SAN JUAN BAUTISTA SCHOOL OF MEDICINE
1978

10TH INTERDISCIPLINARY RESEARCH SYMPOSIUM

BRIDGING SCIENCE AND SOCIETY: COMMUNITY-DRIVEN RESEARCH FOR A HEALTHIER PUERTO RICO

PLENARY SESSION

AS PART OF THIS ANNIVERSARY CELEBRATION, OUR PLENARY SESSION WILL FEATURE TWO OUTSTANDING SCIENTIFIC LEADERS WHO WILL SHARE THEIR EXPERTISE AND DISCUSS HOW RESEARCH CAN BE TRANSFORMED INTO MEANINGFUL COMMUNITY IMPACT.

FILIPA GODOY-VITORINO, PHD

UNIVERSITY OF PUERTO RICO

"The Microbiome Shift: Transforming the Future of Microbiology"

LINDA LARAS, MD, MPH, MSC

SAN JUAN BAUTISTA SCHOOL OF MEDICINE

"Bridging Community-Based Research into Practice to Address Sexual Violence"

APRIL 16, 2026 | 12:00 P.M- 5:00 P.M

SAN JUAN BAUTISTA SCHOOL OF MEDICINE

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SAN JUAN BAUTISTA SCHOOL OF MEDICINE 1978

10th Interdisciplinary Research Symposium

Thursday, April 16, 2026

Program Schedule

12:00 pm Registration, Networking, and Appetizers - *Students' Center*

1:00 pm Welcome and Plenary Session - *Amphitheaters 3 and 4*

Bridging Science and Society: Community-Driven Research for a Healthier Puerto Rico

The Microbiome Shift: Transforming the Future of Microbiology.

Filipa Godoy-Vitorino, PhD

Full Professor, Microbiology Dept., UPR-Medical Sciences Campus

Bridging Community-Based Research into Practice to Address Sexual Violence.

Linda Laras, MD, MPH, MSc

Director, Puerto Rico Health Justice Center
Assistant Professor, San Juan Bautista School of Medicine

Q & A with Speakers

2:30 pm *Break: Students' Center*

3:00 pm Posters Session: *Library and Student Affairs Halls*

4:30 pm Closing and Awards: *Amphitheaters 3 and 4*

Introduction to the Plenary Speakers

The 10th Interdisciplinary Research Symposium proudly features two distinguished speakers whose work exemplifies the power of science to transform communities and advance health equity. Their careers span groundbreaking research, education, and advocacy, reflecting a deep commitment to bridging scientific discovery with real-world impact.

The following biographies highlight their remarkable contributions, leadership, and dedication to addressing critical health challenges through innovative and community-engaged approaches.

Dr. Filipa Godoy-Vitorino is a Professor of Microbiology and Chair of the Department of Microbiology and Immunology at the University of Puerto Rico School of Medicine. With BS and PhD training in Microbial Ecology in Portugal and Puerto Rico, and postdoctoral training in metagenomics at the Joint Genome Institute in California, she developed a strong interest in microbial community dynamics across animal, human, and environmental ecosystems, contributing significantly to the field. Her research focuses on microbial biodiversity, evolution, and dysbiosis in human and animal microbiomes, particularly in Caribbean populations. Her work has identified microbial and metabolic biomarkers associated with HPV persistence and cervical cancer risk. Over the past fourteen years in Puerto Rico, her mentorship has strengthened microbiome research by training faculty across Latin America and supporting trainees at multiple levels. She leads the NIH-funded Puerto Rico Center for Microbiome Sciences and is internationally recognized for leadership and impact worldwide.

Dr. Linda Laras is a distinguished physician and forensic gynecologist in Puerto Rico, widely recognized for her lifelong commitment to supporting victims of sexual violence and advancing their rights. With over three decades of advocacy, she has been a leading voice in framing violence as a critical public health issue. Dr. Laras served as the first medical Director of the Puerto Rico Rape Crisis Center, where she developed key national protocols for the management of domestic violence and sexual assault cases.

She is the founder of the Puerto Rico Health Justice Center, an innovative, trauma-informed, multidisciplinary initiative that provides comprehensive services to survivors—from medical care to legal support—serving hundreds of victims annually. Her work has been instrumental in shaping public policy, improving forensic evaluation methods, and strengthening victim-centered care across healthcare and legal systems.

Dr. Laras is also an active educator and advocate, contributing to professional training, public awareness, and legislative efforts in Puerto Rico. Her outstanding contributions have earned her numerous recognitions, including the Ford Humanitarian of the Year Award and the FBI Civic Leadership Award.

Message from the Chair of the Organizing Committee

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 10th Interdisciplinary Research Symposium. This year's theme, "Bridging Science and Society: Community-Driven Research for a Healthier Puerto Rico," reflects our shared commitment to advancing research that is not only scientifically rigorous, but also deeply rooted in the needs of our communities.

This symposium represents the collective efforts of our students, faculty, and collaborators who continue to push the boundaries of knowledge across disciplines. It is inspiring to witness the growth of our research community and the meaningful impact it is having both locally and beyond.

I would like to extend my sincere gratitude to our plenary speakers for their invaluable contributions and inspiration. I am also deeply grateful to the members of the Organizing Committee for their dedication, teamwork, and commitment in making this event possible. Their efforts have been instrumental in bringing this symposium to life.

Finally, I would like to thank all participants, mentors, and collaborators whose passion for research and education continues to strengthen our mission.

We hope this gathering fosters collaboration, inspires new ideas, and reinforces our collective commitment to improving health outcomes through science, innovation, and community engagement.

Yaritza Inostroza-Nieves, PhD
Chair, Organizing Committee

The Organizing Committee members:
Dr. Yaritza Inostroza, Chair; Dr. Linda Perez-Laras and Dr. Shirley Valentin Co-Chairs; Dr. Estela S. Estape, Research Center Director, and students representatives Mr. Rolando Irizarry (Medicine), Ms. Ada Pool (Public Health), Ms. Fabiola Rodriguez (Nursing), Ms. Daraishka Perez (DNP); and Invited members: Mrs. Maggie Gonzalez, Student Affairs; Ms. Grecia Carrasquillo (President, SJBSM Student Council) and Mr. Yandy Garcia (President, Latin Medical Student Association).

Basic Sciences

1. Energy Constraints on CAR T-Cell Targeting Across a Gel Deposition Barrier Matrix

Manuel J. La Torre-Poueymirou[1], Andre Kelly[2], Roddy S. O'Connor[2] [1]Universidad Central Del Caribe, School of Medicine, Bayamon, Puerto Rico. [2] University of Pennsylvania, Perelman School of Medicine, Center for Cellular Immunotherapies, Philadelphia, Pennsylvania

Introduction: CAR-T efficacy in solid tumors is constrained by the coupled, energy-intensive demands of invasion through extracellular matrix and target-cell cytolysis—a relationship that, to our knowledge, has not been quantified in a single integrated assay. We developed a platform to uncouple migration from killing and test the "speed-trap" concept: faster chemokine-driven migration may not translate into faster killing under solid-tumor–like constraints.

Materials and Methods: Approved by IRB. We established a biosynthetic invasion barrier matrix (BsIBM) by casting organoid Matrigel ± CCL19 (10 nM) over adherent SY5Y-CD19 target cells on eSIGHT real-time cell analysis (RTCA) plates. CD19 CAR T cells (4-1BBζ; mCherry+) were seeded above the barrier. Invasion (first-responder arrival) was quantified by fluorescence microscopy, while cytolysis was quantified in real time by impedance, enabling independent measurement of both steps. This gel-casting paradigm also models a surgically relevant strategy: localized deposition of chemokine- or drug-loaded gels onto solid tumors to modulate the microenvironment at the site of disease.

Results: CCL19 accelerated first-responder arrival through BsIBM, but did not increase killing kinetics, with cytotoxicity indices remaining similar between control and CCL19 conditions. The data supports an energetic "speed-trap," where increased migration demand does not yield proportional gains in cytolysis.

Conclusion: BsIBM provides a first-in-kind framework to decouple and quantify CAR-T invasion vs killing across a defined barrier. Our findings suggest that boosting trafficking alone may be insufficient, motivating strategies such as cooperative/additive killing and localized gel-depot deposition of modulators as a potential new, surgically compatible route to improve solid-tumor responses.

2. Production of Biodegradable Plastic from Plantain Peels (Musa paradisiaca) and Characterization of Biodegrading Microorganisms

Camila Colón, Genesis Gomez, Yimelis Aristud, **Jaimarie Nazario**, Lee Ann Nieves, Yadielis González. CoRA, Escuela de Salud y Ciencias, Universidad del Sagrado Corazón

Puerto Rico faces a severe solid waste management crisis, with a large portion of its waste composed of organic material. This study evaluates the production of biodegradable plastic from plantain peels (Musa paradisiaca) and the identification of microorganisms involved in its degradation as a sustainable alternative to conventional plastics. Bioplastic was synthesized using processed plantain peels combined with starch, glycerol, and an aqueous organic acid solution. The mixture was heated under constant stirring, poured into molds, and air dried at room temperature. Biodegradability was evaluated by incubating dried samples in a yeast suspension at 30 °C. Changes in sample weight and size were documented during the biodegradation process. Control samples without yeast exposure were used for comparison. Microbial growth was evaluated by culturing samples on nutrient agar and tryptic soy agar, followed by microscopic observation and Gram staining. The bioplastic obtained exhibited a homogeneous texture, flexibility, and resistance, with a thick paper like appearance. Differences in decomposition behavior were observed between samples exposed to microorganisms and control samples. Microbiological analysis identified Gram-positive Bacillus spp. And Gram-negative cocobacilli associated with the degrading material.These results demonstrate that plantain peels can be successfully repurposed into biodegradable plastic and that naturally occurring microorganisms contribute to its degradation. This approach supports the use of agricultural waste to reduce plastic accumulation and promote sustainable waste management strategies in Puerto Rico.

3. Neuroproteomic Analysis of Brown Macroalgae Extracts in Drosophila melanogaster

Alondra S. González López[1], Xandra M. Pena Díaz[1,2], Jorlyann M. Campos Ortiz[1,2], Yadira M. Cantres-Rosario[2] , Ana E. Rodríguez de Jesús[2], Loyda M. Meléndez[2,3] and Ricardo Chiesa[1]. [1]Department of Biology, University of Puerto Rico-Cayey. [2]Translational Proteomics Center, Research Capacity Core, Center for Collaborative Research in Health Disparities, University of Puerto Rico-Medical Sciences Campus. [3]Department of Microbiology, UPR-MSC.

Anxiety disorders are among the most common mental health conditions globally, and the side effects and limitations of current anxiolytic medications emphasize the need for safer therapeutic options. Tropical marine macroalgae contain a variety of bioactive metabolites with promising neuroactive properties. This research combines behavioral testing and

quantitative proteomic analysis to investigate the potential anxiolytic effects of brown macroalgae from Puerto Rico using Drosophila melanogaster as an experimental model. Adult flies were exposed to crude algae extracts under both acute and chronic conditions and evaluated through the Open-Field Test, while Rapid Iterative Negative Geotropism (RING) assays were used to confirm normal locomotor performance. For the proteomic analysis, flies were used in a workflow that included acute exposure to the extract, decapitation of flies, protein extraction, quantification, and LC- MS/MS analysis. The analysis identified more than fifty proteins with altered abundance between control and treated groups, many of which were linked to sensory processing, synaptic function, and intracellular signaling pathways involved in stress regulation. Among the algae studied, Stypopodium zonale produced the most notable anxiolytic-like behavioral response without affecting locomotion activity. Additionally, a summer phase focused on refining technical aspects of the study, including achieving more consistent protein yields, improving extraction procedures, and stabilizing sample preparation. The optimization of these protocols enhanced the reliability of the proteomic analysis and support this first neuroproteomic investigation of the behavioral effects of local macroalgae extracts, offering insight into molecular pathways that might contribute to reduced anxiety-like behavior and their potential as safer anxiolytic alternatives.

4. Angiotensin II–AT1R signaling promotes pro-inflammatory and oxidative responses in microglia

Andrea Bahamundi[1], Blake Bailey[1], Khristoffer Bury[1], Ricardo Vazquez[1], Yalimar Rivera[2], Diana Rivera[1], and Yaritza Inostroza-Nieves[1]. [1]Department of Biochemistry and Pharmacology, San Juan Bautista School of Medicine, Caguas, PR, United States. [2] University of Puerto Rico, Humacao Campus, Humacao, PR, United States

The Renin-Angiotensin-Aldosterone System (RAAS) plays a key immunomodulatory role within the central nervous system (CNS), mainly through its effector, Angiotensin II (Ang II). This study investigates the impact of Ang II on microglial activation and its relevance to neuroinflammatory conditions. Analysis of brain tissue from experimental autoimmune encephalomyelitis (EAE) mice revealed elevated expression of Ang II and its receptor AT1R, indicating a strong association with central neuroinflammation. In vitro experiments using human microglial cells (HMC3) demonstrated that Ang II stimulation increases IL-6 secretion, reactive oxygen species (ROS) production, and inducible nitric oxide synthase (iNOS) expression. Losartan, a selective AT1R antagonist, significantly suppressed these pro-inflammatory responses. The data support a model in which Ang II–AT1R signaling drives microglial-mediated inflammation, highlighting AT1R as a promising therapeutic target in neurodegenerative disorders characterized by immune dysregulation.

5. The Phytochemical Diosgenin Modulates the Expression of Chemoresistance- and Metastasis-Associated Genes in EGFR-Mutant Non-Small Cell Lung Carcinoma Cells

Astrid K. González-Castro[1], Laurie Santos[2], Yamixa Delgado[1]. [1]Biochemistry & Pharmacology Department, San Juan Bautista School of Medicine, Caguas, PR [2]Biomedical Sciences Graduate Program, Universidad Central del Caribe, Bayamón, PR

Lung cancer is the leading cause of cancer-related mortality worldwide. Non-small cell lung carcinoma (NSCLC), the most prevalent subtype, presents significant clinical challenges due to acquired resistance to therapy and metastasis. In a subset of patients, this resistance is driven by activating mutations in the Epidermal Growth Factor Receptor (EGFR), which promotes uncontrolled cell proliferation. Phytochemicals are increasingly investigated as sources for novel anticancer agents. Diosgenin, a plant-derived steroidal saponin, has demonstrated anticancer properties in various tumor models; however, its role in EGFR-mutant NSCLC remains poorly understood. This study aimed to evaluate whether Diosgenin modulates the expression of genes involved in chemoresistance and metastasis in the H1975 NSCLC cell line, which harbors EGFR- driver mutations (T790M/L858R). To assess this, H1975 cells were treated with Diosgenin for 24 hours. Total RNA was subsequently extracted, reverse-transcribed to cDNA, and analyzed by RT- qPCR to quantify the expression of markers for chemoresistance (EGFR, ABCB1, NFKB1, STAT3, FOXM1), metastasis (NDRG1, MMP2, MMP9, RAC, PREX1), and immune signaling (PDL1, CD47, IL6, TNF-α). Preliminary findings indicate that Diosgenin downregulated the expression of several genes known to promote chemoresistance (FOXM1, NFKB1, ABCB1), metastasis (MMP2, MMP9), and pro-inflammatory signaling (IL6, TNF-α). Conversely, Diosgenin upregulated the expression of NDRG1, a known metastasis suppressor gene. No significant changes in expression were observed for other key markers, including EGFR, CD47, PDL1 and STAT3. These results suggest that Diosgenin has the potential to modulate key pathways contributing to therapeutic resistance and cancer progression in EGFR-mutant NSCLC.

