



Do You Know Rocky Mountain Spotted Fever When You See It?

In 2017, the number of cases of tick-borne spotted fever rickettsiosis (SFR) reported to the Centers for Disease Control and Prevention (CDC) jumped 46%—from 4,269 in 2016 to a record 6,248 cases. In 2017 alone, the New England, East North Central, and Mid-Atlantic regions experienced an increase of 215%, 78%, and 65%, respectively, although they typically report only a handful of cases each year.

Rocky Mountain spotted fever (RMSF) is the most severe of the SFRs. It begins with nonspecific symptoms such as fever and headache, and sometimes a rash, but when left untreated, the disease can have serious consequences, including the need for amputation. Roughly one in five untreated cases are fatal, with half of the deaths occurring within the first eight days of illness.

However, RMSF is treatable with doxycycline, which can prevent disability and death when prescribed within the first five days of illness, meaning that early recognition and treatment is crucial. Yet cases “often go unrecognized because the signs and symptoms are similar to those of many other diseases,” says CDC Director Robert Redfield, MD. Fewer than 1% of the reported SFR cases in 2017 had sufficient laboratory evidence to be confirmed. And although the annual incidence of SFR in the U.S. increased from 6.4 to 19.2 cases per million persons between 2010 and 2017, the proportion of confirmed cases decreased.

Citing the need to train healthcare providers on the best methods to diagnose tick-borne diseases, the CDC created a “first of its kind” clinical education tool that uses scenarios based on actual cases to help clinicians recognize and differentiate among the various possibilities. The module is self-directed, with knowledge checks, reference materials, and an interactive rash identification tool that allows providers to compare RMSF’s rash with that of other illnesses.

Continuing education credit is available for physicians, nurse practitioners, physician assistants, veterinarians, nurses, epidemiologists, public health professionals, educators, and health communicators. To access the module, [click here](#).

Source: CDC, May 7, 2019

Flu Virus May Have an Achilles Heel

The influenza virus uses a hemagglutinin (HA) protein to enter and infect cells. The “head” of the protein was thought to be safe from antibody attacks, but it turns out that it has a previously undetected chink in its armor. Now, researchers from the National Institute of Allergy and Infectious Diseases (NIAID) may have found an “unexpected new target” for anti-flu therapies. They discovered a naturally occurring human antibody (FluA-20) that—to their surprise—binds to the protein’s head at a site that was not thought to be vulnerable.

Using FluA-20 isolated from a patient who had received many influenza immunizations, the researchers showed that

FluA-20 “reaches into” an otherwise inaccessible part of the HA trimer molecule and “rapidly disrupts” its integrity. In other words, FluA-20 causes it to fall apart, preventing the virus from spreading.

Although the researchers also discovered that the window of opportunity is narrow (the region is only briefly exposed to antibody attack), unlike the rest of HA’s head, the open-access region varies little among the various influenza strains. The critical HA residues recognized by FluA-20 are conserved across most subtypes of influenza A viruses, which explains the antibody’s “extraordinary breadth.” In mouse studies, when used as prophylaxis or therapy, FluA-20 protected against H1N1, N3N2, H5N1, and H7N9 subtypes.

In theory, according to the researchers, direct strikes with antibody-based therapeutics against that part of HA could be effective with many strains of influenza A virus, and possibly other influenza strains.

Source: NIAID, May 16, 2019

Heart Valve Replacement for High-Risk Patients

Left ventricular outflow tract (LVOT) obstruction is a life-threatening complication that can put transcatheter mitral valve replacement (TMVR) out of reach for many patients. But researchers from the National Heart, Lung, and Blood Institute (NHLBI) and Emory University have developed a novel technique to essentially slice through the obstacle, increasing treatment options for high-risk patients.

Transcatheter mitral valve replacement is less invasive than open-heart surgery. Physicians replace the mitral valve by inserting an artificial valve via a catheter. But in more than 50% of patients, the heart leaflet is pushed back, blocking blood flow. During surgery, surgeons can cut out the leaflets while replacing valves because they’re looking at the open chest and heart and can see the problem, says study author Jaffar Khan, MD, a clinician at NHLBI.

