

## Burnout: A Real and Growing Problem for ID

The pandemic's long hours, profound losses and intense pressures might seem a logical reason for burnout among ID professionals. But COVID-19 doesn't bear all the blame, since ID professionals were experiencing this challenge well before March 2020.

Susy Hota, MSc, MD, FRCPC, medical director at University Health Network, and Gonzalo Bearman, MD, MPH, professor, Division of Infectious Diseases, Department of Internal Medicine at Virginia Commonwealth University Health System, explored the causes and solutions in the session "Burnout in Healthcare Epidemiology."

"A lot of what we know about burnout comes from measuring it in a professional environment," Dr. Hota said. "But you can't separate that from your personal life."

Those who are perfectionists are more likely to be burn out, she said. And those who are burned out are more likely to have anxiety or depression.

This is a common issue among physicians. A 2016 study found that 50% of physicians surveyed reported symptoms of burnout. Those who were female, of a background underrepresented in medicine or in an early career stage were more prone to burnout.

For ID professionals, the issue is worse, with 53% of those surveyed reporting the issue. Those who were burned out cited inadequate compensation and a lack of support staff among the common drivers.

While this stretches back before the pandemic began, COVID-19 certainly hasn't helped. One study in

"Decisions we make around infection prevention and control policies affect thousands of people. That's an emotional burden that we carry."  
— Susy Hota, MSc, MD, FRCPC

Vancouver measured burnout levels for internal medicine physicians between August and October 2020, which coincided with a second wave there. Respondents reported burnout 68% of the time.

Dr. Hota listed a variety of reasons why ID professionals may be more prone to burnout. "Our patient is the health care facility or the system as a whole. Decisions we make around infection prevention and control policies affect thousands of people. That's an emotional burden that we carry. With those policies, we can't quite effect the change. That can be exhausting and involve repetition."

Add in that infection prevention and control are "chronically underfunded," said Dr. Hota, and "we wear multiple hats in order to get the work done."

But ID professionals can contribute to burnout and pressure on colleagues, too, she said: "By trying to be highly reliable, we won't work toward standardizing processes. By doing audit and feedback, we're imposing another source of oversight and control over clinical practices. Stewardship and other types of infection prevention and control are integrated into electronic medical

*Continued on page 10*

## Big Tech Offers Big Promises

Technological advances are offering significant promise for infectious disease professionals. "Using Big Technology to Tame Big Beasts" covered three distinct aspects of this: the use of digital solutions in contact tracing and patient notification after exposure to infectious diseases; the potential of machine learning in infection control and infectious disease management; and the benefits and challenges of auditing hand hygiene through an electronic system.

Joanna Masel, DPhil, professor at the University of Arizona, said that digital solutions for contact tracing are appealing for two reasons: speed and scalability. But people tend to have fears about privacy and surveillance when contact tracing is done in a digital, automated way, "and that's completely understandable," she said. The key is to keep information decentralized and local and to allow users to opt in when data must be centralized. In privacy-preserving apps, messages are random, without revealing information to the server, so even if information was extracted, only a limited amount would be available.

Dr. Masel spoke about an app in the U.K. credited with reducing the second wave of COVID-19 by about 25 percent. She also shared results from a smaller-scale effort at the University of Arizona in fall 2020. The technology can work, she said, but only with high adoption in a particular community/population. (Dr. Masel also noted that she has become involved with

a startup that distributes and sells such tech.)

Now is the time to reconsider contact tracing at scale, she said, because the incentive structure has flipped. Being traced was once solely altruistic and led only to uncompensated quarantine. But now, for those who are vaccinated, there would only be a need for testing rather than quarantine, and a positive result could lead to early treatment.

Erica S. Shenoy, MD, PhD, associate chief of the Infection Control Unit at Massachusetts General Hospital, presented "Machine Learning for Infection Detection and Prediction: The Future Is Now."

Machine learning is different from traditional approaches because it's data-driven rather than model-driven. In the machine learning approach, one starts with data, then outputs a model that can be applied to new data, she said.

This approach is particularly exciting now because of the wide availability of high-quality patient- and facility-level electronic health data. Dr. Shenoy gave examples of using data to predict the risk of — and perhaps prevent — *C. difficile* infection in hospitalized patients, as well as predicting patient deterioration from COVID-19 infection. The latter example used data routinely extracted from the electronic health record across multiple institutions with no data sharing between the institutions.

*Continued on page 10*

## A Deeper Dive on Strategic Clinical Trials

With so much important research underway, discovering and assessing new studies can be a daunting task. "Clinical Trials That May Change Your Practice" came to the rescue with an overview of recent clinical trials in viral, fungal and bacterial diseases, including discussion of why each trial was significant.

Thuy Le, MD, PhD, associate professor at Duke University School of Medicine, focused on clinical trials in fungal diseases. Genovefa Papanicolaou, MD, attending physician, Infectious Diseases Service, Depart-

ment of Medicine, Memorial Sloan Kettering, covered viral. And Dafna Yahav, MD, Rabin Medical Center and professor at Tel Aviv University, considered bacterial.

Dr. Le gave an overview of the limitations of current antifungals and shared research on novel antifungal compounds.

Dr. Le gave an overview of the limitations of current antifungals. She then shared research on novel

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## Sex, Gender and HIV: Looking to the Horizon

When it comes to HIV, sex and gender matter. “HIV State of the Art: On the Horizon” explored differences in disease progression, pre-exposure prophylaxis uptake and more.

Latesha Elope, MD, assistant professor of medicine at the University of Alabama, opened the session with a quick review of the four pillars of ending the HIV epidemic: diagnosis, treatment, prevention and quick response to potential HIV outbreaks. She focused on prevention of new transmissions through pre-exposure prophylaxis.

The challenge, she said, is that 40 years into the epidemic, there are still shocking disparities.

