

HEALTH SCIENCES IN  
**PANDEMIC  
TIMES**



**41<sup>ST</sup> ANNUAL**  
RESEARCH AND EDUCATION FORUM  
VIRTUAL MODALITY • MAY, 2021

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UNIVERSITY OF PUERTO RICO

• **Abstract Supplement** •



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# Virtual Forum Description

**A**s a result of the coronavirus pandemic, in March 2020 the 40th Annual Medical Sciences Campus Research and Education Forum was cancelled as a measure of safety to protect the academic community. In order to maintain the continuity of the processes of education, research and dissemination of knowledge, the Dean of Academic Affairs delegated to the Forum's Organizing Committee the task of establishing a structure that would make it possible to develop the 41st Annual Forum using technologies and virtual learning environments.

The proposed structure guarantees protection and institutes measures throughout the various phases of the event planning, logistics and implementation process, under a framework of flexibility and integration of learning technologies. In addition, it is based on models and practices that have been successful at similar events during the pandemic. The 41st Annual Research and Education Forum of the Medical Sciences Campus of the University of Puerto Rico will be held from May 17 to 28, 2021.

This scientific event will take place in asynchronous virtual mode. The scientific program of the event will consist of a plenary session, oral presentations and posters. In the case of posters, authors are expected to be able to process a short video with the specific elements of their work. In addition, authors will be provided with specific instructions for developing their technology-mediated presentations in a virtual environment. The Organizing Committee invites the academic community and graduates in the fields of health sciences to submit their work to present in the category of oral or poster.

## Abstracts\*

### VIRTUAL SPECIAL ORAL SESSION

•4112•

#### **Mitochondrial energy metabolism differs between juvenile, average and late onset Huntington's disease skin fibroblasts**

*Sol V. Pérez-Mártir and Sylvette Ayala-Peña, Department of Pharmacology and Toxicology, University of Puerto Rico*

Huntington's disease (HD) is a neurological disorder caused by an expansion of a cytosine-adenine-guanine (CAG) trinucleotide at the huntingtin gene. CAG repeat length correlates with age of onset of the disease, however, individuals with identical CAG repeat lengths exhibit variability in the age of onset, suggesting that other factors modulate the emergence of symptoms. Mitochondrial dysfunction is a hallmark of HD and may play a role as a modifier of the age of onset. A study showed that fibroblasts from average onset HD patients exhibit lower maximal respiration and spare capacity compared with late onset fibroblasts. Other study showed no significant differences in mitochondrial respiration between juvenile onset fibroblasts and healthy fibroblasts. Therefore, it remains unclear how mitochondrial energy dysfunction is associated with HD age of onset. We hypothesize that mitochondrial bioenergetics will differ according to the age of onset. To test our hypothesis, we measured mitochondrial oxygen consumption rate and glycolysis in primary skin fibroblast cell lines from a healthy, juvenile, average and late onset HD affected individuals using an extracellular flux analyzer. Juvenile onset fibroblasts show similar basal, maximal, and spare respiratory capacities as healthy fibroblasts, whereas average and late onset fibroblasts exhibit reduced respiration and reserved capacity. Fibroblasts from average and late onset HD patients exhibit lower basal, maximal and reserve respiratory capacity compared to healthy controls, and differences between average and late onset fibroblasts were observed only in the levels of reserve capacity. Extracellular acidification rate did not differ between the cell lines. We conclude that juvenile onset skin fibroblasts may compensate for HD-

associated mitochondrial energy deficit, suggesting that the CAG repeat expansion may determine the mitochondrial and cellular energy status. This work was supported by NIH grants SC1 NS095380 (SAP, ), R25 GM061838 (SAP) and U54 MD 007600.

•4121•

#### **Older Women's Experiences of Intimate Partner Violence: A Phenomenological Study**

*Lourdes Irene López, PhD, MSN1 & Karen Kalmakis, PhD, MPH, FNP, FAANP2, University of Puerto Rico, Medical Sciences Campus, San Juan, Puerto Rico1, University of Massachusetts, Amherst, Massachusetts, USA2*

Background and Objectives: Intimate partner violence (IPV) is a global public health problem, linked to long-term health, social, and economic consequences. Despite the growing number of women over age 60 in Puerto Rico, knowledge is lacking about culturally specific IPV in women of this age group. This lack of knowledge is problematic because women experiencing abuse often do not report it, health professionals are not educated to identify cases of abuse in older women, and researchers often includes IPV with other types of abuse, such as negligence by families. The research aims were to explore the experiences of IPV in a sample of Puerto Rican women over 60 years of age and to consider the effects of IPV on women's health. Methodology: An interpretative phenomenological approach was used to understand the experiences of older Puerto Rican women exposed to IPV. Data was collected using in-depth interviews and then carefully read and analyzed to identify codes and themes according to Colaizzi's strategy (1978). Findings: A total of six women participated in this research study. Five emerging themes were used in the analysis and interpretation. These were adverse childhood experiences, IPV influences, IPV implications, support structure for coping with IPV, and coping strategies. The findings revealed that participants began to experience adverse events in childhood. These events influenced the IPV experience in the relationship. Exposure to IPV initiated at the beginning of the relationship and lasted until after

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the age of 60. The patriarchal culture factors also influenced the experience of IPV. Conclusion: These experiences are related to harmful effects on mental and physiological health. The health management and early identification of IPV, along with referrals to centers dealing with trauma or violence, help the victim receive the appropriate interventions to break the cycle of violence. IRB Protocol # 2017-3970

•4125•

**Case report: Surfactant Protein C Deficiency in a Puerto Rican Adolescent with a Rare SFTPC Genetic Variant**

*Jesus M. Melendez Montañez, BS1; Victor M. Acosta Rivera, BS1; Wilfredo De Jesús Rojas, MD, FAAP1-2, 1Ponce Health Sciences University, School of Medicine, Department of Pediatrics, Ponce, Puerto Rico, 00716, 2University of Puerto Rico, Medical Sciences Campus, School of Medicine, Department of Pediatrics, San Juan, Puerto Rico, 00921*

Purpose Surfactant Protein C (SP-C) is a hydrophobic lipoprotein necessary for lung metabolism and immunity. Malfunction of SP-C due to SFTPC genetic mutations have been increasingly identified in patients presenting with childhood interstitial lung disease (chILD). We present an oxygen-dependent 12-year-old Puerto Rican male with chILD and severe pulmonary hypertension caused by a rare SFTPC mutation. To our knowledge, this is the first documented case of SP-C deficiency in the Puerto Rican population. Case Description A 12-year-old adolescent Puerto Rican male who presented with a history of progressive dyspnea on exertion, recurrent wheezing, bronchiolitis, pneumonia and chronic respiratory failure beginning at six months of age. Patient was born at term without neonatal respiratory complications and no significant family history of pulmonary disease. Physical examination was remarkable for oxygen saturation of 85% at room air, generalized digital clubbing but bilateral clear lung sounds. Baseline spirometry demonstrated restrictive airflow pattern (FVC: 63%, FEV1: 61%, FEV1/FVC: 96%). High resolution computer tomography (HRCT) of chest showed bilateral ground-glass opacities, multiple pleural cysts, bronchiectasis and honeycomb lesions. Lung biopsy reported findings consistent with interstitial lung disease (ILD), cystic changes of airspaces and bronchiectasis. Cardiac

catheterization was remarkable for severe pulmonary hypertension. Genetic testing resulted positive for one likely pathogenic variant in the SFTPC gene, IVS4+2, located on c.435+2T>C which is associated with SP-C deficiency. Treatment was initiated with Hydroxychloroquine, Azithromycin, Sildenafil and monthly serial pulses of methylprednisolone with close monitoring of clinical response. Conclusion We present the first known documented pediatric case of SP-C deficiency on a Puerto Rican patient. A high index of clinical suspicion and early pulmonary consultation with expertise in chILD and SP-C deficiency is vital in order to prevent or delay further lung disease. Additional case reports are needed to understand more about the genetics of SP-C deficiency in Puerto Rico. Acknowledgments Funding: This research was funded by the Hispanic Center of Excellence, University of Puerto Rico School of Medicine, Grant Number: D34HP24463, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce.

•4126•

**Uncertainty and unwillingness to receive a COVID-19 vaccine in adults residing in Puerto Rico**

*Cynthia M. Pérez1, PhD, Stephanie Cameron2, BS, Lyz E. Negrón1, BS, Vivian Colón-López3, PhD, Uriyoán Colón-Ramos4, PhD, Josiemer Mattei5, PhD, Emma Fernández-Repolletó, PhD & Andrea López-Cepero1, PhD1Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences Campus, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; 2Department of Biology, University of Puerto Rico-Cayey, Cayey, Puerto Rico; 3Health Services Administration - Evaluation Program, Graduate School of Public Health, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; 4Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington, D.C.; 5Department of Nutrition, T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts; 6 Department of Pharmacology, School of Medicine, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico.*

**Background & Objective:** COVID-19 vaccination is essential to control the pandemic. Estimates of COVID-19 vaccination intent and factors associated with it remain unclear in Puerto Rico (PR). We documented uncertainty and unwillingness of COVID-19 vaccination in PR adults and examined factors associated with vaccination intent. **Methods:** The Health Belief Model (HBM) was used to develop an online survey. Analyses included adjusted logistic regressions. A total of 1,911 adults completed the survey from December 2020 to February 2021. **Results:** Overall, 82.7% reported an intent to get vaccinated. Individuals who did not perceive that their chances of getting COVID-19 were high (OR=2.94; 95%CI=2.24-3.86), or that getting COVID-19 was not a possibility for them (OR=2.86; 95%CI=2.19-3.74), or that were not afraid of getting COVID-19 (OR=3.80; 95%CI=2.76-5.23), had higher odds of uncertainty and unwillingness. Participants who perceived that COVID-19 complications were not serious had higher odds of uncertainty and unwillingness (OR=7.50; 95%CI=3.94-14.3), whereas those who did not perceived that they would get very sick with COVID-19 had 89% increased odds. Those who agreed that they will only take the vaccine if many in the public take it had higher odds of uncertainty and unwillingness (OR=3.32; 95%CI=2.49-4.43). Most commonly reported reasons for uncertainty and unwillingness towards vaccination were vaccine safety (63.8%), efficacy (49.4%), and novelty (45.5%). **Conclusions:** Although COVID-19 vaccination intent was high, the study highlights concerns over vaccine safety and efficacy that should be addressed by public health campaigns and interventions to enhance vaccine uptake. **Acknowledgements:** This work has been partially supported by UPR-RCM RCMI (Grant U54-MD007600).

•4140•

### **Estrategias de Afrontamiento a la Sobrecarga de Cuidadores de Pacientes con Enfermedad Renal en Diálisis**

*Camille Reyes-Vega<sup>1</sup>, Marta Rivero- Méndez<sup>2</sup>.  
1Estudiante Universidad de Puerto Rico Recinto de Ciencias Médicas; 2Preceptora y Facultad de Escuela de Enfermería Programa Graduado de la Universidad de Puerto Rico Recinto de Ciencias Médicas*

**Trasfondo y Objetivo:** Asumir el rol de cuidadores hacia personas con enfermedad renal y en diálisis durante un periodo de tiempo prolongado puede desembocar en el síndrome de quemazón que hace a la persona inoperante y emocionalmente inestable; perjudicando su salud y la del receptor del cuidado. Este estudio tuvo como propósito explorar las estrategias de afrontamiento que implementan los cuidadores de pacientes con enfermedad renal en tratamiento de diálisis para lidiar con la sobrecarga. **Método:** Cualitativo con diseño fenomenológico-descriptivo con entrevistas semi-estructuradas a profundidad a 4 cuidadores. Se recogieron datos sociodemográficos y se aplicó la Escala de Sobrecarga del Cuidador de Zarit. Se realizó análisis temático según el método fenomenológico de Colaizzi. **Resultados:** Se identificaron 6 temas centrales: Inicio como cuidadores, Vivencias como cuidadores, Perspectivas como cuidadores, Sobrecarga y Estrategias de afrontamiento, Necesidades del cuidador y Receptor del cuidado. Las estrategias de afrontamiento adaptativas incluyeron: ejercicios de respiración, oración y tejer. Sin embargo, los cuidadores se enfrentan a constante sentimientos para dejarlo todo, evitar comunicarse y recurrir a conductas de riesgo. **Conclusión:** Para atender la sobrecarga en los cuidadores, se requiere de trabajo interprofesional e intervenciones enfocadas en aliviar la carga y procurar la calidad de vida de las personas en el hogar. Aunque los cuidadores/a utilizan algunas estrategias adaptativas, es importante que este marco de estrategias se amplíe con el debido apoyo institucional y del estado para que el receptor del cuidado pueda recibir un cuidado óptimo, mientras que el cuidador/a alivia su carga y mantiene su salud. **Agradecimientos:** A los cuidadores participantes, al personal administrativo de Fresenius Kidney Care, a la Prof. Marian Saadé por facilitar acceso al escenario y a la Sra. Solymar Solís Báez, Directora del Centro de Investigación y PBE de Enfermería por su apoyo durante el estudio. Protocolo #7530119

•4144•

### **A cross-sectional and correlational study about the effects of the COVID-19 pandemic in healthcare services utilization in Puerto Rico**

David I. Latoni-Morales, MPH1; Stephanie Núñez-González, MPH1; Valerie Amaral-Nieves, MPH1; Alexandra M. Vélez-Martínez, MPH1; Jorge E. Colom-Diez, MPH1; Maygan Cuevas-Oquendo, MPH1; Natalie I. Emanuelli-Vázquez, MPH1; Kiara Hernández-Cárdenas, MPH1; Lizahar M. Hernández-Velázquez, MPH1; Andrea B. Lastra-Annexy, MPH1; Paola N. Riquelmy-Andino, MPH1; Janice Rivera-Martínez, MPH1; Carlos M. Zaccheus-Vizcarrondo, JD, MA, MPH1; Marisol Peña-Orellana, EdD, MSc1; Ruth Ríos-Motta, PhD1,2; Luz E. Cruz Romero, MBA3; Liza I. Millán-Pérez, PhD1; (1) General Public Health Master Program, Department of Health Services Administration, University of Puerto Rico, Graduated School of Public Health, UPR-Medical Sciences Campus, (2) Health System Analysis and Management Doctoral Program, Department of Health Services, Administration, Graduated School of Public Health, UPR-Medical Sciences Campus, (3) Executive Director, Medicaid Program, Puerto Rico Department of Health.

**Background & Objectives:** The COVID-19 pandemic is a historical event in the modern era of public health and medicine. A concerning factor is the impact of the SARS-CoV-2 virus over the use and delivery of healthcare services and population health. This study assessed the effect of COVID-19 in the use of health services in Puerto Rico. A reduction in their use was hypothesized. **Methods:** A cross-sectional, descriptive and correlational study was conducted from May to June 2020, with an online questionnaire distributed through social media for Puerto Rican residents. Univariate and bivariate data analysis were performed for predisposing, enabling, need and environmental variables influenced by COVID-19, and the use of health services variables. **Results:** Of 2,501 participants, the median age was 39.0, 81.3% were female, 37.8% had a bachelor's degree, 72.6% an annual income of \$19,000 or less, and 60.4% a public health insurance. A 92.4% indicated interrupted use of health services amidst the pandemic. Of these, 41.3% reported cancelled medical appointments by their providers, and 32.5% postponed appointments. About 49.4% did not attend healthcare settings due to fear. Only 6.4% were unable to obtain a medical prescription for continued treatment, and 2.5%

experienced trouble paying deductibles. Associations were found between the interrupted use of healthcare services and two variables: the perceived steps the Government of Puerto Rico should take, and the pre-existing medical conditions of individuals. **Conclusion:** The study findings suggest that use of health services in Puerto Rico was affected by the ongoing COVID-19 pandemic, markedly shown in the cancellation of medical appointments. This study presents the need for interdisciplinary collaboration, safety measures and policies to ensure an adequate provision of health services in future emergencies. **Acknowledgements:** We would like to thank the Medicaid Program, Puerto Rico Department of Health for their help delivering the survey electronically. IRB Protocol: B1000120

•4154•

### **Significancia del Campamento Vida y Salud para Adultos Mayores**

Wanda I. Colón-Ramírez, Karla J. Mercado-Rolón, Karla Santiago-Morales, Emanuel Dávila-Collazo, Fabiola González-Leandry. Universidad de Puerto Rico Recinto de Ciencias Médicas

**Trasfondo y Objetivos:** Los seres humanos forman su diario vivir a través de historias e interpretaciones de experiencias vividas. Es necesario conocer cuál es la ganancia de programas de promoción de salud para los adultos mayores. El propósito de esta investigación fue estudiar la significancia de la experiencia vivida de un grupo de adultos mayores al participar por tres años en el Campamento Vida y Salud del RCM-UPR. Específicamente explorar cómo la experiencia evolucionó, qué significado adquirió, y cómo se entrelazó en su línea de vida. **Metodología:** Se utilizó un diseño cualitativo narrativo (Clandinin & Connelly, 2006), con muestra de informantes claves, cuatro adultos mayores de 69, 75, 82, y 90 años, a través de entrevistas semiestructuradas. El análisis incluyó triangulación de investigadores y los participantes revisaron los hallazgos. RCM IRB Protocolo #A2840120. **Resultados:** Se obtuvo significados únicos mediante 3 temas generales: 1. Significados y elementos esenciales- los adultos tuvieron la oportunidad de realizar algo diferente, añadiendo sentido de disfrute, valorando el aprendizaje y modificando la visión de sí mismo y otros. 2. Ganancias y enriquecimientos- se destaca la creación

de lazos de amistad, la ejecución de nuevas acciones en la vida diaria y la aplicación de lo aprendido. 3. Aspectos fundamentales que facilitaron participación- estos fueron entre otros atención y cuidados, prestigio institucional, y personal cualificado. Conclusión: El Campamento tuvo un impacto en la vida de cada entrevistado. Aspectos de la experiencia adquirieron valor según se complementan y se entrelazan con el pasado y presente del adulto. Participantes presentaron cambios positivos en su cuidado propio y bienestar mediante la auto reflexión, cambios en rutinas, aprendizaje, y participación social. Los hallazgos aumentan el entendimiento sobre las experiencias personales de adultos mayores al participar de actividades dirigidas a la salud y bienestar.

•4167•

#### **Association between religiosity and COVID-19 vaccination intent among adults in Puerto Rico**

Yiana G. Toro-Garay<sup>1</sup>, BS, María Archevald<sup>1</sup>, BS, Andrea López-Cepero<sup>2</sup>, PhD, Stephanie Cameron<sup>3</sup>, BS, Lyz E. Negrón<sup>1</sup>, Uriyoán Colón-Ramos<sup>4</sup>, PhD, Josiemer Mattei<sup>2</sup>, PhD, Emma Fernández-Repollet<sup>5</sup>, PhD, Vivian Colón-López<sup>6</sup>, PhD, Cynthia M. Pérez<sup>1</sup>, PhD, <sup>1</sup>Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences Campus, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; <sup>2</sup>Department of Nutrition, T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts; <sup>3</sup>Department of Biology, University of Puerto Rico-Cayey, Cayey, Puerto Rico; <sup>4</sup>Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington, D.C.; <sup>5</sup>Department of Pharmacology, School of Medicine, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico. <sup>6</sup>Health Services Administration - Evaluation Program, Graduate School of Public Health, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico. Background & Objectives: Previous studies assessing the association between religiosity and vaccination with non-COVID-19 related vaccines have produced

mixed results. Given that the vast majority of individuals in Puerto Rico (PR) have a religious affiliation, this study explored COVID-19 beliefs and vaccination intent, barriers, and facilitators by religiosity level among adults in PR. Methods: Data from an online survey administered to residents of PR older than 18 years old from December 15, 2020 to February 15, 2020 (n=1911). The Health Belief Model (HBM) assessed COVID-19 beliefs and vaccination barriers and facilitators. Adjusted logistic regression models explored the associations between level of religiosity (not important (n=411), somewhat important (n=338), important (n=498), and very important (n=664)) and uncertainty/unwillingness towards vaccination and HBM constructs. Results: In adjusted regression models, individuals with the highest level of religiosity were more likely to be unwilling and uncertain towards vaccination compared to those with the lowest level (OR=1.53; 95% CI=1.06, 2.21). Individuals with greater religiosity had less perceived susceptibility to COVID-19 than those with lower religiosity (p<0.05). Compared to individuals with the lowest level of religiosity, those with higher religiosity had less perceived COVID-19 vaccination benefits and had more vaccination barriers (p<0.05). Lastly, individuals of higher religiosity were more likely to get the vaccine if given adequate information about it and if taken by many in the public (p<0.05). Conclusion: COVID-19 vaccination intent was lower among individuals with higher religiosity. COVID-19 beliefs and vaccination barriers and cues to action also differed by level of religiosity. Public health campaigns targeting COVID-19 vaccination education need to be tailored for specific population subgroups to increase vaccine acceptance and uptake in PR. Acknowledgements: This work has been partially supported by RCMI Grant U54-MD007600 from the National Institute of Minority Health and Health Disparities (NIMHD), National Institute of Health (NIH).

•4178•

#### **Targeting contribution of fragrances in personal care products to phthalate gestational exposure among Puerto Rican women in the PROTECT cohort.**

Cardona-Cordero Nancy R<sup>1</sup>, Feric Zlatan<sup>3</sup>, Agosto-Arroyo Luis D<sup>5</sup>, Fitzmaurice Angerica<sup>3</sup>, Watkins Deborah<sup>4</sup>, Meeker Jonh D<sup>4</sup>, Alshawabkeh



Akram<sup>3</sup>, Velez-Vega Carmen M<sup>1</sup>, Cordero Jose F<sup>2</sup>. <sup>1</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Social Sciences; <sup>2</sup>University of Georgia, College of Public Health, Department of Epidemiology and Biostatistics; <sup>3</sup>Northeastern University, College of Engineering, Department of Civil and Environmental Engineering; <sup>4</sup>University of Michigan, School of Public Health, Department of Environmental Health; <sup>5</sup>Puerto Rico Research Science and Technology Trust, Public Health Trust

**Background and Objectives:** Puerto Ricans are a highly exposed population to chemical substances from multiple sources, including personal care products. Our study, the Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), has shown higher urinary phthalate levels among pregnant participants compared to women of reproductive age in the US. Pregnancy is a vulnerable time for the woman and the developing fetus. The contribution of fragrance to phthalate levels has not been studied in Puerto Rico. Cultural context may influence access to healthier care products triggering an additional exposure burden for underrepresented populations. We examined urinary phthalate levels among PROTECT participants and frequency-specific consumer fragrance usage. **Methods:** Use of personal care products was collected by interviewer-administered questionnaire at three separate times during pregnancy and phthalate urinary biomarkers were collected at the same time for a cohort of 891 participants. Non-parametric (Mann-Whitney U Test) statistics were used to detect differences in median phthalate concentrations among groups and to detect differences among fragrance and non-fragrance users. **Results:** Overall, over 75% of participants reported daily use of cosmetics and perfume, which are associated to mono-ethyl phthalate (MEP). Daily users had higher levels of the metabolite compared to monthly, weekly, or no usage ( $p < 0.05$ ). The median concentration of multiple phthalate metabolites (mono-3-hydroxybutyl phthalate [MHBP], mono (2-ethyl-5-oxohexyl [MEHP], cyclohexane-1,2-dicarboxylic acid monohydroxy isononyl ester [MHINCH] and cyclohexane-1,2-dicarboxylic acid monocarboxy isooctyl ester [MCOCH] phthalate, mono-benzyl phthalate [MBzP]) was higher among fragrance users compared to fragrance non-users

for lotion, deodorant and cosmetics across the three visits. **Conclusions:** Fragrance use through personal care products during pregnancy is ubiquitous among PROTECT participants and their use appears to contribute to the phthalate burden during pregnancy. Results of this study could enhance risk assessments targeting pregnant women and consumer product use. **Acknowledgements:** This research was supported by NIH ECHO Award 3UH3OD023251-05S1.

•4180•

### Ocurrencia del Síndrome de Retirada por Opioides y Benzodiacepinas en Pacientes Pediátricos de Cuidados Intensivos

Camelly Reyes-Vega RN, MSN<sup>1</sup>, Ricardo L. García-De Jesús MD, FAAP, FCCM<sup>2</sup>, William D. Miranda MD<sup>2</sup>, Carmen Mabel Arroyo-Novoa RN, PhD, FCCM<sup>1</sup>, <sup>1</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela de Enfermería, <sup>2</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela de Medicina, Departamento de Pediatría

**Trasfondo y Objetivos:** La prevalencia del síndrome de retirada por opioides (OPs) o benzodiacepinas (BZDs) en cuidado intensivo pediátrico (PICU) varía entre 18% y 64.6%. Los objetivos fueron evaluar la ocurrencia de este síndrome en dos unidades de PICU en donde utilizan un protocolo de destete para estos medicamentos y comparar la ocurrencia de este síndrome con datos previos de estas unidades cuando no utilizaban el protocolo. **Método:** Estudio descriptivo de corte transversal exploratorio realizado en la unidad de intensivo del Hospital Pediátrico Universitario. Se incluyeron pacientes expuestos a infusiones continuas o dosis intermitentes de OPs o BZDs por más de 72 horas. Al comienzo del destete de OPs o BZDs todos los participantes se comenzaron en el protocolo y se evaluaron utilizando el Withdrawal Assessment Tool-version 1 dos veces al día por tres días consecutivos. **Resultados:** De un total de 320 admisiones de PICU, 15 participantes cumplieron con los criterios de inclusión. El 53.3% fueron masculinos con una mediana de edad de 11 (IQR, 8-150) meses. Según el protocolo de destete, se administró metadona al 86.7% de los participantes, ativan al 93.3% y clonidine al 13.3%. El 100% de los participantes utilizaron ventilación mecánica. La ocurrencia del síndrome de retirada fue de 20%

en comparación con 70.8% en el estudio anterior, en el cual la muestra consistió de 24 participantes. Conclusión: Los pacientes en nuestro estudio expuestos a un protocolo de destete estandarizado presentaron una menor ocurrencia del síndrome de retirada al compararlos con los pacientes de la misma unidad cuando no se utilizaba el protocolo. Estos resultados deben ser interpretados con precaución debido a que la cantidad de muestra fue menor y las características de los pacientes no necesariamente fueron equivalentes al estudio anterior. Se recomienda realizar el estudio con una muestra mayor. IRB #A5570219.

•4219•

### **Metabolic Syndrome and Periodontitis in Hispanics with Diabetes Mellitus**

*Mariela Martínez-Lebrón, Luis Martínez Ortíz, Milagros J. Toro<sup>1</sup>, Margarita Ramirez-Vick<sup>2</sup>, Julio A. Rivas-Agosto<sup>1</sup>, Lynn M. Pérez<sup>1</sup>, Francisco Muñoz-Torres<sup>1</sup>, Jose Vivaldi<sup>1</sup>, Oelisoa M Andriankaja<sup>1</sup>, <sup>1</sup>University of Puerto Rico, Medical Sciences Campus, School of Dental Medicine, <sup>2</sup>University of Puerto Rico, Medical Sciences Campus, School of Medicine*

**Background & Objectives:** Metabolic syndrome (MetS) is a cluster of conditions, which may increase the risk of cardiovascular disease development or other health problems. MetS and its components are suggested to be independently associated with chronic periodontitis. Further understanding of the relationship between MetS and periodontitis among individuals with Type 2 Diabetes Mellitus (T2DM) is important to improve the oral health-related quality of life and general health of these high-risk individuals. We aimed to assess this association among Hispanic adults with T2DM. **Methods:** In this cross-sectional study, 251 Puerto Ricans, 40 to 65 years with T2DM were interviewed, had their blood drawn, and anthropometric measurements were taken. A dental examination was conducted. Participants were classified as having non-severe or severe periodontitis based on the CDC-AAP definition. MetS was defined as having at least 2 of the following four criteria (excluding diabetes as all have this condition): high blood pressure ( $\geq 130$  mmHg systolic or  $\geq 85$  mmHg diastolic), low HDL levels ( $< 40$  mg/dL in men,  $< 50$  mg/dL in women), high triglyceride levels ( $\geq 150$ mg/dL), and high waist circumference ( $> 102$  cm

in men,  $> 88$  cm in women). We used multivariable logistic regression to evaluate the association between MetS and periodontitis, adjusting for age, gender, education, smoking status, alcohol status, use of hypertension medications, use of lipid-lowering agents, hba1c, and use of anti-inflammatory agents. **Results:** Approximately 69% (N=173) participants had MetS. Nearly 85% (N=214) had no, mild or moderate (or non-severe) periodontitis, while 15% (N=37) had severe cases. Individuals with MetS showed significantly higher severe periodontitis than those without MetS (OR: 2.96; 95%CI: 1.13-7.70). **Conclusion:** In this population with T2DM, those with metabolic syndrome were nearly three times more likely to have severe periodontitis versus those without metabolic syndrome. **Acknowledgments:** This research was supported by a K23-NIH/NIDCR grant.

•4244•

### **Opinion survey among recipients of a COVID-19 vaccine at the UPR Medical Sciences Campus: listening to our community**

*Félix Román, RN, MSN<sup>1</sup>; Luz V. Camacho, RN, EdD<sup>1</sup>; Maribelis Rivera, RN, MSN<sup>1</sup>; Humberto M. Guiot, MD<sup>2</sup>; Francisco Jiménez, Pharm D<sup>3</sup>.; Suane Sánchez, RN<sup>1</sup>; Wanda Maldonado, BS, Pharm. D<sup>3</sup>.; Barbara Segarra, MT, DHSc<sup>4</sup>; Leyra Figueroa, RN, MSN, PhD<sup>1</sup>; Julio Collazo<sup>5</sup>; Carmen Irizarry, MT<sup>2</sup>; Carmen D. Zorrilla, MD<sup>2</sup>, <sup>1</sup>UPR School of Nursing, <sup>2</sup>UPR School of Medicine, <sup>3</sup>UPR School of Pharmacy, <sup>4</sup>UPR School of Health Professions, <sup>5</sup>MSC Deanship of Administration*

**Background:** The Medical Sciences Campus (MSC) COVID-19 Vaccination Center (VC) has administered over 8,000 doses of the Pfizer-BioNTech vaccine since December 28, 2020. This is an interdisciplinary initiative among 5 professional schools of the MSC (Nursing, Pharmacy, Medicine, Dental Medicine, and Allied Health Professions) and the MSC Deanship of Research. Volunteers included students and faculty from all 6 schools, working together with one goal: administration of vaccines efficiently and with high quality. An opinion survey allowed the coordinators to assess satisfaction and quality of service among the recipients of the vaccine. Due to the new experience with COVID vaccines, management of large groups

and overall new experience, assessment to improve quality and efficiency was needed. Methodology: A descriptive, cross-sectional study was conducted in January 2021, at the MSC COVID Vaccination Center using an opinion survey. Quality of service by faculty members and other staff, waiting time, and overall satisfaction were assessed using an electronic survey that participants could complete after receiving COVID-19 vaccination. Participants could only complete the survey once (after first or second dose). Results: 715 recipients of the vaccine completed the survey. The vast majority of the participants rated the service by volunteer staff (98.2%) and volunteer faculty members (98.7%) as excellent. The majority (94.4%) were totally satisfied while 79.4% categorized the waiting time as excellent and a 100% of the participants referred that they would use the service of the clinic again. Conclusions: The level of satisfaction was very high among recipients of the COVID-19 vaccine at the center, and most participants answered that the quality of service was excellent. In this instance, an electronic opinion survey allowed for a quick collection of data. We postulate that the interdisciplinary and interprofessional approach of the clinic could have contributed to the high level of satisfaction among participants.

## VIRTUAL ORAL SESSION

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### **Percepción de las mujeres sobre la violencia obstétrica durante el parto: Un estudio cuantitativo descriptivo sobre tipos y prevalencia**

*Jeannette Molina Viana, RN, MSNc, Mentora: Dra. Beatriz Díaz Santiago, Escuela Graduada de Enfermería del Recinto de Ciencias Médicas de la Universidad de Puerto Rico.*

Trasfondo y objetivos: La violencia obstétrica claramente es un problema de salud público a nivel global. Así lo explica la Organización Mundial de la Salud cuando declara que muchas mujeres reciben tratos abusivos, negligentes e irrespetuosos durante el parto alrededor del mundo (OMS, 2014). Este tipo de violencia institucional puede causar daños a la salud física y psicológica de la mujer, e incluso el Síndrome Post-Traumático (Bradley, 2017). Este estudio tuvo como propósito determinar la percepción

de las mujeres sobre la violencia obstétrica durante el parto, medir la prevalencia en el área metropolitana e identificar los tipos de violencia obstétrica. Método: Esta investigación fue cuantitativa de diseño descriptivo. Se realizó en una clínica del Programa Especial de Nutrición Suplementaria del área metropolitana de Puerto Rico con una muestra de 55 mujeres de 21 años en adelante en su etapa de postparto que tuvieron un parto vaginal, a quienes se aplicó un cuestionario para medir su percepción sobre la violencia obstétrica que pudieron haber sufrido durante la labor de parto. Resultados: Los resultados demostraron que los tipos de violencia obstétrica que prevalecieron fueron: la obligación a permanecer acostada, la prohibición de escoger la posición deseada para parir, la generación de sentimientos de culpabilidad en las parturientas y la realización de procedimientos sin brindar información suficiente. Conclusión: Es indispensable desarrollar mayor concientización en los profesionales de la salud sobre la responsabilidad de favorecer el transcurso natural del parto, libre de violencia, y garantizar los derechos de la madre. Además, es imprescindible el desarrollo de política pública. Reconocimientos: Ninguno.

