM)

Abstract

The incentive spirometer is a pulmonary exercise device widely utilized in the hospital for patients with varying diseases, diagnoses, and post-surgical states. This non-pharmacological intervention positively impacts the respiratory status of patients. At the West Haven VA Medical Center, Six East Medical Surgical unit, a wide variety of patients had access to an incentive spirometer, including patients recovering from surgery, Covid-19, and other health-related conditions. Through observation, many of the patients were not utilizing the device and there was no tool to track the use of the incentive spirometer. A literature review was conducted related to studies concerning education and tracking use of incentive spirometers, and two handouts were developed to increase patient compliance. This project's goal is to provide tools for patients to better utilize the incentive spirometer and provide information about these evidence-based tools to the nurses implementing them.

Implementing Sound Awareness Education in Neonatal Intensive Care Units

Maxine Kellum

Faculty Mentor: Katherine Saracino, Carole Pomarico

Booth: 30, Oak Room (PM)

Abstract

This project educates staff and caregivers on the sensitivity of premature and newborns to environmental stimuli. This response can have negative effects on the physical development and recovery of the infants. An infographic was created to give a snapshot of critical complications to the newborn of noise environments. Information is provided with clear steps for staff and caregivers to implement which will reduce noise levels. This written tool can be posted on unit walls and in patients' rooms for ease of accessibility. It is visually attractive and concisely summarizes material which may improve the frequency and use in practice. Nurse educators can educate staff on this essential information, and adjust the pamphlet to staff needs per hospital policy. Premature babies are a vulnerable population because they have had less time to develop in the womb. Hence, noise exposure in the NICU has posed acute and chronic adverse effects. Specifically, the final stages of hearing development occur in the last few weeks of pregnancy (Başaranoğlu et al., 2020). Premature babies on average spend the first month of their lives in a NICU, where they are constantly exposed to dramatic sounds. Distractions prohibit babies from completing their sleep cycles, and adequate sleep time is vital to healing (Başaranoğlu et al., 2020). A startle response to sudden noise can cause apnea, tachycardia, hypoxemia, and low oxygen saturation. Signs of discomfort in neonates include inconsolable crying, abnormally fast or slow heart rate, difficulty breathing, poor eating, and disturbed sleep. It is critical that nurses are aware of and monitor noise levels inside and outside of incubators and rooms when possible. Education of medical staff and caregivers on their individual behaviors and modifications of their physical environment can reduce excess sound in the environments of preterm infants. Easy steps to maintain a calm environment are often overlooked. Healthcare staff must be reeducated on changing their behaviors to promote a safer noise environment in the NICU. Effective actions include speaking softly with low tones, wearing soft shoes, closing access doors on incubators, promptly responding to alarms, and keeping personal phones on silent. While outside of patient rooms, employees should close doors to rooms, and hold conversations away from doorways. It is important to note that focusing on noise exposure cannot always be a priority; patient safety comes first. Although a calm environment is desired, this type of unit is one of critical needs where emergencies occur, which can be loud and chaotic at times. Increasing awareness of how environments can severely impact the recovery and wellbeing of infants can produce calmer, well-rested, and happier neonates. Healthcare workers in the NICU setting can reduce external noise stimuli to improve the overall health of neonates. Parents and caregivers can learn this behavior to continue in the home environment. Understanding how sound levels in hospital

settings have a direct impact on patient wellbeing and healing time can be carried over into any field of nursing. Although premature babies are a vulnerable population, they are not the only ones affected by loud noises. Sounds can make anyone uncomfortable or anxious, including older patient populations, families, caregivers, and staff. Any unit or population can benefit from decreased noise levels while in the hospital.

Use of Aromatherapy to Treat Postoperative Nausea and Vomiting

Grace Kelly

Faculty Mentor: Rose Iannino-Renz

Booth: 31, Oak Room (PM)

Abstract

Postoperative nausea and vomiting (PONV) is a very common adverse effect in surgical patients due to anesthesia, preoperative medications, and the surgical procedure itself. This puts patients at risk for dehydration, electrolyte imbalances, incision complications, and more. PONV can delay progress toward recovery, increase hospital costs, and prolong length of hospital stay. Aromatherapy is a therapeutic and holistic approach shown to decrease the severity of nausea and vomiting in patients. It uses plant-based essential oils that can be inhaled, absorbed orally and internally, and applied topically. This intervention is noninvasive, non-pharmacologic, and can be less expensive than antiemetics. A learning need was identified as the nursing staff had little knowledge of the use of aromatherapy to treat PONV. Through the application of a learning tool I created, nurses will be able to learn more about aromatherapy and its effectiveness to treat postoperative nausea and vomiting.

Multimodal Pain Management Approach Following Cesarean Section

Madeleine Kinney

Faculty Mentor: Daphney Anicette

Booth: 32, Oak Room (PM)

Abstract

Postoperative pain is a common occurrence following cesarean section delivery that can be debilitating in terms of not only recovery, but also in the mother's ability to care for her newborn. If postpartum patients are unaware of the various approaches effective in managing pain, or if registered maternity nurses do not have the available information to educate their patients, recovery will be especially difficult. Educating patients and nurses regarding multimodal pain management will make postpartum recuperation easier, as it will allow mothers to be more comfortable sleeping, ambulating, and learning newborn care. To address this learning need, a learning tool was developed for patient and nurse reference that outlines multiple pain management strategies. This tool demonstrates both pharmacological and non-pharmacological methods that could be used individually or in combination with each other.

Communication With Mechanically Ventilated Patients

Elizabeth LaBelle

Faculty Mentor: Daphney Anicette

Booth: 33, Oak Room (PM)

Abstract

This project research identifies the best ways for nurses and other healthcare professionals to communicate with mechanically ventilated patients. In the Intermediate Care Area floor of Greenwich Hospital, there is a large population of ventilated patients. In my preceptorship, I identified a need for teaching the nurses how to best communicate with these patients, after observing that many of the nurses were struggling to understand the patients and were not able to communicate with them. Teaching the nursing staff and other healthcare workers the importance of utilizing communication boards and other speech generating devices will help the patients to communicate with their health care providers and enable them to express what they need. It will also help the healthcare providers communicate with their ventilated patients in order to get all the information necessary to provide adequate care. Communication boards mitigate the problem of nurses guessing what their ventilated patients are trying to communicate to them. I researched how communication boards are helpful in the healthcare setting and the importance of adequate communication in healthcare, and I will teach the floor how to use the communication boards with their patients.

How Essential Oils Effect Patient Outcomes

Madison Landers

Faculty Mentor: Erin Orozco

Booth: 34, Oak Room (PM)

Abstract

This project studies the effects essential oils have on patient outcomes. Essential oils are a growing industry, highlighting the various benefits of plant based treatments. After conducting research on essential oils, the data showed how beneficial aromatherapy can be for patients on various hospital units. Many patients are open to the idea of non-traditional treatments, but are uneducated on where to begin. A teaching tool was created to hang in patient rooms, provide in discharge packets, and place in staff lounges in order to educate patients on how essential oils can be integrated into care. Using essential oils, as opposed to over the counter medications, can have lasting health benefits, such as preventing toxicity and hospital readmissions. Patients can experience relief from various symptoms such as nausea, anxiety, insomnia, and headaches by using oils. Patients can learn to manage their symptoms at home with these alternative remedies that they used during their hospital stays.

Effectiveness of Animal Assisted Therapy to Treat Anxiety in Oncology Patients

Allison Lawless

Faculty Mentor: Marian Villaflor

Booth: 35, Oak Room (PM)

Abstract

Therapy animals have long since been used as a method in treating anxiety and other disorders, including physical handicaps, hearing impairedness, and blindness. In the inpatient oncology setting, animal-assisted therapy can be incorporated into the patient's treatment regimen to help decrease feelings of isolation, anxiety, and fears related to their diagnosis. Animal-assisted therapy has been shown to improve quality of life for inpatient oncology patients. When patients interact with an animal, they usually elicit touch as a form of communication. Physical touch can be a very effective method in reducing stress, and specifically touching pets brings a great sense of calm and camaraderie.

Palliative Care: Care for Patients and Families

Alexa Lehan

Faculty Mentor: Amara Ferreira

Booth: 36, Oak Room (PM)

Abstract

Palliative care carries with it a negative connotation often attached to terms including terminal care or hospice care, and is associated with ideas of giving up hope or choosing death. There is a widespread need to debunk palliative care's misleading reputation and educate patients and families on its positive effects on the mind, body, and soul. Palliative care improves quality of life at any stage of illness by managing physical symptoms, prioritizing patient goals, and supporting family through both caregiving and bereavement. However, medical jargon and misunderstandings pose a barrier to effective verbal communication regarding palliative care in the healthcare setting. In addition to verbal communication, pamphlets should be used to offer relevant and easy-to-read written material that patients and families can explore and process on their own and refer back to as reliable sources.

Understanding and Communicating Pain through Flashcards

Haley Liddy

Faculty Mentor: Kathleen Piqueira

Booth: 37, Oak Room (PM)

Abstract

Many post-operative patients of the HSS orthopedic PACU and inpatient unit at Stamford Hospital needed further information on self reporting pain scales in order to effectively communicate with their nurses regarding pain control. A vast majority of patients struggled to accurately quantify the pain that they were feeling on the self reported 0-10 scale. This is significant to care because inability to express pain to nurses causes frustration among patients, barriers to communication between the patient and nurse, over and under medicating of patients, and ineffective pain management, all of which create a negative experience. Unmanaged pain extends further to delay post op rehabilitation and lengthens patient admissions. To address this learning need, I created a set of comprehensive pain flashcards as a patient education tool to facilitate more effective communication and pain management post op. This learning tool consists of a set of eleven cards (0-10) on a ring that include the quantified number in addition to visuals, colors, descriptors, etc., to create a comprehensive understanding of what each pain level represents. The pain cards are visually appealing, simplistic, and have the potential to be beneficial to all patients, not just the orthopedic post op patients of HSS. By giving each patient a set of pain flashcards upon admission, all patients have a tangible tool to flip through and demonstrate to the nurse exactly how they are feeling in that moment. Some potential benefits that this tool provides related to patient care include patient education related to pain, enhanced pain management by administering the proper medication dosage, and increased general patient satisfaction.

Creating an Email Template for Patient Use to Increase Blood Donations During the Nationwide Blood Crisis

Kathryn Lundquist

Faculty Mentor: Stephanie Welsh

Booth: 38, Oak Room (PM)

Abstract

Since the beginning of the Covid-19 Pandemic, blood donations have significantly decreased. During Winter 2021, the American Red Cross declared the first National Blood Shortage. Many patient populations require blood transfusions and due to the decrease in blood supply many patients were unable to receive these much-needed transfusions. Some of these patient populations were those receiving chemotherapy and organ transplants, and individuals who went through a severe trauma and lost large amounts of blood. Without enough blood to allow these patients to have their infusions, many patient populations are struggling. At Mass General in the Cancer Center, I witnessed patients being denied their full blood transfusions, resulting in them having to split their blood transfusions over numerous days. Their blood counts were previously extremely low resulting in them being short of breath and fatigued. Without the full blood transfusions, they had no way to increase their blood counts and feel better overall. Through observation-based research, I found that blood transfusions are vital to many patients' care. Throughout Covid-19 both volunteers for staffing of blood donation centers and individuals donating blood have decreased. To incentivize individuals, I created an email template for patients who need blood transfusions to send to their friends and family. The template begins by educating the reader on the blood shortage. That paragraph is then followed by a patient's personalized antidote on why blood transfusions are important to their plan of care. Lastly, there is information on the guidelines for donating blood along with a link to bring the prospective blood doner to a Red Cross website. Blood donations are a vital aspect of patient care and can determine whether an individual lives.

Don’t Eat Our Young: How the Nursing Floor Can Support New Graduate RNs

Jillian Lyons

Faculty Mentor: Cara Tietjen

Booth: 39, Oak Room (PM)

Abstract

The transition from nursing school to professional practice is no simple task for new graduate RN’s. There is a steep learning curve that they must overcome to feel satisfaction in their personal practice. One strategy to help alleviate the challenging shift for the new graduate is to facilitate a positive learning environment that promotes the success of the new RN. To determine how the nursing floor can best support a new graduate RN, a literature review was conducted using quantitative and qualitative research sources. Based on these findings, a handout was created for the nurses on the floor providing tips on how staff could facilitate a positive experience for new hires. Findings concluded that increased autonomy of the RN, preceptor training, and integrating new staff into quality improvement studies were all ways in which the floor could support new graduate RN’s. Support of the new graduate as he or she adjusts into the floor from experienced staff is an excellent strategy to promote their success.

Improving Quality of Life in Patients with Cancer Through Non-Pharmacological Interventions

Colette Macuch

Faculty Mentor: Mary Murphy

Booth: 40, Oak Room (PM)

Abstract

This project summarizes the literature on ways to improve the quality of life of patients with cancer using non-pharmacological interventions. The association between cancer treatment and its impact on quality of life will be described. Investigation determines non-pharmacological interventions that improve quality of life of Veteran patients at the VA Connecticut Health System. Comparison is made between information learned from a particular Veteran patient to information gathered from a literature review. It is concluded that patients with cancer report an improvement in quality of life when participating in non-pharmacological therapies. These therapies include exercise, relaxation activities, dance motion therapy, mindfulness-based art therapy, yoga, and mentorship programs. A flyer was created to provide resources for health care professionals and patients about different interventions that minimize the side effects of cancer treatment, while improving quality of life.

Intimate Partner Violence Screening Tool

Madison McDowell

Faculty Mentor: Daphney Anicette

Booth: 41, Oak Room (PM)

Abstract

In my six weeks at Greenwich Hospital in the labor and delivery unit, it was determined that the screening tool administered to pregnant patients upon admission for past or current intimate partner violence is flawed. The current assessment tool has the nurse ask a few simple yes or no questions to the woman patient directly after meeting them. The personal, and often uncomfortable, questions are either asked with the partner in the room or neglected altogether if the partner refuses to leave the room. According to the World Health Organization, one in three women will experience intimate partner violence in their life. During pregnancy, this can lead to many complications for the mother and the baby. In order to improve the assessment protocol, I recommend an electronic tool accessed through a QR code. This screening tool will be more appropriate and help ease the difficulty of the assessment for both the nurse and the female patient. With this format, women have the choice to answer through their personal device in private. Depending on their responses, the female patients will be given resources and counseling in hopes of preventing and saving them from intimate partner violence.

The Need for Increased PPE Adherence of Visitors in Inpatient Settings

Elizabeth McLean

Faculty Mentor: Erin Orozco

Booth: 42, Oak Room (PM)

Abstract

Infectious diseases have been a challenge faced by healthcare facilities as they call for extra precautions during patient interactions. Infectious diseases such as Methicillin-resistant Staphylococcus aureus (MRSA), Clostridium difficile (C. diff), and for the past two years COVID-19, have been prevalent diseases in inpatient settings warranting isolation precautions. While healthcare professionals are consistently educated on the necessary need and use of PPE, hospital visitors are not. With COVID numbers rising and falling, visitor policies continuously change; however, outside of the pandemic, most facilities allow patient visitation. Research on visitor PPE adherence within different inpatient facilities produced similar findings, noting that few hospital visitors were compliant with proper PPE use. Through my clinical and work experience, I observed a large number of visitors who are noncompliant with PPE guidelines. PPE adherence decreases the spread of infectious diseases, keeping patients, visitors, and healthcare staff safe. In order to create change, I developed infographics, accessible through QR codes, that educate visitors on a variety of precautions. The evidence-based literature supports the use of infographics as a means of teaching healthcare related information (Martin et al., 2019). The QR codes created can be implemented into any unit that cares for isolation patients, and can become the first step to increasing PPE adherence in the visitor population.

