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"Scientific Horizons: Student Research with MedWrite Academy"

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Abstract:
MedWrite Academy is an internship program specifically designed for aspiring medical and pre-medical students. Our primary objective is to equip students with the essential skills required to transform their innovative ideas into well-structured research papers. At MedWrite Academy, we believe in the power of collaboration and learning through experience. Students are carefully grouped with peers who share similar interests, creating a dynamic learning environment. This grouping fosters not only intellectual growth but also cultural exchange, as our students come from diverse backgrounds around the globe. Each group is guided by an experienced mentor who provides personalized guidance and support throughout the research process. These mentors are dedicated to helping students navigate the complexities of research methodology, data analysis, and academic writing. Their expertise ensures that each student's idea is nurtured and developed into a high-quality, publishable research article. Being a fully virtual internship, MedWrite Academy offers flexibility and accessibility, allowing students from any part of the world to participate without geographical constraints. This unique feature opens doors for international networking and collaboration, enriching the learning experience. Our program not only focuses on academic growth but also aims to develop key professional skills such as teamwork, communication, and time management. MedWrite Academy is the perfect platform for students looking to enter the world of medical research and academia. Join us and turn your ideas into impactful research!

Keywords: MedWrite Academy; student research; literature review

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Conference Abstracts

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Prospective Ocular Outcomes in the Immunomodulating Treatment of Pediatric-onset Multiple Sclerosis

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This paper endeavors to cross-compare both established and poorly studied pharmacotherapies used in the treatment of pediatric-onset multiple sclerosis (POMS) and their role in optic neuritic symptom management, with emphasis placed on second-line non-steroidal therapies and therapies adjunctive to conventional steroid use given the incidence of steroid-resistance, steroid-dependency, and monotherapeutic steroids failing to achieve a desired clinical outcome. In light of the current paucity of literature describing the efficacy of extant MS treatments in preserving ocular integrity in pediatric subjects, children's likelihood of treatment success will be inferred herein on the basis of adult outcomes measured by way of serial VEP/OCT/DFE screenings and corroborating pediatric cohort studies from which outcomes non-differential from those seen in adults can be evinced. Moreover, due attention will be lent to the incidence of childhood risk factors (e.g., retinopathies secondary to pediatric-onset diabetes mellitus) that dispose subjects to ocular toxicities associated with agents discussed herein.

Patient Expectations and Isotretinoin Treatment— A Psychological Perspective

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The use of isotretinoin (ITT) for the treatment of acne vulgaris and other cutaneous diseases has been associated with potential side effects, including depression, myopic changes in vision, and inflammatory bowel disease. ITT induces apoptosis of sebocytes and keratinocytes, resulting in reduced hyperkeratinization and sebogenesis. ITT's lipophilic nature allows it to cross the blood brain barrier, altering cellular processes via all-trans-retinoic acid and retinoic acid receptor-mediated gene transcription, resulting in decreased metabolic activity and increased mood dysregulation. Physicians should take into account the increased risk of developing psychiatric disorders when prescribing ITT to patients. The use of ITT has been demonstrated to cause a significant decrease in thyroid hormones T4 and T3, while increasing thyroid-stimulating hormone (TSH) levels, which is positively associated with the incidence of depression. It is important for clinicians to set realistic treatment expectations, especially with adolescents who are experiencing biological thyroid hormonal changes. The severity of acne can be linked to increased depressive symptoms, and ITT's direct target of the CNS has shown to directly affect mood regulation and behavior. Establishing realistic treatment expectations prior to ITT initiation can prevent negative psychological effects. Low-dose ITT combined with oral prednisolone or azithromycin results in subtherapeutic levels, which only correlate to moderate treatment outcomes and lower patient satisfaction. It is crucial for clinicians to illustrate realistic outcomes to prevent further mental health decline, especially in vulnerable cohorts.

The Role of Diet in In-Vitro Fertilization: A Review of the Current Literature

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In-vitro fertilization is a procedure in which a physician removes an oocyte from a female donor and, using donor sperm from a male donor, fertilizes it in a laboratory setting. This procedure has become widely popularized and has provided many individuals and families the opportunity to bear offspring of their own even in the face of obstacles to fertility. Despite its popularity, however, little is known regarding the impact of diet along with popularized weight-loss diets on success rates of in-vitro fertilization. In this study, we review the current literature available on PubMed.gov regarding diet and in-vitro fertilization, specifically analyzing what is currently known about the popular Ketogenic, Mediterranean, and Caloric Deficit

Diets and their effects on fertility and in-vitro fertilization. We further recommend that clinicians discuss diet with their patients prior to and during in-vitro fertilization procedures in order to maintain proper health for the mother and fetus and to ensure the highest chances of a successful pregnancy.