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### **Sex and socio-economic differences in COVID-19 beliefs and vaccination barriers and facilitators among adults in Puerto Rico.**

*Andrea López-Cepero<sup>1</sup>, PhD, Stephanie Cameron<sup>2</sup>, BS, Lyz E. Negrón<sup>3</sup>, BS, Vivian Colón-López<sup>4</sup>, PhD, Uriyoán Colón-Ramos<sup>5</sup>, PhD, Josiemer Mattei<sup>1</sup>, PhD, Emma Fernández-Repollet<sup>6</sup>, Cynthia M. Pérez<sup>3</sup>, PhD, <sup>1</sup>Department of Nutrition, T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts; <sup>2</sup>Department of Biology, University of Puerto Rico-Cayey, Cayey, Puerto Rico; <sup>3</sup>Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences Campus, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; <sup>4</sup>Health Services Administration - Evaluation Program, Graduate School of Public Health, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; <sup>5</sup>Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington,*

D.C.; 6 Department of Pharmacology, School of Medicine, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico.

**Background & Objective:** COVID-19 vaccination hesitancy is greater among ethnic minorities, women, and individuals of low socioeconomic status (SES). Puerto Rico (PR) has the second-lowest COVID-19 vaccination rate nationwide. In PR, essential information on COVID-19 beliefs and vaccination barriers and facilitators are needed to promote vaccination uptake. This study explored COVID-19 beliefs and vaccination barriers and facilitators by sex and SES among adults in PR. **Methods:** A total of 1,911 adults (>18 years) completed an online survey from December 2020 to February 2021. The Health Belief Model (HBM) was used to evaluate COVID-19 beliefs and vaccination barriers and facilitators. Logistic regression models were used to explore the associations between sex and SES and HBM constructs. **Results:** Women were less likely than men to be afraid of getting COVID-19 and to report that vaccination makes them feel less worried about catching it. Women also reported greater barriers towards vaccination and more willingness to vaccinate if given adequate information about it. Compared to higher SES individuals, those of lower SES had less perceived COVID-19 susceptibility and vaccination benefits. They also had greater barriers towards vaccination and were more likely to report getting the COVID-19 vaccine if taken by many in the public. **Discussion:** COVID-19 beliefs and COVID-19 vaccination barriers and facilitators differed by sex and SES in adults in PR. Education messages towards COVID-19 vaccination in PR need to be tailored for specific population subgroups to increase vaccine uptake. **Acknowledgements:** This work has been partially supported by RCMI Grant U54-MD007600 from the National Institute of Minority Health and Health Disparities (NIMHD), National Institute of Health (NIH). Dr López-Cepero is funded through the National Institutes of Health (5T32DK007703-24).

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### **IMPACT OF COVID-19 IN ADOLESCENTS AGES 12-18 LIVING IN PUERTO RICO AND SOUTH FLORIDA**

*Marién Felipe Fernández, MD, Pediatrics Residency PGY-3, Edna Serrano Oyola, MD, Mentor*

**Backgrounds and objectives:** The novel coronavirus disease (COVID - 19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has spread rapidly, and become a global pandemic. New data is being collected and distributed globally which demonstrate a large variety of clinical presentations. Symptoms differ widely regarding the severity of the disease. The length of the quarantine period, fear of infection, boredom, lack of information, being away from classmates and teachers, lack of personal space at home, and financial losses in the family, caused stress in children and adolescents. All those lifestyle changes may worsen the effects on young people's mental health and even lead to a problematic vicious cycle. A recent poll conducted by UNICEF showed that the COVID-19 crisis is having a significant impact on the mental health of adolescents and young people in Latin America and the Caribbean. We hypothesized that children from ages 12 through 18 living in Puerto Rico and South Florida were affected negatively during the pandemic of COVID-19. This study has the goal to determine if COVID-19 has had a negative mental health impact on adolescent's feelings, as they can react differently to an epidemic. **Methods:** The sample consisted of 255 adolescents. The data were collected with an 8-question online questionnaire. The State-Trait Anxiety Scale will be used to identify anxiety in this population. The variables were **Categorical:** anxiety, Mental Health and **Socio-Demographics:** age, sex, race, city. The data obtained was analyzed through a descriptive statistical analysis that includes frequency of distribution, measures of association and percentage for continuous and categorical variables. We established relationships between anxiety and variables by using the Pearson Correlation. **Results:** Most adolescents have or have had a family member / friend infected with COVID 19 (mode), 186 of the totals of 255 in the sample. 73% of adolescents have or have had a family member / friend infected by COVID 19 and the rest (27%) have not had any case infected by COVID 19 close to their family or circle of friends. The results indicated an increase or appearance of anxiety in the adolescents who participated in the study, suggesting that the situation of confinement at home caused by the COVID 19 pandemic has affected the mental health of adolescents. Most of the adolescents think the COVID-19 pandemic has contributed to

your anxiety (mode), 198 out of the total of 255 in the sample. Conclusions: Anxiety in the adolescents studied manifests itself more between the ages of 16 to 18 years. No differences were found between the sexes. Race and knowing people infected with COVID 19 do not make a difference in the anxiety results of adolescents, although there are differences in terms of place of residence. Adolescents in Puerto Rico show higher levels of anxiety and more cases than those in South Florida. Although cause-effects cannot be established.

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### **Spine trauma secondary to diving accidents**

*César M. Carballo-Cuello, MD; Orlando De Jesus, MD, FAANS; Ricardo J. Fernández-de Thomas, MD; Aixa de Jesús Espinosa, MS, MPH; Juan A. Vigo-Prieto, MD* Section of Neurosurgery, Department of Surgery, School of Medicine, Medical Sciences Campus, University of Puerto Rico, San Juan, Puerto Rico

Objective: Investigate the spine trauma patient profile referred to the Puerto Rico Medical Center secondary to diving accidents. Spinal cord trauma is a common catastrophic injury that causes significant morbidity and mortality. Methods: We performed a retrospective study by analyzing the neurological surgery residency electronic database. Our institution is the only level I trauma center in Puerto Rico; thus, this study likely included all the diving injuries on the island. We searched our patient database for diving accident cases evaluated in our center during the years 2014 to 2020. Sixty-five patients were identified. The cases were evaluated according to sex, age, spine trauma level, and neurological deficit using the American Spinal Injury Association (ASIA) Impairment Scale (AIS). Results: Cases were predominantly (94%) male, with a mean age of 29. The levels affected include cervical (96%), thoracic (2%), and lumbar (2%). Twenty-seven patients (42%) developed SCI secondary to the accident. The AIS was A in 12%, B in 2%, C in 9%, D in 19%, and E in 58%. Diving accidents at beaches were the most common. Conclusions: In Puerto Rico, there is a yearly incidence of 11 diving accidents causing spinal trauma, most frequently affecting the C6 vertebrae (23%). Diving accidents mainly occurred in young individuals, predominantly at beaches (51%). Most

patients were neurological intact after sustaining a diving accident, although 42% sustained SCI, with AIS D (44%) the most common. This study provided a better understanding of this traumatic event and determined its most common affected levels, sites of accident, and population involved.

•4138•

### **A Web-Based Integrative Evidence-Based Therapy approach to treat Perinatal Mental Health Disorders (PMHDs) for Puerto Rican mothers: A pilot project**

*Polaris Gonzalez-Barríos, PhD1; Marianela Rodríguez-Reynaldo, PhD2; Zilkia Rivera-Orraca, PhD3; Karen G. Martínez-Gonzalez, MD, MSc4*

Introduction: The prevalence of PMHDs among Puerto Rican women is not quite known; less is known of what can be the most effective treatment. Up to date, there is no treatment center that offers evidenced-based therapies and standardized treatment protocols to treat PMHDs in Puerto Rican mothers. Traditional pathways to determine effective clinical treatments, may present “as too long of a wait” for mothers presently suffering from PMHDs. Methods: We aimed to modify and implement a culturally sensitive evidenced-based treatment protocol for anxiety and related disorders from the Center for the Study of fear and anxiety in Puerto Rico to women in the perinatal period using a telemedicine platform free of cost. A pilot trial of 4 mothers, 2 in the prenatal period and 2 in the postpartum period, during the COVID-19 pandemic were screened and treated following the Centers treatment protocol with modifications to target the special needs of this population. The treatment protocol consisted of 5 treatment phases: diagnosis/perinatal history, psychoeducation of various topics including present COVID-19 pandemic, mindfulness or acceptance commitment therapy exercises, inclusion of partner to bring awareness of PMHDs, and a last phase of cognitive reframing. Results: After an average of 5-6 sessions, all mothers demonstrated significant decrease of clinical symptoms as measured by Beck Anxiety Inventory and PHQ-9 (Range from High to moderate levels of anxiety/depression to no anxiety or depression). Conclusions: Preliminary application of these treatment protocols shows promising evidence to validate the potential benefit of conducting future clinical trials to measure effectiveness, including

telemedicine interventions. Previous studies have also found such treatments to be effective (Hussain-Shamsey et. al. 2020; Lee et. al. 2016). Additionally, the infrastructure of such academic treatment centers may present a possible route to reduce access to treatment in Puerto Rican mothers living on the island.

•4150•

**Understanding Symptoms Impact in a Group of Breast Cancer Survivors in Puerto Rico: A Qualitative Study**

*Sherily Pereira Morales, Ph.D., RNA 1, Edna Pacheco Acosta, Dr PH 2, Nanet M. López Córdova, Psy. D.3, Stephanie Lee Boggiano4, Rachel Walker, Ph.D., RN, FAAN 5. 1University of Puerto Rico -Medical Sciences Campus (MSC) School of Nursing, Graduate Department, San Juan, Puerto Rico, 2University of Puerto Rico -Medical Sciences Campus (MSC) Center of Excellence in Women Health, San Juan, Puerto Rico.3Albizu University-San Juan Campus Psy. D. Clinical Psychology Program, San Juan, Puerto Rico.4 University of Puerto Rico -Mayaguez Campus (UPRM), Research Assistant.5University of Massachusetts-Amherst, College of Nursing, Massachusetts, United States of America.*

**Background and Objectives:** Breast cancer is the most commonly diagnosed cancer among women in Puerto Rico, accounting for 28.6% of all cases of cancer in women and 18.6% of all cancer deaths. Female breast cancer survivors often experience pain, fatigue, and disrupted function post-cancer treatment. These late effects of cancer illness and therapies contribute to sedentarism and reduced quality of life. The aims of this study were to develop a better understanding of unmet symptom and pain management needs, and to identify potential clinical or community-based strategies for addressing those needs, among female breast cancer survivors in Puerto Rico. **Methods:** A qualitative study interviewing breast cancer survivors about their experiences of cancer-related symptoms, pain presence, and physical activity. Researchers conducted individual interviews in Spanish using a semi-structured interview guide that captured participants socio-demographic characteristics and experiences prior to, during, and post-cancer treatment. The interview guide was forward and back-translated to Spanish, then culturally-adapted from an English version

by investigators and a certified translator. Interviews were audiotaped, transcribed verbatim and coded in NVivo v.12 (QSR International) using directed content analysis techniques. **Results:** The 15 study participant's ages ranged from 33 to 76 years old. Data were synthesized according to a priori categories: cancer treatment, pain, activity, environmental modifications, sleep, symptoms and late effects. Around half of the long-term adult cancer survivors reported experiencing activity limitations and reduced quality of life as a result of on-going symptoms such as pain, fatigue, and sleep disturbances. **Conclusion:** This qualitative study, conducted by an interdisciplinary team, characterize patterns of symptom experiences impacting physical activity among female breast cancer survivors in Puerto Rico. A number of opportunities to intervene on unmet needs related to pain and symptom management were identified, that will form the basis for future intervention work. **Acknowledgement:** Komen CCR-grant- Dr.Walker funded in Massachusetts. IRB RCM #B1480217

•4155•

**Sex and educational attainment differences in HPV knowledge and vaccination awareness among unvaccinated-sexually active Hispanic adults**

*Carla, Oramas Sepúlveda, MPH1; Cynthia, Pérez, PhD2; Maira, Castañeda Avila, MS3; Ana, Ortiz, PhD1,2; Filipa, Godoy, PhD 4; Josué, Pérez, PhD 1; José, Vivaldi, DMD5. 1 Comprehensive Cancer Center, University of Puerto Rico 2 Department of Biostatistics and Epidemiology, University of Puerto Rico Medical Science Campus 3 Department of Population and Qualitative Health Science, University of Massachusetts Medical School 4 Department of Microbiology and Medical Zoology, University of Puerto Rico Medical Science campus 5 School of Dental Medicine, Ana G. Mendez University. Emails: Carla.oramas@upr.edu, Cynthia.perez1@upr.edu, Maira.CastanedaAvila@umassmed.edu, Ana.ortiz7@upr.edu*

**Background:** Despite HPV vaccination was introduced over 10 years ago, knowledge and vaccination uptake remain suboptimal. Research shows disparities by gender and educational attainment, but recent data is scarce. We assessed sex and educational attainment

differences in HPV knowledge and vaccine awareness among unvaccinated adults. Methods: Data from a cross-sectional study (2018-2021) in Puerto Rico among adults aged 21-49 was analyzed (n=256). Adequate knowledge was defined as a score of  $\geq 70\%$  of correct responses in a 13-item knowledge scale. Multivariable logistic regression was used to assess the association of sex (men vs. women) and education ( $\leq$ high-school vs.  $>$ high-school) categories with adequate HPV knowledge and vaccine awareness. Results: Mean age was  $33.9 \pm 8.4$  years and 52% of participants were men. Adequate HPV knowledge was higher among women (53%) and men (46%) with  $>$ high-school education (53%) and was lower among women (42%) and men (27%) with  $\leq$ high-school ( $p=0.043$ ). For HPV vaccine awareness, similar results were observed with highest awareness among women with higher education (80%) and lowest awareness seen among men with lower education (22%). After adjusting for medical insurance coverage, women with  $>$ high-school were more likely to have adequate HPV vaccine knowledge (OR=2.6; 95% CI=1.2-5.6) and vaccine awareness (OR=18.4; 95% CI=7.0-48.3) than men with  $\leq$ high-school. Higher vaccine awareness was also seen in men with higher education (OR=4.96, 95% CI=2.09-11.77) and women with similar lower education (OR=5.56, 95% CI=2.12-14.60) when compared to men with  $\leq$ high-school. The main reasons for being unvaccinated were lack of knowledge (62%), no interest/agreement with the vaccine (22%), and lack of recommendation from providers (21%). The main reason reported by men with lower education was lack of knowledge (98%). Conclusions: Men with lowest educational attainment had inadequate HPV knowledge and vaccine awareness. Educational interventions to improve HPV awareness and vaccination should target this high-risk group. Acknowledgements: Grant #R21DE027226.

•4157•

#### **Understanding disparities in the adoption of assistive technologies among older Hispanics from poor communities**

Elsa M. Orellano<sup>1</sup>, Marta Rivero<sup>1</sup>, Blanca Ralat<sup>1</sup>, Erick Suárez<sup>1</sup>, Ivonne Jiménez<sup>1</sup>, Nelson Varas<sup>2</sup>, Mauricio Lizama<sup>3</sup>, Jeffrey Jutai<sup>4</sup>. <sup>1</sup> University of Puerto Rico Medical Sciences Campus, San Juan

Puerto Rico; <sup>1</sup> Florida International University, Miami, Florida; <sup>3</sup> University of Puerto Rico Central Administration, San Juan Puerto Rico; <sup>4</sup> University of Ottawa, Ottawa, Canada.

Background & Objectives: Functional disability in older people is a significant public health problem that can be compensated by using assistive technology (AT) devices to increase their independence, safety, and quality of life. However, Hispanics are among the least likely to use AT devices and the population most in need for AT given their high prevalence of disabilities in daily activities. Therefore, we aimed to study the barriers for using AT devices among older men and women living in poor communities in Puerto Rico. Methods: We conducted in-depth qualitative interviews in the participants' homes assisted by videos of AT and guided by the Matching Person and Technology Model and the Gender Analysis Framework with a purposive sample of 12 men and 11 women living in the eight communities comprising the Caño Martín Peña. Participants were asked questions regarding reasons for not using AT in the dimensions of person, environment, technology, gender norms, activities, and bargaining positions. We used a directed content analysis with member checks and input of a Community Advisory Board for the interpretation of the results. Results: The major barriers for using AT devices included: lack of information of AT devices, resources, and services; the cost of the AT; lack of availability of AT devices in the community, lack of access to formal AT services, and stigma. Women experienced more barriers than men, including less control of money and power to make independent decisions, fear of using mobility devices, and concerns with the appearance of the AT device. Conclusions: Gender differences exist in the barriers for using AT devices. Health policies as well as future studies should be targeted at increasing older adults access to assistive technologies through academic-community partnerships to develop gender sensitive disability self-management programs. Approved by IRB. This research was supported by NINR grant 1R21NR018039-01A1.

•4158•

**Adaptación de estrategias evaluativas niveladoras en curso de Química General para tiempos de pandemia en la Universidad de Puerto Rico en Bayamón (UPRB).**

William Ortiz, Ph.D., Hilsamar Félix, Ph.D., Jenifer Olavarría, Ph.D., y Solange Benítez, Ph.D. Departamento de Química, Universidad de Puerto Rico en Bayamón. Bayamón, PR 00959.

**Trasfondo y objetivos.** La pandemia del COVID-19 tuvo un gran impacto en el Departamento de Química de la UPRB enfrentando un reto en la adaptación de los procesos de aprendizaje. Ante este escenario, la recolección de datos de avalúo estudiantil fue objetivo de estudio para compararse con el avalúo en tiempos de no pandemia. Los resultados recopilados en el curso de Química General nos permitieron evaluar e implementar cambios en las estrategias evaluativas y la dinámica de enseñanza del curso. Los objetivos medulares estudiados fueron la Clasificación de compuestos y Análisis dimensional, para comparar el dominio conceptual con años anteriores. Además, se analizó la efectividad las estrategias de las evaluaciones usadas. **Métodos.** Análisis estadístico de la recopilación de evaluación directa de 306 estudiantes en el primer semestre año 2019-2020 (antes de pandemia) y 312 estudiantes en el primer semestre 2020-2021 (en pandemia). Los datos utilizados fueron tomados acumulativamente del primer examen y examen final. Las actividades evaluativas se adaptaron a evaluaciones periódicas, directas y aleatorias. **Resultados.** Luego de implementar los cambios necesarios para hacer la transición completa del curso presencial a virtual se encontró que los estudiantes dominaron los objetivos medulares con un 79.0 y 87.0% respectivamente, cumpliendo con las métricas establecidas por el departamento. El desempeño académico en términos de porcentaje de éxito (%A, B y C) fue de 67.3% para el primer semestre 2020-2021 comparado con un 69.3% del año 2019-2020, demostrando que la población evaluada cumple satisfactoriamente con la aprobación del curso según la métrica de este curso básico. **Conclusión.** No se observó diferencia significativa en el porcentaje de éxito académico durante el tiempo de pandemia. Las estrategias implementadas reflejaron un proceso de enseñanza-aprendizaje similar al de un semestre presencial manteniendo los estándares y la transparencia en los procesos evaluativos. **Agradecimientos.** Profesores de Química General.

•4168•

### **Prevalencia del Síndrome Metabólico y su asociación con los turnos de trabajo en el personal de enfermería de dos instituciones hospitalarias del área norte de Puerto Rico**

Amarilys Santiago-Ríos<sup>1</sup>, Nancy Dávila-Ortiz<sup>1</sup>, María Declét-Brana<sup>1</sup>, Rosa Rosario-Rosado<sup>2</sup> & Cruz Nazario-Delgado<sup>2</sup>. <sup>1</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela de Enfermería. <sup>2</sup> Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela Graduada de Salud Pública.

**Trasfondo y objetivos:** El Síndrome Metabólico (SM) predispone a un mayor riesgo de desarrollar DM tipo 2, enfermedad coronaria y cerebrovascular. Estudios sugieren que trabajar turnos rotativos y nocturnos pudiera producir efectos negativos asociados a SM en la salud del trabajador. El objetivo principal de este estudio fue examinar la prevalencia del SM en el personal de enfermería activo en dos instituciones hospitalarias del área norte de Puerto Rico. Además, la diferencia en la prevalencia del SM de acuerdo con el sexo y los turnos de trabajo. **Método:** Se utilizó un diseño descriptivo correlacional de corte transversal. La muestra estuvo constituida por 331 enfermeros activos. Los datos se obtuvieron con el instrumento "Cuestionario para identificar SM en adultos". Se realizó plan de control de calidad aleatorio con el 25% del total de los cuestionarios. Las estadísticas descriptivas, promedios, desviación estándar fueron calculados. La magnitud de la asociación fue evaluada utilizando el POR ajustado por sexo y edad por medio de los modelos de regresión logística. **Resultados:** La prevalencia de SM observada fue de 18.4%, la frecuencia de sobrepeso fue de 29.0% y la obesidad de 39.3%. El análisis no ajustado sugiere que el personal de enfermería femenino tiene dos veces más la posibilidad de desarrollar SM. No se encontró asociación estadísticamente significativa entre el turno de trabajo y el desarrollo del SM. Además, los resultados apuntan que la mayoría de las mujeres entre 50-59 años y del personal que trabaja turnos fijos tiene una mayor frecuencia de SM. **Conclusión:** Los resultados de este estudio permiten recomendar que para mejorar el estado de salud del personal de enfermería y el ambiente laboral, es necesario diseñar intervenciones y programas de educación en nutrición, actividad física y prevención de complicaciones asociadas al SM.



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**Efectividad de un Adiestramiento en Lenguaje de Señas y Sensibilidad para la Entrevista Inicial de Terapia Física en Puerto Rico**

*Iselmarie Núñez Brugman, Loraine Martínez López, Carolina Díaz Álvarez, Karisol Chévere-Rivera, PhD & Jessica Rodríguez-Torres, DPT. Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, Puerto Rico. Departamento del Programa Doctor en Terapia Física.*

**Trasfondo y Objetivos:** Se ha demostrado que los servicios de salud ofrecidos a personas con deficiencias auditivas presentan una limitación en la comunicación paciente/profesional de la salud, principalmente por la falta de conocimiento que tienen estos profesionales sobre el lenguaje de señas. **Objetivo:** Evaluar la efectividad de un adiestramiento en lenguaje de señas para disminuir la distancia social y aumentar las competencias del terapeuta físico en la comunicación culturalmente sensible con las personas sordas durante la entrevista inicial. Por tanto, la pregunta de este estudio es la siguiente: ¿Cuál es la efectividad de un adiestramiento en lenguaje de señas para aumentar las competencias del terapeuta físico en la comunicación culturalmente sensible con pacientes sordos durante la entrevista inicial? **Hipótesis:** Existirá una diferencia estadísticamente significativa entre las puntuaciones de la preprueba y posprueba de distancia social de los terapeutas físicos luego de un adiestramiento en lenguaje de señas para aumentar las competencias en la comunicación culturalmente sensibles con las personas con deficiencias auditivas durante la entrevista inicial. **Método:** Se desarrolló un adiestramiento virtual para terapeutas físicos (n=11) de Puerto Rico sobre la comunidad sorda y el lenguaje de señas. El adiestramiento consistió en dos días; se administró una preprueba antes de comenzar el mismo y una posprueba al finalizarlo. Las pruebas midieron cinco variables: conocimiento, actitudes, sensibilidad, creencias y habilidades. En adición, los participantes realizaron un video practicando varias preguntas de la entrevista inicial en terapia física. **Resultados:** Se observó un aumento en las respuestas correctas de conocimiento y habilidades para la posprueba y hubo cambios en las actitudes, la sensibilidad y las creencias de los participantes. **Conclusión:** El adiestramiento fue efectivo para

aumentar las competencias y la sensibilidad de un grupo de terapeutas físicos en Puerto Rico hacia la comunidad sorda y disminuir la distancia social. **Reconocimiento:** N/A

•4200•

**El CRESCO: Su Transformación Exitosa en Tiempos Pandémicos para Promover las Competencias en Investigación y Comunicación Científica (CICC)**

*Efraín Flores-Rivera<sup>1</sup>, Lizbelle De Jesús-Ojeda<sup>1</sup>, Mildred I. Rivera-Vázquez<sup>2</sup>, Rubén García-García<sup>1</sup>, José R. Moscoso-Álvarez<sup>2</sup>, Margarita Irizarry-Ramírez<sup>1</sup>, Elvis Santiago-Rodríguez<sup>1</sup>, José R. Ubieta-Santiago<sup>1</sup>, Rodolfo Navarro-Figueroa<sup>1</sup>. <sup>1</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, Proyecto Título V RCM-UCC, San Juan, Puerto Rico, <sup>2</sup>Universidad Central del Caribe, Proyecto Título V RCM-UCC, Bayamón, Puerto Rico.*

**Trasfondo y Objetivo:** La UPR-Recinto de Ciencias Médicas y la Universidad Central del Caribe realizan un proyecto cooperativo para proveer adiestramiento y experiencias en investigación clínica y traslacional, principalmente a estudiantes y profesores subgraduados. Su eje es el Centro de Educación en Investigación y Oportunidades en Comunicación Científica (CRESCO). Este es un espacio físico y virtual en la biblioteca de cada una de las instituciones colaboradoras, que ofrece mentoría, talleres, tutoriales y programados en línea para el desarrollo de las CICC. En esta sesión, se presenta cómo el CRESCO se transformó durante la emergencia del Covid-19 para continuar y expandir sus servicios. **Método:** Desde marzo de 2020, todos los servicios del CRESCO pasaron al formato virtual. Se ofrecen tutoriales, talleres y mentoría sobre estadísticas, búsqueda de literatura y el uso de una variedad de programados para la investigación. Se recopilan estadísticas de los servicios prestados y se administra un cuestionario para evaluar los talleres en línea. **Resultados:** El número de participantes que recibió mentorías o consultó los tutoriales fue: 3,332 en 2019; aumentó a 6,867 en el 2020 (inicio de la pandemia), y hasta el 15/04/2020 asciende a 4,221. La asistencia a los talleres fue: 42 en el 2019; 224 en el 2020, y 139 hasta el 15/04/2021. Al evaluar los talleres en línea, los participantes consideran que aprendieron mucho o bastante sobre los siguientes

temas: uso de Intellectus Statistics (87%, n=57); selección de pruebas estadísticas (78%, n=68); uso de Turnitin (85%, n=76); búsqueda de literatura (91%, n=58); y citas y referencias en Mendeley (90%, n=67). Conclusión: La transición del CRESCO a un formato exclusivamente virtual, en medio de la pandemia por Covid-19, ha ampliado el alcance de sus servicios educativos en apoyo al desarrollo de las CICC. Reconocimiento: Financiado por el Proyecto Título V RCM-UCC - # P031S160068.

•4209•

**Association between religiosity and prevalence of psychiatric conditions among adults in Puerto Rico**

Erika I Escabí-Wojna<sup>1</sup>, BS, Michael Santiago-Marrero<sup>1</sup>, BS, Uriyoán Colón-Ramos<sup>2</sup>, PhD, Josiemer Mattei<sup>3</sup>, PhD, Emma Fernández-Repollet<sup>4</sup>, PhD, Andrea López-Cepero<sup>3</sup>, PhD, Cynthia M. Pérez<sup>1</sup>, PhD. <sup>1</sup>Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences Campus, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico; <sup>2</sup>Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington, D.C.; <sup>3</sup>Department of Nutrition, T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts; <sup>4</sup>Department of Pharmacology, School of Medicine, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico.

**Background & Objective:** The COVID-19 pandemic has had a negative impact on mental health. Religiosity is used to cope during times of stress, and studies suggest that it may serve as a protective factor against psychiatric disorders. However, in Puerto Rico (PR), there is a scarcity of data on how religiosity is associated with psychiatric disorders, much less during the COVID-19 pandemic. This study examined whether there is an association between religiosity and psychiatric disorders among adults residing in PR during the pandemic. **Methods:** Data from a cross-sectional online survey administered to adults in Puerto Rico from December 15, 2020 to February 15, 2020 (n=1,945) was used. Importance of religiosity and medical diagnosis of psychiatric conditions (i.e.,

depression, anxiety, Post-Traumatic Stress Disorder, insomnia, and obsessive-compulsive disorder) were self-reported. Logistic regression models explored the associations between level of religiosity (not important (n=414), somewhat important (n=350), important (n=505), and very important (n=676)) and diagnosis of each psychiatric condition controlling for age, sex, education, employment status, marital status, and smoking. **Results:** Compared to individuals who reported that religiosity was not important, those who reported being somewhat important (OR=0.71, 95% CI=0.52, 0.96), important (OR=0.4, 95% CI=0.36, 0.65) and very important (OR=0.64, 95% CI=0.48, 0.84) had lower adjusted odds of having any psychiatric condition. Specifically, individuals with significantly greater religiosity had lower adjusted odds of anxiety (OR=0.60, 95% CI=0.44, 0.80), depression (OR=0.52, 95% CI=0.37, 0.73), and insomnia (OR=0.61, 95% CI=0.41, 0.91). **Conclusions:** Religiosity was significantly associated with lower odds of psychiatric conditions among PR adults during the pandemic. Longitudinal studies are needed to confirm our findings and understand mechanisms of action to design effective public health interventions and allocation of mental health resources.

•4214•

**Oportunidades de prevención en salud en tiempos de COVID-19: Estrategias de adaptación a implementación virtual de Programas Basados en Evidencia**

Edna Acosta-Pérez, PhD, MSc<sup>1,2</sup>, Cristina Díaz<sup>3</sup>, Samaris Vega-Torres, MPH<sup>1</sup>, Leilani Acevedo, MSYM<sup>3</sup>, Massiel Muñiz, BA, MA, MS<sup>1</sup> Zara Serbiá, MSW<sup>1</sup>, Nayda Cruz, BS<sup>1</sup>, Carlamarie Noboa, PhD, MS<sup>1</sup>. <sup>1</sup>Instituto Tercera Misión, Universidad Albizu, <sup>2</sup>University of Puerto Rico, Medical Science Campus, <sup>3</sup>Urban Strategies, LLC

**Pregunta:** Exploramos las condiciones que facilitan la efectividad exitosa al adaptar Prácticas Basadas en Evidencia (PBE) al formato virtual para mejorar destrezas de crianza y comunicación entre familias diversas y la prevención de embarazos en jóvenes. **Revisión:** El programa Puerto Rico Jóvenes en Óptima Salud (PROSa) y el Programa Comienzo Saludable de Puerto Rico son programas de prevención y atención en salud cuyos servicios expanden las PBEs en Puerto Rico. PROSa busca reducir los embarazos

en jóvenes de 12-17 años y aumentar la integración de servicios en salud óptima en jóvenes y “Comienzo Saludable” fortalecer la salud materno-infantil. Los PBEs implementados como parte de este esfuerzo multisectorial son de prevención universal, formato grupal presencial, sincrónicas y dirigidas a aumentar el vínculo y comunicación familiar y la planificación profesional en jóvenes. Implementación: Dado a las restricciones físicas por COVID-19 el equipo de capacitación e implementación llegó a negociaciones con desarrolladoras de las PBEs para identificar estrategias virtuales que mantuvieran los componentes esenciales de las intervenciones. Las PBEs fueron adaptadas para implementarse en modalidad virtual, sincrónica y grupal siguiendo aspectos de adaptación: 1) ajuste de contenido con herramientas virtuales, 2) adiestramiento, 3) asistencia técnica y 4) evaluación continua. Los datos obtenidos mostraron reclutamiento esperados, alta retención de participantes (80%), aumento en las destrezas de facilitación virtual del equipo de implementación, alta fidelidad en la implementación (93%) y alta satisfacción (>85%) en igual comparación a experiencias previas presenciales ( $p=.05$ ). Administramos cuestionarios en línea y los hallazgos fueron utilizados para el mejoramiento continuo de la adaptación e implementación de los PBE. Implicaciones: El éxito en la adaptación de las PBEs en formato virtual ha demostrado la relevancia de la fidelidad y calidad del contenido, la utilidad de las herramientas implementadas, la participación y flexibilidad del equipo y el fortalecimiento programático de las organizaciones. Subvención: Estos proyectos fueron posibles a las subvenciones de HHS OPA (TP1AH000244-01-00) y HRSA (1 H49MC327340100). Approved by IRB: BRANY SBER IRB #19-028-447PR

•4232•

### **Flexibilidad académica: Estrategia sustantiva ante eventos disruptivos en la educación superior**

*Luis E. Estremera De Jesús, EdD, Decanato de Asuntos Académicos, Recinto de Ciencias Médicas de la Universidad de Puerto Rico*

Antecedentes: En los pasados 5 años en Puerto Rico se han suscitado una serie de eventos disruptivo (e. g., huelgas, huracanes, terremotos, y pandemia) que provocaron el cierre parcial o total de universidades

por días, semanas o meses. Factores socioeconómicos, demográficos y geográficos sitúan la isla en un alto nivel de vulnerabilidad ante desastres naturales (Knight, 2015). El huracán María ocasionó cientos de millones dólares en pérdidas y develó el alto grado de vulnerabilidad de los entornos universitarios y en el País. Objetivos: Analizar la flexibilidad académica desde una perspectiva estratégica para garantizar los procesos de aprendizaje y su impacto en la política institucional, la adaptabilidad y en el proceso didáctico. Método: La investigación fue un estudio de casos múltiples y participaron dos gerentes académicos, cuatro docentes y un gerente de tecnologías. Las estrategias de recopilación de información fueron la entrevista y el análisis de documentos. Se utilizó la estrategia de codificación estratificada y el programa Nvivo 12 para el análisis de la información. Resultados: La adopción la flexibilidad académica viabilizó amoldar la política institucional para incrementar los cursos presenciales en curso híbridos o virtuales o integrar las tecnologías. Permitió al docente crear planes educativos creativos atemperados a las necesidades del discente y del entorno. También, hizo posible el crear espacios no pensado para la conectividad y maximizar los dispositivos digitales para establecer alianzas educativas entre el docente y discente garantizando la continuidad del aprendizaje. Conclusión: La transversalidad de la flexibilidad académica y su intercesión en diversos procesos de política institucional, de administración académica, de planificación educativa fue un componente de gran valor y significado para enfrentar los retos que provocó el cierre total, es decir, la disrupción en un entorno universitario. “Una crisis lo que requiere es una flexibilidad” (Docente 3). Aprobado por CIPSHI Protocolo 1819-201.

