

# CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE



## RISING STARS IN MEDICINE: SHANZA SAMI

---

Dear medical newsletter readers,

Wishing all of you a very happy November! We are grateful for our readers! Today, we bring to you the most updated news in the field of medical research! Adeba Mukul is our third Rising Stars in Medicine writer, talking more about Shanza Sami and her work in the field of biomedical engineering! Then, Evonna Chisom focuses on healthcare inflation all over the world. Next, Siri Nikku spreads greater awareness regarding Alzheimer's Disease. Ilana Saidov talks about the combination of the flu, COVID-19, and RSV in the United States. Finally, Adeba Mukul ends by sharing more about treatments for individuals with cervical spinal cord injuries.

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

*Aprile Bertomo*

SEE WHAT ELSE  
IS INSIDE:

---

**PAGE 2 - RISING STARS IN  
MEDICINE: SHANZA SAMI**

**PAGE 3 - GLOBAL INFLATION  
ON HEALTHCARE**

**PAGE 4 - ALZHEIMER'S  
DISEASE AWARENESS**

**PAGE 5 - THE TRIPLE  
EPIDEMIC IN THE U.S.**

**PAGE 6 - UPPER LIMB NERVE  
TRANSFER SURGERY IN  
PATIENTS WITH  
TETRAPLEGIA:**



## Rising Stars in Medicine: Shanza Sami

By: Adeba Mukul

At 14 years old, Iowa high school student Shanza Sami has developed a technology that has the potential to be incredibly instrumental in health issues related to climate change. When we think of climate change, we often do not consider how health is connected to something about the world's atmosphere and weather. However, climate plays a big role in how medical resources are available to communities, how diseases spread in an area, and more. In Sami's case, she fell ill with pneumonia in India at 9 years old due to the air pollution in India. Her hospitalization sparked an interest in biomedical engineering and raised a question: what could she do to help?

Sami decided to participate in the 3M Young Scientist Challenge after developing a project in her school's extended learning program. Because the air filtration device on most cars hasn't been updated in nearly 50 years, Sami decided to develop something to innovate and reduce cars' impact on air pollution. Called the Pura Aerem, the device removes over 99% of fine particulate matter from a car's exhaust system through PECO filtration. Sami worked on the Pura Aerem with her mentor, Dr. Patrick Zimmerman, a scientist at 3M. They have high hopes for the future of their filter, which has a production cost of less than \$50.

With such a device in development, the future seems bright for the reduction of air pollution and climate change. Of course, much more has to be done to alleviate the alarming concerns regarding our situation. Sami's accomplishments for her age truly show how she is a rising star within biomedical engineering and her work is a relief for future healthcare workers. If the Pura Aerem is implemented across the world in car exhaust systems, the rates of strokes (and other illnesses associated with fine particulate matter) should go down. I look forward to seeing what Ms. Sami continues to achieve.



## Global Inflation on Healthcare

By: Evonna Chisom

One of the most important global industries is under threat, global public and private healthcare. The industry is threatened by the development of the inflationary environment and the increase in spending on healthcare. Thus, a drop in the personalization and transformation of medical production may stall due to businesses being on the lookout for cost-saving options. For instance, personalized healthcare has become more common in healthcare systems, driven by the increasing prevalence of chronic diseases and rising preference for tailored products. Inflation slows personalization generally.

Consumer prices have risen immensely than healthcare inflation and general inflation, driving up healthcare supply input costs. Key reasons point toward significant labor costs and the ongoing labor shortage. Labor shortages are likely to impact care access due to potential closures or increased wait times. The majority of the clinical labor shortage then falls on nonclinical workers such as personal care aides. Currently, the rising costs have mainly affected providers due to renewal cycles and contracting cycles. This result may push for some executives to turn to layoffs and address the clinical labor gaps through technology and skill-mix optimization.

Based on the effects of the shift in production, a preference for telehealth has gained more attention as a way to reduce costs. Consumers and governments have recognized digital healthcare services as a cheaper alternative to traditional health services. In an inflationary environment, health companies should look for alternative raw materials, adopt more innovative production technologies and turn to sustainability and effective communication. All while shifting from niche to mainstream production, potential savings, and ever-evolving collaboration to act as a buffer to the inflationary dama