Black women account for more than two-thirds of HIV diagnoses among women, for example, and are six times more likely to be infected by HIV than their white counterparts. Black gay and bisexual men — specifically those in the South — have the highest new infection rates of HIV. Further, recent research has shown that most new HIV diagnoses among transgender people are among Black/African American people.

PrEP has a 92% efficacy with consistent use. But there are disparities in PrEP use, thanks to marginalization, barriers, stigma and other factors; it is underutilized in the populations that need it most.

Addressing the issues of access and uptake requires increasing understanding of individual intersecting identities related to race, gender, culture, poverty and even intimate partner violence. Beyond the individual level, there are also personal relationships with significant others, health care providers, family and friends; cultural influences; and community considerations.

And finally: public policy. “One thing we can work on is making sure, as we’re developing all of these different options for PrEP, that we’re also looking at things like, ‘Do insurance companies provide coverage for this? And how are people who are underinsured or uninsured going to be able to afford this?’” Dr. Elope said.

Cecile Lahiri, MD, MS, associate professor at Emory University, spoke about sex and gender differences in HIV comorbidities. She highlighted the importance of including women in HIV clinical research and reporting sex-stratified results. Dr. Lahiri also covered the sex-specific epidemiology of aging related to non-AIDS comorbidities and insights on potential mechanisms to explain these sex differences. She began by clarifying the difference between sex (biological aspects) and gender (a social construct). “But most of you realize that both of these concepts are a little bit more complicated than that,” she said. “And they reflect a wider spectrum.”

Research almost always reflects sex as a dichotomous variable (men vs. women based on sex assigned at birth), she said, adding, “I ask you to keep these limitations in mind.”

That said, more than half of the more than 38 million people living with HIV worldwide are girls and women. And yet, women have constituted less than 20% of HIV clinical trial participants for antiretroviral therapy and less than 10% of those that looked at HIV cures. Vaccine studies were better, though still just at 38%.

There are differences between women and men in anatomy, genetics, immune cell phenotypes, latency maintenance and hormonal influence on the

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—Latesha Elope, MD

microbiome. In addition, people with HIV are now living longer lives, and multimorbidity is increasing in this population — for example, bone disease, cardiovascular disease, hypertension and chronic kidney disease. Sex- and gender-specific comorbidity screening, prevention and management tools are urgently needed, she said, for those with HIV as they age.

Eileen Scully, MD, PhD, assistant professor of medicine at Johns Hopkins University, rounded out the session with a talk on gender differences in inflammation and disease progression.

Inflammation is the result of an appropriate immune response, she said, but it can drive disease progression in chronic viral infection. When that inflammation is persistent, it can mediate pathogenesis related to the infection and the consequences of the immune response, but “there’s been really limited assessment of the impact of sex and gender on these aspects of pathogenesis,” Dr. Scully said. Moving the field forward will mean including sex as a biological variable in analysis of clinical trial data and basic science, but without excluding gender effects. It’s also important to consider sex and gender as a component of personalized medicine approaches, she said.

## CALL ON CONGRESS TO BOLSTER THE INFECTIOUS DISEASES WORKFORCE



As the ID Community Convenes for IDWeek to Collaborate and Learn from Each Other

Take Action to Support the Next Generation of ID Health Care Professionals

Urge your Senators and Representatives to support the ***Bolstering Infectious Outbreaks Professionals Workforce Act of 2021*** — a new loan repayment program for physicians, pharmacists, physician assistants, nurse practitioners, laboratory professionals, infection preventionists and dentists engaged in biopreparedness or ID care.

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This activity is jointly provided by Global Education Group and Integritas Communications.  
This educational activity is supported by an educational grant from GlaxoSmithKline.  
This is an affiliated event (not official IDWeek programming).

**RELEASE DATE:** October 15, 2021

**EXPIRATION DATE:** October 15, 2022

## TARGET AUDIENCE

This program is intended to educate infectious diseases, internal medicine, and other clinicians involved in the management of patients with mild or moderate coronavirus disease 2019 (COVID-19) who are at risk for clinical progression.

## EDUCATIONAL OBJECTIVES

After completing this activity, participants will be better prepared to:

- Discuss the clinical profiles and trial data for current and emerging anti-SARS-CoV-2 monoclonal antibodies
- Assess patients with COVID-19 who are at high risk for clinical progression, hospitalization, and other poor outcomes
- Manage patients with COVID-19 who qualify for anti-SARS-CoV-2 monoclonal antibody therapy based on current guidelines from the US Food and Drug Administration
- Address barriers to the use of anti-SARS-CoV-2 monoclonal antibody therapies, including patient reluctance and health care disparities

### PHYSICIAN ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Global Education Group (Global) and Integritas Communications. Global is accredited by the ACCME to provide continuing medical education for physicians.

### PHYSICIAN CREDIT DESIGNATION

Global Education Group designates this live activity for a maximum of 1.0 AMA PRA Category 1 Credit™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

### INSTRUCTIONS TO RECEIVE CREDIT

Participants must 1) read the learning objectives and faculty disclosures; 2) view the educational activity; and 3) complete the posttest and evaluation form directly after the activity.

### NURSE PRACTITIONER CONTINUING EDUCATION

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This activity has been planned and implemented in accordance with the Accreditation Standards of the American Association of Nurse Practitioners (AANP) through the joint providership of Global Education Group and Integritas Communications. Global Education Group is accredited by the American Association of Nurse Practitioners as an approved provider of nurse practitioner continuing education. Provider number: 110121. This activity is approved for 1.0 contact hour(s) (which includes \* hour(s) of pharmacology).

\*Pharmacology hour(s) to be determined after clinical content review.

### GLOBAL CONTACT INFORMATION

For information about the approval of this program, please contact Global at 303-395-1782 or [cme@globaleducationgroup.com](mailto:cme@globaleducationgroup.com).

