

# CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE

## Specialty Spotlight: Neurology

Dear medical newsletter readers,

Happy August! We hope you've had a wonderful, restful summer. Today, we bring to you the most updated news in the field of medical research! First, Siri Nikku focuses on the specialty of neurology and then delves into health disparities in LGBT+ populations. Evonna Chisom talks about the benefits of using artificial intelligence in medical situations. Next up, Adeba Mukul explains how fall prevention programs have been found to be helpful in primary care settings. Finally, Ilana Saidov explains how hypertrophic cardiomyopathy can impact athletic performance.

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

*Aprile Bertomo*

### See what else is inside:

- PAGE II- Speciality Spotlight: Neurology
- PAGE III- Health Disparities in LGBT+ populations
- PAGE IV - Detection of Hidden Expression with A.I.
- PAGE V - Perceptions of Facilitators and Barriers to Implementation of Falls Prevention Programs in Primary Health Care Settings in China
- PAGE VI - The Impact Of HCM On Athletic Performance



## Speciality Spotlight: Neurology

By: Siri Nikku

When people think of medical specialties, dermatology, orthopedics, oncology, and various types of surgeons are often thought of initially and are more common. However, neurology is another type of medical specialty with its own conditions that neurologists diagnose and treat.

The root word in neurology is neuro, which is Greek for nerve. A neurologist is recommended to patients who could be suffering from neurological issues such as Alzheimers disease, diabetic neuropathy, nerve damage, and headaches. Patients might also be recommended to neurologists if patients are suffering with signs of neurological disorders like muscle fatigue, confusion, consistent headaches, and paralysis, Within the nervous system, there is the central nervous system (CNS), which is the brain and spine, and peripheral nervous system (PNS), which are all the nerves outside of the CNS.

Due to the vastness of the field, neurologists can do subspecialties in pediatric neurology, pain medicine, sleep medicine, neuromuscular medicine, autonomic diseases, epilepsy, neuropsychiatry, and many more. Generally, neurologists deal with neurological conditions like stroke, brain tumors, sleep disorders, multiple sclerosis, migraines, etc.

Procedures that neurologists perform include lumbar puncture, electromyography, electroencephalogram, and tensilon test.

Lumbar puncture involves collecting a sample of spinal fluid and is used to treat conditions that affect the spinal cord. Neurologists can also inject anesthesia, antibiotics, and cancer treatment using a lumbar puncture needle. Electromyography (EMG) shows how effectively a person's muscles react to electrical stimulation from motor neurons, which are nerves dealing with muscle movement. A trained technician put needles called electrodes into the muscle to record the various electric activity.

Electroencephalogram (EEG) notes electrical brain activity with the neurologist placing electrodes on a patient's brain and the data transferring to another computer. Tenilson tests are used for diagnosing Myasthenia gravis, which is a rare neurological disorder that lowers the strength of arm and leg muscles. Tenilson is a drug that is injected in doses; if after being injected with Tenilson, the patient notices their strength coming back to them instead of getting tired after each dose, there's a chance they have this disorder.

As you can see, neurologists are necessary to treat neurological disorders and can recommend patients to neurosurgeons if surgery is required.

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<https://www.medicalnewstoday.com/articles/326717#summary>



# Health Disparities in LGBT+ populations

By: **Siri Nikku**

The coronavirus disease 2019 pandemic has unequally impacted lesbian, gay, bisexual, trans, and other queer communities (LGBTQ+). The Movement Advancement Project is a nonprofit organization dealing with health equity and its poll findings about the effects of COVID-19 in US households revealed that LGBTQ+ households had less access to financial and educational resources compared to their straight, cisgender households. One in four LGBTQ+ households struggled with medical coverage and two in five LGBTQ+ households had obstacles to receiving proper medical care.

The LGBTQ+ community already has been oppressed in terms of medical care and preventing them from receiving help in the past in the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) epidemic. The oppression they have faced during the HIV/AIDS epidemic and inequalities they faced and still facing from the COVID-19 pandemic is structural as the inequalities is ingrained into how the society in the US runs.

The HIV epidemic lasted for four decades, starting in 1981. The first few years of the epidemic consisted of not having any treatment and the mortality rate was 100%. HIV/AIDS was also described as the "gay plague". With Ronald Reagan not addressing the epidemic until 1985 and the lack of government help, people within the LGBTQ+ community worked together to treat the disabled and sick from this illness. Working with activists pushing for HIV/AIDS aid, various scientific groups were able to increase access to emergency treatment drugs and speed up HIV/AIDS research.

The core beliefs and values of society have led to negligence, mortality, disability, and negative long-term effects that are reflected in the COVID-19 pandemic as well as the current monkeypox outbreaks blaming queer people for the cause or ignoring it due to queer people being outcasted.

Health disparities in LGBTQ+ populations are revealed even more from the COVID-19 pandemic, preventing many queer people from getting healthcare and avoiding going to the doctor due to fear of discrimination. STI treatment, gender-affirming surgery, hormonal therapy, and HIV treatment have reduced during the pandemic, preventing trans and gender non-conforming people of color to not getting the treatment they need.

