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## The Importance of Taking Blood Cultures Prior to Antibiotic Delivery in Sepsis Patients

Important new data are prompting some hospitals and EDs to re-examine how they manage patients who present with sepsis. Specifically, the results of a study, led by investigators from Brigham and Women's Hospital in Boston, underscores the importance of taking blood cultures before delivering antibiotics to patients with the condition.

The analysis involved seven medical centers in North America and took place between November 2013 and September 2018. Researchers enrolled adult patients who had presented to the ED with severe indications of sepsis. Participants were subjected to two blood culture draws: one before antibiotics were delivered and one within two hours of treatment initiation. When the results between the two samples were compared, investigators found that the post-treatment cultures were lacking a significant amount of clinical information, making it more difficult to pin down what organism to target in subsequent treatment decisions.<sup>1</sup>

With so much focus in recent years placed on making sure that sepsis

patients receive antibiotics as quickly as possible, investigators noted these data are important because they demonstrate there is a cost to moving too quickly to treatment before the critical step of taking blood cultures.

### Weigh the Benefits/Risks

Considering that sepsis guidelines already call for blood cultures to be taken before antibiotics are delivered, is it common for these tasks to take place in reverse order? **David Sweet**, MD, one of the authors of the new study and a clinical associate professor in critical care and emergency medicine at Vancouver General Hospital in Canada, believes this happens more often than many clinicians think.

"At most medical centers, the blood cultures are collected by a medical lab assistant ... and the person who gives the antibiotics is usually a nurse who places an IV and then hangs the antibiotics. It is two separate people," he explains.

Under this arrangement, when a patient presents who is extremely sick,

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the nurse will want to administer powerful, broad-spectrum antibiotics immediately, Sweet observes.

“The medical lab assistant who is responsible for taking the blood cultures may be somewhere else in the department or caught up with other tasks,” he says.

Consequently, rather than waiting for the lab assistant to finish his or her work elsewhere, the nurse often will administer the antibiotics.

While time-to-antibiotics is a critical factor in the care of sepsis patients, the study data show that if the blood cultures are not taken prior to this treatment, substantial information will be lost when the cultures are completed.

“What we found is that you lose about 50% of your sensitivity if you do your blood cultures in that two-hour frame after starting your antibiotics,” Sweet explains. This loss of data jeopardizes the ability of the blood culture tests to accurately pinpoint what organism to target.

Typically, sepsis patients receive broad-spectrum antibiotics first until the blood culture test results return in a day or two. The resulting information enables clinicians to specifically target the affecting organism.

“By knowing exactly what bug it is, you can narrow your antibiotic [choice] ... which will result in less resistant patterns to that antimicrobial ... in society as well as the individual,” Sweet shares.

Further, broad-spectrum antibiotics are much more expensive than antibiotics that are narrower in scope, so switching to an antibiotic that specifically targets the organism at issue is more cost-effective as well as better for the patient and society, Sweet argues.

“The other issue is that these more aggressive, broad-spectrum

antimicrobials have a tendency to kill off more of [a patient's] natural gut flora because of their very nature,” he adds.

Thus, patients receiving broad-spectrum antibiotics for an extended period may be more vulnerable to a secondary infection such as *Clostridioides difficile* than if they received a simple, straightforward antibiotic like penicillin, Sweet observes. These are all reasons why it is important to gather all the diagnostic information from a blood culture test that has not lost half of its sensitivity, he explains.

“Our study shows that getting the blood cultures before [delivering] the various antimicrobials will give you significant benefits in determining the actual organism that is causing the infection,” Sweet says. “There is this push and pull going on right now. We know there is an increased mortality if you delay the antimicrobials, but also a benefit to getting the blood cultures done first.”

## Consider Solutions

There are a few potential solutions to the problem, Sweet says. One obvious approach involves directing the nurse to place the IV and then draw the required blood samples from that IV poke before starting the antibiotics. However, Sweet notes that several centers that have tried this approach have discovered high levels of contamination into the blood cultures, most likely due to nurses using inconsistent or non-sterile techniques when conducting the blood draws.

“Most of the centers that I have seen try this have reverted back to having a medical lab assistant take the blood samples,” he says.

One way to eliminate this problem is to make sure nurses are

trained on the proper techniques to conduct the blood draws under sterile conditions so that contamination does not occur, Sweet says. Alternatively, changes can be implemented so that medical lab assistants are ready and available to draw blood when patients with sepsis present.

“These people are very sick, so policies, techniques, and resources need to be in place to make sure the blood cultures are done quickly and before patients get their IV antibiotics,” he stresses.

Sweet envisions implementing a mechanism that works similarly to the way a STEMI code works for patients who are experiencing a heart attack, some sort of trigger that will alert medical lab assistants to immediately come to the bedside of a sepsis patient to take blood cultures. “I think that is probably the easiest way to do it,” Sweet says. “There has to be more emphasis on getting the medical lab assistants [to the patient] before the nurse gets the chance to administer antibiotics.”

## Rethink Priorities

While the study data do not point to needed changes in sepsis guidelines, they do suggest a need for hospitals and EDs to perhaps re-think their priorities when caring for sepsis patients.

“A lot of our medical centers are very good at [sepsis] recognition, getting lactate measures, and delivering antibiotics and fluids,” Sweet explains. “But in a sicker subgroup of patients, we are not as good at getting our blood cultures done [before delivering antibiotics] because I don’t think the emphasis has been on that [requirement].”

For example, the Institute for Healthcare Improvement and the

## EXECUTIVE SUMMARY

New data underscore the importance of following the recommended order of tasks within sepsis care bundles. Specifically, investigators found there are significant benefits from ensuring blood cultures are taken before broad-spectrum antibiotics are delivered to sepsis patients. While taking blood cultures should not significantly delay needed treatment, investigators noted their data prove that cultures taken post-treatment lose nearly half the clinical information needed to make subsequent treatment decisions.

