



OCTOBER 2018

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Medical Centers Employ Rapid Response Teams to Treat Difficult Airways

Clear indications for activation, well-delineated roles enhance opportunities for success

Emergency situations can escalate into crises quickly if early attempts to establish an airway fail, depriving a patient’s brain of needed oxygen. This is why some academic medical centers have developed specialized rapid response teams to deliver expertise and equipment to the bedside of patients with difficult airways. While not all hospitals are equipped to deploy such a team, facilities can borrow some best practices that have been learned from others. Some medical centers have been fine-tuning their rapid response approaches for difficult airways over many years.

Emergency providers are better trained than many other clinicians in establishing airways. Still, investigators note that emergency providers can benefit from the multidisciplinary skill set provided through a rapid response approach, especially when surgical intervention is required. However, the implementation of such an approach

requires carefully developed criteria on when a rapid response team should be activated, and a willingness to opt for this kind of assistance quickly in appropriate circumstances.

Consider Required Surgical Expertise

Investigators at the Hospital of the University of Pennsylvania (HUP) in Philadelphia recently reported on their experience with an airway rapid response (ARR) system. A group developed this system after quality reviews determined that ad hoc processes were contributing to delays in assembling the appropriate expertise and equipment when emergency intubation had failed outside the operating room environment.¹

“The number one obstacle to implementation of a system like [ours] is whether or not the hospital has an in-house surgical presence 24/7,” explains

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Financial Disclosure: Physician Editor **Robert Bitterman**, MD, JD, FACEP, Nurse Planner **Nicole Huff**, MBA, MSN, RN, CEN, Author **Dorothy Brooks**, Editor **Jonathan Springston**, Executive Editor **Shelly Morrow Mark**, and Editorial Group Manager **Terrey L. Hatcher** report no consultant, stockholder, speaker’s bureau, research, or other financial relationships with companies having ties to this field of study.



ED MANAGEMENT®

ED Management (ISSN 1044-9167) is published monthly by Relias Learning, 111 Corning Road, Suite 250, Cary, NC 27518-9238. Periodicals postage paid at Cary, NC, and additional mailing offices. **POSTMASTER: Send address changes to ED Management, Relias Learning, 111 Corning Road, Suite 250, Cary, NC 27518-9238.**

GST Registration Number: R128870672.

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This activity is intended for emergency physicians, ED nurses, and other clinicians. It is in effect for 36 months from the date of the publication.

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Joshua Atkins, MD, PhD, the lead author of this research. Atkins serves as an associate professor in the department of anesthesiology and critical care and the department of otorhinolaryngology - head and neck surgery (ORL-HNS) in the Perelman School of Medicine at the University of Pennsylvania. Atkins notes that the presence of a surgeon is critical if a patient who cannot be intubated by other means requires emergency surgical airway access, best accomplished through an incision to the neck with a scalpel. Atkins says anesthesiologists and emergency physicians in the United States tend to be well trained to provide similar emergency airway access using a needle. Still, Atkins adds there have been fewer opportunities for them to receive surgical training in this area, and the scalpel technique is more effective.

In addition to a trauma surgery attending provider, the ARR team at HUP includes an anesthesiologist, pharmacist, radiology technician (along with a portable X-ray machine), respiratory therapist (along with a battery-powered bronchoscope), a rapid response coordinator, and an ORL-HNS resident and/or attending. Also, nursing staff respond along with equipment, including a surgical airway tray.

Facilitate Education

When implementing the ARR system, one challenge at HUP involved educating all hospital units about the team and when it should be activated. Atkins notes that a clinical emergencies committee provided this education unit by unit. Further, descriptive flyers were distributed and posted in all units. (*Editor's Note: See "Activating the Rapid Response Team" later in this article for more details.*)

If an anesthesiologist has arrived at the bedside already, the flyers indicate that the ARR team should be called in the event the anesthesiologist is unable to ventilate the patient. For example, a first attempt at intubation might fail, there may be an inability to ventilate, or oxygen saturation does not improve despite ventilation. In addition to their display in hospital units, flyers are available online, and are used during training sessions.

