

# CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE



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Dear readers,

Wishing all of you the happiest summer! My name is Aprile Bertomo, and I am The Premed Scene's new Newsletter Director. I am so excited for you to read all about the newest research this month. To begin, our first article features a "Specialty Spotlight" article, in which we discuss a medical specialty each month! This month's article is focused on the field of anesthesiology. Read on about what anesthesiologists do beyond helping patients get comfortable prior to surgical procedures! Next up, we have Evonna Chisom discussing the newest technologies for diabetes management. Siri Nikku then goes on to bring enhanced awareness to the relationship between abortions and maternal mortality. Adeba Mukul talks about the latest research in how increased physician workload can negatively impact the quality of care patients receive. Finally, Ilana Saidov talks about new HIV treatment. There is so much research in the medical field worth sharing, and these articles give you a sneak peak into the latest. Please enjoy reading The Premed Scene's June 2022 Medical Newsletter!

*Aprile Bertomo*

# SPECIALTY SPOTLIGHT: ANESTHESIOLOGY

APRILE BERTOMO

When you think of anesthesiology, you might immediately be thinking about how anesthesiology is frequently used for putting patients to sleep before a medical operation. However, in reality, anesthesiology is so much more. From dealing with chronic pain to cardiothoracic surgeries, anesthesiologists are critical physicians in a myriad of ways.

First and foremost, anesthesiologists are involved with assisting patients with pain management in particular. This can be accomplished in the following ways:

1. General Anesthesia - Anesthesiologists may employ the utilization of general anesthesia for major procedures, including surgeries of the heart and procedures for treating cancer.
2. Sedation - Sedation is utilized by anesthesiologists intravenously. Sedation can assist patients with feeling calmer and less aware of the procedure as it is occurring. Procedures utilizing sedation can involve nerve ablations.



3. Regional Anesthesia - Anesthesiologists use regional anesthesia when they want to numb a particular area of the body. This is often used during epidurals and nerve blocks.

Although it may be commonly believed for anesthesiologists to be primarily involved with processes during a medical operation, they are actually present perioperatively. This means that they are involved in all processes of a procedure- before, during, and after. Prior to a surgery, anesthesiologists work with patients to determine if any medications they take may interfere with the procedure, if they are on any blood thinners such as clopidogrel, etc. Following a procedure, anesthesiologists can talk with patients about any additional pain medications they would be interested in taking and utilization of local anesthetics.

Overall, anesthesiology is such a complex field and one that requires patience and a consistent sense of caution with appropriate medications. There are so many unique opportunities within the field. Anesthesiologists directly influence the lives of patients, healing them in the midst of their pain.

Works Cited:

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<https://www.asahq.org/madeforthismoment/anesthesia-101/types-of-anesthesia/general-anesthesia/#:~:text=While%20there%20are%20many%20types,surgical%20procedures%20to%20treat%20cancer.>

# Devices of the Future for Managing Diabetes

Evonna Chisom



The newest medical devices for diabetes that have been developed in the past decade. Diabetes is a lifelong disease that causes a patient's blood sugar levels to become too high. There are two types of diabetes, Type 1 and Type 2, though Type 2 is more common to inherit. There are since there is currently no cure for diabetes, patients need more user-base friendly devices to monitor their condition with regular blood tests to ensure their blood glucose levels stay balanced.

One of the most recent developments is Continuous glucose monitors (CGMs). CGMs are used to assist diabetic patients throughout their day to keep an eye on glucose levels. These devices have the ability to view glucose levels in a simple and effective way. A user only has to prick a finger for a blood test about twice a day to check that their readings are accurate. The level readings help patients make informed decisions about the types of physical activities, food, and medication they need on a day-to-day basis. CGMs also test interstitial glucose levels every few minutes and send this information to a smartphone or monitor, allowing patients to get alerts when their glucose levels need adjustment.

Another device that should be mentioned is a blood glucose monitoring solutions provider by the name of LifeScan has launched a new version of its diabetes management mobile app; OneTouch Reveal. OneTouch Reveal has been designed to automatically identify recurring highs or lows in blood sugar, then alert its users on their smartphones to any unusual readings. The products of OneTouch such as the OneTouch Verio Flex metre can be used alongside OneTouch Reveal which connects wirelessly to the app so patients do not need to manually input their blood glucose level results. This app is currently available in 24 countries, including the United States.

With all the available services to aid in controlling diabetes currently, the potential for preventing diabetes may still be possible. A study was taken to cure diabetic mice, and the research collected was enough to ensure that the concept was proof that monogenetic forms of diabetes could be cured by correcting the diabetes-causing mutation in stem cells extracted from a patient's own cells. Monogenetic diabetes differs from Type 1 and 2 since monogenetic is a rare condition that results from mutations in a single gene. This research could lead the way for treatments for monogenetic diseases beyond even diabetes.

## Sources:

Edwards, Charlotte, and Charlotte Edwards. "World Diabetes Day: The Latest Medical Devices for Managing Diabetes." Medical Device Network, 21 Oct. 2021, <https://www.medicaldevice-network.com/analysis/newest-medical-devices-for-diabetes/#:~:text=Continuous%20glucose%20monitors&text=CGMs%20rely%20on%20a%20tiny,levels%20need%20to%20be%20adjusted.>

Jakobsen, Rasmus Kragh. "Interview: CRISPR and Stem Cells to Cure Diabetes." CRISPR Medicine, 23 Apr. 2020, <https://crisprmedicineneeds.com/news/crispr-and-stem-cells-to-cure-diabetes/#:~:text=For%20the%20first%20time%2C%20scientists,reverse%20severe%20diabetes%20in%20mice.>

# The Impact of Abortions on Maternal Mortality

Siri Nikku

With current news of Roe vs. Wade being overturned, there has been an uproar about losing autonomy over their bodies and privacy to make this important decision; marginalized groups like LGBT+ people, people of color, and anyone who can become pregnant are impacted the most by this decision, losing one of their fundamental rights. While, the World Health Organization (WHO) has stated that abortion is a necessary reproductive health service for maternal health, in 2015, about 400 abortion-restricting laws were looked at in 46 states with 17 of them passing about 57 new abortion-related restrictions. Maternal mortality has been high in the US, which is unusual for a high-income country, and is disproportionately affecting black and other people of color.