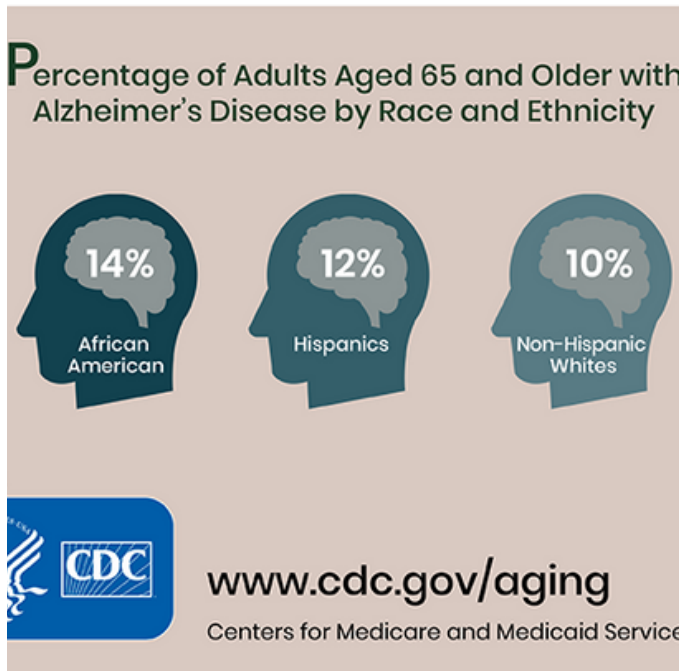
### Works Cited

Bailey, Victoria. "Inflation, Labor Costs Will Increase Healthcare Spending by \$370B." *RevCycleIntelligence*, 23 Sept. 2022, <https://revcycleintelligence.com/news/inflation-labor-costs-will-increase-healthcare-spending-by-370b>.

Rude, Jana. "How Inflation Surge Is Affecting Global Healthcare Trends." *Euromonitor*, 13 July 2022, <https://www.euromonitor.com/article/how-inflation-surge-is-affecting-global-healthcare-trends>.

## Alzheimer's Disease Awareness

By: Siri Nikku



November is Alzheimer's Disease Awareness Month with currently over 6 million Americans being diagnosed with Alzheimer's Disease with 3 million new cases occurring annually. Alzheimer's disease is a progressive and deadly disease that occurs in the brain with no known cure. There is still research being done on what the root cause of Alzheimer's is but scientists think it has to do with the accumulation of incorrectly folded proteins between nerve cells, resulting in brain damage.

This damage starts a decade before physical symptoms start appearing so it's important to check for any symptoms such as mild cognitive impairment (MCI), which can lead to Alzheimer's and other types of similar brain diseases. Some symptoms of MCI include losing items a lot, forgetting to attend events and do simple tasks, and having issues in speaking and coming up with words than people of the same age. On the other hand, some symptoms of Alzheimer's include memory loss, poor decision-making skills, difficulty in completing simple tasks, sudden mood and personality changes, struggles in handling bills and financial matters, repeating questions, more anxiety and/or aggression, and more.

The main risk factors for Alzheimer's include age (people who are older have a higher chance), family history, and lack of healthy behaviors.

If you or someone you know is experiencing the symptoms listed above in a sudden increase, it is important to get checked by a physician to be correctly diagnosed. While there is no cure, there is still treatment for the disease like medications and lifestyle management skills. Treatment can include aiding people to maintain brain health, regulating behavior symptoms, and slow down symptoms.

### References

<https://www.hopkinsmedicine.org/news/newsroom/news-releases/november-is-alzheimers-disease-awareness-month-what-you-need-to-know>

<https://www.cdc.gov/aging/aginginfo/alzheimers.htm#:~:text=Alzheimer's%20disease%20is%20the%20most,thought%2C%20memory%2C%20and%20language.>





## The Triple Epidemic in the U.S.

By: Ilana Saidov

The U.S. is currently in a triple epidemic of the flu, RSV, and COVID-19. Cases for all three viruses are rising, with new variants appearing throughout the year.

The Influenza (flu) virus, although a mild illness, can lead to death. Individuals with the flu can develop various complications, including pneumonia, sinus infections, and ear infections. This virus can also cause serious complications, such as myocarditis, encephalitis, and multi-organ failure. A recent report by the CDC stated that there had been an increase in influenza cases nationwide, with the highest levels in the southeast and south-central areas. Overall, there have been an estimated 1,600,000 illnesses and 730 deaths from the flu.

As seen with the flu, cases of RSV have also increased. RSV, or respiratory syncytial virus, is a respiratory virus that causes cold-like symptoms. It is a known precursor to more severe infections such as bronchitis and pneumonia. This virus is particularly dangerous for infants and children with other health conditions such as chronic lung disease, congenital heart failure, and a weakened immune system. Due to the severity of the virus, an estimated 58,000 to 80,000 children are hospitalized each year. Additionally, the virus is known to cause additional health issues for individuals with conditions such as asthma or congenital heart failure.