Expedite Care Decisions

In practice, when the ARR team is activated, the team members will assess the patient jointly with the primary team. Then, the group determines what action is needed based on a series of activation pathways. This may involve no airway intervention, some type of intubation, replacement of an existing tracheostomy, or a bedside surgical airway. Alternatively, the patient may be transported to the operating room for a surgical airway, a surgical direct laryngoscopy, a rigid bronchoscopy, or extracorporeal membrane oxygenation.

In a retrospective review of 117 ARR-involved events that took place during a 40-month period between August 2011 and November 2014, investigators found that an airway was secured in all patients for whom the ARR team attempted airway management.

Investigators noted that a surgical airway was completed in five patients; seven patients were transported to the operating room for airway management procedures.

"Many of our surgical airways actually occur in the operating room. In other words, they start on the floor or the ICU or the ED, and then the actual surgical airway takes place in a controlled setting by surgeons in

the operating room,” Atkins explains. “The other thing that our research highlights is that many of the [airway] emergencies were actually patients with existing tracheostomies. What we have learned that is as important, if not more important than actual skill set in actually performing a surgical airway, is the interdisciplinary experience with airways.”

Atkins notes that by assembling a multidisciplinary team quickly, appropriate care decisions can be expedited. “You can come to a rapid team discussion and arrive at a quick plan instead of an ad hoc, sort of haphazard, sequential sort of activation of various exercises, which leads to a less efficient solution of the problem,” he adds.

Address Activation Delays

In the early stages of implementation of the ARR system, investigators found instances when clinicians thought that calling ENT and anesthesia was equivalent to activating the ARR system. “We had to go back and do some education [noting] that this was not the case,” Atkins notes.

Investigators also saw some other cases when activation of the ARR team was delayed incorrectly. Atkins recalls one such case that resulted in a poor outcome. “[The treating clinicians] first went to anesthesia, and then they called ENT. They eventually activated the ARR system when the patient actually met the criteria for activation from the beginning,” he explains. “Then, we had almost the exact same type of case where clinicians activated [the ARR team] from the beginning, and there were two different outcomes.”

Atkins observes that this reluctance to activate the ARR team when

EXECUTIVE SUMMARY

While emergency providers are trained in the management of difficult airways, there are times when added multidisciplinary expertise can be essential to ensuring a good outcome. To address these instances, some medical centers have established rapid response teams that will come to the bedside of patients with known difficult airways or new complications that make airway access problematic.

- Investigators at the Hospital of the University of Pennsylvania (HUP) in Philadelphia developed an airway rapid response (ARR) system after quality reviews determined that ad hoc processes were contributing to delays in assembling the appropriate expertise and equipment in cases in which emergency intubation had failed outside the operating room environment.
- In addition to a trauma surgery attending provider, the ARR team at HUP includes an anesthesiologist, pharmacist, radiology technician (along with a portable X-ray machine), respiratory therapist (along with a battery-powered bronchoscope), a rapid response coordinator, and an otorhinolaryngology - head and neck surgery resident and/or attending. Also, nursing staff respond along with equipment, including a surgical airway tray.
- Johns Hopkins Hospital in Baltimore developed its difficult airway response team (DART) in 2005, and it is now a part of the culture in the ED. In fact, emergency medicine providers are part of the DART team, although they only respond to activations in the ED.
- Experts note that successful deployment of a rapid-response approach requires clear designations of responsibility to the players involved when activation occurs, and an active review process for ongoing improvement.

indicated has decreased, but he notes that the unit where this reluctance tends to be the highest is in the ED. “I think this is unique somewhat to the academic medical center because part of the issue is that emergency physicians are, to some extent, airway experts themselves. There has been some reluctance at times to engage other airway experts,” Atkins offers.

To address the issue, the hospital is implementing an interdisciplinary surgical airway team training simulation program. Clinicians are invited to participate in complex circumstances that would require the activation of the ARR team. “Then, we bring the ARR team in real time down to the ED, and we work through these issues,” Atkins notes. “Then we debrief, highlighting

the criticality of the interdisciplinary conversation.”

Atkins observes that even hospitals without resources to implement a rapid response team can improve outcomes. For instance, he explains that one of the most successful improvements at HUP was the creation of an interdisciplinary airway safety committee, which Atkins co-chairs.

“That actually gets all the personalities and players in the room regularly so that they are much more prepared,” he says. “We found that we identified many more issues than people thought there were. Now, within 24 hours I hear of almost any unusual airway situation in a huge health system.”

