What You Need to Know

Pennsylvania hospitals are required to report adverse events, but do you know why it's so important? *Event reports* *can be the first indication of underlying problems, regardless of whether harm occurs.* *They* **can be tools to trigger widespread change facilitywide—or even nationwide.**

Below is the story of how event reports helped a hospital team identify a risk to patients early and inspired change to improve patient safety throughout their hospital. Each month, this newsletter will feature similar stories that demonstrate the impact of reporting and give you the information you need to keep patients healthy and safe.

Medication Safety Event Reports Lead to Facilitywide Change

Event reports do more than simply record what went wrong—they're an important way to communicate issues so things can go better next time. That's why one medical center holds weekly meetings to review all medication-related events reported by frontline staff. Over several months, two participants of this workgroup, a pharmacy manager and quality improvement coordinator, noticed a concerning trend: a bacitracin solution ordered for wound irrigation was being administered through an intravenous (IV) bag instead of through the wound vacuum-assisted closure (VAC) device. Although the error had not yet harmed any patients, these staff members saw an opportunity to make improvements that would keep patients safe.

Recognizing that the mistake was happening because the antibiotic medication was provided in an IV bag, the workgroup queried frontline staff for solutions and consulted with the wound VAC manufacturer about their ideas. This resulted in a product switch to bacitracin in a bottle instead of a bag; the bottle cannot be connected to a patient's IV, only to the wound VAC for irrigation. The pharmacy manager also worked with the center's information technology team to change computerized provider order entry for the medication to indicate "irrigation solution" instead of "intravenous solution," which also removed "intravenous" from printed medication labels, helping to avoid possible confusion. **By highlighting an issue before patients were harmed, these event reports and proactive staff kicked off facilitywide innovations in hardware, systems, and processes, preventing more serious adverse events later.**

Surgery — The Future of Antibiotics

Biomedical engineers at Brigham and Women's Hospital are applying advanced science and technology to develop new antibiotics specifically targeted to prevent bone infections after orthopedic surgery. Conventional prophylactic treatments for common procedures such as hip and knee replacements require large doses of antibiotics that affect the entire body, not just bone tissue, and contribute to bacterial resistance to antibiotics—a growing global health threat that causes 700,000 deaths a year.

To solve this problem, Brigham researchers used an interdisciplinary approach and artificial intelligence to build a library of antibiotics and identify a promising antibiotic candidate, VCD-077, which is effective against many drug-resistant bacteria and inhibits future resistance. When loaded into a polymethacrylate (PMMA) bone cement and tested in a rat model, VCD-077 performed better than all antibiotic-loaded bone cements currently in use. While they must first evaluate its safety and applicability toward humans before clinical trials, this novel antibiotic cement holds potential for minimally invasive, tissue-specific treatments without worsening antibiotic resistance, and this high-tech method of designing it could be applied more broadly to develop other drugs more quickly and efficiently.
Source: Medical Xpress

Improving Diagnosis — A New Way to Listen to Patients

What if Siri or Alexa could tell you when you're sick, just by the sound of your voice? That future may not be far off. The National Institutes of Health Bridge to AI program is committing more than $100 million to build a database of 30,000 voices of people with different diseases, including neurological, mood, and respiratory disorders.

Over the next four years, 12 institutions, co-led by researchers from the University of South Florida's Health Voice Center and Cornell Medicine, will collect voice data and other data, such as patient history and genetic background. This information will be used to **train an artificial intelligence (AI) to detect various conditions just by listening to your voice**. A cough or your speech patterns or how you're breathing could all provide vital clues to your health. Ultimately, they hope to develop a new tool that doctors in rural or underserved communities can use to diagnose patients and connect them with specialists. However, while much patient data can be anonymized, voices are more recognizable, so legal experts and bioethicists will have to decide how vocal recordings can be shared and used in this brave new world.
Souce: NPR

Infection Prevention — Burning Questions About Wildfires and Fungal Infections

When we think of airborne infections, viral infections like the flu are probably the first to come to mind, but people can also get *fungal* infections like valley fever by breathing in spores, perhaps kicked into the air when the ground is disturbed—or suspended in smoke when dirt or vegetation burns. This is a major health risk not only for unprotected firefighters, but also for residents living hundreds of miles away, as these hardy pathogenic microbes can survive intense heat and be carried wherever the wind blows, and ultimately find their way onto your skin and into your lungs.

