



Trends & Technology

Trends

Doxycycline reduces sexually transmitted infections by two-thirds

A study funded by the National Institute of Allergy and Infectious Diseases (NIAID) of men who have sex with men and transgender women found the oral antibiotic doxycycline prevented the acquisition of sexually transmitted infections (STIs) when taken within 72 hours of having condomless sex. The post-exposure approach, doxy-PEP, resulted in a two-thirds reduction in the incidence of syphilis, gonorrhea, and chlamydia among the study participants, all of whom reported having an STI within the previous year. According to the CDC, an estimated 2.5 million cases of syphilis, gonorrhea, and chlamydia occurred in 2021 – up from 2.4 million cases in 2020 – all of which can lead to brain and nerve problems, blindness, infertility, and increased risk of HIV acquisition. Antimicrobial resistance among STIs is an emerging public health threat. The study enrolled over 500 adults assigned male sex at birth; reported sexual activity with a man in the previous year; diagnosed with HIV or taking or planning to take pre-exposure prophylaxis (PrEP) medication to prevent HIV acquisition; and diagnosed with gonorrhea, chlamydia, or early syphilis in the prior year. Over 300 participants were taking HIV PrEP medications, and 174 participants were people living with HIV. Participants were randomly assigned to receive either doxy-PEP or standard of care. Among participants on HIV PrEP, at least one or more STIs were diagnosed in 10.7% of quarterly clinic visits in the doxy-PEP study arm compared to 31.9% of visits in the standard of care arm. Among study participants living with HIV, one or more STIs were diagnosed in 11.8% of quarterly visits in the doxy-PEP arm versus 30.5% in the standard of care arm. Gonorrhea was the most frequently diagnosed STI in the study. Doxy-PEP may offer less protection against gonorrhea strains that are already tetracycline-resistant. Wider population-based surveillance for this type of resistance is needed.

Source: asamonitor.pub/3NA8SMh

FDA approves allogeneic cord blood-based cell therapy for patients with blood cancers

The U.S. Food and Drug Administration (FDA) has approved Omisirge (omidubicel-only), a substantially modified allogeneic cord blood-based cell therapy to

quicken the recovery of neutrophils in the body and reduce the risk of infection. The product is intended for patients with blood cancers planned for umbilical cord blood transplantation following a myeloablative conditioning regimen. Recovering white blood cells reduces the possibility of serious or overwhelming infection associated with stem cell transplantation. Omisirge, administered as a single intravenous dose, is composed of patient-specific, human allogeneic stem cells from umbilical cord blood that are processed and cultured with nicotinamide (a form of vitamin B3). A randomized, multicenter study comparing transplantation of Omisirge to transplantation of umbilical cord blood enrolled 125 subjects with confirmed blood cancers. Eighty-seven percent of subjects who received Omisirge achieved neutrophil recovery with a median of 12 days following treatment with the product, compared to 83% of subjects who received umbilical cord blood transplantation and who achieved neutrophil recovery with a median of 22 days. Bacterial or fungal infections by 100 days following transplantation were seen in 39% of subjects receiving Omisirge versus 60% of subjects in the control group who received umbilical cord blood.

Source: asamonitor.pub/3nw9W9f

NIH study stopped early to investigate effect of statin on cardiovascular disease in people living with HIV

A National Institutes of Health (NIH) clinical trial was stopped early because planned interim analysis of data from the Randomized Trial to Prevent Vascular Events in HIV (REPRIEVE) study found that participants with HIV who took pitavastatin calcium, a daily statin, lowered their risk of major adverse cardiovascular events by 35% compared with those receiving a placebo. REPRIEVE began in 2015 and enrolled over 7,700 volunteers who were all taking antiretroviral therapy, with CD4+ cell counts greater than 100 cells/mm³ of blood at enrollment and had low-to-moderate traditional cardiovascular disease risk that would not typically be considered for statin treatment. Premature heart disease and other chronic conditions have emerged as leading causes of morbidity and mortality in people with HIV, contributing to persistent gaps in lifespan between people with HIV and the broader population. New data suggest that a common cholesterol-lowering medicine could substantially improve cardiovascular outcomes in people with HIV.

The study's Data Safety and Monitoring Board (DSMB) determined that the benefits of daily pitavastatin use outweighed any risks and recommended that the study terminate early, and that a full data collection be conducted across sites for final analysis.