### **VIRTUAL E-POSTERS SESSION**

•4100•

### **Reducing newborns early exposure to antibiotics in the neonatal intensive care unit**

*Daniela López-Vallejo 1, Ariana Fuentes-López, BS1, Inés García-García, MD, FAAP2; Zayhara Reyes-Bou, MD, FAAP2; Juan Rivera-González, MD, FAAP2 & Lourdes García-Fragoso, MD FAAP2 UPR Rio Piedras*

Campus1, UPR School of Medicine, Department of Pediatrics, Neonatology2

**Background & Objectives:** Neonates are frequently exposed to antibiotics after birth because of risk factors for infection or for non-specific signs suggesting sepsis. The use of antibiotics has been associated to an increase prevalence of infections by antimicrobial resistant organisms. We developed guidelines for the initiation and duration of antibiotics in the first days of life of infants admitted to the Neonatal Intensive Care Unit (NICU) to reduce early use of antibiotics. The objective of this study is to analyze antibiotics use before and after the protocol implementation. **Methods:** Medical records from newborns admitted to the University Pediatric Hospital NICU during the first week of life were reviewed. Analysis of data on antibiotic prescription included the periods before protocol implementation (January-June 2017) and after (July 2017-December 2019). Statistix 8.0 used for analysis. IRB approved. **Results:** Subjects included 1,209 newborns (23-42 weeks gestation). An 11% decrease in the number of newborns initiated on antibiotics at admission was reported after the protocol implementation. We achieved a 12% decrease in the number of term infants initiated on antibiotics and a 10% decrease in preterm infants. A 22% decrease in total days of antibiotics from admission (9 days vs 7days) was also seen. **Conclusion:** The implementation of antibiotic stewardship guidelines for infants admitted to NICU during the first week of life successfully reduced the number of infants exposed early to antibiotics. Continuous monitoring of antibiotics use practices is important to avoid the emergence of resistance organisms and the adverse effects of antibiotic therapy. **Acknowledgements:** I would like to offer my special thanks to our team leader, Dr. Lourdes Garcia-Fragoso, for her mentorship and advice throughout the data gathering and analysis. IRB number = 2020116.

•4103•

### **The Development of a Knowledge Test on Transgender Patients' Care**

Jonathan Hernández-Agosto1, \*, Kyle Melin2, Jurynelliz Rosa-Vega3, Edgar Carlo-Frontera3, Andrés Rodríguez-Ochoa3 and Darlene Santiago-Quñones4. 1Curriculum and Institutional Effectiveness

Evaluation Division, University of Puerto Rico School of Pharmacy, San Juan 00936, PR, USA; 2Department of Pharmacy Practice, University of Puerto Rico School of Pharmacy, San Juan 00936, PR, USA; 3Doctor of Pharmacy Program, University of Puerto Rico School of Pharmacy, San Juan 00936, PR, USA; 4Department of Pharmaceutical Sciences, University of Puerto Rico School of Pharmacy, San Juan 00936, PR, USA; kyle.melin@upr.edu(K.M.); jurynelliz.rosa@upr.edu(J.R.-V.); edgar.carlo@upr.edu(E.C.-F); andres.rodriguez1@upr.edu(A.R.-O.); darlene.santiago@upr.edu(D.S.-Q.)\*Correspondence: jonathan.hernandez12@upr.edu; Tel.: +1-(787)-758-2525 (ext. 5420)

**Background & Objectives:** One of the biggest challenges researchers often face is to develop a new instrument when phenomena to be measured is not widely addressed in the literature. The objective of this study was to develop an assessment instrument to measure the effects of a continuing education intervention on 3 domains in pharmacists' knowledge needed to provide pharmaceutical care for transgender patients: (1) foundations of gender-affirming care, (2) health disparities and the specific needs of transgender patients, and (3) hormone treatments for transgender patients. **Methods:** Multiple-choice questions were developed, and an initial item bank of 47 items was drafted. Item bank revision was conducted by content matter experts, while feedback from 8 practicing pharmacists was provided for face validity and further insights. A preliminary test, containing 42 items was administered to 64 pharmacists before and after a three-hour continuing education intervention. **Results:** Preliminary results showed the possibility of measuring changes in pharmacists' knowledge related to the care of transgender patients, as the results of the pre- and post-tests showed a mean increase in performance of 20.42% ( $p < 0.001$ ). Cronbach's alpha coefficient yielded a value of 0.65 as a pre-test and 0.77 as a post-test. Items were less difficult to answer by participants after taking the three-hour continuing education, showing better discrimination among high and low performers in the instrument administration as post-test, as well as better correlation when comparing participants' performance in the overall score against

item-level performance. Conclusions: Psychometric evidence presented here supports the potential use of this test as a useful tool for measuring the effectiveness of educational interventions to improve pharmacists' knowledge and abilities to provide care for transgender patients. Acknowledgments: We acknowledge the collaboration of Marlene McClosky-Oliver, Sergio Baerga Maldonado, Nelly Conte Schmidt, and Carlos Rodríguez-Díaz.

•4104•

**Metástasis de carcinoma escamoso de cérvix en la cavidad retroperitoneal: estudio de caso en mujer de 44 años.**

*Yelemis De La Cruz-Ortiz, CT(ASCP)CM (yelemis.delacruz@upr.edu)1, Yadiris López-Rivera, CT (ASCP), MSc, DrPH (yadiris.lopez1@upr.edu)1, Dr. Steven Catinchi-Jaime (jcatinchi@nwpathlab.com) 2. 1Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, Puerto Rico. Escuela de Profesiones de la Salud, Departamento Graduado, Programa de Citotecnología. 2 Laboratory Medical Director at Northwest Pathology Services, Manatí, Puerto Rico.*

**Propósito:** El cáncer cervical ocupa la cuarta posición en incidencia en mujeres a nivel mundial. En Puerto Rico, la incidencia ha aumentado un promedio de 2.4%. Esta malignidad está asociada a infección por el VPH. Las metástasis de cáncer cervical usualmente se localizan en nódulos linfáticos inguinales, pulmón, hígado y huesos; raramente en la cavidad retroperitoneal. La literatura científica indica que la mayoría de los carcinomas escamosos en la cavidad retroperitoneal son de origen metastático. El objetivo del estudio de caso fue evaluar los hallazgos histológicos de una masa inusual en la cavidad retroperitoneal y correlacionarlos con el historial clínico de la paciente y las pruebas auxiliares. **Descripción del caso:** El estudio caso corresponde a una mujer de 44 años con historial de carcinoma cervical diagnosticado hace siete años. Se presenta con una masa retroperitoneal en el lado izquierdo. El diagnóstico diferencial inicialmente fue linfoma. Se le realiza una biopsia percutánea con aguja gruesa. El hallazgo patológico consistió en un infiltrado de células tumorales epitelioides agregadas en nidos

o islas, entre el estroma fibroso. Presentan núcleos agrandados hiper cromáticos y pleomórficos en forma bizarra. La cromatina es gruesa y el citoplasma es denso eosinofílico, en un fondo inflamatorio. El panel inmunohistoquímico tuvo los siguientes resultados: negativo para CD45, Cromogranina, S100 y positivo para p16 y p63. Se desconoce la prognosis del paciente. **Conclusión:** Los hallazgos histológicos y las pruebas auxiliares son consistentes con el diagnóstico de metástasis de carcinoma escamoso pobremente diferenciado de origen cervical. La expresión positiva de p16 y p63 confirman la diferenciación escamosa y posible relación con el VPH. Según la literatura científica revisada, no se ha reportado ningún caso con este diagnóstico. Los hallazgos de este caso sustentan la importancia del trabajo multidisciplinario entre la evaluación patológica y la descripción clínica del paciente.

•4105•

**Applying Sentiment Analysis on Twitter to Follow the Progression of COVID-19**

*Marcelo O. Sztainberg, PhD, Northeastern Illinois University; Diego A. Pérez Morales, University of Puerto Rico, Río Piedras Campus, Computer Science Department*

**Background and Objectives:** With the number of COVID-19 cases rapidly increasing in the US and the delays on testing results, the task of following the progression of the disease in real time, within a specific region, has become extremely difficult. The object of this research is to try an approach in tracking COVID-19, by analyzing people's postings on Twitter. These posts are done in real time, thus by performing a sentiment analysis of these tweets we hope to find a strong correlation with the actual progression of the disease. **Methods:** Sentiment Analysis is a popular method within Machine Learning. This method assigns a positive or negative sentiment/attitude to a particular text based on the sentiment assigned to words that are part of that text. The specific sentiment analysis algorithm used in this research was the Bernoulli Naive Bayes model. This event model is especially popular for classifying short texts. To acquire this short text data we ran our sentiment analysis algorithm on Tweets retrieved from the Twitter API. We extracted tweets from the month of March for the state of

Virginia. Our analysis looked at data grouped over seven consecutive days at a time, to make it consistent with the way that health data is tracked (7 day average). Results: We took official COVID-19 data for the month of March from the Virginia state website and compared the progression of positive cases with the negative sentiment using a linear regression. Our results indicate a correlation coefficient of .80 between the negative sentiment of tweets and the confirmed cases. As the negative sentiment grew on Twitter, the amount of confirmed cases increased. Conclusion: This study presents a possible reliable and inexpensive prediction method for confirmed COVID-19 cases using negative sentiment data from Twitter. Acknowledgements: None

•4106•

**Monoarticular Rheumatoid Arthritis of the Elbow**

*Adianez Santiago, Luis M. Vilá. Division of Rheumatology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Rheumatoid arthritis (RA) is a chronic autoimmune disorder characterized by polyarticular inflammatory arthritis. Classification criteria for RA require the presence of arthritis of multiple peripheral joints in association with elevated acute phase reactants and/or positive RA serologic tests such as rheumatoid factor and anti-cyclic citrullinated peptide [CCP] antibodies. Conversely, monoarticular RA is extremely rare and represents a diagnostic challenge. Case Description: A 57-year-old woman presented with a one-year history of right elbow pain and swelling. On physical examination, she had tenderness, swelling, and limited range of motion of the right elbow. There were no abnormalities of other peripheral joints. Anti-CCP antibodies were elevated at 217 Units (normal range <20 Units). Magnetic resonance imaging of the right elbow showed capsular distension, joint effusion, and bone marrow edema. Synovial tissue biopsy revealed hyperplasia with lymphoplasmacytic infiltrate consistent with RA. She was treated with methotrexate 7.5mg orally weekly resulting in a good clinical response. Conclusion: Herein, we present a case of a middle aged woman with monoarticular RA of the right elbow. The elbow joint is involved in approximately one third of RA patients, but monoarticular RA

of the elbow has been reported in only one other case in the medical literature. This patient did not fulfill classification criteria for RA per the American College of Rheumatology. However, the diagnosis of RA was confirmed by serologic tests, imaging studies, and synovial tissue biopsy. This case highlights the importance of considering the diagnosis of RA even in the absence of polyarticular involvement. Clinicians should maintain a high suspicion of an inflammatory arthritis, although limited to one joint, because delayed recognition and treatment of RA can lead to joint destruction, disability, and increased morbidity and mortality. Acknowledgements: None

•4107•

**Extensive Longitudinal Transverse Myelitis in a Patient with Systemic Lupus Erythematosus Induced by Influenza A Virus Infection**

*Suheiry Márquez, Luis M. Vilá. Division of Rheumatology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Transverse myelitis (TM) is a rare complication seen in 1-2% of patients with systemic lupus erythematosus (SLE) that results in increased morbidity and mortality. Among other factors, viral infections may cause TM in these patients by causing a dysregulation of their immune system. Herein, we present a patient with SLE who developed severe TM after influenza A infection. Case Description: A 28-year-old woman with SLE presented with a 4-day history of nausea, vomiting, diarrhea and skin rash. Influenza A test was positive. Two days later she experienced urinary retention, bilateral lower extremity (LE) paralysis, upper extremity weakness, and blurred vision. Neurological examination demonstrated bilateral LE paralysis, decreased handgrip strength, hyperreflexia, and decreased sensation in LE and perianal region. Ophthalmologic exam disclosed bilateral retinal vasculitis, and optic nerve and macular edema. Laboratory tests showed leukopenia, lymphopenia, anemia, and proteinuria. C3 and C4 complement levels were low and anti-dsDNA antibodies were elevated. Magnetic resonance imaging showed a C4-T12 hyperintense lesion consistent with TM. She was treated with intravenous methylprednisolone 1g daily for 3 days and 6 cycles of intravenous

cyclophosphamide monthly. This treatment was followed by oral prednisone and mycophenolate mofetil. She had a remarkable clinical response. Within 6 months of treatment, visual acuity improved to her baseline and muscle strength almost fully recovered. Conclusion: To the best of our knowledge, this is the first case of TM induced by influenza virus in a patient with SLE. Influenza A virus infection induces a robust immunologic response, including the elevation of interferon-alpha which is the signature cytokine in SLE. Clinicians should be aware that viral infections, including influenza, may induce an exacerbation of SLE. This case highlights the importance of early recognition and prompt treatment of immunosuppressive drugs in such cases. Acknowledgements: None

•4108•

**Neurothekeoma: Case report of 17-year-old female and review of literature**

*Humberto Lugo Vicente, MD, Cristhian G. Negrón Rodríguez. University of Puerto Rico, Medical Sciences Campus, Surgery Department, San Juan, Puerto Rico; University of Puerto Rico, Río Piedras Campus, Biology Department, San Juan, Puerto Rico.* Purpose: Rare diseases like neurothekeoma are not always taken into consideration for differential diagnosis, even when the indications arise. The lack of patients presenting this disease is one of the main reasons why it is challenging for the physician to take it into consideration during the diagnosis. The case is presented to increase awareness of this disease, so it can be added to the differential diagnosis when the signs are presented. Case description: A 17-year-old female presented with a history of several asymptomatic nodules in the left arm. The patient had no significant past medical history. An excisional biopsy was performed. Based on the morphological and immunohistochemistry findings, Pathology determined these were most compatible with myxoid neurothekeoma, focally extending to margin. Grossly, the left forearm mass was a 0.6 x 0.4 x 0.3 cm tan rubbery tissue fragment on the subcutaneous tissue. The patient underwent two further resections. Two months following the first pathology report, the patient returned for the removal of a nodule on the antecubital fossa. The patient is set for further

evaluation. Conclusion: Neurothekeoma is a rare benign nerve sheath tumor, rarely seen on infants and children. Nerve sheath myxoma is identified by a greater degree of myxomatous changes, less cellularity with well circumscribed spindle cells in myxoid matrix and multinucleated giant cells. This case report should increase awareness about the rare disease of neurothekeoma, where it should be included in the differential diagnosis of dermal lesions in infancy, children, and young adults. Acknowledgements: None.

•4109•

**A Leiomyosarcoma vs. PEComa of Uterus With HMB-45 Positive Lung Metastasis and Endometriosis**

*Mario Barrera<sup>1</sup>, Manuel Pastrana<sup>1</sup>, Luis Santos-Reyes<sup>1,2</sup>; <sup>1</sup>San Juan City Hospital, San Juan, Puerto Rico; <sup>2</sup>University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Perivascular epithelioid neoplasm (PEComa) are a group of rare mesenchymal tumors from uncertain cellular origin. Although their natural history and prognosis is not well known, it has been observed that they may have benign or malignant behavior. These tumors are anatomically ubiquitous, yet gynecological PEComas are most commonly observed in uterus. They are associated with Tuberous Sclerosis Complex (TSC), thus specific treatment with mTORC1 inhibitors have been proposed. PEComas are histologically and immunochemically distinguishable by vascular patterns and specific tumor markers (e.g. HMB45, actin), but diagnosis is challenging due to their similarity to other myomatous tumors of the uterus (e.g. leiomyosarcoma). Precursor tumor lesions have been seldom reported, yet endometriosis is known to increase the risk for gynecologic malignancies; to the best of our knowledge there have been only two cases reporting endometriosis and PEComa. Case description: We present a case of a 62-year-old woman, with endometriosis, who presents with a uterine tumor and metastasis to lungs for which PEComa was suspected. Even though lung biopsy suggested a PEComa primary tumor from a gynecologic origin, the final pathological diagnosis was uterine leiomyosarcoma FIGO stage IV B. Conclusion: This discordance between diagnosis exemplifies the difficulties in diagnosing these types of tumors. To date we are still evaluating and comparing

histology and immunochemistry for final diagnosis. To the best of our knowledge this would potentially be the first gynecologic PEComa described in Puerto Rico and Latin America. Acknowledgments: No funding or conflict of interests.

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### Characteristics at Presentation of Patients with Scleritis in Puerto Rico

*Cristina Arruza<sup>1</sup>, B.A., Javier Colon<sup>1</sup>, B.S., Estefania Ramirez<sup>1</sup>, B.S., Guillermo Puebla<sup>1</sup>, B.S., Daniela Ortega<sup>2</sup>, B.S., Mariella Pappaterra<sup>1</sup>, B.S., Erick Rivera Grana<sup>1</sup>, MD, Frances Marrero<sup>1</sup>, MD, Emilio Baez<sup>3</sup>, MD, MS, Carmen Santos<sup>1</sup>, MD, Armando L. Oliver<sup>1</sup>, MD. <sup>1</sup>University of Puerto Rico, Medical Sciences Campus, Department of Ophthalmology, San Juan, Puerto Rico; <sup>2</sup>Universidad Central del Caribe, School of Medicine, Bayamon, Puerto Rico; <sup>3</sup>San Juan Bautista, School of Medicine, Caguas, Puerto Rico*

**Background & Objectives:** Patients with scleritis may have an associated systemic disease, which is often autoimmune and seldom infectious in origin. The data regarding such associations for scleritis in the Puerto Rican population is scarce. Herein, we evaluated the demographics, scleritis types, and disease associations in a cohort of patients with scleritis living in Puerto Rico. **Methods:** A retrospective review of medical records of all scleritis patients of 2 private uveitis practices in Puerto Rico was performed, which records spanned from January 1990 to July 2020. Demographic and clinical data were entered into a new database, and a descriptive statistical analysis was performed. **Results:** A total of 116 eyes of 95 patients with a diagnosis of scleritis were identified. The median age was 54 (range 13-80), 69% were female and all Hispanics. The disease was unilateral in 77.89% of patients. Diffuse anterior scleritis was present in 73.28%, nodular anterior scleritis in 13.79%, necrotizing scleritis in 6.90%, and posterior scleritis in 6.03% of eyes. The presenting visual acuity was better than 20/50 in 77% of eyes, while 9% had a visual acuity of less than 20/200. An associated autoimmune disease was present in 32.63% of patients (rheumatoid arthritis 15.79%, relapsing polychondritis 4.21%, Sjögren's syndrome 5.33%, sarcoidosis 3.16%, systemic lupus

erythematosus 2.17%, and systemic vasculitis 1.05%). An associated infectious disease was present in 6.32% of patients (4.21% syphilis, 1.05% Herpes zoster, and 1.05% Lyme disease). **Conclusions:** As in other cohorts, scleritis in Puerto Rico was most common in females and had a median age in the sixth decade. The majority of patients presented with unilateral and diffuse anterior scleritis. Rheumatoid arthritis was the most common autoimmune systemic disease association, while syphilis was the most common infectious cause. **Acknowledgments:** None. Approved IRB Protocol B1960320

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### El Covid-19 y los Cambios Estructurales No Tradicionales en el Sistema de Salud Pública de Puerto Rico

*José M. Pérez Díaz. Universidad de Puerto Rico, Recinto de Ciencias Médicas. Escuela Graduada de Salud Pública y Ciencias Biosociales, Departamento de Administración de Servicios de Salud, San Juan, Puerto Rico.*

**Política Pública Analizada:** Se analizan las políticas públicas relacionadas a la respuesta del COVID-19 en el sistema de salud pública de Puerto Rico y se recomiendan cambios estructurales no tradicionales dentro de un contexto de un sistema complejo adaptativo. **Disciplina o Teoría:** El modelo de sistemas complejos adaptativos por John H. Holland es aplicado para evaluar el sistema de salud pública de Puerto Rico. Un sistema adaptativo complejo reaccionará de diferentes formas a la pandemia del COVID-19 dependiendo de su entorno socio-antropológico-cultural. Buscamos identificar aquellos cambios estructurales necesarios para optimizar la respuesta ante una crisis mayor de salud pública. **Fuentes de Información:** Entrevistas a diferentes expertos en el funcionamiento y cultura del sistema de salud de Puerto Rico. **Método:** Se utilizó el método Delphi para investigaciones cualitativas. **Hallazgos:** Se revelan cambios estructurales no tradicionales como cambios en la estructura de prestación de servicios intergeneracionales de salud, cambios en la estructura socio-financiera de la salud y cambios en la estructura de acceso médico-cultural a la salud en el sistema de salud pública de Puerto Rico. **Implicaciones:** Si un sistema público de salud aspira



a ser resiliente en el manejo de crisis mayores de salud debe incorporar cambios estructurales no tradicionales para responder a su entorno socio-antropológico-cultural. Reconocimientos: Ninguno.

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**Huracán María en Puerto Rico: un estudio fenomenológico sobre la participación de los terapeutas físicos**

*Leila M. Rosado Pérez<sup>1</sup>, SPT; Valeria M. Correa Ortiz<sup>1</sup>, SPT; Josué R. Sánchez González<sup>1</sup>, SPT; Karisol Chévere Rivera<sup>1</sup>, PhD; Ana L. Mulero Portela<sup>1</sup>, PT, PhD; <sup>1</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas*

**Trasfondo:** A pesar de que la Confederación Mundial de Terapia Física (WCPT) ha especificado los roles que los terapeutas físicos podrían asumir en las distintas fases de la respuesta ante los desastres, las aportaciones de estos profesionales en tales eventos han sido pobremente documentadas. Similarmente, existe poca literatura acerca de los patrones y frecuencias de lesiones luego de un desastre natural. **Objetivos:** 1) Evidenciar la participación de los terapeutas físicos en Puerto Rico luego del paso del huracán María a través de los roles que estos asumieron tanto en su trabajo como en la comunidad. 2) Describir la incidencia de lesiones músculoesqueléticas y otras condiciones de salud que surgieron luego del huracán y sus implicaciones en la práctica de terapia física ante un desastre. **Métodos:** Estudio cualitativo fenomenológico realizado en Puerto Rico. Se recopiló información de 12 terapeutas físicos mediante entrevistas semiestructuradas (N=10) y un grupo focal (N=2). Las entrevistas fueron audio grabadas, transcritas y analizadas mediante análisis de contenido cualitativo. Proyecto fue aprobado por IRB. **Resultados:** Los terapeutas físicos asumieron roles como asistir a otras profesiones en los hospitales, educar en la prevención de lesiones y ayudar a las comunidades. Se vio un aumento en lesiones músculoesqueléticas de cadera, hombro y espalda por caídas, esfuerzos excesivos y accidentes en el proceso de recuperación del desastre. **Conclusiones:** Los terapeutas físicos pueden asumir diferentes roles luego de un desastre natural, pero muchos desconocen que pueden ser parte del equipo de respuesta a estos eventos y cómo pueden utilizar sus destrezas

en medio de la emergencia. Se recomienda que los terapeutas físicos reciban entrenamiento en manejo de emergencias y se incluya un módulo en sus estudios sobre cómo colaborar ante un desastre natural. Reconocimientos: ninguno.

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**COVID-19 Case report: Early Versus Late Medical Care, What are the Outcomes?**

*Tamara González Copo, BS1, Wilfredo De Jesús Rojas, MD, FAAP<sup>1-2</sup>; <sup>1</sup> Department of Pediatrics, University of Puerto Rico, Medical Sciences Campus, School of Medicine, Department of Pediatrics; <sup>2</sup> San Juan Bautista School of Medicine, Caguas, Puerto Rico; Emails: Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu); Corresponding author: Correspondence should be addressed to: Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu)*

**Purpose:** To compare clinical outcomes of early versus late medical care in two siblings with COVID-19. **Case Description:** Case 1: A 17-year-old overweight (BMI 29.6kg/m<sup>2</sup>) male with bronchial asthma, sought medical attention after presenting with myalgias, increased respiratory effort, cough and fever (40oC) for one day. For the past four days patient has been SARS-COV-2 PCR positive; following father's positive results. Physical exam (PE) in the emergency department (ED) showed diminished pulmonary sounds, respiratory distress and single-breath-count of seven. Chest X-Ray (CXR) revealed low lung volumes and RML infiltrates and diffuse ground-glass opacities on chest-CT. Inpatient treatment included Acetaminophen, Vitamin C, Azithromycin, Famotidine, Oseltamivir, Remdesivir and respiratory support via face mask at 0.35 FIO<sub>2</sub>. On day six, patient was discharged with 99% SaO<sub>2</sub> at room air and single-breath-count of 30. Outpatient pulmonary function test showed no airflow limitation five months later. Case 2: A 16-year-old male with obesity (BMI 32.3kg/m<sup>2</sup>), sought medical attention after presenting with malaise, fever (>40oC), dry cough, SOB and respiratory distress for the past six days prior to evaluation. PE evidenced tachypnea, decreased pulmonary sounds bilaterally, 60% SaO<sub>2</sub> at room air and single-breath-count of 15, requiring PICU admission. ED SARS-COV-2 PCR was positive. Imaging showed extensive bilateral airspace and

ground-glass opacities following a “crazy-paving” pattern compromising 85% lung surface. Inpatient treatment included Dexamethasone, Vitamin C and D, Famotidine, Azithromycin, Zinc, Remdesivir, Melatonin, convalescent plasma and Tocilizumab. On day five post-admission, an apical pneumothorax and pneumomediastinum complicated the clinical course with a marked increase on inflammatory markers. Upon transfer to a tertiary hospital and despite maximized treatment and respiratory support using extracorporeal membrane oxygenation treatment, patient died from cardiorespiratory arrest. Conclusion Delaying medical care for COVID-19 can result in detrimental pediatric patient outcomes regardless of pre-existing lung disease, which may be exacerbated by obesity. Acknowledgements: None

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#### **Characteristics Upon Presentation of Patients with Type 2 Macular Telangiectasia in Puerto Rico**

*Orlando G. Gonzalez Martinez<sup>1</sup>, Jan Ortiz<sup>1</sup>, Sebastian Quiñones<sup>1</sup>, Jonathan G. Alicea<sup>1</sup>, Francisco Guevara<sup>1</sup>, Alejandro Perez<sup>1</sup>, Mariella Pappaterra<sup>1</sup>, Claudia Amaral<sup>1</sup>, Erick Rivera Grana<sup>1</sup>, Victor Villegas<sup>1</sup>, Cesar Quiñones<sup>1</sup>, Andres Emanuelli<sup>1,2</sup>, Armando L. Oliver<sup>1</sup>. <sup>1</sup>University of Puerto Rico, Medical Sciences Campus, Department of Ophthalmology, San Juan, Puerto Rico. <sup>2</sup>Emanuelli Research and Development Center, Arecibo, Puerto Rico.*

**Background & Objectives:** Macular telangiectasia is a rare macular disease characterized by abnormal tortuosity and dilation of the parafoveal capillaries. Its etiology is thought to be neurodegenerative, and presently, there are no effective treatments for this condition. Our study seeks to describe the systemic disease associations and clinical features, upon initial presentation, of patients with macular telangiectasia in Puerto Rico. **Methods:** A retrospective cohort study was performed. All patients with macular telangiectasia in 4 retina practices in Puerto Rico were included. The demographic, systemic diseases, and clinical characteristics were recorded, and descriptive statistics were used for the analysis. **Results:** Twenty-one patients diagnosed with macular telangiectasia were identified and included in the analysis. All patients had type two macular telangiectasia. The

median age of presentation was 62 years; 86% were female, and all patients were Hispanics. The median visual acuity at presentation was 20/50. A prior medical diagnosis of type II diabetes mellitus was found in 15 (71.4%) patients, essential hypertension in 12(57.1%), dyslipidemia in 9 (42.9%). The most common findings were the presence of right-angle vessels in 32 (76.2%) of eyes, telangiectatic vessels in 28 (66.7%) of eyes, and hyperfluorescence temporal to the fovea on fluorescein angiography, found in 22 (52.4%) of eyes. All patients had bilateral disease. One eye had evidence of choroidal neovascularization. **Conclusions:** The prevalence of type 2 diabetes mellitus in our cohort was higher than expected for an age-matched population in Puerto Rico. This concurs with other studies that have suggested an association between type 2 macular telangiectasia and diabetes mellitus. Our research indicates that Type 2 macular telangiectasia was the predominant type in Puerto Rico, similar to other western cohorts. The demographic and clinical characteristics were similar to those found in other cohorts, such as the Beaver Dam Study. Acknowledgments: None. Approved IRB Protocol B19603129

•4119•

#### **Ocular Manifestations in Patients with Asymptomatic West Nile Virus Infection in Puerto Rico**

*Mariella Pappaterra-Rodríguez<sup>1</sup>, Sofia Muns<sup>1</sup>, Erick Rivera Grana<sup>1</sup>, Gabriel Sanz<sup>2</sup>, Armando L. Oliver<sup>1</sup>. <sup>1</sup>University of Puerto Rico, Medical Sciences Campus, Department of Ophthalmology, San Juan, Puerto Rico. <sup>2</sup>Wilmer Eye Institute, Johns Hopkins University, Baltimore, Maryland.*

**Background and Objectives:** Ophthalmic manifestations of West Nile virus (WNV) infection include optic neuritis, retinal vasculitis, and chorioretinitis. Vectors for WNV include *Aedes*, *Ochlerotatus*, and *Culex* species, with the latter being highly abundant in Puerto Rico. Seropositivity to the virus has been described in local birds such as *Mniotilta varia* since 2002, making it plausible for humans on the island to become incidental hosts and develop clinical manifestations of WNV infection. Our study aims to characterize the ocular findings of a cohort of patients with asymptomatic WNV infection in Puerto Rico. **Methods:** A retrospective review of medical records of a single

uveitis practice in Puerto Rico was performed. All patients with a history of optic neuritis, retinal vasculitis, and chorioretinitis with positive WNV serology were selected for analysis. Patients with a history suggestive of symptomatic WNV infection, or any other systemic condition that may have explained the ocular findings, were excluded. A descriptive statistical analysis of the demographic and clinical characteristics was performed. Results: Six patients met the study criteria; all had positive IgG and negative IgM for WNV. The median age at presentation was 61 years (range 25 - 70); all were female and Hispanic. Eleven of 12 eyes (91%) were affected with a manifestation allusive to WNV disease. Eighty-one percent of eyes had a visual acuity of 20/30 or better. Seven eyes of 5 patients had curvilinear chorioretinal lesions characteristic of WNV chorioretinitis. Two patients had bilateral retinal vasculitis. Four patients had evidence of prior optic neuritis, and one had physiological blind spot enlargement: all present unilaterally. Conclusions: Our study suggests that patients with asymptomatic WNV infection may develop ocular manifestations. It also provides evidence to suggest that locally acquired WNV transmission and disease are plausible in Puerto Rico. Acknowledgments: None. Approved IRB Protocol: B1960121

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**Bioavailability of cannabinoids in patients experiencing acute pain.**

Rafael Y Nieves-Beltrán<sup>1</sup>, Hecristine Perez<sup>1</sup>, José Rodríguez-Orengo PhD<sup>1</sup>, Jorge Duconge PhD<sup>1</sup>, Joseph Bloom PhD<sup>1</sup>. <sup>1</sup>University of Puerto Rico, Medical Sciences campus. <sup>1</sup>rafael.nieves7@upr.edu, <sup>1</sup>hecristine.perez@upr.edu, <sup>1</sup>jose.rodriguez139@upr.edu, <sup>1</sup>jorge.duconge@upr.edu, <sup>1</sup>joseph.bloom@upr.edu

Background & Objectives: Cannabis has been used worldwide for thousands of years for its analgesic and antispasmodic properties, among others. The pharmacodynamics and pharmacokinetics of the cannabinoids and the efficacy of vaporized cannabis use for acute pain is unknown. We developed and validated an easy and effective method for quantifying cannabinoids in plasma and serum following Food and Drug Administration (FDA) guidelines using LC/MS Triple Quad. This method was used to analyze

the correlation between biological cannabinoids levels and clinical outcomes to determine whether there is a dose-response effect between cannabinoid exposure and response. Methods: The cannabinoids  $\Delta^9$ -tetrahydrocannabinol (THC), cannabidiol (CBD), 11-hydroxy- $\Delta^9$ -tetrahydrocannabinol (11-OH-THC), 11-nor-9-carboxy- $\Delta^9$ -tetrahydrocannabinol (11-COOH-THC), tetrahydrocannabinolic acid (THCA-A) and, cannabidiolic acid (CBDA) were analyzed in patients using vaporized cannabis. Cannabinoids present in plasma were quantified using protein precipitation followed by MS detection in positive electrospray ionization mode, using two transitions for each cannabinoid. Results & Conclusion: This method showed highly sensitive THC, CBD, THCA-A, and CBDA with a low limit of quantification (LLOQ) of 0.5 ng/mL and 11-OH-THC 11-COOH-THC of 1.0 ng/mL. The calibration curve demonstrated linearity of  $R^2 > 0.995$  over the range of 0.5-300 ng/mL for THC, CBD, THCA-A and, CBDA and 1.0-300 ng/mL for 11-OH-THC and 11-COOH-THC. We validated a fast, easy, and sensitive method for the analysis of the cannabinoids in plasma and serum. The developed and validated method was applied to analyze the cannabinoids of plasma samples in patients who experience acute pain. The highest concentration of cannabinoids in plasma was typically observed at the first point (5 min) after exposure to the vaporization, and metabolites were observed after the second point (15 min). Pharmacokinetics of the cannabinoids vary by patients due to the intensity of the inhalation. No significant results were observed on the correlation of dose and response effect in the participant.