A relatively young line of research is **studying possible links between increasing California wildfires and increasing cases of fungal infections** in the surrounding areas. Investigators have detected living bacteria and fungi in wildfire smoke, which can cause potentially deadly infections, especially in people with compromised immune systems. This provides an unexpected explanation for unusual illnesses and a greater number of infections when wildfires are burning. Researchers are building evidence to support the case for wildfires as disease vectors, collecting air samples to determine the source of pathogens and comparing maps of smoke plumes from wildfires and electronic medical records for patients diagnosed with fungal infections. If they can prove causation, people will know to take extra precautions against wildfire smoke. Such evidence also may bolster efforts to *prevent* wildfires and related illnesses through prescribed burns that can be planned and controlled for healthier forests and people.
Source: Wired

Mental Health — Mapping Mental Health

Unlike most fields of medicine, psychiatry has few definitive tests, such as X-rays or CT scans, to provide clinical decision support. While fMRI (functional magnetic resonance imaging) scans the brain to detect the areas of activity and how they interact with each other, it's really only useful as a research tool rather than a diagnostic one. However, fMRI may have a clinical use after all: **helping to come up with the best treatment plan once a psychiatrist has made a diagnosis**.

Researchers have been looking at how fMRI may allow them to anticipate how patients will respond to different drug therapies, such as antidepressants, taking some of the guesswork out of psychiatry. They've already seen success with one such treatment, transcranial magnetic stimulation (TMS), by using brain scans to identify the appropriate part of the brain to target. In the future, they may even be able to expand TMS treatment and measure its effectiveness with brain scans. But turning fMRI into a clinical tool won't be as easy as flipping a switch; the technology still requires tremendous resources and training to understand the data it provides.
Source: Slate

Medication Safety — Do Drug Shortages Put Patient Safety at Risk?

From baby formula to toilet paper, shortages of products due to global supply chain issues have been affecting everyone, leaving people to manage with substitutes or go without. When it comes to drug shortages, pharmacists have been warning that they put patient safety at risk, and a new French study published in the *British Journal of Clinical Pharmacology* has the data to back up these claims.

Researchers looked at 462 cases in the French Pharmacovigilance Database from 1985 to 2019 which mentioned a drug shortage and found that 11% (51 out of 462) involved medication errors—in some cases causing serious harm, including three life-threatening situations and four deaths. Most of these errors were attributed to human factors during medication administration; using a replacement drug for one that is unavailable could contribute to such errors because of different packaging, labeling, dosage, or route of administration. As drug shortages increase, risk of patient harm can be mitigated by clear communication and education to healthcare providers and patients about limited availability of products and their replacements.
Source: Pharmaceutical Journal

Patient Perspective — Treating Domestic Violence Like a Disease

With more than 10 million Americans suffering physical abuse from their partners each year, many view domestic violence as an epidemic—and healthcare providers are starting to treat it like a disease. Anita Ravi, MD, says, "I look at it as an infection," because the harm it causes can spread from one generation to another.

Ravi founded her clinic, PurpLE Family Health, in New York City to **bring a health-based, team approach to help women who are victims of intimate partner violence, sexual assault, and human trafficking**. Instead of waiting for them to arrive in an emergency department and fill out a questionnaire with no follow-up, she promotes screening at primary care, prenatal care appointments, and in other medical encounters. She has also been training healthcare professionals—5,000 to date—to take a more proactive approach to domestic violence cases: not just recognizing its warning signs, caring for victims, and notifying law enforcement, but connecting patients to social services partners and resources to help them break the cycle. Rather than simply treat the victims of domestic violence, they're taking steps to *reduce* it, and get more people thinking about abuse as a factor that affects women's mental and physical health.
Source: Suggest

Pediatrics — Caring for Preemies

Most people probably associate the neonatal intensive care unit (NICU) with "preemies," babies who are born prematurely. But what does prematurity mean, and are all premature babies destined for the NICU? Ohio pediatrician Leann Poston, MD, answers questions about **the ins and outs of the NICU**, and some of the facts might surprise you.

Dr. Poston explained that a baby born before the 37th week of pregnancy is considered premature, and most preemies do go to the NICU, but their level of care differs according to how early they're born and their needs at birth. Level 1 is considered basic infant care for babies who are well enough to be transferred or go home. Level 2 provides advanced care and monitoring for babies at 32–34 weeks gestation, while a Level 3 NICU provides subspecialty support like cardiac or pulmonary care for babies born before 32 weeks. Level 4 provides the highest level of care for the smallest, youngest preemies. The Centers for Disease Control and Prevention reports that 1 in 10 babies are born prematurely each year, so it happens more often than you might think, but researchers are still trying to understand the causes of premature birth. *Source: Romper*

PSA — Patient Safety Authority

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