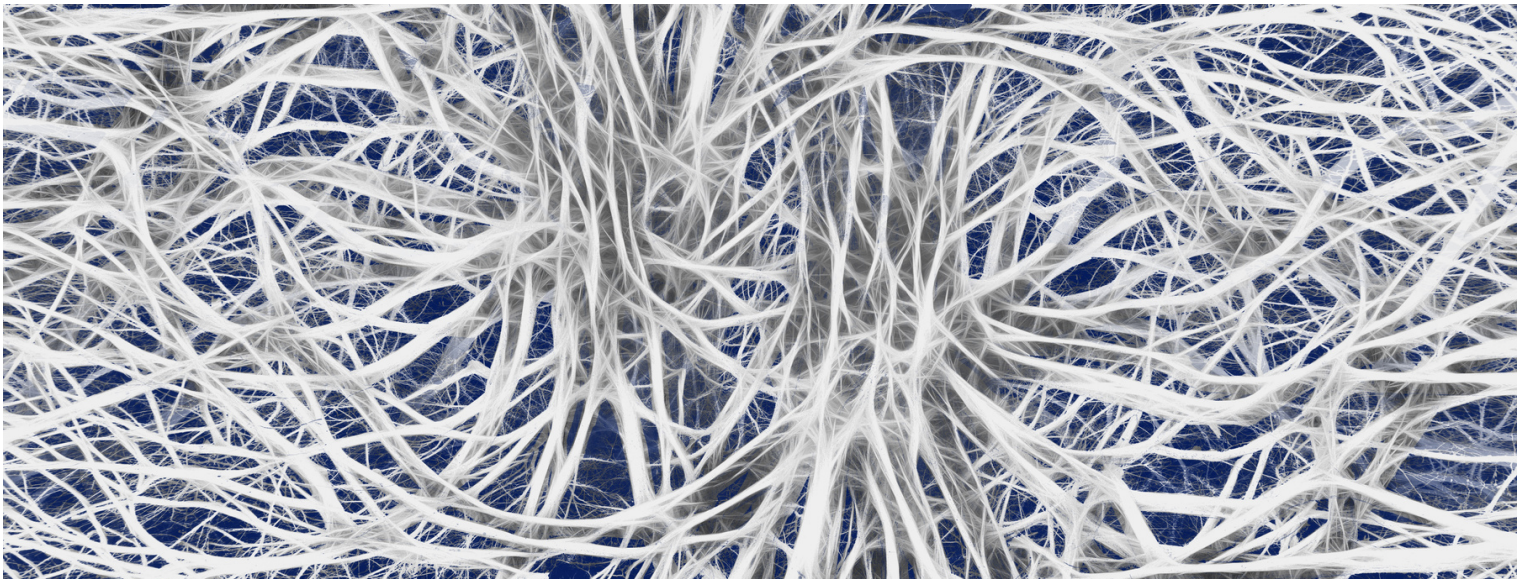
COVID-19 cases have also risen in the last several months in southern and western states. Specifically, there has been a 50% increase in cases in Nevada, New Mexico, and Utah alone. As hospital admissions increase by 20%, the death rate continues to average 350 individuals per day.

Resources:

"Flu Symptoms & Complications." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 3 Oct. 2022, <https://www.cdc.gov/flu/symptoms/symptoms.htm>.

"Symptoms and Care of RSV (Respiratory Syncytial Virus)." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 24 Oct. 2022, <https://www.cdc.gov/rsv/about/symptoms.html>.

"US Faces Triple Epidemic of Flu, RSV, and Covid." The BMJ, <https://www.bmj.com/content/379/bmj.o2681.full.print>.



## Upper Limb Nerve Transfer Surgery in Patients With Tetraplegia

By: Adeba Mukul

Spinal cord injuries can have a devastating impact on a person's quality of life - for example, people with tetraplegia often struggle with feeding themselves and mobility. One promising option for restoring function to areas affected by tetraplegia is nerve transfer surgery. Nerve transfer surgery reanimates paralyzed muscles by "redirecting healthy proximal nerve axons that originate above the zone of injury onto paralyzed muscle-nerve units caudal to the zone of injury." While nerve transfers seem favorable for spinal cord injuries, there is not a lot of research regarding said surgeries. This study reported the results of the largest known prospective case series of nerve transfers.

22 patients with traumatic cervical spinal cord injuries were recruited for the study and following the nerve transfer surgery, their progress was tracked for the next 4 years. Statistical analysis found that nerve transfers facilitate motor recovery and functional independence. Hand reanimation in particular appeared to improve after the surgery, which has interesting implications for ongoing nerve regeneration and cortical plasticity. Additionally, this study shows that chronic spinal cord injuries can benefit from nerve transfers, which was previously rejected by researchers. The noted improvements from the surgery plateaued around 2 years post-operation, which places importance on continuous hand therapy and attention to general health for patients.

There is still a need for a study that is larger and more multicentered with a comparative control group to determine if this can be an efficient treatment option for people with spinal cord injuries. This study produces hopeful results for a new hope for tetraplegic patients and new information on how the brain responds and treats injuries.

Works Cited:

Javeed S, Dibble CF, Greenberg JK, et al. Upper Limb Nerve Transfer Surgery in Patients With Tetraplegia. *JAMA Netw Open*. 2022;5(11):e2243890.  
doi:10.1001/jamanetworkopen.2022.43890