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**Experiences of the nursing and medical professional on delirium in adult and pediatric patients in the intensive care unit: A phenomenological study**

Pamela Miró-Vázquez RN, MSN; Bryan O. Ortiz-Sierra RN, MSN; Milagros I. Figueroa-Ramos, RN, PhD

Background and Objectives: Delirium is a manifestation of acute brain dysfunction, characterized by an acute or fluctuating onset. Although reversible, research has identified a prevalence of between 45% and 87% in adults, 13% to 43% in children and 50% in infants and toddlers, during their stay in intensive care units (ICU). Among nursing professionals and doctors, there

is still a poor knowledge in the identification and management of patients with delirium. The objective of this study was to explore the experiences of the nursing and medical professional in the identification and management of delirium in adult and pediatric patients admitted in intensive care. Methodology: Qualitative descriptive phenomenological study. The scenarios were 2 hospitals in the metropolitan area of Puerto Rico. Four focus groups (2 nursing groups and 2 physician groups) were carried out using a semi-structured question guide. The focus groups were audio-recorded, transcribed and subjected to content analysis to obtain a clear understanding of the phenomenon. Findings: According to the accounts of the participants, there are no protocols for the early diagnosis of delirium. In addition, there is variability in pharmacological and non-pharmacological treatment in each shift. The organization of work in the ICU also affects when estimating, managing and preventing delirium. However, family inclusion favors the early detection of delirium. Conclusion: There are barriers and unawareness in the estimation, management and prevention of delirium. For this reason, we must reinforce the education of professionals about it, in order to improve the process of care and attention in patients with delirium.

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#### **Invasive fungal infection with Cryptococcal Meningoencephalitis in Systemic Lupus Erythematosus**

*Ariana González-Meléndez, MD, MPH; Suheiry Márquez-Márquez, MD; Salvador Vilá, MD, Division of Rheumatology, Department of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by injury to multiple body systems and systemic inflammation. Management requires the use of drugs that modulate and suppress the immune system, known to increase the risk of serious infections. Discerning between SLE flares and infections can be challenging, with serious clinical implications if the correct diagnosis is missed. Case Description: A 23-year-old-woman with SLE, treated with mycophenolate mofetil, hydroxychloroquine, and corticosteroids was hospitalized with a 3-weeks history of worsening frontal headache, fever, nausea,

vomits, and photophobia. She exhibited diffuse alopecia and healed discoid lesions. Neurological and ophthalmologic examinations were normal. The anti-dsDNA antibodies were elevated and serum C3 and C4 were low. Magnetic resonance (MR) imaging, MR angiography, and MR venography were consistent with nonspecific findings of intracranial hypertension. There was no evidence of cerebral vasculitis or venous thrombosis. Lumbar puncture revealed pleocytosis (85.0 cell/uL) with monocytic predominance, low glucose (35 mg/dL), high proteins (46 mg/dL) and elevated cerebrospinal fluid (CSF) pressure (25 cmH<sub>2</sub>O). Cryptococcal antigen in CSF was negative, however, CSF culture was positive for *Cryptococcus neoformans*. During her hospital stay, the immunosuppression was not increased. She was prescribed amphotericin B and flucytosine, followed by fluconazole for maintenance. Within 2 weeks of starting treatment, she had a marked and sustained improvement in clinical symptoms. Conclusion: Infections can be mimickers of a SLE flare-up, particularly when serological markers suggesting high SLE activity are present. Cryptococcal meningitis should be considered in the differential diagnosis of SLE patients with high disease activity and subacute presentation of headache and fever, particularly in the setting of immunosuppression. This case highlights the importance of meticulously scrutinizing SLE mimickers, as infections are known to increase mortality if unrecognized and untreated. Acknowledgments: None

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#### **Differences in mental health conditions by age groups among adults in Puerto Rico during the COVID-19 pandemic.**

*Stephanie Cameron-Maldonado<sup>1</sup>, BS, stephanie.cameron@upr.edu, Cynthia M. Pérez<sup>2</sup>, PhD, cynthia.perez1@upr.edu, Lyz E. Negrón<sup>2</sup>, BS, lyz.negron@upr.edu, Uriyoán Colón-Ramos<sup>3</sup>, PhD, uriyoan@gwu.edu, Josiemer Mattei<sup>4</sup>, PhD, j.mattei@hsph.harvard.edu, Emma Fernández-Repollet<sup>5</sup>, PhD, e.fernandez@upr.edu, Andrea López-Cepero<sup>4</sup>, PhD, andrea.lopez11@upr.edu. <sup>1</sup>Department of Biology, University of Puerto Rico-Cayey, Cayey, Puerto Rico, <sup>2</sup>Department of Biostatistics and Epidemiology, Graduate School of Public Health, Medical Sciences*

Campus, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico, 3Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington, D.C, 4Department of Nutrition, T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts. 5Department of Pharmacology, School of Medicine, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico.

**Background & Objective:** The COVID-19 pandemic has exacerbated mental health conditions, with young adults being at higher risk due to its related detrimental consequences. Puerto Rico residents bear a significant burden of mental health conditions due to environmental and social stressors exacerbated during the pandemic. However, the scarcity of data on mental health conditions during the emergency hinders understanding these vulnerable groups' conditions. This study evaluated the prevalence of mental health conditions during the COVID-19 crisis in adults and assessed its association with age. **Methods:** A total of 1,945 adults ( $\geq 18$  yr.) completed an online survey from December 2020-February 2021. Responders self-reported age and mental health diagnoses (i.e., anxiety, depression, and insomnia). Logistic regression was used to evaluate the associations between age and mental health conditions adjusting for sex, education, income, marital status, and smoking. **Results:** Age categories within the age range 18-50 yr. constituted 62.5% of the sample. The prevalence of anxiety, depression, and insomnia was 23.6%, 15.9%, and 11.0%, respectively. A third of the sample reported at least one mental health condition. Compared to individuals over 50 yr., those between 18-29 yr. and 30-39 yr. had significantly higher adjusted odds of anxiety (OR=1.59, 95% CI=1.17-2.16; OR=1.38, 95% CI=1.01, 1.89; respectively). However, younger individuals had lower adjusted odds of insomnia than those over 50 yr.: OR18-29yr=0.44 (95% CI=0.29, 0.66); OR30-39yr=0.52 (95% CI=0.33, 0.81); and OR40-49yr=0.67 (95% CI=0.45, 0.99). **Conclusion:** Mental health conditions were prevalent during the pandemic among adults in PR and they differed significantly by age group. More research is needed to allocate appropriate

mental health resources during emergencies according to population subgroups. **Acknowledgment:** This work has been partially supported by RCMI Grant U54-MD007600 from the National Institute of Minority Health and Health Disparities (NIMHD), National Institute of Health (NIH).

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### **Determination of Cannabinoids in urine of patients after vaporization using LC-MS/MS**

Hecristine Pérez-Vélez<sup>1</sup>, Rafael Nieves-Beltrán<sup>1</sup>, Joseph Bloom-Oquendo<sup>2</sup>, José Rodríguez-Orengo<sup>3</sup>.  
<sup>1</sup> University of Puerto Rico, Medical Sciences Campus, School of Pharmacy, San Juan, Puerto Rico. <sup>2</sup> University of Puerto Rico, Medical Sciences Campus, San Juan, Puerto Rico. <sup>3</sup> University of Puerto Rico, Medical Sciences Campus, School of Medicine, San Juan, Puerto Rico.

Currently, the use of medical cannabis has increased drastically due to its potential use for different health conditions. Most of the methods in the literature analyze plasma use LC/MS/MS to analyze cannabinoids in plasma. Analysis of cannabinoids in urine use GC/MS and are focused on 11-nor-9 carboxy-tetrahydrocannabinol (11-THC-COOH) as the compound of interest. We developed and validated an LC-MS/MS method to determine cannabidiol (CBD),  $\Delta 9$ -tetrahydrocannabinol (THC), 11-hydroxy- $\Delta 9$ -tetrahydrocannabinol (11-OH-THC), 11-COOH-THC and 11-nor-9-carboxy- $\Delta 9$ -tetrahydrocannabinol glucuronide (11-COOH-THC Gluc) in human urine of patients to identify their cannabis profile when vaporizing cannabis. This method can be used to determine bioavailability of cannabis by this dosage method. **Method:** Twelve patients who vaporize an amount of cannabis flower using the Volcano Vaporizer were recruited. Urine from these patients were collected for a period of 24 hours. Approximately 600  $\mu$ l of urine was prepared by a simple liquid-liquid extraction with ethyl acetate, then the extract was dried and reconstituted with 1:1 MeOH:ACN and, then analyzed by LC-MS/MS. **Results:** The lower limit of quantification values were 0.5ng/mL for CBD, THC, 11-OH-THC, 11-COOH-THC and 5.0ng/mL for 11-COOH-THC Gluc. The calibration curves had coefficients of determination ( $r^2$ ) of at least 0.995 for all cannabinoids. The method was fully validated for

linearity, sensitivity, selectivity, accuracy, precision and stability parameters. Conclusion: The results exhibit that the method was capable of determining and quantifying CBD, THC, 11-OH-THC, 11-COOH-THC and 11-COOH-THC-Glucuronide in urine samples of patients who vaporize the flower of cannabis. To our knowledge, this is the only LC/MS/MS method validated for all the aforementioned cannabinoids in urine samples, which can be used for bioavailability and pharmacokinetic studies.

•4128•

**Case Report: Allergic Bronchopulmonary Aspergillosis: With or Without?**

Victor M. Acosta Rivera, BS1; Jesus M. Melendez Montañez, BS1; Wilfredo De Jesús Rojas, MD, FAAP1-2. 1 Ponce Health Sciences University, School of Medicine, Department of Pediatrics, Ponce, Puerto Rico, 00716; 2 University of Puerto Rico, Medical Sciences Campus, School of Medicine, Department of Pediatrics, San Juan, Puerto Rico, 00921. Email addresses: Victor M. Acosta Rivera, BS: (vacosta16@stu.psm.edu), Jesus M. Melendez Montañez, BS: (jmelendez20@stu.psm.edu), Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu). Corresponding author: Correspondence should be addressed to Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu)

Purpose: Allergic bronchopulmonary aspergillosis (ABPA) is a pulmonary hypersensitivity reaction to the *Aspergillus fumigatus* superimposed in patients affected from either asthma or cystic fibrosis (CF). Current diagnostic criteria for ABPA must include the presence of these predisposing conditions in order to establish diagnosis. We present a challenging case of ABPA in a Puerto Rican 21-year-old male that went underdiagnosed and undertreated due to lack of asthma or CF history prior to initial ABPA symptomatology development. Case Description: A 21-year-old nonsmoker male who presented with a 12-month history of acute-onset shortness of breath, cough with brown sputum production, chest pain, general malaise and episodic fever. Past medical and family history was unremarkable previous to the development of his symptoms. Over this time period, the patient had seven hospitalizations attributed

to recurrent mycoplasma pneumonia. Physical examination was remarkable for bilateral polyphonic wheezes on auscultation. PFTs showed FVC: 43%, FEV1: 26%, FEV1/FVC: 62% of predicted values and a 20% of predicted change in FEV1 on post-bronchodilator test. FeNO was 105 ppm (normal <30 ppm). Workup revealed central bronchiectasis with extensive ground-glass opacities on HRCT, eosinophilia of 14,300 cells/μL, total serum IgE of 7001 kU/L and *A. fumigatus* IgG level of 20.6 mcg/mL (normal <2 mcg/mL), confirming the diagnosis of ABPA. Patient was initiated on oral prednisone 30 mg (0.5mg/kg) daily for two months. Following therapy, HRCT showed significant reduction of prior lung lesions, PFTs revealed marked improvement in severe airway obstruction (FVC: 67%, FEV1: 72%, FEV1/FVC: 108%) and FeNO decreased to 69 ppm. Conclusion: Given the good prognostic value of treated ABPA, physicians should have high clinical suspicion for ABPA in Puerto Rican patients presenting with difficult-to-treat asthma associated with productive cough, central bronchiectasis, eosinophilia and pneumonia that fails antibiotic treatment even without history of asthma or CF as predisposing conditions. Acknowledgments: Funding: This research was funded by the Hispanic Center of Excellence, University of Puerto Rico School of Medicine, Grant Number: D34HP24463, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce. Institutional Review Board Statement: The study was conducted according to the guidelines of the University of Puerto Rico, Medical Sciences Campus, and approved by the Institutional Review Board of the University of Puerto Rico, Medical Science Campus, Department of Pediatrics protocol code: B1730120. Conflict of interest: Authors declare no conflicts of interest regarding the publication of this article. Author's Contributions: All authors were involved in the design of the study and edition this article.

•4129•

**Case Report: The Impact of Obesity Status on COVID-19 Hospital Admission in Two Puerto Rican Children.**

Natalie M. Fernandez, B.S.1, Wilfredo De Jesús Rojas, MD, FAAP1-3; 1 San Juan Bautista School of Medicine; 2 Ponce Health Sciences University School

of Medicine, Department of Pediatrics, 3 Department of Pediatrics, University of Puerto Rico, Medical Sciences Campus, School of Medicine, Department of Pediatrics; Emails: Natalie M Fernandez, B.S.: (natalief@sanjuanbautista.edu), Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu); Corresponding author: Correspondence should be addressed to: Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu)

**Purpose:** To highlight the impact of obesity status on hospital admission for COVID-19 infection in two pediatric cases. **Case Presentation:** Case A: An 11-year-old male without past medical history presented to the emergency department with a fever of 38.4°C, vomiting, nausea, and diarrhea beginning earlier that day. Patient was in contact with his mother, who tested positive for SARS-COV-2 PCR. Patient's Body Mass Index (BMI) was 20 kg/m<sup>2</sup> (84th), with a saturation of 99% on room air. Lungs were clear to auscultation bilaterally. Chest X-ray (CXR) revealed no focal lung consolidation. The patient's hospital stay was uneventful; his fever resolved after 24 hours, he did not become hypoxic, and he continued receiving supportive care. Case B: A 12-year-old obese male, brother of case A, with a history of asthma presented with cough, nasal congestion, and fever of 38.5°C. He was also in contact with his COVID-19 positive mother. Patient's BMI was 31 kg/m<sup>2</sup>, (99th). On examination, the patient had increased work of breathing, decreased breath sounds, and 96% saturation on room air. Laboratory results revealed C-reactive protein of 2.4 mg/dL, and D-dimer level of 324 ng/mL, indicating mild inflammatory process. CXR exhibited low lung volumes and LLL atelectasis; subsequent chest CT revealed clear lungs bilaterally. No additional complication resulted during hospitalization. Supportive care with oxygen at FIO<sub>2</sub> 0.24 was administered via nasal cannula. Both Cases A and B were discharged home on day four of illness with anticipatory guidance and telemedicine follow-up with their pediatrician. **Conclusion:** Both cases highlight the impact of obesity status on COVID-19 hospitalization in children. Puerto Rico has high rates of pediatric obesity, which is exacerbated by sedentarism during the pandemic. Strategies to identify and reduce pediatric obesity may help to avoid COVID-19-related hospitalizations in Puerto

Rican children. **Acknowledgements:** Authors declare no conflict of interest regarding the publication of this article. A formal written informed consent will be obtained from a legal caretaker. All authors were involved in the edition of this article.

•4131•

### **Knowledge, attitudes and practices towards preventive measures against COVID-19 virus among pregnant Hispanic women living in Puerto Rico**

Laura Seda Rodríguez<sup>1</sup>, Indira Pelet Rivera<sup>1</sup>, Yesenia Fuentes Pérez<sup>1</sup>, Josefina Romaguera<sup>1,2</sup>, Erika Benabe González<sup>1</sup>; <sup>1</sup>San Juan City Hospital, San Juan, Puerto Rico; <sup>2</sup>University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

**Background & Objectives:** Hispanic communities experience higher rates of infection and complications due to COVID-19 compared to other non-minority groups. Historic inequities in access to health care and other resources contribute to these disparate outcomes in the United States. Health care professionals should be vigilant in counseling pregnant women and in screening for exposure as well as symptoms of COVID-19. We aim to identify women at high risk for health problems associated to poor education and practices about preventive measures of virus exposure. **Methods:** A cross-sectional descriptive study design was conducted with pregnant women living in Puerto Rico. After IRB approval, a self-administered survey using Survey Monkey was distributed to females 21 years-old or older between October 2020 and March 2021. Descriptive statistics were used to summarize our data. **Results:** Of the 236 participants, 62.71% were between 21-29 years old, 61.41% lived in the Metropolitan Area, 83.05% received prenatal care at private offices, and 61.02% had government insurance. Participants recognized the following symptoms as the most commonly found with COVID-19: cough (89.41%), fever (78.82%), malaise (75.21%), and nausea (40.25%). Only 2.54% did not recognize symptoms. About 75% identified that comorbidities during pregnancy increase the risk of complications if infected with COVID-19. Patients reported that the best way to avoid infections is to wash hands with soap and water (93.64%), cover nose and mouth with a facemask (96.18%), use alcohol 70% (77.11%), and social distancing of 6 feet (94.07%). **Conclusion:** Our

population reported adequate level of awareness about symptoms and proper hygiene methods to avoid infection with COVID-19. Education should be promoted at all prenatal visits regardless of risk for exposure. Further studies are needed in Puerto Rico to assess knowledge and attitudes toward prevention of this novel virus in pregnant patients. Acknowledgment: No funding or conflict of interests.

•4132•

**Importance of Folic Acid in Hispanic Females During Preconception Period and Pregnancy: Knowledge, Attitudes, Practices, and Use**

*Sofía López Díaz MD1, Yesenia Fuentes Pérez MD1, Rafael Martinez MS2, Paola Fernández Molinary BS, Josefina Romaguera MD MPH1,2, Olga Pereira Díaz MD FACOG1; 1San Juan City Hospital, San Juan, Puerto Rico; 2University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

**Background & Objectives:** The incidence of neural tube defects (NTD's) in Puerto Rico has not decreased and remains higher compared to the USA and the prevalence occurs in 9.48 for every 10,000 live births. The aim is to identify the level of knowledge and awareness of folic acid during the preconception period and pregnancy. **Methods:** The cross-sectional study consisted of pregnant women from the prenatal clinics of the San Juan City Hospital in Puerto Rico who completed a survey from October 2017 through April 2019 about the use and knowledge of folic acid. Main observations were compared to those found in previous profile studies performed in the Adults University Hospital from Puerto Rican females of reproductive age using the Chi-square and Fisher's exact test for categorical variables, while the strength of association was assessed through Cramer's V. For all tests, a p-value of 0.05 or less was considered an indicator of a significant difference. Statistical analysis was performed using Stata 14.2 (StataCorp, Texas, USA). **Results:** From 130 patients, 65.38 % were actively taking folic acid, 13.85% started to use folic acid before current pregnancy and 51.54% started to use folic acid after a positive pregnancy test. We found associations between Adults University Hospital (UDH) and our population regarding sociodemographic characteristics. We observed a decrease in the use of folic acid prior pregnancy in

our population compared to UDH study group (23.0% vs. 13.85%) ( $\chi^2(1):36.64, p<0.001$ ). **Conclusion:** With the years we observed a decline in folic acid awareness and use within our study population which might represent a burden to the health system in the future. **Acknowledgements:** Supported by the UPR Endowed Health Services Research Center through grants 5S21MD000242 and 5S21MD000138, from the National Center for Minority Health and Health Disparities, National Institutes of Health (NCMHD-NIH).

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**Validation of a Pharmacogenetic-guided Algorithm to Predict PRU Values in Caribbean Hispanics on Clopidogrel.**

*Andrés López Reyes1, Jorge Duconge Soler2, Ednalise Santiago Cartagena2. 1University of Puerto Rico Río Piedras Campus, San Juan Puerto Rico; 2University of Puerto Rico Medical Sciences Campus, San Juan Puerto Rico.*

**Background & Objectives:** Clopidogrel has proven to be an effective antiplatelet drug for patients with Acute Coronary Syndrome (ACS) due to its ability to reduce ADP-induced platelet aggregation through inhibition of the P2Y12 receptor. However, patients with High Residual Platelet Reactivity (HTPR) tend to display poor response to clopidogrel and greater risk for stent thrombosis and other ischemic events. A pharmacogenetic-guided algorithm has been developed to estimate Platelet Reactivity Unit (PRU) values via clinical, demographic and genetic variables, yet its utility to obtain precise estimates in Caribbean Hispanics (CH) has not been verified. We hypothesized that if the selected genetics, demographics and clinical variables are adequate to estimate true PRU values in CH patients on clopidogrel, then the pharmacogenetic-guided algorithm is effective and accurate to guide antiplatelet therapy in the CH population. This study aims to validate the pharmacogenetic-guided algorithm among CH on clopidogrel. **Methods:** A cohort study was performed on 314 CH patients on clopidogrel 75 mg/day. Individual clinical and genetic data were collected from medical records across different medical institutions in Puerto Rico (approved by IRB, protocol #A4070417). Two different cutoff values were used to define HTPR (i.e., PRU  $\geq 208$  &



PRU  $\geq$ 230). PRU values were estimated using a web-based App (<https://clopidogrel-app.firebaseio.com/>). Individually estimated PRUs were compared to their corresponding measured PRUs (P2Y12 assay VerifyNow®). Results: When using 208 as cutoff, 120 (38%) patients were non-responders, while 194 (62%) were sensitive to clopidogrel. When using 230 as cutoff, 61 (19%) patients were non-responders, while 253 (82%) resulted to be sensitive to clopidogrel. Conclusions: In both cutoff points, more than 80% of estimated PRUs were not different from measured PRU reading. Our results indicate that the algorithm is accurate and effective for obtaining PRU values among Caribbean Hispanics. Acknowledgements: This research was supported by NIMHD-RCMI grant #U54 MD007600.

•4135•

**Characterization of aggressive behaviors of pfs gene knockout in *Drosophila melanogaster*.**

Coral A. Castro Olmo, Amarilys Morales Rivera. Bayamón Central University, Bayamón, Puerto Rico.

**Background & Objectives:** *Drosophila melanogaster* has emerged as an important animal model to determine whether aggression can be traced down in a gene. The peacefulness gene can be truncated without affecting the life cycle of the fruit fly. The peacefulness gene (pfs) that encodes for a cofactor synthesis 1 protein catalyzes the first step in a very important biosynthetic pathway. The inhibition of this co-factor leads to a display of anti-aggressive behaviors and it's specific for male-male interactions. This study pretends to determine the differences in aggressive behavior characteristics in the *Drosophila melanogaster* model based on its genetical aspects. **Methods:** The sample used was a total of 200 male *Drosophila melanogaster*, 100 wild type and 100 d03517 knock-out pfs gene. Control (wild-type) and experimental (d03517 knock-out gene pfs) groups were put in isolation for a period of 5 to 7 days. Quantification of aggressive stereotyped behaviors previously reported in the literature was measured. The wing threat behaviors were labeled by two types of behaviors revealed by the flies: low level wing threat (encounters lasted from 0-300 seconds) and high-level wing threat (encounters lasted from 301-600 seconds). **Results:** We found a significant difference

in low-level wing threat where control animals display more wing threat when compared to experimental groups ( $p < .000011$ ). In the average high-level wing threat control vs experimental we found a significant difference also in wing threat behaviors ( $p < .00001$ ), where control animals display more wing threat than experimental groups. **Conclusions:** This study found significant behavioral differences concerning aggression behaviors on the *Drosophila melanogaster* model that can be traced to a genetical variation in the pfs gene. **Acknowledgements:** Funded by the US Department of Education PO31C160043-18 and Bayamón Central University.

•4136•

**Assessing the Impact of the Covid-19 Pandemic on the Families of Children from 0 to 5 years of age with Suspected or Diagnosed Developmental Disabilities**

Carol Salas-Pagán,<sup>1</sup> Paola A. Manrique Pizarro,<sup>1,2</sup> Deandre J. Santos Alvira,<sup>1,2</sup> Maria N. Reyes Medina,<sup>1</sup> Iliá M. Torres Avillán<sup>1</sup>. <sup>1</sup>Institute on Developmental Disabilities, Graduate School of Public Health, Medical Sciences Campus, University of Puerto Rico; <sup>2</sup>Leadership Education in Neurodevelopmental and related Disabilities (LEND) Program Westchester Institute for Human Development, University Center for Excellence in Developmental Disabilities and New York Medical College

**Background and Objectives:** COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans. On March 16 2020, the Puerto Rico Government declare a state of emergency and a lockdown because of the Covid-19 pandemic. Worldwide, families with children with intellectual and developmental disabilities (IDD) have been experiencing many challenges with the pandemic. The objective of the study were to explore the changes and needs that families with children with IDD have experienced when facing the Covid-19 pandemic. **Methods:** This study is a descriptive transversal non-experimental study. The time frame for the research was from January to March 2021. The convenience sample consisted of 12 parents or caregivers with children with intellectual and developmental disabilities receiving services PR-UCEDD Child Development

Center and PR-UCEDD Preschool Development Center. Families were interviewed by phone using a semi structured anonymous questionnaire. They consent to participate and answered questions about general socio-demographic data, the impact of covid-19 pandemic on children with IDD and their families, the availability service and training recommendations (IRB approval, B1840620). Results: A total of 12 caregivers completed the survey. About 16.7% of the participants' respondent were dads, 16.7% of the participants were persons in charge of the child and 66.7% of the participants were the mothers of the children. Most families perceived the most needed services to be: therapies (66.6%) and childcare (41.7%). The symptoms presented in the lock down in the children were: Irritability (58.3%), Excess motor restlessness (58.3%), High Intense Tantrums (50.0%) among others. The principal needs reported by the families were recreation (91.7%), clinical services (41.7%), emotional support (33.3%) and economic difficulties (33.3%). Conclusions: Families with children with developmental disabilities experience a significant changes in their lifestyle during the Covid-19 Pandemic. The most needed services were childcare and therapies.

•4137•

**Defunciones en tiempos de huracanes: Irma y María**  
*Nilda Karlich Ríos Morales, Mariana Pagan Jiménez, José A. López Rodríguez, Ana Luisa Dávila Román. Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela Graduada de Salud Pública y Ciencias Biosociales, Departamento de Ciencias Sociales, San Juan, Puerto Rico.*

Introducción y justificación: En la temporada de huracanes de 2017 Puerto Rico se vio afectado por el paso de Irma y María, huracanes de fuerza mayor que provocaron muertes, algunas atribuidas directamente a los huracanes, y otras posiblemente a la falta de energía eléctrica. Estudios al respecto las estiman entre 1,139 y 4,645. Sin embargo, es el Registro Demográfico la agencia que provee los datos oficiales de mortalidad. Objetivos: 1) Cuantificar y comparar las diez principales causas de muertes por mes desde septiembre de 2016 a marzo de 2017 y septiembre de 2017 a marzo de 2018, al ser estos meses los de mayor mortandad debido a estos

eventos. 2) Presentar la distribución geográfica de las tasas de mortalidad por municipios en el periodo de septiembre de 2017 a marzo de 2018. Método: Esta investigación es de carácter descriptivo. Los datos provienen del Registro Demográfico adscrito al Departamento de Salud de Puerto Rico. Se utilizó para el análisis el paquete de datos estadísticos SPSS. Resultados: Aunque sean 56 las muertes causadas por los huracanes y documentadas por los estándares establecidos, entre septiembre de 2016 y marzo de 2017 el total oficial de muertes fue de 12,834; un año más tarde durante los mismos meses se registraron 1,287 defunciones adicionales para un total de 14,121, lo que representa 9.11%. Los aumentos se observaron en las diez primeras causas de muerte a excepción de cáncer que disminuyó de 3,047 a 2,951. Los municipios con tasa brutas de mortalidad mayores de 70/00 son Vieques, San Germán y San Juan, y los de menos de 4.50/00 son Toa Alta, Gurabo y Guayama. Conclusión: La recomendación de incluir el nombre del fenómeno atmosférico en la causa de muerte, subestima la mortalidad, ya que ciertas muertes asociadas a los desastres no fueron vinculadas.

•4139•

**Idiopathic Intracranial Hypertension Induced by Corticosteroids in a Patient with Systemic Lupus Erythematosus**

*Nicolle Medina-Cintrón, Luis M. Vilá. Division of Rheumatology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Idiopathic intracranial hypertension (IIH) is a headache disorder characterized by increased intracranial pressure without an intracranial mass or cerebrospinal fluid abnormalities. IIH is a rare neuropsychiatric manifestation seen in systemic lupus erythematosus (SLE). Risk factors include obesity, female sex, active SLE, renal involvement, thrombosis, and corticosteroid exposure. Herein, we describe a patient with SLE and IIH. Case Presentation: A 37-year-old Puerto Rican female was diagnosed with SLE in 2016 when she presented with malar rash, photosensitivity, arthritis, hypocomplementemia, and positive antinuclear and anti-dsDNA antibodies. Initially, she was treated with hydroxychloroquine, methotrexate, and prednisone. In 2019, she developed

IIH manifested by headaches, blurred vision, transient loss of vision, and papilledema. Lumbar puncture revealed elevated opening pressure and normal fluid analysis. Brain magnetic resonance imaging was unremarkable. Antiphospholipid antibodies were not detected. She was treated with acetazolamide and several immunosuppressive agents including corticosteroids, belimumab, and mycophenolate mofetil. Because of persistent symptoms, she required placement of a ventriculoperitoneal shunt. Despite these treatments, she had multiple emergency department visits and hospitalizations because of severe IIH manifestations. On several occasions she received treatment with high-dose methylprednisolone or prednisone, and remained on moderate-to-high dose prednisone therapy. Because of the possibility that corticosteroid therapy was inducing or aggravating her IIH, in June 2020 prednisone dose was gradually decreased until a low-dose was achieved. She had a remarkable clinical improvement with resolution of blurred vision and papilledema. Conclusion: IIH is an atypical manifestation of SLE as well as a consequence of treatment. IIH associated with SLE is treated with immunosuppression, including corticosteroids, but these may also induce IIH. In our patient, IIH improved after tapering down of corticosteroids. Thus, a thorough evaluation and clinical intuition are imperative to ascertain the correct etiology and proper management to avoid further complications and damage accrual.

Acknowledgment: None

•4142•

**Mitochondrial Neurogastrointestinal Encephalomyopathy (MNGIE) in a Puerto Rican patient presenting as a Sub-acute Sensory-Motor Neuropathy with Diplopia**

*Melissa Morales García<sup>1</sup>, Karylana Palermo Cruz<sup>1</sup>, Patricia Hernández Hawa<sup>1</sup>, Yesenia Enríquez González<sup>1</sup>, Roberto Rodríguez Ramos<sup>1</sup>, José Carlo Izquierdo<sup>1</sup>; <sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Objective: Mitochondrial neurogastrointestinal encephalomyopathy (MNGIE) is a rare metabolic disease caused by mutations in nuclear gene TYMP encoding for the enzyme thymidine phosphorylase, producing substrate accumulation and mitochondrial

DNA damage. Given its broad systemic manifestations, this disorder represents a challenging diagnosis, making imperative to raise awareness for its early recognition and management. Case Description: A 21 y/o Puerto Rican male presented to our institution with 2-month history of distal progressive weakness, numbness and visual problems. Prior to onset, physicians and patient reported normal gait, and ability to run a bicycle. The patient had prior history of severe weight loss, and chronic painful gastrointestinal bleeding. After extensive evaluations he had a possible diagnosis of “superior mesenteric artery syndrome”. On examination, he presented with BMI of 12, distal bilateral leg weakness on dorsiflexion and plantarflexion with pes cavus, decreased sensation to pinprick and vibration distally, and external ophthalmoplegia. Full laboratory workup was only significant for normocytic anemia. Spinal MRI was negative for spinal cord pathology. Brain and orbit MRI revealed extensive T2 foci of deep white matter signal throughout both cerebral hemispheres, and extraocular muscle atrophy. Electrodiagnostic studies revealed a symmetric neuropathy with demyelinating and axonal features, with denervation in distal extremities. Genetic test results revealed homozygous TYMP mutation indicative of MNGIE. Conclusion: We present a patient with clinical, imaging and laboratories findings consistent with MNGIE disease. The unusual, rapid manifestation of peripheral neuropathy, known to occur in MNGIE at a slower pace, led to the diagnosis. With this illustrative case we want to bring awareness to the multi-systemic features of this rare mitochondrial disorder, including the atypical presentations that may occur obscuring the diagnosis. MNGIE has been reported in Puerto Rican families making the various presentations of this disease important in our clinical setting. Acknowledgement: None.

•4143•

**Choriocarcinoma Presenting as Lower Extremity Weakness: A Case Report and Literature Review of Spinal Cord Metastatic Disease**

*Genesis Millan Serrano, Anarys, Bonilla Alvarado, Laura P. Reguero Cadilla & Sharee Umpierre. <sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

Purpose: Choriocarcinoma is the most aggressive histologic type of gestational trophoblastic neoplasia (GTN). It is associated with early hematogenous metastasis and poor prognosis. Spinal metastases are extremely rare. To our knowledge only nineteen cases of metastatic disease to the spinal cord have been reported with eleven of these being to the epidural space. Efficacy of treatment of metastatic choriocarcinoma to the spinal cord is unknown. This is a case report of metastatic choriocarcinoma with epidural space involvement. The consent statement, clinical course, radiologic features, pathology, and treatment is reported. Case Presentation: A 24-year-old female G4P3013 presented with bilateral lower extremity weakness that was associated to a fall and progressed to paraplegia 9 months after hydatidiform mole evacuation. GTN metastasis workup revealed a human chorionic gonadotropin hormone level (HCG) of over 1 million. A spine MRI showed an extensive abnormal posterior and bilateral epidural expansion with enhancement seen spanning from T3 through T9 and most prominent at the level of T5. Chest CT showed innumerable pulmonary nodules consistent with metastases. A multidisciplinary team was assembled including gynecology oncology, neurosurgery, and hematology oncology to determine the most effective treatment for metastatic disease and paraplegia. Neurosurgery determined risks outweigh the possible benefit of the surgery due to the hypervascularity of the lesion. High dose steroids were administered without neurological improvement. Seven cycles of EMA-CO chemotherapy were completed with one negative HCG up to this submission. The patient did not recover from paraplegia despite chemotherapy and physical therapy. She is pending completion of chemotherapy. Conclusion: This rare case of choriocarcinoma with epidural metastases causing lower extremity weakness then paraplegia illustrates the importance of having multidisciplinary approaches to managing gynecologic malignancies.