6. The Role of Estrogen Fluctuations in Migraine Pathophysiology

Anusha Reddy. San Juan Bautista School of Medicine

Background: Migraine is a debilitating neurological condition affecting people of all ages all over the world. Migraine is three times more likely to affect women during their reproductive years than men. This increased prevalence may be linked to the changing hormone levels in women. Factors such as the menstrual cycle and pregnancy, which impact estrogen levels, can lead to increased or decreased susceptibility to migraine.

Methods: A literature review comprised of peer-reviewed articles was conducted to investigate a possible connection between hormone levels and migraine prevalence in women. Changes in estrogen levels affecting cortical excitability and the trigeminovascular system were examined.

Results: Decreased estrogen leads to cortical hyperexcitability, which increases cortical spreading depression (CSD). Decreased estrogen also activates the trigeminovascular system, leading to increased release of calcitonin gene-related peptide (CGRP), meningeal vasodilation, and neurogenic inflammation. These factors can lead to the onset of migraine. Decreased estrogen can be seen during the late luteal phase of the menstrual cycle, which makes women more prone to migraine during this phase of their cycle. Pregnancy often protects against migraine due to its increased estrogen state. However, during the postpartum period, estrogen levels fall and migraine risk rises.

Discussion: Fluctuations in estrogen levels, specifically rapid decreases in estrogen, have been shown to increase migraine susceptibility in women. Therefore, the hormone estrogen can be seen to have an impact on migraine prevalence in women.

Conclusion: Further investigation into how estrogen plays a role in migraine pathogenesis can guide pharmacotherapy focused on hormonal stabilization and CGRP inhibition to decrease migraine susceptibility.

7. Discovery and Development of Anxiolytic Agents from Tropical Marine Algae using Drosophila melanogaster as a Behavioral Model

Mardelys González Ruiz[1], **Ana M. Torres Cardona[1]**, Gabriela I. Hernández Alicea [2], Fabián A. Santiago Rodriguez [1], Paola N. Guzmán Torres [1] Ana M. Torres Cardona[1], Layza M. Alicea López[1], Adriann Torres Pedraza[3] and Ricardo Chiesa[1]. 1 Department of Biology, University of Puerto Rico-Cayey. 2 General Sciences Program, University of Puerto Rico-Cayey. 3 Department of Social Sciences, University of Puerto Rico-Cayey

Reports from the World Health Organization indicate that one third of the population suffers from anxiety disorders. Benzodiazepines and antidepressants are commonly prescribed, but safer treatments are needed due to their long-term use risks. Marine natural products (NP) have emerged as a potential bioactive source with neuroprotective properties. Our research focuses on the anxiolytic effects of NP derived from tropical marine algae, using the fruit fly, Drosophila melanogaster as a model. We aim to chemically characterize algae extracts, conduct behavioral tests, and propose a mechanism of action underlying the observed anxiolytic effects. Flies were exposed to algae extracts using both chronic and acute treatments. Following exposure, anxiety- like behavior was assessed using Open-Field (OFT) and Dark-Light Box (DLB) tests. A Wall- Following Decrease Index (WFDI) was calculated based on the distance the flies travel away from the walls toward the center of the arena. RING assays were performed as a counter-assay to rule out algae extract toxicity. DLB test measured latency time for D. melanogaster by movement from an illuminated compartment to a dark one. Flies spent more time in the illuminated zone suggesting less anxiety-like behavior. Also, S. zonale extract showed significant anxiolytic effects when compared to diazepam as a positive control. Dictyota cervicornis and Padina boergesenii also presented anxiolytic effects, although no anxiolytic effects were observed for Lobophora variegatta, Ulva, Symploca, and Sargassum sp. species. Our research represents an unprecedented approach to anxiolytic drug discovery, improving our understanding of Puerto Rico's marine NP's chemo-diversity.

8. Restoring STING Expression in STING-Silent Head and Neck Cancer Cell Lines Using Epigenetic Drugs to Enhance STING-Induced Sensitivity to Therapies

Valeria A. Román[1,2], Hannah Aldrich[2], Kishore Banik[2], Thomas Hayman2 [1]San Juan Bautista School of Medicine [2]Yale School of Medicine, Department of Therapeutic Radiology

Background:Head and neck squamous cell carcinoma (HNSCC) is commonly treated with radiation and platinum-based chemotherapy, yet therapeutic resistance remains a major cause of treatment failure. The tumor-intrinsic STING (Stimulator of Interferon Genes) pathway promotes tumor cell death through type I interferon signaling and reactive oxygen species production following DNA damage; however, many tumors epigenetically silence STING expression, resulting in reduced sensitivity to genotoxic therapy and worse clinical outcomes.

Materials and Methods: Human (FaDu) and murine (MOC1, MOC2) HNSCC cell lines with low baseline STING levels were treated with a DNA methyltransferase inhibitor (5-azacytidine), a histone demethylase KDM1A inhibitor (SP2509), or combination therapy. STING protein expression was assessed by western blot after treatment.

Results: Epigenetic therapy partially restored STING expression across all models, with cell-line specific responses. In FaDu cells, combination treatment produced the greatest STING re-expression. In MOC1 cells, KDM1A inhibition yielded the strongest increase, whereas in MOC2 cells DNMT1 inhibition was most effective.

Conclusion: These findings indicate heterogeneous epigenetic regulation of STING across HNSCC models and show that STING silencing is reversible through pharmacologic epigenetic modulation. Restoration of tumor-intrinsic STING expression represents a potential therapeutic approach to enhance response to DNA-damaging therapies. Future studies will assess interferon pathway activation and evaluate whether STING restoration increases tumor radiosensitivity in immunocompetent in vivo models.

9. Characterization of Cellular Viability Responses in A172 Glioma Cells Following PSP Exposure

Yariselis Cardona-Maldonado1; Angeline Cabeza-Méndez1; Edwin Vazquez-Gracia1; Ashlin Álvarez-Flores2; Geraldine Cintrón-Velez3; Glamaris Rosario-Sanfiorenzo1; Giovanni Alicea- Perez1; Naiara Hernández-Santisteban4; Amanda Rivera-Payán4; Jeshua Colón-Fernández4; Carolina Nieves-Moreno2; Samuel Caldero-Reyes1; Natalia Sánchez-Otero4; Fabiola Colón- Santiago5; Perla Rivera-Soto6; Fabiola Guevarez-Russe1; Julieness Correa-Haifa1; Carolina Felix-Rosario1; Gabriela Arvelo-Colón2; Carla Toledo-Tejada2; Alanis Pagan-Santisteban4; Eduardo Álvarez-Rivera, PhD5. 1Department of Biology, Universidad de Puerto Rico, Bayamón; 2Department of Biology, Universidad de Puerto Rico, Arecibo; 3Universidad de Puerto Rico, Río Piedras. 4Department of Science and Technology, Universidad Interamericana de Puerto Rico, San Juan; 5Universidad Central del Caribe, School of Medicine, Bayamón, Puerto Rico; 6Universidad Central de Bayamón.
Abstract:

Background: Bioactive metabolites produced by fungal components have emerged as significant modulators. Among these, polysaccharide peptide (PSP) isolated from Coriolus versicolor has demonstrated biological activity across multiple experimental systems. Despite growing interest in fungal-derived bioactives, the direct impact of prolonged PSP exposure on glioma cell viability and metabolic activity remains insufficiently characterized. The present study investigates how sustained PSP treatment causes significant cytotoxicity in a human glioma model. Methods: A172 human glioma cells were maintained under standard culture conditions and treated with increasing concentrations of PSP (500-4000 µg/mL) for 6 and 9 days. Cellular metabolic activity was measured using the MTT assay as an indicator of viability and proliferative capacity. Dose- response and exposure-duration effects were analyzed to characterize PSP-associated cellular changes. Results: Treatment with PSP produced progressive reductions in cellular metabolic activity that were dependent on both concentration and duration of exposure. At higher concentrations (3500-4000 µg/mL), metabolic activity decreased to approximately 48% at day 6 and further to 30% by day 9 compared with untreated controls. Lower concentrations resulted in partial but measurable effects. These findings demonstrate a clear exposure-responsive pattern in A172 cellular viability following PSP treatment. Conclusion: Sustained exposure to a fungal- derived polysaccharide peptide alters metabolic and viability profiles in A172 glioma cells in a dose- and time-dependent manner. These observations expand current understanding of how microbiome-associated fungal metabolites influence tumor cell physiology in vitro and support continued mechanistic investigation of host cellular responses to natural bioactive compounds.

10. Characterizing Neuronal Subtypes in Human Pulvinar and Claustrum Using Intracranial Single-Unit Recordings Across Multiple Sleep Sessions

Jonathan C. Barreto-Nieves[1,2], Rodrigo Dalvit[2], Eyiyemisi Damisah[2]. 1San Juan Bautista School of Medicine, Caguas, PR. 2Department of Neurosurgery, Yale School of Medicine, New Haven, CT

Background: The claustrum (CLA) and pulvinar (PUL) are subcortical structures implicated in cortical coordination whose roles during sleep remain unclear. NREM sleep is characterized by slow waves and spindles that orchestrate neural synchrony. Our group previously demonstrated that human CLA neurons track slow-wave activity during NREM sleep, yet CLA spindle dynamics and PUL single-unit activity during sleep remain uncharacterized. We present the first simultaneous CLA and PUL single-unit recordings in a human patient during NREM sleep.

Methods: A patient with drug-resistant epilepsy undergoing presurgical intracranial monitoring was implanted with 40 µm microwires targeting PUL and CLA. Signals were sampled at 30 kHz across three consecutive sleep sessions. Electrode localization was confirmed using LeGUI and Lead- DBS. Spike detection, artifact rejection, and clustering were performed with Combinato with manual curation. Units were classified as narrow interneurons or putative pyramidal cells using CellExplorer criteria based on firing rate, burst index, and trough-to-peak latency.

Results: Across three sleep sessions, 54 units were isolated (26 from CLA and 28 from PUL). The CLA showed a pyramidal-to-interneuron ratio of 5.5:1, while PUL exhibited a lower ratio of 1.8:1, reflecting greater inhibitory tone consistent with thalamocortical gain modulation. Unit clustering in t-SNE was driven by neuronal subtype rather than anatomical origin.

Conclusion: These findings reveal distinct cellular compositions between CLA and PUL, with PUL enriched in interneurons consistent with thalamocortical gain modulation. Cell-type rather than anatomical origin drove unit clustering, implying

shared functional cell-class organization and establishing a cellular foundation for investigating spindle coordination during human NREM sleep.

11. Short Term High Glucose-Induced Activation of Microglia: Insights into Neuroinflammation in Diabetes

Sebastián Hernández[1], **Ricardo Laboy**[1], Jorge García[1], Andrea Bahamundi [1] Institutions: [1]San Juan Bautista School of Medicine, Department of Biomedical Sciences, Caguas, Puerto Rico; [2]San Juan Bautista School of Medicine, Department of Physiology and Neuroscience, Caguas, Puerto Rico

Introduction: Type 2 diabetes mellitus is a chronic metabolic disorder that disrupts glucose regulation and increases the risk of neurodegenerative diseases, including Alzheimer's disease. Growing evidence indicates that chronic hyperglycemia promotes neuroinflammation by activating microglia, the resident immune cells of the central nervous system. Sustained microglial activation leads to the release of pro-inflammatory cytokines, oxidative stress, and neuronal dysfunction.

Methods: To investigate the effects of elevated glucose on microglial activation, human HMC3 microglial cells were cultured under normal- and high-glucose conditions. Morphological changes were assessed using light microscopy. Expression of inflammatory genes (tumor necrosis factor-alpha and interleukin-6) was quantified via quantitative polymerase chain reaction (qPCR). Cytokine secretion was measured using enzyme-linked immunosorbent assay (ELISA). Oxidative stress was evaluated by Muse flow cytometry using a reactive oxygen species–sensitive fluorescent dye. Activation of the NF-κB signaling pathway was analyzed through protein expression and nuclear translocation studies.

Results: High-glucose exposure induced significant morphological alterations characterized by reduced branching and enlarged somas, consistent with an activated phenotype. Reactive oxygen species levels were elevated, indicating oxidative stress as a key mediator. Both gene expression and secretion of tumor necrosis factor-alpha and interleukin-6 were increased, confirming an inflammatory response. Enhanced NF-κB expression and nuclear translocation established a mechanistic link between hyperglycemia and inflammatory signaling in microglia.

Conclusions: These findings demonstrate that high glucose directly induces microglial activation via oxidative stress and NF-κB–mediated pathways, contributing to diabetes-associated neuroinflammation and highlighting potential therapeutic targets.

12. Regulatory Effects of a Polysaccharide Peptide on Adaptive Immune Signaling in Jurkat T Cells

Cecilia Guzmán-Guzmán1; Glamaris Rosario-Sanfiorenzo1; Giovanni Alicea-Perez1; Naiara Hernández-Santisteban2; Ashlin Álvarez-Flores3; Amanda Rivera-Payán2; Jeshua Colón- Fernández2; Carolina Nieves-Moreno3; Samuel Caldero-Reyes1; Natalia Sánchez-Otero3; Fabiola Colón-Santiago4; Perla Rivera-Soto5; Fabiola Guevarez-Russe1; Julieness Correa-Haifa1; Yariselis Cardona-Maldonado1; Angeline Cabeza-Méndez1; Edwin Vazquez-Gracia1; Geraldine Cintrón-Velez6; Carolina Felix-Rosario1; Gabriela Arvelo-Colón3; Carla Toledo-Tejada3; Alanis Pagan- Santisteban2; Eduardo Álvarez-Rivera, PhD4. 1Department of Biology, Universidad de Puerto Rico, Bayamón; 2Department of Science and Technology, Universidad Interamericana de Puerto Rico, San Juan; 3Department of Biology, Universidad de Puerto Rico, Arecibo; 4Universidad Central del Caribe, School of Medicine, Bayamón, Puerto Rico; 5Universidad Central de Bayamón. 6Universidad de Puerto Rico, Río Piedras.

Background: Bioactive metabolites derived from fungal sources have gained attention for their capacity to influence host immune signaling networks. Among these, polysaccharide peptide (PSP) from Coriolus versicolor has demonstrated modulatory activity in innate immune models. However, the extent to which PSP affects signaling architecture within adaptive immune cells remains incompletely defined. This study examines the impact of PSP exposure on key regulatory pathways associated with T-cell activation and cytoskeletal control. Methods: Jurkat T-helper cells were incubated with increasing concentrations of PSP (50-1,000 µg/mL) for 3 and 6 days. Protein expression of Toll-like receptor 4 (TLR4), protein kinase R (PKR), and cofilin- 1/phosphorylated cofilin was evaluated by immunoblotting. PKR transcript levels were quantified using RT-qPCR. Cellular metabolic activity was assessed using MTT assays to monitor treatment tolerance. Complementary viral particle quantification was performed in THP-1 cells to evaluate downstream functional effects. Results: PSP exposure produced concentration-dependent increases in TLR4, PKR, phosphorylated cofilin, and total cofilin expression. Transcript analysis confirmed elevated PKR mRNA following treatment. Jurkat cells maintained metabolic viability across exposure conditions. In THP-1 cells, PSP treatment resulted in a measurable reduction in viral particle levels. Conclusion: Exposure to PSP alters multiple signaling mediators involved in adaptive immune regulation and cytoskeletal organization. These findings contribute to the broader characterization of host cellular responses to fungal bioactives and support continued in vitro investigation of PSP-mediated signaling modulation.