An airway safety committee should incorporate representatives

from anesthesia, ENT, surgery, the ED, respiratory therapy, and rapid response nursing, Atkins advises. If a committee is integrated across a large health system involving multiple hospitals challenges are more likely to come to light so they can be addressed specifically, Atkins says.

“Our committee hosts a system-wide interdisciplinary airway seminar once a year. We introduce new protocols that we have developed, and we also review multiple airway cases for everyone’s edification,” Atkins reports.

Another important step hospitals can take is to try to standardize the equipment and processes used to address difficult airways. Further, if clinicians and specialists move between hospitals within a larger health system, then standardization should encompass the entire system, Atkins advises.

For example, the same bronchoscopes and laryngoscopes should be used in every setting so clinicians are not asked to rescue a patient using tools they have never seen before.

“We had one device in the ED and the ICUs, [and] another device that was used in the operating room that

the anesthesiologists used,” Atkins recalls of one such episode. “Now that we have the whole hospital on the same equipment, there is a lot more working familiarity on everyone’s part with the equipment so that issue doesn’t become an obstacle.”

Difficult airway incidents may not occur often in some hospitals, but Atkins notes that these events occur in large medical centers like HUP more often than many surmise.

“By bringing attention to these events, we have been able to catalyze interest in potentially designing an interdisciplinary training program for this,” Atkins says.

The difficult airway response team (DART) at Johns Hopkins Hospital dates to 2005, explains **Susan Peterson**, MD, associate medical director for patient safety and quality in the department of emergency medicine. “It has been a part of the culture of the ED ever since I have been here,” she explains.

Unlike the ARR team at HUP, emergency medicine physicians were part of the team that developed DART. Other DART developers included anesthesiologists,

otolaryngologists, trauma surgeons, and risk management professionals. However, the ARR and DART missions were similar in that clinicians were endeavoring to develop a multidisciplinary approach to difficult airways and to standardize the emergency response process throughout the hospital.

Peterson acknowledges that even with the involvement of emergency medicine in DART’s creation, there were some initial concerns among emergency physicians about the prospect of implementing a rapid response approach in this area. “A difficult airway is something that we train extensively in,” Peterson explains. “There was certainly hesitancy when these discussions started. But as most things like this start, the origins were in cases where additional help would have been useful.”

Further, early scrutiny of the approach demonstrated that the DART approach is valuable. Investigators at Johns Hopkins tallied 360 activations of the DART team over a five-year period (July 2008-June 2013), finding that there were no airway management-related deaths, sentinel events, or malpractice claims in DART team-managed patients.²

While the DART process is firmly ingrained at Johns Hopkins Hospital, there is an ongoing, iterative process that refines and improves policies and practices related to the approach. A review committee studies every DART case with an eye toward further optimizing the process, Peterson adds. A major component of DART is the deployment of special carts throughout the hospital. These carts are equipped with all the supplies that potentially will be needed to address a difficult airway situation. Over time, significant detail has been added to the policy regarding this aspect. “We have two DART carts that exist in the

ACTIVATING THE RAPID RESPONSE TEAM

At the Hospital of the University of Pennsylvania, administrators have posted descriptive flyers in all hospital units. These flyers include the numbers to call to activate the airway rapid response team and spell out the indications for when activation is warranted. These indications include:

- a history of failed or difficult intubation or severe tracheal stenosis;
- significant bleeding from the mouth or nose;
- a fresh tracheostomy or other surgical airway;
- recent surgery to the neck or intraoral surgery;
- an inability to open the mouth;
- severe swelling around the mouth or neck;
- severe subcutaneous emphysema around the neck;
- leakage of fluids into the neck;
- severe acromegaly (the overproduction of growth hormone).

ED — one in the main area, and one over by our critical care trauma base,” Peterson explains. “All of the details regarding if [the carts] get opened, who then resets [the carts], and who cleans up the equipment ... needed to get put into the process over time. The scopes [used to open airways] don’t belong to the ED. Details that one wouldn’t perhaps think of initially have evolved over time.”

One particularly important issue that was highlighted and resolved through the review process was determining who should be in charge when this giant DART team responds to a case in the ED.

“It was something that came out of cases where anesthesia attending physicians would come down,” Peterson notes. “They are used to being in charge in the operating room.”