## Molecular Imaging of Bacterial Infections Awarded Grand Prize at 2021 IDea Incubator Competition

The [Infectious Diseases Society of America Foundation](#), in collaboration with [Johnson & Johnson Innovation – JLABS](#), recently awarded more than \$17,000 in funding through the 2021 [IDea Incubator](#) competition to three finalists for their promising innovations aimed at advancing the field of infectious diseases.

The pitch-style competition was hosted Sept. 28 as a part of the second fully virtual IDWeek conference. The finalists, who were selected out of more than 50 applicants from across the U.S., presented their original ideas, products and concepts to a panel of five judges across the business, technology and health care fields as well as a live virtual audience.

Sanjay Jain, MD, Filipa Mota, PhD, and Alvaro Ordonez, MD, of Johns Hopkins University took home the top grant of \$10,000 for their innovation Molecular Imaging of Bacterial Infections. The team developed F-FDS, a patent-pending, bacteria-specific PET imaging technology that differentiates gram-negative bacterial infections from other diseases, such as cancer metastases and tumors. Unlike more traditional approaches for diagnosing infections, F-FDS does not require surgery or biopsy, has nearly 100% specificity and can detect infections anywhere in the body with rapid results available within the same day.

Kyriaki Hatziagapiou, MD, PhD, Spyridon

Kintzios, PhD, and Sofia Mavrikou, PhD, were awarded \$5,000 for their innovation Cell-Based Bio-electric Biosensor for the Detection of the SARS-CoV-2 S1 Spike Protein Antigen. The team developed a low-cost, easy-to-use test that uses bioelectric recognition assay technology to provide a fast and accurate diagnosis of SARS-CoV-2 and other respiratory pathogens, with results provided within three minutes.

Additionally, David Kaufman, MD, and Josh Odrich, both from the University of Virginia, received \$2,500 to further develop their innovation, the Neonatal Antibiotic Stewardship App. The free web-based app offers 24/7 evidence-based guidance for neonatal providers to stop or narrow the spectrum of antibiotics that are prescribed in neonatal intensive care units with the hopes of reducing infants' risks for life-long adverse effects.

"The IDea Incubator competition sparks innovation and provides funding for exciting new ideas in the field of infectious diseases," said Stephen E. Peeler, CFRE, executive director of the IDSA Foundation. "Through our continued collaboration with JLABS, we're able to bring more visibility to this competition among some of the brightest minds across industries, as well as expand the valuable content offered during the live event."

This year, by engaging with [BLUE KNIGHT™](#)

— JLABS' joint initiative with BARDA (Biomedical Advanced Research and Development Authority) — attendees had the opportunity to learn about eligibility requirements, selection processes and potential benefits of joining the Blue Knight initiative or other BARDA innovation initiatives during an intermission session.

"At the IDea Incubator, we come together to encourage and celebrate big thinkers who are getting creative in their approach to improving global health through science and technology," said Rachel Rath, MBA, MPH, director of the BARDA Alliance for JLABS. "Through our collaboration with the IDSA Foundation, we can potentially further ignite the work of promising innovators by introducing them to a global network of like-minded experts and entrepreneurs."

Javeed Siddiqui, MD, MPH, chair of the IDSA Telehealth and Emerging Technologies Workgroup and co-founder and chief medical officer of TeleMed2U, launched the first IDea Incubator at IDWeek in 2018. Since then, the competition has awarded nearly \$70,000 in funding. Siddiqui served as the host of this year's competition.

For more information about IDea Incubator, including information about past awardees, visit [idsafoundation.org/ideaincubator](https://idsafoundation.org/ideaincubator).

A [full recording of this year's competition](#) is also available.

## Precision Medicine Offers Possibilities for Pediatrics

Imagine a world in which a physician can anticipate development of a cytomegalovirus in a pediatric transplant patient, know which children will contract pneumonia and who is most at risk for an adverse drug reaction. Thanks to new tools and insight, those ideas are getting a bit closer to reality.

That was the focus of the session "Precision Pediatric ID: Targeting Treatment and Prevention Strategies for Challenging Pediatric Infections."

Daniel Dulek, MD, assistant professor of pediatrics at Vanderbilt University Medical Center and Monroe Carell Jr. Children's Hospital at Vanderbilt, explored prevention and treatment of infectious diseases in transplant patients. Using a frame of cytomegalovirus to explore immune modeling, Dr. Dulek discussed several studies that focused on T-cell immunity and NK cells.

Though his work is primarily with pediatric transplant patients, most studies focused on adults. "One of the challenges is there are limited data to guide a precision approach to CMV prevention and treatment strategies in pediatric transplant patients," he said.

Kevin Downes, MD, assistant professor of pediatrics, Division of Infectious Diseases at Children's Hospital of Philadelphia, explored biomarkers that

may show an increased risk of sepsis or pneumonia. "Those are big causes of death for children worldwide," he said. The World Health Organization estimates there are 150 million pediatric cases of pneumonia annually, accounting for about 15% of deaths in children younger than age 5.

Dr. Downes discussed various biomarkers including presepsin, pneumonia soluble urokinase receptor (suPAR), cytokines and microRNA.

"I believe that a multi-biomarker approach or biomarker profiles will be the best way to characterize the etiology and severity of infections in children," he said. "Obviously cost and standardization of multi-biomarker approaches need to improve to make them more feasible."

Jennifer Goldman, MD, MS-CR, associate professor of pediatrics at Children's Mercy Kansas City, University of Missouri-Kansas City, wrapped up the session discussing how genomic testing might reduce adverse drug reactions. She pointed out that she was focusing not on overdoses or the wrong medicine given to a patient, but only those cases "when a drug is prescribed and it causes an unintended consequence."

These events account for anywhere from 4 to 30% of hospital admissions, costing billions in the United States alone. "As we know, as those

who prescribe them, antimicrobials are the most common drug to cause an adverse drug reaction in pediatrics."

There are on-target adverse drug reactions, which are "considered predictable." This might include when an antibiotic kills off good bacteria, leading to *C. difficile*. With off-target ADRs, genomics may be a valuable tool in helping to prevent these reactions.