13. Cofilin-1-Associated Cytoskeletal Responses in Jurkat T Cells Following Erinacine Exposure

Joan Fernández-Rosa1; Glamaris Rosario-Sanfiorenzo2; Giovanni Alicea-Perez2; Naiara Hernández-Santisteban3; Ashlin Álvarez-Flores4; Amanda Rivera-Payán3; Jeshua Colón- Fernández3; Carolina Nieves-Moreno4; Samuel Caldero-Reyes2; Natalia Sánchez-Otero3; Fabiola Colón-Santiago5; Perla Rivera-Soto6; Fabiola Guevarez-Russe2; Julieness Correa-Haifa2; Yariselis Cardona-Maldonado2; Angeline Cabeza-Méndez2; Edwin Vazquez-Gracia2; Geraldine Cintrón-Velez7; Cecilia Guzmán-Guzmán2; Carolina Felix-Rosario2; Gabriela Arvelo-Colón4; Carla Toledo-Tejada4; Alanis Pagan-Santisteban3; Eduardo Álvarez-Rivera, PhD5. 1Universidad Interamericana de Puerto Rico, Bayamón; 2Department of Biology, Universidad de Puerto Rico, Bayamón; 3Department of Science and Technology, Universidad Interamericana de Puerto Rico, San Juan; 4Department of Biology, Universidad de Puerto Rico, Arecibo; 5Department of Microbiology and Immunology, Universidad Central del Caribe, School of Medicine, Bayamón, Puerto Rico; 6Universidad Central de Bayamón; 7Department of Biology, Universidad de Puerto Rico, Río Piedras.

Background: Fungal-derived metabolites have emerged as important regulators of host cellular architecture and signaling. Among these compounds, erinacines isolated from Hericium erinaceus have been associated with neuroactive and immunomodulatory properties. Despite increasing interest in these bioactives, their influence on cytoskeletal regulatory networks within adaptive immune cells remains insufficiently defined. This study evaluates the effects of erinacine exposure on actin-associated signaling pathways in a Jurkat T-cell model. Methods: Jurkat T cells were treated with increasing concentrations of erinacines (50-1000 µg/mL) for up to 6 days. Protein levels of total and phosphorylated cofilin-1 were assessed by immunoblotting, and transcript expression was quantified using RT-qPCR. Dose-dependent effects were analyzed using one-way ANOVA with appropriate post hoc comparisons. Results: Erinacine exposure produced significant concentration-dependent increases in both total and phosphorylated cofilin-1 expression. These changes were more pronounced at extended exposure intervals and were consistent with altered actin regulatory activity. Transcript analysis supported coordinated upregulation of cofilin-1 following treatment. Conclusion: Treatment with fungal-derived erinacines modulates cofilin-1-associated cytoskeletal signaling in Jurkat T cells. These findings expand current understanding of how mushroom-derived bioactives influence fundamental host cellular processes and support continued mechanistic investigation of cytoskeletal regulation in adaptive immune models

14. Gallium Maltolate Disrupts Iron-Dependent Bioenergetics and Induces Concentration-Dependent Cytotoxicity in Glioblastoma

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Glioblastoma (GBM) remains the most lethal primary brain tumor, with a median survival of ~14.6 months despite maximal therapy. Novel mechanistic approaches targeting fundamental tumor vulnerabilities are urgently needed. Gallium compounds act as iron mimetics, disrupting iron-dependent processes essential for tumor survival, including DNA synthesis, mitochondrial respiration, and proliferative signaling. Using two established GBM cell lines, U-87 MG and U-173 MG, we demonstrate that gallium maltolate (GaM) exerts robust concentration- dependent effects on cell viability, growth, and death, with an IC_{50} of approximately 100 µM at 48 hours. Critically, GaM does not merely suppress proliferation; it actively drives cell death at therapeutically relevant concentrations. Furthermore, GaM significantly impairs mitochondrial metabolism and bioenergetics, revealing that iron-dependent mitochondrial function represents a central and exploitable vulnerability in GBM cells. Disruption of this axis likely compromises both energy production and biosynthetic capacity, crippling the tumor cell's ability to sustain rapid proliferation. These findings establish GaM as a mechanistically distinct anti-GBM agent that simultaneously targets iron homeostasis, mitochondrial respiration, and cell survival pathways. Ongoing studies are characterizing gallium-induced changes in oxidative phosphorylation, glycolytic reprogramming, and ribonucleotide reductase (RRM2) activity using Seahorse XFe-Pro bioenergetic profiling and Western blot analyses. Collectively, this work positions GaM as a promising lead compound for GBM therapy and provides a mechanistic foundation for next-generation iron-targeted therapeutic strategies against this devastating malignancy.

15. High Glucose-Induced Activation of Microglia: Insights into Neuroinflammation in Diabetes

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Background: Type 2 diabetes mellitus (T2DM) is associated with an increased risk of neurodegenerative diseases, including Alzheimer's disease. Chronic hyperglycemia can induce systemic inflammation, which may extend to the central nervous system and trigger microglial activation, a hallmark of neuroinflammation. However, the molecular mechanisms linking high glucose to microglial inflammatory responses remain incompletely understood. Objective: To evaluate the effects of high-glucose exposure on microglial activation, oxidative stress, and inflammatory signaling pathways. Methods:

Human microglial (HMC3) cells were cultured under normal or high-glucose conditions for 4 weeks. Morphological changes were assessed microscopically. The expression and secretion of pro-inflammatory cytokines (IL-6) were quantified using qPCR and ELISA, respectively. Reactive oxygen species (ROS) production was measured by flow cytometry, and NF-κB activation was evaluated by expression and nuclear translocation assays. Results: High-glucose exposure induced morphological changes consistent with microglial activation, characterized by reduced branching and enlarged soma. ROS production significantly increased under high-glucose conditions, indicating elevated oxidative stress. Furthermore, IL-6 expression and secretion were markedly upregulated. NF-κB activation and nuclear translocation were also enhanced, confirming the involvement of this pathway in glucose-mediated neuroinflammation. Conclusion: Our findings demonstrate that high-glucose conditions promote microglial activation through oxidative stress and NF-κB- dependent inflammatory signaling. These results provide mechanistic insight into the link between diabetes and neuroinflammation, highlighting NF-κB and ROS pathways as potential therapeutic targets to mitigate diabetes-associated neuropathology.

16. Endometriosis-Derived Factors Disrupt Blood–Brain Barrier Integrity via TGF-β–Dependent Mechanisms: Protective Effects of LY2157299

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Introduction: Endometriosis is a chronic inflammatory disease affecting 10–15% of women of reproductive age and is increasingly associated with neurological and neuropsychiatric symptoms. The mechanisms by which endometriosis-derived factors impact the central nervous system remain poorly understood. The objective of this study was to determine whether endometriotic cells disrupt blood–brain barrier (BBB) integrity and to evaluate the protective effects of TGF-β pathway inhibition.

Methods: Human in vitro models were used to assess BBB integrity. 12Z endometriotic epithelial cells were applied to BBB cultures, and barrier function was evaluated by transendothelial electrical resistance (TEER). Cellular migration was assessed using injury assays. Gene expression of MMP9 and YKL-40 was quantified by RT-qPCR, and YKL-40 protein levels were measured by ELISA. Cells were treated with the selective TGF-β receptor I inhibitor LY2157299 (galunisertib) in the presence or absence of TGF-β.

Results: Exposure to 12Z cells significantly reduced TEER values, indicating compromised BBB integrity. Treatment with LY2157299 increases TEER, demonstrating a protective effect on barrier function. In migration assays, LY2157299 significantly reduced cell migration. TGF-β significantly increased MMP9 and YKL-40 gene expression, while LY2157299 markedly suppressed their expression. Consistently, YKL-40 protein secretion was significantly reduced following LY2157299 treatment.

Conclusion: These results demonstrate that endometriosis-derived factors disrupt BBB integrity and promote a pro-migratory, pro-inflammatory phenotype through TGF-β pathways. Pharmacological inhibition of TGF-β restores BBB function and attenuates inflammatory mediators, identifying a potential therapeutic strategy to protect the brain from peripheral inflammatory insults in endometriosis.

Case Reports

17. Atypical Mpox Presentation With Proctitis in a Puerto Rican Patient: A Case Report

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Mpox, formerly known as Monkeypox, is a viral illness that has spread beyond its previous endemic areas and is now reported in the Caribbean. This report describes a 32-year-old man from Puerto Rico with a history of Herpes simplex virus and human papillomavirus who went to the emergency room with pelvic pain, fever, fatigue, rash, and constipation. Three days later, the rash turned into pustules. A CT scan showed rectal inflammation, and PCR testing confirmed Mpox infection. The patient had recently traveled to Minnesota and reported unprotected sexual contact with an unknown male partner approximately one week before his symptoms began.

Initially, the presentation was attributed to bacterial proctitis, which delayed the correct diagnosis. After supportive care with antivirals and topical treatment, symptoms improved, and he was discharged with home isolation instructions. This case illustrates how Mpox can resemble other sexually transmitted infections and highlights the importance of including it in the differential diagnosis when evaluating patients in Puerto Rico, where it is still uncommon.
Because atypical Mpox may present with limited lesions, minimal systemic symptoms, and early anorectal complaints, it can be mistaken for more common STIs, underscoring the need for clinicians in low-incidence regions to remain vigilant.

18. "Isolated" Sacral Metastasis: An Unusual Presentation of Breast Carcinoma

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Purpose: Breast carcinoma rarely presents with sacral involvement, and distinguishing metastatic disease from other neoplasms is challenging in patients with Neurofibromatosis type 1 (NF1), who are predisposed to multiple, unrelated tumors. This case highlights the diagnostic complexity created by overlapping clinical histories, including a prior gastrointestinal stromal tumor (GIST), and emphasizes the role of integrated pathology and molecular testing in clarifying tumor origin.

Case Description: A 50-year-old woman with NF1 and remote GIST resection presented with progressive sacral and right leg pain. Imaging demonstrated a lobulated sacral mass (S3–S4), an enhancing L3 vertebral lesion, and intradural nodules at L2–L3. Resection of the sacral lesion revealed a high-grade carcinoma with neuroendocrine differentiation. Immunohistochemistry showed strong ER expression with GATA3, TRPS1, mammaglobin, and epithelial markers, supporting metastatic breast carcinoma. Postoperative studies identified a left breast mass with axillary lymphadenopathy and additional metastatic lesions involving the spine and small bowel. Molecular profiling demonstrated NF1 mutation with RAS/MAPK pathway activation and chromosomal instability but no evidence of BRCA1 mutation or 17q loss, helping distinguish this carcinoma from recurrent GIST or a nerve sheath tumor.

Conclusions: This case illustrates the diagnostic challenges of evaluating new tumors in NF1 patients, who are susceptible to diverse malignancies. Combined histopathology, immunophenotyping, and genomic profiling were essential for identifying breast origin and avoiding misclassification as recurrent GIST. Vigilant surveillance and prompt evaluation of new symptoms remain critical in NF1 due to their elevated cancer risk.

19. Atypical Severe Postpartum Hypothyroidism Presentation with Absence of Myxedema Coma

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Postpartum thyroiditis is a common autoimmune condition that typically follows a transient and self-limited course. Progression to severe hypothyroidism requiring intravenous hormone replacement in the absence of myxedema coma is rare and may present a diagnostic challenge in primary care. We report the case of a 31-year-old woman with a remote history of hypothyroidism who developed severe postpartum hypothyroidism approximately four months after delivery. She had discontinued levothyroxine several years earlier and remained asymptomatic until the postpartum period. Following a presumed allergic rhinitis episode, she developed upper respiratory and otologic symptoms, including bloody otorrhea, prompting emergency department evaluation. Over subsequent weeks, she experienced progressive systemic symptoms, including facial edema, constipation, dizziness, and fatigue. Laboratory evaluation revealed profound thyroid dysfunction, with a thyroid-stimulating hormone level of 310 mIU/mL, free thyroxine <0.10 ng/dL, and markedly elevated thyroid peroxidase antibodies of >1,000 IU/mL. Despite the absence of classic features of myxedema coma, the severity of hormones derangement and clinical symptoms suggested progression toward hypothyroid crisis. The patient was hospitalized and treated with intravenous levothyroxine for one week, followed by transition to oral therapy. She demonstrated significant clinical improvement and was discharged with outpatient endocrinology follow-up. This case highlights an unusual presentation of severe postpartum hypothyroidism requiring parenteral therapy in the absence of myxedema coma. It underlines the importance of early recognition of thyroid dysfunction in postpartum patients presenting with nonspecific multisystem symptoms and emphasizes the critical role of primary care physicians in preventing progression to life-threatening endocrine emergencies.

20. Splenic Rupture as a Rare Postoperative Complication of Appendectomy: A Case Report

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Introduction: Postoperative complications in older adults may evolve insidiously and present with nonspecific findings, increasing the risk of delayed diagnosis and systemic deterioration. Rare entities such as atraumatic splenic rupture can initiate inflammatory cascades with widespread physiologic consequences. Early recognition is essential to prevent life-threatening progression in vulnerable populations.

Case Presentation: A 72-year-old woman underwent laparoscopic appendectomy for gangrenous appendicitis with minimal blood loss and no splenic manipulation. One week later, she presented with acute left upper quadrant pain, hypotension, tachycardia, and progressive anemia. Laboratory studies demonstrated leukocytosis and significant hemoglobin decline. Contrast-enhanced imaging revealed hemoperitoneum consistent with splenic rupture.

Emergent exploratory laparotomy evacuated approximately one liter of intraperitoneal blood and confirmed inferior pole capsular rupture; splenectomy was performed with transfusion support and stabilization. In the postoperative period, the patient developed persistent systemic inflammatory response characterized by leukocytosis, elevated procalcitonin, stress hyperglycemia, and metabolic instability. Repeat imaging demonstrated a subdiaphragmatic abscess and reactive pleural effusion. She subsequently developed atrial fibrillation with rapid ventricular response, likely precipitated by inflammatory activation, acute anemia, and adrenergic stress. Multidisciplinary management resulted in clinical recovery.

Discussion: Hemoperitoneum likely triggered a systemic inflammatory cascade leading to secondary intra-abdominal infection and cardiopulmonary manifestations. In older adults, physiologic reserve is reduced, amplifying the impact of inflammatory and metabolic stressors.

Conclusion: Delayed atraumatic splenic rupture may present with multisystem complications requiring rapid diagnosis and coordinated care. Heightened clinical vigilance in older adults is critical to reduce morbidity and improve outcomes.

21. An Impending Case of Lemierre Syndrome: Managing Infection, Injury, and Addiction

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Lemierre syndrome is an infectious thrombophlebitis of the internal jugular vein resulting from oropharyngeal infections, characterized by inflammation of the carotid sheath vessels and bacteremia. Impending Lemierre syndrome refers to the early stage of disease progression concerning neck symptoms before metastatic complications or thrombosis have developed. This case highlights a patient showing atypical otogenic inflammation rather than classic pharyngitis and the importance of recognizing early-disease recognition. A 35-year-old male with opioid use disorder, a two-year history of left tympanic membrane rupture, and a two- week history of otorrhea and otalgia presented to the emergency department with three weeks of left ear pain associated with nausea, vomiting, and headache. Physical examination findings included tremors, rhinorrhea, otorrhea, and left tympanic membrane rupture. Head CT revealed extensive left otomastoid disease with bony erosion with a filling defect involving the internal jugular vein and ipsilateral transverse sinus, suspicious for septic thrombophlebitis. Laboratory studies were consistent with severe bacterial infection. Point-of-care ultrasound confirmed internal jugular thrombus, supporting suspected impending Lemierre syndrome. Management involved treating the tympanic membrane rupture and otitis media along with early opioid withdrawal symptoms. Sepsis workup, intravenous fluid resuscitation, and administration of broad-spectrum intravenous antibiotics were initiated. The patient was transferred to a tertiary care center for advanced ENT management. This case emphasizes the importance of recognizing atypical, early-stage disease to prevent the eventual development of Lemierre syndrome. Early imaging supplemented by bedside ultrasound can support early recognition, guide prompt antibiotic therapy, and facilitate urgent ENT management before septic embolic complications arise.