- The analysis involved seven medical centers in North America and took place between November 2013 and September 2018. The researchers enrolled adult patients who had presented to the ED with severe indications of sepsis.
- Each participant underwent two blood culture draws: one before antibiotics were delivered and one within two hours of treatment initiation. Comparing the two samples, researchers found that the samples lose about 50% of their sensitivity if the blood cultures are drawn in a two-hour frame after starting antibiotics.
- Investigators noted processes need to be developed to ensure blood cultures are taken prior to the delivery of antibiotics but in a way that does not delay treatment.
- Experts who have led successful sepsis quality improvement efforts recommend hospitals and EDs establish a strict protocol for how and when care steps should be completed. That education should focus on ensuring clinicians understand how to use the protocol.

Society of Critical Care Medicine collaborated on the one-hour bundle for sepsis. This procedure calls on clinicians to measure a patient’s lactate levels and then repeat the measure if those levels are high, obtain blood cultures before antibiotics, deliver antibiotics, and then administer fluids. For patients with low blood pressure and high lactates, the bundle calls for vasopressors — all of this within the first hour, Sweet explains.

“Of all of those five things, which have been defined as the five most important things, the one that gets the least amount of emphasis is getting the blood cultures done,” he says.

Sweet notes the reason why blood cultures do not receive as much emphasis is because all the other measures relate to the immediate severity of illness, either providing

important insight on the patient’s current condition or providing needed treatment.

“The blood cultures are part of the package, but [the results] are two days down the road,” he explains. “When you get the information back, you can narrow your antibiotics, which helps with [antimicrobial] resistance, helps with preventing *Clostridioides difficile*, and helps with costs. However, [taking blood cultures] is not a lifesaving measure up front, so I don’t think it has the same weight or emphasis as the other four aspects of the bundle.”

However, Sweet notes that the new study data prove that taking the blood cultures before antibiotics is important. One could lose about half the information in the test results if one waits to take the blood cultures until after the patient has received antibiotics. “What I hope is that

[these study data] will emphasize that component a little bit more,” Sweet observes. “We have to have policies and procedures in place to get [the blood cultures] done before we deliver the antibiotics, but still not delay the antibiotics. We have to have more resources to get it done.”

## Avoid Delays

**Emily Gilbert, MD**, medical director of the sepsis program at Loyola University Medical Center (LUMC) in Maywood, IL, agrees that obtaining blood cultures prior to the administration of antibiotics is important, but she stresses that this task should never delay the delivery of antibiotics.

“What we saw earlier, before we were emphasizing the sepsis bundle, is that people would delay the delivery of antibiotics because they couldn’t get the blood cultures,” she explains.

Typically, this would involve a patient from whom it was difficult to draw blood.

“We were concerned that this delay was potentially leading to increased mortality. Now, we basically say to please try to get blood cultures prior to the delivery of antibiotics. If there is any sort of delay and you can’t get the blood, just give the antibiotics. That is a major part of the bundle that leads to decreased mortality,” Gilbert shares.

In the ED at LUMC, the same nurse who hangs the antibiotics for a sepsis patient also draws blood samples for any required tests. The process is somewhat simplified compared to an ED that uses two different people (a medical lab assistant and a nurse) to perform these tasks. However, Gilbert notes that nurses in the ED are highly skilled at drawing blood under sterile conditions, and there has been no

problem with contamination of the blood samples.

“The nurses in the ED are who [the nurses on the upper floors] call when they can’t get an IV in or they can’t get blood,” Gilbert notes. “The [ED nurses] do this all the time, so there really hasn’t been an issue with contamination.”

## Tap a Sepsis Coordinator

Further, LUMC’s sepsis care quality improvement program, implemented in advance of sepsis shock guidelines adopted by the Centers for Medicare & Medicaid Services (CMS) in 2015, has resulted in significant improvements, according to a recently published analysis. Researchers reviewed the records of nearly 14,000 adult patients with suspected infections, comparing the outcomes of those treated both before and after implementation of the quality improvement program.

For those patients treated following implementation of the program, the in-hospital death rate was 30% lower, and the time to discharge from the hospital was 25% faster than patients treated prior to implementation of the program, according to investigators. Also, the program was associated with \$272,645 in savings.<sup>2</sup>

Among the key components of the sepsis program is a nurse who works full time as a sepsis coordinator, focusing on bundle requirements and pushing for continued quality improvement. Gilbert notes that in the early days of the program’s implementation, the sepsis coordinator organized regular meetings between core sepsis committee members and took charge of educating nurses on their role in managing sepsis.

“[The sepsis coordinator] would go to the nursing huddles in the morning and answer questions the nurses had about the new bundles,” she explains. “I was more responsible for educating the physicians and the residents.”

While the sepsis bundles are now ingrained into practice, the sepsis coordinator continues to provide education to the constant flow of new nurses joining LUMC and takes charge of collecting and reporting data to show how the hospital is performing with regard to carrying out the bundles as required and outcomes related to sepsis.

## Push Ongoing Improvement

The sepsis program also includes a sepsis steering committee composed of Gilbert, the physician lead, a physician representative from the ED, a nurse from the ED, a floor nurse, the sepsis coordinator, and several administrators from quality improvement.

“We meet once a month for one hour, and we review the data,” Gilbert shares. “We will talk about our metrics and what our goals are going forward.”

For instance, Gilbert notes that clinicians strive to put 95% of sepsis patients on antibiotics within the first hour. Also during this monthly meeting, committee members will respond to any questions that have emerged from clinicians on the floors or the ED, and they will discuss how to resolve any problems that have surfaced. For example, Gilbert recalls one discussion that revolved around floor nurses who said they did not always fully grasp what steps or treatment tasks were completed in the ED when sepsis patients were brought

upstairs. “The ED nurses would start the sepsis bundle, but by the time the patients got to the floor the floor nurses weren’t sure what had been done,” Gilbert explains.

To resolve the problem, the sepsis committee created a bright green sepsis sheet that follows sepsis patients from the ED to the floors.