"Several studies now show potential avoidability of antibiotic adverse drug reactions. This is important when we think about drug safety. It's this balance between antimicrobial stewardship and pharmacovigilance."

Identifying biomarkers may eventually help prevent many of these ADRs, she believes. Research on how specific genotypes interact with specific drugs could open new possibilities as well.

However, only about 10% of drugs contain information on genetic factors and drug response, Dr. Goldman said.

Still, "these are really exciting times, and some exciting research is going on," she said. "Potential clinical benefits of genetic testing would be to prevent these rare but life-threatening severe reactions. We want to be able to monitor and risk stratify."

## SHEA Offers Prevention Course in HAI Knowledge and Control

SHEA's [Prevention Course in Health-care-Associated Infection Knowledge and Control \(Prevention CHKC\)](#) is designed to train frontline health care personnel, defined as those responsible for direct patient care, in best practices to prevent and control health care associated infections and pathogens that can spread in the health care setting.

Available through [SHEA's Learning CE site](#),

this training educates frontline personnel to successfully execute best practices in topics that include:

- Prevention of CLABSI, CAUTI, SSI and VAP/VAE
- Prevention of *C. difficile* and MRSA
- Prevention strategies, including methods for appropriate performance and timing of hand hygiene in the health care setting as well as disinfection and environmental control



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While there are no FDA-approved therapeutic options with the ability to repopulate the microbiome today, ongoing research is investigating microbiome restoration for the future<sup>2,6,12</sup>

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Perspectives on the pathogenesis of recurrent *Clostridioides*  
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## IDSA and HIVMA Recognize Members for Outstanding Achievements and Contributions

The Infectious Diseases Society of America and its HIV Medicine Association announced recipients of the organizations' highest honors during a virtual celebration on Sept. 30.

IDSA is proud to present the **Alexander Fleming Lifetime Achievement Award** to **David Relman, MD, FIDSA**. A trailblazing researcher, Dr. Relman developed the first cultivation-independent, molecular approach to identify previously uncharacterized microbes in humans. His work has inspired a revolution in ID molecular diagnostics. A clear voice for ethics, transparency and the public good in the scientific enterprise, Dr. Relman has contributed to national policy discussions in multiple areas, including gain-of-function research and, most recently, the search for the origins of the SARS-CoV-2 virus.

HIVMA is proud to honor **Roger Bedimo, MD, MS, FIDSA**, with its **Clinical Educator Award**, which recognizes members who have demonstrated significant achievement in HIV clinical care and provider education and who move the field of HIV prevention and care. Dr. Bedimo is recognized for his exemplary service contributions as an HIV clinician and researcher, as well as his deep commitment to mentoring the next generation of infectious diseases professionals and increasing equity and access in the field. Most recently, he has taken on four COVID-19 related national research studies and was selected as a member of the Department

of Health and Human Services and National Institutes of Health Panel on Guidelines for the Management of COVID-19.

IDSA and HIVMA are also pleased to recognize the following IDSA and HIVMA members for their outstanding work and contributions to the field:

The **D.A. Henderson Award for Outstanding Contributions to Public Health**, named to honor the memory of the epidemiologist who led the successful eradication of smallpox, recognizes a lifetime of achievement in public health. This year's recipient is **Lawrence C. Madoff, MD, FIDSA**.

The **Watanakunakorn Clinician Award** honors the memory of Dr. Chatrchai Watanakunakorn and is given by the IDSA Foundation to an IDSA member or fellow in recognition of outstanding achievement in the clinical practice of infectious diseases. This year's awardee is **Steven W. Parker, MD, FIDSA**.

The **Walter E. Stamm Mentor Award**, which honors late past-president Walter E. Stamm, MD, is presented to an IDSA member or fellow who has been exceptional in guiding the growth of ID professionals. This year's winner is **Michael Wessels, MD, FIDSA**.

The **Oswald Avery Award for Early Achievement** recognizes outstanding achievement in infectious diseases by a member or fellow of IDSA who is 45 or younger. This year's recipient is **Michail Lionakis, MD, ScD, FIDSA**.

The **Clinical Practice Innovation Award** recognizes members who devote the majority of their time to patient care and who have significantly advanced the clinical practice of infectious diseases within the last 5 years. This year IDSA presents this award to two individuals: **Erin K. McCreary, PharmD, BCPS, BCIDP**, and **Vera Luther, MD, FIDSA**.

The **Society Citation Award** is given in recognition of exemplary contribution to IDSA, an outstanding discovery in the field of infectious diseases or a lifetime of outstanding achievement. This year, IDSA presents this award to four individuals: **Dial Hewlett Jr., MD, FIDSA**, **Suzanne F. Bradley, MD, FIDSA**, **Henry Masur, MD, FIDSA**, and **Tina Tan, MD, FIDSA**.

The **Clinical Teacher Award** honors a career dedicated to teaching clinical infectious diseases to fellows, residents and medical students, recognizing excellence as a clinician and motivation to teach the next generation of physicians. This year, the award goes to **Carlos Isada, MD**.

The **HIVMA Research Award** recognizes members who have made significant contributions to HIV clinical or basic research early in their career. This year's award goes to **Colleen Kelley, MD, MPH**.

More detailed information and biographical information on award winners is available on the [IDSA](#) and [HIVMA](#) websites.

## Clinical Trials

*Continued from page 1*

antifungal compounds such as oteseconazole, rezafungin, ibrexafungerp and enochleated AmB. Oteseconazole is an oral tetrazole effective for superficial fungal infections such as acute and recurrent vulvovaginal candidiasis and onychomycosis of the toenail; rezafungin is a once-weekly echinocandin used to treat candidemia and invasive candidiasis; ibrexafungerp is effective for VVC, and multiple trials are ongoing for more invasive infections; and enochleated AmB shows promise for treatment of cryptococcal meningitis with less toxicity than other options.