•4145•

**Bartholin cyst or vulvar leiomyoma?: A pediatric case report**

G. Rivera-Castro, MD; G. Millán- Serrano, MD; E. Benzaquen; N. Bracero, MD, FACOG

Purpose: A vulvar leiomyoma is a rare tumor that is hardly ever included in the differential diagnosis when evaluating a vulvar mass. Commonly vulvar masses are misdiagnosed as a Bartholin gland cyst. We present a pediatric case report of a vulvar leiomyoma, the work up, imaging and management of our patient. Additionally, we will review previously reported cases of smooth muscle tumors of the vulva. Case Presentation: Our case, a 20-year-old female who presented to the emergency room with discomfort around the left vulvar area associated with a 2-month history of progressive swelling. Upon evaluation, physical exam was remarkable for a left vulvar mass of approximately 6cm with erythema and mildly tender to palpation. Suspected Bartholin gland cyst at time, therefore drainage was attempted and IV antibiotics started. Given no response, 3D ultrasound was performed along with MRI suggesting a leiomyoma vs rhabdomyosarcoma. Vulvar mass excision performed at OR without complications. Final pathology reported a vulvar leiomyoma. Conclusion: It is important to include vulvar leiomyomas within a differential diagnosis for a vulvar mass. After performing a thorough literature review, we have concluded that imaging such as ultrasound and/or MRI may aid in surgical planning to determine the best approach. The treatment of choice for these types of masses appears to be excisional biopsy, as performed in our patient. We are currently following the post op course and recovery of our patient to determine complete resolution of the vulvar leiomyoma; however, at 2-weeks post op visit, patient presented without complaints, incision was well healed without signs of infection and no mass recurrence. Follow-up after treatment is highly recommended. Acknowledgments: No disclaimers.

•4146•

**Reasons for Vaping among Adolescent Students in Puerto Rico, Consulta Juvenil 2018-20**

Linnette Rodríguez-Figueroa, PhD1; Margarita R. Moscoso-Álvarez, PhD2; Juan C. Reyes-Pulliza, EdD1; Laura M. Zayas-Martínez, MS2; Hector M. Colón, PhD1; 1University of Puerto Rico, Graduate School of Public Health, 2Universidad Central del Caribe, School of Medicine

Vaping has increased in popularity among teenagers. The reasons for vaping are a great concern due to the health problems associated to it. Our objective was to describe the main reasons for vaping among adolescent students in Puerto Rico by gender, school type, grade, living with parents, lifetime tobacco use, and frequency of vaping. The sample (n=8,603) in this 2018-20 island-wide school-based cross-sectional survey was selected using a multi-stage stratified cluster sampling design, and was representative of all 7th-12th grade students in PR. Data was collected using a pre-coded self-administered questionnaire. Proportions were compared using chi-square tests; odds ratios were computed. Analyses were performed on weighted data. Lifetime prevalence of vaping was 22.7%. Main reasons for vaping were that friends or family members used them (40.7%) and availability of flavors (32.7%). Only 2.0% were used them to quit using other tobacco products. Males, students in 10th-12th grade, with lifetime tobacco use, and who frequently vaped were more likely to vape for almost all reasons. However, females were more likely to vape due to friends/family vaping, flavor, and because they were easier to get. Middle school (7th-9th) students were more likely to vape due to flavor, cost, to look "cool", and because famous people used them. Those in private schools were more likely to vape due to friends/family vaping, to get high, because they could do so in areas where tobacco products were not allowed, and to quit tobacco. Students who had never used tobacco were more likely to vape due to friends/family vaping or to look "cool". Continued monitoring of electronic cigarette use among teens is important to guide strategies to prevent and reduce vaping in this age group. This includes the reasons for vaping. Research supported by ASSMCA.

•4147•

#### **Dissolution Studies of CBD capsules and soft gel**

*Dorian N. González-Díaz, Sunita Dahiya PhD and Joseph Bloom Oquendo PhD., University of Puerto Rico Medical Science Campus, San Juan, Puerto Rico*  
Background & Objectives: This to study the dissolution profile of the drug. According to the FDA, cannabis is originally a plant that has more than eight biologically active chemical compounds, one of them being cannabidiol (CBD). This has gained a lot of interest

due to its relationship to health benefits, although the FDA emphasizes that it has limited data on the safety and risks of using CBD as therapy for different health conditions. The recent increase in the purchase of CBD as a dietary supplement leads us to investigate the dissolution of capsules and soft gels. Methods: As part of the methodology, a dissolution bath with pH 6.8 and pH 1.7 buffer was used, where only buffer and buffer with surfactant were used. Due to the low solubility of the capsules and soft gels, sodium dodecyl sulfate (SDS) as surfactant in a concentration of 1% was added. Samples were analyzed by a validated HPLC method. Results: We found capsules that, on their labels indicated a CBD content, but when analyzed did not contain CBD. While those that indicated the CBD content on the label, the amount dissolved did not exceed 50% of the drug after 8 hours. Conclusions: Dietary supplements have not strict regulation by the FDA, we can find that some on their label mention a dose, but when we carry out the analysis that supplement does not have any amount of CBD. When analyze capsules and soft gel that the CBD is quite like that indicated on the label, see results that are worrying because after 8 hours we have a dissolution of the supplement that does not reach half of the CBD contained in the capsule or soft gel.

•4148•

#### **Fine Needle Aspiration of an Alveolar Soft Part Sarcoma in a Thigh Mass: A Case Study of an 18-year-old Female with Metastasis in the Brain and Lungs**

*Darla M. Piñero-Vázquez, CT (ASCP)1,2, Yadiris López-Rivera, Dr.PH, CT (ASCP)1, Débora García-Flores, CT (ASCP)3, Víctor Carlo-Chévere, MD2. University of Puerto Rico, Medical Science Campus; School of Health Professions- Cytotechnology Program1; Puerto Rico Pathology2; Core Plus Servicios Clínicos y Patológicos3.*

Purpose: Alveolar soft part sarcoma is an uncommon cancer that represents 1% of all soft tissue sarcomas. The tumor presents unique morphologic and cytologic characteristics. The objective of the case study was to describe the morphologic and cytologic findings in a patient with this malignant tumor and analyze the ancillary techniques helpful for the final diagnosis. Case Description: This case is from an 18-year-old with a 7.4cm mass on the left thigh, of approximately

3 years of duration. At the time of admission to the hospital, metastasis was found in brain and lungs. A fine needle aspiration was performed on the mass with four punctures. An on-site assessment for adequacy was done. The pathologist prepared 3 cytology slides and 1 cellblock; 1 slide was unfixed and stain with Diff Quick procedure, 2 slides were air dried and rehydrated and stained with Papanicolaou staining, and the cellblock was fixed in formalin and stained with Hematoxylin & Eosin. The cellular sample presented large cells with macronucleoli, abundant cytoplasm, and an alveolar pattern was seen in the cellblock preparation. The characteristic intracytoplasmic crystals were seen in the Periodic Acid–Schiff stain. The diagnosis was ASPS, confirmed with the positive result in the fluorescence in situ hybridization technique, presenting abnormal rearrangement that involves the region of TFE3 with a common fusion known as ASPSCR1. By immunochemistry, the only immunomarker positive was PD-L1. Conclusion: ASPS is a rare soft tissue tumor and a challenging diagnosis; this cancer affects young adults between the age of 15 and 35 years old. The FNA findings allow a diagnosis if enough tissue is obtained. At the time of the diagnosis, the patient already had metastasis. A limitation of this case study is the lack of patient information, procedures, and treatments, once diagnosed with this type of malignancy and prognosis.

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**Bradycardia, Renal failure, Atrioventricular block, Shock and Hyperkalemia in Chronic kidney disease Stage 4**

*Michelle Márquez Rosario, MD<sup>1</sup>, Alexandra Lozano San Miguel, MD<sup>1</sup>, Fernando Zayas Torres, MD<sup>1</sup>.  
<sup>1</sup>University of Puerto Rico, Medical Sciences Campus, Department of Family Medicine and Geriatrics, San Juan, Puerto Rico.*

**Purpose:** The term “BRASH Syndrome” refers to a cycle of signs (bradycardia, renal failure, atrioventricular (AV) blockade, shock and hyperkalemia) that could evolve into multiorgan failure if not detected early and treated appropriately. Our aim is to increase awareness about this under-recognized syndrome, which is often seen in patients with compromised renal function treated with AV nodal blockers. **Case Description:** A 52 year-old female with past medical history of diabetes mellitus type 2, hypertension,

obesity and chronic kidney disease (CKD) stage 4 on high-dose insulin and calcium channel blocker was consulted due to decompensated heart failure. Our team assessment was that volume overload could be secondary to acute on chronic renal failure (creatinine at 6.93 mg/dL) versus decompensated heart failure leading to admission for urgent dialysis. Later, the patient presented with severe bradycardia, hypotension, refractory hypoglycemia, decreased breath sounds at bases and edema up to mid-calf bilaterally. Electrocardiogram showed sinus bradycardia with QT prolongation. BRASH syndrome was diagnosed and managed with epinephrine drip for blood pressure and heart rate stabilization; dextrose 13% drip to sustain glucose levels, nebulized continuous albuterol therapies, calcium chloride and intravenous insulin for the treatment of hyperkalemia. Patient remained stable up to hemodialysis (HD) after which BRASH syndrome was resolved. BRASH is a cascade of events where AV node suppression impairs renal perfusion, worsening renal failure, and increasing hyperkalemia. The spiral of events is potentiated by AV blockade accumulation and hyperkalemia, creating the pathological cycle that results in shock and further renal function deterioration. **Conclusion:** As CKD, hypertension and diabetes become more prevalent, it is important to acknowledge the existence of this syndrome to avoid patient’s harm and improve treatment outcomes. Clinicians should have a careful approach while prescribing AV nodal blockers, especially in patients with deteriorated renal function. **Acknowledgements:** Dr. Fernando Zayas.

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**Double Anti-SRP (signal recognition protein) and Anti TIF-1 $\gamma$  (transcription intermediary factor 1 $\gamma$ ) positive dermatomyositis.**

*Grissel Ríos Solá1, University of Puerto Rico, Medical Sciences Campus, School of Medicine, San Juan, Puerto Rico*

**Purpose:** Dermatomyositis (DM) is an idiopathic inflammatory myopathy commonly associated to specific antibodies. Myositis Specific Antibodies (MSA) have been implicated with clinical features and disease prognosis. Estimated rates of MSA presenting in DM range for 20-50%, but the presence of more than one MSA in a single patient is rare. It is unknown if

coexistence of MSAs can have prognostic implications. Case description: A 58-year-old woman with hypertension presented with rapidly progressive dysphagia, dry cough, ulcerated skin lesions and severe proximal weakness. Skin biopsy confirmed the diagnosis of dermatomyositis. Laboratory work up showed elevated signal recognition protein (SRP) and transcription intermediary factor 1 $\gamma$  (TIF-1 $\gamma$ ) antibodies. Neurological exam showed decreased motor strength of upper extremities bilaterally shoulders 0/5, forearms 2/5, hands 4/5; and lower extremities bilaterally hips 0/5, knees 2/5, with reduced neck flexors. CPK levels were elevated 2305 U/L She received treatment with intravenous methylprednisolone 1mg/kg/day, two courses of IV gamma globulin (400mg/kg for 5 days each 4 weeks) and Rituximab 375mg/m<sup>2</sup> weekly for 4 weeks. Her muscle strength improved gradually with upper extremities bilaterally shoulders 4/5, forearms 4/5, hands 5/5; and lower extremities bilaterally hips 3/5, knees 4/5, not presenting dysphagia or new skin lesions. Conclusion: In this report, we present a case of a middle-aged woman with double antibody positive DM and severe disease. Anti-SRP has been associated to rapidly progressive muscle weakness, dysphagia, cardiac involvement, and treatment resistance. Anti TIF-1 $\gamma$  has a strong correlation with prominent skin features, dysphagia but less severe muscle disease. Although is difficult to establish a relationship between clinical features overlapping and disease severity, our case suggests that double antibody positive DM needs a more aggressive therapy. Acknowledgements: The authors have no conflicts of interest to report.

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#### **Cyanosis and Increased Oral Secretions in a Newborn: Rare Case of E type Tracheo-Esophageal Fistula**

*Lianela Negron Garcia, MD, and Lourdes Garcia Fragoso, MD, University of Puerto Rico, Medical Science Campus, School of Medicine, University Pediatric Hospital Dr Antonio Ortiz, Department of Pediatrics, Neonatology Section*

Purpose Tracheoesophageal fistula (TEF) is a congenital anomaly of the respiratory tract estimated to be 1 in 3000 to 1 in 4500 live births. Type E TEF describes an anomalous connection between the trachea and the esophagus and represents less than 5% of cases.

Type E TEF is diagnostically challenging and delays in diagnosis have been described up to 26 days to 4 years. We report a case of E type TEF in a 22-day old male with severe symptomatology. Case Description Case of twenty-two-day old male born term without complication transferred to Pediatric University Hospital due suspected TEF type E vs severe gastroesophageal dysmotility after completing two antibiotic courses and inconclusive subspecialty evaluation. On physical examination, patient found with tachypnea, intermittent coughing, noisy breathing, nasal discharge, choking/cyanosis with feeding, nasal cannula, increased oral secretions, poor oral secretion management, upper transmitted sounds, naso-enteric tube in place, hypotonia, short neck and wrinkled abdomen. Unremarkable laboratory workup at admission. At 1 day of admission, Upper gastrointestinal series with pullback technique revealed E type TEF. Patient found with possible Noonan syndrome vs VATER association by Genetics service, and with left aortic arch and small PFO by Cardiology Service. Patient was taken to OR by Pediatric Surgery and Ear, Nose and Throat Surgery services 10 days after admission where bronchoscopy, esophagoscopy and canulation of fistula for surgical repair with cervical approach was performed under GETA. No complications reported. At 14 days after admission, oral feedings started and progressed successfully. Patient was discharged 26 days after admission with full enteral diet, reported weight gain, inspiratory stridor with cry, weak suck and hypotonia. Respiratory symptoms resolved and subspecialty follow up arranged. Conclusion This case illustrates the importance of maintaining a wide differential diagnosis and focusing on clinical symptomatology when evaluating a patient. Acknowledgements: The authors of this study have no financial affiliations or conflict of interest.

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#### **Development of a Dynamic Face Mask for Addressing COVID-19 Restrictions**

*Abraham Schwartz<sup>1</sup>, Ricardo Nieves Santiago<sup>1</sup>, Paola K. Rodriguez Rivera<sup>2</sup>, Abigail Toledo Rosado<sup>4</sup>, Veronica D. Diaz Rivera<sup>3</sup>, Jessiry M. Abreu Cruz<sup>4</sup>, Emma Fernandez-Repollet<sup>1</sup>. <sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; <sup>2</sup>University of Puerto Rico Mayaguez Campus,*

Mayaguez, Puerto Rico; 3University of Puerto Rico Bayamón, Bayamón, Puerto Rico. 4University of Puerto Rico Humacao, Humacao, Puerto Rico.

**Background & Objectives:** The CDC recommends that everyone should practice social distancing of 6 feet and the use of a face mask as an important barrier to reduce the likelihood of coronavirus infection. Social and commercial activities at restaurants became affected when government restrictions were imposed to control the COVID-19 pandemic. In response to this challenge, the BioMed Innovation Center (BIC) Team applied its skill sets of 3D design and 3D printing to develop a mechanism to protect against airborne pathogens by designing a face mask with an opening/closing mechanism that reduce exposure while ingesting food or drinking. **Methods:** After a semester technical workshop, undergraduate students at the BIC applied 3D design and 3D printing technology to create a “Dynamic Facemask” based on radio frequency ID tags that could allow safer social and increased commercial interactions. A prototype of the mask was designed and printed, and a preliminary survey was conducted among restaurant owners to assess the usefulness of the “Dynamic Facemask”. **Results:** A prototype of the mask with its electronics components was developed and tested. Two videos were produced to depict the principle of the mask and were shown to restaurant owners. 95% of the owners expressed an overall positive response to the use of the mask at their restaurants. **Conclusion:** The prototype of the Dynamic Face Mask developed at the BIC provided mechanical Proof of Concept. Most restaurant owners indicated that the dynamic mask could help protect clients and increase restaurant occupation while eating or drinking. **Acknowledgements:** Department of Pharmacology, University of Puerto Rico School of Medicine and Puerto Rico Science, Technology and Research Trust. US Patent Pending: Application # 17128420.

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### **Descriptive Study of the Prophylactic Management of Opportunistic Infections in HIV-Positive Patients Admitted to University-Affiliated Institutions**

Camila Alonso-Conty, PharmDc, Andrea Barreto-Mercado, PharmDc, Natalia Olmeda-Viera, PharmDc, Idaliz Rodríguez-Escudero, PharmD, MS. School of Pharmacy, University of Puerto Rico Medical Sciences

Campus, San Juan, Puerto Rico. Emails: camila.alonso@upr.edu, andrea.barreto@upr.edu, natalia.olmeda@upr.edu, idaliz.rodriguezescudero@upr.edu

**Background & Objectives:** Omitted or improper primary and secondary prophylaxis against opportunistic infections (OIs) for patients with HIV (human immunodeficiency virus) remains one of the most commonly reported medication errors in this population. The objective of this study was to evaluate the appropriateness of primary and secondary prophylactic therapy, consistent with clinical guidelines recommendations, for selected OIs, in HIV-positive patients admitted to university-affiliated hospitals. **Methods:** This study was descriptive, retrospective, observational, and based on review of electronic medical records of patients with HIV/AIDS admitted to two university-affiliated hospitals in Puerto Rico, between January 2017 and December 2020. Medication errors and faults identified during the admissions were classified using an adapted version of the drug-related problems categories. Proportion of patient without CD4 count was also recorded. **Results:** Overall, 393 admissions were reviewed, with 66 (17.1%) admissions included for analysis. The remaining 327 (83.0%) admissions were not further evaluated for appropriateness because they did not have a CD4 count. Of the 66 evaluated admissions, 22 (33.3%) had inappropriate primary or secondary prophylaxis regimens, presenting at least one drug-related problem. Most drug-related problems were for toxoplasmosis prophylaxis (15, 62.5%), followed by Pneumocystis pneumonia prophylaxis (6, 25.0%), Mycobacterium avium complex prophylaxis (2, 8.3%), and histoplasmosis prophylaxis (1, 4.2%). **Conclusion:** One third of the admissions evaluated were not properly managed for OIs prophylaxis in the inpatient setting. The information from this study should provide a foundation to identify areas of opportunities among infectious diseases departments, antimicrobial stewardship programs, and clinical pharmacists in hospitals, since prevention of OIs in HIV-positive patients contributes to better health outcomes. **Acknowledgments:** Zaritza Cajigas, PharmD; Cristian Méndez, PharmD; Kyle Melin, PharmD; José García, MD; and Damyr Aponte, MD. The study was not funded. No conflicts of interest to disclose. Approved by IRB, protocol B2000120.



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**Overcoming Therapy Resistance in HER2-positive Breast Cancer with the Dual Rac/Cdc42 Inhibitor MBQ-167**

Luis Emmanuel Velazquez-Vega<sup>1</sup>, Michael Rivera-Robles<sup>1</sup>, Paula Vigo-Morales<sup>2</sup>, Suranganie Dharmawardhane<sup>1</sup>. <sup>1</sup>University of Puerto Rico Medical Sciences Campus, <sup>2</sup>University of Puerto Rico Rio Piedras Campus

**Introduction & Objectives:** Breast cancer is one of the leading causes of cancer-related mortality among women. Approximately 20% of cases are categorized as HER2-positive, which which overexpress the human epidermal growth factor receptor (HER2). HER2 activation leads to signaling cascades that result in cell proliferation, survival and metastasis. Clinically, trastuzumab (Herceptin) has been the standard of care for decades. Unfortunately, some patients have intrinsic resistance while others develop resistance within a year of treatment. One of the resistance mechanisms reported in the literature is the compensation of signaling through other receptors that converge on the activation of guanine nucleotide exchange factors (GEFs), which in turn activate the GTPase Rac and its close homolog Cdc42. Rac/Cdc42 are critical factors involved in cell survival and metastasis that have been implicated with therapy resistance, and overexpression of Rac decreases survival in HER2 positive breast cancer patients. Therefore, we developed and characterized the dual Rac/Cdc42 inhibitor MBQ-167 to block the interaction of Rac and Cdc42 with their respective GEFs. Our objective is to test the utility of MBQ-167 to overcome therapy resistance in HER2-positive cells. To accomplish this, we will test the hypothesis that targeting Rac/Cdc42 (downstream effectors of the HER2 receptor) will disrupt signaling and decrease cell viability and metastasis of HER2 positive resistant cells. **Methods:** We performed cell viability assays at different time points and with different concentrations of MBQ-167, trastuzumab and combination of MBQ-167 and trastuzumab. **Results:** HER2-positive trastuzumab resistant cells showed decreased cell viability (up to ~90%) after MBQ-167 treatment. **Conclusions:** This data demonstrates the potential of MBQ-167 to overcome HER2 targeted therapy resistance. **Acknowledgements:** LV was supported by

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**Bioenergetic profile altered in Prostate Cancer Cells Treated with Andrographolide.**

Jesus Sosa-Rivera<sup>1, 2</sup>, María M. Sánchez-Vázquez<sup>1</sup>, Carlos A. Torres-Ramos<sup>3</sup>, Magaly Martínez-Ferrer<sup>1, 2</sup>. <sup>1</sup>University of Puerto Rico Comprehensive Cancer Center, <sup>2</sup>Department of Pharmaceutical Sciences, University of Puerto Rico, School of Pharmacy, <sup>3</sup>Department of Physiology, University of Puerto Rico, School of Medicine

Prostate cancer (PCa) is the second leading cause of cancer deaths in the United States. The combination of natural products with conventional treatments are proved to enhance the life quality of patients. Andrographolide, the main phytochemical of the *Andrographis paniculata*, has shown a wide range of therapeutic potential, including cancer. Previous studies from our laboratory have demonstrated that Andrographolide induces a DNA damage response (DDR), inducing cell cycle arrest and apoptosis of PCa cells. The DDR is known to induce accumulation of the metabolic modulator and cancer suppressor protein p63. In this study, we aim to (1) determine the role of Andrographolide on the expression of p63, and (2) the effect in the bioenergetics profile of PCa cells. 22Rv1 and PC3 PCa cells were treated with Andrographolide (25µM) for 24 h and 48 h. The gene expression was assessed by RT-qPCR. At the protein level, the expression of p63 was evaluated by immunofluorescence. The bioenergetics profile was performed using the Agilent Seahorse XF Real-Time ATP Rate Assa. RT-qPCR results showed a significant upregulation of the TP63 with a fold-change of 2.2 ( $p < 0.05$ ) and immunofluorescence analysis showed an increase in expression of p63 protein with a fold-change of 1.8 ( $p < 0.05$ ) in 22Rv1 cells treated with Andrographolide. The bioenergetics profile of PC3 cells, 48 h after Andrographolide treatment, revealed a shift in the cytoplasmic to mitochondrial ATP production rate from 54.4% to 72.6% and from 45.6% to 27.4%, respectively. Similar results were

obtained in 22Rv1 cells. These results confirmed that Andrographolide induces the expression of the tumor protein p63 in 22Rv1 PCa cells and alters the bioenergetics profile of both PC3 and 22Rv1 PCa cells. Our findings suggest a novel mechanism in which Andrographolide promotes the expression of p63 as in normal cells and transforms the bioenergetics by increasing glycolytic-ATP.

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**Bronchiolitis Obliterans and Primary Ciliary Dyskinesia, What is the Link?**

Ninoshka M. Caballero Colón, BS1; Wilfredo De Jesús Rojas, MD, FAAP1,3,4; 1 San Juan Bautista School of Medicine, Caguas, Puerto Rico, 00726; 3 Pediatric Pulmonology, Ponce Health Sciences University – School of Medicine, Ponce, Puerto Rico, 00716; 4 Department of Pediatrics, Medical Sciences Campus, School of Medicine, University of Puerto Rico, San Juan, Puerto Rico, 00921. Email addresses: Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu), Ninoshka M. Caballero Colón, MS4: (ninoshkacc@sanjuanbautista.edu). Corresponding author: Correspondence should be addressed to Wilfredo De Jesús Rojas, MD, FAAP: (wilfredo.dejesus3@upr.edu)

Purpose: To describe and understand the genetic relationship between Primary Ciliary Dyskinesia (PCD) and a predisposition to develop Bronchiolitis Obliterans (BO) in a pediatric patient. Case Description: Case of a 4-year-old male with year-round wet cough, fatigue and dyspnea on exertion for 12-months. Past medical history was remarkable for recurrent lower respiratory tract infections. Patient was born at term with no history of neonatal respiratory distress syndrome, congenital heart defects, or recurrent oto-sinus infections during early childhood. On physical examination, oxygen saturation of 88% at room air, chest inspection revealed increased work of breathing and moderate intercostal and subcostal retractions. Auscultation revealed bibasilar crackles and expiratory wheezes bilaterally. Chest radiograph showed hyperexpanded lungs, peribronchial thickening and bibasilar atelectasis. High resolution computed tomography of the chest revealed a mosaic attenuation pattern, bibasilar mild bronchiectasis

and air trapping concerning of BO. Bronchoalveolar lavage findings were supportive for an acute bacterial pneumonia due to Pseudomonas Aeruginosa. Patient was admitted for double coverage antipseudomonal eradication protocol. Genetic testing for PCD-related genes identified a heterozygous pathogenic variant in DNAI1 gene and a heterozygous variant of uncertain significance in DNAH1 gene. Nasal ciliary biopsy showed inner dynein arms and of outer dynein arms ultrastructure ciliary defects with was consistent with PCD diagnosis. Conclusion: We highlight the importance of including PCD in the differential diagnosis of patients presenting with Pseudomonas aeruginosa infection and BO. Awareness of the variable clinical manifestations and initial presentation of PCD will be translated into an early diagnosis, appropriate medical management and avoidance of further lung damage in our pediatric population. Funding: This research was funded by the Hispanic Center of Excellence, University of Puerto Rico School of Medicine, Grant Number: D34HP24463, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce.

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**Patrones de movilidad de los trabajadores de 16 años o más residentes en Puerto Rico y sus características sociodemográficas: 2015-2019**

Figueroa Santiago, Gretchen. Programa de Demografía, Centro de Investigaciones Demográficas, Recinto de Ciencias Médicas, UPR, Escuela Graduada de Salud Pública

Antecedentes y objetivos: Puerto Rico muestra una alta prevalencia de personas que salen diariamente a trabajar. Por esta razón, se observa cada día un mayor flujo vehicular en nuestras carreteras a la hora de entrada y salida de estas personas de sus trabajos. Esto le ha brindado una importancia particular al estudio de los patrones de movilidad al trabajo en la isla. El objetivo principal del estudio fue examinar la prevalencia de movilizarse al trabajo en Puerto Rico y las características demográficas de esta población. Métodos: La fuente de datos fue la Encuesta de la Comunidad de Puerto Rico, 2015-2019. El estudio fue transversal descriptivo. Hallazgos En Puerto Rico se movilizan diariamente

en promedio unas 976,826 personas. Cerca de un 53% de estas salen de fuera de su municipio de residencia a trabajar. Aproximadamente un 39% sale a trabajar entre 7:00 y 9:00 am. Un poco más de tres cuartas partes conduce a su trabajo solo en un vehículo, o medio de transportación privado. El tiempo promedio al trabajo es de aproximadamente 30 minutos. El ingreso promedio anual de las personas que conmutan es de \$17,300. Conclusión Puerto Rico cuenta con un nivel alto de personas que se movilizan y que a su vez salen del municipio de residencia a trabajar. Aunque la población que viaja no tiene efecto en la estructura poblacional del municipio al que llega, la misma tiene la capacidad de aumentar el tamaño de ésta en las horas laborables. De igual forma, estos patrones presentan grandes retos para el desarrollo de la infraestructura del país. Por lo tanto, es importante estar al tanto del volumen y las características sociodemográficas de población que se moviliza al trabajo para poder determinar el impacto que tiene esta en los servicios y en la economía de los municipios receptores.

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#### **Afrontamiento y Adaptación en Pacientes con Fallo Renal Crónico en Hemodiálisis**

*Jared M. Vélez Nieves, RN, MSNs;1 Sherily Pereira Morales, RNA, Ph.D.1. 1Universidad de PR, Recinto de Ciencias Médicas, Escuela de Enfermería -San Juan, Puerto Rico*

**Trasfondo y objetivo:** En los Estados Unidos el 15% de los adultos presenta fallo renal crónico. Durante los años 2001-2015, la tasa de crecimiento porcentual de pacientes en diálisis en Puerto Rico fue de 71% y la incidencia de casos aumentó en un 28.2%. Esta enfermedad no tiene cura, sus tratamientos son altamente invasivos y produce un fuerte impacto a nivel físico, psicológico, social y económico. Los objetivos de este estudio incluyeron describir y comparar la capacidad de afrontamiento y adaptación entre dos grupos de pacientes con fallo renal crónico en tratamiento de hemodiálisis. **Método:** Estudio cuantitativo observacional, diseño descriptivo transversal. Se utilizó la Escala del Proceso de Afrontamiento y Adaptación (CAPS) en un grupo de pacientes en tratamiento de hemodiálisis con dos años o menos y un segundo grupo con cinco años o más.

**Resultados:** Se reclutaron 24 pacientes entre ambos grupos, 70.8% hombres y 29.2% mujeres, entre las edades de 40 a 95 años con una mediana 59.5 (IQR, 20). En promedio, ambos grupos obtuvieron un grado alto de capacidad de afrontamiento y adaptación, reflejando estrategias activas de afrontamiento en conjunto de estrategias centradas en el problema. El grupo de pacientes con dos años o menos en tratamiento de hemodiálisis produjo puntuaciones más elevadas en comportamientos relacionados a creatividad, procesar información, manejo metódico de situaciones, buscar ayuda y uso de la memoria. El grupo de cinco años o más produjo puntuaciones más elevadas en reactivos que reflejan las reacciones físicas y la entrada de información. **Conclusión:** Los resultados sugieren una alta capacidad de afrontamiento y adaptación en ambos grupos de pacientes renales en tratamiento de hemodiálisis. Estos hallazgos se deben interpretar con cautela debido al tamaño de la muestra. Se recomienda realizar este estudio con una muestra mayor de pacientes. **Agradecimiento:** Atlantic Health Group. IRB RCM (#B 1480120)

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#### **How Teaching Aids can improve students' performance in Endodontics Competency**

*Pedro A. Berríos-Reyes, Dr. Teresa Irizarry-Caro. University of Puerto Rico, Medical Sciences Campus, School of Dental Medicine, San Juan, Puerto Rico.*

**Background and Objectives:** Research demonstrated that many dental school students consider Endodontics to be extremely challenging and do not consider themselves to be fully competent to perform an Endodontics procedure. Using the students' perception on current teaching methods can provide crucial information on how to enhance the learning experience. The objectives of this project are: 1) Get involved in teaching experiences that that further reaffirm my interest in pursuing an academic career. 2) Assist in the enhancement of the students' Endodontics pre-clinical course experience. 3) Assess the students' perception of the Endodontics course's teaching aids and their self-perceived competency in performing the procedures. **Methods:** As part of the didactic component of the PRET7387 Third Year Comprehensive Care Clinic course at the UPR-School

of Dental Medicine, I had the opportunity to give a conference about Endodontic Difficulty Assessment to DS-3. In said presentation I employed a pre- and post-conference assessment where a clinical case was given to the students and, using their judgement, they had to decide whether to treat or refer. Results: The responses provided valuable information that helped me give the conference in a way that students could take advantage of all the topics discussed and giving them the opportunity to self-assess their competency. After giving the conference and repeating the assessment, significant positive changes in their response were seen. Conclusions: This exercise served as a first-hand experience of the immeasurable value, and apparent positive outcomes, that utilizing students' perceptions and different teaching techniques, have on the student's overall comprehension and integration of the information provided. Acknowledgments: This project was part of American Dental Education Association Academic Dental Careers Fellowship Program.