There have already been connections preventing access to abortion care and maternal mortality in low and middle-income countries. However, a study has looked at the data from the National Vital Statistics System from 38 states and the District of Columbia from 2007-2015 and correlated "gestational age limits for abortions" led to a 38% rise in maternal mortality and reducing 20% of Planned Parenthood clinics led to an 8% rise of maternal mortality.

Reducing access to abortions as shown has led to more maternal mortality in the past and with this important case being overruled, abortion is criminalized. It is proven that restricting abortions will lead to unsafe abortions and more maternal deaths.

Additionally, people forced to be pregnant had a higher chance of staying in toxic relationships, having negative physical and mental health, and living in impoverished conditions.

The study examines how abortion restrictions in the states correlate to maternal mortality.

One of the results includes that states with more abortion restricting legislation had poor socioeconomic conditions for the people living there; high rates of poverty and racial disparities of not investing in proper maternal healthcare for communities of color have led to more maternal mortality in people of color. Additionally, the chances of dying during pregnancy or a year after giving birth is higher in states where there is more abortion restriction.

While there are restrictions in this study that should be noted, the overall results portray that restricting access to abortion and other types of reproductive access can lead to maternal mortality as well as negative implications for the long-term health of people giving birth.



Sources:

Vilda, D., Wallace, M. E., Daniel, C., Evans, M. G., Stoecker, C., & Theall, K. P. (2021). State abortion policies and maternal death in the United States, 2015–2018. *American Journal of Public Health*, 111(9), 1696–1704. <https://doi.org/10.2105/ajph.2021.306396>



# Physician Workload and Quality of Care

ADEBA MUKUL

We've all heard the idiom "They've spread themselves too thin" before, but when we think about this in relation to physicians, it becomes a little more concerning. When someone spreads themselves too thin, they either jeopardize themselves or the quality of the work they've thrown themselves into. If a physician spreads themselves too thin, or has too many patients, then the quality of their care will decrease, which is potentially very dangerous for their patients.

This idea is what guided researchers at Yale to study the relationship between hospitalist physician workload, length of stay, and return to the hospital. Physician workloads have increased in recent years, and in 2012, it was reported that 40% of hospitalists (physicians that exclusively work at hospitals) felt that they were "exceeding a workload that they considered safe for patient care and... high workload led to delays in care,

poor communication, and medication errors." To assess this claim, the researchers conducted an observational study using data from 38,141 hospitalizations at Yale-New Haven Hospital from 2015-2018.

After using multilevel Poisson and logistic regression to examine associations between workload and length of stay (LOS), return to the Emergency Department (ED), and readmission, it was determined that LOS was prolonged by 0.05 days when comparing the 75th workload percentile (16 patients) to the 25th workload percentile (13 patients). There was no association found between workload and ED visits or readmissions. While a weak association between higher workload and longer LOS was found, clinical reports of the harmful impact of higher physician workload should not be taken lightly and further research should be done.

Source:

Djulgovic, M, Chen, K, Cohen, AB, et al. Associations between hospitalist physician workload, length of stay, and return to the hospital. *J Hosp Med.* 2022; 17: 445- 455. doi:10.1002/jhm.12847

# Unique Vaccine Treatment for HIV/AIDS Developed by Israel

Ilana Saidov



Researchers at Tel Aviv University have recently discovered a new method for treating HIV/AIDS. AIDS, or acquired immunodeficiency syndrome, is caused by HIV. HIV causes damage to an individual's immune system, lowering their ability to fight off infection and disease. It can spread through sexual contact between infected and uninfected individuals or through the transfusion of infected blood. In addition, AIDS results from the viral destruction of helper T-cells (white blood cells in the immune system). Without helper T-cells, the body is unable to produce antibodies and additional molecules to target foreign invaders. HIV/AIDS has caused over 36 million deaths worldwide which is why it is imperative to discover an effective treatment.

The research team in Israel genetically engineered type B white blood cells from individuals with AIDS. The general function of type B blood cells is to generate antibodies against bacteria and viruses. Once the cells form, they can move into the lymphatic system and bone marrow as well as spread throughout the rest of the body. After the modifications of the cells are complete, the blood cells would secrete neutralizing antibodies against HIV and destroy the virus.

In the study, B cells were modified using gene-editing technology called CRISPR. CRISPR technology mimics a molecular search engine that can locate and disable viral sequences. Using CRISPR, the team was able to "introduce genes into desired sites along with the capabilities of viral carriers to bring desired genes to desired cells". Therefore, when engineered B cells were exposed to HIV, the virus stimulated B cells, divided them, and spread the antibodies. Additionally, if the virus were to change, the B cells would change with it, making it the first medication able to evolve inside the individual's body. Dr. Barzel from the research team stated that one of their goals was to "utilize the cause of the disease to combat it". In the future, the research team plans on utilizing their discoveries to produce medication for AIDS, infectious diseases, and even virus-causing cancers.

## Source:

Groundbreaking treatment for HIV/AIDS developed by Israeli Research Team. (n.d.). Retrieved June 18, 2022, from <https://www.jpost.com/health-and-wellness/article-709293>