22. Addison's Disease in a Patient with Stroke and Diabetes—A Fatal Lesson in Diagnostic Delay

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Background: Addison's disease is a rare endocrine disorder caused by adrenal cortex failure, most commonly from autoimmune destruction. It presents with nonspecific symptoms such as fatigue, weight loss, hypotension, and hyperpigmentation, often delaying diagnosis. Acute adrenal crisis is life-threatening and requires urgent treatment.

Diagnosis is confirmed with ACTH stimulation testing and hormonal assays. Lifelong hormone replacement and follow-up are essential. When coexisting with diabetes mellitus and stroke, clinical complexity increases due to compounded cardiovascular and metabolic risks, requiring vigilant, individualized care.

Case Presentation: We present a 51-year-old female with hypertension, multiple strokes, seizures, type 2 diabetes, and Addison's disease who presented with 10 days of weakness and dysphagia. Labs revealed dehydration and electrolyte abnormalities. She developed hypotension, hyperglycemia, and altered mental status, raising concern for acute adrenal crisis. MRI showed basal ganglia atrophy; EEG revealed seizure activity. Despite treatment with IV hydrocortisone, insulin, fluids, and antibiotics, she required intubation and vasopressors, suffered three cardiopulmonary arrests, and achieved return of spontaneous circulation.

Discussion: This case highlights the importance of early recognition, aggressive management, and cardiovascular risk reduction in complex endocrine-neurological patients. The patient presented with hypoglycemia, hypotension, and metabolic acidosis consistent with acute adrenal crisis, a life-threatening emergency. Cortisol deficiency impairs cardiovascular and metabolic stability, while prior strokes may reduce cardiopulmonary reserve. Infection, dehydration, and poor intake can precipitate rapid decompensation. Despite appropriate treatment, patients with Addison's disease and multiple comorbidities remain at elevated risk of cardiovascular morbidity and mortality.

23. Pontine Stroke With Neurobehavioral Changes Unmasking an Autoimmune Overlap Syndrome

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Ischemic stroke can rarely be the first clue to autoimmune connective tissue disease in young adults, particularly when traditional vascular risk factors are limited. A 32-year-old man with rheumatoid arthritis off therapy presented with acute dizziness, diplopia, nausea/vomiting, and severe gait ataxia with inability to walk. Family noted brief bizarre behavior. Brain MRI demonstrated an acute left-predominant pontine infarct, and CT showed a small right frontal ischemic focus near the caudate. CT angiography of the head/neck showed no large-vessel occlusion or carotid stenosis. Transthoracic echocardiography with bubble study revealed no shunt, and bilateral leg Dopplers were negative for DVT. Autoimmune testing showed ANA positivity with low complements (C3 72 mg/dL, C4 3 mg/dL), elevated anti–double-stranded DNA (156 IU/mL), and strongly positive Sm/RNP antibodies (>8.0). Anti-CCP was elevated (31), and p-ANCA was positive (1:80) with negative MPO/PR3, leading rheumatology to suspect a rare overlap connective tissue disease phenotype on the SLE spectrum. He received aspirin for secondary stroke prevention, GI prophylaxis, multidisciplinary rehabilitation, psychiatry consultation, and pulse-dose IV methylprednisolone (1 g daily for 5 days) followed by an oral prednisone taper. Neurologic deficits improved, but residual left arm weakness persisted at discharge, and he elected outpatient neurorehabilitation with close neurology and rheumatology follow-up. This case highlights autoimmune overlap syndromes as potential causes of posterior circulation stroke and underscores the value of coordinated neurology, radiology, rheumatology, psychiatry, and rehabilitation care to expedite diagnosis and initiate immunosuppression when indicated.

24. A Diagnostic Journey to GRIN-1: When Genetic Testing Unlocks a Multisystem Pediatric Case

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Background: The GRIN1 gene is responsible for producing the GluN1 subunit of NMDA receptor which is particularly important in the central nervous system for its involvement in synaptic plasticity and functions as a learning and memory hub. Mutations in this gene are described as GRIN1-related neurodevelopmental disorder and the most commonly reported clinical features include developmental delay, intellectual disability, muscle hypotonia, epilepsy, hyperkinetic movement disorders, and sometimes MRI findings such as polymicrogyria. Early non-neurologic presentations are mentioned but remain under-recognized. Objective: To describe an unusual case of GRIN1-related neurodevelopmental disorder initially presenting with severe gastrointestinal and sleep disturbances, highlighting diagnostic challenges and disease progression that led to the diagnosis. Methods: This study is a retrospective case report using medical records of a single patient from 1 month through age 12. Specific attention was given to the onset of gastrointestinal and neurologic symptoms. Case description: A 1 month old, female patient presenting with feeding intolerance, gastrointestinal reflux and metabolic disturbances was initially evaluated for multiple disorders such as Hirschsprung disease and Rett syndrome. Despite nutritional support, the patient developed persistent sleep disturbances, constipation and global developmental delay during early childhood. By age 3, manifestations of hypotonia, motor delay and later-onset seizures were present. Genetic testing at age 6 revealed pathogenic GRIN-1 variant. Conclusion: This case expands the phenotypic spectrum of GRIN1-related disorders by underscoring gastrointestinal dysmotility and sleep disturbance as early, pre-neurologic manifestations. Recognition of atypical presentations may highlight the need for early genetic testing and may facilitate diagnosis. Acknowledgements: Approved by IRB (EMSJBIRB- 18-2025, August 19,2025). No external funding or conflicts of interest. Poster presentation preferred.

25. Congenital Hypothyroidism in an 8-Month-Old Male: A Case Report

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Introduction: Congenital hypothyroidism (CH) affects approximately 1 in 2,000–4,000 newborns in the United States and often presents with nonspecific findings, increasing the risk of delayed diagnosis.
Although newborn screening is mandatory in all 50 states and territories, up to 5% of cases may be missed. Without prompt treatment, CH can result in profound neurodevelopmental impairment. Early detection and rapid initiation of thyroid hormone replacement are essential to support normal growth and neurologic development.

Case Presentation: An 8-month-old male was referred by his gastroenterologist after abnormal thyroid function testing were identified. He was born at 35 weeks' gestation and required neonatal intensive care for hyperbilirubinemia and hypoglycemia. Newborn screening was reportedly negative. His history included global developmental delay, constipation, reflux, failure to thrive and progressive macrocephaly. Due to persistent developmental concerns, evaluation for trisomies was pursued. As part of this workup, thyroid function testing revealed an elevated thyroid- stimulating hormone level of 288 µIU/mL and a free thyroxine level of 0.09 ng/dL. Physical examination demonstrated mecocephaly, macroglossia, widened anterior fontanelle, hypotonia, and delayed developmental milestones consistent with congenital hypothyroidism.

Therapeutic Intervention: He was started on intravenous levothyroxine, which was transitioned to oral therapy. Nutritional rehabilitation included combined oral and nasogastric tube feeds with caloric fortification (30 kcal/oz), resulting in appropriate weight gain. Multidisciplinary consultations included endocrinology, gastroenterology, physical medicine and rehabilitation, social work, and surgery for future gastrostomy tube placement.

Outcome and Follow-up: He was discharged with multispecialty follow-up and ongoing thyroid replacement therapy. This case demonstrates the importance of early detection and management to prevent severe neurodevelopmental compromise.

26. Defying the Prognosis: One-Year Survival In An Infant With Platyspondylic Lethal Skeletal Dysplasia, Torrance Type

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Introduction: Platyspondylic Lethal Skeletal Dysplasia, Torrance type (PLSD-T) is a rare and typically perinatally lethal type II collagenopathy caused by mutations in the C-propeptide domain of COL2A1. The majority of affected infants die at birth or shortly thereafter from respiratory failure, though rare long-term survivors have been reported.

Case Presentation: We present a female infant born at 38 5/7 weeks gestation via cesarean section for breech presentation with prenatal imaging suggestive of skeletal dysplasia. Postnatal examination revealed characteristic features including severe platyspondyly, brachydactyly, short limbs, and narrow chest. Genetic testing confirmed a de novo pathogenic COL2A1 variant consistent with PLSD-T. The patient required immediate NICU admission for respiratory failure with mechanical ventilation. Her prolonged hospital course was complicated by multiple extubation failures, Serratia marcescens bacteremia, pneumonia, and persistent pulmonary hypertension requiring sildenafil and diuretic therapy. Additional complications included feeding intolerance necessitating total parenteral nutrition, electrolyte disturbances, and anemia requiring transfusions. Through intensive multidisciplinary management involving pulmonology, cardiology, speech pathology, nutrition, and genetics, she achieved clinical stability. At discharge at 3 months of age, she had transitioned to full oral feeds with adequate growth and demonstrated resolution of patent ductus arteriosus with improving pulmonary pressures. She is currently one year old.

Conclusion: This case represents exceptional survival for PLSD-T, demonstrating that survival beyond infancy could be possible with intensive multidisciplinary care. Key factors included early genetic diagnosis, meticulous ventilatory management, aggressive nutritional support, and treatment of pulmonary hypertension. Continued outpatient surveillance remains critical to optimize long-term outcomes for these rare survivors.

27. When Excess Growth and Hormones Collide: A GH/PRL Co-Secreting Pituitary Adenoma Causing Acromegaly and Amenorrhea

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Background: Pituitary macroadenomas (≥10 mm) comprise approximately 48% of clinically evident pituitary adenomas, with a prevalence of 1 in 2,300 individuals. Clinical manifestations arise from mass effect and endocrine dysfunction, including visual disturbances, headaches, hypopituitarism, or hormone excess syndromes. Evaluation requires contrast-enhanced MRI and comprehensive hormonal testing. Management is guided by tumor functionality and symptomatology, with transsphenoidal resection as first-line therapy for symptomatic lesions and adjunctive medical or radiation therapy in select cases. Early diagnosis and prompt treatment are crucial for improving patient outcomes.

Case Presentation: A 35-year-old Hispanic woman with no medical history presented with progressive headaches, visual impairment, amenorrhea, and profound metabolic derangements, including severe hyperglycemia. Physical examination revealed overt acromegalic features, such as large hands and feet, and bitemporal hemianopsia. Endocrine evaluation demonstrated markedly elevated GH and IGF-1 with panhypopituitarism. Brain imaging identified a large pituitary macroadenoma compressing the optic chiasm. Following multidisciplinary optimization for surgery, transsphenoidal resection achieved metabolic improvement and endocrine stabilization.
Subsequently, pharmacologic management was initiated to properly regulate the patient's post-surgical hormone levels.

Discussion: Bihormonal pituitary adenomas co-secreting growth hormone and prolactin are quite rare and frequently present with aggressive growth patterns and diagnostic ambiguity. This case illustrates how subtle prolactin elevation, likely from stalk effect or assay limitations, can obscure recognition of a hormonally dominant acromegalic tumor. The combination of severe metabolic dysfunction, optic chiasm compression, and multiaxial pituitary failure underscores the need for comprehensive hormonal evaluation and early multidisciplinary intervention to avoid permanent endocrine and neurologic consequences.

28. First Puerto Rican Case of TANC2-Associated Neurodevelopmental Disorder Due to a De Novo Intragenic Deletion

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Variants in TANC2 are a rare cause of neurodevelopmental disorders characterized by global developmental delay, intellectual developmental disorder, language impairment, hypotonia, and features concerning for autism spectrum disorder, with intragenic deletions infrequently reported and genotype–phenotype correlations remaining limited (Guo et al., 2019). We report a case of a 4-year-old Puerto Rican female presenting with early-onset global developmental delay, severe hypotonia, absent expressive speech, feeding difficulties, ophthalmologic abnormalities, and behavioral features concerning for autism spectrum disorder. Prior metabolic, neuromuscular, and neuroimaging evaluations were non-diagnostic. Exome sequencing identified a primary finding of a heterozygous intragenic deletion involving exons 3–8 of TANC2 (RefSeq NM_025185.4), corresponding to a 271.96 kb deletion at 17q23.2q23.3 (ISCN: arr[hg38] 17q23.2q23.3(63023307_63299056)×1), classified as a variant of uncertain significance. Parental testing supported a de novo event. Longitudinal follow-up demonstrated continued developmental progress without regression, though significant motor and language delays persist. This case expands the phenotypic and genotypic spectrum of TANC2-associated neurodevelopmental disorder and represents the first reported Puerto Rican patient with a TANC2 intragenic deletion. The findings underscore the value of exome sequencing in children with unexplained hypotonia and developmental delay and highlight the importance of early intervention, ongoing multidisciplinary care, and long-term follow-up.

29. When ADHD Isn't Just ADHD: A Case Report on the Role of Obstructive Sleep Apnea in Adolescent Inattention

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Background: Attention-Deficit/Hyperactivity Disorder (ADHD) and Obstructive Sleep Apnea (OSA) share significant symptom overlap in pediatric populations, including inattention, hyperactivity, impaired concentration, executive dysfunction and academic decline. This overlap poses a diagnostic challenge, particularly in adolescents with comorbid obesity, where OSA prevalence is elevated.

Case Presentation: We describe a 16-year-old Hispanic male with obesity (BMI 32.72 kg/m²) who presented for evaluation of suspected ADHD with symptoms of poor concentration, inattention, procrastination, and daytime somnolence. Clinical evaluation with Vanderbilt Assessment Scales completed by parents and multiple teachers supported a diagnosis of ADHD, predominantly inattentive type. Treatment with amphetamine salts (Adderall) yielded significant improvement in attention and academic functioning. However, concurrent evaluation for persistent daytime somnolence despite adequate sleep duration revealed severe bilateral tonsillar and adenoid hypertrophy (Grade 4), ultimately leading to a diagnosis of OSA. Additionally, the patient was found to have elevated blood pressure on multiple measurements and borderline hypercholesterolemia, necessitating temporary suspension of stimulant therapy pending cardiovascular evaluation.

Conclusions: This case highlights the importance of evaluating sleep-disordered breathing in adolescents presenting with ADHD-like symptoms, particularly in the context of obesity. The significant symptom overlap between OSA and ADHD necessitates a comprehensive differential diagnosis to avoid diagnostic overshadowing. Early identification and treatment of OSA may significantly improve cognitive and behavioral symptoms. Clinicians should maintain a high index of suspicion for OSA in overweight or obese adolescents with attentional complaints, even when diagnostic criteria for ADHD are met, as unrecognized sleep-disordered breathing may result in incomplete treatment response and untreated medical comorbidities.