“The sheet has all the components of the sepsis bundle. There are little boxes that the nurses in the ED check to say that blood cultures were drawn at noon, antibiotics were given at 12:30, when specifically the lactates were drawn, and what the value was,” Gilbert explains. “That form goes on the chart with the patient up to the floor so that the nurse on the floor can see exactly what has been done in the ED and what is still due within the bundle.”

Other aspects of the quality improvement program include a sepsis early warning system in the electronic medical record and other technologic features designed to enhance adherence to sepsis guidelines. There also is a mechanism in place to provide early feedback to physicians on their sepsis care decisions.

## Establish a Protocol

Gilbert acknowledges that there has been some resistance to the continuing push for faster bundle times from frontline providers in the

ED. She expresses some sympathy for their concerns.

“The issue with the one-hour bundle is that the ED does need some time to figure out what is going on,” Gilbert notes. “It is really hard to try to differentiate pneumonia from just flu, and you don’t want to throw a bunch of broad-spectrum antibiotics at the flu.”

Gilbert says that a too-hasty approach would mirror what happened several years ago with the ill-fated CMS bundle for the management of pneumonia.

“We were throwing antibiotics at every single person who walked in with an upper respiratory infection because we needed to get antibiotics in ASAP for pneumonia,” she says. “Then, after a lot of outcry and a lot of overdosing on antibiotics, [CMS] pulled that bundle for pneumonia.”

While clinicians will always work hard to quickly deliver antibiotics to someone with a clear-cut case of bacterial sepsis, one hour is not always enough time to discern whether broad-spectrum antibiotics are the best course of action, Gilbert explains.

“Sometimes, people will come in with abdominal pain and diarrhea. It turns out that they have *Clostridioidea difficile*,” she observes. “Antibiotics potentially worsen that situation. We really do need a little bit more time to work out what is going on with the patient rather

than just [administering] antibiotics to them as soon as they hit the door.” Considering that LUMC has produced good results from its quality improvement approach with sepsis, Gilbert’s advice to colleagues pursuing similar goals is to establish a strict protocol that everyone needs to follow. For instance, create an order set with clearly defined steps. Make it accessible with the click of a button. This is particularly important for academic institutions like LUMC where new physicians and nurses are constantly arriving on the front lines.

“Education and a really easy-to-use order set are key,” Gilbert says. “People tend to get stuck in a routine in how they do things, so you really do need to continually educate people: This is how we do things now. Please use this order set. This is the bundle. This is how we manage sepsis.” ■

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# CDC Offers Guidance on How to Recognize, Manage Vaping-Associated Lung Injury

While cases of e-cigarette or vaping product use-associated lung injury (EVALI) continue to mount, the CDC has issued interim guidance for healthcare providers based on what investigators have gleaned thus far from the evidence collected.

As of Oct. 22, there have been 1,604 cases associated with EVALI reported to the CDC. These cases have come from 49 states, Washington, DC, and one U.S. territory. Further, 34 deaths from EVALI have been confirmed in 24 states. The latest agency guidance is designed to offer a framework for the initial assessment, evaluation, management, and follow-up of patients with EVALI.<sup>1</sup>

In particular, the guidance states that patients suspected of presenting with EVALI should undergo a chest radiograph. Hospital admission is recommended for patients with low blood oxygen levels or who are in respiratory distress.

Further, the guidance states that treatment options to consider include the empiric use of a combination of antibiotics and antivirals or steroids, depending on the clinical context.

Beyond these steps, practitioners are encouraged to recommend evidence-based tobacco cessation tactics and to counsel patients on discontinuing their use of vaping products.

Furthermore, to avoid the risk of recurrence, patients who have been treated for EVALI should be encouraged strongly not to resume their use of vaping products. There have been reports of patients with EVALI who were readmitted for clinical care following treatment for

the condition and discharge from hospitals.

In a media briefing about the outbreak on Oct. 11, **Anne Schuchat**, MD, principal deputy director at the CDC, explained what investigators have learned about EVALI presentations thus far.

“Based on data submitted to the CDC from 339 patients ... about 95% initially experienced respiratory symptoms like cough, chest pain, or shortness of breath,” she indicated. “A large proportion, about 77%, had gastrointestinal symptoms like abdominal pain, nausea, vomiting, and diarrhea. Nearly half required transfer to intensive care units.”

Schuchat also noted that 22% of patients required mechanical ventilation. Further, out of 287 patients for whom the CDC had collected information, 88% received corticosteroids.

“We only had follow-up information for 140 of [these patients], and 82% were reported to have improved,” she said. “We don’t know yet how many of these [patients] might have improved without corticosteroid treatment, and we don’t know yet whether there are negative consequences like worsening infection risk for treatment with corticosteroids.”

The findings collected so far show that products containing tetrahydrocannabinol (THC), the high-inducing ingredient in marijuana, have been linked to most EVALI cases identified, Schuchat noted. “Given that a small percentage of patients have reported exclusive use of e-cigarette or vaping products containing nicotine, and many people with these lung injuries report

combined use of THC and nicotine-containing products, we cannot exclude the possibility that nicotine-containing products play a role in this outbreak,” she said.

While investigators continue their efforts to pin down the precise causes for EVALI, Schuchat stressed that the outbreak remains a critical issue.

“We need to take steps to prevent additional cases. We are not seeing a meaningful drop-off in new cases,” she stressed. “Many more people have been hospitalized with lung injury each week since we first advised the public about the national outbreak. We have seen cases from all but one state [Alaska], and continue to learn of more deaths from this condition. We urge clinicians to report illnesses consistent with lung injury in people who have used e-cigarettes or vaping products to their state or local health departments.”

**Ned Sharpless**, MD, the acting commissioner of the FDA, also spoke at the briefing about the agency’s work toward finding the root of the EVALI cases.

“Our staff are using state-of-the-art methods to assess the presence of a broad range of chemicals, including nicotine, THC, ... metals, cutting agents, additives, pesticides, and other toxins,” he explained. “We do know that THC is present in most of the samples tested, which is why FDA issued an updated consumer safety alert ... warning consumers not to use vaping products that contain THC, and not to modify or add any substances, including THC or other oils, to vaping products.”