However, the review committee process determined that the emergency attending physician for a patient should remain in charge, clearing up any confusion that might arise when a DART team is dispatched to the ED. Emergency medicine providers are part of the DART group; however, they generally do not respond to DART calls when they occur outside the ED, Peterson explains.

“This is related to the fact that we simply can’t have our emergency physicians constantly leaving the ED to respond to things around the house because there are too many emergency patients coming through the front door of the ED,” she says. “For those [DART calls] that are in the ED, the attending physician for that patient is the one who is ultimately responsible — and is also the most familiar with the techniques that have already been tried.” While a DART team can be activated any time an attending physician believes it is warranted, there are specific indications when a DART activation is recommended.

For example, Peterson notes there is a process in the Hopkins electronic medical record (EMR) through which patients who have demonstrated historically difficult airways can be flagged.

“It could be that they have a neck tumor or an anatomic bone entity,” Peterson says. “If [patients] are flagged as [exhibiting] a difficult airway and require urgent intubation, that alone — even with the emergency physician not attempting intubation initially — would be appropriate [for a DART call].”

In emergent situations, the emergency physician would initiate a trial of rapid sequence intubation while calling DART simultaneously, Peterson observes. Patients who have not been flagged for difficult airways, but nonetheless present with recognized deformities, injuries, or other issues that suggest that the airway is going to be difficult, also would be candidates for a DART response.

“There is also a separate pediatric DART team ... that has its own criteria that pertains to activations,” Peterson adds.

Since DART is unique to Johns Hopkins Hospital, there are ongoing efforts to ensure the constant flow of residents and other incoming clinicians understand the process and related policy requirements. “On an annual basis, when the new interns come in, they get hit with a lot of information, and there is specific education related to DART included,” Peterson explains. “[Also,] we have physician advisors for each department who are responsible for discussion and communication of policy requirements if any new faculty have joined.”

Peterson’s advice to other hospitals considering rapid response approaches to difficult airway situations is to establish a clear understanding of who

is involved and everybody’s specific role. Also, she advises working into the process both an immediate debrief and a later review of all rapid response situations.

“The best versions of this that we have had have always involved some sort of debrief to learn from any real-time issues that have occurred,” Peterson notes. “You always want to make sure that the residents who are directly at the bedside get some real-time feedback about the issue that is going on.”

In its review of all incidents, the DART committee can study broader issues that may come out of a specific response, Peterson adds. Instituting mechanisms for ongoing education about the rapid response process is critical because activations of any DART-like process are likely to be infrequent.

“On a daily basis, the number of those that are actually happening in the ED is low, so that education is very important,” she says. “People need to know the resource exists [and] when it should be used. Then, if it is activated, everyone needs to understand what their role is.” ■

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Higher STD Rates Alarm Investigators

Researchers from the CDC report that STD diagnoses are at the highest they have ever been in the United States, signaling what some are calling a public health crisis.

According to preliminary data released by the CDC at the 2018 STD Prevention Conference in Washington, DC, in August, there were 2.3 million cases of chlamydia, gonorrhea, and syphilis diagnosed in 2017. This reflects a 76% spike in syphilis diagnoses and a 67% increase in gonorrhea diagnoses since 2013. Chlamydia remained the most common STD reported to the CDC, with more than 1.7 million cases diagnosed in 2017. Researchers noted that nearly half these cases occurred in young women 15-24 years of age.

The new data show that STD rates have increased every year since 2013. At a press briefing, **Gail Bolan**, MD, director of the CDC division of STD prevention, said the numbers reflect a persistent and troubling trend. She noted that rates of gonorrhea have nearly doubled among men and increased by one-fifth among women during the five-year period. She added that this is a particular concern,

given that a small but growing fraction of lab specimens of gonorrhea show signs of antibiotic resistance. Bolan called for a new commitment from the healthcare sector, scientists, industry, and state and local health departments to address the surge in STD cases.

David Harvey, MSW, executive director of the National Coalition of STD Directors, placed part of the blame for the crisis on what he termed an extreme lack of awareness and education about STDs and sexual health. He said physicians are not sufficiently testing and screening for STDs, and that patients do not realize that they need to ask for screening and treatment.

Current recommendations stipulate that women younger than the age of 25 should be tested annually for chlamydia and gonorrhea, and that men who have sex with men should get tested at least annually, Bolan said. Without treatment, women can be left infertile.