30. When Lupus Affects The Brain: Neuropsychiatric Systemic Lupus Erythematosus Manifestations In An Adolescent

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Systemic lupus erythematosus (SLE) is an autoimmune disorder with multi-organ involvement characterised by periods of remission and exacerbation. In childhood-onset SLE, neuropsychiatric manifestations typically occur within the first two years of disease onset and are associated with increased morbidity. The most common presentations include headaches, seizures, and mood disorders. We report the case of a 13-year-old female recently hospitalized and diagnosed with de novo systemic lupus erythematosus (SLE). Four days after discharge, she presented to the emergency department with disorientation, slowed and slurred speech, and auditory hallucinations. Her initial diagnosis of SLE was made during hospitalization after she presented with anorexia, oral ulcers, purpura on both palms, and unexplained weight loss. Given the severity of psychosis symptoms, she was admitted to the Pediatric Intensive Care Unit. Electroencephalography showed intermittent frontally predominantly rhythmic delta activity (FIRDA) and excessive beta activity, which is associated with encephalopathic states due to various etiologies such as infectious, metabolic and toxic. Brain magnetic resonance imaging with and without contrast showed atrophy involving both cerebral hemispheres as well as areas of increased signal intensity along the periventricular white matter, findings consistent with neuropsychiatric features. The patient was treated with three courses of pulse-dose corticosteroids, four doses of Rituximab, two doses of intravenous immunoglobulin, Risperidone, and optimization of her immunosuppressive regimen. Despite the life-threatening nature of this complication, the patient showed significant clinical improvement and was discharged with immunosuppressive medications. This case highlights that neuropsychiatric SLE can present dramatically even in newly diagnosed patients, requiring aggressive multidisciplinary approach.

31. Beyond the sore throat; Epstein Barr Virus infection complicated by upper airway obstruction leading to cardiorespiratory arrest.

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Introduction: Epstein–Barr virus (EBV) is a ubiquitous herpesvirus that typically causes infectious mononucleosis and may present with fever, lymphadenopathy, and pharyngitis. Although upper airway obstruction is an uncommon complication, it may occur secondary to severe tonsillar and adenoidal hypertrophy, posing a life threatening emergency requiring airway management.

Case summary: Case of a 20-year-old male with a history of chronic sinusitis, started to present with nasal congestion, sore throat, and generalized malaise, one week prior to admission. He was initially diagnosed with Influenza A treated with anti-viral and antibiotic. Despite multiple evaluations, his symptoms worsened, developing facial swelling, muffled voice, and dysphagia. Computed tomography of the neck revealed cervical lymphadenopathy and marked tonsillar hypertrophy, for which was transferred to our pediatric intensive care unit for cardiorespiratory monitoring due to progressive upper airway obstruction. The patient subsequently developed acute hypoxic and hypercapnic respiratory failure, leading to a

2.5-minute cardiorespiratory arrest secondary to airway obstruction, successfully resuscitated with epinephrine and intubated.

During his hospital course, he required mechanical ventilation, sedation weaning, respiratory therapies, and nutritional support. EBV PCR was positive, suggesting acute viral infection. He completed treatment with antibiotics followed by oral amoxicillin-clavulanate due to adenoidal small abscess. Upon extubation, his tonsillar inflammation resolved, and he regained independent mobility with physical therapy. Patient was successfully discharged home with sub- specialist follow up.

Conclusion: This case highlights EBV infection as a rare but severe cause of upper airway obstruction in young adults, emphasizing the importance of early recognition, airway protection, and multidisciplinary management to prevent fatal outcomes.

32. Severe Neuroinvasive West Nile Virus Infection Acquired in Puerto Rico: A Case Report of Encephalitis and Respiratory Failure

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Background: West Nile virus (WNV) is a mosquito borne, single-stranded RNA flavivirus transmitted primarily by Culex species. Most infections are asymptomatic or present as a self-limited febrile illness and in rare occasions progress to neuroinvasive disease. Although WNV has been detected in Puerto Rico, limited surveillance and overlapping clinical features with other endemic arboviruses may contribute to underrecognition, underscoring the importance of including WNV in the differential diagnosis of encephalitis in older adults in this region.

Case Presentation: A 64-year-old woman with multiple comorbidities presented with 7 days of progressive neurologic and psychiatric symptoms, including slurred speech, generalized weakness, inability to ambulate, and hallucinations. Within 24 hours of admission, she developed respiratory failure and shock, requiring emergency intubation, vasopressors, and mechanical ventilation.
Cerebrospinal fluid revealed elevated protein levels, and brain MRI demonstrated extensive supra- and infratentorial anoxic injury with diffuse cerebral edema. EEG showed global cortical dysfunction. CSF serology was positive for WNV IgG, supporting neuroinvasive infection complicated by severe hypoxic-ischemic encephalopathy.

Discussion: Puerto Rico's infectious disease surveillance focuses primarily on Dengue, Zika, and Chikungunya, while WNV remains underrecognized as a cause of neuroinvasive disease. This case highlights the diagnostic challenges in an older patient with rapidly progressive encephalopathy and respiratory failure, mimicking toxic-metabolic, hypoxic, or structural etiologies. Atypical MRI findings with diffuse cytotoxic edema and positive CSF WNV IgG support neuroinvasive infection complicated by hypoxic-ischemic injury. Despite supportive management, neurologic recovery was poor, highlighting the importance of early recognition, CSF evaluation, and targeted treatments.

33. Staged Reconstruction of Left-Sided Forme Fruste Microtia in a Pediatric Patient: A Case Report

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Introduction: Forme fruste microtia is a subtle, incomplete congenital malformation of the external ear. It may present as underdeveloped auricular structures rather than complete absence. Even mild cases can impact aesthetics and self-esteem in pediatric patients. Surgical management often requires a multi-staged approach. Reconstruction aims to restore normal ear contour and landmarks.

Methods: A 12-year-old male with left ear microtia underwent initial otoplasty in 2022, including projection framework placement with porous polyethylene (PPE) and lobule repositioning. In 2023, a second-stage reconstruction was planned to elevate the framework, reposition the lobule, and create a tragus with a composite cartilage and skin graft from the contralateral ear; however, surgery was postponed due to Mycoplasma infection and prolonged bleeding. In April 2024, the patient underwent transposition of the lobule using Z-plasty, tragus reconstruction with composite grafts, and full-thickness grafting from the left inguinal region. Postoperative care included suture removal, topical dressings, and headband protection, with follow-up visits to monitor healing. At 14 years old, he is scheduled for the final stage: left lobule revision and scar assessment, with autologous fat grafting if indicated.

Results: To date, the staged reconstructions have successfully recreated the left ear's contour and basic anatomic landmarks, including lobule and tragus formation. The patient demonstrates adequate wound healing, graft integration, and postoperative stabilization, with no major complications reported from prior interventions.
Conclusion: Multi-staged reconstruction using PPE frameworks, Z-plasty, composite grafts, and autologous fat grafting provides effective anatomical and cosmetic restoration for pediatric microtia. Careful planning and close follow-up are essential to achieving optimal outcomes.

34. Mirror-Image Dextrocardia with Situs Inversus Totalis and Multiple Cardiac Defects in a Stable Neonate: A Case Report

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Introduction: Situs inversus totalis (SIT) with mirror-image dextrocardia is a rare congenital laterality defect characterized by complete right-left reversal of thoracoabdominal organs, occurring in approximately 1 in 10,000–12,000 births. Although often benign, congenital heart disease (CHD) occurs in a minority of cases and typically involves complex structural lesions. The coexistence of SIT with multiple simple cardiac defects in a stable neonate is uncommon.

Case Description: A full-term male neonate was evaluated on day 1 of life following prenatal suspicion of abnormal cardiac positioning. He was stable without cyanosis or signs of heart failure. Physical examination revealed heart sounds best auscultated over the right hemithorax.

Results: Electrocardiography showed a pattern suggestive of findings of mirror-image dextrocardia with appropriate lead placement. Transthoracic echocardiography demonstrated SIT with atrioventricular and ventriculoarterial concordance, a stretched patent foramen ovale with left-to-right shunting, and a tiny mid-muscular ventricular septal defect without hemodynamic significance. A right-sided bovine aortic arch variant was identified without coarctation.
Abdominal ultrasonography confirmed complete mirror-image visceral orientation and revealed a small simple congenital hepatic cyst. In the absence of hemodynamic compromise, conservative management with outpatient cardiology follow-up was recommended.

Conclusion: We report the first case of situs inversus totalis with minor intracardiac defects and a right-sided bovine aortic arch managed without early surgical intervention. Future research should focus on identifying prognostic markers within the SIT spectrum to support evidence-based risk stratification and early anticipation of complications.

35. Interval Enlargement of a Pericardial Cyst During Metachronous Ipsilateral Breast Cancer Recurrence: A Case Report

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Introduction: Pericardial cysts (PCs) are rare, benign congenital anomalies, with an estimated incidence of approximately 1 per 100,000 individuals. They typically follow an indolent course, with nearly half remaining stable and up to one-third demonstrating spontaneous regression. Interval enlargement is uncommon and may introduce diagnostic uncertainty, particularly in patients with malignancies known to involve serosal surfaces. The coexistence of an enlarging PC alongside metachronous ipsilateral breast cancer recurrence has not been previously described.

Case Description: A 52-year-old woman with right-sided high-grade ductal carcinoma in situ (DCIS) diagnosed seven years earlier achieved five years of remission following breast-conserving surgery and adjuvant radiation. She later developed metachronous ipsilateral invasive lobular carcinoma (pT3(m)N1a) requiring bilateral mastectomy, adjuvant chemotherapy, radiation, and endocrine therapy.

Results: During preoperative planning for delayed autologous breast reconstruction, contrast-enhanced computed tomography (CT) incidentally identified a 4.8 cm fluid-attenuation lesion adjacent to the right atrium without high-risk features. Seven months later, during postoperative evaluation for transient exertional hypoxemia, CT pulmonary angiography demonstrated interval enlargement to 5.7 × 2.5 cm without enhancement, invasion, effusion, or chamber compression. The patient remained asymptomatic, and multimodal imaging favored a congenital PC. Surveillance with outpatient cardiac magnetic resonance imaging was subsequently recommended.

Conclusion: We report the first documented case of interval enlargement of a PC occurring concurrently with metachronous ipsilateral breast cancer recurrence. Future research should explore treatment-related inflammatory or hemodynamic mechanisms that may influence cyst dynamics during active malignancy.

36. Dual-Plane Autologous Fat Grafting Using Adipocyte-Enriched Fat and Nanofat in Parry-Romberg Syndrome

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Progressive hemifacial atrophy, also referred to as Parry-Romberg syndrome, is an uncommon condition characterized by unilateral degeneration of facial soft tissues and osseous structures, typically presenting in childhood with progression over several years before stabilization in early adulthood. We present the case of a 41-year-old woman with right-sided progressive hemifacial atrophy who underwent serial autologous adipocyte-enriched stem cell fat grafting for restoration of facial volume, with targeted augmentation of the right perioral region, malar region, and supraorbital region. Serial grafting was performed to achieve gradual volumetric correction while improving graft survival and minimizing resorption, offering a more durable solution compared with injectable fillers. In contrast to volumetric fat grafting, nanofat grafting was utilized to address superficial soft tissue changes. Nanofat grafts, which lack viable adipocytes, were applied in the superficial plane to improve skin quality, elasticity, and texture, targeting dyschromia and dermal thinning commonly observed in progressive hemifacial atrophy. The combined use of adipocyte-enriched stem cell fat grafting and nanofat grafting allowed for a layered reconstructive approach, addressing both deep volume deficiency and superficial tissue degeneration. This case highlights the complementary roles of volumetric and regenerative fat grafting techniques in the management of progressive hemifacial atrophy and demonstrates how multimodal autologous fat-based reconstruction can optimize functional and aesthetic outcomes in complex facial asymmetry.

37. Progression of Hypoattenuated Leaflet Thickening to Valve Failure Despite Anticoagulation

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Background: Hypoattenuated leaflet thickening (HALT) is typically detected within the first year after bioprosthetic valve implantation and is often subclinical with spontaneous resolution. Late progression to severe structural valve deterioration is uncommon.

Case Presentation: A 78-year-old man with atrial arrhythmias and left ventricular dysfunction underwent surgical aortic valve replacement with a 25 mm Edwards Perimount bioprosthetic valve in November 2020. Cardiac CT at 4 months demonstrated normal leaflet coaptation without thickening. Over the next five years, he experienced four COVID-19 infections and developed long COVID while on therapeutic anticoagulation for atrial flutter. Fatigue began in 2023 and progressed through 2025 with dyspnea on exertion. Transthoracic echocardiography revealed severe prosthetic aortic stenosis with peak velocity 3.73 m/s and DVI 0.20. Cardiac CT demonstrated HALT with leaflet calcification and reduced systolic excursion. He underwent successful valve-in-valve transcatheter aortic valve replacement with normalization of gradients and symptom resolution.

Discussion: This case demonstrates abnormally late HALT progression along the thrombosis-to-calcification continuum despite continuous anticoagulation, which is typically associated with prevention or early resolution. To our knowledge, this is the first reported association between HALT progression and recurrent COVID-19 infections with long COVID. Recurrent infection may have produced sustained endothelial injury and hypercoagulability, promoting thrombus organization beyond the anticoagulation-responsive phase.

Conclusion: HALT may develop years after implantation and progress to valve failure despite anticoagulation. Clinicians should maintain suspicion in patients with inflammatory or hypercoagulable states and pursue early CT imaging when prosthetic valve dysfunction is suspected.

38. Longitudinal Multistage Reconstruction of a Left Tessier Type 4 Cleft with Orbital Dystopia: Surgical Management From Childhood Through Adolescence

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Introduction: Tessier type 4 clefts are rare craniofacial anomalies involving disruption of the orbital framework, maxillofacial skeleton, and periorbital soft tissues, often associated with orbital dystopia, regional soft-tissue hypoplasia, and functional impairment. Management requires staged reconstruction adapted to craniofacial growth and evolving

functional and aesthetic needs. We report the longitudinal surgical management of a female patient with a left Tessier type 4 cleft and orbital dystopia from early childhood through adolescence.

Methods: Initial postoperative care in 2013 included grafting which demonstrated 100% graft take with preservation of a left tarsorrhaphy. Secondary interventions were performed as the patient matured to address progressive soft-tissue volume loss, cicatricial deformity, and asymmetry. In 2014, autologous fat grafting was performed to the left anterior cheek and lower eyelid. In 2019, revision of the left cleft lip scar, left alar base advancement, and full-thickness grafting of the left alar base were completed uneventfully. Further refinement in 2024 included Z-plasty of the left medial lower eyelid, contouring of the infraorbital lower eyelid and malar eminence, and autologous fat grafting to the lower cheek, upper eyelid, and nasolabial junction.

Results: Multidisciplinary evaluation revealed persistent epiphora and left-sided nasal obstruction due to orbital malposition and inferior turbinate dystopia. Planned management includes placement of a left orbital porous polyethylene implant, assessment and possible reconstruction of the lacrimal drainage system, and turbinectomy.

Conclusions: This case highlights the value of staged, growth-adapted reconstruction and long-term multidisciplinary

39. One of the Largest Reported Hemorrhagic Ovarian Cysts in an Adolescent: A 34 cm Infarcted Functional Ovarian Mass with Severe Mass Effect

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Introduction: Abdominal pain remains a common pediatric emergency department complaint, representing a diagnostic challenge in adolescent females given its broad differential. Hemorrhagic ovarian cysts are functional cysts resulting from excessive bleeding into the corpus luteum during ovulation. While typically small and self-limiting, these cysts can predispose to rupture, hemoperitoneum, and torsion. Adolescents are particularly vulnerable, with most cases occurring on the right side. Obesity is an independent risk factor, and complication risk increases with cyst size. Giant hemorrhagic cysts (>15cm) are rare lesions with atypical presentation, increasing the risk of delayed recognition and irreversible damage. We report a massive infarcted hemorrhagic ovarian cyst distinguished by its extraordinary size and mass effect.