Sharpless cautioned that the investigation is not limited to only THC. Nevertheless, until the case is

solved, investigating this outbreak is the agency's leading priority. "The FDA is focused on identifying the products that are making people ill and following the supply chain to its source," he said. Sharpless added that the agency is following "every

possible lead, which includes traveling throughout the country to gather any available evidence, including devices, pods, diluting agents, and more." ■

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# EDs Critical to Curbing HIV Epidemic, But More Involvement Needed

Researchers from Johns Hopkins Medicine recently concluded that EDs may well be pivotal in slowing the spread of HIV infections. However, additional steps are needed to fully leverage this opportunity. Their research is presented as a follow-up to an earlier study of ED patients in South Africa that demonstrated HIV testing in EDs is an effective way to find and diagnose hard-to-reach populations with HIV.<sup>1</sup>

For the new study, researchers worked with colleagues in three EDs in the Eastern Cape province of South Africa, an area known for its high prevalence of HIV infections. What they found is that efforts there are falling well short of the UNAIDS 90/90/90 goals: 90% of patients with HIV aware of their diagnosis, 90% of these individuals on antiretroviral therapy (ART), and 90% of all people on ART to exhibit undetectable levels of the virus in their blood so that they cannot transmit HIV to others, all by 2020.

Between June 2017 and July 2018, researchers tested 2,901 patients aged 18 to 70 years, 800 of whom tested positive for HIV. Of these, 28.9% were newly diagnosed. Further, while the prevalence of HIV in women (35.3%) was much higher than in men (20.7%) who were tested, researchers found that men were twice as likely to be unaware of their HIV

status and unlikely to be on ART or virally suppressed.<sup>2</sup>

While the study was conducted in South Africa, investigators noted the information is relevant to health systems around the world. For example, ending the HIV epidemic has been announced as a goal by the U.S. Department of Health and Human Services (HHS).<sup>3</sup> One of the key messages coming out of this study

is that EDs need to be much more involved in not only testing for HIV, but also counseling and treatment aspects of care to make the desired progress. To date, that is not the primary model for HIV testing and care practiced in U.S. EDs.

Researchers reported that despite considerable investment toward addressing the HIV epidemic in South Africa, the country is not

## EXECUTIVE SUMMARY

Researchers at Johns Hopkins Medicine discovered that EDs may need to be leveraged in different ways to effectively bring the HIV epidemic to heel. In particular, investigators say there is a need for EDs to not just perform routine testing for HIV, but also take more ownership of the counseling and treatment aspects of care. Further, investigators state that EDs can be pivotal in providing HIV testing and treatment to young men, a critical population that is much less likely to be diagnosed or virally suppressed. Further, while this research was conducted in South Africa, investigators state that many of their findings are applicable worldwide.

- Working with colleagues in three EDs in South Africa, investigators found that efforts there are falling well short of UNAIDS 2020 90/90/90 goal.
- Between June 2017 and July 2018, researchers tested 2,901 patients aged 18 to 70 years, finding that more than 800 tested positive for HIV.
- While the prevalence of HIV in women (35.3%) was much higher than in men (20.7%) who were tested, researchers found that men were twice as likely to be unaware of their HIV status and unlikely to be on antiretroviral therapy or virally suppressed.
- While many U.S. hospitals in urban areas have initiated HIV testing programs in their EDs, experts note that HIV is not just a disease of high-density, urban populations. Consequently, there are communities at risk for the disease that are missed.

even close to meeting 90/90/90 goals. From their work in EDs in the region, researchers concluded that the reason for this failure is efforts to address the epidemic are missing a critical population: young men, explains **Bhakti Hansoti**, MBChB, PhD, MPH, FACEP, an associate professor of emergency medicine at the Johns Hopkins University School of Medicine and the study's lead author.

"Young men were significantly less likely to be engaged in care and significantly less likely to be virally suppressed," Hansoti reports. "What we also found is that the HIV incidence in this population was significantly higher than what is reported."

How does this finding carry over to U.S. EDs and elsewhere? Hansoti says that it is generally accepted worldwide that young men are less likely to engage with the healthcare system.

"Existing HIV testing programs really focus on pregnant women or patients who are already engaged with the healthcare system," she says. "This young male population that does not engage is being missed."

The reason why EDs are so pivotal in reaching this population is they present the best chance for identifying and interacting with this hard-to-reach population, Hansoti observes.

"This is the one time these patients are likely to interact [with healthcare providers]," she explains. "We are concerned that this population in particular is less inclined to go and seek out the treatment that they need [in outpatient settings]. The burden of responsibility needs to fall on the ED."

Furthermore, investigators note that merely testing such patients for HIV in the ED is not enough. "Testing is only part of the package.

Testing without treatment is not very useful," Hansoti shares. Instead, she stresses EDs need to play an active role in treatment initiation, follow-up case management, and linking these patients to care outside the ED.

**Richard Rothman**, MD, PhD, vice chair of research in the department of emergency medicine and a professor of emergency medicine at Johns Hopkins, notes there has been considerable progress in recent years in the United States regarding how EDs are making a difference on HIV testing and what he calls the linkage-to-care cascade.

"With recommendations by the CDC as well as other various societies, including the ACEP, many EDs, particularly in urban, high-prevalence locations, have recognized the role they can play in helping to curb different aspects of the epidemic," he says.

For instance, EDs in several large, academic medical centers have initiated programs through which patients are screened routinely for HIV, regardless of why they presented for care. Patients who test positive for HIV are quickly linked to care at specialized clinics that can start patients on ART and provide ongoing care and treatment.

"Most EDs that have [HIV testing] programs in place have that ability to link people into care pretty quickly," Rothman shares. "I think one of the reasons why [the rapid initiation of ART] is being heavily advocated is because even though we give people these referrals and think people are going to get into care pretty quickly, there are often logistical delays that end up happening."

