DECEMBER 2022 | THE PREMED SCENE'S MONTHLY MEDICAL NEWSLETTER

CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE

Dear medical newsletter readers,

Happiest December! I hope all of you are ending this year happy and healthy! Today, we bring to you the most recent news in medical research! Siri Nikku is our third Rising Stars in Medicine writer, talking more about Jason Schneider and his dedication to working for the LGBTQ+ community in the field of medicine! Then, Ilana Saidov focuses on the relationship between T cells and loss of smell resulting from COVID-19. Next, I spread greater awareness regarding advancements in technology for nephrologists and their patients. Adeba Mukul talks about new ways of regulating diabetes. Finally, Siri Nikku ends by sharing more about organ-on-chip technology.

Please enjoy reading The Premed Scene's December 2022 Medical Newsletter! Till next month.

Aprile Bertomo

RISING STARS IN MEDICINE: Jason Schneider

Rising Stars in Medicine: Jason Schneider

By: Siri Nikku

Dr. Jason Schneider M.D. was awarded the Excellence in lesbian, gay, bisexual, transgender queer,and etc (LGBTQ) Health Award. This award goes to physicians, residents, fellowships, and studnets in their last year of medical school who have shown commitment and leadership in LGBTQ+ policy, patient care, healtchare administration, and work diversity. He received this work from contributing largely to Grady Memorial Hospital Gender Clinic, which is a clinic for transgender and other peopel who are not within the gender binary. Dr. Schneider also served on the Board of Directors of the Gay & Lesbian Medical Associations (GLMA), which is a worldwide medical organization that strives for health equality for LGBTQ+ patients, for 13 years. He was even President of the organization for two years.

Some background about Dr. Schneider is that he is an Associate Professor at Emory University' School of Medicine in Atlanta, Georgia. He works in the Divison of General Medicine and Geriatrics at Grady Memorial Hospital. He received his M.D. from New York University School of Medicine in Manhatten in 2000 and finished his primary care internal medicine residency at Emory in 2003. Most of his work was a clinical educator, specifically educating people all throughout the medical fields. His clinical interests involves sexual health and sexuality, primary care for LGBTQ+ patients, and the relationship between general and psychiatry medicine, correlating to much of his work and involvement to better medicine for LGBTQ+ patients.

References:

https://www.ama-assn.org/about/awards/how-these-6-physicians-are-making-difference-medicine
https://www.lgbtqiahealtheducation.org/us/faculty-advisory-board/jason-schneider/

How T-Cells Impact Sense of Smell After COVID

By: Ilana Saidov

Have you ever wondered why some individuals do not regain their sense of smell after having COVID-19? A team of researchers from Duke Health may have found the solution to this medical mystery. The scientists analyzed olfactory epithelium using a biopsy-like approach. They determined that individuals who lost their sense of smell for a prolonged amount of time have a declining amount of olfactory nerve cells.

Millions of individuals have suffered from post-COVID symptoms such as fatigue, heart palpitations, and anosmia - the loss of a sense of smell. Since it is unknown exactly how anosmia occurs, multiple researchers from around the United States used a biopsy-based approach to analyze olfactory epithelial samples from COVID patients with a prolonged loss of smell. The biopsy revealed that the cause of anosmia might be due to our immune system's T-cells. T-cells are the long-term memory cells of the immune system that directly kill infected cells. The T-cells in the nose were engaged in an autoimmune response. Specifically, the nerve cells in the olfactory epithelium in the nose were inflamed. This autoimmune-like response would cause a decline in nerve cells and impair an individual's sense of smell. Although the reason for this to occur is unclear, this discovery allows researchers to figure out how to restore the sense of smell. Therefore, if T-cells are responsible for damaging the olfactory epithelium, which causes a decrease in nerve cells, scientists can use this information to design a treatment for this condition.

Source:

"Study Finds Why Some COVID-19 Patients Never Regain Sense of Smell." The Jerusalem Post | JPost.com, https://www.jpost.com/health-and-wellness/coronavirus/article-725479.

Artificial Intelligence in Nephrology

By: Aprile Bertomo

The implementation of artificial intelligence, or AI, in varying sectors has brought about widescale changes in many aspects of life. One particular site of influence is in the field of medicine. From more accurate cancer diagnoses to assisting the elderly, artificial intelligence has proven to show great potential in changing human life as a whole. In this article, there will be a focus on the impact of artificial intelligence utilization on the field of nephrology.