The researchers describe their new method, LAMPOON, as “a transcatheter mimic of surgical chord-sparing leaflet resection.” The method involves the intentional laceration of the anterior mitral valve leaflet. The operator inserts two catheters through the patient’s groin, up to the heart, and a thread-sized electrified wire woven through the catheter splits open the leaflet.

In the LAMPOON study, researchers evaluated the results of the procedure in 30 patients at high risk for surgical valve replacement and prohibitive risk of LVOT obstruction during TMVR.

Survival was 100%, and 30-day survival was 93% (vs. 38% survival reported with other methods). In all, 73% of patients met the primary outcome: a successful LAMPOON procedure followed by a successful TMVR without reintervention. No one experienced a stroke.



Each year, more than 20,000 people in the U.S. die from heart valve disease. The researchers hope that their innovative technique will help to reduce that number.

Source: *Diagnostic and Interventional Cardiology*, May 22, 2019

CDC Updates Cancer Cluster Guidelines

In 2013, the CDC published guidelines to help state, tribal, local, and territorial public health agencies apply a systematic approach when responding to inquiries about suspected cancer clusters.

But since then, there have been technical and scientific advances that may prove useful, and the agency has stated that it's time to update "Investigating Suspected Cancer Clusters and Responding to Community Concerns: Guidelines from CDC and the Council of State and Territorial Epidemiologists."

The CDC is working with the Agency for Toxic Substances and Disease Registry (ATSDR) to update the 2013 guidelines to ensure that users have access to current scientific tools and approaches. The new version will include input from subject matter experts, public health agencies, the public, and other stakeholders.

Once the guidelines are written, the public will have the opportunity to comment. Interested organizations and the public were invited to participate by submitting written views, information, recommendations, and data. The agencies had posed questions such as "What are the best approaches to respond to community concerns about potential cancer clusters?" and "What gaps and challenges exist in the 2013 guidelines? What are possible solutions to overcoming them?"

For more information, visit <https://www.federalregister.gov/documents/2019/05/15/2019-09998/updating-federal-guidelines-used-by-public-health-agencies-to-assess-and-respond-to-potential-cancer>.

Source: *Federal Register*, May 15, 2019

Steroids Might Not Benefit Patients Who Have Mild Asthma

The gold-standard treatment is no more effective than placebo for patients who have mild persistent asthma, say researchers from the Steroids in Eosinophil Negative Asthma (SIENA) study, funded by the NHLBI.

The researchers divided 295 participants into groups based on low or high sputum eosinophil levels, then assigned them randomly to each of three treatment groups for 12-week periods: inhaled steroid (mometasone), a long-acting muscarinic antagonist (LAMA; tiotropium), or placebo.

Surprisingly, 221 participants—nearly 73%—were classified as having low sputum eosinophils (Eos-low, < 2%), which was a much higher frequency than the researchers had expected. And of those participants, the number who responded better to steroids was no different than the number who responded to

placebo. Of the Eos-low group, 60% had better symptom control with LAMA, and 40% had better symptom control with placebo.

By contrast, patients classified as "Eos-high" were almost three times as likely to respond to inhaled steroids than to placebo.

Other research indicates that about half of the population with mild persistent asthma have less than 2% sputum eosinophils, and they are not likely to respond well to steroids. However, laboratory tests to measure sputum eosinophils are not routinely used in most clinics, the researchers say.

The difference between the groups is not large enough to conclude that patients are more likely to do better on LAMA drugs, according to the researchers, but the study highlights the need to look for alternatives to inhaled steroids for patients with mild asthma.

The research underscores the value of customizing treatments to help people with asthma, said James Kiley, PhD, director of NHLBI's Division of Lung Diseases. "This study adds to a growing body of evidence that different patients with mild asthma should be treated differently, perhaps using biomarkers like sputum eosinophils to select which drugs should be used—a precision medicine approach."