Case Summary: A 17-year-old female with morbid obesity presented with four days of progressive right upper quadrant abdominal pain and vomiting despite treatment for presumed gastritis. Laboratory findings of leukocytosis and elevated inflammatory markers prompted ultrasound which reported large abdominal mass. Follow-up contrast-enhanced CT revealed a 31.6 × 19.6 × 34.5 cm right adnexal cystic lesion extending to mid-upper abdomen with bowel displacement. Negative tumor markers lead to laparoscopic cystectomy with ovarian preservation, draining six liters of serosanguinous fluid. Pathology confirmed an infarcted hemorrhagic ovarian cyst with transmural hemorrhage and coagulative necrosis. The patient was discharged on iron supplementation for post-operative anemia with multidisciplinary follow-up.

Conclusion: This case highlights the importance of maintaining a broad differential in adolescent females with abdominal pain. In obese adolescents, lower thresholds for advanced imaging are warranted. Timely surgical intervention is critical to prevent complications and fertility loss.

40. From Gastroenteritis To Pelvic Abscess: Recognizing A Rare Pediatric Complication

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Acute gastroenteritis in adolescents is generally self-limited; however, suppurative intra- abdominal complications are rare and may be life-threatening if not promptly recognized. Pelvic abscess formation following presumed uncomplicated infectious enteritis in immunocompetent pediatric patients is exceedingly uncommon. We report a previously healthy 19-year-old male who presented with five days of profuse watery diarrhea, non-bloody emesis, and epigastric pain after ingestion of potentially contaminated food. Initial computed tomography (CT) demonstrated enteritis with ileus, and empiric intravenous ciprofloxacin and metronidazole were initiated. Despite therapy, he developed persistent fever, worsening leukocytosis, and escalating abdominal discomfort. Repeat CT on hospital day 10 revealed a 15.4-cm peripherally enhancing pelvic abscess causing significant bladder compression and left hydroureteronephrosis. CT-guided percutaneous drainage placement on day 13 yielded purulent fluid growing ciprofloxacin-resistant Escherichia coli, prompting escalation to intravenous piperacillin–tazobactam. Following definitive source control and a 14-day targeted antibiotic course, serial imaging demonstrated complete resolution of the abscess and obstructive uropathy. The patient's inflammatory markers normalized, pain resolved, bowel function returned to baseline, and he was discharged home on hospital day 25 in stable condition without need for surgical intervention. At outpatient follow-up, he remained asymptomatic with preserved renal function. This case highlights the need to reconsider the diagnosis in adolescents with

persistent systemic inflammation despite appropriate therapy for gastroenteritis even in immunocompetent patients. Early repeat imaging, timely interventional radiology involvement, and culture-directed antimicrobial therapy are essential to prevent morbidity and achieve favorable outcomes.

Clinical Research

41. Association of COVID-19 with New-Onset or Exacerbated Rheumatoid Arthritis in Puerto Rico: Analysis of a National Medical Claims Database

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Background. Emerging evidence suggests that COVID-19 may influence the risk of developing rheumatoid arthritis (RA); however, population-based data remain limited. This study evaluated the association between COVID-19 infection and subsequent RA diagnosis, as well as population-level trends, in Puerto Rico.

Methods. We conducted a retrospective cohort study using de-identified claims data from Plan Vital, the publicly funded health insurance program administered by the Administración de Seguros de Salud de Puerto Rico (ASES). Data from 2018–2022 were analyzed. RA and related diagnoses were identified using ICD-9-CM and ICD-10-CM codes, and COVID-19 was identified using ICD-10-CM code U07.1. Individuals with documented COVID-19 in 2020, 2021, or 2022 were compared with those without COVID-19 in the same year, excluding patients with RA at baseline. Incident RA diagnoses were tracked in subsequent years. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using Fisher's exact test, with analyses stratified by sex. Annual RA prevalence (2018–2023) and incidence (2019–2023) were also estimated.

Results. In 2020, COVID-19 infection was associated with increased RA risk overall (OR 1.28, 95% CI 1.21–1.36), with higher odds in males (OR 1.29) and lower odds in females (OR 0.12). No significant association was observed in 2021. In 2022, RA risk increased overall (OR 1.35) and among females (OR 1.18). RA prevalence increased from 1.66% in 2018 to 2.63% in 2021, then declined to 2.24% in 2023; incidence peaked in 2021.

Conclusions. COVID-19 infection was associated with increased RA risk in select years, particularly among females. RA prevalence and incidence fluctuated during the pandemic.

42. Multicenter-Prospective, Real-World Validation of Remote Artificial Intelligence-Based Digital Uroflowmetry and Symptom Tracking

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Lower urinary tract symptoms (LUTS) and benign prostatic hyperplasia (BPH) are highly prevalent in men, yet conventional clinic-based uroflowmetry is limited by variability, patient discomfort, and under-representation of real-world voiding patterns. Recent advances in remote, digital, and sound-based uroflowmetry enabled non-invasive, repeated home-based assessment of urinary flow, with strong correlation to standard methods and high patient acceptability. This multicenter, prospective cohort study demonstrates the feasibility and patient engagement of remote smartphone artificial intelligence (AI) uroflowmetry and symptoms tracking, with over 3,500 tests performed by 170 patients from five urology centers in Puerto Rico. Longitudinal data were analyzed, including demographic characteristics, uroflowmetry parameters, testing frequency, device utilization, time-of-day distribution of tests, Prostate Symptom Score (IPSS), quality of life (QoL) measures, and device usage patterns. The dataset demonstrates high patient adherence, sustained engagement, and repeated testing. The uroflowmetry and symptom parameters were consistent with the target population's voiding patterns, supporting feasibility and clinical relevance. This finding supports the integration of AI- based digital monitoring into routine urological practice to enhance diagnosis, individualized management, and follow-up.

43. Surgical Management Inequities in Pediatric Osteosarcoma: Evidence from a Puerto Rican Cohort

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Introduction: Osteosarcoma (OS) is the most common bone malignancy in the pediatric population. Hispanic patients in the U.S. have a higher incidence compared to Caucasians. Limb- salvage surgery (LSS) is the preferred surgical approach for OS due to improved functional outcomes and oncologic control. However, its access requires surgical expertise and resources that may not be accessible across all regions. Our study aims to examine patterns in surgical management in Hispanic pediatric OS patients using a cohort from Puerto Rico (PR).

Methods: A retrospective cohort study was conducted from pediatric patients (<21 years) with histologically confirmed extremity OS treated at Pediatric University Hospital in PR from 2012 to 2024. Patients with axial OS were excluded. Demographic information, insurance, diagnosis, and surgery were recorded. Surgeries were categorized as LSS or amputation. Descriptive statistics were used to summarize patient characteristics and patterns in surgical management.

Results: Among 37 cases of extremity OS, all identified themselves as Hispanic. Only 37% (n=14) received surgical intervention from which 64% (n=9) received amputations while 36% (n=5) received LSS. Notably, 80% of LSS procedures were performed outside of PR. All patients in our cohort were insured, 62% with private insurance and 37% with public insurance.

Discussion: These findings raise concern for barriers in access to advanced surgical care. The predominance of amputation along with reliance on outside referrals for LSS suggest potential geographical and institutional limitations in local surgical capacity to manage OS. Further research is warranted to better define system-level influences on access to LSS.

44. Prenatal Breastfeeding Education as a Strategy to Improve Exclusivity at a University Hospital in Puerto Rico

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Introduction: Breastfeeding is the optimal form of nutrition for infants. Although the World Health Organization and the American Academy of Pediatrics recommend exclusive breastfeeding during the first six months of life, many mothers face barriers that limit their success. Prenatal breastfeeding education plays an essential role in improving knowledge and preparation before delivery. At the Univesirty District Hospital, the breastfeeding initiation rate is 65%, but exclusive breastfeeding among healthy term newborns is only 4%. Objective: To evaluate the need for prenatal breastfeeding education and to design and implement an educational program in the prenatal clinic.

Methods: Ten, 20-minute modules were developed and offered weekly to pregnant mothers. Topics included the benefits of breastfeeding, skin-to- skin contact, proper latch, common myths, frequent difficulties, and management during the first postpartum weeks. Sessions were interactive, and pre and post intervention surveys were used to assess knowledge and satisfaction. Postpartum follow-up was also done.

Results: Fourteen mothers participated in the initial needs assessment survey: 79% had partial information and 21% were unfamiliar with the topic. Eighty mothers participated in the educational sessions; 60% achieved ≥1 hour of skin-to-skin contact, 50% were exclusively breastfeeding and 67% reported continued breastfeeding. These results are preliminary and demonstrate the need to strengthen prenatal education in breastfeeding practices.

Conclusion: Integrating prenatal education and maternal support effectively strengthens breastfeeding practices. IRB Protocol #: 2601530363.

45. Hispanic Caregivers' Opinions on Inaccessibility of Essential Resources for Meeting Type 1 Diabetes Care Goals in Adolescent Offspring

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Introduction: Caregivers need resources for meeting type 1 diabetes treatment goals in adolescents (T1DTGA). Few studies have examined Hispanic parents' input about which resources they need to meet these goals. We explored caregivers' opinions about the inaccessibility of essential resources (IER) for meeting T1DTGA and the relationship between IER and psychosocial and health-related indicators (PHRI).

Methods: Sixty-five Hispanic caregivers (81.54% women) aged 32–58 (M=43.34) answered an open-ended question about IER for meeting T1DTGA during a clinical trial for adolescents (IRB#1112-005). We identified the main themes using

content-based categories. Caregivers and adolescents completed depression diagnostic interviews and questionnaires focused on PHRI. We assessed associations between two main themes and PHRI using Chi-square tests and ANOVAs ($p \leq .05$).

Results: Inter-coder agreement was perfect. Categories of resources and their occurrence were: “Resources for Improving Adherence and Physical Health” (RIAPH; 37.35 %), “Resources for Improving Psychosocial Aspects of Health” (RIPASH; 24.10%), “Enhancing Structural Aspects of Health Services” (ESAHS; 20.48%), “Increased Adolescents’ Commitment/Sense of Control” (2.41%), and “Did Not Identify Unmet Needs” (15.66%). Caregivers who needed RIPASH showed higher parental burden and had children with more quality-of-life problems and higher barriers to diabetes treatment adherence, but less family support. Parents who demanded ESAHS had offspring with more helplessness/hopelessness, greater glucose-testing noncompliance, and higher rates/severity of depression, but lower use of psychiatric/psychological treatment and diabetes self-efficacy.

Conclusion: Interventions for Hispanic caregivers must include strategies to meet T1DCGA, including RIPASH, ESAHS, and not only RIAPH. Addressing psychosocial and structural barriers may improve mental health and diabetes-related outcomes.

46. Association of Gestational Diabetes with Long-Term Cardiovascular Disease in the All of Us Research Program: Time-to-Event and Mediation Analysis

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Background: Gestational diabetes mellitus (GDM), affecting approximately 6–9% of pregnancies in the United States, is a predictor of future type 2 diabetes (T2DM) and has been associated with increased cardiovascular disease (CVD) risk. However, the extent to which long-term CVD risk is explained by progression to diabetes remains uncertain. We evaluated longitudinal CVD risk following GDM and quantified mediation by T2DM in a large national cohort.

Methods: We conducted a retrospective cohort study within the All of Us Research Program (n=14,049 women aged 25–65 with prior pregnancy and no baseline CVD or diabetes). GDM exposure was identified using electronic health record codes. The primary outcome was new-onset cardiovascular disease (hypertension, coronary artery disease, stroke, or heart failure). Cox proportional hazards models estimated adjusted hazard ratios (HRs) controlling age, BMI, race, and ethnicity. Time-to-event models and mediation analysis through T2DM were performed.

Results: Women with prior GDM developed CVD more frequently and earlier during follow-up. GDM was associated with increased risk of CVD (HR 1.74, 95% CI 1.56–1.94, $p<0.001$), with 23.5% mediated by T2DM. After adjustment for T2DM, risk remained elevated (HR 1.57, 95% CI 1.40–1.76, $p<0.001$).

Conclusion: GDM is associated with prolonged cardiovascular risk only partially mediated by progression to T2DM. These findings support expanded cardiovascular surveillance in postpartum care for women with prior GDM beyond routine diabetes screening.

47. Evaluation of the Effectiveness of a First Responders Naloxone Program in Reducing Overdose Mortality in Puerto Rico Correctional Institutions (2020–2025)

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Introduction: Substance use disorders are highly prevalent in correctional populations and represent a major contributor to overdose-related mortality. In Puerto Rico, harm-reduction strategies, including the implementation of a First Responders Program with intranasal naloxone, were introduced to mitigate preventable overdose deaths within correctional institutions.

Materials and Methods: A descriptive, longitudinal quality improvement study was conducted using secondary data from the Office of Quality, Compliance, and Statistics of Physician Correctional. All documented overdose events and naloxone administrations from 2020 to 2025 were included. Variables analyzed included gender, age group, correctional institution, overdose outcomes, and mortality rates. Data were analyzed using descriptive statistics and estimation measures to evaluate program effectiveness.

Results: A total of 6,318 overdose events were reported during the study period. Most events occurred among male individuals (96%) and those aged 31–40 years (35%). The Ponce and Bayamón Correctional Complexes accounted for the highest event frequency (38% and 31%, respectively). Overdose mortality decreased from 9.19 deaths per 1,000

incarcerated individuals in 2020 to 4.60 per 1,000 in 2025, representing a reduction of 4.59 deaths per 1,000 following expansion of naloxone use and staff training initiatives.

Conclusion: The findings demonstrate that the First Responders Program and systematic intranasal naloxone deployment were associated with a significant reduction in overdose-related mortality within Puerto Rico correctional institutions. These results support sustaining naloxone- based emergency response programs and reinforce the importance of continuous quality improvement initiatives aligned with National Commission on Correctional Health Care standards.

48. Obesity and Incident Cancer Risk: A Retrospective Cohort Study Using the All of Us Research Program

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Background: Obesity is the second most common modifiable risk factor for cancer, with strong associations for endometrial and colorectal cancers and inconsistent findings for prostate cancer. However, the magnitude and biologic pattern of association across cancers and the degree to which sex modifies this association remain unclear. These cancers differ mechanistically, colorectal cancer is predominantly metabolic, whereas endometrial and prostate cancers are hormonally influenced and sex-specific, providing a framework to evaluate pathway-specific and sex- dependent obesity-related risk.

Methods: This retrospective cohort included 247,043 adults aged 21–65 from the All of Us Research Program with ≥12 months follow–up, with BMI categorized as normal, overweight, or obese. Participants with prior cancer were excluded, and incident cancers were identified from electronic health records. Cox proportional hazards models adjusted for age, sex, and race estimated hazard ratios (HRs). Smoking-adjusted sensitivity analyses and BMI trend tests evaluated dose-response.

Results: During follow-up, 6,857 colorectal, 934 endometrial and 393 prostate cancers occurred. Obesity increased colorectal cancer hazard (HR 1.25, 95% CI 1.17-1.33; p<0.0001), with stronger association in women (HR 1.44) than men (HR 1.09, not significant). Overweight status was also associated with increased colorectal cancer hazard (HR 1.098, p=0.0058). Endometrial cancer risk increased in overweight (HR 1.21; p-0.0438) and obese women (HR 1.36; p=0.0004). No association was observed for prostate cancer (HR 1.08; p=0.58). This increase in risk, across BMI categories remained significantly after smoking adjustment.

Conclusion: Obesity was associated with increased incident colorectal and endometrial cancer, particularly among women, but not prostate cancer, supporting pathway-specific and sex- dependent oncologic risk.