Preventing Pressure Injuries During Surgical Procedures

Ali McPherson

Faculty Mentor: Amara Ferreira

Booth: 43, Oak Room (PM)

Abstract

Surgeons at Danbury Hospital operate on thousands of patients every year and, with each and every surgical patient, there is a need to protect their skin from pressure injury while they are in surgery. Pressure injuries frequently develop in the days following surgery due to the fact that parts of their body were not properly supported or aligned during the procedure. When the patient is not properly supported or aligned, blood flow can get cut off to various parts of their body, therefore increasing their chances of developing a pressure injury. Not only are pressure injuries costly to treat, they increase the length of the patient's hospital stay, putting them at risk for other hospital acquired issues. It is imperative that operating room nurses are aware of factors such as age, nutritional status, and comorbidities that put patients at a higher risk for developing this type of injury. It is also crucial that nurses are well-educated on the different positioning devices that can be used during surgery to help prevent these injuries. Upon suggestion from operating room nurses at Danbury Hospital, an informational tool was created to help nurses position patients correctly for their surgeries. This tool acts as a guide to help nurses determine what positioning devices should be used for each patient, depending on what kind of surgery they will have. The tool also points out areas prone to pressure injuries for each surgical position. The tool was placed on the operating room nurses' station for the nurses to use as a reference.

Postpartum Depression in NICU Mothers

Sierra Morowitz

Faculty Mentor: Marian Villaflor, Rose Iannino-Renz

Booth: 44, Oak Room (PM)

Abstract

Postpartum depression (PPD) is a maternal mental health condition that can occur during pregnancy or in the postpartum period. This project examines studies on the prevalence of PPD in mothers with babies in the neonatal intensive care unit (NICU), and the strategies that could be implemented by the NICU to better screen for PPD, educate mothers and their families about the signs of PPD, and offer resources to overcome this obstacle. Evidence-based research shows that creating a foundation of resources in the NICU for mothers such as screenings, referrals, and couplet care promotes mother-baby bonding during a traumatic time. The goal of PPD screening helps nurses to identify this condition, effectively treat it, and achieve positive outcomes for mothers and their babies. An infographic about those most at risk, signs to look for, questions to ask, and how to help has been created for nurses to ensure that they are not only caring for newborn patients, but also their mothers.

Preventing Ventilator Associated Pneumonia with a VAP Bundle Bookmark

Megan Nichols

Faculty Mentor: Kathleen Jaramillo

Booth: 45, Oak Room (PM)

Abstract

Ventilator Associated Pneumonia (VAP) is a prominent issue that negatively impacts patients at a high rate in intensive care units. It is one of the most common nosocomial infections in critical care units, has a high mortality rate, and requires a great deal of money to treat. VAP is also linked to additional days on the ventilator and in the intensive care unit, and an overall increased length of hospital stay. It is crucial that intensive care units implement interventions to prevent VAP. Although interventions such as head of bed elevation greater than thirty degrees, daily sedation break, daily assessment for extubation, peptic ulcer prophylaxis, deep vein thrombosis prophylaxis, etc., prove to decrease the rate of VAP, it is a difficult task to maintain compliance of these measures. This quality improvement initiative decreases the number of VAP cases in the Danbury Hospital Intensive Care Unit and improves patient safety and outcomes.

Maternal Birth Positions to Minimize Tearing and Promote High Quality Outcomes

Natalie Nickolaus

Faculty Mentor: Kathleen Jaramillo

Booth: 46, Oak Room (PM)

Abstract

When one comes to think of giving birth, most likely people will think of the typical position, in a hospital, laying on your back. This is actually not always the best option for birth as many women can experience perineal tears of varying degrees. A perineal tear can extend down into several layers of the fascia and cause many health concerns later on for the woman. Such concerns can include pain, tearing in later births, and difficulty with sexual intercourse. When discussing this issue with several other students, every single one stated that they witnessed women giving birth in the lithotomy position when in their maternity clinical. One patient I discussed this with had experienced perineal tearing with one of her previous children. Throughout my research and in public knowledge, I feel as though there is a great deficit of understanding about several other ways to give birth. The lithotomy position provides most benefits to the provider and assisting healthcare staff, not the patient. My information presents alternative birth positions that help to use both mechanics and gravity to facilitate birth and minimize physical trauma, which can include hands and knees position, sitting, or even assisted standing. As a result of the potential deficit in the healthcare system, I created a guide to alternative birth positions that a patient and healthcare provider can easily understand, with a short explanation of the reasons for each and the benefits. This way, nurses and physicians can be aware of the positions that can help the woman to feel comfortable and supported during the labor and birth process, with the members of the healthcare team understanding the core value of beneficence during practice, and not utilizing positions solely for the comfort and ease of the provider. This way, women can give birth safely and comfortably and minimize the chances of perineal tears and the side effects later in life.

Automatic Pediatric Palliative Consults Process and Importance

Erin Patten

Faculty Mentor: Erin Orozco

Booth: 47, Oak Room (PM)

Abstract

Palliative Care (PC) in the pediatric setting has been shown to improve patient and family satisfaction, quality of life, patient comfort, and communication between families and interdisciplinary healthcare teams. Still, the Pediatric Intensive Care Unit (PICU) exhibits a lack of palliative care team presence as a result of few referrals, oversight, and late care involvement. There is an intrinsic need for a standardized referral process for a palliative care team consult as provider perception shows a decrease in referral orders. Nurses, doctors, and several other healthcare professionals are educated on the benefits of PC in the PICU setting, yet referral and referral timeliness remain inconsistent. This project produced a checklist with several indicators that call for an automatic or “trigger” referral point. Providing a checklist to nurses and staff in the PICU that would produce automatic referral criteria eliminates the need for provider perception and increases order timeliness. This system would inform hospital administrators of the patients in need of further evaluation and assistance from the beginning of their admission or as critical events occur. Integrating this tool into rounds would serve to benefit the patient as an increase in palliative care team presence continues to show better patient outcomes.

Importance of Infant Positioning

Jillian Pernerewski

Faculty Mentor: Genevieve DaFonte

Booth: 48, Oak Room (PM)

Abstract

Since infants are unable to reposition themselves independently, it is essential for nursing staff to check in on infant patients and reposition them frequently. Proper positioning of infants can promote comfort, mobility, nutrition, thermoregulation, and intracranial pressure. Work, other children, family obligations, and the COVID-19 pandemic, among other things, often prevent parents from being able to stay with their baby throughout the day. When infant patients do not have the benefit of a family member by their side all day, it is crucial for pediatric nurses to promptly round on them. This project educates the nursing staff on the 6th floor of Connecticut Children's Medical Center about the importance of infant positioning. With the safety and comfort tool that I have referenced and modified, the nursing staff and families will have access to education about the benefits of infant positioning and the proper safety precautions necessary.

The Power of Physical Touch in Healing and Comfort Care

Gabrielle Persechino

Faculty Mentor: Donna Coletti

Booth: 49, Oak Room (PM)

Abstract

Incorporation of physical touch, such as holding a patient's hand or kissing them on the forehead, in healing and comfort care is essential to holistic and well-rounded nursing. It has been identified to benefit the patient and caregiver. The act of physically touching another initiates the production of oxytocin, dopamine, and serotonin, the "feel-good" hormones in the brain, which promote feelings of trust, comfort, and love. Conversely, the lack of physical touch can lead to increased feelings of loneliness and negative symptoms such as pain. There has been a notable lack of connection between health care professionals in hospitals, outpatient settings, and especially assisted living/hospice facilities since the rise of the Covid-19 pandemic. However, the staff members at The Fairfield County House in Stamford, Connecticut have exhibited the importance of physical touch and connection in the hospice setting, regardless of the limitations of social distancing. These individuals have made it their priority to holistically care for their patients and ensure that they feel loved and comfortable by integrating physical touch into each patient interaction. The benefit of touch has been successful with improving patient outcomes, and decreasing the rate of nurse and caregiver burnout.

Effect of Understaffing on the Emotional Health of the Oncology Patient

Aidan Phillips

Faculty Mentor: Daphney Anicette

Booth: 50, Oak Room (PM)

Abstract

Understaffing takes an extensive toll on the emotional health of the oncology patient. Patients with a cancer diagnosis are vulnerable and anxious about the unknown; oncology patients have extreme emotional needs that the average patient does not alway require. Therefore, it is essential to have adequate staffing of nurses so that there is a time during the nursing treatment plan to support the patients emotionally. Many nurses only have time to fulfill the basic care needs such as medication administration, and this leads to a neglect of the emotional needs of oncology patients. In this project, I note the oncology patients on the medical/oncology floor at Greenwich Hospital. Through extensive research, the study yielded the following: offering emotional support to oncology patients produced shorter patient stays, better patient outcomes, reduction in patient overload, strong communication within the patient-nurse relationship, patient adherence to the treatment plans, better overall emotional wellbeing of patients, higher instances of patient recovery, and a decrease in nurse burnout. Offering psychosocial care to oncology patients generates great positive benefits, but this support is only possible when staffing ratios are adequate.

Benefit of Donor Milk in Replacement of Formula in Hospital Settings

Julia Renz

Faculty Mentor: Stephanie Welsh, Katherine Saracino

Booth: 51, Oak Room (PM)

Abstract

Donor breast milk is an incredible tool that can be implemented for newborns delivered prematurely, have low birth weight, or a mother unable to exclusively breastfeed. It is utilized in hospitals all around the United States, primarily in the Neonatal Intensive Care Units. In Connecticut, donor milk is available in Connecticut Children's Medical Center, Hospital of Central Connecticut, Manchester Memorial Center, St. Francis Hospital and Medical Center, and Yale New Haven Medical Center. I created an educational program that would provide health care providers, including, but not limited to nurses and physicians, information on the benefits of utilizing donor breast milk on their units. This program presents information regarding the cost, pasteurization process, availability, and identification of candidates who could donate milk. The goal of this tool is to increase awareness on donor breast milk and its use in the hospital setting.

Addressing Mental Health Among Pregnant Persons

Hannah Rinko

Faculty Mentor: Katherine Saracino

Booth: 52, Oak Room (PM)

Abstract

Most labor and delivery floors consist of relatively healthy pregnant persons there for the delivery of their babies. The labor process for each person varies in severity and length. As a result of an increase in hormones, pregnant persons face different challenges throughout their labor journey. The Covid-19 pandemic has only amplified these obstacles, leaving new parents often feeling overwhelmed and out of control. Individuals with pre-existing mental health conditions, such as anxiety or depression, are at a higher risk for postpartum depression and other psychological strains. The physical manifestations of anxiety and depression lead to poorer maternal and fetal outcomes. The implementation of aromatherapy, exercise, phototherapy, and herbal remedies can be beneficial in reducing these symptoms. This project creates awareness around psychological disorders that face pregnant persons during pregnancy, as this is an area so rarely discussed. By researching the benefits of these therapies and educating patients prenatally with the handout I created, I encourage their use in L&D nursing practice and help improve mental health during pregnancy.

Improving Nursing Knowledge About Comprehensive Foot Checks

Catherine Roche

Faculty Mentor: Michelle Saglimbene

Booth: 53, Oak Room (PM)

Abstract

Foot care is a vital part of patient health and hygiene. Absence of quality foot care can lead to pain, reduced mobility, infection, and accidental injury. Many clients are at an increased risk of adverse outcomes related to foot health due to chronic diabetes, foot neuropathy, poor eyesight, reduced mobility/flexibility, arthritis, muscle weakness, etc. RNs are in a pivotal position to educate clients, provide comprehensive foot assessments and care, and improve overall patient outcomes due to foot health. This project studies the literature surrounding the benefits of providing exceptional foot care and produces a standardized process of completing a foot exam for qualifying clients. The outcome is a pocket-sized assessment cheat-sheet for RNs to follow in order to complete a comprehensive and consistent foot check. Such an assessment would be indicated for patients who qualify as meeting the criteria for being at risk for foot-related health issues. Benefits of implementing a comprehensive foot assessment include decreasing the likelihood of discrepancies in abnormal findings and providing a standardized documentation process.

What to Expect After a Stroke and Tips for Managing Care

Shealyn Rodorigo

Faculty Mentor: Majeda Basilio, Rose Iannino-Renz

Booth: 54, Oak Room (PM)

Abstract

This project educates caregivers and families of stroke survivors on what to expect after leaving the hospital. It goes over the common lasting effects of stroke, tips for managing care, information on caregiver burnout, and outside resources for these families. Properly educating stroke survivors' caregivers and families can lessen the frustration for all and result in a better outcome. From my capstone experience, I noticed that all educational material was aimed at patients, and I found that there was a great need for family education, as it is an adjustment for all parties.

Benefits of Lactation Consultants and Cost Mitigation Strategies

Emily Schillinger

Faculty Mentor: Stephanie Welsh

Booth: 55, Oak Room (PM)

Abstract

The Labor, Delivery, Recovery and Postpartum floor welcomes new life into the world and is where the breastfeeding journey physically begins. Breastfeeding rates across the country dropped due to modifiable factors that Lactation Consultants are educated to help alleviate. Lactation Consultants are certified professionals who concentrate on breastfeeding issues. They provide support and comfort to mothers by educating, listening, answering questions, giving advice, and helping rectify breastfeeding difficulties. Several benefits to breastfeeding include improved maternal mental and physical health, infant health, and increased breastfeeding rates. All of these combined lead to a great improvement in community health. The introduction of IBCLC's link to an increase in breastfeeding rates and maternal satisfaction. Several initiatives across the country have developed policies and grants to promote breastfeeding. This project provides knowledge and resources for hospital administrators to use in the process of integrating a Lactation Consultant into inpatient LDRP floors. Using a brochure, hospital administrators will have an easy-to-read resourceful tool. This project examines the cost and benefits of introducing breastfeeding support, and different strategies to help mitigate the costly endeavor.

Combatting Boredom During In-Patient Hospital Admissions

Audrey Sedensky

Faculty Mentor: Michele Lecardo

Booth: 56, Oak Room (PM)

Abstract

Many patients experience boredom and deconditioning during in-patient stays. After observation of Stamford Hospital's Intermediate Care Unit, it was evident that patients lacked variety in their days. Patients spent time watching TV, staring at their phones, and waiting for the next healthcare provider to arrive. Lack of meaningful activities and stimulation lead to boredom, depression, anxiety, and cognitive decline. Resources such as brain games, art, and journaling are associated with less cognitive decline in patients who utilize them versus those who do not. Scientific literature highlights that boredom increases readmission rates and delays discharge, especially in older adults. The Brain Boredom Book combats boredom by providing patients with cognitively stimulating activities including crosswords, sudoku, coloring, and reflection prompts. This packet, given upon admission, is an outlet for patients to keep their minds sharp while working on their physical recovery in the hospital.