Also, syphilis can spread from mother to fetus, causing babies to be born with birth defects or to be stillborn. Despite mandatory syphilis

testing when a woman is found to be pregnant, Harvey noted that 1,000 babies a year are diagnosed with congenital syphilis.

Harvey called on Congress to provide more funding for provider training through the CDC's STD Prevention Training Centers, where funding has been cut over the past two decades. Noting that treatment for STDs costs \$16 billion a year, Harvey also asked for \$70 million in funding to help state and local health programs handle the crisis. Harvey added that the United States has the highest STD rates in the industrial world, and that the problem affects the most vulnerable populations.

Michael Fraser, PhD, CAE, executive director of the Association of State and Territorial Health Officials, said that any solution to the STD crisis must include repairing the country's "crumbling public health infrastructure." He noted that cuts in funding have affected programs that focus on prevention. With appropriate support, public health can take some of the pressure off the clinical system, he said. ■



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The Case for Broader ED-based Screening Strategies for Hepatitis C

Funding remains a stubborn obstacle to EDs interested in establishing screening programs

With new treatments offering greatly improved prospects for patients infected with the hepatitis C virus (HCV), more EDs have begun screening for the virus among high-risk groups, especially people born between 1945 and 1965, the group deemed at highest risk for HCV. The yield from such efforts has been impressive, although asking patients about high-risk behaviors has proven problematic.

However, there is evidence that ED-based screening efforts are considerably more effective at identifying HCV infections with routine testing, regardless of whether patients are baby boomers or report high-risk behaviors such as injection drug use.

The latest evidence comes from Boston University Medical Center (BUMC), which offers opt-out HCV testing to all emergency patients older than age 13 whose blood is drawn for any reason. Studying the three-month period between November 2016 and January 2017, investigators found that out of 3,808 tests performed, 504 of the initial tests for HCV were positive. Confirmatory tests were carried out in 497 of these cases, with active infections confirmed in 292 patients in the tested population.¹

What is interesting about these results is that half the patients found to be infected with HCV did not fall within the baby boomer cohort recommended for testing by the CDC. (*Editor's Note: More information about the CDC recommendations are available at: <https://bit.ly/2hxNkCb>.*) These results are not necessarily unique, as other EDs are finding similar

results from broader HCV testing approaches. Prior to implementing the nontargeted HCV screening approach, emergency physicians at BUMC only tested for HCV when there was a clinical indication that a patient was infected, explains **Elissa Perkins, MD, MPH**, the study's lead author and vice chair of emergency medicine research at BUMC.

"It was incredibly rare that [testing for HCV] would happen," she says. "The year prior to our starting this intervention, we had approximately 15 tests per month performed. There really was no organized screening."

Investigators hypothesized that a nontargeted screening program likely would identify a high number of active HCV infections because the area had been hit hard by the opioid

epidemic. "We had a suspicion ... that if we went only by the CDC screening guidelines [for HCV] that we would be missing a portion of patients," Perkins explains. "There is a lot of stigma associated with injection drug use. Patients aren't always honest about whether they are actively using drugs or have used drugs in the past. We decided that ... as long as we were developing a new program, we would be really broad in who could be potentially impacted."

Investigators decided to begin HCV testing at age 13 because patients must be at least that age to receive the newer, breakthrough drugs for HCV.

"Whoever enters the blood draw order in the electronic medical record [EMR] ... that is what triggers a best

EXECUTIVE SUMMARY

Although the CDC recommends frontline providers use a targeted screening strategy for the hepatitis C virus (HCV), some EDs are finding that nontargeted approaches are more effective at uncovering new infections. Further, investigators note there is a new surge in HCV infections among younger people that is associated with the opioid epidemic. Such individuals often are reluctant to disclose their use of injectable drugs or other behaviors that put them at risk for HCV.

- Data collected as part of a nontargeted screening program in the ED at Boston University Medical Center show that roughly half of the patients identified with HCV fall outside the baby boomer cohort recommended for testing by the CDC.
- The ED at the University of Alabama at Birmingham Hospital moved from a targeted to a nontargeted screening approach for HCV in 2015, essentially doubling the number of infections identified.
- Experts note that ED-based screening for HCV can be automated to the point where it does not place unacceptable burdens on emergency providers. Still, navigators are needed to link patients who test positive for HCV to appropriate care.

practice advisory [BPA] ... indicating that the patient is eligible for HCV testing,” Perkins explains. “It prompts the provider to obtain the patient’s authorization for the test, and then it allows the provider to sign off on the BPA.”