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**Relationship between diabetic numeracy and glycemic control outcomes in Puerto Rican diabetic patients on insulin therapy.**

*Janet M. Colón Castellano, MD; Nydia Burgos Cortes, MD; Loida A. Gonzalez Rodriguez, MD. University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico.*

**Background & Objectives:** Diabetes Mellitus (DM) is a worldwide epidemic with a prevalence of 463 million in 2019. In racial minorities, the rates of DM are disproportionally higher. Diabetes numeracy (DN) is the ability of patients to use numeracy skills to solve problems and perform self-management tasks specific to diabetes care. There is evidence of the relationship between low levels of diabetic numeracy and poor glycemic control outcomes in general diabetic population, but the data on Hispanic is limited. Our aim is to assess the level of diabetic numeracy in the diabetic patients evaluated at the Endocrinology Clinic at the University Hospital in San Juan, Puerto Rico using the Diabetic Numeracy 15 Latino Test (DNT-15). **Methods:** This is an observational, cross sectional study where patients with age 21 years old with

diagnosis of type 1 and insulin-dependent type 2 DM were invited to take the DNT-15. Demographic and medical data were collected from medical records. Results: A total of 72 patients completed the DNT-15. The results showed that patients' average age was 47 +/- 16 years, average glycosylated hemoglobin (HbA1C) 7.7 +/- 1.4% and mean DNT-15 Latino score of 7.6 +/- 4.19 (Maximum score = 15). Patient with diagnosis of type 2 DM have lower scores than patients with type 1 DM. Patients with type 1 and 2 DM have deficiencies in DN skills particularly to calculate carbohydrate grams from food labels and multiple step insulin management. Furthermore, we found that higher level of education and younger age were associated with a higher DNT-15 score while patients with a higher number of comorbidities had lower DNT-15 score. Conclusions: These findings highlight the importance to consider patients characteristics as markers to individualized diabetes care and emphasizes the need for a patient-centered healthcare approach. Approved by IRB. PROTOCOL NUMBER: B0790319

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**Air Pollution and Chronic Obstructive Pulmonary Diseases concerning the Mental Health in Puerto Rico: A view from 2014 to 2018**

*Ricardo A. Berríos Pérez<sup>1</sup>, Nancy R. Cardona Cordero<sup>1, 2</sup>; <sup>1</sup>University of Puerto Rico, Aguadilla Campus, Natural Sciences Department. <sup>2</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Social Sciences Department*

**Background and objectives:** Environmental factors such as air pollution can have a profound influence on the pathogenesis of pulmonary and neurological disorders that lead to the development of psychiatric symptoms, including depression, anxiety, panic attacks, and increased tiredness. The American Lung Association states that as the air quality worsens, people that have or start developing chronic obstructive pulmonary diseases (COPD), may experience shortness of breath related to the decreased air quality that can provoke psychiatric symptoms because of the induced stress and lack of activity. This study explores the pattern of air pollution and increases in COPD among the population of Puerto Rico and how mental health

is related to a) abundance of particulate material (PM10 and PM2.5), B) the presence of COPD symptoms, C) the effects these have on behavior and neuropsychological functioning. Methods: Concentration of air pollution samples was provided by the Environmental Protection Agency. Health-related data was collected by the phone-administered Behavioral Risk Factors Surveillance System questionnaire. All statistical analyses were conducted using R 4.0.4. Results: Our preliminary results show an increase in the prevalence of depression and COPD reported increased from 2014 to 2018 in our study population. As well, higher concentration levels of PM2.5 were reported in these years in selected cities. Conclusion: This study serves as a baseline and further studies should consider that the effects of the pollution are further escalated by the composition of the numerous toxic elements that can be present in the particulate material as these can interfere with the development and functioning of the nervous system. Acknowledgements: This research was supported by US Department of Education MSEIP P120A200097. We acknowledge the database management contribution of Prof. Luis D. Agosto.

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### **Asociación entre el historial de comorbilidades y la intención de vacunación contra el COVID-19 en adultos en Puerto Rico.**

*Hermilis Berrios Ortiz*<sup>1</sup>, BS, [hermilis.berrios@upr.edu](mailto:hermilis.berrios@upr.edu), *Tanialy Rivera Santiago*<sup>1</sup>, BS, [tanialy.rivera@upr.edu](mailto:tanialy.rivera@upr.edu), *Yanice Duquesne Maldonado*<sup>1</sup>, BS, [yanice.duquesne@upr.edu](mailto:yanice.duquesne@upr.edu), *Uriyoán Colón-Ramos*<sup>2</sup>, PhD, [uriyoan@gwu.edu](mailto:uriyoan@gwu.edu), *Josiemer Mattei*<sup>3</sup>, PhD, [j.mattei@hsph.harvard.edu](mailto:j.mattei@hsph.harvard.edu), *Emma Fernández-Repollet*<sup>4</sup>, PhD, [e.fernandez@upr.edu](mailto:e.fernandez@upr.edu), *Andrea López-Cepero*<sup>3</sup>, PhD, [andrea.lopez11@upr.edu](mailto:andrea.lopez11@upr.edu), *Cynthia M. Pérez*<sup>1</sup>, PhD, [cynthia.perez1@upr.edu](mailto:cynthia.perez1@upr.edu). <sup>1</sup>Departamento de Bioestadística y Epidemiología, Escuela Graduada de Salud Pública, Recinto de Ciencias Médicas, Universidad de Puerto Rico, San Juan, Puerto Rico; <sup>2</sup>Departamento de Salud Global, Escuela de Salud Pública del Instituto Milken, Universidad de George Washington, Washington, DC; <sup>3</sup>Departamento de Nutrición, Escuela de Salud Pública T.H. Chan, Universidad de Harvard, Boston,

*Massachusetts; 4 Departamento de Farmacología, Escuela de Medicina, Centro Colaborativo para la Investigación en Disparidades de Salud, Recinto de Ciencias Médicas, Universidad de Puerto Rico, San Juan, Puerto Rico*

Trasfondo y objetivos: Las personas con selectas condiciones crónicas preexistentes, tales como obesidad, hipertensión y enfermedades cardiovasculares, están a mayor riesgo de enfermedad severa y muerte por COVID-19. Este estudio comparó la intención de vacunación, las creencias sobre el COVID-19 y las barreras y facilitadores para la vacunación en personas con y sin historial de comorbilidades crónicas. Métodos: Un total de 1,911 adultos de 18 años o más en PR completaron una encuesta en línea durante los meses de diciembre 2020 y febrero 2021. La encuesta utilizó el Modelo de Creencias de la Salud para investigar las creencias sobre el COVID-19 y las barreras y facilitadores para la vacunación. Se utilizó un modelo de regresión logística para evaluar la asociación entre el historial de comorbilidades y la intención de vacunación. Resultados: Las enfermedades cardiovasculares (34%), psiquiátricas (31%) y respiratorias (29%) fueron las comorbilidades más frecuentes. La percepción de susceptibilidad y severidad al COVID-19, la percepción de los beneficios de la vacuna y la intención de vacunación sujeto a que se provea información adecuada sobre la vacuna fue significativamente ( $p < 0.05$ ) mayor en personas con historial de comorbilidades. Las personas con historial de comorbilidades crónicas expresaron mayor intención de vacunarse contra el COVID-19 en comparación con personas sin dicho historial luego de ajustar por edad, sexo, educación, estado marital y literacia en salud (OR=1.36, IC 95%=1.04-1.79).. Discusión: La intención de vacunarse contra el COVID-19 fue mayor en personas con historial de comorbilidades. Sin embargo, las diferencias observadas en los facilitadores para vacunarse sugieren la necesidad de reforzar la educación sobre la vacunación para aumentar la cobertura en poblaciones de alto riesgo. Reconocimiento: Este estudio ha sido parcialmente auspiciado por fondos de RCMI (U54-MD007600) de los Institutos Nacionales de la Salud.

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### **Sulfur Dioxide Levels and Chronic Health Indicators in Puerto Rico before and after Climate Disasters**

Verónica Morales-Rodríguez<sup>1</sup>, Nancy R. Cardona-Cordero<sup>1,2</sup>. <sup>1</sup>University of Puerto Rico, Aguadilla Campus, Natural Sciences Department; <sup>2</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Social Sciences Department

**Background:** Puerto Rico (PR) has high incidence of respiratory illness, including chronic obstructive pulmonary disease (COPD). Sulfur dioxide (SO<sub>2</sub>) is a toxic compound that can affect chronic respiratory symptoms by inhalation and may irritate the eyes and mucous membranes. PR has multiple sources of SO<sub>2</sub> including the burning of coal-fired power plants and oil fossil-fuel SO<sub>2</sub>. The trends of SO<sub>2</sub> before and after Hurricane Maria in PR remain unreported to date. This study aims to explore SO<sub>2</sub> levels in PR from 2017 to 2019 and describe the prevalence of COPD reported for those years in PR. **Methods:** This research uses data collected by Environmental Protection Agency monitors in PR through the years of 2017-2019 and self-reported COPD information was obtained from the Behavioral Risk Factor Surveillance System database. All statistical analyses were conducted using R-4.0.4. **Results:** Similar levels of SO<sub>2</sub> were reported for the year 2017 on specific municipalities. Higher SO<sub>2</sub> concentrations were observed for the year 2019 reaching up to 70 ppb, when compared to 2017 and 2018. Our analyses indicate that the prevalence of COPD in our sample population who responded to the BRFSS was 4.6%, 6.3% and 4.8% for 2017, 2018 and 2019, respectively. When evaluating COPD by gender, women had higher prevalence of COPD for 2017, 2018 and 2019 when compared to men. **Conclusions:** This explanatory study of a chronic health indicator and air pollution serves as a foundation for future studies that can target specific relationships between environmental impact in human health after climate disasters in vulnerable communities. **Acknowledgements:** This research was supported by US Department of Education MSEIP P120A200097. We acknowledge the database management contribution of Prof. Luis D. Agosto.

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### **Trends in Air Quality and prevalence of Cardiovascular Diseases in Puerto Rico**

Nachalie Ramos-Montalvo<sup>1</sup>, Nancy R. Cardona-Cordero<sup>1,2</sup>. <sup>1</sup>University of Puerto Rico, Aguadilla Campus, Natural Sciences Department, <sup>2</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Social Sciences Department

**Background & Objectives:** Anthropogenic sources may contribute to higher concentrations of particulate matter (PM) worsening the quality of air and affecting the people who live in Puerto Rico. Exposure to higher concentrations of PM<sub>2.5</sub> and its components may represent a risk and possibly aggravate chronic health diseases including cardiovascular diseases. Preceding studies have showed that exposure to PM<sub>2.5</sub> affects the cardiovascular system among vulnerable populations. The aim of this study was to explore particulate matter patterns and prevalence of specific indicators of cardiovascular disease: stroke, coronary heart disease, and myocardial infarction among the population. Data from the Air Monitoring Network collected by Environmental Protection Agency was analyzed for the years 2016-2019. Self-reported socioeconomic and cardiovascular disease-related data was obtained from the Behavioral Risk Factor Surveillance System database. All statistical analyses were conducted using R-4.0.4. **Results:** Higher prevalence of stroke occurs in 2019, from which females have a higher percentage, compared to male. Higher prevalence of either coronary heart disease or myocardial infarction occur in 2018, where the majority were reported by males. Consistently throughout the years, strokes, either coronary heart disease or myocardial infarction are most reported by people who reported low income (<15,000), people with low educational attainment (<High School) and over the age of 65 years old. Analyses of the air quality showed that particulate matter varies by city and season of the year. Overall, the highest concentrations of particulate matter were observed in the years 2018 and 2019 for selected cities. **Conclusions:** Concentrations of PM<sub>2.5</sub> in Caguas, Mayagüez, and Ponce are of concern during each season. Therefore, specific health profiles should be completed among those cities to explore the contribution of air pollution exposures to cardiovascular diseases. **Acknowledgements:** This research was supported by US

Department of Education MSEIP P120A200097. We acknowledge the database management contribution of Prof. Luis D. Agosto.

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### **Unilateral Pseudo-Pulmonary Fibrosis in a Child: Why?**

*Daniela M. Albors-Agulló1, BS; Pedro Diaz, MD3-4; Wilfredo De Jesús Rojas, MD, FAAP1-2. 1Ponce Health Sciences University, School of Medicine, Department of Pediatrics, Ponce, Puerto Rico, 00716, 2University of Puerto Rico, Medical Sciences Campus, School of Medicine, Department of Pediatrics, San Juan, Puerto Rico, 00921, 3CME San Lucas, Radiology Department Director, 4Ponce Health Sciences University School of Medicine, Department of Radiology*

**Purpose:** Highlight the importance of early identification of congenital unilateral pulmonary hypoplasia of a pulmonary artery to prevent pulmonary complications in pediatrics. **Case Description:** A 14-year-old female with a previous diagnosis of 3-methylglutaconic aciduria presented to our institution with a history of chronic wet cough and recurrent respiratory tract infections that led to multiple hospitalizations throughout the patient's childhood. Physical examination findings included: small head, sunken eyes, feet inversion and a body mass index in the 3rd percentile. The respiratory evaluation was pertinent for intermittent wet cough episodes and asymmetrical breath sounds with intermittent central rhonchi. Mild scoliosis and hypotonia in all extremities were observed. Chest imaging demonstrated nonspecific thickening of the interstitial markings. Echocardiography revealed mild tricuspid regurgitation by a congenital defect without pulmonary hypertension. Contrast-enhanced Computer Tomography of the thorax was consistent with the diagnosis of right-sided pulmonary artery system hypoplasia with unilateral pseudo-pulmonary fibrosis type changes. Limited blood flow to the patient's right lung parenchyma restricts pulmonary parenchyma development and accentuates the pseudo-fibrotic changes seen in the patient's hypoplastic lung. **Conclusion:** This case report highlights the difficulty of identifying and diagnosing unilateral pulmonary hypoplasia due to its variable symptomatic presentation in children while

exploring the potential etiologies for the development of unilateral pulmonary pseudo-fibrosis. It also recognizes the importance of early identification of the defect to prevent the worsening of complications such as recurrent pulmonary infections, bronchiectasis, and pseudo-pulmonary fibrosis in pediatrics. **Acknowledgments:** Funding: Funded by the Hispanic Center of Excellence, UPR School of Medicine, Grant Number: D34HP24463, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce. The study was conducted according to the guidelines of the UPR-RCM, and approved by the IRB of the UPR-RCM, Department of Pediatrics protocol code: B1730120.

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### **New Pathogenic RSPH4A Variant in a Child with Primary Ciliary Dyskinesia**

*Dalilah Reyes De Jesús, MD<sup>1</sup>; Wilfredo De Jesús Rojas, MD1-2. (1) Department of Pediatrics, University of Puerto Rico, Medical Sciences Campus, School of Medicine, (2) Department of Pediatrics, Ponce Health Sciences University, School of Medicine*

**Introduction:** Genetic mutations in more than 45 human genes, including RSPH4A can lead to Primary Ciliary Dyskinesia (PCD) which alter the configuration of the ciliary ultrastructure. As a result PCD manifests as Neonatal Respiratory Distress (NRD), chronic oto-sino-pulmonary diseases, infertility, and others. The suggested diagnostic algorithm for PCD recognizes the presence of biallelic pathogenic variants in PCD-associated genes as a diagnosis of the disease, but a combination of single pathogenic or non-pathogenic variants with positive structural ciliary changes may also represent diagnosis. **Case Presentation:** We describe a 12-year-old Puerto Rican male with past medical history of NRD despite term gestation, daily wet-cough and recurrent oto-sino-pulmonary infections. On physical examination, the patient showed bilateral crackles at right middle lobe (RML) and left lower lobe (LLL). Bilateral nasal polyps and mild clubbing were also present. Chest X-ray showed patchy opacities suggesting chronic atelectasis and cylindrical and varicose bilateral bronchiectasis on RML and LLL were evident on Chest CT. Spirometry showed a pseudorestrictive pattern. Sweat test was intermediate however, CFTR genetic test was negative. FeNO

was decreased [ $<5$  ppm]. Bronchoalveolar lavage resulted positive for *Pseudomonas Aeruginosa*. Nasal ciliary biopsy showed abnormal microtubules number, distribution and configuration. Initially extended PCD genetic panel revealed one pathogenic variant at the RSPH4A gene [c.921+3\_921+6delAAGT (Intronic)]. Additional two likely pathogenic variants were noted: RSPH4A [c.1103T>G (p.Val368Gly)] and DNAH8 [c.9839A>T (p.Gln3280Leu)]. Familial genetic studies showed that RSPH4A [c.1103T>G (p.Val368Gly)] variant was maternally inherited. As a result of the family analysis, RSPH4A [c.1103T>G (p.Val368Gly)] PCD genetic variant was reclassified as pathogenic. Conclusion: Elucidation of new pathogenic variants of PCD and modes of inheritance are necessary for advancement in the diagnosis and management of patients of PCD.

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#### **Trastuzumab conjugated-liposomes for siRNA delivery against inflammatory breast cancer**

*Mariénid Flores-Colón<sup>1,2</sup>, Rohit Sharma<sup>2</sup> and Pablo E. Vivas-Mejía<sup>1,2</sup>. <sup>1</sup>University of Puerto Rico, Medical Science Campus; <sup>2</sup>University of Puerto Rico, Comprehensive Cancer Center*

**Background and Objectives:** Breast cancer is developed by approximately 12.5% of US woman at some point of their life. Around 4% of woman suffering from breast cancer are HR-/HER2+, the second deadliest breast cancer subtype. Inflammatory breast cancer (IBC) is a rare and aggressive type of cancer where the tumor cells block the lymph vessels. IBC are in most cases HER2+ and therefore, can be treated with anti-HER2+ targeted therapies. One of the most used therapies for HER2+ tumors is trastuzumab. This drug is a monoclonal humanized antibody anti-HER2 currently used to reduce the growth of breast cancer cells. **Methods:** We developed a three step reaction to obtain trastuzumab-DSPE-PEG(2000)-maleimide conjugates. To characterize the product, we used dynamic light scattering to measure the size distribution of the particles after each reaction step. **Results:** The initial size of trastuzumab alone was 5.6-nm. However, the size of the first step corresponding to the pyridilthiol-activated trastuzumab was 6.1-nm, the second step, sulfhydryl-activated trastuzumab was 5.9-nm; and the final conjugate, trastuzumab-DSPE-

PEG(2000)-maleimide, generated two populations of 23.4-nm and 75.4-nm. These two populations could correspond to vesicles with different lamellarity of the same product indicating the success of the conjugation. All products displayed a polydispersity index of less than 13%, indicating homogeneous populations. Additionally, we did a thiol assay to measure and compare thiol concentration in each of the products. Conclusion: The reduced thiol group (-SH) of the sulfhydryl activated trastuzumab had a higher concentration when compared to the -SH groups of the products from the other steps, thus, we conclude that the reaction between sulfhydryl-activated trastuzumab and the DSPE-PEG(2000)-maleimide was successful. There is ongoing work to prepare trastuzumab-conjugated liposomes, inside with small-interference RNA (siRNA) against inflammatory breast cancer cells. Acknowledgements: This project is funded by MBRS-RISE grant: R25-GM061838; RCMI grant: MD007600; and UPR Comprehensive Cancer Center.

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#### **Nivel de conocimientos sobre Diabetes Mellitus Tipo 2 y la asociación con las prácticas de autocuidado en adultos mayores**

*Mariana González-Bravo, Adlin Ayala-Lojo, & Nancy Dávila-Ortiz. Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela de Enfermería, Programa de Maestría en Ciencias en Enfermería.*

**Trasfondo y objetivos:** La DM es una de las enfermedades crónicas que más afecta la población de adultos mayores. De la jurisdicción de Estados Unidos, Puerto Rico es el lugar con la más alta prevalencia de casos de diabetes, condición que ocupa la tercera causa de muerte en la Isla. Estudios han reportado que adultos mayores carecen de conocimientos relacionados a la condición siendo esto un vínculo clave en la adherencia a las prácticas de autocuidado. El objetivo de esta investigación fue explorar el nivel de conocimiento sobre DM2 y su relación con las prácticas de autocuidado que realizan los adultos mayores. **Método:** Diseño descriptivo correlacional de cohorte transversal. La muestra fue de 59 adultos mayores con DM2, participantes de un Centro de Envejecientes en Puerto Rico. Se utilizaron los instrumentos: Cuestionario de Conocimientos en Diabetes (DKQ-24) y el Cuestionario de Actividades



de Autocuidado en Diabetes (SDSCA). Resultados: La puntuación total del cuestionario de conocimiento se situó en una media de 13 puntos de un total de 24 como la puntuación superior posible ( $13.46 \pm 4.40$ ). El porcentaje promedio de conocimiento en diabetes fue de un 56.8%. En cuanto a la variable de autocuidado, la constante de la frecuencia al realizar las actividades de autocuidado diarias fue entre 3 a 5 días del total de 7 días que comprende una semana. Se encontró una correlación moderada y significativa entre el nivel de conocimiento y las actividades de autocuidado que requiere la DM ( $r= 0.58, p < 0.001$ ). Conclusión: La adherencia y la consistencia en el autocuidado, está relacionada al nivel de conocimiento que tenga el adulto mayor sobre la condición de DM2. Se recomienda la implementación de programas de servicio, que incluyan el refuerzo educativo, para así mejorar las prácticas de autocuidado en la población de adultos mayores con DM2.

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**Prevalence of hypertension, diabetes, and cardiovascular disease in Puerto Ricans with non-alcoholic fatty liver disease.**

*Adriel González Rivera*<sup>1</sup>, *Valerie M. Vargas Figueroa*<sup>1</sup>, *Emmanuel Candal Rivera*<sup>1</sup>, *Esther A. Torres*<sup>2</sup>. <sup>1</sup>Department of Medicine, School of Medicine, University of Puerto Rico, San Juan, PR. <sup>2</sup>University of Puerto Rico, School of Medicine-Gastroenterology and Liver Diseases San Juan PR.

**Background & Objectives:** Patients with non-alcoholic fatty liver disease (NAFLD) have a higher prevalence of hypertension, diabetes mellitus type 2 (T2DM), and cardiovascular disease, and vice versa. The mechanism of this development is unknown but appears to be related to an underlying metabolic derangement that affects multiple organs. The aim of this study was to determine the prevalence of these conditions in patients with a diagnosis of NAFLD in a cohort of Puerto Ricans attending liver clinics. **Methods:** We conducted a cross-sectional study of the prevalence of hypertension, T2DM, and cardiovascular diseases in patients with NAFLD registered in the Liver Database of the UPR Gastroenterology Research Unit using the medical records. Cardiovascular diseases included hypercholesterolemia, dyslipidemia, ischemic heart disease and peripheral vascular disease. Patients with

other causes of liver disease were excluded. The study is approved by the MSC IRB. Results: 141 participants with a diagnosis of NAFLD were included, 64.5% ( $n = 91$ ) of which were females. Average age was  $69 \pm 10.2$  years (36-114). Prevalence of hypertension and T2DM were 53.9% and 57.5% respectively. Of all the patients, 7.8% had at least one cardiovascular disease, specifically ischemic heart disease (5.7%), hypercholesterolemia (0.71%), dyslipidemia (5.7%) and peripheral artery disease (3.6%). No significant association between gender and the prevalence of these conditions was found. Of the patients with T2DM, hypertension and cardiovascular diseases, 80.3% ( $P < 0.001$ ), 72.4% ( $P > 0.05$ ) and 81.8% ( $P > 0.05$ ) respectively, were  $\geq 65$  years. **Conclusions:** Our data indicate that hypertension and T2DM are highly prevalent in patients with NAFLD in Puerto Rico, however, cardiovascular diseases were not as common. Further studies are required to further define these associations. We recommend that all patients with a diagnosis of NAFLD be screened for other metabolic conditions. **Acknowledgements:** This study was supported by the UPR Endowed Health Services Research Center through grants 5S21MD000242 and 5S21MD000138, from the National Center for Minority Health and Health Disparities, National Institutes of Health (NCMHD-NIH).

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**Mycology matters: the oral fungal biofilm is associated to periodontal disease and reflects the composition of the built and the outdoor environment**

*Acosta K1., B., Bolaños-Rosero*<sup>1.</sup>, *Oramas C. 2; Vivaldi, J. 3, Perez, J2. Pérez, C.M. a4, Ortiz, A.P. a2, Godoy-Vitorino, F\* a1. aPrincipal Investigators NIH R21DE0227226, \*Mentor, Microbiome. 1 Department of Microbiology and Medical Zoology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico, 2 Comprehensive Cancer Center, San Juan, Puerto Rico, 3 School of Dental Medicine, Ana G. Mendez, University, 4School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico*

**Background & Objectives:** Fungi are a major component of the human microbiome that has only recently received increased attention. Shifts in the biodiversity of both

bacteria and fungi are important in shaping oral health, especially in people with inflammatory disease such as periodontitis. The imbalance of indigenous fungal communities can be proposed as drivers of oral dysbiosis. We assessed the oral mycobiota and its association to periodontitis. Methods: This ongoing cross-sectional study is recruiting Individuals aged 21 to 49 from sexually transmitted infection clinics in Puerto Rico [IRB 2018-01-01 (CCC), IBC 49218]. A total of 95 patients were assessed and a full-mouth periodontal examination performed following the NHANES protocol. Periodontitis was defined according to the Centers for Disease Control/American Academy of Periodontology (CDC/AAP). Saliva was collected for genomic DNA extraction and downstream ITS-2 genes were amplified, sequenced and analyzed with QIITA and Qiime2 platforms. Results: A total of 31% of individuals had periodontal disease and 69% did not have periodontitis. We found a total of 7 fungal phyla. In terms of diversity, we found no significant differences in alpha, nor beta diversity, however compositional changes were found in association to periodontitis. Higher proportions of *Candida albicans*, *Aspergillus penicilloides* and *Malassezia restricta* were associated with periodontitis while *Trichosporon\_ asahii* yeast were more dominant in people without disease. Surprisingly we found most of the detected fungi to be filamentous fungi representing the outdoor (Basidiomycetes) and indoor (Ascomycetes) environments. Conclusions: Our preliminary data confirms polymicrobial colonization of yeast and filamentous fungi in the oral biofilm, reflecting the impact of the environment on the human microbiome. Yeast such as *Malassezia* and *Candida* are likely associated to the inflammatory process, as shown in studies of fungi colonizing the anogenital mucosa. Mycotic dysbioses should be considered when choosing therapeutics for periodontal disease. Acknowledgments: NIDCR Grant 1R21DE027226-01A1.

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#### **Cryoglobulinemic Vasculitis in a 7-year-old male**

*Michel Garcia-Crespo M.D., Mayra Oseguera M.D., Samuel Pabon-Rivera M.D., Yvonne Arroyo M.D., Lissette Lugo-Calzada M.D.*

Purpose: Cryoglobulinemia is defined as the precipitation of cryoglobulins in the blood resulting

in a systemic inflammatory syndrome that involves small-to-medium size vessels. It should be suspected in patients presenting with skin ulcers, arthralgia, glomerulonephritis, and peripheral neuropathy. Incidence is approximately 1 in 100,000 in the general population but in children the incidence is not fully understood. Case description: 7-year-old male patient with past medical history of mild asthma was admitted to a secondary institution with history of fever, cough, and clear rhinorrhea. Within a week of onset of symptoms, a raised papule surrounded by erythematous macula appeared in the left arm followed by similar lesions spreading throughout the extremities, progressing to erythematous bullous lesions, accompanied by persistent fever peaks of 39.5 C and arthralgia of the upper extremities. Patient was admitted and work up for infectious etiologies ordered as well as broad-spectrum antibiotics. Physical exam revealed multiple, tender bullous lesions, with necrotic centers, associated edema, and erythema of the surrounding skin. Dry gangrene in the distal second to fourth phalanges of the left hand with loss of function was noted. Patient was transferred to our institution for further management. Skin punch biopsies of lesions revealed thrombosis of small vessels. Cryoglobulins in serum were abnormally elevated. Cardiac, renal, hepatic, and central nervous system involvement were ruled-out. Patient was treated with high dose steroids and plasmapheresis. Lesion progression was effectively halted, however there was loss of function in the left hand, with necrosis and dry gangrene in the distal phalanges of second to fourth fingers resulting in amputation. Patient discharged after two months with surgery, rheumatology, and enterostomal therapy follow-up. Conclusion: High index of suspicion is required in pediatric patients with cryoglobulinemia since initial phase could suggest a bacterial infection and delay of treatment could result in lifetime secuela. Acknowledgements: None

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#### **A Retrospective Analysis of Temporal Bone Fractures in Puerto Rico**

*Omar Font-Torres BS2, Shyanne Lajud-Guerrero MD1, José Sánchez-Pérez MD1, José López-Ventosa BS2, Antonio Riera-March, MD1. 1 Otolaryngology*

Head and Neck Surgery Department, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; 2 University of Puerto Rico School of Medicine, San Juan, Puerto Rico. Contact: Omar Font-Torres, BS: [omar.font1@upr.edu](mailto:omar.font1@upr.edu), Shayanne Lajud-Guerrero, MD: [Shayanne.lajud@upr.edu](mailto:Shayanne.lajud@upr.edu), Jose Sanchez-Perez, MD: [jose.sanchez34@upr.edu](mailto:jose.sanchez34@upr.edu), Jose Lopez-Ventosa, BS: [jose.lopez87@upr.edu](mailto:jose.lopez87@upr.edu), Antonio Riera-March, MD: [antonio.riera@upr.edu](mailto:antonio.riera@upr.edu)

Background and objectives: The temporal bone is a strong and complex anatomical structure that serves as protection to the brain, facial nerve, inner ear structures, carotid artery and jugular vein. Fractures to the temporal bone are classically the result of head trauma which can lead to neurological problems such as hearing loss, intracranial bleeds and facial nerve dysfunction. Recent data about this condition and its associated injuries is scarce, particularly for the Puerto Rican population. This study sought to describe the clinical presentation of temporal bone fractures, associated injuries and mechanisms of trauma in the Puerto Rican population. Methods: Retrospective chart review was conducted, total of 183 patients consulted to the Otolaryngology department from February 2018-January 2020. Data was collected from patient's charts and analyzed using excel. Results: The mean age of presentation was 39.4 years +/- 22.02 years. Temporal bone fractures were more common in men (82.5%) and unilaterally (85.8%), with a compelling number of patients presenting with bilateral fractures (14.2%). Most common signs and symptoms were hemotympanum (71%), otorrhagia (65%), external auditory canal (EAC) laceration (44.8%) and hearing loss (15.3%). Other symptoms include: otorrhea (5.5%), otalgia (1.1%), vertigo (1.6%) and tympanic membrane perforation (13.1%). A great proportion of patients also presented with EAC fractures (53%). Most common mechanisms of injury were falls (37.7%), MVA (32.2%) and MBT-Pedestrian (14.2%). The majority of patients that presented with facial nerve dysfunction had otic capsule sparing fractures, while a smaller proportion of patients had otic capsule violating fractures. Conclusion: This study allowed the creation of the database that will lay a groundwork for other studies in this field and in our population. Data analysis was limited due to the critical condition

in which patient presented to the hospital. Future directions include following patients in time to assess evolution of neurological complications.

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### Validation of PON1 as a Biomarker of Clopidogrel Resistance in Caribbean Hispanics

Mariangeli Moneró-Paredes<sup>1</sup>, Ednalise Santiago, Ph.D.<sup>2</sup>, and Jorge Duconge, Ph.D.<sup>3</sup>; <sup>1</sup>Department of Pharmacology and Toxicology, School of Medicine, University of Puerto Rico- Medical Sciences Campus (UPR-MSC), San Juan, P.R.; E-mail: [mariangeli.monero@upr.edu](mailto:mariangeli.monero@upr.edu); <sup>2</sup>RCMI CCRHD Program, Academic Affairs Deanship, UPR-MSC, San Juan, P.R.; E-mail: [ednalise.santiago@upr.edu](mailto:ednalise.santiago@upr.edu); <sup>3</sup>Department of Pharmaceutical Sciences, School of Pharmacy, UPR-MSC, San Juan, P.R.; E-mail: [jorge.duconge@upr.edu](mailto:jorge.duconge@upr.edu)

Background: Clopidogrel is an antiplatelet drug used to prevent heart attack and strokes in cardiovascular patients. Pharmacological studies of clopidogrel have been mainly conducted in individuals of European ancestry, therefore missing genetic diversity and enhancing disparities of care. Since admixed Caribbean Hispanics are among those often underrepresented, we want to identify predictive or risk biomarkers of the response to clopidogrel within this population. Preliminary data using Tandem Mass Tag (TMT) coupled with mass spectrometry revealed that paraoxonase-1 (PON1) is downregulated in patients treated with clopidogrel (-49.50) when compared to other cardiovascular patients. PON1 is an HDL-associated protein that protects against accumulation of oxidized lipids and prevent cardiovascular disease. Our aim is to validate the low abundance of PON1 by western blot analysis. Methods: All patients signed an informed consent approved by the Institutional Review Board (protocol number A4070417). Blood was collected and a platelet reactivity test was performed using the VerifyNow® P2Y12 assay to determine if the patient was a poor responder (PRU  $\geq$ 230). For validation, Western Blot analysis was done and PON1 protein was quantified in plasma of healthy (n=6), cardiovascular (n=6), normal responders (n=14), and poor responders (n=10) groups. For statistical analysis Shapiro Wilkins Test was used to determine the normality of the

data and one-way ANOVA was run as a variance test. Results: The total PON1 intensity signal was detected in healthy ( $1.11 \pm 0.34$ ) and cardiovascular controls ( $1.00 \pm 0.00$ ), normal ( $1.06 \pm 0.45$ ) and poor responders ( $0.89 \pm 0.34$ ), with a lower mean value in the latter but no statistical differences among the groups ( $p > 0.05$ ). Conclusions: PON1 could not be validated as a downregulated protein in poor responders when compared to other cardiovascular groups by western blotting. Acknowledgments: This work was supported by grants from NIH, NIMHD, RCMI Grant # U54MD007600/5318 and NIGMS-RISE R25 GM061838.

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**Prevalence of Lateral Incisor Anomalies with Microdontia in Puerto Rican Children with Oral Clefts.**

J. Rovira - Gonzalez, M. Soto, G. Ortiz - Bernard, M. Salcedo, N. Debs, L.M. López Del Valle, C. J. Buxó - Martínez. Juan Pablo Rovira – Gonzalez 1, DDS ([juan.rovira4@upr.edu](mailto:juan.rovira4@upr.edu)); Gabriela Ortiz – Bernard 1, DDS ([gabriela.ortiz40@upr.edu](mailto:gabriela.ortiz40@upr.edu)); Mairim Soto-Ortiz 1, DrPH ([mairim.soto@upr.edu](mailto:mairim.soto@upr.edu)), María Ilse Salcedo González 1, DDS ([maría.salcedo@upr.edu](mailto:maría.salcedo@upr.edu)); Natalio Debs 1, MD ([debsnat@gmail.com](mailto:debsnat@gmail.com)), Lydia M. Lopéz Del Valle 1, DMD ([lydia.lopez1@upr.edu](mailto:lydia.lopez1@upr.edu)); Carmen J. Buxó – Martínez 1, DrPH ([carmen.buxo@upr.edu](mailto:carmen.buxo@upr.edu)). 1School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico.