In terms of work, a survey revealed one in three LGBTQ+ adults said they had fewer hours during the pandemic.

With not being able to get as much paid sick pay, they are getting paid less and also have to deal with being denied housing. Denying LGBTQ+ people housing and jobs can lead to homelessness, which is at increased rates during the COVID-19 pandemic. With not having enough money to pay for food, there is food insecurity and being homeless in several states leads a cycle that prevents queer people from being able to be successful and exist happily.

The way our society views LGBTQ+ people as well as the structure of health systems must change. Some methods of reform include providing safe spaces for LGBTQ+ healthcare, communicating healthcare information in various accessible forms, learning about LGBTQ+ health, and utilizing individualized care.

## References:

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# Detection of Hidden Expression with A.I.

*By: Evonna Chisom*

Technology for measuring gene expression is present in hospitals and has spread its outreach to detecting severe conditions with common symptoms. For instance, sepsis is a life-threatening condition and the leading cause of hospitalization and death worldwide. The condition has a high mortality rate and is responsible for one in five deaths globally. Due to the high mortality rate, early diagnosis is critical.

However, the diagnosis of sepsis can be complicated as a result of the nonspecific early symptoms acquired. Early symptoms are the most effective way to improve outcomes, but systems for accurate early identification are lacking. Artificial intelligence has surfaced as a new technique to help rapidly detect sepsis. The device uses A.I. algorithms to detect several key sepsis risk factors by monitoring patients' electronic medical records as physicians input information. Flagging high-risk patients helps in timely intervention, improving outcomes, lowering healthcare costs, and saving lives.

The new A.I. system developed at John Hopkins University has saved more patients than earlier traditional methods, patients are 20% less likely to die of sepsis than those treated without the system. Accuracy detection of sepsis was found in 82% of cases and found on average nearly six hours earlier than traditional methods. Additionally, the AI system identified patients at risk for pressure injuries, and sudden deterioration caused by bleeding, cardiac arrest, and respiratory failure.

Using machine learning, researchers at the University of British Columbia were able to recognize sets of genes that anticipated whether patients would potentially gain severe sepsis. The researchers were also able to further simplify the five distinct ways in which sepsis develops. With these amazing machines, immediately identifying the type of sepsis a patient has assists physicians in determining appropriate treatment.



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# Perceptions of Facilitators and Barriers to Implementation of Falls Prevention Programs in Primary Health Care Settings in China

**Adeba Mukul**

As one of the most common reasons for hospitalizations in the 65+ population, falls prevention has become one of the notable characteristics of governments' healthcare for the elderly. China is no similar - in 2009, the National Essential Public Health Service Package (NEPHSP) was launched to support the primary health care system and "provide annual complimentary health management service for community residents aged 65 years and older, including falls prevention."

This study took a look at how the implementation of the NEPHSP affected falls prevention. The study, conducted by Harbin Medical University, assessed 3 districts that varied in geographic location and socioeconomic status. 130 participants took part in focus group discussions or in-depth



interviews and several obstacles to fall prevention were identified.

The major barriers to implementing falls prevention programs included "insufficient confidence in delivering interventions and poor understanding of the magnitude of falls and the importance of falls prevention, and weak financial incentives." Additionally, because of the disjointed nature of the data collection of falls, the quality of the understanding of falls (and the impact of falls prevention) are compromised. The study provides 7 strategies to account for these obstacles, which include an integrated data system, regular performance updates and markers, and more training for service professionals.

The findings of this study should be extrapolated to other countries and regions with caution, as this was a qualitative study. Further quantitative studies are necessary to confirm these findings. As our aging population grows, it is important to recognize what prevents from living a quality life, independently and out of hospitals.

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# The Impact Of HCM On Athletic Performance

By: Ilana Saidov



Have you ever witnessed an athlete suddenly collapse on the field without an obvious cause? Although such occurrences may seem uncommon, about one-third of non-trauma-related sudden deaths in young asymptomatic student-athletes are credited to Hypertrophic Cardiomyopathy (HCM).

HCM is the most common genetic disease of the heart muscle. Specifically, it is a myocardial disorder that is caused by abnormal genes that limit the ventricle's ability to pump blood in and out of the heart. It is currently diagnosed with echocardiography and cardiac magnetic resonance. Presently, various management and treatment strategies can decrease mortality and morbidity rate. For example, HCM can be managed with medication such as beta-blockers or even an implantable device to slow heart rate. While this condition can be managed in the general population, it poses a severe issue for athletes.

Athletes diagnosed with HCM have reduced functional capacity of their heart which makes it difficult to participate in high-intensity sports such as football, running, and basketball. Intense sports pose an immense risk for arrhythmia and can cause sudden death in young athletes. Such instances are the reason why multiple U.S. and European consensus patterns labeled HCM as a risk marker that is used to disqualify athletes from participating in competitive sports. Athletes who were once the MVPs of their team are forced to stop participating in competitive sports due to the increased risk of SDA instances. Instead of engaging in intense sports, physicians recommend non-competitive aerobic exercise programs to improve cardiorespiratory fitness as well as healthier lifestyles overall.

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