Not only is the BPA a flag, Perkins says the BPA also is tied to an order entry so that once the provider accepts the BPA, it automatically generates an order for the HCV screen and prints labels for the blood tubes. The only instance when this will not occur is when a patient’s HCV status is documented in the EMR already. The system will check for this information automatically before generating the order for blood work.

“This approach was very intentionally designed to not be a heavy lift on the emergency physicians. We anticipated that if we were asking too much from them, they would not be interested in completing it,” Perkins says. As a result, emergency providers have been supportive of the program.

Are patients supportive? There are no hard data on what patients think about the screening, although most eligible patients have had orders placed for the test.

“In my own personal experience, I have only had one patient decline the HCV test in the two years we have been doing [the nontargeted screening],” Perkins reports. “Most patients, once they understand what it is, are very happy to have the screening.”

Employ Navigators

The preliminary HCV test determines whether a patient is antibody-positive or has been exposed to the virus. That is all that is required for patients who receive negative results. However, for patients who test positive on the antibody test, a second,

confirmatory test is needed to show whether the patient is infected. Generally, Perkins says that the initial antibody test returns from the lab at BUMC within one or two hours. In most cases, patients still are in the ED at that point, and the provider can notify patients of the results.

When the antibody tests are positive, confirmatory tests are ordered, but they generally take a few days to complete.

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EARLY.

“We have navigators who get a list of all the patients who have positive test results,” Perkins shares. “[Navigators] then contact all of those patients, inform them of their positive test, and work with them to link them to care.”

However, connecting with patients after they have left the ED is not always successful. In Perkins’s study, only about one-third of patients with active infections were scheduled for follow-up appointments. Of those, only 66 patients made it to the follow-up appointment. “There is a large number of patients we just

have a lot of difficulty getting in contact with. To some extent, that is a product of this particular patient population,” Perkins laments. “A lot of the people we are diagnosing who we are unable to contact have injection drug use issues; many are homeless, and many have mental health issues.”

To improve follow-up for patients with active infections, program leaders have built capacity into the system so that patients who have been diagnosed with HCV will be flagged if they return to the ED for any reason.

“It is automated. The EMR will flag the navigator, and the navigator can then come down to the ED and talk to the patient and try to link him or her to care,” Perkins says.

Finding outpatient providers with the expertise to treat patients with HCV has not been a problem, as increasing numbers of primary care physicians have been trained in the treatment of HCV in recent years.

“We have been able to expand capacity in almost every outpatient provider arena,” Perkins says. “We are also working with our addiction providers to expand their capacity for treating HCV.”

Currently, much of the new HCV screening program at BUMC is funded through a pharmaceutical company that developed curative treatments for HCV. However, Perkins believes the program will endure beyond this grant funding.

“The institution’s [leaders] are showing they are very supportive of the program,” she says. “They recognize this is a need of our patients.”

Emergency medicine professionals interested in developing similar screening strategies should involve all key stakeholders early, Perkins advises.

“Figure out what the institutional priorities are and how you can work within those priorities to develop

a program that is going to be supported,” she says. “Without this stakeholder buy-in and leadership ... such a program is going to be very difficult.”

Perkins adds that the results from BUMC strongly suggest that HCV screening should be expanded beyond what the CDC recommends.

“This is a bigger problem than what we recognized [earlier],” she says. “If we only screen the people recommended under the current guidelines, we will be missing a sizable portion of infections.”

Eliminate Stigma Barrier

James Galbraith, MD, vice chair of research in the department of emergency medicine at the University of Mississippi Medical Center, conducted some of the original investigative work showing that ED-based screening for HCV had great potential to identify a high number of infected patients. This work revealed an opportunity to prevent downstream medical complications/costs and further spread of the infection to other individuals.^{2,3}

Further, Galbraith implemented the HCV screening program in place in the ED at the University of Alabama at Birmingham (UAB) Hospital. After initially screening in accordance with the CDC’s recommendations at UAB Hospital,

Galbraith moved to universal screening criteria in 2015. “It is very easy to identify the risk factor of somebody’s date of birth. It is very hard to identify the other risk factors for acquiring HCV [outlined in the CDC guidelines]. A birth cohort-only screening strategy will be great at identifying baby boomers, but it is going to miss the growing number of individuals — especially those who are younger than baby boomers — who have acquired HCV even more recently through injection drug use,” he explains. “We have seen HCV surge in a second wave of this epidemic that coincides with the opioid epidemic.”