Despite the potential great usefulness of artificial intelligence, there are other factors that have the capacity to greatly influence its implementation. Some of these barriers can be related to legalities, including issues regarding legalities or timelines/deadlines. Other barriers include the depth of complexity of the data set, such as data set size and type. Artificial intelligence could also potentially cause problems related to privacy. Regardless of these potential barriers, artificial intelligence still can be useful within the field of nephrology.

One way that artificial intelligence can assist patients with kidney issues is through utilization in identification of delayed graft function, or DGT. Delayed graft function can be described as being the need for dialysis post-kidney transplantation. Artificial intelligence, particularly within the realm of machine learning, can help with preventative health in terms of predicting the later development of delayed graft function. Artificial intelligence can also assist with gathering together large, complex data sets in the evaluation of long-term graft function. New forms of therapy for patients who have undergone kidney transplantation is necessary also because survival rates of such populations are lower relative to those who have not undergone kidney transplantation in the past.

Despite the possible struggles associated with using artificial intelligence for patients with kidney issues, there is evidently great promise in nephrology and beyond.

Reference:
https://link.springer.com/article/10.1007/s40620-022-01529-0

New Improvements in Effective Improvements in Diabetes Control

By: Adeba Mukul

Type 2 diabetes is a disease that affect over 37.3 million adults every year in the United States. There have been many studies conducted to assess what strategies are effective in controlling diabetes – one of them being exercise. Currently, American Diabetes Association guidelines recommend "at least 150 minutes of moderate-to-vigorous intensity aerobic exercise per week, spread over at least 3 days, and 2 to 3 sessions of resistance training weekly" – a guideline only 24% of adults with type 2 diabetes follow.

However, researchers at Stanford University were curious whether an increased regularity of exercise made an effective impact in controlling diabetes in adults with type 2 diabetes. The IMPACT (Initiate and Maintain Physical Activity in Communities Trial) study recruited 357 adults with type 2 diabetes and placed them into three groups: a structured once-a-week exercise intervention, a thrice-a-week exercise intervention, usual care (advice only). The exercise interventions were conducted at 60+ local fitness centers in the San Francisco area.

The results of this study support the researchers' hypothesis that those who attend structured thrice-weekly exercise interventions would see the most success in lowering their HbA1c, or hemoglobin A1C. An important element of the results were the relatively attendance rates to said exercise interventions; when that is taken into account, the difference in effectiveness between usual care and structured exercise interventions is negligible.

In order to lower HbA1c levels in adults with type 2 diabetes, the American Diabetes Association must come up with nutritional and exercise guidelines that diabetics will follow more strictly, which is something that can also start at the community. Medical centers can work with communities to offer incentives, on-site fitness coaching, and placing fitness centers closer to medical centers. This study adds to previous research in emphasizing the importance of consistent exercise for diabetics and raises new questions about *how* to encourage adherence to exercise regulations.

Works Cited: Mukherji AB, Lu D, Qin F, et al. Effectiveness of a Community-Based Structured Physical Activity Program for Adults With Type 2 Diabetes: A Randomized Clinical Trial. JAMA Netw Open. 2022;5(12):e2247858. doi:10.1001/jamanetworkopen.2022.47858

Microphysiological System Advancement in Drug Development

By: Siri Nikku

Microphysiological systems (MPS) are organs-on-chips or tissue engineered 3D organ constructs that replicate real interactions within human body through actual human cells. MPSs combine microsystems and cell biology, resulting in cell-culture models that can copy breathing of human lungs, circulating immune cells through capillaries, functioning tissues and interacting cells. Current MPS are being used in animals like rats and dogs, which have provided info about toxicities and side effects from drugs that were species-specific. MPS are also morally better alternatives to animal testing; the data on drug action better translates to humans than animal trials or electronic cell system replications. MPS can be utilized for efficacy as it is quicker to run clinical trials on organ or tissue chip systems than testing humans. Traditional in-vitro models don't comprise of 3D tissue-tissue interfaces and mechnanical interactions, which can lead to cultured cells becoming less specialized and not being similar to how an entire human body would work.
Other cases of MPS being beneficial is when there is no current or suitable animal models to predict human responses; this can be for much more rarer conditions that have not been seen in many humans. There is a potential of a personalized treatment option through MPS with using cells and tissues of the patients to test in a MPS before being used on a patient. While there is a still a long way to go with improving MPS and making it an official replacement for animal testing, MPS have been very promising with changing how clinical trials will run.

References:
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