Rothman notes there can be transportation, insurance, or other hurdles that patients struggle to navigate. To address these challenges,

there is some research into the feasibility of executing a rapid start on ART from the ED, but Rothman notes such a model comes with its own challenges.

"It is not that simple because emergency physicians aren't always used to starting people on this therapy. They are not very comfortable with that overall," he explains. "Ultimately, that may be a model that works in the U.S., but we are not quite there. I think the things that need to happen are primarily educating the physicians about it, making the process as simple as possible, and then assuring ... that there is a good, warm handoff [to an outpatient provider for continued care]."

Hansoti agrees that, theoretically, it makes sense in the United States that that providers from an HIV treatment clinic would start a patient identified with HIV in the ED on ART because they have the time to provide this care without competing priorities.

"However, one of the challenges of that kind of model is that it can give ED providers the idea that it is not their problem. They did their bit by testing, and now off the patient goes," she says. "What may be a stronger model is if the ED itself takes a little bit more ownership."

Rather than just pass these patients on, Hansoti would like to see ED providers provide a stronger bridge leading patients into the clinic system.

"What happens in the ED is the patient comes in with their acute illness and they build a relationship or bond with that initial provider," she says. "Then, if that initial provider also is able to tell them about their HIV diagnosis and counsels them somewhat on the need for ART, that trust is built. Then, there is



that bridge to the clinic-based intervention.” Under current CDC guidelines, routine screening in the ED is not recommended if the prevalence of HIV in the population is less than 0.1%. That is why such testing in the United States is more likely to be taking place in EDs located in larger urban centers.

“The issue with that is that many places don’t even know what their prevalence [of HIV] is,” Rothman observes. “Many places that think their disease prevalence is low start doing testing, and then find out it is higher than they anticipated.”

Rothman stresses that HIV is not just a disease of high-density, urban populations.

“There are important areas of the country where there are communities at risk and people are contracting HIV, and local sub-epidemics are occurring,” he explains. “They get missed for a while until testing gets initiated, and the local communities become more aware of the fact that the disease has no particular geographic prevalence.”

Hansoti sees a parallel with the opioid epidemic in this regard.

“What we have learned from the opioid epidemic is that it is not an urban or a rural problem. It is an everywhere problem,” she says. “Every ED has a role in identifying patients at risk of an overdose and either linking them into care or, at the very least, providing them with naloxone.”

Similarly, with HIV, it is not that urban areas have a higher prevalence of disease; rather, the prevalence in areas that have not implemented routine testing is unclear, Hansoti notes.

“If we were to integrate the need for HIV screening as part of routine ED processes across the country, I think you would be surprised at how many people have been missed,” she

offers. The types of patients who come to EDs in both urban and rural areas are all engaging in unanticipated interactions with the healthcare system either because of trauma or an acute illness or injury, Hansoti explains.

“These patients are generally at higher risk of mental health problems, substance use problems, and other health disparities and vulnerabilities,” she says. “That is true in the rural setting as it is true in the urban setting.”

Further, whether one is talking about the opioid epidemic or the HIV epidemic, the ED is set up to play a critical role, Hansoti stresses.

Hansoti and colleagues intend to study ways to make ED-based HIV testing more mainstream, and to address the challenges involved with linkage to care. This is partly in response to the observation that add-on programs funded by external agencies tend not to be sustainable.

“The funding runs out, the program becomes de-prioritized, and the provider institutions often don’t take ownership of the interventions,” she laments.

As part of this work, one idea Hansoti plans to explore is the potential of using rapid “INSTI” tests for HIV during the triage process. (*Editor’s Note: Learn more about this test at: <http://bit.ly/2BKROgt>.)* The tests, completed with just a finger prick, can deliver results within two minutes, making it relatively easy to integrate testing within the regular workflow of a busy ED, she explains.

Hansoti also wants to investigate the utility of using peer mentors during ED visits as a way to deliver education about the disease and to address the significant stigma investigators have observed regarding HIV testing and diagnoses. Further, she is interested in working with

stakeholders and institutions to prioritize the availability of resources for testing and systems that can quickly tell emergency providers where a person lives, where the closest treatment provider is, and whether the person has engaged in treatment. Hansoti wants to make it easy for frontline providers to access this information quickly.

Rothman applauds HHS’s efforts to prioritize ending the HIV epidemic, but he observes that these plans have not yet been matched with the needed support required to reach the intended goal.

“Emergency departments are really a critical venue in terms of identifying many of the unrecognized patients as well as getting people on therapy who need to be on therapy. EDs are currently constrained by the relative lack of resources to basically meet the [90/90/90] targets,” he explains. “There are a lot of competing priorities in terms of what we are trying to do in taking care of the chief problems that patients present with as well as many of the chronic disease problems that patients have. I believe that emergency physicians are generally very engaged in trying to provide the best care on both ends of the spectrum.”

Further, Rothman stresses that EDs cannot be the only ones trying to figure out how to improve approaches for identifying patients with HIV and placing them into treatment.

“It really has to be a whole health system approach,” he says. “To really make the change, a particular health system or hospital has to realize [it] wants to play a part. Then, engage many of the key stakeholders in trying to figure out how to put systems in place to advance testing and linkage [to care].” ■

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# Steep Increases in STDs Jeopardize Efforts to End HIV Epidemic

Public health officials are expressing significant concern about recent data showing steep and sustained increases in the incidence of sexually transmitted diseases (STDs) in recent years.

The data, released by the CDC, included an analysis of STD cases reported for 2013 and preliminary data for 2017. (*Editor's Note: Learn much more about these data online at: <http://bit.ly/2pPBDf4>.*)

The data show diagnoses of gonorrhea increased by 67% overall and nearly doubled among men. Cases of primary and secondary

syphilis increased by 76% during this period. Further, the CDC reported that chlamydia remained the most common STD reported, with 1.7 million cases diagnosed in 2017. Among these cases, 45% occurred in women 15-24 years of age.