She also covered new antifungal strategies for existing drugs. Posaconazole, she said, appears to be a more tolerable option for treatment of invasive aspergillosis than voriconazole; and a single high dose of liposomal amphotericin B (LAmB) is non-inferior to seven days of amphotericin B deoxycholate (d-AMB) for induction therapy of cryptococcal meningitis with better tolerability.

Dr. Papanicolaou also spoke about a number of clinical trials: AZD7442 PROVENT Phase III prophylaxis for COVID-19; molnupiravir treatment for mild to moderate COVID-19; DAS181 for parainfluenza;

maribavir for transplant-associated refractory cytomegalovirus infection; and poxvirus vectored CMV vaccine. AZD7442 marks the first antibody combination to potentially provide long-lasting protection from COVID-19 in a clinical trial. Molnupiravir has shown clinical benefits when started early in high-risk populations. Maribavir is believed to be a safer alternative to current antivirals.

Dr. Yahav discussed the comparison of seven- and 24-day treatment of antibiotics on afebrile men with urinary tract infections. UTI is a common reason for antimicrobial use, she said, and UTI in men "lacks a defined optimal treatment duration."

The primary outcome for the study was resolution of symptoms, and seven days of treatment was found effective. But questions remain: First, the study was limited to ciprofloxacin and TMP/SMX; would the findings be the same with other drugs? What might the results be with febrile UTI? And could the treatment be even shorter?

Dr. Yahav also discussed another study: the effect of a seven-day or 14-day treatment of C-reactive protein-guided antibiotics on the 30-day clinical failure rate for patients with uncomplicated gram-negative bacteremia. Gram-negative bacteremia is frequent; there's a marked variability in the choice of antibiotic duration; and a previous randomized

clinical trial supported seven days. The result: the seven-day treatment was non-inferior to 14 days, with no statistical differences in clinical failure by day 30 (with "failure" defined as relapse, complications, restart of antibiotic therapy or death).

A third trial looked at discontinuing  $\beta$ -lactam treatment after three days for those with community-acquired pneumonia in non-critical-care wards. Most guidelines recommend five to eight days of antibiotics, based on studies of five or more days. Here, too, there was non-inferiority with three days of treatment.

If patients with moderately severe CAP are stable at three days, then they can receive just three days of treatment. But questions remain in terms of those who are not stable by the third day, those with aspiration pneumonia or intra-cellular bacteria, and those who are immunocompromised.

Finally, she explored three trials related to the use of daptomycin: in methicillin-susceptible *Staphylococcus aureus* bacteremia; alone or with fosfomycin for methicillin-susceptible *Staphylococcus aureus* bacteremia and endocarditis; and with or without an antistaphylococcal  $\beta$ -lactam in patients with MRSA bacteremia. In summary, Dr. Yahav cautioned against combination therapy for *Staphylococcus aureus* bacteremia outside of clinical trials.

## Apply for HIV Clinical Fellowship

The [HIV Medicine Association](#) and the [IDSA Foundation](#) are [accepting applications](#) for the 2022–2023 HIV Clinical Fellowship training year. The award includes a stipend set according to the PGY-4 salary level at the training institution, funds to cover the fringe benefits provided by the sponsoring organization and an additional \$5,000 to support educational opportunities or offset administrative costs. Up to two fellowships will be awarded.

The application period will close on Dec. 13. Program and application requirements are on the [HIVMA website](#), including [recommended competencies](#) for HIV clinical fellows. [Email HIVMA staff](#) with questions or for more information.

## Mark Your Calendar Now for IDWeek 2022

Plan now to attend IDWeek 2022, Oct. 19–23, 2022, in Washington DC. IDWeek 2022 will feature the state-of-the art science and timely content you expect from the premier infectious diseases event as well as can't-miss networking and career opportunities for all health care professionals in ID and healthcare epidemiology and prevention.

Exhibitor and partner opportunities to host sessions, exhibit, support and promote industry content during the event will launch in January 2022.

Visit [idweek.org](#) for on-demand access to 2021 and 2022 event information as it becomes available. We look forward to seeing you there!

## Outpatient ID Brings Constant Challenges

More testing is not always the answer, particularly when it comes to unusual cases that come into an outpatient ID practice.

Using actual case studies, Ole Vielemeyer, MD, associate professor of clinical medicine at Weill Cornell Medical College, and Kristin Englund, MD, infectious disease physician at Cleveland Clinic Foundation, attempted to stump each other with “clinical vignettes that highlight challenges when taking care of patients,” as Dr. Vielemeyer said at the outset. The two led the session “Clinical Pearls in Outpatient ID Practice: Field Notes from the Front Lines.”

For the first case, Dr. Vielemeyer discussed a 35-year-old woman who had recently gotten engaged and sought testing for sexually transmitted diseases. All tests were negative except for HSV-1 AB positive. Her fiancé accused her of cheating.

“We do see those patients not all that infrequently,” said Dr. Vielemeyer. “The first thing to remember is when you get a diagnosis of herpes, it’s a traumatic experience for these patients. They understand that this is a stigma that will be there for the rest of their lives. You have to show empathy and explain that it’s a serious issue. At the same time, it’s important to remind patients that this is not uncommon.”

Dr. Englund noted that she might not have even screened for HSV-1 because “it does add a complication because so many people are antibody positive.”

Digging into the case record more deeply, however, it was revealed that the patient had remembered incorrectly; she had actually been positive for HSV-2. “It’s always important to verify with the record,” Dr. Vielemeyer said. “It changes the case.”

Dr. Englund noted that she would be “talking about testing her partner” and if he was negative, she would discuss safe methods to prevent transmission.

The second case focused on a 45-year-old man who was referred from a local neurology colleague for pelvic pain and urethral burning, something he had endured for six years.