Use of the NIHSS by Emergency Department Nurses

Emma Sidoti

Faculty Mentor: Genevieve DaFonte

Booth: 57,Oak Room (PM)

Abstract

The NIHSS is used to assess stroke severity and monitor the neurologic status of stroke patients. Nurses must use the NIHSS consistently to assess baseline neurologic status for stroke patients in the ED. At Primary Stroke Centers, clinicians must perform the NIHSS on every stroke patient at least once, and more often for patients receiving tPA. Normally these patients would be moved to the ICU where nurses are able to closely monitor them, but during the COVID-19 pandemic, ICU beds were scarce and these stroke patients remained in the ED. The NIHSS has since become more essential to ED nurse practice. Since the NIHSS is complex, those using it should complete a certification for how to score it properly. Most ED nurses have not completed this certification, so there is a learning need for ED nurses to perform the NIHSS accurately. This project includes some scoring rules and nursing pearls for performing the NIHSS that may be distributed to ED nurses to ensure accurate, consistent NIHSS scoring.

Preoperative Education with Incentive Spirometers to Prevent Postoperative Complications

Diana Smith

Faculty Mentor: Jessica Marraffa

Booth: 58, Oak Room (PM)

Abstract

Atelectasis—the partial or complete collapse of the alveoli of the lung—is a common respiratory complication in the postoperative population. Anyone can develop atelectasis; however, postoperative patients are at increased risk due to the body's response to anesthesia, incisional pain, and immobility. Signs and symptoms can be mild for some patients, while others may experience increased work of breathing, wheezing, and coughing. Atelectasis can be prevented by practicing deep breathing exercises using an incentive spirometer. Incentive spirometers (IS) are small and simple hand-held devices that mimic the body's natural deep breathing and yawning responses. This allows the lungs to expand at a volume greater than that of a normal breath, thus expanding lung capacity and improving gas exchange. While incentive spirometers are simple and effective when used properly, a learning need was identified for patients on my unit at Stamford Hospital. It was observed that a majority of people in the inpatient setting lack an understanding of the proper use and significance of the incentive spirometer. This project examines the effectiveness of preoperative teaching with incentive spirometers to prevent postoperative respiratory complications. An educational pamphlet was designed, using evidence-based research, to provide both written and visual instruction for patients to effectively use the incentive spirometer and practice deep-breathing exercises.

The Effect of Futile Care on Moral Distress Among ICU Nurses

Alexander Stanley

Faculty Mentor: Daphney Anicette

Booth: 59, Oak Room (PM)

Abstract

As medical technology advances, the ability to artificially prolong life also improves, especially in the ICU setting. Research has found that ICU nurses face ethical dilemmas and experience moral distress as a result of futile care. Futile care is any intervention provided that has therapeutic effects, but no benefits for the patient. Moral distress arises when one feels conflicted over actions that go against what they believe is right. Research shows that the moral distress ICU nurses experience due to providing futile care causes decreased caring behaviors towards patients, lower job satisfaction and quality of care, increased burnout, and physical and emotional suffering. Educating patients' families on unfruitful life-sustaining measures, and educating nurses to recognize signs of moral distress and situations that cause the provision of futile care, are effective in reducing the prevalence of both issues. To this end, a handout was created to help educate nurses on these topics.

Utilizing Acupuncture as Pain Management for Oncology Patients

Riannan Stapleton

Faculty Mentor: Marian Villaflor

Booth: 60, Oak Room (PM)

Abstract

This project examines how to integrate acupuncture into patient care for oncology patients in order to reduce symptoms of chemotherapy. Acupuncture is a form of integrative medicine that originated in ancient China in which pricking the skin with needles helps to diminish pain. Throughout my clinical rotation on an oncology floor, I found that patients often express how they are in pain or experiencing side effects from the chemotherapy that they are receiving. The nurses were constantly making rounds to administer medications to these patients with hopes of relieving the various ailments that they were experiencing. Once I acknowledged acupuncture as an option for pain management, I decided that it would be helpful to educate not only the patients, but the nurses. My project revolving around acupuncture aims to decrease the workload of the nurses by offering an alternative to pharmacologic interventions not widely discussed as an option.

Using Kronos to Reduce Breaches in Patient Confidentiality

Isabel Steneri

Faculty Mentor: Evanica Rosselli

Booth: 61, Oak Room (PM)

Abstract

Patient confidentiality is becoming an ever-growing problem across all modes of care. Similar to many other inpatient hospital floors, Yale New Haven Hospital's 12th floor Oncology Unit handles data containing patient sensitive information every day. The chaos at the end of every shift leaves medical professionals scrambling to get out the door at the end of each day, and as a result, patient materials are brought home. This simple mistake can lead to significant breaches in patient confidentiality: the risk of addresses being released, billing information being shared, and the exposure of Social Security Numbers. These leaks compromise patient safety, as well as cause distrust between the patient and provider. This project implements an idea so that when medical professionals swipe out at the end of the day, professionals are asked if they have disposed of patient materials appropriately. Ensuring that these materials have been disposed of properly will reduce the risk that personal information is leaked.

Importance of Proper Incentive Spirometer Usage in Post-Surgical Patients

Emily Stinton

Faculty Mentor: Amara Ferreira

Booth: 62, Oak Room (PM)

Abstract

This project focuses on the importance of proper incentive spirometer usage in the post-surgical population. After patients undergo surgery, they are given an incentive spirometer at the bedside to use throughout their recovery to promote deep breathing. Evidence-based research shows the importance of utilizing the incentive spirometer properly to prevent respiratory issues from developing in post-surgical patients. At Danbury Hospital on 8 Buck Pavilion, an ortho surgical/trauma floor, there was a need to help the patients use the incentive spirometer properly which led to the creation of a pamphlet. The pamphlet was designed to be given to each patient along with their incentive spirometer that provided them with directions on how to use their incentive spirometer and information about why to use it. By supplying patients with a handout, along with education at the bedside, about proper incentive spirometer use, patients will have better knowledge of how to then use their incentive spirometers during their recovery.

Effectiveness of Medical Honey to Treat Partial and Full Thickness Burns

Deja-Lee Tam

Faculty Mentor: Katherine Saracino

Booth: 63, Oak Room (PM)

Abstract

Treating burn patients is often a complicated and financially taxing process. Globally, over 180,000 people die from burns each year (World Health Organization, 2018). Honey is an ancient treatment for various ailments and medical problems, but it most commonly heals wounds such as burns (Almasaudi, 2021). Many patients' families are uninformed regarding the use of medical honey within the healing process when treating burns. Its antibacterial properties on burns cause the dehydration of the bacteria through creating a toxic environment in these wounds, decreasing the susceptibility to infection (Almasaudi, 2021). Research supporting this project referred to studies that discuss honey's antibacterial activity, the two types of severe burns, and drawbacks of each brand of medical honey. Understanding the benefits and disadvantages of medical honey on burns allowed the burn patients' families to consider its use in the plan of care and prevent further complications. This project further explores and educates patients' families on medical-surgical floors about the different medical honey brands and their efficacy in treating partial and full-thickness burns.

Therapeutic Play in the Pediatric Population: Improving Physiological and Psychological Hospital Outcomes

Michelle Tolochko

Faculty Mentor: Mary Murphy, Kathy Saracino

Booth: 64, Oak Room (PM)

Abstract

“Through play activities, insight can be gained about children’s stressful events, inner conflicts, and health status” (Liu, 2021). The importance of therapeutic play activities in acute healthcare settings is explored in numerous studies that exhibit an overarching theme of stress indicators, such as heart rate, verbal response, and uncomfortable body language, being reduced as a result of thoughtful and intentional play interventions, despite diagnosis. This project recognizes and communicates a positive correlation between developmentally appropriate therapeutic play and a decrease in hospital induced stress. This stress may manifest differently in varying pediatric age groups, thus the importance of altering the tangible play tool and intent. Younger children benefit more from a play/learn combination, while adolescents, who typically have stronger coping strategies and a better understanding of their diagnoses, benefit from distraction/entertainment play and other stereotypically calming toys. A tangible tool created to address therapeutic play benefits, simplified implementation strategy, and toy suggestions for each age group is intended to stimulate a response amongst pediatric healthcare staff, ultimately resulting in the implementation of play for better healthcare outcomes.

The Necessity of Oral Care Implementation in Hospital Settings

Michael Urbano

Faculty Mentor: Cara Tietjen, Rose Iannino-Renz

Booth: 65, Oak Room (PM)

Abstract

Good oral care practices are recommended twice a day in terms of brushing and flossing. In hospital settings, many floors neglect this type of care, and patients often develop serious complications such as aspiration, oral infections, hospital-acquired pneumonia (HAP), hypertension, and malnutrition due to lack of nutritional intake. Many hospitals across the country have limited interprofessional collaborations regarding oral care, in addition to limited research aimed at establishing evidence-based oral care practice in hospitals. On the 7th floor at Norwalk Hospital, an orthopedic and neurology unit, I noticed a lack of oral health care policy and systemic protocols put into place for oral care. Many hospital staff do not enforce the importance of brushing, using mouth swabs with antiseptic oral rinses, and the routine use of denture care in the patients on the floor. Since many of the patients on the floor have neurological deficits and suffered cerebrovascular accidents, they are not capable of remembering to practice oral hygiene, so these practices never get done in their time admitted on the unit. Addressing the hospital policies, I also noticed that in the Nuvance Health charting, there is not a specific section to document oral care, with the appropriate resources and tools given (toothbrush and toothpaste, oral rinsing, suctioning for secretions, etc.,) for patients. Therefore, I proposed the inclusion of oral care documentation in patient charting that would be visible under hygiene, so that nurses, technicians, and other medical staff can see this in the chart. This documentation would be in the form of a checklist tool to make it easier for nurses who are either not knowledgeable of or resistant to effecting these changes. In addition, an educational brochure will be given to medical staff and patients that details the importance of habitual oral care practice, and the complications that can result from not doing so. I hopethat by implementing these changes, not only will the rate of infections on the unit decrease, but an increase in the prevalence of oral care due to acquired knowledge will set a model example for other floors in the hospital, showing the different ways to overcome barriers related to poor oral care habits and dental diseases alike.

Importance of Medication Reconciliation for Surgical Patients

Amanda Wong

Faculty Mentor: Patricia Lamb

Booth: 66, Oak Room (PM)

Abstract

The Greenwich Hospital's Surgical floor cares for a multitude of patients recovering from, or preparing for, surgical operations. These patients often experience other health conditions or are treated with poly-pharmacy which makes their care more complex. Also, it is common for these surgical patients to experience multiple transitions of care from being admitted, transferred, and discharged from different facilities. Due to these complexities, there are more opportunities for miscommunication about these patients. Medication reconciliation is an important process, especially among surgical patients. When patients undergo surgery, their bodies are in a vulnerable state. These patients are more likely to suffer greater consequences from medication errors due to poor medication reconciliation since they undergo invasive procedures. This project educates patients about medication reconciliation to teach them how to communicate with their healthcare team to better advocate for themselves.

Benefits of Delayed Cord Clamping

Madison Woodruff

Faculty Mentor: Michele Lecardo

Booth: 67, Oak Room (PM)

Abstract

During labor, healthcare providers want everything to go smoothly to ensure a healthy baby; however, the birth process is unpredictable, and we can only control so much. Delayed cord clamping is a practice that we can control and is not widely implemented. Several providers practicing at Stamford Hospital's Labor and Delivery unit currently implement delayed cord clamping but only to some degree. The need for consistency amongst all providers at Stamford Hospital is necessary for all newborns to reap the same benefits. Several of these neonatal benefits include increased iron stores, improved circulation, and decreased risk of anemia. I observed the typical delay to be only 30-45 seconds, if it is even done. Research supports a much longer delay, with a minimum of sixty seconds. By educating staff, a uniform protocol and required documentation can be implemented to delay cord clamping for a duration of time supported by evidence-based research.

Benefits of Educating Patients on Their Stroke Risk Factors in the Neurological Intensive Care Unit

Joelle Zullo

Faculty Mentor: Katherine Saracino

Booth: 68, Oak Room (PM)

Abstract

Stroke is one of the most prevalent incidents, yet not enough people know that it is preventable. One way to decrease the prevalence of strokes is through education. Educating people on ways to help amend modifiable risk factors such as high blood pressure, excessive alcohol use, etc. can help improve patient outcomes. I established an assessment and educational tool that nurses can use to communicate with their patients about what their risk factors are. The tool that I created is a checklist of the patient's stroke risk factors with visuals to help understand the risk factor. This tool can be used at the bedside to assess the patient's knowledge about their risk factors. It can also be used as a way for nurses to begin discussing and educating the patient about their own individual risk factors. The goal of this tool is to increase patient awareness, thereby decreasing stroke prevalence.

Comparing Outcomes for Behavioral Health Patients Seen in Telehealth Versus Face-to-Face Sessions with Masks

Joy Appiah

Faculty Mentor: Joyce Shea

Booth: 125, BCC Lobby (PM)

This Research Was Supported by the Lawrence Family Fund

Abstract

Telehealth is a fast emerging approach to healthcare delivery, especially with the current pandemic of coronavirus and related safety concerns. Evidence-based studies that describe best practices in delivering telehealth service, its relevance in sustaining patient satisfaction and treatment adherence, and achievement of optimal outcomes, is essential. This quality improvement study explored outcomes including patient and provider satisfaction to compare the use of Telehealth versus Face-to-Face sessions with masks. Findings suggest that telehealth is effective for the delivery of care and management for people seeking behavioral health (BH) services when compared to face-to-face sessions with masks. Telehealth use may afford patients and providers a safe platform to provide and receive care, promoting an environment for increased adherence to treatment regimen and thereby optimizing patient outcomes. Although some limitations were identified, overall findings support the use of telehealth technology as an effective mode of providing access to quality BH care services. Telehealth can be equally satisfactory to face-to-face provision of care, especially when providers incorporate best practices.

School of Engineering

INNOVATIVE RESEARCH SYMPOSIUM

Fairfield University

School of Engineering

End-to-End Wireless Communication System Using FPGA Modulation

Shamrock Barrera, Ali Al Rawendoozi, John Dowling, John Fee, Kostiantyn Kaldaras

Faculty Mentor: Uma Balaji

Booth: 131, BCC Lower Level (PM)

Track: Environment and Sustainability, Community Engagement

This Research Was Supported by Hardiman Scholars

This Research Was Also Presented at the American Society for Engineering Education

Abstract

This project establishes end-to-end wireless communication between two programmable logic boards, called Field Programmable Gate Arrays (FPGA). Analog modulation techniques, such as phase, frequency, and amplitude modulation, are used to encode messages in radio waves transmitted through the air. Our objective is to create both a modulator and demodulator with a combination of FPGA board, programmable development board, such as a Zedboard, and a transceiver for both transmitting and receiving encoded messages. Recently, more devices have been utilizing Quadrature Phase Shift Key modulation, which is another type of encoding messages in radio waves that uses a phase shift of π/4 to encode a messages' bit pairing in one of four combinations (00,01,10,11) to allow for information to be transmitted in the same bit frame. We intend to implement this communication system technique through FPGA implementation using Hardware Design Language (HDL). HDL is defined in a program called Simulink, and allows us to simplify our process into an easy-to-understand signal flow block diagram. This process will be done using the MATLAB software with the Simulink add-on. This will allow us to create a wireless transceiver operating under the Industrial, Medical, and Scientific (ISM) frequency band of 433 MHz, 915 MHz, or 2.4 GHz, which will allow us to transmit in the unlicensed band. After successful transmission, the software defined radio will demodulate and recover the message. Finally, the goal of our project is to successfully transmit and receive via implementation of a communication system using QPSK on digital hardware to verify correctness.