Monoclonal Antibody Treatment Delivery for Alzheimer's Disease & BBB

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Alzheimer's disease (AD) is a progressive neurodegenerative disease associated with neuron reduction and brain atrophy. It affects the aging population worldwide and is the most common form of age-related dementia. The disease is characterized by memory impairment and cognitive decline, which eventually leads to mood and behavioral changes. Currently, available treatments for AD provide symptomatic relief rather than alter the progression of the disease. The economic burden associated with AD is significant, with healthcare costs noted to increase as the population at risk grows. Therefore, there is a need to find effective treatments to slow disease progression and improve the quality of life for patients. The pathophysiology of AD involves the formation of amyloid-β (Aβ) plaques and neurofibrillary tangles (NFTs) in the brain. The plaques induce neurotoxicity and lead to cell death. NFTs consist of hyperphosphorylated tau proteins which accumulate in neurons and contribute to neurological dysfunction. Monoclonal antibodies (MA) have been shown to be effective in treating many neurological and non-neurological conditions, such as multiple sclerosis, Parkinson's disease, and metastatic melanoma of the brain. MA treatments can target specific molecules involved in the pathologies of these conditions, providing symptomatic relief and disease-modifying effects. However, current research is exploring the use of MA treatments in targeting amyloid β aggregates in AD

A Review of the Association Between Congenital Zika Syndrome and Congenital Heart Defects

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Zika Virus is a zoonotic virus that is transmitted via the Aedes mosquito and has been known to cause congenital infection in fetuses of infected mothers. As such, women who are pregnant or who plan on becoming pregnant are advised to avoid travel to endemic areas and to properly protect themselves against infection. While Zika infection in adults can present asymptomatically or with nonspecific symptoms, such as fever and rash, there have been documented consequences of Congenital Zika Syndrome in infants, such as microcephaly. Recently, evidence has pointed towards a potential association between Congenital Zika Syndrome and heart defects. The goal of the present review is to review the current literature regarding congenital zika syndrome and its association with congenital heart defects. We also suggest a potential mechanism by which Congenital Zika Syndrome is associated with congenital heart defects.

Cannabinoid Hyperemesis Syndrome in Infancy

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This article delves into the intricate relationship between maternal cannabis use and its potential consequences on fetal development, with a specific emphasis on the potential for the development of cannabinoid hyperemesis syndrome (CHS) in an infant. Cannabis, a globally prevalent recreational and medicinal drug, has witnessed a notable surge in popularity, prompting heightened concerns about its impact, particularly during pregnancy. The paradoxical nature of cannabis, as both an antiemetic and a potential trigger for severe nausea and vomiting as observed in CHS, poses a diagnostic challenge for this syndrome. Additionally, the contradictory antiemetic properties of cannabis and existing societal stigmas make. This review explores the presence of cannabinoid receptors in neonates and fetuses, raising concerns about the potential impact of maternal cannabis during pregnancy. The interplay between cannabinoids, the endocannabinoid system, and serotonin receptors is investigated, shedding light on possible mechanisms behind cannabis-induced nausea and vomiting. We advocate for further research to explore maternal cannabis use and its potential implications for fetal development.

Exploring a Potential Link Between Guillain-Barré Syndrome and Cardiomyopathy

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This study investigates a potential link between Guillain-Barré syndrome (GBS) and cardiomyopathy, with a specific focus on takotsubo cardiomyopathy. GBS, an autoimmune disorder causing acute paralysis, is characterized by autoantibodies attacking the peripheral nervous system. The article posits a relationship between GBS and cardiomyopathy, particularly in the context of sympathetic and vagal neural impulses, proposing that imbalances may contribute to the onset of both conditions, especially in aging hearts. Notably, cardiovascular complications, including takotsubo cardiomyopathy, are observed in GBS patients post-treatment. The research emphasizes the need for clinicians to be vigilant about this potential correlation, urging proactive monitoring through regular echocardiography. The study concludes by highlighting the significance of early intervention in GBS cases to mitigate fatalities, emphasizing the role of healthcare professionals in recognizing and managing the cardiovascular implications of GBS.

The Effects of UV Exposure on Varicella Presentation — A Review

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The human immune system consists of innate and adaptive immunity, which work together to protect the body against infections. The skin, as the largest organ, plays a crucial role in preventing the entry of pathogens. However, various factors can influence immune system function, including genetics, age, diet, lifestyle, and exposure to ultraviolet (UV) radiation. UV radiation from the sun can cause damage to the skin, leading to inflammation, erythema, and immunosuppression. This immunosuppression can contribute to the reactivation of the Varicella Zoster Virus (VZV), resulting in the development of Shingles. VZV primarily causes Varicella (chickenpox) during the initial infection and subsequently leads to Shingles when reactivated. The virus targets the epidermis, predominantly consisting of keratinocytes, and triggers the release of proinflammatory cytokines and chemokines, resulting in immune responses and cytokine storms. VZV can establish latency in sensory neurons, and its reactivation leads to Shingles lesions in the skin innervated by the affected neurons. The incidence of Shingles exhibits a seasonal variation, with a peak in the summer months, which can be attributed to increased UV

exposure and subsequent immunosuppression. Studies using mice models suggest that the skin microbiome may play a role in protecting against UV-induced immune suppression and reducing zoster incidence. Probiotics, such as Lactobacillus casei DN-114 001, have shown the potential to regulate immune responses and reduce skin inflammation. Further research is needed to understand the underlying mechanisms and the differences observed in seasonal zoster incidence between males and females. Additionally, exploring the potential of immune response regulators, microbiomes, and probiotics may provide avenues for controlling zoster reactivation and reducing the incidence of Shingles.

Conflicts of Interest
The authors declare they have no conflict of interests.

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