“It must be exhausting and stressful. We need to acknowledge that for him,” Dr. Englund said. “I would go over the testing so that he’s fully aware that you know what the workup has been. Next, we need to discuss the treatment that he has had and the fact that it’s been very adequate. Trying to find out the timing of this and when all the symptoms started may lead us down a better path rather than just more testing and treatment that may not be successful.”

She suggested asking what had happened in his life before the symptoms began, pointing to a possible traumatic event or psychological cause. “You can’t make that diagnosis of the patient right away without going through all the treatment that they’ve had. You also cannot get caught up in ordering more tests. It’s easy to do that. You can’t go down the easy route.”

Dr. Vielemeyer said that in cases like these, with chronic suffering without a clinical reason, “it’s really important to show empathy. You can acknowledge that the patient deserves to be in better health.”

Other cases included an 88-year-old man who is “clearly demented.” While syphilis was suspected as a root cause, getting an accurate sexual history from the demented man would be impossible and embarrassing to ask of his daughter. In another case, the patient presented with chronic itching and was certain that it was a parasitic disease.

“These patients have such intricate stories,” Dr. Englund said. “It is important to start off by listening to the patient. Chances are they’ve seen a lot of people who have blown them off. Delusory parasitosis is something we’ll be seeing and there is very little that we can do with this.”

It takes encouraging patients that “more medication is not going to be better,” she said, and probably a referral to a psychiatrist. “You might say something like, ‘Even though I don’t understand what’s causing your symptoms, I want you to be treated for the stress that this is causing you.’”

Digging into unusual cases and complex patients can be challenging. But ID clinicians working in outpatient settings should employ a few strategies, Dr. Englund said. “When anything can come in to you, drop that façade of knowing everything. Get used to looking things up and asking your colleagues.”

## IDSA, SHEA and PIDS Issue Statement on Caring for Individuals Returning and Evacuated from Afghanistan

The U.S. government is working with returning U.S. citizens and resettling Afghan nationals from Afghanistan. The Infectious Diseases Society of America, the Pediatric Infectious Diseases Society and the Society for Healthcare Epidemiology of America recommend, in collaboration with the U.S. Centers for Disease Control and Prevention, that clinicians caring for these evacuees consider the varied presentations of medical conditions, including infectious diseases. The spectrum of infections may include tropical diseases, vaccine preventable diseases and infections caused by multi-drug-resistant organisms.

Many of the evacuees are from areas with limited access to health care and vaccinations, raising the risk of infectious diseases. Evacuees

may also be colonized with MDROs, which increases their risk of MDRO infection. Antibiotic susceptibility testing of isolates from clinically significant cultures (i.e., those causing infections) is an effective way to identify MDROs and inform antimicrobial treatment, if needed.

IDSA, PIDS and SHEA recommend that all clinicians who may care for evacuees are aware of the recent [CDC Health Alert Network guidance](#) that reports that evacuees are at increased risk of gastrointestinal infections, including shigellosis, giardiasis, cryptosporidiosis, rotavirus and viral diarrheal diseases. CDC is also aware of some cases of measles, varicella, mumps, tuberculosis, malaria, leishmaniasis, hepatitis A and COVID-19 among evacuees. In addition, clinicians should ensure that evacuees are evaluated and confirmed

to be up to date on routine ACIP and CDC recommended immunizations and that appropriate actions are taken to prevent further spread of these diseases.

Clinicians are encouraged to maintain heightened awareness for the possibility of MDROs, in addition to the infectious diseases noted above, and consider obtaining appropriate microbiologic cultures among patients arriving in or returning to the United States from other countries. This recommendation reinforces that clinicians should continue to collect a detailed travel history to help identify and provide appropriate and effective treatment to prevent further spread of infectious diseases.

## PIDS Provides Free Educational Resource to Train Strong Vaccine Advocates

Vaccinating children against infectious diseases is one of the most effective public health interventions of modern times. These benefits, however, are threatened when immunization rates drop, either because of vaccine hesitancy among parents or, more recently, because of disruptions to health care delivery due to the COVID-19 pandemic.

In response, the [Pediatric Infectious Diseases Society](#), in collaboration with partners at Children’s Mercy Kansas City in Kansas City, Missouri, and Vanderbilt University Medical Center in Nashville, Tennessee, launched [Vaccine Education from Training to Practice](#), a new educational program designed to provide health care providers with training and resources to be strong advocates for childhood immunizations and support high immunization rates.

This free online educational curriculum and electronic resource is designed for pediatric and family medicine residents, fellows in training and anyone interested in vaccine education, including practicing physicians, nurse practitioners, pharmacists and others. The program includes a curriculum created by the Collaboration for Vaccination Education and Research (CoVER) that has been shown to improve vaccine knowledge and confidence when counseling parents about immunizing their children.

The program’s nine online educational modules cover vaccine fundamentals, vaccine safety, vaccine preventable diseases, vaccine communication, HPV, influenza, COVID-19 vaccines, bacterial meningitis and travel vaccines. This content is now available on the [PIDS website](#), along with the

latest edition of the Vaccine Handbook App, which contains the full content of *The Vaccine Handbook: A Practical Guide for Clinicians*.

Accessible on iOS and Android devices, the Vaccine Handbook App includes new content on vaccines to prevent COVID-19 as well as updates on the science of in vivo expressed subunit vaccines, emergency use authorization for vaccines and maintaining routine immunizations during the pandemic. Timely updates on other vaccines and related issues, including how to address concerns, are also provided.

The CoVER modules and TVH app are available free of charge through unrestricted educational grants to the PIDS Foundation from GlaxoSmith-Kline; Merck & Co., Inc.; Sanofi Pasteur US; Pfizer, Inc.; Seqirus USA, Inc.; and Valneva USA, Inc.



## What's Hot in ID + HIV: The Heat Goes On

Infectious disease trailblazer John Bartlett, MD, captivated IDWeek audiences with his popular annual “What’s Hot” summaries.