**Background & Objectives:** Microdontia is a dental anomaly where undersized teeth are present. These anomalies present problems that affect the occlusion, arch length, width, and facial esthetics. Study's aim is to determine the prevalence of upper lateral incisor microdontia ("lateral peg") in patients with oral malformations. **Methods:** Data were collected from a clinical examination ( $n=144$ , 84 cases and 60 controls) performed in an ongoing case-control study of families with children aged 0-18 years, with/without non-syndromic oral clefts. Data on the location of lateral teeth with microdontia were identified and analyzed along with age and sex variables. STATA version 14 was used to calculate frequencies and percentages of each variable, and statistical tests such as Fisher's Chi-square to identify differences between

cases and controls. Results: Participants with a mean age of 6.4 years + 5.0 years were examined and cases ( $n=84$ ) presented oral clefts: cleft lip (12.6%), cleft palate (12.6%), and cleft lip with palate (33.6%). Microdontia in lateral teeth was identified in 4.2% of the participants, in which cases (100%), males (66.7%), 0 to 6 years old. (66.7%), bilateral (1.4%) and right (1.4%) as tooth laterality were the most reported. No statistically significant differences ( $p > 0.05$ ) were found for microdontia by sex ( $p=0.23$ ), age ( $p=0.27$ ), cleft type ( $p=0.13$ ), and between cases and controls ( $p=0.06$ ). Among cases, there were no differences by cleft type ( $p=0.69$ ), age ( $p=0.66$ ) nor sex ( $p=0.43$ ). No participant reported lateral tooth repair. Conclusion: Results obtained showed that no anomalies were found in controls. Although there were no statistical differences between cases and controls, there is certainly a clinical significance with higher frequency of individuals with oral clefts presenting these anomalies. It is recommended to evaluate microdontia among cases and controls in a larger sample to identify differences and determine the association between these anomalies and oral clefts. Acknowledgments: This research was supported by NIH/NIDCR R00DE024571 and NIH/NIGMS U54GM133807

•4195•

**Prevalence of Missing and Supernumerary Teeth in Puerto Rican Children with Oral Malformations.**

G. Ortiz-Bernard, M.Soto-Ortiz, J. Rovira - Gonzalez, M. Salcedo, N. Debs, L.M. Lopéz Del Valle, C. J. Buxó - Martínez. Gabriela Ortiz–Bernard 1, DDS ([gabriela.ortiz40@upr.edu](mailto:gabriela.ortiz40@upr.edu)); Mairim Soto-Ortiz 1, DrPH ([mairim.soto@upr.edu](mailto:mairim.soto@upr.edu)), Juan Pablo Rovira – Gonzalez 1, DDS ([juan.rovira4@upr.edu](mailto:juan.rovira4@upr.edu)), María Ilse Salcedo González 1, DDS ([maría.salcedo@upr.edu](mailto:maría.salcedo@upr.edu)); Natalio Debs 1, MD ([debsnat@gmail.com](mailto:debsnat@gmail.com)), Lydia M. Lopéz Del Valle 1, DMD ([lydia.lopez1@upr.edu](mailto:lydia.lopez1@upr.edu)); Carmen J. Buxó – Martínez 1, DrPH ([carmen.buxo@upr.edu](mailto:carmen.buxo@upr.edu)). 1School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico.

**Background & Objectives:** Oral clefts (CL/P) are the most prevalent craniofacial malformation with a multifactorial etiology. Dental anomalies that include

differences in teeth's number/quantity, shape, position, size and structure can be found. Study's aim is to identify the prevalence of missing teeth (MT) and supernumerary teeth (ST) in children with oral malformations. Methods: Data were collected (n=144, 84 cases and 60 controls) from a clinical examination performed in an ongoing case-control study with children with/without non-syndromic CL/P. ST and MT were analyzed with other variables: age, sex, alteration in number of teeth, location, affected tooth and number of alterations. STATA v14 was used to calculate frequencies, percentages, and statistical tests such as Fisher's Chi-square to identify differences between cases and controls. Results: Participants with a mean age of 6.4 years + 5.0 years were evaluated, in which cases (n=84) presented CL/P: cleft lip (CL,12.6%), cleft palate (CP,12.6%) and cleft lip with palate (CLP,33.6%). MT was identified in 19.4% of participants, in which cases (96.4%), females (57.1%), 7 to 12 years (46.4%), 1 tooth (53.6%), and frontal superior location (13.1%) were the most reported. Significant differences were found in MT by age ( $p=0.001$ ), and cleft type ( $p<0.001$ ), in which CLP (75%) was the most reported type presenting this anomaly. Among cases, significant differences in MT were found for cleft type ( $p=0.01$ ) and age ( $p<0.0001$ ). ST were identified in 8.6% of participants, in which cases (81.8%), males (54.6%), 1 tooth (90%), and frontal superior location (7.6%) were the most reported. No differences in ST by sex ( $p=0.68$ ), age ( $p=0.90$ ) and cleft type ( $p=0.09$ ) were identified. Conclusion: Differences were found in MT by age and cleft type, indicating a relationship with CL/P. A study with radiographs is recommended to identify/confirm these anomalies, their association with CL/P, and its repercussions in permanent dentition. Acknowledgments: This research was supported by NIH/NIDCR R00DE024571 and NIH/NIGMS U54GM133807.

•4196•

#### **Mortalidad por Alzheimer en Puerto Rico 2016-2018: ¿Quiénes y dónde?**

Pagán Jiménez, Mariana, BA; Ríos Morales, Nilda K., BA; López Rodríguez, José A., MS; Dávila Román, Ana L., Ph.D.

Introducción y justificación: La enfermedad de Alzheimer es un asunto de salud pública, debido a sus repercusiones tanto a nivel social como económico. Esta es la primera causa de discapacidad en personas mayores de 65 años o más y la mayor contribuyente de dependencia, sobrecarga económica y estrés psicológico en el cuidador. Objetivos: 1) Describir las características sociodemográficas de las personas fallecidas por enfermedad de Alzheimer en Puerto Rico: 2016-2018. 2) Presentar la distribución geográfica de las tasas brutas de mortalidad por municipios en el periodo de 2016-2018. Método: Esta investigación es de carácter descriptivo. Los datos provienen del Registro Demográfico adscrito al Departamento de Salud de Puerto Rico. Para el análisis, se utilizó el paquete de datos estadísticos SPSS. Resultados: La enfermedad de Alzheimer es la cuarta causa de muerte con 6,753 defunciones, lo que representa el 7.5% de todas las muertes. Esta enfermedad afecta más a las mujeres (66.2%) que a los hombres (33.8%). Los hombres que la padecen mueren tres años más jóvenes (83.6) que las mujeres (86.5). El 30.7 % de las defunciones ocurrieron en asilos y el 49.7% fue en su residencia. Los municipios con las tasas más altas son: Lajas (10.1‰) y Yauco (10.0‰), y en Maricao (1.2‰) y Las Marías (2.0‰) se observan las más bajas. Mientras, en la población total de personas fallecidas, el 45.5% son mujeres y el 54.5% son en hombres. Conclusión: Distintos estudios realizados evidencian que la enfermedad de Alzheimer va en aumento tanto en Puerto Rico como a nivel mundial. Desde la pasada década, la población de la isla, se ha reducido y se ha agudizado el envejecimiento de la población. Por lo que es de esperarse que la enfermedad de Alzheimer vaya en aumento como ha ocurrido a nivel mundial.

•4197•

#### **Capacitación profesional: Innovación, tecnología y servicio ante una emergencia de salud pública**

Solaritza Rivera León, MPHE1, Luis E. Estremera De Jesús, EdD2, Ivonne Morales Montalvo, MSW3, Daisy M. Gely Rodríguez, MPHE4. Centro de Educación y Adiestramiento sobre SIDA, Recinto de Ciencias Médicas1; Decanato de Asuntos Académicos, Recinto de Ciencias Médicas 2, División de Educación

*Continua y Estudios Profesionales, Recinto de Ciencias Médicas 3,4.*

Antecedentes: En marzo 2020 la Organización Mundial de la Salud decretó un estado de pandemia a causa del COVID-19. Un cierre total a nivel nacional detuvo toda actividad socioeconómica y académica. El Departamento de Salud mediante la Orden Administrativa 424, requirió a los profesionales de la salud 2 horas de capacitación sobre las medidas de prevención de las enfermedades transmisibles. En consecuencia, la División Central de Educación Continua y Estudios Profesionales diseñó el curso virtual Enfermedades Respiratorias Transmisibles: Coronavirus, Influenza y Micoplasma. Objetivos: Producir un módulo educativo virtual sobre enfermedades respiratorias transmisibles; capacitar profesionales de salud mediante la educación a distancia integrando tecnologías para garantizar los servicios educación continua. Método: Se utilizó el diseño curricular aprobado por la Oficina de Reglamentación y Certificación de los Profesionales de la Salud y la información publicada por las autoridades sanitarias. Se establecieron las tecnologías a ser utilizadas. Se desarrollo el contenido del curso en la plataforma Google Site y se construyeron en Google Form la inscripción, pre-pos prueba y evaluación. El módulo estuvo disponible en la plataforma de RCM-Online 24/7 de marzo a mayo del 2020. Resultado: El curso virtual certificó 9,396 profesionales de salud. El 87% indicó que luego de la experiencia, el nivel de conocimiento fue excelente. Una participante expresó "...profesionales como ustedes hacen la diferencia. ...hoy se hizo la diferencia en la vida de un ser humano que literalmente estaba en crisis...", lo que sustentó la necesidad que existía y el impacto a nivel emocional de esta iniciativa. Conclusión: La educación virtual evidenció la capacidad de respuesta de la DECEP para satisfacer las necesidades educativas de los profesionales de la salud, el cual incidió en el aspecto emocional. Igualmente, provocó un aumento en conocimiento. Además, la integración de las tecnologías demostró ser un recurso efectivo para la capacitación profesional virtual.

•4199•

**Emigrantes e inmigrantes en Puerto Rico, 2015-2019: ¿Cómo estos difieren en sus características?**

*Avilés Ramos, Nadjarie, MSc y León López, Luz E. Ph.D. Centro de Investigaciones Demográficas, Programa de Demografía, Escuela Graduada de Salud Pública, Recinto de Ciencias Médica, Universidad de Puerto Rico*

Introducción y objetivos: Puerto Rico está experimentando un descenso marcado en su población. Las variables responsables de esta disminución son el descenso en la fecundidad y el número considerable de emigrantes. La salida y entrada de migrantes tiene consecuencias en los países de origen y destino. El objetivo de esta investigación fue analizar las diferencias en las características sociodemográficas de las personas que se mudan fuera de P.R. y las que vienen a vivir al país. Métodos: La fuente de datos fue La Encuesta de la Comunidad de Puerto Rico, 2015-2019. El estudio fue uno transversal descriptivo. Hallazgos: En el 2019 se mudaron hacia EE. UU. 66,021 personas. Inmigraron a P.R. unas 37,226; el 84% era procedente de EUA. La población que se mudó a EUA presentó una proporción mayor de féminas (51%) y una mediana de edad más joven (29.8) comparada con los inmigrantes de ese país. La población que emigró de P.R. a EUA presentó niveles más altos de educación (32% bachillerato+) e ingreso (mediana \$15,242) y niveles de pobreza (37% bajo pobreza) más bajos que los inmigrantes procedentes de ese país. El 22.4% de los inmigrantes desde USA tenía educación mayor a bachillerato, ingreso mediano de \$12,376 y el 48% estaba en pobreza. Los inmigrantes procedentes de otros países presentaron mayores niveles de educación e ingreso y menor pobreza que los de USA. Conclusión: La población que se muda fuera de P.R. y la que entra a residir al país difieren en sus características. De particular relevancia es el hecho de que el país está perdiendo población en edades productivas y reproductivas con altos niveles de educación. Ante la situación demográfica y económica actual que experimenta PR, es de suma importancia el desarrollo de política pública dirigida a retener el talento humano que reside en la Isla.

•4201•

**Community-acquired pneumonia with *Acinetobacter lwoffii* bacteremia in a healthy child: A case report**

*Jessica Ayala-Cuesta, MD (1), Ines Esquilin, MD(2). (1) University of Puerto Rico, School of Medicine.*

Department of Pediatrics San Juan, Puerto Rico.  
(2) University of Puerto Rico, School of Medicine.  
Department of Pediatrics Infectious Disease.

*Acinetobacter lwoffii* is a non-fermentative aerobic gram-negative bacillus involved in a variety of infectious diseases primarily associated with hospital settings. We report on the case a 3 years 11 months old previously healthy child, admitted for fever, ear ache, cough and left upper quadrant abdominal pain. On radiographic examination corresponded to left lung pneumonia with associated large left pleural effusion. A detailed diagnostic workup revealed *Acinetobacter lwoffii* bacteremia and community acquired pneumonia. Patient had no apparent risk factors or history of recent hospitalizations.

•4202•

**Case of an Adolescent Boy with Surfer's Myelopathy**

Jennifer M. Ruiz Boada<sup>1</sup>, Carlos Llorens<sup>1</sup>, Jahzel M. González Pagán<sup>1</sup>. <sup>1</sup>University of Puerto Rico, School of Medicine, Department of Pediatric

Purpose: A child with acute back pain and extremity weakness demands emergent medical attention. The combination of these symptoms is uncommon but worrisome for permanent injury. A rare etiology for these symptoms is Surfer's Myelopathy. We present the disease progression with its management to create awareness of this condition and promote prevention. Case Description: Healthy 13-year-old boy presented with back pain and progressive lower extremities weakness for the past 14 hours. Symptoms started after a 3-hour long surf class when he complained of lower back pain that rapidly progressed to 10 of 10 in intensity. It was associated with difficulty walking and urinary retention. In physical examination, he had weakness, hyperreflexia, paresthesia, paraplegia, and upper motor signs in lower extremity. There was no history of trauma during surfing lessons, recent injury, or infections. Spine MRI with intravenous gadolinium showed increased signal intensity in T2 weighted images predominantly involving the cord's central aspect, with increase in caliber expansion of the spinal cord distal to the level of T7 - T8. This suggested mild restricted diffusion of the distal cord, consistent with Surfer's Myelopathy. Conclusion: Surfer's Myelopathy is an uncommon non-traumatic spinal cord injury. It results from an ischemic insult to the spinal cord's due

to prone and hyperextended posture during sports like surfing, gymnastics, and cheerleading. Although therapy is still unclear, experts recommend combining steroids, hydration, and induced hypertension to promote spine reperfusion and reduce inflammation. Our patient showed clinical improvement regaining lower extremity function following the recommended therapy. To protect the spinal cord, the mnemonic "SPINE" can be followed: Sit on your board while waiting for waves; Pace your time in the water; Insist on knowledgeable instructor; Notice signs of pain in your back; Exit the water and seek help if you experience pain, tingling, or weakness.

•4203•

**Human and Mouse Apurinic/aprimidinic endonuclease 1 (APE1) activity is deficient in Huntington's disease.**

María M López Llegus<sup>1</sup>, María del Rocío Castro<sup>1</sup>, and Sylvette Ayala-Peña<sup>1</sup>. <sup>1</sup>Department of Pharmacology and Toxicology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico Huntington disease (HD) is a neurodegenerative disease caused by an expansion of CAG repeats in the huntingtin (htt) gene. The brain regions affected are the basal ganglia and the frontal cortex, but the mechanisms leading to pathogenicity are not understood. Compelling evidence suggests that oxidative damage to the mitochondrial DNA (mtDNA) is a hallmark of HD-associated neurodegeneration. The apurinic/aprimidinic (AP) endonuclease 1 (APE1) is the major mammalian endonuclease that repair of mtDNA damage via the base excision repair mechanism and is essential for the survival of neurons. Whether APE1-mediated mtDNA repair is involved in neuronal dysfunction in HD is unknown. We hypothesize that the repair of mtDNA damage is deficient in HD due to defective AP endonuclease activity. To test our hypothesis, we measured APE1 endonuclease activity incubating a double-stranded fluorometric oligonucleotide containing an AP-site with total protein extracts from postmortem HD brains and from two mouse models of HD. Results showed that APE1 endonuclease activity is significantly reduced in postmortem caudate/putamen and in the striatum and cerebral cortex of the R6/2 and HdhQ150 knock-in mice, respectively. Also, the repair kinetics of mtDNA

damage by treating mutant huntingtin expressing mouse striatal (Q111) and wild type neurons (Q7) with 200 $\mu$ M hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) for 1 hour and mtDNA damage was measured 1, 2, 3, and 24 hours after treatment using qPCR. We show that levels of mtDNA lesions are higher in the Q111 cells versus Q7. Also, we show that both cell lines repair mtDNA damage after 1 hour, however, levels of damage significantly increased after 24 hours only in the Q111 cells. Q111 cells show reduced levels of APE1 activity 24 hours after treatment. Our results suggest that APE1 repair function is deficient in HD, supporting a role for APE1 in HD neurodegeneration. Supported by SC1NS095380 and R25GM061838.

•4204•

**A Case Series study of Neonatal Opioid Withdrawal Syndrome (NOWS) in the University of Puerto Rico affiliated hospitals' neonatal units**

*Pamela Morales<sup>1</sup>, Jessica Rosario<sup>2</sup>, Darlene Santiago<sup>2</sup>. 1 University of Puerto Rico, Rio Piedras Campus, 2 University of Puerto Rico, Medical Sciences Campus*

**Background & Objectives:** NOWS is defined as the drug withdrawal symptomatology suffered by neonates exposed in-utero opioids. Several studies have widely described the prevalence of NOWS in the United States, however little is known regarding the prevalence of this disease in Puerto Rico (PR). The principal aim of this study was to describe NOWS in UPR affiliated hospitals' neonatal units in terms of occurrence, treatment (pharmacological or not) and diagnosis. It was also set out to explore potential relationships between the NAS therapy and its outcomes. **Methods:** Our study was primarily an examination of medical records of 12 NOWS identified cases from 2018 to 2020. Descriptive and inferential statistics were employed to analyze trends amongst the described cases. **Results:** From our study cohort, 41.7% were males (n=5) and 58.3% were females (n=7). Mean birth weight score obtained was 2566  $\pm$  605.44g, with 41.7% (n=5) of those cases reporting low birth weight. An average of 34.4  $\pm$  3.06 weeks of gestational age was documented, with 58.3% (n=7) born prematurely. Nine patients (75%) resulted to have experienced polydrug exposure in-utero, being exposed to either

illicit or non-illicit opioids, depressants, or stimulants. NOWS symptom assessment using FNAST resulted in a mean score of 14 (8 to 22). First line of therapy was pharmacological, with either phenobarbital or morphine prescribed as the first agent, or co-administering the two agents. No evidence was found from medical records regarding non-pharmacological therapy. On average, newborn's pharmacotherapy lasted 33  $\pm$  4.77 days, and length of hospital stay on average was 39 days  $\pm$  4.16 days. (IRB #E010121) **Conclusions:** Further research on this matter is needed for a deeper understanding that supports the development of improved and effective treatment protocols in PR.

•4206•

**Clínicas de Vacunación COVID-19 del RCM: Experiencia Clínica para los estudiantes del Programa Doctor en Terapia Física.**

*Ana Font-Rivera, Jessica Rodríguez-Torres, Alexie H. Seda-Díaz. Universidad de Puerto Rico Recinto de Ciencias Médicas, Escuela de Profesiones de la Salud, Programa Doctor en Terapia Física, San Juan, Puerto Rico*

**Trasfondo y Objetivos:** La pandemia del COVID-19 representa un reto para la educación de los profesionales de la salud en Puerto Rico y en Estados Unidos. Las clínicas Vacunación contra COVID-19, de la comunidad del Recinto de Ciencias Médicas se han utilizado como escenario para practica de destrezas clínicas de los estudiantes del Programa Doctor en Terapia Física. Los objetivos identificados para esta actividad son: 1) Promover la comunicación de los estudiantes con la comunidad general. 2) Practicar la toma de información de salud de las personas de la comunidad. 3) Practicar destrezas de movilidad y transferencias en sillón de ruedas. 4) Exponer a los estudiantes a educar a la comunidad general. 5) Promover la comunicación y socialización interprofesional. 6) Fomentar la interacción profesional con la comunidad fuera de un ambiente. **Método:** Se circularon invitaciones por correo electrónico a los estudiantes y facultad. Se diseñó un formulario para documentar la experiencia de los estudiantes en las clínicas. La experiencia educativa se diseñó bajo el Modelo de Excelencia en la Educación en Terapia Física, este modelo enfatiza en el aprendizaje



mediante la práctica. Resultados: 31 estudiantes han participado, de estos el 100 % ha participado del proceso de registro; el 99.97% de las actividades de movilidad en sillón de ruedas y educación a los participantes en vestirse y desvestirse con una mano; el 99.97 % compartieron interprofesionalmente con otros estudiantes. En entrevistas informales han reportado que la actividad les ayudó a desarrollar destrezas de comunicación con los participantes de una forma más humana y menos clínica, a confirmar que seleccionaron la profesión correcta y les apasiona, tener una interacción con los participantes y que estos se sintieran cómodos. Conclusiones: La participación de los estudiantes en estas clínicas han aportado al desarrollo de sus destrezas clínicas. Reconocimientos: Ninguno.

•4207•

**Screening of Postnatal Maternal Mental Health Symptoms in a level IV Neonatal Intensive Care Unit.**

Valeria Fadhel Hernández<sup>1</sup>; Karla Sánchez Contreras<sup>1</sup>; Cynthia García Coll<sup>4</sup>; José Martínez González<sup>3</sup>; Zayhara Reyes Bou<sup>4</sup>; Inés García García<sup>4</sup>; Lourdes García Fragoso<sup>4</sup>; Mineris Figueroa Angélica<sup>2</sup>; Amaris Rosado Rodríguez<sup>1</sup>; Edmarie Sánchez Cintrón<sup>1</sup>; Andrea Cabrer Mesquida<sup>1</sup>.  
<sup>1</sup>University of Puerto Rico, Rio Piedras Campus, <sup>2</sup>University of Puerto Rico, Cayey Campus, <sup>3</sup>Albizu University, San Juan, <sup>4</sup>University of Puerto Rico, Medical Sciences Campus, Neonatology Section, San Juan. Karla N. Sánchez Contreras, BS Student (karla.sanches12@upr.edu), Cynthia García Coll, PhD (cynthia.garciacoll@upr.edu), José Martínez González, PhD (jmartinez@albizu.edu), Zayhara Reyes Bou, MD (zayhara.reyes@upr.edu)

**Background & Objectives:** An infant in the Neonatal Intensive Care Unit (NICU), can be traumatic for mothers, and affect the bonding and subsequent health. We assess the maternal anxiety/depression, NICU sources of stress, and associations between perinatal complications and social/spiritual support with maternal symptoms. **Methods:** We interviewed 110 mothers of infants admitted in NICU. Measures included: STAI-6 detects anxiety; PHQ-9 measures depressive symptoms; PSS: NICU evaluates stress sources; MSPSS assess social support. Perinatal complications were

compiled from medical records. Results: Subjects mean age was 27. Infant's mean gestational age was 34 +/- 5 weeks; mean birth weight: 2,050g +/- 1,03g. NICU mothers presented slightly high anxiety (m=41.7, sd=13.8) and mild depression symptoms (m=5.6, sd=4.70). The overall NICU stress experienced was low to mild (m=1.98, sd=1.06), although parental role alterations (m=2.92, sd=1.03) was higher than unit's sights/sounds (m=1.95, sd=1.11), infant behavior/appearance (m=1.69, sd=1.04) and staff behavior/communication (m=1.37, sd=1.08). A correlation was found between higher maternal NICU stress (infant behavior/appearance) with higher perinatal complication (p=.01). Less anxiety symptoms were related to higher spiritual support (p=.01). Less overall NICU stress was related to higher family and friend support (p< 0.05). Specifically, more NICU stress in response to staff behavior/communication of mothers having low friends support (p=.02). Conclusions: Higher anxiety, mild depression, and mild stress, can be found in conditions of low social support. Less anxiety is related to more spiritual support. Less NICU stress and symptoms of depression are associated with more support from family and friends. These findings have implications for the delivery of services for mothers in the NICU who report low social support. Aprobado por IRB.

•4208•

**Experiences and perspectives of cannabis use from opioid use disorder patients in treatment with buprenorphine: Case Series Study.**

Lizmarie Rosado Rivera<sup>2</sup>, Nilmarys Reyes Muñoz,<sup>2</sup> Marielys Villa Ortiz,<sup>2</sup> and Darlene Santiago<sup>1</sup>. <sup>1</sup> Department Pharmaceutical Sciences, University of Puerto Rico Medical Sciences Campus; <sup>2</sup> Department of Pharmacy, University of Puerto Rico Medical Sciences Campus

**Background and Objectives:** Opioid use disorder (OUD) is a health emergency affecting both the US and Puerto Rico (PR). Buprenorphine being one of the safest treatment for OUD, its use combined with medicinal cannabis is an ongoing debate. Contradicting theories of the impact on buprenorphine OUD patients have been reported with some suggesting that OUD patients should avoid medicinal cannabis. While other suggest that combining

both may support adherence and OUD treatment outcomes. It is important that the experiences and perceptions of cannabis use from OUD patient in PR be reported. As such, this study aimed at documenting these experiences and perceptions as a first step of a research agenda aiming at increasing OUD treatment outcomes in PR. Methods: This case series study was conducted in an OUD clinic in the Bayamon metropolitan area, recruiting patients +21-year-old and under treatment with buprenorphine for OUD, and using cannabis. Recruitment consisted in providing informed consent to previously identified potential prospects by clinic's personnel, that met inclusion criteria. Afterwards, an interview and medical record evaluation proceeded for a total of eleven patients. Results: All subjects were male (26 and 78 years), starting buprenorphine treatment between 2013 through 2021. Most of the subjects previously used recreational cannabis, and transitioned to medicinal cannabis certification, mostly consuming it in the flower dosage form. Recommendations included: insomnia, pain management, lack of appetite and anxiety. Most of the patients reported feeling happy with the use of cannabis, and no adverse effect were reported. Some of the patients reported having relapses at some point while in treatment for OUD, however an association to their cannabis use could not be established. Conclusion: Recruited OUD patients overall report a positive cannabis use experience. Further research is warranted for an island-wide description from OUD buprenorphine patients in PR. Acknowledgements: This research was funded by The National Institutes of Health Award Numbers: HCTRECD R25MD007607, HiREC S21MD001830, PRCTRC (2U54MD007587) and RCMI 8G12MD007600.

•4210•

**Vaping among Teens: Results from a representative sample of adolescent students in Puerto Rico**

*Linnette Rodríguez-Figueroa, PhD1; Margarita R. Moscoso-Álvarez, PhD2; Juan C. Reyes-Pulliza, EdD1; Laura M. Zayas-Martínez, MS2; Hector M. Colón, PhD1. 1University of Puerto Rico, Graduate School of Public Health; 2Universidad Central del Caribe, School of Medicine*

The use of electronic cigarettes (vaping) has become a new and popular substance use modality among

teens. Little is known about the prevalence of this public health problem in Puerto Rico. Our objective was to estimate the prevalence of vaping among adolescent students in Puerto Rico by gender and school level. The sample (n=8,603) in this 2018-20 island-wide cross-sectional survey was selected using a multi-stage stratified cluster sampling design, and was representative of all 7th-12th grade students in the island. Data was collected using a pre-coded self-administered questionnaire. Proportions were compared using chi-square tests; odds ratios were computed. Analyses were performed on weighted data. Lifetime prevalence of vaping was 22.7% and 15.8% reported vaping in the last year. Almost half (42.9%) of the students who vaped started vaping at ages 14-15 and 32.6% started before age 14; most used nicotine (32.7%) or marijuana (16.1%) in their vaping devices. Males and high school students (10th-12th) were more likely to report vaping than females and middle school students (7th-9th). It is estimated that over 45,000 students in Puerto Rico have engaged used electronic cigarettes. Prevention efforts should target this dangerous modality. Education programs geared towards teens that emphasize the dangers of vaping should be targeted to the high risk groups identified. Research supported by ASSMCA.

•4211•

**Multisystemic Inflammatory Syndrome in Children: Acute pancreatitis and hepatitis in a 8-year-old male Puerto Rican patient.**

*Juan Pablo Arocho, MD. Isabel Sánchez, MD. Patricia Rodríguez, MD.*

Purpose: Multisystemic inflammatory syndrome in children (MIS-C) is a rare disease in pediatric patients temporally associated with SARS-CoV-2 infection. MIS-C was first reported on April 26, 2020, after the progression of the Coronavirus 2019 pandemic. Patients diagnosed with MIS-C are 21-years of age or younger and present with fever, elevated inflammatory markers, and findings consistent with inflammation of different organ systems. Case description: We report an eight-year-old male Puerto Rican patient who presented with acute pancreatitis associated with hepatitis in the clinical setting of MIS-C. This case is the first known MIS-C reported in a Puerto Rican pediatric patient presenting acute pancreatitis requiring

admission to PICU and prolonged hospitalization in the pediatric ward. The patient was treated with high-dose intravenous immunoglobulins and methylprednisolone, with adequate clinical response. Gastrointestinal symptoms are often associated with MIS-C, but there have been scant cases reporting acute pancreatitis as the initial presentation. Conclusion: It is crucial to have a high index of suspicion to diagnose MIS-C as early, and prompt treatment is essential to decrease morbidity and mortality in the pediatric population diagnosed with MIS-C.

•4212•

**“¿Bebés en tiempos difíciles? Tendencias en las tasas de fecundidad en Puerto Rico 1980-2020”**

Génesis M. Alvelo Colón<sup>1</sup>, Ana Luisa Dávila<sup>2</sup>.  
<sup>1</sup>Estudiante graduada de la Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela Graduada de Salud Pública, Departamento de Ciencias Sociales, San Juan, Puerto Rico. genesis.alvelo@upr.edu  
<sup>2</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela Graduada de Salud Pública, Departamento de Ciencias Sociales, San Juan, Puerto Rico. analuisa.davila@upr.edu

Trasfondo: Con el pasar de los años la fecundidad en Puerto Rico ha ido descendiendo gradualmente. A partir del 2016 nacieron menos personas de las que mueren. Además, desde el 2020 el mundo se enfrenta a la pandemia del SARS-CoV-2 (COVID-19). En miras de proteger a la población del virus, el Gobierno limitó actividades que las personas realizan en su diario vivir, lo cual también causó incertidumbre en aspectos socio-económicos y también se han impactado las dinámicas demográficas. Objetivos: Describir el descenso de la fecundidad desde las últimas décadas del siglo pasado y explorar la cuantificación de la reducción de nacimientos debido al COVID-19 y los desastres naturales recientes. Método: Esta investigación es de carácter descriptivo. Los datos provienen del registro Demográfico adscrito al Departamento de Salud de Puerto Rico, y de los estimados de población del Negociado del Censo de los Estados Unidos. Se utilizó el paquete de datos estadísticos SPSS para el análisis. Resultados: El descenso de la fecundidad se aceleró a partir de la década de 1980. Desde 1994 no se reemplazan las generaciones y desde el 2016 el crecimiento

natural es negativo. Los huracanes Irma y María, y la pandemia de COVID-19 precipitaron aún más la caída de los nacimientos. Entre el 2015 y 2020 los nacimientos se redujeron en un 39.9%, alcanzando una cifra aproximada de 18,774 nacimientos en el 2020. Así se obtiene una tasa bruta de reproducción cercana a 0.43 hijas por mujer, lo que parece asegurar, junto con la emigración, un continuo descenso en la población. Conclusión: Estas tendencias apuntan a una continua pérdida de la población, una reducción del grupo trabajador y de los grupos de menores de 16 años, y agravará el envejecimiento de la población con las repercusiones sociales y económicas implícitas.

•4213•

**Prosthetic Rehabilitation and Self Image Improvement in a Special Care Patient with Dentoalveolar Injury in Esthetic Zone: Case Report**

Camila Pérez López, DMD, Yatnee Encarnación Ginés, DMD, Uzkelia Uzkategui Moncada, DMD. General Practice Residency, University of Puerto Rico, Hospital UPR Dr. Federico Trilla

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by severe motor manifestations, that limit the physical capability of individuals to perform basic daily activities. These individuals may experience recurrent falls and fractures as a consequence of the disease. The purpose of this case is to describe the treatment sequence and emphasize the importance of self-image in a 60 year old female patient with a medical history of Parkinson's Disease and Depression and a present dental history of dentoalveolar trauma due to a fall. Maxillary right central incisor had Ellis type II fracture, maxillary left central incisor was avulsed, maxillary left lateral incisor had extrusive luxation and maxillary left canine presented a concussion. After a comprehensive evaluation quality treatment was provided using special care management techniques. It was taken into consideration that patient took medications in the morning so scheduled appointments were relatively short one within 90 minutes after administration of PD medications to enhance the patient's ability to cooperate with care. Local anesthetic agents without epinephrine such as Mepivacaine were administered to avoid adverse drug interactions. Also, Chair inclination was of 45 degrees, placement of bite prop

and both low and high-volume oral evacuation suction were used to enhance airway protection, among other techniques. At initial appointment, left lateral incisor with extrusive luxation was extracted in an atraumatic manner. Corticocancellous bone allograft and absorbable collagen membrane was placed in socket of maxillary left central and lateral incisors and held in place with interrupted polyglactin sutures. After adequate healing period, provisional fixed partial denture was done. After this appointment, the patient projected happiness and expressed gratitude. In the long-term, this event will improve the patient's quality of life from a point of view of physical and emotional well being, thereby having a positive impact on depression and overall mental health.