While antibiotics offer a cure for all these STDs, the CDC noted most of these cases are going undiagnosed and untreated, leading to severe adverse effects, including infertility, pregnancy complications, and an increased risk of contracting HIV.

In response to the data, a statement released by the Infectious

Diseases Society of America (IDSA) said that the numbers represent damaging effects to public and individual health, and that federal efforts to end the epidemic of HIV will not succeed if the escalating incidence of STDs is not fully addressed. (*To read much more of the statement from the IDSA, please visit: <http://bit.ly/34cvGrF>*)

Expressing concern about “dangerous gaps” in the public health infrastructure, the IDSA called for increased funding for STD prevention and surveillance efforts across the country. ■

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# Busy Community Hospital Develops Process to Speed ED Throughput

Like many EDs across the country, the ED at Lakewood Regional Medical Center (LRMC) in Lakewood, CA, struggles with wait times.

“We are a small community hospital that sees an average of 150 patients a day through our ED. We stay busy because the ED is usually a patient’s first access to healthcare,” explains **Patty Stierle**, RN, BSN, interim director of the ED and disaster coordinator at LRMC.

However, some patients are coming to the ED from nearby urgent care centers and physician

offices where their care has already begun. ED administrators saw in this group a new opportunity to reduce wait times while also promoting better care integration between different healthcare settings.

Consequently, they developed a red “fast pass” card specifically designed to streamline the process for these patients when they present to the ED.

A provider at an urgent care center or physician’s office who is referring a patient to the ED will first call the ED and discuss the need for a transfer of care with an emergency

physician. Then, the referring physician will provide the patient with a fast pass card, along with any other important information about the patient’s condition and medical care.

When the patient arrives in the ED, he or she will hand the fast pass card to the registrar to begin the process of moving that patient into the ED quickly.

“Our staff members know that this patient has been seen prior to arriving [in the ED] and is coming to us for additional care,” Stierle explains. “If the patient is coming to

us from an urgent care facility and has this card, we know that initial care has been started.”

The fast pass card includes “Lakewood Regional Medical Center Emergency Room” written on the front.

“The patient will also come in with any other results or reports that the referring agency is sending,” Stierle says.

She adds that the back of the card includes space where the referring provider will write their name and location. This makes it clear where the patient has just been seen.

“The fast pass card also has a note that reads ‘Although fast pass patients are a priority, please understand that patients with life threatening conditions will be seen first,’” Stierle explains.

The approach has been designed, in part, to promote good communication between different healthcare entities that are located within 10 miles of LRMC, particularly given that a number of new urgent care facilities have been built in the area surrounding the hospital in recent years.

“Noticing and differentiating patients based on acuity ultimately will help speed up any ED process,” Stierle observes.

In fact, the idea came about as a result of hospital outreach to many of the physician offices and urgent care

facilities in the area. They expressed the need for a more streamlined process for moving patients into the care area, Stierle relates.

Then, the ED throughput committee at LRMC, which includes members of the hospital administrative team, physicians, and business development staff, engaged in a collaborative process to design a new approach for those patients coming to the ED from another setting. At those other facilities, patients may have received some form of workup such as X-rays, lab work, or other clinical care.

Once the throughput committee designed the fast pass process, they ran it by the outpatient providers for additional input prior to implementation.

Stierle notes that in recent years, EDs have moved away from a linear process where patients first see a provider and then undergo testing and labs to one where many of these steps occur simultaneously in more of a multitiered approach.

“This is the next step in that process, to streamline what we can for patients who are coming into the ED,” she says. “We are starting with the identification process for our referring providers. When a person walks in with a fast pass card, it tells us that this patient has already been seen at an urgent care facility [or a physician’s office] nearby, and we

are going to continue their care.” While data regarding any effect on wait times are not available yet, early indications are that the fast pass approach is earning high marks from stakeholders involved, according to Stierle.

“The patients feel that they have a team for their healthcare,” she says.

Further, she notes the referring providers are pleased with the approach, too. Stierle notes that the different healthcare providers always should work in concert with one another.

“It elevates care for the community,” she adds.

Other EDs interested in pursuing a similar approach must understand that there are many steps involved with developing and implementing a successful process, Stierle cautions.

“Our business department at LRMC did the legwork of reaching out to our neighboring urgent care facilities [to explain] the process. We also then had to educate our ED staff in identifying and noticing patients who walk in with the red fast pass cards,” she explains. “Ultimately, implementing the process takes time, but it is a great benefit because we have to work as a team across different organizations.”

Stierle adds that when professionals talk peer to peer about specific cases, it helps improve the provider knowledge base. ■

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## CME/CE QUESTIONS

- 1. Researchers from Johns Hopkins Medicine report that despite considerable investment toward addressing the HIV epidemic in South Africa, efforts there and around the world are missing a critical population:**
  - a. pregnant women.
  - b. teenage women.
  - c. young men.
  - d. men older than age 35 years.
- 2. The "fast pass" approach at Lakewood Regional Medical Center applies to patients who:**
  - a. present with extremely urgent medical conditions.
  - b. are destined for inpatient hospitalization.
  - c. are coming to the ED from a doctor's office or urgent care center.
  - d. require workups prior to surgery.
- 3. A new study of steps in the sepsis care bundle has found that one loses about how much sensitivity if one draws blood cultures in the two-hour frame after starting patients on antibiotics?**
  - a. 20%
  - b. 30%
  - c. 40%
  - d. 50%
- 4. According to the latest update from the CDC, what substance has been linked to most e-cigarette or vaping product use-associated lung injury cases so far?**
  - a. Vitamin E
  - b. THC
  - c. Food additives
  - d. Nicotine

## CME/CE OBJECTIVES

After completing this activity, participants will be able to:

1. Apply new information about various approaches to ED management;
2. Discuss how developments in the regulatory arena apply to the ED setting;
3. Implement managerial procedures suggested by your peers in the publication.

## Feds Mandate Hospitals Develop and Maintain Antibiotic Stewardship Programs

The Centers for Medicare & Medicaid Services (CMS) has finalized new requirements for hospitals to establish antibiotic stewardship programs as part of their infection control efforts, leaving no more excuses for facilities that have thus far failed to act.