This year, following Dr. Bartlett’s passing, a host of physicians picked up the torch and took off running. “He was a role model and mentor to thousands of infectious disease clinicians, and we hope to do him justice with this session going forward,” said Susan Rehm, MD, vice chair of the Department of Infectious Disease at Cleveland Clinic.

In addition to Dr. Rehm, “What’s Hot in ID + HIV” featured Rajesh Gandhi, MD, professor of medicine at Harvard Medical School and director of HIV clinical services and education at Massachusetts General Hospital; Diane Havlir, MD, chief of the Division of HIV, Infectious Diseases and Global Medicine/School of Medicine/University of California, San Francisco - Zuckerberg San Francisco General Hospital; and Cynthia Sears, MD, professor at Johns Hopkins University School of Medicine. Dr. Gandhi covered what’s hot in HIV basic and translational science; Dr. Havlir spoke about HIV clinical science; Dr. Sears considered what’s hot in ID basic and translational science; and Dr. Rehm discussed ID clinical science.

“In preparing for this talk, despite COVID, I was really struck by the many exciting non-COVID ID papers that have been released in the last year,” Dr. Sears said. “So there were a lot of tough choices, and I’m only showing you a snapshot of what is worthy — and only a snapshot of what’s in those papers.”

That “snapshot” included fungal disease, antimicrobial resistance and global health (partic-

ularly malaria, dengue and malnutrition). Dr. Sears quoted *Scientific American* on the idea that fungi are “moving right now, changing their habitats, altering their patterns, taking advantage of emergencies such as COVID to find fresh victims.”

Dr. Rehm touched on the duration of antibiotic treatment for various infections, as well as treatment of rectal chlamydia infection, infections among solid organ transplant recipients, evolving uses of PET/CT imaging in ID and other “potpourri.”

Dr. Gandhi explored what it will take to cure HIV. He also discussed how antibodies might be used to treat and prevent HIV, where we are in the quest for an HIV vaccine and what advances might help those with HIV live longer and healthier lives. Several recent independent studies, for example, showed that intact proviruses (potentially replication competent) decline over time on antiretroviral therapy, but defective proviruses do not. “What we really need to know now is ... if an intervention lowers proviral DNA, does that translate into a longer time to HIV rebound?” said Dr. Gandhi. One study suggests that’s the case, but larger studies are needed for validation. Also of note in the past year: increased understanding that it’s not just the quantity of the reservoir that matters, but also the quality and location.

In terms of improving health, Dr. Gandhi said, there are new insights into the role of inflammation and fibrosis in chronic diseases, and novel interventions are being pursued for targeting inflammation and reversing fibrosis.

Finally, Dr. Havlir covered whether long-acting ART is “here or almost here” and took a look at

longer and ultra-long ART on the horizon. She also discussed the “double trouble” of COVID and HIV, the bane of weight gain for ART management and the 40th anniversary of the first report of HIV.

First, she said, the FDA approval of the long-acting combination of cabotegravir/rilpivirine earlier this year represents a “historic milestone in HIV treatment.” Patients now have the option, she said, to maintain viral suppression with a once-monthly injectable regimen. In addition, cabotegravir injections alone every two months are under review for HIV prevention. Data like these mark the beginning, Dr. Havlir said, of an “aspirational trajectory” for HIV long-acting treatment and prevention.

As for the anniversary of the first report of HIV, Dr. Havlir noted the “remarkable successes” that have come in response to the epidemic, particularly over the last decade. Of the 37 million people living with HIV worldwide, 27.4 million are now on ART. ART is now better, easier and more tolerable. There’s now a normal life expectancy with treatment. In addition, there are more HIV drugs coming and there’s a robust cure agenda.

That said, there are still “alarming” gaps and disparities in treatment and viral suppression in the U.S. The trajectory of decline for HIV infection — particularly in specific populations — is still too slow, and children are being left behind in ART treatment. Globally, many children are not being tested; 54% of children living with HIV are receiving ART therapy, compared with 73% of adults.

“More of the same,” she said, “will not get us where we need to go.”

## Long COVID’s Impact Explored

There is much still to be learned about the long-term effects of COVID-19. Still, three experts offered the latest information on its impact on the heart, brain and lungs in the session “Long COVID.”

Erica Spatz, MD, MHS, associate professor of cardiovascular medicine, Yale University School of Medicine, Allison Navis, MD, assistant professor, Division Neuro-Infectious Diseases, Icahn School of Medicine at Mount Sinai, and Emily Fraser, PhD, MRCP, MBChB, consultant in respiratory medicine at Oxford University Hospitals NHS Trust, went in-depth in each of those three areas, sharing the latest information as well as where uncertainty remains.

One thing is for sure, however: “Most of us have learned the most about long COVID from the media, from newspapers who have profiled patients who have suffered from the long-time consequences of having acute coronavirus infection,” Dr. Spatz said. “Many of their stories are heartbreaking.”

Clinicians are beginning to refer to it as post-acute sequelae of coronavirus, or PASC, which occurs when symptoms extend beyond 12 weeks post infection. Fatigue, malaise, brain fog, sleep disturbances and a host of other challenges can be present.

Dr. Spatz said that some studies suggest 10 to 30% of adults who contract acute COVID-19 will have these ongoing symptoms. “It’s a whole range of symptoms that have baffled us,” she said. “Some people will have a steady decline in their system, some will have a heightened response and some will have an acute response.”

Studies are limited because of lack of a control group and respondent bias, since many of the

current research projects are based on finding participants through social media, she said.

At Yale, Dr. Spatz’s institution, a CDC-funded study called INSPIRE is attempting to follow patients for 18 months to track clinical outcomes. It does have a control group as well.

One thing is clear: because of the myriad of symptoms these patients deal with, “we need multidisciplinary teams,” Dr. Spatz said. “The longer we’re in this game, the more we don’t know.”