Source: asamonitor.pub/3pfIL2Q

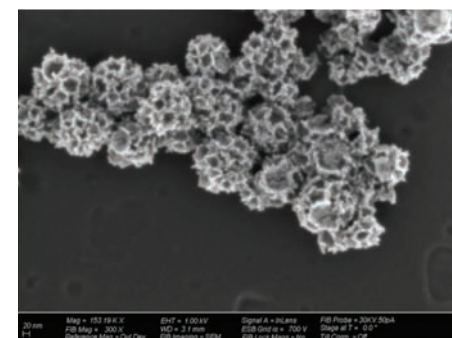
Technology

Infused tympanostomy tubes for treatment of middle ear infections

Middle ear infections are extremely common and affect children especially, with 40% developing recurrent infections that can lead to complications like impaired hearing, speech and language delays, perforations in their eardrums, and life-threatening meningitis. “Tympanostomy tubes” (TTs) are surgically inserted into the eardrum to create an opening between the ear canal and middle ear, ventilate the middle ear, provide a route for fluid to drain out, and allow antibiotic drops to reach the infection-causing bacteria, as one form of treatment. The plastic or metal hollow cylindrical devices are imperfect treatments, however, as bacteria can lay down biofilms and local tissue can grow on their surfaces, which blocks TTs' lumen and causes them to extrude, and antibiotic ear drops applied in the ear canal may not reach the site of infection anymore. Problems affecting TTs similarly affect other fluid-transporting “implantable medical conduits” (IMCs), such as catheters, shunts, and various small tubes with use in the brain, liver, eyes, and other organs where a high-pressure barrier prevents fluids from flowing through the conduit. To improve the devices, biomedical engineers look for ways to reduce IMC devices' size and invasiveness without increasing their risk of becoming blocked and malfunctioning. Researchers have created a new design for IMCs with predictable and effective uni- and bi-directional fluid transport at the millimeter scale that resists various contaminations. Using infused tympanostomy tubes, they have optimized drug delivery into and drainage of fluids out of the middle ear, resistance against water crossing from the outside into the middle ear, as well as the prevention of bacterial and cell adhesion to tubes, by introducing a novel curved lumen geometry of the tube from materials with liquid-infused surfaces and 3D printing. When the iTT prototypes were animal-tested, they kept out environmental water, prevented

infectious buildup, reduced scarring, and remained clear for aeration and pressure equalization. They also preserved hearing and enabled more easy and reliable dosing of antibiotic ear drops to the middle ear compared to conventional TTs.

Source: asamonitor.pub/3nuGrEY



Gold nanoparticle drug delivery framework that targets tumors with remarkable precision, while dramatically reducing the potential for systemic side effects.

Credit: Stevens Institute of Technology

Gold nanoparticles reduce side effects in cancer treatment

Researchers have developed a drug delivery system that uses gold nanoparticles to deliver drugs to tumors with precision while dramatically reducing the potential for systemic side effects. Many cancer drugs potent enough to kill tumors also cause unpleasant side effects for patients. The development of the treatment involves packing and sealing drugs into a porous gold nano-framework, then applying a hyaluronic acid coating on the outer surface of the nanoparticle to further seal the drug inside, resulting in a stable particle that releases the drugs when it binds to hyaluronic acid receptors on the surface of a lymphoma tumor. The drugs are delivered selectively, with minimal leakage into the bloodstream, so lower quantities of drugs can be used to treat a tumor reducing the risk of toxic side effects. The gold nanoparticles continue to circulate in the bloodstream much longer than free-floating drug molecules, meaning that patients who currently receive daily treatments might be able to switch to weekly or biweekly regimens. In animal trials, lymphoma tumors also responded better to the targeted drug delivery than to non-targeted treatments, suggesting that new treatment protocols could be developed to improve outcomes in human cancer patients. The nanoparticles can be loaded with drugs very quickly and efficiently using inexpensive and scalable chemical processes, offsetting the expense of using gold to deliver pharmaceuticals.

Source: asamonitor.pub/3NA8Zni

Continued on page 34

New CME Helps Enhance Physician-Patient Communications

David Matthews (Matt) Hatch, MD, MBA, FASA

Research shows that many physicians have “jargon oblivion,” the use of terms not clearly understood by patients, as much as 70 times per encounter. So while you may believe you’re communicating clearly with patients, they might not agree. For example, “PACU,” “ventilator,” and “acute pain” are terms you may think patients understand, but most do not. Helping anesthesiologists recognize how the terms we often use can prevent patients from understanding important information is one of the three topics covered in a new ASA continuing medical education (CME) course.

The complimentary three-module course, worth 1.5 credit hours, is based on ASA’s Enhancing Patient Communications Program (EPCP) toolkit, which you may have read about in the *Monitor* last year or learned about at the ADVANCE 2023 meeting in Orlando, Florida. The EPCP toolkit was developed by the Committee on Communications (COC) as part of ASA’s Made for This Moment campaign to provide you with resources for enhancing your patient experiences through effective communications in all interactions. While this is important for health care providers overall, it’s essential for anesthesiologists, who have limited time to build relationships with patients.

We’re now expanding the program beyond the toolkit to include a series of CME courses available for free to all ASA



to recognize how both play a significant role in patient communication.