Computational Approach for Understanding the Interactions Between Gabapentin and LAT1

Chizimuzo Chibuko

Faculty Mentor: Isaac Macwan

Booth: 132, BCC Lower Level (PM)

This Research Was Supported by Hardiman Scholars

This Research Was Also Presented at the American Society for Engineering Education, 2021 and Biomedical Engineering Society, 2021

Abstract

Our research project focuses on LAT1 protein and its interaction with a drug called Gabapentin. LAT1 is a key regulator in metabolism, immune pathways, and gestation due to its role in amino acid, hormone, and drug transfer across the cell membrane. It has been hypothesized that LAT1 transporters tend to share a general mechanism of action—alternative access transport. From previous research, it has been determined that LAT1 protein may act as a channel through which Gabapentin, a neurological drug commonly used for the treatment of neuropathic pain and epilepsy, passes through to enter the cell membrane. However, there is insufficient research on the mechanism and process by which Gabapentin passes through LAT1. Our project analyzes the interactions at the interface of LAT1 and Gabapentin. We are visualizing and comparing the conformational changes of the LAT1 protein based on its adsorption on a carbon surface and a phospholipid membrane using Visual Molecular Dynamics (VMD) and Nanoscale Molecular Dynamics (NAMD). In our analysis, we have different measures, such as RMSD (Root Mean Square Deviation), hydrogen bonds, salt bridges, and interaction energies in the form of electrostatic and Van der Waals forces, to determine the energy and stability of the interactions between LAT1 and Gabapentin. Our results illustrate how interactive forces help convey substrates through LAT1 providing for essential transport of amino acids and drugs through the blood brain barrier. This would provide more insight into the treatment of neurological diseases such as Parkinson’s disease.

3-D Bioprinted Vein-like Heart System

Andrea Colon, Evan Fair, Joshua Heras, Peter Gori

Faculty Mentor: Naser Haghbin, Shelley Phelan

Booth: 133, BCC Lower Level (PM)

Track: Diversity and Inclusive Excellence, Community Engagement

This Research Was Supported by Hardiman Scholars

Abstract

People who require a heart transplant must wait six months or more to receive a donor heart. In 2019, 165 million people in the United States had signed up to be organ donors, with only 3% of organs remaining viable after the donors' death. Also, some people who receive an organ might have their immune system reject it and find themselves in need of another organ. Up to 50,000 patients are heart-transplant candidates, but because of the severe organ scarcity healthcare practitioners must carefully consider who should receive a heart transplant. The objective of this project is to simulate and manufacture a muscular and vascular system, composed of living cellular tissues and other bioengineered materials, then actuated to produce a volumetric flow rate by means of peristalsis via electromechanical stimulus. The first step in developing a fully functional heart is to develop a vein-like scaffold by using bioink and biomaterial in an Extrusion-Based 3D Bioprinter. To do so, the first phase is to make a simple 3-D bioprinted block using GelMa-C, live cells, and media. We cultured stem cells and differentiated them into muscular and vascular tissue. Then, light microscopy of the 3-D bioprinted block was taken on day one, day four, and day seven and reported in this project.

Community Situated Biomechanics Research

Jack Devlin, Ugochukwu Anamege, Avery Nocella, Joseph Viale, Gabrielle Romero, Caroline Neilson

Faculty Mentor: John Drazan

Booth: 134, BCC Lower Level (PM)

Track: Community Engagement

This Research Was Supported by Hardiman Scholars

This Research Was Also Presented at the Northeast Bioengineering Conference

Abstract

Most research on musculoskeletal injuries is performed after an injury has occurred. With this project, we seek to understand the development of injuries in healthy people rather than retrospectively tracking the recovery of injured people. As a proof of concept, we develop a new way to assess Achilles Tendon function. An Achilles injury, such as ruptures or tendinopathy, is commonly seen in athletes and older people. This project develops a mobile biomechanical tool to measure the Achilles tendon function in the field, rather than in the traditional laboratory. This field-based approach to research has potential to allow for the prospective study of Achilles pathology across a large population of at-risk individuals. Our multi-disciplinary design team has developed a mobile “iso-damping dynamometer” that can be used to measure plantar-flexor function in community-accessible spaces, such as community centers. This type of research will create a new principle of mobile biomechanics that focuses on communities for those with at-risk musculoskeletal structures rather than in a stationary laboratory.

Understanding the Interactions Between a Human Mismatch Repair Protein, MutSbeta, and a Mismatched DNA

Jack Devlin, Jenna Madigan

Faculty Mentor: Isaac Macwan

Booth: 135, BCC Lower Level (PM)

This Research Was Supported by the Corrigan Scholars Fund

This Research Was Also Presented at the Biomedical Engineering Society, American Chemical Society, American Society for Engineering Education

Abstract

Deficiency of MutSbeta protein has proven to be a cause of Lynch Syndrome, also known as hereditary non – polyposis colorectal cancer (HNPCC) or colon cancer. The root cause of this condition is the failure to detect the DNA base pairing errors, inhibiting the signaling for the mismatch repair pathway to proceed. To examine the essential role of MutSbeta at the interface of a mismatched DNA, three sets of molecular dynamics (MD) simulations are performed on the MutSbeta and mismatched DNA controls and a combined system. Stability and energetics analysis is performed for quantifying the root – mean square deviation (RMSD), hydrogen bonds, salt bridges, center of mass, secondary structure analysis, and non-bonding energies in the form of electrostatics and Van der Waals. In the first 100 ns, the outermost domain of MutSbeta (clamp AP4 on chain B) holds the DNA, and the trajectory indicates that the inner domains (AP1 on chains A and B) prepare to scan the DNA strand. RMSD of 5-7 Å for the control MutSbeta compared to 3-6.5 Å for the combined system, along with the number of salt bridges and the 16Å reduction in the distance between MutSbeta and the DNA, indicate that starting ~75ns, MutSbeta initiates the scanning of the mismatched DNA. The Van der Waals energies show increased attraction of 25 kCal/mol starting ~86ns, which continues to increase further up to ~40 kCal/mol, demonstrating the role of positive and hydrophobic residues of MutSbeta in the detection process.

Impact of STEM Outreach Activities on Engineering Education

Abigail Diltz, Margaret Millar, Lorenzo Arabia, Megan Rourke, Kobi Oktobi

Faculty Mentor: Elif Kongar, John Drazan

Booth: 136, BCC Lower Level (PM)

Track: Environment and Sustainability,Diversity and Inclusive Excellence,Community Engagement

This Research Was Supported by Constellation's E2 Energy to Educate grant program

Abstract

This study elaborates on the findings of the STEM activities conducted with youth at Wakeman Boys and Girls Club, located at Bridgeport, Connecticut. The SuSTEMability grant award provided by Constellation's E2 Energy to Educate grant program supported hands-on activities that aimed at inspiring students from underrepresented backgrounds in STEM to take an active role in improving sustainability in their community while encouraging them to consider a career in science, technology, and the environment. Fellows worked with three School of Engineering (SOE) faculty members on sustainable energy and environment issues and integrated these activities and lessons plans into club activities and curriculum, thus engaging new populations of youth in informal STEM education. Fellows worked together to create engaging accessible curriculum related to engineering, science, and sustainability. Students at Wakeman were broken into groups and spent six weeks completing these fellow-designed activities. These activities ran the gamut from learning about the global carbon cycle and sustainable technologies for generating electricity, to strategies for reducing greenhouse gasses in their schools and homes, to using sports to teach the students about data collection and experimental design.

Sustainability Activities and STEM

Brianna Duswalt, Isabella Carrano, Dermot Warner

Faculty Mentor: Elif Kongar, Uma Balaji

Booth: 137, BCC Lower Level (PM)

Track: Environment and Sustainability, Diversity and Inclusive Excellence, Community Engagement

This Research Was Supported by Constellation's E2 Energy to Educate grant program

Abstract

This study summarizes the impact of SuSTEMability, a STEM outreach project, conducted by undergraduate students at Fairfield University. The SuSTEMability project addressed fundamental challenges to a sustainable energy future, i.e., highlighting the importance of creating sustainable systems to reduce energy usage and environmental deterioration, and attracting underrepresented students in STEM to the sciences. Supported by the grant awarded by Constellation, undergraduate SuSTEMability Fellows conducted various hands-on activities focusing on environmentally sound and sustainable energy sources. The student fellows and their faculty mentors visited Cesar Batalla, a Bridgeport public school that serves 1,072 students in grades PreK-8, during February and March 2022. SuSTEMability addressed these issues by providing students from diverse backgrounds with an understanding of science, technology, and today's energy challenges through age-appropriate activities that illustrated our role as individuals and as a community in building a climate-safe, renewable future. This study, while detailing the activities conducted in the classroom, also investigated the impact of the program on Fellows. In this regard, the study analyzed the impact of outreach activities in tertiary STEM education on improving Fellow's twenty-first century skills, such as flexibility, multidisciplinary problem-solving, communication, punctuality, critical thinking, and creativity.

Role of Graphene Oxide in Disentangling the Amyloid Beta Fibrils

Brianna Duswalt

Faculty Mentor: Isaac Macwan

Booth: 138, BCC Lower Level (PM)

This Research Was Also Presented at the Biomedical Engineering Society

Abstract

Through previous research, Amyloid Beta(Aβ) accumulation in the brain has been linked to the development of Alzheimer's Disease(AD). The accumulation of Aβ within the brain leads to the formation of aggregated plaques of Aβ, neurofibrillary tangles(NFTs), and fibrils involved in the development of AD. Aβ accumulation causes a lack of cross propagation of Aβ fibrils and the misfolding of Aβ, which play crucial roles in the development of AD. Graphene Oxide(GO) activates the autophagy which expels Aβ, preventing the misfolding of Aβ and formation of aggregated plaques. Even though GO has been previously shown as a potential nanomaterial to address AD, the Aβ and GO interactions have not been extensively studied. In this study, a molecular graphics program, Visual Molecular Dynamics(VMD), is used to simulate the interactions between GO and Aβ, and to further understand the conformational changes in Aβ in which GO disintegrates Aβ fibrils. VMD is further utilized to model the waterbox with the necessary salt concentration and the molecules of GO and Aβ. The system is simulated for 200 nanoseconds in order to see the interactions between Aβ and GO. A trajectory file is created for analysis of the different interfacial energies and stability. The simulations showed a destabilizing effect of the Aβ fibril in the presence of GO and analysis is performed on different factors of stability.

RBC Lubrication Device: Create a Fully Automated Machine to Apply Grease to Bearings to Remove the Need for a Human Operator

Sean Feeney, Brian Feeney, Kevan McDonald, Aytana Muschajew, Owen Kinne,

Martin Corraro, Matthew Primatello, Basheer Alkhalil

Faculty Mentor: Naser Haghbin, Shahrokh Etemad

Booth: 139, BCC Lower Level (PM)

This Research Was Supported by Hardiman Scholars

Abstract

This project created a fully automated bearing lubrication system. This was done by a team of mechanical, electrical, and computer science students. Our group worked with several engineers at RBC Bearings to create our device. Our main purpose was to take the shop worker out of the lubrication process, and to make the process quicker so as to decrease the cycle time from about 20 seconds to 7 seconds or less (for the time it takes to apply grease to the bearing). It was also a goal to make the brush operational on a range of bearing sizes so that it does not have to be switched out and can be continuously used on varying sizes of bearings that RBC makes. This had to be done at minimal cost while still being effective and user-friendly for the workers to operate. The device mainly consists of a linear actuator, a machined “gripper/brush” design, a pump to dispense the grease onto the bearing, PLC software to automate the system, and all the necessary wiring to bring everything together.

Target Tracking in the Presence of Space Debris and Decoys Using InfraRed (IR) Imaging Sensors

Kyle Hochenberger

Faculty Mentor: Djedjiga Belfadel

Booth: 140, BCC Lower Level (PM)

Abstract

Efficient detection and tracking of orbiting space objects (SOs) are critical elements for enhanced missile defense system (MDS) and improved Space Situational Awareness (SSA). This project addresses one of the key requirements for a successful MDS, namely the ability to discriminate between the missile and decoys or space debris using space-based infrared (IR) sensors. To achieve this goal, we first develop an algorithm to detect and track all the SOs. Then the velocity information (available after the tracking) is used to identify the objects slowing down rapidly as decoys. This project allows students to work on projects related to space technology and learn about defense systems.

Design and Fabrication of a Human Cornea Using a Syringe-Based Bio-3D Printing Process

Eliza Hogan, Dylan Richardson, Luke Borgos

Faculty Mentor: Naser Haghbin

Booth: 141, BCC Lower Level (PM)

This Research Was Supported by Hardiman Scholars

Abstract

3D Bioprinting is an emerging technology that has the potential to develop fully functional tissues and organs utilizing living cells. In this study, a human cornea structure was designed using Solidworks software and fabricated with a Cellink BioX 3D printer using a cell culturing procedure. The bioink GelMA C was used in the first phase of the research for an appropriate printing procedure to be developed. In the 3D printing process, nozzle size (25G), pressure (8kPa), infill density (30%), nozzle scan speed (10mm/s), infill pattern (linear), and eliminating air bubbles by centrifuging (1100 rpm for 2 minutes) were important. A mold was then developed with Pluronics 40% in order to maintain the corneal structure. In the next phase, breast cancer cells were used in the printing process. The cancer cells functioned as a sample cell line to assess cell printing protocol while corneal epithelial cell lines were developed. A mixture of GelMA C and cancer cells were utilized to print sample blocks. The printing procedure produced successful cell viability in the GelMA C material. Further work will be required to maintain the corneal mold with proper concavity using corneal cells in GelMA C.

Java App Store

Ricky Jagroo, Lam Bui, Maaz Vohra, Raqibul Haque, Sachin Verma, Harshal Khatri

Faculty Mentor: Douglas Lyon

Booth: 142, BCC Lower Level (PM)

Track: Diversity and Inclusive Excellence, Community Engagement

Abstract

We present a synopsis that reviews our team's efforts to create a web-based marketplace for applications written in the Java programming language. We discuss the potential of this marketplace to meet a previously unserviced market of Java developers seeking to deploy their applications. We show that the project is certainly possible through the creation of a prototype marketplace, and we find that the project has very large market potential in terms of its total addressable market, serviceable available market, and serviceable obtainable market. We also include an analysis of our marketing campaigns for our platform, which is an ongoing effort to attract customers. Campaigns have been run on the Kickstarter and Indiegogo platforms and have been accompanied by advertising campaigns and social media posts. These campaigns have brought the team into contact with potential customers and allowed the team to validate its marketplace.