The difficulty of identifying risk factors for HCV in the ED has everything to do with stigma, Galbraith shares. “Patients feel stigmatized by their behavior. They are unwilling to share with providers because they feel like it will affect their rapport with them, and vice versa,” he says.

“Emergency providers are very challenged sometimes to ask the risk-based questions to every patient coming into the department, fearing that we will offend them, interfering with our rapport with the patient. A lot of HCV cases go undetected [with a targeted screening approach].”

With a universal screening strategy, providers no longer need to ask about risk factors. “We test people based on their awareness of their HCV status. If they are [unaware

of] their HCV status or they haven’t been tested, we offer a test,” Galbraith reports. “We test approximately 22,000 people annually [in the UAB Medical Center ED] ... and we see an overall antibody-positive prevalence of 7.7%.”

Similar to the BUMC data, roughly half the individuals who test antibody-positive were born after 1965, putting them outside the baby boomer cohort targeted in the CDC screening guidelines.

“The most striking thing we identified at UAB Hospital is that our HCV antibody-positive prevalence for those born after 1965 overall is 6%. It is very high even in that younger group, but it is driven by a 13.7% prevalence amongst white individuals born after 1965 compared to a 2% prevalence for persons who are black,” he says. “It is a young, white problem. It fits exactly with what we are seeing going on in our local communities with the opioid epidemic and what is known also throughout Appalachia and nationally.”

When UAB Hospital moved to a universal testing strategy, it essentially doubled the number of HCV cases it was identifying, Galbraith explains.

“Part of the story here with HCV is that we do have this wave of baby boomers who still account for the majority of infections in the U.S. ... but there are more and more people transitioning and injecting opioids every day. We are failing to identify

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those individuals ... and that includes not just HCV testing, but also HIV testing.”

Address Concurrent Addiction

The HCV testing process in the ED at UAB Hospital begins when patients present to the front desk for any complaint.

“If they are older than age 18, the nurse asks them if they have ever been diagnosed with HCV. If the patient states no, then an opt-out test is offered,” Galbraith explains. “That nurse will then explain that [the ED] performs routine HCV testing, and that a test will be performed that day unless the patient wishes to decline.”

As long as the patient does not decline, an automated order for the HCV test will be issued; the patient will have blood drawn during the visit, and an HCV test will be conducted, Galbraith adds.

In the early days of the HCV testing program at UAB Hospital, finding outpatient providers to treat all patients who were testing positive was challenging. However, those capacity issues have eased considerably in recent years.

“Our linkage-to-care rate has improved and it has improved secondary to more providers coming on board to treat HCV,” Galbraith says. “Also, we have more treatment providers now in our surrounding Federally Qualified Health Centers, which have really allowed us to get patients into more stable medical homes.”

It has been very convenient to send patients who have otherwise uncomplicated HCV infections to primary care physicians, rather than subspecialists, to be treated, Galbraith notes. However, he says that new challenges have emerged: Many

patients diagnosed with HCV also struggle with competing addiction problems.

“We have a new type of patient who has different needs than many of the baby boomers [with HCV] that we were seeing,” Galbraith says. “Many of the new, younger individuals we are identifying have problems with opioid addiction. We are really challenged to get them stabilized with their addictions.”

To address this problem, UAB Hospital will initiate buprenorphine prescribing in the ED.

“We are working on a lot of things in this area, and trying to build the resources needed because we want to treat individuals for HCV. We certainly can treat them, even while they have their addiction, but we are really not giving them the service they need if we are not getting them help for their addiction, which is actually potentially much more lethal.”

Galbraith intends to get both HCV and HIV testing off the ground at the University of Mississippi Medical Center ED and to work on opioid harm reduction interventions. Galbraith also recently assisted a colleague in starting an HCV testing program in the ED at the University of Kentucky HealthCare.

“Kentucky has perhaps the highest prevalence of HCV in the U.S., largely driven by the opioid epidemic,” Galbraith observes.