49. Racial and Ethnic Disparities in Multiple Sclerosis Treatment Initiation and Selection among Participants in the All of Us Research Program

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Background: Multiple Sclerosis (MS) is an autoimmune neurodegenerative disease leading to neurologic impairment that decreases the patient's overall quality of life. Early disease modifying therapy (DMT) is critical to target inflammatory processes that predominate in the initial stages of the disease, thereby preventing irreversible disability. This study aimed to evaluate racial and ethnic differences in DMT initiation, timing and drug class selection.

Methods: Adults with confirmed MS (≥2 diagnostic codes, 365-day lookback) were identified from the NIH All of Us Research Program, yielding an analytic cohort of 646 participants. Patients were classified by the first post-index DMT class: injectable, oral moderate-efficacy, oral high- efficacy, and infused high-efficacy. DMT initiation rates, drug class selection, and time to first DMT were stratified by sex and race/ethnicity. Pre-index DMT users (n=52) were excluded in a sensitivity analysis to assess for prior-treatment bias.

Results: Of 646 patients 329 (50.9%) initiated DMT. Black patients had the highest initiation rate (60%), yet they experienced a wait of about 3.5 years (1,265 days) before starting their first DMT, compared to white patients (50.1%, 776 days). Hispanic patients had the lowest initiation rate (38.5%). The most common therapy was injectables (38.9%), however black patients received the oral moderate-efficacy DMT class 30.7% of the time in comparison 13.9% in white patients.

Conclusion: These results demonstrate a disproportionate delay in treatment timing rather than overall treatment access with a strong racial disparity in the selection of DMT drug class. These findings reveal the need for equitable access to early MS care and high-efficacy DMT.

50. Maternal-Infant Bonding Difficulties and Psychological Distress in the Neonatal Intensive Care Unit

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Background & Objectives: Mothers of infants hospitalized in the Neonatal Intensive Care Unit (NICU) frequently experience psychological distress related to separation and disruption of the maternal role, which may interfere with early maternal–infant bonding. This study examined the association between difficulties in establishing maternal–infant bonding and symptoms of anxiety and depression among mothers of hospitalized infants. Methods: A cross-sectional study was conducted among 347 mothers of infants admitted to the University of Puerto Rico – Medical Sciences Campus NICU. Participants ranged in age from 15 to 47 years. Bonding difficulties were assessed using maternal role-related items from the Parental Stressor Scale: NICU. Anxiety and depressive symptoms were measured using the State–Trait Anxiety Inventory short form (STAI-6) and the Patient Health Questionnaire (PHQ-9). Pearson correlations and linear regression analyses were performed using IBM SPSS Statistics version 31. Results: Bonding difficulties were positively correlated with depressive symptoms ($r = .243$, $p < .001$) but were not significantly associated with anxiety ($r = .084$, $p = .117$). Linear regression indicated that bonding difficulties significantly predicted depressive symptoms ($F(1,345) = 21.56$, $p < .001$), accounting for 5.9% of the variance ($R^2 = .059$). Higher bonding difficulty scores were associated with higher depression scores ($\beta = .243$, $p < .001$). Conclusion: Difficulties in establishing maternal–infant bonding during NICU hospitalization are significantly associated with maternal depressive symptoms, underscoring the importance of targeted interventions to support maternal mental health and promote early relational development. Acknowledgements: The authors would like to acknowledge the Department of Pediatrics, Neonatology Section, at the University of Puerto Rico Medical Sciences Campus for their support of this study.

51. Epidemiology, Risk Factors, and Clinical Outcomes of invasive Candida Infections in a Hospital in North Puerto Rico: A Retrospective Study

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Background: Candida infections remain a significant cause of morbidity and mortality among hospitalized patients, particularly in older and medically complex populations. There is need to conduct hospital-based studies in Puerto Rico to identify species distribution, resistance patterns, and risk factors. This study aimed to characterize the epidemiology, species distribution, and outcomes of Candida infections.

Methods: This is a 1-year retrospective descriptive study from the Intensive Care Unit (ICU) and general inpatient rooms of a medical center in north Puerto Rico. Data came from culture-proven candidiasis in blood, urine, and other fluids from February 2024 – June 2025 using the Meditech electronic medical record. Demographics, comorbidities, invasive device use, microbiological findings, ICU admission, length of stay, and mortality were collected.
Descriptive statistics were used.

Results: A total of 257 patients met inclusion criteria, representing 1.2–1.3% of hospital admissions. Median age was 76 years, with balanced sex distribution. Overall, 396 Candida isolates comprising ten species were identified; 110 (27.8%) isolates originated from ICU patients. Candida parapsilosis predominated in bloodstream infections; C. albicans, C. tropicalis, and Candida group isolates were most common in urine and respiratory samples. The most frequent species were, C. parapsilosis (96), C. tropicalis (93), C. albicans (85), and unspecified Candida group isolates (76). Frequent risk factors included diabetes, chronic kidney disease, and invasive device use.

Conclusions: Non-albicans species predominated in this population. These findings support targeted antifungal stewardship and aggressive source control to improve clinical outcomes. The proportion of unspecified isolates highlights the need for improved diagnostic capacity and enhanced fungal surveillance.

52. Outcomes of Mechanical Thrombectomy for Ischemic Stroke: First-Year Experience in the Comprehensive Neurosciences Center in Puerto Rico

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Approximately 795,000 individuals in the United States experience a stroke annually, with 87% being ischemic strokes. 1,2Ischemic strokes, caused by thrombus-mediated occlusion of cerebral vessels, represent the third leading cause of disability worldwide.3 Mechanical thrombectomy has revolutionized acute ischemic stroke treatment for large vessel occlusion, nearly doubling functional independence rates and reducing 90-day mortality by 15% compared to medical management alone.4,5 Hospital Menonita Caguas is currently the only center in Puerto Rico capable of performing mechanical thrombectomy for acute ischemic strokes. No data currently exist on the effectiveness of mechanical thrombectomy or its outcomes in the Puerto Rican population. This study aims to report the outcomes, complications, and follow-up of ischemic stroke patients who underwent mechanical thrombectomy during the first year of its implementation at the Hospital Menonita in Caguas, Puerto Rico. This retrospective cohort study collected data using electronic medical records and imaging reports of all patients who underwent mechanical thrombectomy for ischemic stroke in the institution between October 2022 and October 2023. Preliminary analysis of patients treated in 2022 demonstrated favorable outcomes. Complete data analysis for the full study period (October 2022-October 2023) is ongoing, and preliminary findings suggest outcomes consistent with established literature. This study will provide the first data on mechanical thrombectomy outcomes in the Puerto Rican population and establish baseline performance metrics for the inaugural year of this critical stroke intervention program at the only thrombectomy-capable center in Puerto Rico.

53. Use of Non-Pharmacological Strategies to Reduce Pain in Children During Venipuncture

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Introduction: Venipunctures are common but painful procedures in pediatrics, generating stress for both patients and caregivers. Despite existing recommendations for pain management, non-pharmacological strategies are often underutilized. Objectives: To implement and evaluate non-pharmacological interventions aimed at reducing perceived pain in children undergoing venipuncture at the University Pediatric Hospital.

Methods: The PDSA model was used to implement interventions such as breastfeeding, music, visual distraction, and skin-to-skin contact in 27 patients, ranging from newborns to 14 years of age. Pain was documented using the Wong-Baker FACES scale before and after applying the strategies. Procedure duration and number of attempts were also recorded.

Results: A significant reduction in pain levels was observed, with average Wong-Baker scores decreasing from 8–10 to 2–5. The number of attempts required to complete venipuncture decreased from 3–5 to 1–2, and procedure duration was reduced by approximately 70%, with most procedures completed in under 10 minutes. Caregivers reported higher satisfaction and lower anxiety during the procedure.

Conclusion: Non-pharmacological strategies such as distraction, music, and caregiver involvement were effective in reducing pain during pediatric venipunctures. Early implementation of these practices may improve the child's overall experience and should be integrated into hospital clinical protocols. Ongoing education is essential to ensure that nurses consistently maintain and apply these practices. IRB# 2602540944

54. Cardiometabolic Effects of GLP-1 Receptor Agonists in a Real-World Cohort: Propensity-Weighted Analysis of the NIH All of Us Research Program

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Background: Although GLP-1 receptor agonists (GLP-1 RAs), incretin-based glucose-lowering agents, are becoming more widely used in clinical settings and have been shown to have cardioprotective benefits, there is still limited data about their wider effects on metabolic indicators in practical settings. To address this gap, this study examined the relationship between GLP-1 RA exposure and a comprehensive range of cardiometabolic markers within a real-world cohort.

Methods: Using the NIH All of Us Research Program, 6,619 adults with T2DM and BMI ≥25 were assigned to seven treatment groups. 3,291 had pre/post outcome data. Outcomes (HbA1c, LDL, and triglyceride response) were assessed via IPTW logistic regression with HC3 robust standard errors and Benjamini-Hochberg FDR correction, with a landmark-corrected pre/post design.

Results: Odds of achieving improvements across all four binary outcomes were found among 1,382 - 1,900 patients. GLP-1 RAs reached LDL reduction ≥30% (OR=1.79, p=0.005) and triglyceride reduction ≥15% (OR=1.65, p=0.001) against metformin; the hyperlipidemia was less likely seen among GLP-1 users when compared to non users (OR=0.60, p=0.0002) which could potentially reflect differences on baseline metabolic burden. Also, patients under GLP-1 RAs experienced better odds of reducing their HbA1c levels (≥0.5%) when compared with non GLP-1 RAs users (OR=2.15, p=7e-6).

Conclusion : When patients with similar baseline metabolic profiles, GLP-1 RAs patients were significantly more likely to achieve clinically meaningful cardiometabolic panels when compared to non users. GLP-1 RAs have a broader metabolic effect beyond the glycemic control and could be used to reduce the risk of cardiometabolic events.

55. Focused Ultrasound-Mediated Blood-Brain Barrier Opening to Enhance Temozolomide Delivery in Glioblastoma: A Systematic Review

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Introduction: Glioblastoma (GBM) is the most aggressive primary malignant brain tumor in adults, with persistently poor survival despite chemoradiation and temozolomide (TMZ). Limited intratumoral drug delivery imposed by the blood-brain barrier (BBB), along with intrinsic and acquired resistance mechanisms, constrains TMZ efficacy. Focused ultrasound (FUS)-mediated BBB opening (BBBO) has emerged as a noninvasive strategy to transiently and locally enhance central nervous system drug delivery.

Methods: A systematic search of PubMed, Cochrane Library, ClinicalTrials.gov, Embase, and Scopus was conducted through October 2025. Eligible studies combined FUS-mediated BBBO with systemic TMZ in preclinical GBM models or human patients and reported pharmacologic, therapeutic, or safety outcomes.

Results: Eight studies (6 preclinical, 2 clinical) met inclusion criteria. All studies employed microbubbles to facilitate BBBO. Preclinical studies consistently demonstrated increased intratumoral TMZ delivery, improved tumor control, and prolonged survival with FUS plus TMZ compared with TMZ alone. Two studies directly quantified enhanced intratumoral drug exposure. Clinical studies demonstrated reproducible, MR-guided BBBO with favorable safety profiles and no procedure-related neurological complications. However, survival and pharmacokinetic endpoints were not evaluated.

Conclusion: Focused ultrasound-mediated BBBO is a feasible and well-tolerated strategy to augment TMZ delivery in GBM. While preclinical evidence supports enhanced intratumoral drug exposure and therapeutic benefit, clinical efficacy remains unproven. Future studies should prioritize standardized protocols, direct pharmacokinetic validation, and adequately powered trials incorporating molecular stratification and clinically meaningful endpoints.

56. An Analysis of Hymen Type, Tanner Stage, and Menarche in Girls Receiving Treatment for Child Sexual Abuse at the Puerto Rico Health Justice Center

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Female pubertal development is a complex biological process marked by hymenal morphology, Tanner staging, and onset of menarche. Although these developmental features are routinely assessed in clinical settings, misinformation and limited knowledge on the hymen, even among physicians, may lead to inconsistencies in exams. During exams related to child sexual abuse (CSA), girls often undergo comprehensive genital and pubertal evaluations, presenting a unique opportunity to understand developmental patterns. Additionally, exposure to trauma has been linked to earlier onset of puberty and menarche, raising concerns for developmental outcomes. This study aims to describe key developmental and demographic characteristics in girls receiving treatment for CSA at the time of forensic medical examination. A cross-sectional chart review of 309 girls who received services for CSA at the Puerto Rico Health Justice Center between 2017 and 2023 was conducted. The average age of participants was 9.97 years (sd 4.45), and the majority have a public health

plan (77.99%). Most participants lived at home (88.35%) while others lived with a relative (2.27%) or in foster care (9.39%). The most frequently observed residence municipality was San Juan (15.86%). The most common puberty progression was prepubescent (59.22%), Tanner stage I (45.95%), and premenarche (54.05%). The average age of menarche was 11.11 years (sd 1.32). The observed hymen types were narrow-border (41.10%) and wide-border (36.89%). Patients were predominantly prepubescent, presenting at Tanner stage I, and prior to menarche at the time of forensic evaluation.

Behavioral & Community Research

57. Promoting Safe Human Milk Donation Practices in Puerto Rico: A Multidisciplinary Quality Improvement Initiative

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The absence of a Human Milk (HM) bank in Puerto Rico (PR) has led to informal sharing practices, particularly via social media or word of mouth, which may expose vulnerable infants to harmful agents, such as oncoviruses and environmental toxins. Although Law 88 of 2025 mandates the establishment of an HM bank, its implementation has not yet been completed.

To address these informal sharing practices, we conducted a quality improvement (QI) study using a before-and-after design. A 30-minute educational session was delivered to healthcare and scientific professionals. Surveys measured knowledge, attitudes, and readiness regarding safe HM donation practices. Results were analyzed using quantitative statistical tests and thematic analysis of qualitative responses.

Thirteen participants completed both surveys. Following the intervention, knowledge (mean $\Delta = +1.12$, $p = 0.021$) and practice readiness (mean $\Delta = +1.07$, $p = 0.035$) improved significantly with moderate to large effect sizes, while attitudes improved moderately. Qualitative findings reveal persistent knowledge gaps, infrastructure needs, cultural considerations, and increased motivation to support regulated HM donation.

These findings demonstrate how feasible, behavior-focused QI interventions can support policy implementation, address cultural and infrastructural barriers, and strengthen community readiness. This model is scalable and may inform future public health strategies for equitable HM banking in PR.

58. Caregivers' Understanding of Service and Emotional Support Animals for Children With Special Health Care Needs

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Introduction: Animal-assisted therapies (ATT) incorporate animals to help manage psychological, cognitive, and physical symptoms, in children with neurodevelopmental disabilities. They can reduce pain, behavioral distress, and improve symptom control in hospitalized children. In Puerto Rico, there is scant public information about ATT.

Objective: To assess knowledge among caregivers of children with special health care needs regarding service and emotional support animals.

Methods: This is a cross-sectional pilot study. A questionnaire was completed by adult caregivers of children attending clinics at the University Pediatric Hospital in 2025. IRB approved.

Results: Subjects included 34 caregivers, mean age 38 years (range 26-57), 88% mothers. Children's mean age was 10 years (range 0-20). Most common health care needs included mood disorders (29%), developmental delay (23%), epilepsy (21%), autism (18%), and cancer (18%). Regarding service animals, 94% heard about them, 91% correctly identified their definition, and 6% reported having one (dogs). In relation to emotional support animals, 79% had heard of them, 44% correctly identified their definition, and 21% reported having one (dogs/cats). Only 49% identified the difference. Overall, 77% mentioned potential child benefits including reducing anxiety, increasing happiness, decreasing fear, and detecting health issues.