Inhibition of Interactions Between the Enzyme Nucleoside Diphosphate Kinase – B (NDPK-B) and the Guanine Nucleotide-binding Protein (G Protein) Using Graphene Oxide

Ryan Jaworski, Alexa Fiorica

Faculty Mentor: Isaac Macwan

Booth: 143, BCC Lower Level (PM)

This Research Was Also Presented at the Biomedical Engineering Society, 2022

Abstract

During heart failure, higher amount of nucleoside diphosphate kinase (NDPK) enzyme in the sarcolemma membrane inhibits the process of synthesizing second messenger cyclic adenosine monophosphate (cAMP), which is necessary for the regulation of the calcium ion balance of a normally functioning heart. Normally, NDPK phosphorylates the stimulatory guanosine diphosphate, GDP(s), to a guanosine triphosphate, GTP(s), on the heterotrimeric guanine nucleotide binding protein (G protein), results in cAMP formation. When heart failure occurs, an increased quantity of NDPK reacts with GDP(i), which is then converted into a GTP(i), resulting in the inhibition of cAMP. Typically, the βγ dimer of the G protein binds with hexameric NDPK-B/C complex and receives the phosphate at the residue His266 from residue His118 of NDPK-B. NDPK-C is required for NDPK-B to phosphorylate the G protein. In this work, the interactions between NDPK-B, NDPK-C, and G-Protein are quantified in the presence and absence of graphene oxide through stability analysis involving hydrogen bonds, center of mass, root mean square deviation, and salt bridges. Furthermore, analyses involving energetics that includes Van der Waals (VDW) and electrostatic energies are underway. It is anticipated that the interfacial water molecules at the interface of NDBK-B, NDPK-C, and G-Protein in the presence and absence of GO would play a crucial role in the nonbonding interactions and hence interfacial water molecules also investigated to understand the nature of these interactions. We find that NDPK-B and NDPK-C interact favorably with the G-Protein in the absence of GO, whereas the presence of GO would make such interactions not favorable, directly affecting the transfer of phosphate from HIS118 from NDPK-B to HIS266 of the βγ complex.

Micro Bioreactor Array for Tissue Engineering Applications

Caroline Kent, Erin Harvey, Nwachukwu Ibekwe, Garfield Curtis

Faculty Mentor: Sriharsha Srinivas Sundarram

Booth: 144, BCC Lower Level (PM)

Track: Environment and Sustainability

This Research Was Supported by Hardiman Scholars

Abstract

This project creates a Micro Bioreactor Array for Tissue Engineering Applications. The bioreactor array will incorporate 3D tissue scaffolds, which have the ability to simulate the absorption of different drugs by the human body. These scaffolds are created using a 3D printer and undergo a foaming process which enlarges the scaffold for it to be placed within the bioreactor chamber. As many as ten chambers are then connected together to form the bioreactor array. Single bioreactors can simulate a response from a single human organ; however, we will create an array, which can consider the response to a drug when interacting with multiple organs within the human body at one time. By keeping this bioreactor array on the microscale, we aim for it to be a low cost, but easy to transport device so that it can be used and tested virtually anywhere, even in a spacecraft. When analyzing results of how the drugs react with different human tissues, the findings can eventually be applied to human medicinal processes. The goal is to automate the drug moving through the chambers and analyze the drug moving through the scaffold without having to remove the scaffold each time.

Wearable Sensors to Measure Plantarflexor Kinetics During Recreational Activities

Adam Krzywosz, Alexander White, Brigid Protzmann

Faculty Mentor: John Drazan

Booth: 145, BCC Lower Level (PM)

This Research Was Also Presented at the Orthopaedic Research Society

Abstract

Plantarflexor function (the ability to rotate your ankle towards the sole of your foot) is important for daily human activities, such as walking, running, and climbing stairs. Previously, measurement of plantarflexor function took place primarily in the lab, limiting opportunities for repeated measurements over time in functionally relevant situations. Our project develops a new method for analyzing plantarflexor function outside of the laboratory using wearable sensors called LoadSols. These sensors measure force data from the heel, midfoot, and toe during activities such as basketball and wirelessly transmit these data to a tablet interface. This information is critical in the calculations for internal load on tendons and ligaments, such as the Achilles Tendon, at risk of injury during recreational activities. While awaiting IRB approval, we collected data on our faculty mentor, Dr. John Drazan, while he played basketball wearing the LoadSols. We used a quasistatic approximation and summation of moments about the ankle to calculate the Achilles Tendon load. This pilot study allowed us to identify high risk movements on the basketball court that resulted in the highest Achilles Tendon loading patterns. This is important because high risk movements can lead to injury or failure of the Achilles Tendon, especially among people of Dr. Drazan's age (32 years old) and activity level (weekend warrior playing basketball). This summer, pending IRB approval, we plan to recruit new subjects to get more data in order to develop and train a machine learning algorithm to automatically detect high risk movements in recreational sports such as basketball.

Using Machine Learning Methods to Study EEG Data

Thanh Le

Faculty Mentor: Danushka Bandara, Jessica Karanian

Booth: 146, BCC Lower Level (PM)

Abstract

This project used Machine Learning to classify EEG data. The data was taken from psychological research on twenty human subjects, which consisted of an encoding phase and a retrieval phase. We used Python's pandas library to handle and process data and scikit-learn library to perform Machine Learning tasks. First, we performed data processing: we calculated aggregated metrics for each data epoch. Metrics include max, min, mean, standard deviations, and some statistical metrics (FFT, band power, Hjorth Activity…). We also used window-sliding techniques to divide epochs into smaller windows. For data classifications and predictions, we ran classifications for encoding data to predict whether the subjects were looking at left-oriented or right-oriented objects. We got accuracy scores of about 80% and figured out the most predictive features. Then, we worked on retrieval data, with the goal of revealing patterns about true and false memory. So far, we yielded accuracy scores not much better than random predictions. Overall, we tried different subsets of data to find any possible trends. To improve correctness and speeds of Machine Learning attempts, we incrementally tried different models and methods. The models include Logistic Regression, SVM, Naïve Bayes, Random Forest Classifier, LightGBM, and XGBoost. The methods include parameter-tuning using random-search or grid-search, PCA, and feature selections using statistical metrics like f-score or chi-squared.

A Study on Printing Scaffolds with Cells Using BioX 3D Printer

Maciej Lewicki

Faculty Mentor: Sriharsha Srinivas Sundarram

Booth: 147, BCC Lower Level (PM)

This Research Was Supported by the Corrigan Scholars Fund

This Research Was Also Presented at the International Mechanical Engineering Congress and Exposition (IMECE)

Abstract

This research project involved designing and printing three dimensional plastic scaffolds in order to promote cell growth. Utilizing the new bioprinter, the Bio X, and the new thermoplastic printhead, we will create precise scaffolds and grow cells within them. In addition, we use polylactic acid (PLA), a biocompatible plastic polymer, for our scaffold material, and cells from Cellink. The most important task is to analyze different geometries and determine which geometry aids the most in cell proliferation. Once we do this, the scaffold will undergo solid-state foaming. This process essentially injects carbon dioxide into the scaffold in order to increase the porosity of the material and the surface roughness. The carbon dioxide is then released while the physical properties of the scaffold are retained. An increased surface roughness will allow the cells to better adhere to the surface of the scaffold, further improving cell proliferation. With the help of the Keyence VR 3D Microscope and Nanosurf Naio Atomic Force Microscope, we will analyze and assess our scaffolds. These microscopes have the ability to measure small objects with utmost precision, which will be extremely useful during our project.

Robotic Surgery Training Dome

Jenna Madigan, Stephanie Prado, Clarissa Rotonto, Chloe Stokinger

Faculty Mentor: Susan Freudzon

Booth: 148, BCC Lower Level (PM)

Track: Environment and Sustainability

This Research Was Supported by Hardiman Scholars

This Research Was Also Presented at the American Society for Engineering Education, 2022

Abstract

Robotic-assisted surgery is more prevalent in the medical field as there is a higher demand for minimally invasive procedures. The robotic surgery instruments perform complex motions and can maneuver in small spaces. Currently, robotic-assisted procedures are performed in the field of gastroenterology, urology, gynecology, and cardiothoracic surgery. Surgeons undergo extensive training before operating robotic-assisted devices. The training involves first observing procedures, next assisting with cases, then practicing in dry and wet labs to practice basic robotic skills, and finally operating under the supervision of others before operating independently. The focus of this project is on the training for robotic surgery. Frequently, training programs utilize a training dome that simulates training activities such as suturing and other fine motor skills, but they do not provide feedback on how well skills were performed. In this project, Arduino, an open source electronics platform, and Matlab software quantify the forces and tensions that occur when a robotic-assisted surgery training is performed. This quantitative feedback will improve the quality of robotic-assisted surgery. This, in turn, will help improve surgeries for both the patient and the surgeon as engineering and healthcare continue to overlap.

Polymer/Graphene Oxide Nanocomposites for Applications in Biomedical Engineering

Alexander Maier, Ky Duyen Le, Bibek Timalsina, Emre Aydin

Faculty Mentor: Isaac Macwan

Booth: 149, BCC Lower Level (PM)

This Research Was Supported by Hardiman Scholars

This Research Was Also Presented at the B-plan Competition, American Society for Engineering Education

Abstract

Graphene oxide (GO), an oxidized form of graphene, a carbon allotrope, is a very attractive nanomaterial with potential biomedical applications in tissue engineering owing to its electrochemical activity. However, it lacks the ability to form freestanding films that can actively function as an electrochemical substrate. To work around its inability to do so, different methods have been reported such as annealing, ultrafiltration, electrophoresis, and midinfrared polarizers. Two of the popular techniques to synthesize free standing films are electrospinning and electropolymerization through cyclic voltammetry (CV). In recent years nanofibrous substrates have been used for unique applications in the field of biomedical engineering, especially in wound healing. Nanofibrous films are ideal for preventing bacterial contamination in open wounds, and, in conjunction with viable materials, can serve as biocompatible skins for wound dressings. Similarly, CV is a popular electrochemical technique utilized to investigate the reduction and oxidation processes of a species and to synthesize novel substrates for biomedical applications. This work deals with utilizing these two techniques to synthesize nanocomposite GO films with polyvinyl alcohol (PVA) and polypyrrole (Ppy) polymers acting as scaffolds. PVA, which is a biocompatible, water soluble, synthetic polymer, is simultaneously electrospun with GO to create a scaffold capable of supporting the GO film. Polypyrrole, which is both chemically and thermally stable and has good biocompatibility both *in vivo* and *in vitro*, can significantly impact cell adhesion, proliferation, and differentiation, as well as tissue regeneration and repair. The developed nanocomposite would improve the mechanical properties of tissue engineering scaffolds and is anticipated to be utilized as a wound dressing material.

Reticle Particle Inspection System

Angelica McAfee, Ari Paloumbis, David Hanrahan, Jack Baker, Minh Hoang, Timothy Cusack-McPartlin, David London

Faculty Mentor: Douglas Lyon, Dr. Andy Judge

Booth: 150, BCC Lower Level (PM)

Track: Environment and Sustainability

This Research Was Supported by Hardiman Scholars, CT Next Grant

Abstract

The impact of ASML's lithography systems on the devices we take for granted every day is understated. Moore's Law observes that the number of transistors in an integrated circuit doubles every two years. The same amount of computing power can be achieved in a microchip half the size in just two years. Anyone that tried to run a computer application in the late 90's understands the impact of Moore's law on advancing our electronics. ASML's lithography machines strive to continue this industry trend. As transistors get smaller, the impact of defects and contamination in these machines and on their components increases. Improving and refining the inspection process of lithography components is imperative. This refining would allow for technological advances to continue with fewer issues during validation and verification testing. Developing a stand-alone system to inspect components before they are placed in the machine will effectively reduce defectivity and increase yield of the microchips that make up the electronics we all have come to rely on. Lithography systems used to create microchips act similarly to the copier machine used in a home or office. A technology company will take a pattern of the microchip that they wish to develop masked onto a component called a reticle. ASML's machine then uses a series of lasers to expose the pattern into a silicon wafer in multiple steps. The reticle is the master pattern of a microchip which makes each chip unique to the end-users' specifications. One way to reduce defectivity caused by contamination is to inspect these reticles for particles which have the potential to distort the image exposed onto the microchip. Our goal is to develop a stand-alone system that can accept a reticle, inspect the surface(s) for particles as small as 1 micron, and return the reticle to the operator indicating a pass or fail status for use in ASML's machine. This machine will inspect the reticle to detect any contamination before the reticle is used, resulting in potentially thousands of unusable microchips. Different types of systems have different methods of transferring a reticle pattern to a silicon wafer. DUV (Deep UltraViolet) systems use a reticle that lasers shine through to create the pattern. These systems would benefit from having both the backside of the reticle and the front side of the reticle's protective cover (the pellicle) scanned for contamination. Therefore it has become a stretch target for our stand-alone machine to inspect both the reticle backside and pellicle frontside. In either case, an advanced mechatronic delivery system will need to be developed to transport the reticle through the inspection process.

Portable Solar Desalinator

Michael O'Leary, Charles Lewis, Vincent Tiernan, Henrique Lopes, Justin Ormiston, Shaun Ormiston

Faculty Mentor: Mehdi Safari

Booth: 151, BCC Lower Level (PM)

Track: Environment and Sustainability

This Research Was Supported by Hardiman Scholars, NASA Grant and CT Next Grant

Abstract

Our project's goal is to design and produce a solar desalinator that is portable and effective to allow for higher accessibility around the globe. With millions of people lacking access to fresh water, our team's efforts aid in the global water crisis by supplying struggling communities with this basic human necessity. Since September 2021, our team designed and assembled a desalination system that operates strictly off of solar energy. This was an important aspect of our design as sunlight is accessible anywhere in the world. It was also important to design a device that posed no threat to the environment. The Fall semester focused on the design and prototyping of our system. The Spring semester has been dedicated to the assembly, testing, and improvement of our desalinator.

Benchtop Battery Assembly

Kristen Oliger, Jacob Cassidy, Carlos Ponce, John Cain, Rian Boutin

Faculty Mentor: Douglas Lyon, Ravikumar Vasudevan

Booth: 152, BCC Lower Level (PM)

Track: Environment and Sustainability

Abstract

We present a study that designs, prototypes, and constructs a battery assembly glove box for the purpose of assembling lithium-ion batteries. A glove box provides an ideal, controlled environment for working with elements particularly reactive to general atmospheric elements, namely nitrogen and oxygen. Glove boxes utilize various sensors to ensure the environment is stable for the exposed element. When exposed to oxygen, lithium quickly deteriorates, losing many of its desirable chemical properties. It also poses a safety risk due to its flammable reactivity with oxygen. We differentiate our product from the rest of the glove box market by including ergonomic improvements and a custom user database to optimize battery efficiency. We strive to support the world's transition to cleaner, non-renewable forms of energy. Lithium-ion batteries are critical to the success of new, cutting-edge technologies such as electric vehicles and solar applications. Our glove box will include a custom database that tracks all of the conditions and forces that each battery cell experiences during the assembly process. This will allow us to compare different conditions and ultimately optimize the battery assembly process in order to assemble the most efficient batteries possible.

Arduino Door Sensor

Nicole Reynolds, Melanie Napierala, Noah Duncan

Faculty Mentor: Elif Kongar

Booth: 153, BCC Lower Level (PM)

Abstract

Our research project was conducted throughout the Fundamentals of Engineering class as part of the team design project (TDP). This project goal was to use an Arduino Uno to hold a function helpful to society. Provided constraints included an input, a sensor, two outputs, and an actuator. After our brainstorming sessions, our TDP group decided to create a door sensor, as we live in dorms and sometimes either forget to or do not lock our doors. Many door sensors are created for homes, providing a sense of security knowing that you are safe in your own home. For example, the company Ring has their own version of a door sensor.