While the logistics of creating such a program in the ED are very feasible, funding remains an obstacle for many.

“There is just not enough financial support to screen. It is still not reimbursable,” Galbraith laments. “If you are going to test tens of thousands of patients annually, you are running budgets that are in the hundreds of thousands of dollars.” In addition to testing, funds are needed to support linkage-to-care components.

“It is a full-time job for multiple individuals to work on the navigation, and the cost of that navigation is expensive,” Galbraith acknowledges.

However, he stresses that the benefits of ED-based HCV screening are considerable.

“There are a lot of lessons we have learned from the HIV epidemic. One of the lessons was that testing was an important component of prevention,” Galbraith notes. “It gives people an opportunity to be treated. If they are treated, then they are not going to spread the virus anymore.” ■

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SOURCES

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Study: Drug-resistant Bacteria Increasingly Common in Urinary Tract Infection Patients

New research suggests that antibiotic-resistant infections remain a challenging problem, leaving frontline providers with few options when tried-and-true medicines fail to knock out invading bacteria.¹

Investigators from Highland Hospital in Oakland, CA, found that nearly 6% of urinary tract infections (UTI) diagnosed in the ED over the course of one year were caused by extended-spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae*, making the infections resistant to commonly used antibiotics.

The authors reported that 62 out of 1,045 patients with UTIs were infected with the drug-resistant bacteria. Nearly half of these infections were acquired in the community rather than in a healthcare setting. In the past, most drug-resistant bacteria have been acquired in hospital settings. However, researchers noted that in recent years, drug-resistant bacteria have been affecting more people in the community, especially in the case of UTIs. In this study, more than two out of every five infections analyzed were contracted in the community. Investigators noted that is the highest proportion reported thus far in the United States.

Of particular concern to investigators was the fact that in most of these cases, there was no way to determine which patients were at risk. They reported that eight patients were women younger than 50 years of age with no comorbidities and no more than one UTI in the previous year. Twelve tested samples contained *Escherichia coli*, and genotyping revealed them to exhibit genes for ESBL, making the bugs

resistant to most cephalosporins as well as fluoroquinolones. However, the infections were susceptible to fosfomycin.

The researchers noted that nearly half the patients with drug-resistant infections were initially prescribed antibiotics that are not effective for ESBL-producing infections. Consequently, investigators noted that if ESBL-producing *Enterobacteriaceae* become more prevalent, then cephalosporins may no longer be recommended for treatment of UTIs. They also advised changes to clinical practice in the ED, including the more widespread use of urine culture tests and the development of a reliable follow-up system for patients who test positive for drug-resistant infections.

In addition, investigators urged providers to increase their awareness of their own hospital's antibiogram, which shows which antibiotics work against specific bacteria. The authors

also advised adherence to treatment guidelines and awareness of which antibiotics should be avoided in certain circumstances.

Bradley Frazee, MD, the lead author of the study and an attending physician at Highland Hospital, noted that while more work remains to address the causes of antibiotic resistance, the development of new drugs also is critical. ■

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CME/CE OBJECTIVES

After completing this activity, participants will be able to:

1. Apply new information about various approaches to ED management;
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CME/CE QUESTIONS

- 1. The number one obstacle to implementation of an airway rapid response system like the one in place at the Hospital of the University of Pennsylvania is whether the hospital has:**
 - a. leadership support for the concept.
 - b. the required specialized equipment.
 - c. round-the-clock nursing support for the rapid response team.
 - d. an in-house surgical presence 24/7.
- 2. One of the most successful airway improvements at the Hospital of the University of Pennsylvania was the creation of:**
 - a. an interdisciplinary airway safety committee.
 - b. a disciplinary process for providers who fail to activate the rapid response system.
 - c. a specialized equipment team.
 - d. None of the above
- 3. Providers are seeing hepatitis C (HCV) cases surge in a second wave of this epidemic that coincides with:**
 - a. cuts in funding.
 - b. the opioid epidemic.
 - c. passage of the Affordable Care Act.
 - d. changes in CDC treatment guidelines.
- 4. When the ED at the University of Alabama at Birmingham Hospital switched from a targeted to a universal screening approach for HCV, the number of active infections identified:**
 - a. halved.
 - b. doubled.
 - c. tripled.
 - d. quadrupled.