The modules are 15-20-minute on-demand webinars led by COC subgroup members who helped spearhead this initiative. Since many of us may think we don’t have issues with how we communicate with patients, we provide you with an overview of why this program is needed for each module, citing the research and best practices to enhance your interactions. The tips and tactics are demonstrated in a series of simulated videos featuring anesthesiologists and



David Matthews (Matt) Hatch, MD, MBA, FASA

Vice Chair, ASA Committee on Communications, and Private Practice Anesthesiologist, Piedmont Triad Anesthesia, Winston-Salem, North Carolina.

You can access the complimentary course at asahq.org/PatientCommunication. Look for additional courses in the future on topics such as Expressing Empathy, Establishing Expectations, and Providing Culturally Competent Care. To learn more about the Enhancing Patient Communications Program and other ways to communicate your value, visit the Made for This Moment member page at asahq.org/member-center/patient-communications-toolkit. ■

members. In addition to Avoiding Jargon, the other CME modules are:

- “Introducing Yourself, Establishing Roles,” which demonstrates how to introduce yourself and other team members in a way that clearly establishes and explains the anesthesiologist’s role as leader of the anesthesia care team. It also helps us recognize the public’s lack of awareness about our specialty and the role we play in patient care
- “Nonverbal Communication,” which illustrates the importance of using body language and nonverbal cues to convey attentiveness and openness, and

patients. You may recognize me in some of them, and I hope you find them helpful by seeing how little changes made in your interactions can make a big difference.

We hope that all ASA members will take advantage of this program – from medical students, residents, and early-career physicians to experienced anesthesiologists. Effectively communicating with patients can help us ensure better care, improve outcomes, increase patient satisfaction scores, and increase reimbursement.



Trends & Technology

Continued from page 12

Transbronchial microwave ablation treats oligometastatic tumors

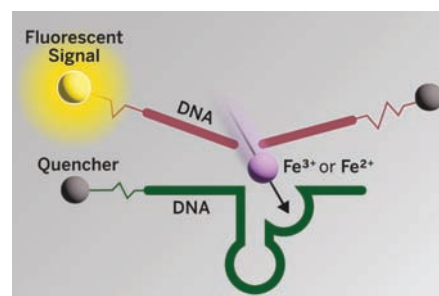
The first patient in North America has received treatment for oligometastatic (OML) tumors in the lung with Ethicon’s NEUWAVE™ FLEX Microwave Ablation System guided by the MONARCH® Platform. The company’s multicenter, single-arm study examines the safety and effectiveness of transbronchial microwave ablation on OML tumors. The lung is a common site for metastatic spread of solid organ cancers such as colorectal, kidney, and sarcoma. A subgroup of patients with solid organ cancers has residual tumors in the lung and other organs that do not resolve despite systemic treatments. This subgroup of patients is determined to have an intermediate state of advanced malignancy

in the lung, or OML disease, for which managing physicians seek minimally invasive and lung-sparing therapies. The precision robotic-assisted bronchoscopy delivers targeted transbronchial microwave ablation for the treatment of metastatic tumors in the periphery of the lung. The company’s transbronchial microwave ablation technology is a minimally invasive option and received FDA clearance in July 2020.

Source: asamonitor.pub/3noSGTr

Imaging probe investigates link between iron redox and Alzheimer’s

Researchers have developed a new imaging technique to expand upon evidence that iron in the brain may play a role in Alzheimer’s disease. The imaging probe has shown that there is an increase in iron redox in the same regions of the brain where the amyloid beta plaques associated with Alzheimer’s occur. Within the past decade,



Schematic of a novel iron sensor. when a short strand of DNA called a dnzyme (Green) binds to a specific form of iron (e.g., Fe³⁺ or Fe²⁺), the dnzyme cuts a second strand of DNA (Red) and releases a fluorescent signal (yellow) that indicates visually the presence of the specific form of iron. Credit: David Steadman/University of Texas at Austin

scientists discovered that ferroptosis leads to cell death and plays a key role in neurodegenerative diseases, such as Alzheimer’s. Researchers developed DNA-based

fluorescent sensors that can detect two different forms of iron (Fe²⁺ and Fe³⁺) at the same time in cell cultures and in brain slices from mice genetically modified to mimic Alzheimer’s. This is the first imaging technique that can simultaneously detect both forms of iron in cells and tissue while also indicating their quantity and spatial distribution. Researchers using the imaging probe can change one parameter at a time to see if it changes the plaques or the oxidative states of iron. That ability could help them better understand why there is an increased ratio of Fe³⁺ to Fe²⁺ in the location of amyloid beta plaques and whether increased iron redox is involved in forming the plaques. If further research determines that iron redox changes cause cell death in Alzheimer’s patients, that information could provide a potential new strategy for development of a drug that changes the ratio of Fe³⁺ to Fe²⁺ to help protect brain cells. ■

Source: asamonitor.pub/3nznWPv