Source: NHLBI, May 19, 2019

Pregnancy-Related Deaths Represent "Web of Missed Opportunities"

Approximately 700 women die each year in the United States as a result of pregnancy-related problems, according to a CDC analysis of national and state data. About 60% of those deaths are preventable.

The causes of death differ throughout pregnancy and postpartum. Overall, heart disease and stroke result in more than one in three deaths. During delivery, most deaths are a result of obstetric emergencies, such as severe bleeding and amniotic fluid embolism. In the week after delivery, severe bleeding, high blood pressure, and infection are most common.

But one-third of the deaths occur one week to one year after delivery, and these are most often caused by cardiomyopathy.

The findings also confirm racial disparities, according to the CDC. Black and Native American women were almost three times as likely as white women to die from a pregnancy-related cause.

The researchers analyzed 2011–2015 national data on pregnancy mortality and 2013–2017 data from 13 state maternal-mortality review committees.

Their analysis revealed that most pregnancy-related deaths were preventable, regardless of race or ethnicity. Each death, say the researchers, represents a "web of missed opportunities." The mortality review committees determined that all deaths were associated with several contributing factors, including lack of access to appropriate care, missed or delayed diagnoses, and a lack of patient and provider knowledge about warning signs.



The CDC offers advice on keeping patients safe during and after pregnancy. They suggest:

- Helping patients to manage their chronic conditions
- Teaching them about warning signs
- Using tools to flag warning signs early so women can receive timely treatment

Hospitals can also standardize patient care, the CDC advises, by having high-risk women deliver at hospitals with specialized providers and equipment. Hospitals can train non-obstetric providers to consider patients' recent pregnancy history. Most importantly, healthcare practitioners should continue to provide high-quality care for mothers up to at least one year after the baby's birth.

Source: *Morbidity and Mortality Weekly Report (MMWR)*, May 10, 2019

Keeping Watch on Crypto

If it's swimming season, it's also *Cryptosporidium* season. The parasite, spread through feces of infected humans or animals, is the culprit in most disease outbreaks linked to water.

Between 2009 and 2017, Crypto-related outbreaks increased by an average of 13% per year, according to the CDC. In the 446 outbreaks reported, 7,465 people became sick, 287 were hospitalized, and one died. The CDC says these numbers are likely to be underestimates.

One-third of the outbreaks were in treated swimming water, including pools and water playgrounds. Smaller percentages were linked to contact with cattle, infected people in childcare settings, and raw milk or apple cider.

Crypto's tough protective shell is the secret to its long life. It can survive for days even in chlorinated pools or on

surfaces that have been disinfected with chlorine bleach. Moreover, *Cryptosporidium* oocysts are immediately infectious upon excretion, and are excreted in numbers multiple orders of magnitude higher than the human infectious dose (≤ 10 oocysts). Just a few germs can make someone sick—and there can be millions in a pool. Infection with *Cryptosporidium* can cause profuse, watery diarrhea that lasts for up to three weeks. It's particularly dangerous for immunocompromised patients, and leads to malnutrition and wasting.

The CDC has some advice for staying Crypto-free:

- If you are ill with diarrhea, don't swim; children with diarrhea should not attend daycare.
- Don't swallow the water you swim in.
- Wash hands with soap and water after any contact with animals, especially with their feces (note: alcohol-based hand sanitizers are not effective against Crypto; hydrogen peroxide should be used in childcare settings for disinfection purposes).
- Remove shoes that have been worn in animal environments before going inside your home.
- Drink only pasteurized milk or apple cider.

Although the numbers remain high, the CDC says testing has improved and may be helping with increased detection, particularly since the institution of CryptoNet, the country's first molecularly based surveillance system for a parasitic disease. Based on DNA fingerprinting, the system has already demonstrated that it can elucidate *Cryptosporidium* transmission chains in outbreaks occurring in treated recreational water, the CDC says, and it has the potential to do likewise for investigations in other Crypto outbreaks.

Sources: *MMWR*, June 28, 2019; CDC, April 26, 2019 ■