The move is notable as it is the first federal policy to actually mandate hospital antibiotic stewardship. This is viewed as a big step against multidrug-resistant organisms and the misuse of antibiotics.

There is plenty of room for improvement in this area. The CDC estimates that about one-third of the antibiotic prescriptions written by providers each year are for patients with conditions that do not require these drugs. It is a problem that experts hope will improve under this mandate, although smaller community hospitals and critical access facilities in rural areas may find it challenging to put an antibiotic stewardship program in place.

### Push for Improvement

Why push so hard for hospitals to create antimicrobial stewardship programs?

“The primary goal is to ensure that antimicrobials in general are only used when they are necessary and that they are right for [each] particular case,” explains **Dan McQuillen**, MD, a staff infectious disease physician at Lahey Hospital & Medical Center in Burlington, MA, and the incoming vice president of the Infectious Diseases Society of America (IDSA). “In general, stewardship programs have been shown to improve patient outcomes and increase cure rates because [they help to] get people on drugs that are effective for their infections theoretically faster.”

Further, there are fewer adverse events when a facility maintains an effective stewardship program. Part of the

role of such programs is to monitor the use of antibiotics for some of the common adverse outcomes that can happen when those drugs are used, McQuillen notes. For instance, effective stewardship has been shown to reduce the incidence of *Clostridioides difficile* infections.

By preventing such adverse effects, stewardship programs can shorten lengths of stay in the hospital and reduce overall costs, McQuillen shares.

“The other important effect of a stewardship program is to help mitigate or decrease the incidence of resistant organisms in hospitals,” he explains. “There are plenty of data to show that if you use too-broad antibiotics for too long in patients who don’t need them, you end up with multiple resistant organisms that are really hard to treat and get rid of.”

While developing a stewardship program makes sense, not all hospitals have taken this important step. When the CDC released guidelines on what a comprehensive stewardship program should consist of in 2017, the percentage of hospitals developing the recommended stewardship teams and infrastructure increased from about 48% to more than 70%.<sup>1</sup> However, that still left many hospitals without formal stewardship efforts.

This is why IDSA has long pushed for CMS to include creating an effective stewardship program as a condition of participation in Medicare.

“This move will hopefully drive [the percentage] of hospitals with stewardship programs to 100%,” McQuillen says. “It is basically taking the CDC construct and making it mandatory. If you want to participate in Medicare, you have to do this, and that is key.”

### Manage Resources

In general, stewardship activities involve the regular review of a hospital’s antibiotic prescribing practices by

experts in infectious disease. “[A program] will have infrastructure and personnel to be able to collect those data and act on it,” McQuillen notes.

“It is just a much more structured, formal way of making sure that stewardship is practiced,” he says.

The problem is that while large academic medical centers typically have the resources and expertise to build such a program, smaller community hospitals and critical access hospitals in rural areas face many challenges in this regard.

Further, McQuillen notes that the pipeline of infectious disease physicians is diminishing, in part because of the financial constraints on people entering the infectious disease field. “There are areas of the country where you’ve got a small hospital that is 100 miles from [a population center], and there is not enough business for an infectious

disease physician to work locally there,” McQuillen observes.

To address this problem, many large health systems have developed outreach programs, networks, and telehealth solutions to help smaller hospitals access the expertise and infrastructure they need to improve their antibiotic prescribing practices and meet regulatory requirements.

One example of this is Intermountain Healthcare’s Infectious Diseases Telehealth program. Under this initiative, 17 community hospitals that are part of the Salt Lake City-based health system and two additional hospitals in other states are receiving assistance with antibiotic stewardship, explains **Todd Vento**, MD, MPH, medical director of the program.

He says the program is somewhat unique in that consultation and advice on infectious disease is tightly integrated with the actual antibiotic stewardship component. “We use

telehealth to deliver both of those components,” he explains.

When the program started three years ago, Vento notes that the first order of business was to track how many facilities would be interested in infectious disease telehealth services, along with when and why providers were seeking assistance.

“We tracked that for our first 18 months to get a flavor of what the demand was and where we could find opportunities to help with stewardship programs and improving [antibiotic prescribing] practices,” Vento shares.

More recently, the program has focused on specific, commonly seen conditions to gauge the effect of the program. For example, Vento notes that *Staphylococcus aureus* bacteremia is one of the most important infectious disease conditions for which it is well known that one can improve outcomes if one consults with an infectious disease specialist.

“We started to look at that ... and our initial findings are that there looks to be a decrease in both 30- and 90-day mortality when we compare cases where the Infectious Disease Telehealth program was on board vs. cases where the program was not on board,” he explains.

## Consider Partnering

The specific effect of the program on the larger issue of antibiotic stewardship may take longer to gauge, in part because the model focuses on establishing a partnership with the participating facilities.

“When we first started the program, we basically did site visits to every facility in our system that we were covering to make sure that they had a local program,” explains **John Veillette**, PharmD, BCPS, an advanced clinical pharmacist in

## EXECUTIVE SUMMARY

While most hospitals have moved to put antibiotic stewardship programs in place, experts suggest that a new CMS requirement should go a long way toward ensuring 100% compliance with guidelines for such programs already established by the CDC. Also, the move is seen as a big step against multidrug-resistant organisms and the misuse of antibiotics.

- The primary goal of stewardship programs is to ensure that antimicrobials are used only when they are necessary and right for each specific case. They also are designed to mitigate or decrease the incidence of resistant organisms in hospitals.
- Experts note that stewardship programs have been shown to improve patient outcomes, increase cure rates, and reduce the incidence of adverse events such as *Clostridioides difficile* infections.
- While large, academic medical centers typically have the resources and expertise to build effective stewardship programs, smaller community hospitals and critical access hospitals in rural areas face many challenges in this regard.
- Intermountain Healthcare is one of several large health systems that have developed outreach programs aimed at helping smaller facilities meet the regulatory requirements for stewardship programs.

the Infectious Disease Telehealth program. “We made sure that we identified local champions, [a physician and a pharmacist], who were going to help us evaluate antibiotic prescribing practices at the hospitals.”