Tri-DAR Platform

Samuel Santos, Jesse Veilleux, Erick Ruilova, Beatriz Guevara, Tea Young Kim

Faculty Mentor: Douglas Lyon

Booth: 154, BCC Lower Level (PM)

Track: Community Engagement

This Research Was Supported by Hardiman Scholars

Abstract

Our Tri-DAR Platform project creates a budget test bench that enables STEM students and researchers to learn and tinker with LiDAR in a ready-to-go package. Through the use of an Arduino, we ensure ease of use alongside the proprietary code that can be modified by users, but that comes ready to plug and play. The thermoformed chassis keeps costs down while enabling an open-air design that is structurally sound and capable of demonstrating all the work that goes into such a project.

Breathalyzer Using Arduino

Alesandro Scaramuzzino, Michael Felix

Faculty Mentor: Djedjiga Belfadel

155, BCC Lower Level (PM)

Abstract

Driving a car with a BAC of 0.08 percent or higher is unlawful in the United States. Thus whether you are aware of your alcohol level or not, you put yourself at danger of being caught and convicted of a DUI if you sit in your car and drive it any place with a BAC of 0.08 percent or higher. We created and designed our breathalyzer using Arduino. We wanted to design something that can be used every day and help save lives. A breathalyzer is an electronic device used for measuring the breath alcohol content (BrAC) of a person. Making a breathalyzer using Arduino is feasible and practical. It is something that has been done before so it is not impossible. We designed our breathalyzer based on the constraints of its importance. Testing a person's sobriety is of utmost importance. It could essentially save lives. When people are under the influence, their brains do not work correctly and if they get behind a wheel, it could end badly. The products we use to build an alcohol indicator are Arduino, LEDs, an MQ-3 Alcohol sensor, etc. We test and benchmark our design by building the breathalyzer and testing it with code on the Arduino application. From there, we implement our design by starting with just a few components, and then add the rest one by one. This is a complicated process, so doing it step-by-step is key to making it work easily and efficiently. We discussed many different ways to design a breathalyzer. Each design needs an MQ-3 Alcohol Sensor, which is essential for where you “blow” to test your BAC levels. This piece is not included in the Arduino UNO starter kit, so we purchased it from Amazon. The MQ-3 alcohol sensor contains a heating element that heats a layer of conducting material whose resistance is continuously measured. Its resistance changes when fumes or smell from alcohol comes in contact with the MQ-3 sensor. Every 45 minutes a drunk driver kills a person, so in conclusion the breathalyzer can play a large role in keeping everyone safe.

STEM Outreach through Sports Biomechanics

Tobenna Ugwu, Chizimuzo Chibuko, Aina March Razakamanantsoa, Prince Addo, Rachel Jacobson, John Minogue

Faculty Mentor: John Drazan

Booth: 156, BCC Lower Level (PM)

Track: Community Engagement

This Research Was Also Presented at the 48th Northeast Bioengineering Conference

Abstract

This project aims to diversify the STEM pipeline. The problem is that existing outreach programs cater to students who are already aware of and value STEM such as robotics club members or science fair participants. Hence, students who need an authentic introduction to STEM, that is, the ones who are unaware of STEM potential, remain excluded from such existing programs. Therefore, with our project, we incorporate STEM outreach into youth sports programs, thus broadening access to STEM careers into new populations who are presently underrepresented in this field based on initial interest in sports rather than STEM per se. Team members work closely with stakeholders in education, sports, and biomechanics research through every step of the engineering design process to develop devices that can positively impact the lives of hundreds of youths by redefining their perception of science. They have developed new tools and redesigned existing low-cost sports biomechanics measurement devices to be deployed locally with potential for broad deployment across the country. Given a group of high school students interested in athletics, for instance, the team would provide them with the tools and instructions on how to assemble and use them to measure their own training (e.g. speed, strength, agility), hence peaking their interest in STEM.

Applying Hough Transform to Identify Lines Drawn on a Mobile Screen

Ben Kraft

Faculty Mentor: Mirco Speretta

Booth: 157, BCC Lower Level (PM)

Abstract

ChemQuest is a mobile application developed by students in the School of Engineering at Fairfield University. The application is designed to help students practice drawing and identifying different chemical compounds. We focus on the application's drawing feature. This feature is intended to recognize a user-drawn chemical compound, and then direct the user to the compound's related page on PubChem, a site containing a large collection of easily accessible chemistry information. After using the existing data to identify the drawbacks of ChemQuest's current ability to recognize the user-drawn compounds, we investigate a new automatic technique to improve the capability of recognizing hand drawn lines and vertices. The technique that we evaluate is based on the Hough transform technique, which focuses on identifying the line segments within the drawing. We plan to evaluate the effectiveness of the new technique based Hough transform by tracking its rate of successful matches. Then, we compare its accuracy with the technique currently used in the application.

Numerical Statistic Word Analysis over the NIST 800-53 Cybersecurity Framework

Rohan Sahu

Faculty Mentor: Mirco Speretta

Booth: 158, BCC Lower Level (PM)

Abstract

Implementation of Cybersecurity frameworks is required in many organizations. In general, it helps to mitigate the potential risks of cyber attacks and breaches. Examples of frameworks include NIST, CIS, and ISO. Although very critical for the business of an organization, the process of implementing these frameworks is very time consuming and resource intensive. This is due to the manual process cybersecurity experts must use to assess the guidelines and appropriately choose the ones that should be followed by the organization. This project investigates the feasibility of automating or semi-automating the process of guidelines selection. In the study, we use the NIST cybersecurity framework and apply numerical statistics techniques across all the guidelines. The resulting ranked tokens are then compared among the families of guidelines. If this comparison will highlight enough differences, then the tokens will be used in other algorithms that support the automatic selection of guidelines.

Competing on Analytics: A Small Business Perspective

Oliver Dizon, Andre Hernandez, Zhaofan Hou, Dajun Yin

Faculty Mentor: Mirco Speretta, Jonathan Wilson

Booth: 159, BCC Lower Level (PM)

Abstract

Small business owners sit on a wealth of data about their customers. The problem is that it becomes an overwhelming analytical task as there is too much data to digest. Small business owners know that they must use the data to make profits, but they often lack the skills, time, or people to help analyze and use the data effectively. Significant competitive advantage can be achieved for those that can harness the information gained from their customer activities. The goal of this project is to help small business owners gain that competitive advantage. We partnered with a small firm whose website focused on covering the range of issues relating to raising kids ages 15-25. Our initial plan is to construct a data warehouse that will extract the data from the various technology platforms currently used by the website owners. Using SQL Server Integration Services (SSIS), website data on individual user and usage as well as subscription revenues and newsletter engagement will be extracted from the different systems, transformed using various operations, and loaded into a data warehouse. Once the data is loaded, the process of gaining business insights from the data can begin. Our next step is to provide the business owners with an on-demand website dashboard that can display visual trends of their business activities to help them gain a better understanding of their business and aid them in making data driven decisions. And finally, with subscription as a main revenue driver, we will use various supervised machine learning techniques to build different classification models to help in building a better sales pipeline while also predicting customer churn. For small businesses to compete using analytics, they must evolve from static reports on things that have already happened to interactive and customized visualization that reveal insights and spot trends as they happen. They must be able to choose the data that they want to analyze and return quality insights almost immediately. While spreadsheets and free online tools are available to small business owners to manage their business data, such tools are often time consuming to produce, limited in scope, provide less informed insights, and prone to human error. Our proposal takes the step of unifying the data from the various technology platforms, presenting the information in a visually engaging way, and using machine learning to help drive business insights. All of this can be accomplished using open-source tools at no cost, and customized to the business process of the small business user versus the business needs of the technology provider.

Felidetect: A Machine Learning Approach to Cat Classification

Karen Exantus, Sai Greeshma Saladi, Tianyu Yang, Rohindraj Kumaramangalam Kandasamy

Faculty Mentor: Danushka Bandara, Ashley Byun

Booth: 160, BCC Lower Level (PM)

Abstract

The *Felidae* cat family originated 10.8 million years ago in what is now Southeast Asia. Today, they are found across vastly different environments on every continent except Antarctica with eight major lineages recognized. The *Pantherinae* are the earliest diverging of these cat lineages alive today. They communicate using a wide variety of vocalizations ranging from discrete calls, such as hisses, to increasingly graded calls, such as growls. Many features give these calls their distinctive properties, allowing them to convey unique meanings. These features include simple, commonly known features such as frequency and amplitude range and also more complex features such as spectral contrast. A research team interested in recreating the vocalizations of extinct *Felid* ancestors attempted to manually extract these features, but encountered nuances such as reduced accuracy due to human error and difficulties extracting more complex acoustic features, which often have the most effect in distinguishing vocalizations. Using machine learning technology, we set out to extract key acoustic features to distinguish the vocalization types and identify the different species of the *Pantherinae* lineage. Using various data mining algorithms and techniques, we created and optimized models to identify *Pantherinae* vocalizations from a set of previously unobserved test cases. The results were models that accurately classified both cat vocalizations and species at up to 91%. Furthermore, we were able to identify the most important of these vocal features and develop a new database of cat vocalizations which will help researchers study the relationship between acoustic features and animal behavior.

Machine Learning: Image Classification through Supervised Learning

Hector Gonzalez Barron, Casey Mott, Xiaojia Chen, Likitha Varapana

Faculty Mentor: Xiaojiang Wu

Recording: https://drive.google.com/file/d/1be0GFQgER6Nmg-vsyzanlXOiStl0xyYg/view

Abstract

This project implements a machine learning framework in an application that classifies images that an end user uploaded into it. The classification model is obtained through extraction of unique features from pixels of labeled images, which is called Supervised learning. An independent image enhancement algorithm processes the new images before transferring them to the classifier package in order to cope with image quality variation of the new photos provided by the end user. Upon completion, the user received the corresponding classification for the image uploaded. The motivation behind this project is the utilization of different frameworks used in Data Science to find a complete solution for an end user. It represents artificial intelligence since the machine learned by observation, not relying on coded specifications, and makes decisions (classification) with the acquired learning. Python libraries are used to process the data and databases are created to store the information, as well as to design and implement a user interface. A front End UI to display the results to the user is created.

Graph Node Classification Using Autism Genetic Interaction Network

Kyle Riccardi

Faculty Mentor: Danushka Bandara

Booth: 162, BCC Lower Level (PM)

Abstract

Autism Spectrum Disorder (ASD) is a heavily researched topic, but so far research has provided very few answers. ASD networks show the interaction between genes both related and not related to ASD. The goal of this model is to classify the relationship each gene has to ASD. The model used for this dataset required the ability to handle the lack of a relationship towards ASD, so to solve this problem we used two techniques, Up sampling and Graph Smote, to fix our imbalanced dataset. The dataset used is autismdb network and contains interaction between genes that do exist in the ASD gene list and ones that do not. The SFari dataset was used on top of the autismdb network to identify which genes are related and not-related. The experiments analyzed with this dataset were Graph Convolutional Neural Network with an Up sample, Graph Sage with an Upsample, Graph Sage using Graph Smote, and Graph Convolutional Neural Network using Graph Smote. These modeled experiments used a node feature mapping related to 1294 binary locations about the nodes. This feature mapping was used alongside the adjacency matrix of autsimdb network to classify the relationship genes have with ASD, which showed that Graph Neural Networks could be used to classify genes related to ASD.

Athlete Academy

Alex Rusu

Faculty Mentor: Xiaojiang Wu

Recording: https://www.dropbox.com/s/65botrzw33qwbhb/AlexRusu_PosterRecording.mp4?dl=0

Abstract

The analysis of soccer player performance is dependent on establishing and tracking granular metrics to determine players' respective strengths and weaknesses. The more granular the metrics and the longer they are recorded for, the harder it is for soccer professionals to understand their meaning if the data is not presented in an intuitive manner. The interpretation and relation of data collected by team managers in the field of athletics, for the purpose of developing pre-game objective scenarios such as tactical set plays, drills, or other player performance monitoring tasks, can be daunting, considering the high dimensionality of the data. Managers of a team can gather data using many disparate methods that relate to specific player attributes, such as speed, precision, or other performance values; however relating this data in a unified manner may be hard to do. The goal is to introduce an application called Athlete Academy, which is a visualization suite that addresses this challenge by providing detailed player statistics relating to player performance and dynamics in a metaphoric and intuitive way. Within the application, it will record data of athletes' skill sets and provide recommended drills and data analysis reports for young athletes, coaches, and parents to use. With Athlete Academy, a variety of natural field elements represent several data categories that cross-reference specific key player elements, and allow for the quick visualization and interpretation of data. The overall goal achieved was to create a metaphor-based data visualization appealing to the team manager, thus minimizing overall cognitive effort surrounding team player and attribute analysis.

Visual Representations of the Vulnerability Assessment for the Diocese of Bridgeport

John Shashaty, Philip Ruggirello, Joseph Scannell, Kyle Clarke

Faculty Mentor: Mirco Speretta, Elif Kongar

Booth: 163, BCC Lower Level (PM)

Abstract

The Diocese of Bridgeport is the Catholic Church network that spans all of Fairfield County, Connecticut. The organization is made up of 80 parishes, 24 elementary schools, 4 high schools, and 1 special needs school. The Diocese has been trying to improve their cybersecurity infrastructure in various ways. Among other initiatives, we support this effort by including a vulnerability assessment of various critical facilities within their organization. The goal was to highlight vulnerabilities which existed within their system and could provide various threat actors or hackers through an attack vector into their system. Our group used a variety of in-person and remote scanning techniques and tools to run the vulnerability scans. From each of these scans, we generated multiple extensive reports that included technical information regarding each specific open port, the service running on the port, and the vulnerabilities associated. Using various UNIX commands, our group was then able to condense these reports into more intelligible statistics that the organization would use in identifying glaring areas of vulnerability, and begin patching and resolving these weak points. We also use Tableau to visually show the data collected from the scans. This approach is already being used by other commercial scanning solutions. In our case, we would like to create a dashboard that has various levels of detail and, therefore, can be used by the management and technical personnel of the organization.

Selecting and Implementing a Cybersecurity Framework for the Diocese of Bridgeport

John Shashaty, Philip Ruggirello, Joseph Scannell, Kyle Clarke, Nadav Zarmi, Christian Hakim, Patrick Lappin

Faculty Mentor: Mirco Speretta

Booth: 164, BCC Lower Level (PM)

Abstract

The Diocese of Bridgeport represents the Catholic Church in Fairfield County, Connecticut. The diocese is making efforts to modernize their cybersecurity infrastructure to remain secure in the ever-changing cyberspace. The goal of this study is to support the improvement of their cybersecurity infrastructure by implementing the National Institute of Standards and Technology (NIST) Risk Management Framework (RMF). More specifically, this project focuses on the general families of controls outlined in the NIST Special Publication 800-53 (NIST 800-53). The NIST RMF provides guidance that addresses the Diocese's security requirements. RMF provides a comprehensive, flexible, and measurable 7-step process that any organization can use to assess risk and implement security controls. The steps include prepare, categorize, select, implement, assess, authorize, and monitor. The scope of this project includes the steps prepare, categorize, and select only. One of the main tasks of the prepare step is to collect information. This was accomplished by interviewing stakeholders from various teams in the diocese. The information gathered from the interviews provides a comprehensive overview of all the security requirements, both physical and online. The categorize step uses the data collected to identify assets, sensitivity levels, and risk acceptance criteria. In the select step, the last one in the scope of the project, we provide an interim 'Minimum Set' of controls for immediate implementation while continuing the evaluation of the remaining controls defined in RMF.