Conclusions: Caregivers demonstrated high knowledge about service animals, but less knowledge about emotional support animals and their differences. Regardless, most caregivers agreed that their child could benefit from having ATT's. Further studies are needed to identify therapeutic goals, suitable animals, and training needs, so that ATT can be widely implemented for children with special needs in Puerto Rico.

59. Cumulative Risk Profiles and Comorbidity Burden Among Men with Oropharyngeal Cancer: A Cohort Analysis from the All of Us Research Program

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Background: Oropharyngeal cancer (OPC) incidence is rising among males in the United States, reflecting complex interplay among social, behavioral, and biological determi-nants. This study aimed to quantify cumulative risk profiles and their relationship with comorbidity burden in men with OPC using the All of Us Research Program cohort. Methods: We developed a cumulative risk index from nine biological, clinical, and social vari-ables for males with OPC in the United States. Comorbidity burden was measured by the number of unique comorbid conditions per patient, excluding HIV/AIDS and primary OPC to avoid circularity. Poisson regression was performed to estimate incidence rate ratios (IRR) for comorbidity by risk group/count. Results: Under strict criteria requiring data for each risk factor, mean comorbidity was 1.90 in the low-risk (N=10) and 2.29 in moderate-risk (N=7) groups; in an inclusive, 'liberal' analysis, most cases (74%) were mod-erate risk with much lower mean comorbidities (mean=0.050–0.205), with only 5% having any comorbidity recorded. Each additional risk factor was associated with an 81% increase in unique comorbidities (IRR=1.81, 95% CI: 1.16–2.91; p=0.01). The high-risk group had substantially higher comorbidity, but comprised only two individuals. Essential hyper-tension, hyperlipidemia, and chest pain were the most common comorbidities, and the most frequent co-occurring risk factors were family history of head and neck cancer with no insurance. Conclusions: Most male OPC patients present with multiple risk factors, but comorbidity burden is concentrated in a small minority, highlighting the need for risk stratification and integrated, multidomain prevention and care strategies.

60. Impact of Neonatal Diagnoses on Maternal Anxiety and Depression Levels

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INTRODUCTION: Research shows that mothers of neonates hospitalized in the Neonatal Intensive Care Unit (NICU) frequently experience critical significant levels of depression and anxiety during their neonate's hospitalization period associated with the neonate's medical vulnerability. However, it is less known how the severity of the neonatal medical diagnoses shapes maternal psychological outcome, making it important to understand the differences of depression and anxiety among NICU mothers based on neonate diagnoses complexity.

METHOD: Therefore, the study compares the levels of depression and anxiety among mothers of neonates with severe diagnoses to mothers of neonates with mild diagnoses in the NICU. The mothers answered a semi-structured interview that included sociodemographic questions, as well as the PHQ-9 for depressive symptoms and the STAI for anxiety symptoms. The sample consists of 345 mothers with a mean age of 27 years old from the NICU at the University Pediatric Hospital in Puerto Rico. The education level among the mothers was primarily a high school diploma (20%) and a bachelor's degree (13.9%) and the majority of the mothers were married (59.7%).

RESULTS: Our results showed that mothers' depressive and anxiety symptoms did not vary significantly across diagnosis severity among our sample.

CONCLUSION: The results showed high levels of reported social support that can minimize the levels of anxiety and depression in mothers with neonates in the NICU. This can explain why levels across our sample do not vary significantly despite the diagnosis of the neonate.

61. Discovery of Anxiolytic Potential of Stypopodium zonale in a Drosophila melanogaster Model

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Anxiety disorders affect nearly one-third of the population, representing one of the most common mental illnesses worldwide (World Health Organization, 2019). Current pharmacological treatments, such as benzodiazepines and antidepressives, are effective but can generate tolerance and dependence (Griffin et al., 2013), making the discovery of natural products with anxiolytic potential a priority. Tropical marine algae, particularly Stypopodium zonale, produce bioactive metabolites with neuroactive properties (Dorta et al., 2002). This study aimed to evaluate the anxiolytic potential of crude S. zonale extracts using Drosophila melanogaster as a behavioral model and bioassay based proteomic profiling. Organic extracts form S.zonale were obtained using an ultrasonic bath and a mixture (2:1) of dichloromethane:methanol. Adults D. melanogaster were exposed to crude S. zonale extracts under acute and chronic conditions. Behavioral assays, including the Open Field Test (OFT), assessed anxiety-like responses measuring locomotor activity and distance travelled from the arena center to the periphery. Comparative proteomic analysis of fly heads was conducted using LC-MS/MS to identify proteins differentially expressed in control versus experimental groups. Both acute and chronic exposures to S. zonale produced significant anxiolytic-like behavioral effects, comparable to diazepam (positive control), with p-values <0.001. Proteomic profiling revealed 53 dysregulated proteins, predominantly downregulated odorant-binding and signaling-related proteins; suggesting a possible molecular basis for the observed behavioral changes. These findings demonstrate that S. zonale exhibits anxiolytic effects in a translational Drosophila model. This dual approach advances the understanding of marine natural products as potential sources for novel anxiolytic agents.

62. Health in Times of Crisis: Well-being and Self-Rated Health Among Vulnerable Older Adults in Puerto Rico

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Introduction: Older adults represent a rapidly growing segment of Puerto Rico's population, accounting for 24.6% in 2024, one of the highest proportions among U.S. states and territories. Accelerated population aging, driven by declining birth rates and sustained migration of working- age adults, has weakened family support systems, reduced caregiver availability, and increased social isolation. These structural vulnerabilities place older adults at greater risk during public health emergencies. This study examines the relationship between physical and emotional well- being and self-rated health among older adults living in vulnerable communities in Puerto Rico.

Methods: A mixed-methods design was used. Quantitative measures included self-rated health, physical and emotional well-being, and sociodemographic characteristics. Descriptive analyses were conducted using PSPP. Qualitative data were analyzed through thematic content analysis of narrative interviews, integrating categories, dimensions, and codes to identify factors shaping health perceptions.

Results: The quantitative analytic sample included N = 651 older adults (mean age: 68.87 ± 8.84); 59% were women. Overall, 43% reported fair or poor self-rated health. Following recent public health emergencies, 79% reported decreased physical activity and 87% reported worsened mood. A qualitative subsample (n = 25) was analyzed. Qualitative findings indicated that perceived health reflected the intersection of biological fragility, social isolation, and structural barriers, while community support emerged as a key psychosocial protective factor.

Conclusion: These findings highlight how public health emergencies shape health perceptions among older adults in vulnerable communities and emphasize the need to strengthen social support systems and implement culturally responsive, community-based policies to reduce health disparities.

63. Schools as Community Health Infrastructure: International Leadership Responses to Public Health Crises in Vulnerable Contexts

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Introduction: The COVID-19 pandemic highlighted that schools fulfill a role that extends beyond their academic function, particularly in vulnerable contexts where they operate as strategic hubs of community support. This study examines how schools functioned as community health infrastructure during a global public health crisis.

Methods: A comparative qualitative design was employed, based on semi-structured interviews with educational leaders from eight countries (Puerto Rico, Colombia, Venezuela, Dominican Republic, Chile, Spain, France, and Mozambique). Thematic analysis was conducted to identify common patterns, emerging practices, and contextual differences in the responses implemented to address health, social, and emotional challenges.

Results: Findings reveal that, regardless of national context, schools assumed key functions related to community health, including psychosocial support, dissemination of preventive information, facilitation of access to essential services, and intersectoral coordination. In settings with greater structural limitations, these functions proved critical in mitigating risk, reducing social isolation, sustaining the continuity of basic supports, and strengthening community resilience among vulnerable populations.

Conclusion: Recognizing schools as community health infrastructure enhances response capacity during public health emergencies and broadens the understanding of the educational sector's role in safeguarding collective well-being. The results underscore the need for intersectoral policies that integrate education, health, and community systems, and that position school leadership as a central component in preparedness, response, and recovery efforts for future public health crises.

64. Puerto Rico Health Justice Center: A Decade of Integrated Clinical and Forensic Services for Sexual Violence Survivors

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Background: Sexual violence is a critical public health concern due to its psychological, physical, social, and legal consequences. National estimates indicate that 20–25% of the population has experienced sexual violence, highlighting the need for responsive services. The Puerto Rico Health Justice Center (PRHJC), established, in 2015, at the San Juan Bautista School of Medicine as a transdisciplinary model integrating forensic medical care, advocacy, and education. Grounded in trauma-informed and victim-centered principles, the PRHJC bridges the healthcare and justice systems to reduce service fragmentation and improve outcomes for survivors.

Objective: Describe the profile of PRHJC participants over ten years to inform academic program review, public policy development, and health promotion planning.

Methods: A retrospective descriptive analysis was conducted examining ten years of PRHJC service delivery. Variables assessed include demographic characteristics, geographical distribution, forensic interviews, medical examinations, and other service indicators. These will be contextualized alongside sexual violence crime reports and registered sex offender data.

Results: The PRHJC has provided services to more than 1,000 victims of sexual violence. Data will be presented by age range, sex, geographical residence, type of forensic and clinical services received, and characteristics of alleged offenders. Academic research generated by the Center and its relevance to public policy will also be summarized.

Conclusion: Exposure to sexual violence is a significant health risk. Understanding survivor characteristics and service needs is essential for trauma-informed care and reducing revictimization. The PRHJC represents a unique integrated model that strengthens coordinated health-justice responses and promotes survivor wellness.

65. Cuidando Corazones: A Community-Based Home Outreach Initiative Supporting Isolated Caregivers in Puerto Rico

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Background: Juan Asencio, a rural barrio in central Puerto Rico, faces persistent socioeconomic challenges, geographic isolation, and limited access to health and social services. These conditions particularly affect older adults, homebound individuals, and caregivers with restricted mobility.

Program Description: Cuidando Corazones is a community-led home outreach initiative developed by Casa Salud Inc. to provide educational, emotional, and nutritional support to households experiencing social isolation. The program engages local leaders and faith-based organizations to help identify families in need and organize small “impact teams” composed of educators, spiritual support providers, and volunteers. Teams conduct home visits, distribute food supplies, and share a self-care booklet featuring reflective activities designed to promote emotional well-being and conversation.

Program Highlights: During its initial implementation in Juan Asencio, the initiative supported multiple households through coordinated home visits and ongoing community assistance. The program also facilitated connections to existing municipal services and established volunteer follow-up support. Due to strong community engagement, the initiative has since been extended to additional barrios in Aguas Buenas and expanded to communities in San Germán and Humacao, illustrating the model’s adaptability across diverse settings.

Conclusions: Community-driven outreach initiatives such as Cuidando Corazones can help address service gaps among isolated caregivers and older adults by fostering local partnerships, strengthening social support networks, and promoting emotional resilience. Continued expansion will focus on deepening community collaborations and exploring telehealth-informed support strategies.

66. clinicaLea in Social Media: A Project to Advance Clinical Research Education for Hispanics in Puerto Rico and Abroad

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Introduction: Hispanics (or Latinos) comprise 19% of the US population and 37% of the US population that used 1 or more prescription drugs daily in the past 30 days (2015-2016). However, only 11% of research participants are Hispanics (2020). Therefore, the objective of this project is to educate the public and potential participants on clinical research in Spanish language. The significance of this project is that future medicines and medical procedures’ effectiveness and safety are adequately documented for Hispanics. Materials and

Methods: “clinicaLea” is a clinical research education page that was created on Facebook, Instagram, and YouTube since July 2025: the top social media apps for adults. Twenty-one (26) videos with clinical research educational content have been posted (still underway).

Results: In Facebook, there have been 58,418 views and 2,685 engagements with support of 2 ad campaigns. Meanwhile, in YouTube, there have been 13,366 views and 6,349 impressions.

Conclusion: Considering that about 86.6% of adults use social media worldwide, clinicaLea in Social Media project is an innovative approach. Furthermore, it is our understanding that clinicaLea in Facebook, Instagram, and YouTube is the 1st public and potential participant-centric and directed virtual space for clinical research education. Eventually, the audience may become potential clinical research participants who already know what clinical research study participation consists of and the required level of commitment necessary for successful participation. This will lead to a more confident and educated informed consent process, higher clinical research participant compliance, and more robust clinical research studies data.

67. Alimentos Insuficiencia en Medicina (AIMS): Food Insecurity Among Medical Students in Puerto Rico

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Introduction: Puerto Rico experiences disproportionately high rates of food insecurity, affecting nearly 40% of residents– almost three times the rate observed in the mainland United States.
Medical students face substantial academic and financial demands that may heighten vulnerability to unmet basic needs. The prevalence and determinants of food insecurity within the Puerto Rican medical school community remain unclear.

Methods: This study conducted a multisite cross-sectional survey of 172 medical students enrolled in one of the four accredited medical schools in PR. Food security during the prior 12 months was assessed using the United States Department of Agriculture (USDA) Adult 10-item Food Security Module. Descriptive statistics, bivariate analyses, and

multivariable logistic regression models were used to estimate prevalence and identify associated socioeconomic, demographic, and educational factors.

Results: Approximately half of participants reported some degree of food insecurity (USDA score ≥ 1), and 25% met criteria for low or very low food security (USDA score ≥3).
First-generation medical students had significantly greater odds of food insecurity (OR approximately 4.5-6.0, p=0.04). Reliance on government loans was also independently associated with increased odds (OR ~4.0, p=0.02). Living with family was strongly protective, whereas lower parental education suggested a trend toward higher vulnerability (OR ~4.7, p≈0.06).

Conclusion: Food insecurity is prevalent among medical students in Puerto Rico and is closely linked to socioeconomic background and financial structure. Institutional screening and targeted support strategies are warranted to protect student well-being and academic continuity.

68. Perceived Inclusivity and Specialty Choice Among LGBTQ+ Medical Students in Puerto Rico: A Surgical vs Non-Surgical Comparison

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Introduction: LGBTQ+ medical students face challenges during specialty selection and the residency match process, particularly related to disclosure of sexual orientation and gender identity. Surgical specialties are often perceived as less inclusive, which may influence specialty avoidance. This study compared perceptions of inclusivity, discrimination, and mentorship between surgical and non-surgical specialties among LGBTQ+ medical students in Puerto Rico.

Methods: A cross-sectional study was conducted using an anonymous online survey of LGBTQ+ medical students enrolled in Puerto Rican medical schools (n=32). Participants rated perceived inclusivity across medical specialties using Likert-scale responses. Survey domains included perceived inclusivity, experiences of discrimination during clinical rotations, visibility of LGBTQ+ role models, and accessibility of mentorship. Specialties were categorized as surgical or non-surgical. Descriptive statistics summarized responses.

Results: Non-surgical specialties were perceived as more inclusive than surgical specialties. General Surgery demonstrated markedly lower perceived inclusivity than Family Medicine (mean score 1.67 vs 4.22). Over half of respondents reported experiencing or witnessing discrimination during surgical rotations, while most reported neutral or inclusive experiences in non-surgical settings. Mentorship was perceived as less accessible in surgical specialties, and over half of the participants considered changing their specialty preference due to discrimination concerns.

Conclusions: LGBTQ+ medical students perceive surgical specialties as less inclusive than non-surgical fields. These disparities may influence specialty choice and contribute to the underrepresentation of LGBTQ+ individuals in surgical careers, underscoring the importance of institutional accountability, faculty training, and structured mentorship initiatives.