•4216•

**Hemiscrotal abscess secondary to transsphincteric perianal fistula; an unusual initial presentation of Crohn's disease.**

Báez-Bravo, G.A.1, Arocho-González, J.P.2, Jiménez-Almodóvar, M.C.3. 1Pediatrics Residency Program (PGY-1) University of Puerto Rico Medical Sciences Campus, [gabriela.baez@upr.edu](mailto:gabriela.baez@upr.edu); 2 Pediatrics Residency Program (PGY-1), University of Puerto Rico Medical Sciences Campus, [juan.archo2@upr.edu](mailto:juan.archo2@upr.edu); 3 Pediatric Gastroenterologist, Associate Professor, Pediatric University Hospital, UPR-MS, [jimenezmaria@outlook.com](mailto:jimenezmaria@outlook.com)

Purpose. Crohn's disease (CD) is a type of Inflammatory Bowel disease that primarily affects the gastrointestinal tract from mouth to anus, but that has multiple extraintestinal manifestations and complications. Of those, genitourinary complications are present in about 5-25% of cases, with less prevalence in the pediatric population. Moreover, scrotal abscesses are rarely described in the literature and usually arise in patients whose diagnosis of CD has already been established. Case Description. We present the case of a 20-year-old male who presented with acute onset left hemiscrotal swelling that was found to be secondary to a scrotal abscess that originated from a transsphincteric perianal fistula. Review of systems was pertinent for episodes of watery diarrhea in the past year. Abdominal imaging revealed findings suggestive of CD and colonoscopy findings confirmed the diagnosis.

Patient was initially treated with IV antibiotics and incision and drainage of abscess. Once symptoms resolved, the patient was started on a biological agent for treatment of primary disease. Conclusion. To our knowledge, this is the first case since 1995 (Simoneaux et al.) of a pediatric patient whose initial presentation of his CD is with a scrotal abscess. There is lack of literature about scrotal abscesses in patients with CD, especially of young patients with no prior diagnosis. It is important to include CD in our differential diagnosis when a patient presents with scrotal swelling and pain as their chief complaint. Acknowledgements. No conflicts of interest to disclose. All co-authors and mentors have read and approved the abstract.

•4218•

**¿Descenso de la fecundidad es igual a descenso de los partos dobles? Un acercamiento descriptivo a los partos dobles en Puerto Rico 2015-2020**

Lanselotte Oliveras Vega B.A.1. 1Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, Puerto Rico.

Antecedentes: El descenso de la fecundidad en Puerto Rico se viene observando desde el siglo XX, como en muchos países desarrollados, aunque esta tendencia se ha agudizado en la primera década del siglo XXI. El descenso de la fecundidad es tal que en la actualidad Puerto Rico tiene un crecimiento natural negativo. La literatura consultada sugiere que los tratamientos de fertilidad llevan a un aumento en las tasas de nacimientos dobles. Objetivos: Los objetivos de este estudio son trazar las tendencias de los partos dobles, describir las características sociodemográficas de las mujeres con estos partos y presentar la distribución geográfica de las tasas de nacimientos dobles por municipio de Puerto Rico 2015-2020. Métodos: Este estudio es de corte descriptivo, se usaron los datos del Registro Demográfico adscrito al Departamentos de Salud. Se utilizó el programa estadístico SPSS y el sistema de información geográfico ArcGIS para el análisis de datos. Resultados: Se encontró que la proporción de partos dobles se ha mantenido en constante aumento desde el 1985 aunque en la última década se ha estabilizado a cerca del 2%. La edad media de las mujeres con partos (28.32) es casi dos años

más que las mujeres con partos simples (26.46). Las mujeres con partos dobles tienen más escolaridad, en promedio (14.24) años versus (13.68) años de las mujeres con partos simples. Además, se encontró que luego del Huracán María la reducción en los partos totales ha sido mayor que la observada en los partos dobles. Conclusión: La reducción en la fecundidad no parece afectar los partos de mellizos o gemelos y no necesariamente está vinculada a tratamientos de infertilidad.

•4220•

**Assessment of Knowledge and Confidence of Lidocaine Use for Local Anesthesia in the Emergency Department: A Quality Improvement Project**

*Isabel Sánchez Cano MD1, Jahzel M. González Pagán MD1. 1University of Puerto Rico, Medical Sciences Campus, Department of Pediatrics.*

**Background and Objectives:** The University Pediatric Hospital (UPH) receives daily patients that require local anesthesia for wound cleaning and repair. The most common local anesthetic used is Lidocaine. Local anesthesia is generally safe, but there is an adverse event called local anesthetic system toxicity (LAST). LAST is a rare but life-threatening adverse reaction that can occur after the administration of local anesthetics. The mechanism of LAST is multifactorial but can be prevented by restricting drug dosage. Our objective is to improve residents' knowledge and confidence by 50%, including how to recognize and treat LAST. **Methods:** A needs assessment was performed using an anonymous pre-survey completed by pediatric and rotating residents at the UPH. Different strategies were used to maximize residents learning. These interventions included an initial oral presentation, an informative card distributed among all the residents, and several rounds around the hospital reinforcing the material 1 week afterward. A post-intervention anonymous survey was given 2 weeks after the initial intervention. **Results:** A total of 60 residents were surveyed. Pre-survey showed poor knowledge in various categories; definition of LAST (41% correct), lidocaine with epinephrine maximum dose (7% correct), and LAST treatment (30.8% correct). Only 30.8% of the residents were confident using Lidocaine. Post-survey scores were compared using a two-sample T-Test with unequal variances, and increase in knowledge score

was found after the interventions with a significant P-value  $\leq 0.01$ . Confidence using Lidocaine improved by 65%. **Conclusion:** Last is a preventable event that can cause significant morbidity and even death. We achieved our goal to improve both residents' knowledge and confidence by more than fifty percent. Simple interventions in hospitals can be implemented and be effective in improving patient's safety while repairing lacerations. Nevertheless, further interventions need to be done to assure persistent results. Next QI phase will focus on this important goal.

•4221•

**Acceptance of Pessary use in women living in Puerto Rico with Pelvic Organ Prolapse**

*Lyz Annette López Pérez, MD1, Fidel Santos Santos, MD1, Antonio Santos Roca, BS2, David Santos Malavé, BA3. 1University of Puerto Rico Medical Sciences Campus, Obstetrics & Gynecology Department, San Juan, Puerto Rico. 2Universidad Central del Caribe, School of Medicine, Bayamón, Puerto Rico. 3University of Puerto Rico Medical Sciences Campus, School of Medicine, San Juan, Puerto Rico. Emails: lyz.lopez@upr.edu, fidel.santos@upr.edu, 117asantos@uccaribe.edu, david.santos4@upr.edu*

**Objectives:** Pelvic organ prolapse (POP) is a condition with detrimental effects on quality of life that affects many women. Treatment strategies include physical therapy, pessary or surgery. POP is more prevalent in Latinas and there are cultural differences in how Latinas view POP. The aim of this study is to evaluate the acceptance of pessary use in women living in Puerto Rico and we hypothesize that the overall acceptance of pessary use will be lower in this population possibly related to cultural factors. **Methods:** A retrospective chart review was performed at the Gynecology Clinics of the UPR School of Medicine & Private Urogynecology Practice. Eligible subjects with initial visit between July 2013 and July 2018 diagnosed with POP were included in the study. Descriptive statistics were done for those with documented initial treatment decision. **Results:** A total of 194 patients were included with an average age of 66 years (63% were from UPR Clinics and 37% from Private Urogynecology Practice). Overall,

62% of patients were offered pessary or surgical management at first visit. With regards to initial treatment choice, 24% of those chose pessary and 66% chose surgical management. Of those who chose pessary, 7% were sexually active versus 24% of those who chose surgery. Conclusions: The acceptance rate of pessary use was low in women living in Puerto Rico and is lower than the rate of acceptance for other non-Latina populations within the existing literature. Research on pessary acceptance is limited especially with regards to the effect of cultural factors. Further studies are needed to determine the extent to which culture and other demographic factors influence pessary acceptance. Acknowledgements: This study was supported by the UPR Endowed Health Services Research Center through grants 5S21MD000242 and 5S21MD000138, from the National Center for Minority Health and Health Disparities, National Institutes of Health (NCMHD-NIH). Its contents are the sole responsibility of the authors and do not necessarily represent the official views of NCMHD-NIH. Approved by IRB. Protocol number B0970120

•4223•

**Plasmodium berghei Glutathione Pathway Gene Expression Analysis Throughout the Life Cycle using The Malaria Cell Atlas**

Roberto G. Díaz-González, B.S.1, Emilee E. Colón-Lorenzo, Ph.D.1, Adelfa E. Serrano, Ph.D.1. 1Department of Microbiology and Medical Zoology, University of Puerto Rico, School of Medicine, San Juan, PR. Roberto G. Díaz-González: roberto.diaz7@upr.edu, Emilee E. Colón-Lorenzo: emilee.colon@upr.edu, Adelfa E. Serrano: adelfa.serrano@upr.edu

**Background & Objectives:** Malaria, caused by Plasmodium parasites is transmitted by female Anopheles mosquitoes. We previously reported the role of P. berghei gamma-glutamylcysteine-synthetase (pbggcs), glutathione-reductase (pbgr), glutathione-S-transferase (pbgst), and the multidrug resistance protein-2 (pbmrp) genes in drug resistance and parasite development using the rodent malaria model. The pbggcs and pbgr are key genes for parasite development in mosquitoes, while pbgst is a blood-stages essential gene, and pbmrp is involved in hepatocyte invasion and gametocytogenesis. Our

goal was to determine gene expression throughout the parasite life cycle using the recently developed Malaria Cell Atlas, an online single-cell expression database, to be applied in further studies. **Methods:** The expression profile of pbggcs, pbgr, pbgst, and pbmrp2 was individually evaluated in P. berghei life cycle stages using the Malaria Cell Atlas (<https://www.sanger.ac.uk/tool/mca/mca/>). **Single-cell transcriptomes** (RNA-seq) were analyzed using visual analysis with UMAP (uniform manifold approximation and projection). **Results:** The pbggcs, pbgr, and pbmrp genes showed low to moderate expression in hepatocytes and blood stages. In contrast, pbgst was highly expressed in gametocytes. Moderate to high expression was observed for all genes in ookinetes and oocysts, while sporozoites showed low expression except for pbmrp. **Conclusion:** The analyzed gene expression patterns correlate with the previously reported phenotype of the null mutants for each gene and revealed potential targets for intervention. High expression in specific stages would support the notion that inhibitors of the gene might be effective at that stage. The Malaria Cell Atlas proves to be a useful tool for gene analysis and could have potential uses in experimental design and drug testing. **Acknowledgements:** RCMI-NIMHHD-U54MD007600.

•4224•

**Auditory, Communications and Developmental Profile of Infants Born to Zika Infected Mothers**

Wanda Lugo-Vélez & Soami Santiago de Snyder. Doctor of Audiology Program, School of Health Professions, Medical Sciences Campus

It is well established that Zika virus (ZV) infection could be prenatally passed from mother to the fetus, but the full spectrum of this congenital infection is not yet fully understood. There is increasing evidence that infection with this virus during pregnancy could cause microcephaly, visual and hearing impairment, and developmental and communication delay. At the present time there is no information regarding hearing problems and communicological disorders suffered by children born to mothers infected with Zika virus in Puerto Rico. The aim of the study was to gain an understanding of hearing sensitivity as well as the development of auditory skills by these children. Another objective was to establish a profile

of infants born to Zika infected mothers. The profile was established epidemiologically (descriptive cross-sectional study) as well as experimentally with a sample of infants and toddlers (0-3 years old). Results: The researchers collected experimental auditory data and extracted developmental communication information from records to create a profile of infants born to ZIKA infected mothers. The study found that 94% of the subjects had thresholds within normal hearing levels and 2% of the subjects showed a mild conductive hearing loss. Conclusions: Although the initial findings did not indicate hearing impairment during the first assessment of children from mothers exhibiting evidence of Zika virus infection, it is important to continue longitudinal follow-up studies. This will help to determine if there is a delay in auditory skills or progressive hearing loss in this cohort. This research was possible thanks to the support of the Hispanic in Research Capability Endowment-HiREC-Mini-Infra-Structure Research Awards.

•4225•

**Failure of biologic therapy in psoriasis**

Rocío Cardona, MD, Natalia M. Pelet del Toro, BS, Eduardo Michelen-Gómez, BS, Gabriel E. Arias Berríos, MD, Rafael F. Martín-García, MD, University of Puerto Rico School of Medicine, San Juan, Puerto Rico

**Background & Objective:** Many advances regarding biologic drugs for the treatment of psoriasis have been made, although their discontinuation continues to be reported. Biologic switching, the discontinuation of one biologic to transition to another, has been reported to be as high as 44.1%. This study aims to describe the frequency of biologic therapy failure in psoriasis patients along with associated patient demographics and characteristics. **Methods:** This was a retrospective medical-record review of seventy-seven psoriasis patients who failed biologic therapy at least once evaluated from January 1st, 2013, through May 1st, 2018. **Results:** Hypertension (58.4%), diabetes (37.7%), dyslipidemia (27.3%), and psoriatic arthritis (23.4%) were the main comorbidities observed. Adalimumab (ADA, 80.5%), ustekinumab (UST, 70.1%), and etanercept (ETA, 14.2%) were the most frequently used biologics in our cohort. The biologic with the longest mean duration of

use prior to its discontinuation was UST (17.0 months), followed by ADA (15.9 months) and ETA (13.6 months). **Conclusion:** The most common reason for discontinuing biologic therapy was that said therapy was not effective, though for ETA and UST, the fact that biologic therapies are not universally covered by insurance company was found to be associated with their discontinuation, as well. There were no statistically significant associations found between biologic therapy discontinuation and age, gender, or comorbidities, which last included obesity, class I. Larger studies are warranted to identify risk factors associated with biologic therapy failure to help guide drug selection, decrease morbidity associated with such nonadherence and improve patient outcomes. **Acknowledgements:** There are no conflicts of interest to disclose. No funding was provided for this study. Approved by IRB #B1340218.

•4228•

**A cross-sectional study of the association between lipid and glucose levels and thyroid dysfunction in Hispanic individuals with type 2 diabetes.**

Paola C. Ruiz Ramírez 1, 2, Gabriela N. Vázquez Morales 1, 3, Julio A. Rivas-Agosto 1, Oelisoa M Andriankaja 1. 1Center for Clinical Research and Health Promotion, University of Puerto Rico Medical Science Campus, School of Dental Medicine, 2College of Natural Sciences Department of Biology, University of Puerto Rico, Rio Piedras Campus, 3Natural Sciences Department, University of Puerto Rico, Cayey Campus

**Background:** Diabetes, thyroid disease and lipid abnormalities are health problems with high prevalence in the United States and Puerto Rico. Thyroid dysfunction is more common in patients with Type 2 Diabetes (T2D) than in the general population and can adversely influence metabolic control. Lipid levels are likely to be abnormal in people with low or high TSH levels. **Objectives:** To assess whether poor glucose control and higher lipid levels are associated with hypothyroidism among individuals with T2D. **Methods:** Data on 256 participants with T2D, aged 40- 65 years from the cross-sectional “Lipid Lowering agents use in Periodontitis and Diabetes Study” was analyzed. Definition for high fasting serum glucose ( $\geq 130$ mg/dL), high triglycerides ( $\geq 150$  mg/dL),

and low level of high-density lipoprotein cholesterol (HDL-C) (men  $\leq$  40mg/dL, women  $\leq$  50mg/dL) were used. Thyroid dysfunction was reported as having a diagnosis for hypothyroidism. Multivariable logistic regression models were used to assess the associations between the exposures (high glucose, high triglycerides, and low HDL-C) and the outcome hypothyroidism, adjusting for potential confounders (lipid-lowering agents use, age, gender, education, smoking and alcohol status, BMI, and Metformin use). Results: Approximately 14.5% of the participants had a diagnosis of hypothyroidism. Nearly 60.6%, 50.4% and 53.1% had high glucose, high triglycerides, and low HDL-C, respectively. The adjusted odds ratios (adj. ORs) of the associations between high glucose, high triglycerides, and low HDL-C and the occurrence of hypothyroidism were adj. OR= 0.73(95% CI:0.35-1.53); 1.09 (0.52-2.26); and 2.32 (1.03-5.21), respectively. Conclusions: Low level of HDL is associated with hypothyroidism. The non-association between glucose and occurrence of hypothyroidism could be related to insulin resistance and/or medications to control their diabetes condition. Acknowledgements: Supported by NIDCR [K23 DE025313-05] and the Alliance [NIGMS: U54GM133807]. IRB approved (B0930116).

•4229•

### Are Arthritic Patients Using Cannabis? A Descriptive Study

Jessica Carnivali García. Department of Health Services Administration, UPR-MSA

Background & Objectives: The medical use of cannabis is quickly becoming a largely relevant topic of study. Pain management, along with sleep disorders and anxiety have been consistently reported by medical cannabis users within the literature. Similarly, chronic pain remains an important component of burden for patients with arthritis. Given that some arthritic patients are using cannabis for medical purposes while its therapeutic effects are still being studied it is important to understand and monitor this population. The objective of this study was to describe a sample of arthritic patients and their use of cannabis. Methods: The weighted sample was comprised of 13658 arthritic patients residing in states with medical cannabis programs in 2017, the dataset analyzed

was the 2017 Behavioral Risk Factor Surveillance System from the CDC. Descriptive analysis was performed for cannabis use, arthritis burden and socio-economic characteristics. Results: The sample was composed mainly of retired white older women with some college education. Only a small percentage (7.3%) of arthritic patients were currently using cannabis. Within current users, 65.3% were medical users, 23.1% were non-medical, 11.6% combined reasons; and 69.1% consumed cannabis by smoking. Within patients burdened with arthritis there was a higher percent of medical use. Conclusion: A small percent of burdened arthritic patients appear to be using cannabis mainly for medical purposes. Further research is warranted to explore the associations of cannabis use and arthritis burden. Acknowledgements: The author would like to thank the mentorship of Prof. Viviana De Jesús and the assistance of Dr. Hector Colón in this study. The author acknowledges Dra. Viviana De Jesús Monge as mentor and appreciates Dr. Hector Colón assistance for this study.

•4230•

### Association between Vitamins before and during Pregnancy and Oral Clefts in Puerto Ricans.

Soto-Ortiz, M., DrPH MPH BS ([mairim.soto@upr.edu](mailto:mairim.soto@upr.edu)); & Buxó-Martínez, C.J., Buxó – Martínez 1, DrPH, MPH, MSc ([carmen.buxo@upr.edu](mailto:carmen.buxo@upr.edu)). 1School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico.

Background/Aims: Oral clefts (CL/P) are described as birth defect characterized by an opening that compromises facial structures. Identification of maternal factors associated to CL/P risk is described as a prevention step. Study's aim is to identify factors in the vitamin's consumption before/during pregnancy that modulate the risk for developing CL/P. Methods: A case-control study (N=448) collected maternal data from a pregnancy history questionnaire. Mothers with children with/without non-syndromic CL/P provided information related to vitamins consumption before (BP) and during pregnancy (DP). Chi-square statistical tests and frequencies were calculated for each variable. Crude and adjusted odds ratios (ORs) analysis with confidence intervals (CI) at 95% were performed to estimate risk. STATA (version 14) was the statistical program used for analyses. Results:



Sample was mostly composed of married (35.2%) with a high school degree (39.0%) and income of less than \$10,000 (42.3%) mothers of children that presented cleft lip with cleft palate (n=122,27.4%) was the most observed CL/P. Analysis of vitamins consumption BP showed significant differences for multivitamins (p=0.003), vitamin C (p=0.04), and folic acid (p<0.0001). Logistic regressions after adjusting for maternal sociodemographic variables showed that multivitamins (OR<sub>adj</sub>=0.55; 95%CI[0.34,0.90]), vitamin C (OR<sub>adj</sub>=0.41; 95%CI[0.19,0.90]) and folic acid (OR<sub>adj</sub>=0.42; 95%CI[0.26,0.70]) reduced the risk for CL/P. Analysis DP showed differences for vitamin B (p=0.04), and vitamin C (p=0.01). After adjusting, logistic regressions showed vitamin B (OR<sub>adj</sub>=0.28; 95%CI[0.08,0.89]), vitamin C (OR<sub>adj</sub>=0.25; 95%CI[0.08,0.81]) and vitamin E (OR<sub>adj</sub>=0.24; 95%CI[0.06,0.90]) decreased the odds for CL/P if consumed DP. Analysis by cleft type was also performed and differences were found BP for multivitamins (p=0.03), and folic acid (p=0.004); and DP for vitamin B (p=0.03). Conclusion: Vitamins supplementation before/during pregnancy are essential for healthy fetal development. Doses and consumption before/during pregnancy stages data should be collected to assess association with CL/P. Acknowledgments: This research was supported by NIH/NIDCR R00DE024571, NIH/NIGMS U54GM133807

•4231•

**Lipid-Lowering Agents use and increased Insulin level in Hispanic individuals with Type 2 Diabetes**

*Víctor L. Vergara Rodríguez<sup>1,2</sup>, Francisco J. Bruno Rivera<sup>1,3</sup>, Julio A. Rivas-Agosto<sup>1</sup> MPH, Oelisoa M. Andriankaja<sup>1</sup>, DDS, PhD. <sup>1</sup>Center for Clinical Research and Health Promotion, University of Puerto Rico Medical Science Campus, School of Dental Medicine; <sup>2</sup>Interdisciplinary Sciences Department, University of Puerto Rico, Rio Piedras Campus, <sup>3</sup>Biology Department, University of Puerto Rico, Cayey Campus*

Background: Statin treatment is necessary for diabetic patients to reduce cardiovascular risk. Despite this benefit, treatment with certain statins could worsen insulin resistance, demonstrating higher levels of insulin and glycated hemoglobin (HbA1c). Objectives: To

assess whether lipid-lowering agents (LLA) use, mostly statins, is associated with increased serum insulin level in individuals with type 2 diabetes (T2D). Methods: A total of 256 individuals with T2D, aged 40 to 65 years, participated in the cross-sectional “Lipid-lowering agents use in periodontitis and diabetes Study” (LLIPDS). An intensive interview-based questionnaire was used to thoroughly assess participants’ LLA use. Participants were classified as LLA users (currently taking) or non-users (never or formerly taken LLA). Fasting serum insulin was measured by Immunoenzymometric assay. Insulin level  $\geq 25$  (mIU/L) was classified as high. Multivariable logistic regression was used to evaluate the association between LLA use and high insulin level, adjusting for potential confounders (age, gender, smoking and alcohol status, educational level, glycated hemoglobin, BMI, and Metformin use). Results: Approximately 52.3% (N=134) of the participants reported taking LLA, and 18% (N=46) had high insulin levels. The crude odds ratio (OR) of the association between LLA use and high insulin was 1.91 (95%CI: 0.98-3.71). After model adjustment, participants who took LLA were 1.97 (95%CI: 0.96 – 4.03) times more likely to have high insulin levels as compared to those who reported not taking LLA. Conclusion: This study suggests that LLA use, such as statins, may be associated with high insulin levels in individuals with T2D. If the finding still holds true in further large and prospective studies, physicians may benefit from knowing this pathophysiology; it provides guidance to the management of glycemic control and reduction of cardiovascular risk. Acknowledgments: This study was supported by NIDCR [K23 DE025313-05] and the Alliance [NIGMS: U54GM133807]. IRB approved (B0930116).

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**Anti-N-methyl-D-aspartate (NMDA) and Myelin Oligodendrocyte Glycoprotein (MOG) Demyelinating Conditions, an overlapping disease with independent timeline occurrence.**

*Patricia Fernandez-Hawa<sup>1</sup>; Marisel Vázquez-Correa<sup>1</sup>. <sup>1</sup>University of Puerto Rico Medical Science Campus*

Background: Anti-N-methyl-D-aspartate receptor encephalitis (NMDA) is a well-characterized immune-mediated encephalitis that presents with psychiatric

symptoms, seizures, and movement disorders. Myelin oligodendrocyte glycoprotein (MOG) is a membrane protein expressed on the surface of oligodendrocyte and myelin sheaths. Recently there has been recognized an overlap between NMDA-Positive and MOG-Positive Antibodies on demyelinating conditions. Case Description: Case of 8 Y/O female that presents to ER due to one-month evolution of Left eye blurry vision. One year prior to this admission patient presented with a clinic of Autoimmune Encephalitis NMDA-Positive and focal seizures treated with immunoglobulin (IVIG) for 5 doses and lamotrigine. On examination findings are compatible with Left Eye Optic Neuritis (nerve paleness, altered visual field and positive red desaturation test). Brain, Cervical and Orbital MRI with and without IV gadolinium were within normal limits. Laboratories without leukocytosis, electrolyte disturbances or altered inflammatory markers; CSF without pleocytosis, protein and glucose levels within normal limits; RPR, Hepatitis panel and HIV were non-reactive; Basic rheumatology test, including ANA and RF were negative. As part of Optic Neuritis Workup, Aquaporin-4 (AQP-4) Antibody ELISA were sent and reported to be negative; MOG Antibody Cell Based Assessment was Positive. Patient was treated with serial IVIG's and Prednisolone tapering as per Brain Works Protocol, which is a web based International Inflammatory Brain Disease Outcome Study. Patient has remained with MOG antibodies titers positive, but no disease recurrence has been reported one year after complete protocol. Conclusions: Patients with NMDA-Positive Encephalitis may develop overlapping or independent episodes of MOG-Positive Demyelinating Diseases, especially Optic Neuritis and Myelitis episodes. Both tests should be considered on Typical and Atypical Autoimmune Encephalitis Cases, as early diagnosis and treatment can improve patient outcome.

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### **Anesthetic Management for H-type Tracheoesophageal Fistula Repair**

*Paola N. Montalvo-Miró, MD1; Adolfo E. Barragán-Cabrera, MD2; Dimaris Dominguez-Ayala, MD2. Department of Pediatrics, UPR-School of Medicine1; Department of Anesthesiology, UPR-School of Medicine2*

Among the different types of tracheoesophageal fistulas, incidence rates have been well established, placing type E (H-type) at 4%. TEF patients will often present with symptoms of pulmonary aspiration or feeding difficulties early in the neonatal period, making surgical intervention imperative. Perioperative management descriptions and reviews of H-type TEF repairs present an arsenal of precautions, methods, and tools to safely and successfully achieve control and secure the patient's airway. A 1-month-old male born TAGA at 39 WGA by C-section presented for repair of H-type TEF. The medical history is remarkable for cerebral cysts and a small muscular VSD and PFO. Upon examination a well-nourished, active, and hemodynamically stable patient is found spontaneously breathing at room air without distress. Preoxygenation without positive pressure and peripheral IV access was used for rapid sequence induction using Propofol and Succinylcholine. After induction, a stent was placed through the TEF for its identification and control while in apnea. Intubation was performed on the first attempt with 3.0mm uncuffed ETT with Miller #1 direct laryngoscopy and placed on mechanical ventilator. After open repair of the TEF was conducted, esophagoscopy and bronchoscopy was performed and found unremarkable for complications or unexpected findings. For paralysis reversal, Neostigmine and Glycopyrrolate were administered after return of spontaneous ventilations; patient was extubated to mild positive airway pressure (<10cmH2O) and neck hyperextension was avoided to protect the surgical site from tugging and tearing. Supplemental oxygen was provided for the postoperative period. Prompt recognition of TEF allows for proper diagnosis and treatment, hence decreasing the risk of potential airway related perioperative complications. Many clinical characteristics of this case yielded beneficial circumstances and permitted an uneventful sequence of events, but it is crucial to review and prepare for the multiple potentially adverse outcomes. Disclosure and acknowledgments: The authors report no conflicts of interest in this work and believe that appreciation and recognition must be shown to the OR staff from the University Pediatric Hospital for their dedication and support in the benefit of the patients.

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**La población que posee acceso a internet en Puerto Rico, 2015-2019: sus características sociodemográficas, un asunto de gran pertinencia ante la pandemia del covid-19**

Lugo García, Stephanie, MSc. & León López, Luz E., Ph.D. Centro de Investigaciones Demográficas, Programa de Demografía, Escuela Graduada de Salud Pública, Recinto de Ciencias Médica, Universidad de Puerto Rico

**Introducción y objetivo:** El acceso al internet se ha convertido una herramienta importante en cada vivienda. Sin embargo, no todas las personas o áreas geográficas lo poseen. Actualmente, este servicio ha facilitado la posibilidad de estudiar, trabajar, y/o recibir consultas de salud. En tiempos del COVID-19 ha ayudado a acceder y manejar asuntos de salud relacionados con este evento. La literatura señala que la brecha digital y la presencia de ciertas características, pudiera potenciar la vulnerabilidad preexistente en ciertas poblaciones. El propósito de esta investigación fue estudiar la desigualdad en el acceso al internet y a la tecnología analizando características sociodemográficas tanto de las personas que poseen y no lo poseen. **Métodos:** La fuente de datos fue la Encuesta de la Comunidad de Puerto Rico, 2015-2019. El estudio fue uno transversal descriptivo. **Hallazgos:** En P.R. 461,285 viviendas no tienen ningún tipo de acceso a servicio de internet, representando un 38.7% de estas. De aquellas que tienen servicio, la mayoría tiene banda ancha y lo accede utilizando su celular (84.2%). Un poco más de la mitad indicó accederlo mediante cable o fibra óptica. Las personas fuera de la fuerza laboral y con ingresos bajos presentaron las proporciones más bajas de acceso a internet. Por otro lado, a medida que aumenta el nivel de educación aumenta la proporción de personas con acceso a internet. En términos de dispositivos tecnológicos, el por ciento mayor correspondió a los celulares (60%) seguidos por la computadora (31.5%). **Conclusión:** La falta del servicio de internet o el equipo para acceder el mismo puede significar el no recibir o retrasar servicios apremiantes para las personas mantener su salud. Ante situaciones de emergencia como huracanes, temblores y la pandemia del COVID-19 la falta de internet o alfabetización

digital se convierte en una herramienta que aumenta la vulnerabilidad de la población.

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**Una mirada al Covid-19 como una sindemia: características sociodemográficas que potencian la enfermedad entre los adultos mayores en Puerto Rico**

Torres Vilanova, Jim, B.S.; Román Díaz, Brittanie, B.S.; y León López, Luz E. Ph.D. Centro de investigaciones Demográficas, Programa Graduado de Demografía, Escuela de Salud Pública, Recinto de Ciencias Médicas, UPR

**Introducción y objetivos:** La población de adultos mayores en Puerto Rico ha mostrado un aumento considerable. Puerto Rico posee una estructura de edad vieja. Esta población ha mostrado una mayor probabilidad de contraer COVID-19 y morir de este. La vulnerabilidad de los adultos mayores ante la enfermedad requiere ser analizada desde el concepto de una sindemia. Este se utiliza cuando dos enfermedades interactúan causando más daño que simplemente la suma de estas. Los adultos mayores tienen morbilidades y la interacción de estas con el ambiente social amplia el daño de la enfermedad. El objetivo del estudio fue analizar las características sociodemográficas de la población de adultos mayores en Puerto Rico que pueden potenciar la vulnerabilidad de estos ante el COVID-19. **Métodos:** La fuente de datos fue la Encuesta de la Comunidad de Puerto Rico, 2015-2019. El estudio fue transversal descriptivo. **Hallazgos:** Para el 2019 el 21% de la población tenía 65 años o más. La expectativa de vida en P.R. es de 81 años. Todos los municipios muestran una estructura de edad vieja, aquellos en la zona oeste presentan mayores proporciones de esta población. Una cuarta parte de los adultos mayores viven solos (25%), y un 26% son viudos. Cuatro de cada 10 viven en condiciones de pobreza, 87% recibe solo de ingresos el seguro social, y 41% son beneficiarios del PAN. El 45% no se graduó de escuela superior. Estos presentan una alta proporción de discapacidad (48%). **Conclusión:** Las características sociodemográficas de la población de adultos mayores en P.R. aumentan su vulnerabilidad ante el COVID-19. El analizar esta situación como una sindemia permite comprender que estamos ante un cuadro complejo que requiere considerar la interacción de esta enfermedad con otras

comorbilidades y las características en el desarrollo de políticas y programas para atender los riesgos de contagios por COVID-19.

•4240•

**The Cholinergic Anti-Inflammatory Response in High Fat Diet induced neuroinflammation.**

Cindy López-Hernández<sup>1</sup>, Sonneliz Cotto-Rios<sup>2</sup> & José Colón-Sáez<sup>3</sup>. <sup>1</sup> Department of Physiology; University of Puerto Rico, Medical Sciences Campus. <sup>2</sup> Department of Chemistry University of Puerto Rico Rio Piedras Campus. <sup>3</sup> Department of Pharmaceutical Sciences University of Puerto Rico Medical Sciences Campus.

Obesity rates have nearly tripled in the past 45 years affecting globally close to 2 billion adults which are either overweight or obese (1), concurrently, the worldwide prevalence of dementia has also tripled in that same span (2). One of the mechanisms that is thought to play a major role in obesity induced cognitive decline is the consumption of a High Fat Diet (HFD). HFD has been shown to activate neuroinflammation, which can result in neuronal injury (3), and can lead to a decline in cognitive performance (5,9–11). Neuroinflammation has been shown to be a common denominator of many neurodegenerative and neuropsychiatric disorders<sup>8</sup>. Diet induced neuroinflammation, is mediated by activation of the

CNS resident immune cells, the microglia (3–7). Recently an important role for the  $\alpha 7$ -nicotinic acetylcholine receptor ( $\alpha 7$ -nAChR) has been found in the control of both systemic (13,14) and CNS inflammation (15–17). This receptor is a key component of the cholinergic anti-inflammatory response which is a neural system that controls both systemic and neuroinflammation. To study the therapeutic potential of the  $\alpha 7$ -nAChR for diet induced neuroinflammation we used the allosteric modulator PNU-120596. Mice were fed either a control or a HFD and their cognitive performance was characterized using the novel location recognition test. Furthermore, the activation of neuroinflammation was also studied using western blot and ELISA. Our data indicate that mice that received PNU-120596 had no significant difference to control groups that received either the control or the HFD alone. However, both western blot and ELISA analysis shows that PNU was able to prevent the inflammatory changes that result from the HFD. So far, we can conclude that PNU is effective at reducing the inflammatory response to an HFD, however we could not observe cognitive effects of this diet under our experimental conditions. Acknowledgements: “Infrastructure support was provided in part by grants from the National Institute on Minority Health and Health Disparities (2U54MD007600).” This work was supported by the National Institute of General Medical Sciences (5P20GM103642).

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