Analysis of the Correlation Between Housing Prices and Types of Crime in Boston, Massachusetts

Khalela Stevens, Timothy Murphy, Ekrem Uzun, Nuh Akbiyik, Rujia Lin

Faculty Mentor: Xiaojiang Wu

Recording: https://fairfield.zoom.us/rec/play/sTFR1u8gLLj22lPRGWAH2A1u23MNiphZsX2oEyUUEPaYjOs8u_A7ox9T9dDLjXwziVGEM9uhiaV-xk_1.FBYaCyjoXvTtAsLf?startTime=1649783511000&_x_zm_rtaid=uzC-E_9tSgmTFluQcqbZmw.1649876067412.e9fc7d9edc3a3c8b854264aaaa4b1dfe&_x_zm_rhtaid=631

Abstract

Our team analyzes the relationship between crime and housing prices in Boston, Massachusetts, in order to find out the factors that determine whether or not an individual will move into one of its neighborhoods. Boston's distinct neighborhoods have given it a colloquial reputation concerning its wealth and housing disparity--one of many other cities like it in the United States. Our team decided to conduct our own analysis to better understand the process of data collection and analysis, and bring further awareness to a common issue facing many individuals today. In doing so, we want to answer several questions such as: what kind of crimes affect housing the most? How has a low or high crime rate affected the various neighborhoods in the city? What specific crimes determine if a housing price rises or falls? To answer these questions, we gathered data from the Boston Police Department and Boston's average housing prices from Zillow's publicly available research data, and utilized several analytical methods such as T-Tests, correlation tests, time series analysis, along with creating several Machine Learning models and analyzing their feature importance. Furthermore, we created several visualizations with Tableau and Python to further highlight our research and draw factual conclusions about Boston's housing prices and crime rates.

3D Printed and Foamed Lattice Structures for Applications in the Engineering Industry

Dylan Weber

Faculty Mentor: Sriharsha Srinivas Sundarram

Booth: 166, BCC Lower Level (PM)

This Research Was Supported by Hardiman Scholars

Abstract

Structures currently used in the engineering industry for energy absorption include porous structures like foams, composites, and honeycombs. However, recent studies indicate the potential of triply periodic minimal surfaces (TPMS) for use in energy absorption applications and weight reduction. TPMS structures contain a minimal surface that can be replicated in 3 dimensions, forming a lattice, and portray beneficial characteristics worth researching. This study presents three TPMS lattice structures, namely the Gyroid, Fischer-Koch S, and PMY, which are fabricated in uniform and graded densities. These structures were created in the MS Lattice software and 3D printed using the Markforged and Makerbot printers. Some of the samples were subjected to a foaming process using carbon dioxide to investigate benefits of higher porosity in energy absorption. The structures were then characterized for compressive strength, thermal properties, surface hardness, and porosity. The results of the study show that the graded Fischer-Koch S structure, 3D printed with a composite base material, withstood 5,821 Newtons at 25 percent deformation, the most of any structure, while the gyroid exhibited the greatest compression modulus, at 24.12 N/mm2. Lastly, the results are discussed to infer possible applications in engineering industry.

The Sleep Prevention Mobile App

Daniel Wilson, Cesar Gavilano, Matthew Wojslaw, Malathi Rayakota, Nicholas Costanzo

Faculty Mentor: Elif Kongar

Recording: https://drive.google.com/file/d/1-QrBkt_tPhSSLh52hElToFDX_3_VTDVP/view

Track: Environment and Sustainability, Community Engagement

Abstract

Sleep deprivation is a common problem in today's high-paced work environment. In addition to adversely affecting daily life activities, the lack of sleep causes serious potential problems during daily travel. Drivers behind the wheel may end up drifting into sleep after a long day at work and may crash into other vehicles. While getting sleep is the optimal solution, sometimes it may not be possible. This study proposes a temporary mobile solution that can address this problem. The Sleep Prevention Mobile App will monitor the user as they drive to their intended destination. This app should ideally be used when traveling long distances and is optimal to catch the user dozing off as the long journey is likely to lull them into sleeping. Should the user show signs that they are dozing off, the app will alert them when they close their eyes. The app has a trained machine learning model that will recognize the difference between the user's eyes being closed or open and thus the proper judgment and response can be taken.

Independent Projects

Reconstructed Views

Ramsha Asad

Faculty Mentor: Cheryl Yun Edwards

Booth: 124, BCC Lobby (All Day)

Track: Diversity and Inclusive Excellence, Community Engagement

Abstract

My goal is to inspire people to look deeply into my work and see through my pictures. I focus on the frame of the camera, and finding frames within my surroundings that require me to take time composing my images. I chose to photograph at places of transit - train stations, convenience stores, street vendors - because hundreds of people pass through there and each has a different story to tell. At the train station, I documented that ambiguity. I chose to photograph people in between their journeys; one does not know if an individual is waiting, departing, or arriving. My project's main idea is to capture something uncertain and up to the imagination.

The Growth of Netflix and Creation of the Streaming Industry

Matthew Bevacqua, Caylee Gatto, Julie McGovern, Olivia Doody

Faculty Mentor: Vishnu Vinekar

Booth: 71, Dogwood Room (AM)

Track: Community Engagement

Abstract

This study in data analytics takes a deep dive into how the streaming industry's growth over the past ten years. Using information about the development of original content, subscriber growth in different regions, revenue growth, and stock value, we created a model that analyzes where Netflix targets its newest expansion points. Then, we used metrics such as ratings, success of shows, and ratio of originals to independent content to determine how and where Netflix might expand next, which, in turn, could be a possible metric for understanding how this wider industry influences the entertainment and interconnectedness of different communities. The majority of the data is concentrated between 2018 and 2021. We considered the pandemic's influence, but that is not the main focus of this research. The analysis was done using different visual models including Excel, RapidMiner, and Tableau. This analysis is useful to reviewing expansion opportunities for streaming services, and determining the value of an original content library on its financial standing. The data comes from existing sources such as Netflix's public data, NASDAQ, 3rd party collection, and datasets created from our group's research. This model could be used to examine other streaming services, but we would need public information over the last three years.

Connection

Olivia Burke

Faculty Mentor: Suzanne Chamlin-Richer

Booth: 126, Loyola Gallery (All Day)

Track: Diversity and Inclusive Excellence

Abstract

My works center around the moon, addressing social justice with themes of womanhood, unity, and identity. One painting, based on the poem ""The Two-Headed Calf"" by Laura Gilpin, includes two moons, representing the perspective of a calf whose two heads allow him to see twice as many celestial bodies. The moon is often characterized as a woman with the sun being a man. One piece depicts the singer Mitski, inspired by her song “Your Best American Girl,” about not feeling that she fits into the American beauty or cultural ideal as someone from Japan. She describes her love interest, an American man, as the sun, and herself as “not the moon.” The moon depicted as a woman also inspired my painting depicting various moon goddesses. The theme of the moon connecting us is expressed by people, non-human animals, and mythological figures all living in its presence, and by the knitted piece, inspired by the fact that everyone on Earth sees the same phase of the moon each day.

Don't Hit Mute, Play On

Kaitlyn Capone

Faculty Mentor: Shannon Kelley

Booth: 72, Dogwood Room (AM)

Track: Diversity and Inclusive Excellence

Abstract

This project analyzes two plays, *Othello, Moor of Venice* by Shakespeare and *Desdemona* by Toni Morrison, and draws comparisons to how the folk ballad, ""The Willow Song,"" is interpreted by the white character, Desdemona, and the Black character, Barbary, whom we meet fully in Morrison's adaption. First, I look at how ""The Willow Song"" depicts both characters' inner struggles in relation to their husbands' cruelty. Transitioning to Morrison, I analyze the added layer of inner suffering in connection to Barbary's race in *Desdemona*. I then analyze how such inner suffering is portrayed through ""The Willow Song,"" and how that relates to Barbary. I look at what Barbary calls her new song in the afterlife in *Desdemona* and how this solidifies that her suffering much more than what was brought on by her husband. I bring the reader on a critical thinking journey during which they see this underlying message that perhaps Shakespeare intended. I leave readers with some overarching themes by paying more attention to this underlying element of race in "The Willow Song," where no one feels that they are on mute.

Internalized Racism in Shakespeare's *Othello*

Finn Collins

Faculty Mentor: Shannon Kelley

Booth: 73, Dogwood Room (AM)

Abstract

Often in Shakespeare's *Othello*, the downfall of Othello is attributed to jealousy, but what many overlook is the deep-rooted mental impacts of the racism that Othello faces almost every time that he speaks with someone. Even his own wife, Desdemona, refers to Othello as ""the Moor,"" despite her unwavering loyalty to him. As the play progresses, Othello becomes riddled with insecurities, fueled by Iago's ability to take advantage of the doubts that Othello already has about himself because his identity is constantly reduced to his race. Desdemona's loyalty to Othello is utilized by Iago to heighten these insecurities. Iago's greatest talent as a manipulator throughout the play is his ability to exploit traits central to Desdemona and Othello to advance the undoing of Othello. Although Othello faces racism in his everyday life, directed at him from the outside, the preconceptions that this racism causes in Othello's mind, and Desdemona's loyalty to her husband, create the perfect environment for Iago to accelerate Othello's demise.

Telemental Health Training in Counselor Education: A Qualitative Study

T.J. Debicella, Lucy Edwards, Lisi Ewert, Yolanda Russell

Faculty Mentor: Jocelyn Novella, Dilani Perera

Booth: 74, Dogwood Room (AM)

This Research Was Supported by the McGuinness Mentorship Program

Abstract

Counselors-in-Training (CITs) during the COVID-19 pandemic had a radically different clinical training experience than is typical due to the sudden need for technological delivery of services. This qualitative study explores the lived experience of masters-level counselor education students as they navigated their clinical training in a telemental health environment. This research will inform CITs and counselor educators in several areas: 1) best practices in integrating basic counseling skills training with innovative delivery method training; 2) key aspects of switching to telemental health delivery; and 3) how CITs can manage crises during their clinical experiences.

Mr. Perfectly Fine

Jared DiPietro

Faculty Mentor: Suzanne Chamlin-Richer

Booth: 127, Loyola Gallery (All Day)

Abstract

Mental wellness has been neglected until the recent past with many, if not all, people, struggle with at some point in their lives. In my experience, it seems a tougher subject to discuss with my male friends. Men seem to think that mental health is not something that should be talking about. As a result, we keep our feelings bottled up, sometimes eating away at us. Not all men feel or act this way, but I found that it is a common behavioral trait. I bring these feelings of loneliness and isolation to light in my series. I validate these feelings and show that they are real. While I don't wish to offer a solution, I think that this project's validation aspect is a step forward. Ambient lighting was a key factor within this series. I love how natural ambient light looks on skin tones, and I prefer the look of natural to staged lighting. When using ambient lighting for images, I look mainly at windows and shadows. I focus on how the cast shadows cut through a room and where the light naturally falls. Once I find a shadow pattern that I like, I place a model in the space. I then move the subject around to ensure that the lighting hits them to compliment the subject's appearance. I often direct my subject to move in a way that the shadow cuts through them. I used lighting from a fish tank for some images since I could change to different colors and experiment with how they lit the subject. Images for this series were taken on a digital camera. I used a Canon 1DX with an 85mm f/1.2L lens. Feelings of isolation are difficult and irrational. Sometimes we feel isolated with those closest to us. I honed in on these emotions from a man's perspective. In my experience, it is more difficult for men to be open about feeling alone or disassociated. This work only serves to acknowledge and validate these feelings. I drew inspiration mainly from two artists. I began studying Gregory Crewdson and focused on the elaborate sets in his images. I also studied Edward Hopper and his use of lighting. His shadows are very linear and geometric. I found lighting and shadows that drew parallels to his. Crewdson's work typically uses very cool tones, while Hopper's has many warm tones. My work reflects both. My series depicts a character experiencing isolation and disassociation. He is seen looking into a fish tank feeling envious of their perfectly groomed world tailored specifically for them. He is also placed in a perfectly lit room as the warmth hits his face during the sunset. Even though he is in what seems to be a dreamlike serenity, he still feels lost. He is always alone; he does not seek help from others because he feels like he is perfectly fine. He is Mr. Perfectly Fine.

Untitled (Finding Ambient Light)

Jared DiPietro

Faculty Mentor: Cheryl Yun Edwards

Booth: 123, BCC Lobby (All Day)

Abstract

For this series, I focus on using only ambient lighting. This forces me to do some problem solving. I have to work with the lighting that I am seeing. I focus on a small area of a room, and make sure that my model is framed well within the space that she is in. I direct her to appear like she is displaced in her surroundings by utilizing certain facial expressions or looking in a direction away from me. Conceptually, I validate the feeling of isolation and loneliness. My subject seems lost in her own home, a place where we think someone should feel most comfortable. Yet, she seems even more vulnerable within her own place of living. I study Gregory Crewdson and gain inspiration from his elaborate sets and his ability to tell a story through his tableaus. I am inspired by how Crewdson is so skilled at conveying a visceral feeling simply through a staged tableau.

Anatomy of a Self-Care Infused Graduate Program

Ashley Evans, Isabella DelVecchio, Abigail Side

Faculty Mentor: Paula Gill Lopez

Booth: 75, Dogwood Room (AM)

This Research Was Supported by the Lawrence Family Fund

Abstract

This project describes a school psychology graduate program with a strong emphasis on self-care – in program literature, school catalogs, website, graduate information sessions, admissions interviews, and coursework. Examination of existing student documents (e.g., admissions notes, course evaluations, intern reflections, emails, etc.) reveals the tremendous value and appreciation that students have for the self-care focus. Students' own voices tell the story of the benefits of infusing self-care into a graduate program.

Elemental Shifts: New Directions in Experimental Cyanotype

Leslie M. Gasper

Faculty Mentor: Kathryn J. Yarrington

Booth: 122, BCC Lobby (All Day)

Track: Community Engagement

Abstract

I create experimental abstract art using Cyanotype, an alternative photographic process utilizing chemical compounds, sunlight, water, and other natural materials that react to create art in tones of blue and white. Unlike traditional Cyanotype techniques, I apply Cyanotype chemicals and natural toning materials directly on paper and manipulate their flow while they are exposed to the sun in a method commonly called “Wet Cyanotype.” While developing the piece in sunlight in order to complete the reactive process, I tightly photograph the changing colors that fleetingly appear during the exposure. Once immersed in water, these colors transform and are fixed into the blues and whites common to Cyanotypes. I also incorporate mixed media such as inks and paints in my works. My experimental techniques and abstract art pieces are fairly unusual in the field of Cyanotype. I share them with other artists and community members through exhibits, workshops and videos.