A comprehensive post-COVID center at Yale called RECOVERY brings together pulmonary, cardiology, neurology, rheumatology and psychiatry experts. Teams also work closely with social workers and physical therapists, she said: “It’s been an immense opportunity to connect with other health care providers to understand what’s going on to help them get better.”

Given that many with long COVID are young and had no underlying health conditions, the challenge is on. “People are very much taken out of their life, their work productivity,” Dr. Spatz said. “This can last months and maybe a year.”

While there rarely is evidence of organ injury, it’s clear those patients are “having a difficult time,” she said.

She believes clinicians are ready for “some large rigorous randomized controlled trials at all stages of inquiry. We need one approach. A disease like PASC exposes some of the gaps in our health care system, some of the gaps in treatment and care.”

Dr. Navis explored the neurologic complications of PASC. She agreed that it is “really unclear” how many of those with acute COVID are impacted. “Neurological symptoms seem to be more com-

mon with PASC than from COVID,” she said.

Those symptoms can range from Guillain-Barré syndrome and myelitis to brain fog and headaches. “For many people, these symptoms can be persistent of symptoms they had with COVID illness, or they can develop new symptoms,” said Dr. Navis.

Diagnostic tests like CT scans and MRIs typically are normal to rule out strokes or large inflammatory lesions. “Most brains look normal,” she said. “We do see white matter changes in some MRIs, but it’s important to keep in mind that these are extremely normal findings.”

Through the last year or so, her approach to a patient workup “has changed rapidly.” She’ll begin by testing to rule out anything else. She said, “If you’re doing it for an answer to the symptoms, you likely won’t find anything.”

Dr. Fraser explored the respiratory impacts and concerns of scarring. Research showed that the majority of patients hospitalized with COVID pneumonia have abnormalities on a CT scan at 12 weeks, while 58% have one abnormal lung function parameter. “There is a discrepancy between symptoms and radiological findings,” she said.

Even in patients who appear to heal normally, there remain abnormalities. “We are seeing patients coming through with a significant amount of healing with fibrosis. Anecdotally, it seems to be older patients. What we’re not seeing to date is a new disease process.”

“The longer we’re in this game,  
the more we don’t know.”

— Erica Spatz, MD, MHS



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## Big Tech

*Continued from page 1*

The approach used was the Michigan Critical Care Utilization and Risk Evaluation System, an open-source patient deterioration model.

It is possible, she said, to develop, internally validate and externally validate a risk prediction model during a pandemic. The lack of data sharing was instrumental in making it possible.

There are, however, cautions. Data is messy; it's important to choose the right outcome and to ensure sufficient data for training validation and testing; transparency is crucial and speaks to credibility; and working with interdisciplinary teams brings both benefits and challenges. The next step, she said, is action, and actually doing something with the findings.

James P. Steinberg, MD, chief medical officer at Emory University Hospital Midtown, discussed "Use of Technology to Audit Hand Hygiene Adherence — Lessons from a Large-Scale Implementation." The implementation he spoke of ended up being larger and more time-consuming than imagined.

The electronic hand hygiene monitoring system included in the study worked through Bluetooth beacon badge-reels; sensors that could detect the badges and use of hand hygiene products; and ultrasound proximity sensors that could detect motion in and out of the room as well offer a "gentle voice reminder" to clean the hands. That voice reminder turned out to be key, providing an immediate bump in compliance.

The effort began with a promising small-scale trial. Rather than a phase-in approach, organizational leadership favored a system-wide implementation across all acute care and adult ICU

Machine learning is different from traditional approaches because it's data-driven rather than model-driven.

beds in its nine hospitals, with more than 9,000 staff and providers needing to be badged, Dr. Steinberg said.

COVID had a major impact not only on implementation (and staff turnover), but also on the ability to measure health care associated infection rates. Other challenges included the size of the implementation; the maintenance of the badges, batteries and sensors; and getting the tech to work in rooms of various dimensions.

But lessons have been learned. An electronic system alone won't optimize hand hygiene adherence, Dr. Steinberg said; there must be culture change and widespread engagement. The technology can, however, be a tool to facilitate culture change — albeit an expensive one. And trusting the data is an issue, but that can be managed even when the technology is imperfect.

So far, the effort has included more than 7,000 health care workers badged with more than 25 million hand hygiene opportunities. It has improved hand hygiene adherence and elevated the importance of hand hygiene as a key element of patient safety, he said, but it's too early to assess the impact on the HAI rates.

"Ask me in a year," he said, when more data is available.

## Burnout

*Continued from page 1*

records, which we know has come out in multiple surveys as a source of stress."

She recommends a commitment to a positive work environment and advocating, but "know when to step back, when it's too much." Limiting social media and getting out from behind the desk can help as well: "Remember who the people are behind those cases. Remember what brought you into medicine and that they recognize that what you do is important as well."

Dr. Bearman focused his portion on leading when exhausted. "It's not just about supporting individuals, but improving the work environment, recognizing and clearing the bureaucratic barriers to make it as easy as possible for everyone to succeed."

One way to mitigate burnout in teams is to recognize "the unique talents on the team," he said. "For physicians who spent at least 20% of their effort on work they find most meaningful, the risk of burnout is decreased."

With so many pressures on an ID team, it is important to "define urgent versus important to set priorities," he said.

The pandemic has brought Zoom burnout with "too many meetings with too many participants and without a clear agenda," which has led to wasted time and stress.

It also has reduced communication. "You can't tap one another on the shoulder and ask questions or get help. Remote workers feel cut off from information and from each other," he said. "Without in-person check-ins, managers may miss signs of burnout or team dysfunction."

Of course, a leader can't do it all alone. "Organizational level changes are more likely to be successful long term to mitigate burnout," said Dr. Bearman. Still, resilience is a skill that can be developed, he said, adding, "It is true that we're living in difficult times. Be aware of others and yourself. Be aware of your mood and your energy."

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Support received as of Sept. 20, 2021