This is a critical step because CMS requires hospitals to designate a multidisciplinary team to oversee stewardship activities.

“That is step one to meet the requirements: Have dedicated people responsible for looking at [antibiotic prescribing],” Veillette notes. “Then, [Vento] and I have an advisory role where we call in to all of the [team] meetings or we attend the meetings in person to help guide the team members in evaluating their antibiotic use and also looking for opportunities to improve.”

Further, Veillette helps the participating teams and facilities with active surveillance daily.

“I use a computer program to identify patients that have the most severe infections, such as patients who have bacteria in their blood or patients who are on multiple broad-spectrum antibiotics,” he says. “I look at those cases on a daily basis to try to identify opportunities to improve.”

Veillette will call hospitals to advise staff on opportunities to optimize antibiotic treatment for those extremely sick patients.

“They will also call into me with questions. I serve as a central drug information resource for them and try to identify patients who either need to have their antibiotics improved or changed,” he says. “I also identify patients who need to be seen by an infectious disease clinician.”

Veillette adds that this is a good example of the tie between antibiotic surveillance efforts and infectious

disease consultation within the program.

Beyond the daily surveillance and advisement activities, Veillette will assist the participating facilities in reviewing their antibiotic use on a longitudinal basis to try to find opportunities to change prescribing practices and advance care.

“We just did a site visit to one of our critical access hospitals and shared with them some data on how they were managing urinary tract infections [UTI] in the ED and opportunities for improvement there,” he explains.

**LOCAL STEWARDSHIP TEAMS CAN DEVELOP POLICIES AIMED AT TREATING THE SPECIFIC CONDITIONS AT ISSUE IN A DIFFERENT WAY.**

Vento and Veillette will document all of their regular surveillance and quality improvement efforts for each participating hospital. Then, each facility will receive that information to share with site surveyors or regulatory agencies that come to review antibiotic stewardship activities.

“All of that documentation is put together, and then the hospitals are ready for their regulatory surveys,” Veillette says.

However, Veillette stresses that the Intermountain program serves an advisory role.

“One of our central concepts is local empowerment with centralized

support and resources,” he says.

In other words, specific areas targeted for improvement and final prescribing decisions are made at the local level.

“Sometimes, [a local provider] will want to know what he or she should do in a specific scenario,” Veillette continues. “Dr. Vento will give advice to the physician, and I will give advice to the local pharmacist on how I would approach the situation. The ultimate decision on how to move forward is up to them. We present the information, and we try to keep them up to date on the latest research and guidelines.”

One thing that helps the Intermountain Healthcare facilities is the fact that they are in an integrated system that already has instituted corporate-level stewardship practices and policies, Vento observes.

“That helps to give people boundaries ... beyond that, we can provide them with their data on antibiotic usage and how it compares to other facilities,” he says. “However, they can choose to look at the things they think are important to their facilities.”

A facility may be concerned about three emergency physicians who are using one antibiotic repeatedly in cases in which it is not required. That is the type of situation that will come up in discussions between the local stewardship teams and the telehealth program, Vento notes.

“If they need our help, they will tap into Veillette, and he will help pull case data or central antibiotic use data so they can support their findings and then report back to their medical teams,” Vento shares.

Then, the local stewardship teams can develop policies aimed at treating the specific conditions at issue in a different way, rather than

going straight to the antibiotic that is used unnecessarily, Vento adds.

## Provide Education

To further support local antibiotic stewardship efforts, Vento and Veillette occasionally will hold grand rounds at a small community hospital to present cases that they see a lot but that can be managed better.

Also, the duo holds monthly telementoring seminars with all the stewardship teams and any providers or staff members at the participating hospitals who wish to attend.

“We have a didactic session about an important stewardship topic, and then we have the stewardship teams share their data. Then, we discuss cases, projects, and [tactics] that work in each facility,” Vento explains. “We moderate that discussion so that there is shared learning.”

Typically, the topics for these monthly seminars revolve around an infection that is seen commonly in the hospitals and affects many patients or an infection associated with bad outcomes if it is not treated appropriately, Veillette explains.

UTIs affect many patients and have been a frequent topic of discussion at the monthly seminars. The stewardship teams discuss which patients require treatment, what antibiotics to use, and what

the duration of treatment should be. “We are going around to each site talking about our new local guidelines for UTI management,” Veillette says.

Alternatively, Veillette notes that *S. aureus* bacteremia is an infection that is associated with severe morbidity and mortality if not treated appropriately. This has been another topic at monthly seminars.

“We have spent at least two sessions talking about how to interpret blood cultures and tests related to that infection, and what is the optimal way to treat it,” he says.

## Assemble Resources

For small hospitals still struggling to comply with the regulatory requirements for antibiotic stewardship, Veillette suggests they evaluate what resources might be available to them in the community. Consider partnering with a local or state health department, a university, or academic medical center.

“There are lots of different forms of outreach that could be done. I think there is value in seeking out people who have experience with stewardship programs, infectious disease, and improving outcomes in this area,” Veillette explains.

Vento advises hospitals to consider what resources they have to put toward the effort, and what

pieces they are missing. Some hospitals will even hire other people to handle stewardship for them, he observes.

“We personally feel like the [local] ownership piece is important because the responsibility of looking at your own issues and your own stewardship practices is really on the hospital,” he offers.

The way Vento sees it, antibiotic stewardship is no different than any other quality process in the hospital.

“You want to own that process,” he says.

Further, Vento notes that hospitals that have taken the time to designate champions and identify the things they want to work on can seek help more easily from experts at a larger medical center or healthcare network to provide the specific assistance they need for their program.

*(Editor’s Note: The Joint Commission offers a toolkit and other resources for antibiotic stewardship, which can be found online at this link: <http://bit.ly/33Y1NLj>.)* ■

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