Connection Capstone Exhibit

Emily Giovannone

Faculty Mentor: Suzanne Chamlin-Richer

Booth: 128, Loyola Gallery (All Day)

Track: Environment and Sustainability

Abstract

This project focuses on my large drawing of Michelangelo's David. However, I did not want to exclude everything else that I had worked on. Many of my initial ideas were to convey environmental activism through art. I drew from many references, including old *National Geographic* magazine covers, which reinforced my skills of drawing from observation. Sketching David was a personal project that I ultimately wanted to incorporate it into the exhibit. My exhibit is a culmination of thoughts, ideas, and drafts this semester. It is important to hold these personal values close when making art. Finding that connection that truly inspires you is the first step.

Telling Stories and Constituting Democracy: The Supreme Court and Executive Authority, 2000-2020

Vincent Gritzuk

Faculty Mentor: Gwendoline Alphonso

Booth: 76, Dogwood Room (AM)

This Research Was Supported by the Vincent Rosivach Faculty Student Collaborative Research Fund

Abstract

In several ways, the Trump presidency has unsettled established norms, patterns, and expectations of presidential behavior and the role of the presidency within American democratic government. With the onset of the Trump presidency, scholarship on American political development has grappled with the extent to which the Trump era is an anomaly or part of more long-term political trends, newly examining urgent questions related to democratic backsliding and existential threats to democratic government in the United States (US). As scholars point out (Mettler and Liberman (2020), Levitsky and Ziblatt (2018), contrary to conventional wisdom, the US has undergone repeated crises of democracy. In particular, they identify recurrent threats that – alone or in combination - plague the American democratic experiment: political polarization, racism and nativism, economic inequality, and excessive presidential power. Importantly, they find that what is unique, and alarming, about the current moment in American politics is that we face a confluence of all four threats at once. This formidable confluence makes the contemporary era an especially grave moment for democracy in the US. The new field of American political democracy shows that the occurrence of these threats is not unprecedented. However, these examinations center on legislative-presidential relations and legislative and presidential data/sources and thus fail to consider the unique role of the Supreme Court, how the judiciary quells, modifies, or reflects these democratic threats. This project attempts to do just that. Focusing on the modern era, 2000 to present, the project examines the role of the Supreme Court, as the Constitution's ultimate political-institutional arbiter, during times of heightened democratic threats and asks these research questions: How does the Court, through (a) its choice of cases and (b) construction of judicial doctrine and discourse, shape political discourse on democracy? In particular, the project asks: How does the Court decide on issues concerning executive power, and what impact does it have on American democracy?

A Recreation of a Lost Wall Painting Depicting the Centauromachy from the Theseion

Tyler Heffern, Molly Lamendola

Faculty Mentor: Katherine Schwab

Booth: 77, Dogwood Room (AM)

Abstract

Within Greek art, the Centaur is a creature that figures prominently in the Centauromachy, the mythical battle between the half-horse-half-human creatures and the Lapiths at the wedding feast of Perithoos. Depicted throughout much of the later centuries of Greece in vase painting and sculpture, including the Parthenon south metopes, it is believed that renditions in and after the fifth century BCE are largely based on a lost wall painting dating to the 460s BCE from the shrine known as the Theseion in Athens, as described by Pausanias. Using images from extant works in the visual record dated to around the time of, and after, the wall painting's projected completion as reference, we attempt to reconstruct this important scene. We support these decisions with primary and secondary literature, and descriptions of the mythical battle in order to contextualize elements of the painting as appropriate.

Cryptocurrency has Arrived; United States Accounting Guidance has Not

Nikki Koval

Faculty Mentor: Dawn Massey

Booth: 79, Dogwood Room (AM)

Abstract

Bitcoin. Ethereum. Tether. All are cryptocurrencies or ‘digital’ assets used for transacting business and investing. These top three cryptocurrencies (out of 18,000+ in use as of March 2022) came into existence after 2008 and, despite their relative newness, have amassed a combined market capitalization of ~$2.0 trillion or ~25% more than Amazon’s ~$1.5 trillion market cap. Given these numbers, cryptocurrencies are clearly important to the business community, broader economy, investors, and creditors. Yet, the United States accounting standard-setter – FASB – has done little to provide guidance in accounting for crypto assets and transactions. This project reviews FASB’s work on accounting for crypto assets and transactions, and compares it to that of FASB’s international counterpart, the IASB. I then review alternative accounting treatments that may relate to crypto assets and transactions, and present my recommendations for best practices. I conclude by discussing my work's implications.

Log Cabin Republicans and the Construction of Male Citizenship in the GOP

Molly Lamendola

Faculty Mentor: Gwendoline Alphonso

Booth: 78, Dogwood Room (AM)

Track: Diversity and Inclusive Excellence

Abstract

This project observes differences in the construction of traditional male citizen pillars by the activist group known as the Log Cabin Republicans (LCR), the nation's oldest and largest Republican organization dedicated to LGBTQ+ issues, and the Republican Party as a whole. By observing the progression of LCR's mission statement and statements from 1996 to the present regarding the pillars of marriage and soldiering, we see that the Log Cabin Republicans attempted to prove that the traditional male citizenship pillars were not impacted by someone's sexuality. By comparing the LCR's Mission Statements to the evolving party platforms of the GOP from 1996 to the present, it is seen that the GOP believed that sexuality directly impacted someone's ability to participate in marriage and soldiering traditions and thus was not a compatible pillar of traditional male citizenship.

Connection

Christopher Maidoh

Faculty Mentor: Suzanne Chamlin-Richer

Booth: 129, Loyola Gallery (All Day)

Track: Diversity and Inclusive Excellence

Abstract

This project focuses on the unique styles of hair in African American culture. Through my art, I shine light on the importance of hair in our community and how it is like a crown for African Americans. Growing up in a household of girls, I found it interesting how my sisters would do each other's hair. It was interesting to see how many different styles there were. Just knowing how to do hair was so important because it was a representation of yourself. Taking care of your hair is important and just like a garden or plant, you have to take care of your hair in order to maintain it. I was very motivated to bring you into my world and show you how I see things. The different aspects of one's culture can anchor and sooth, and provide a place to nurture oneself and create unique cultural standards for how to express oneself.

Meta Platforms and the Metaverse: A Capitalist, Temporal Culmination

Jack Martorano

Faculty Mentor: Annemarie Iddins

Booth: 81, Dogwood Room (AM)

Abstract

Amidst the COVID-19 pandemic in October 2021, Facebook co-founder and CEO Mark Zuckerberg announced that the company would undergo a rebranding to “Meta.” Zuckerberg’s announcement revealed a rebranding of Facebook and aspirations for an all-encompassing virtual reality conceived of as a meta-platform. This project asks what Facebook’s discourse about the metaverse indicates about the evolution of platforms in relation to political economy and their impact on social time. Scholars argue that the rise of platforms has coincided with a new stage of capitalism described as “platform capitalism” (Srnicek, 2016) or “surveillance capitalism,” (Zuboff, 2019) and that platforms have blended labor and leisure time (Faucher, 2018). This project analyzes Facebook and Zuckerberg’s public discourse around Meta and argues that this rebranding represents the culmination of multiple larger phenomena, including the political and economic conditions, at work since the later part of the twentieth century. This project also explores social media platforms and the metaverse’s potential impact on the transformation of human experience as it relates to the broader construct of time.

The Roles and Experiences of Women in The Spanish Civil War

Kelly-Ann McAlice

Faculty Mentor: Jerelyn Johnson

Booth: 82, Dogwood Room (AM)

Abstract

The research explores the roles and experiences of women during the Spanish Civil War, which lasted from 1936-1939. The war, and the subsequent reign of Francisco Franco, profoundly impacted the lives of women in Spain. This project investigates existing research, including primary sources from the time period, film, and literature. *La Voz Dormida,* a novel by Dulce Chacón, is based on the true experiences of several women imprisoned for their involvement in or support of the war and provides insight into the reality of the time period for so many. The impact of women who participated in the Spanish Civil War on both sides has often been overlooked. This project explores and discusses this impact and the effects of the war and its aftermath on the everyday lives of women in Spain.

Apollon XIV: Publishing the World

Dylan McDermott, Dean Hartl, Nicolas Peeples, Abigail White

Faculty Mentor: Silvia Marsans-Sakly

Booth: 121, BCC Lobby (Noon-2)

Track: Diversity and Inclusive Excellence

Abstract

Students in "HU 3210 DIGITAL HUMANITIES: Publishing Practicum" assume the roles of editor, copy-editor, and peer reviewer and responsibility for creating the content of *Apollon* (www.apollonejournal.org), a digital journal with an eleven-year history that publishes double-blind peer-reviewed undergraduate research in the humanities from universities all over the globe. HU 3210 is an immersive, skills-based seminar for humanities majors designed to help students gain marketable job skills in the publishing industry. Students in this course have an opportunity to engage in the following activities associated with managing an undergraduate research journal and producing its annual issues: write and post a call for papers; manage submissions; read and evaluate submissions; compose rejection, acceptance, and revise/resubmit letters; compose reader reports; maintain professional correspondence with contributors/clients; market and publicize the journal through social media platforms; and line edit accepted submissions. Because this is a digital journal, students learn to use Google Analytics; curate existing digital content, including podcasts and video content; evaluate digital humanities submissions; develop an e-book for each issue; and maintain an existing archival system.

Desdemona: Filling in Shakespeare's Missing Pieces

Katherine Peterson

Faculty Mentor: Shannon Kelley

Booth: 83, Dogwood Room (AM)

Track: Diversity and Inclusive Excellence

Abstract

In this project, I argue that Toni Morrison's play *Desdemona* highlights factors hidden from audiences throughout William Shakespeare's play: *Othello: The Moor of Venice*. These factors, which she introduces through her modern day adaptation, encourage readers to empathize with Othello rather than blame him for his actions. I discuss various characters introduced by Morrison such as Othello's mother and the Barbantios' slave, and I reference and analyze several of Othello's powerful claims that he makes in the afterlife. These new perspectives ultimately humanize Othello, and give him a voice, which is seemingly limited in the play's original version. Nearly four hundred years later, Morrison's adaptation satisfies modern day readers who recognize the extremely apparent racial bias from which Othello suffered. Consequently, Morrison fills in Shakespeare's gaps and kindles a long overdue empathy for one of the most prominent black characters from the 1600s.

National and International Approaches to Sustainable Economic Development

Carmen Phan

Faculty Mentor: Kathryn Nantz

Booth: 84, Dogwood Room (AM)

Track: Environment and Sustainability

This Research Was Supported by the Corrigan Scholars Fund

Abstract

This project explores various approaches to sustainable economic development. Kate Raworth's doughnut economic model and the circular economy model are analyzed. The doughnut economic model shows that an optimal regenerative economy lies between a strong social foundation that meets human needs and the boundaries of the Earth's ecosystem. A study that examined the effect of GDP growth and GDP per capita on renewable energy consumption in developed and developing countries is also included. The results suggest that increases in GDP per capita of a nation associate with decreases in the renewable energy consumption rate. This could be attributed to the hypothesis that some countries with higher GDP per capita benefited from industrialization that relied on fossil fuels.

Connection: Group Capstone Exhibition

Annie Tran

Faculty Mentor: Suzanne Chamlin-Richer

Booth: 130, Loyola Gallery (All Day)

Track: Diversity and Inclusive Excellence

Abstract

REPAIR is a project that honors the art of kintsugi, a Japanese art that uses gold in pottery restoration. On a similar note to its philosophies, I honor the repair that comes with maintenance of relationships over time. Being able to face uncomfortable feelings with one another fosters relationships that are even more beautiful. This can apply to any of our relationships, including the ones that we share with our parents, friends, family, community, and country. My process involves breaking objects that represent different relationships in life: my relationship with my family… my Asian-American relationship with my community... women's relationship with society... many more. As opposed to creating my pieces from scratch, many of the objects that I chose were ones I repurposed, contemplating the history of the object as it already exists. I wish to bring hope to our human histories, serving as a reminder that things can always change if we bring empathy and vulnerability into the conversation.

Women’s Obedience To Their Male Counterparts - A Dead End

Gianna Valela

Faculty Mentor: Shannon Kelley

Booth: 86, Dogwood Room (AM)

Abstract

This project explores female compliance to the male gender, and how such a notion ultimately leads to women's demise. To effectively convey this argument, an analysis of Desdemona and Emilia, two female characters from the Shakespearean tragedy, *The Tragedy of Othello, The Moor of Venice*, both of which exhibited the traits of the typical and highly sought after “virtuous woman” of the sixteenth and seventeenth centuries, was conducted. Though both Desdemona and Emilia displayed the efforts of the archetypal obedient wife, both women suffered devastating deaths by the play’s end. However, one female remained by the play’s conclusion: Bianca, the prostitute. In essence, Bianca’s survival further emphasized the notion that women’s obedience to their male counterparts leads to their downfall, as the one woman who refused to comply with any man was the only woman to live.

Representations of the Holocaust in Spanish Literature and Film

Sydney Youd

Faculty Mentor: Jerelyn Johnson

Booth: 87, Dogwood Room (AM)

Abstract

One common historical misconception is that Spain was neutral during World War II. The Spanish dictator Francisco Franco's role in the War and atrocities committed in the Holocaust are often overlooked. However, in the early 2000s, the people of Spain began to more openly discuss their history, especially that of the Spanish Civil War. A closer look at recent cultural explorations of Spain’s troubled past show that Spain and the Holocaust have a greater connection than once thought, and many recent cultural works from Spain include treatments of the Holocaust. This project analyzes representations of the Holocaust in contemporary Spanish literature and film in order to show the intersection between Franco and Hitler. Spain and the Holocaust are inextricably linked. One cannot fully understand the Holocaust without understanding Spain’s involvement, and the history of Spain without understanding its involvement in the Holocaust.

Fairfield University Jazz Ensemble Spring Concert with Special Guest Arti Dixson, Drums

Brian Salvador , Andrew Becker, Brody Biebel, Thomas McKenzie, Alec Gonzalo, Olivia Knode, Brady Hanney

Faculty Mentor: Brian Torff

Booth: Gonzaga Auditorium (Evening)

Abstract

We will perform the music of Steve Winwood, Nat Adderly, Brian Salvador, Brian Torff, and Fairfield University Alumni Lynn Andrianni in the Gonzaga Auditorium at 7:30 p.m.

Project X Screening

Theatre Fairfield

Faculty Mentor: Lynne Porter

Booth: BCC Lobby (All Day)

Track: Diversity and Inclusive Excellence

Abstract

Project X is an original Theatre Fairfield production about race and privilege. It is centered on Fairfield University, but reflective of America's twenty-first century struggle with race and social justice. Some topics are so important that we need to use the actual words of actual people, not invented dialogue by a playwright. Hence, the dialogue was pulled from hundreds of hours of interviews of Fairfield students, faculty, staff, and alumni. A core team of theatre artists worked for six months, researching and gathering the interviews. Then playwright Judy Tate worked with director Godfrey Simmons in crafting the final script. Both Judy and Godfrey are award-winning professional theatre artists of color. Theatre Program faculty, students, and alumni are passionate about helping America and the theatre industry become more inclusive, respectful, and anti-racist. In our small corner of Fairfield University, in the small town of Fairfield, Connecticut, we know that we are part of making positive, lasting change. *Project X* was performed and recorded in December 2021. This was a script-in-hand reading, which allowed for a short rehearsal process and flexibility with the evolving script. Performed by Theatre Fairfield. Written by Judy Tate. Directed by Godfrey Simmons, Jr. Produced by Prof. Lynne Porter.