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Briefings On Accreditation and Quality

Volume 29 Issue No. 8 August 2018

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Infection control

HFAP revised standards: Legionella

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To keep themselves as closely aligned with CMS as possible, HFAP has updated their Acute Care Manual with a new requirement for Infection Control Standard 07.01.03—*Reduce Risk of Legionella in Water Systems.*

The accrediting organization (AO) says facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of legionella and other opportunistic pathogens.

CMS issued S&C memo 17-30 last summer, reminding healthcare organizations of the dangers of legionella. Surveyors from all AOs are paying closer attention to facilities' water systems as a result.

Alise Howlett, AIA, CFPE, CHFM, is HFAP's emergency management, physical environment, and life safety standards advisor. And **Karen Y. Beem,** MS, RN, serves on HFAP's standards interpretation staff and participates in the development and revision of standards.

This Q&A has been lightly edited for clarity.

Q: In your opinion, what's one of the most significant changes in HFAP's legionella standards? And how will they help patients?

Howlett: The most significant change is in terms of the intent of the standard; that's most helpful to facilities to know.

During survey, we're really going to be assessing facilities for their risk management process for legionella. Before, we might have had questions about it or it might have been a small part of their policy. But right now, they have to outline a very specific risk assessment that identifies:

- Where they'll be testing their water
- Who's going to be looking at the results
- Who's making decisions about what needs to happen
- How to ensure the quality of their water is reported through the safety committee and isn't reviewed by a single entity

One of the problems in general we see in life safety or in physical environment compliance is that hospitals tend to work in silos. Maybe the facilities people stick to themselves and the clinical people stick to themselves. We really want to see more cross-coordination between medical staff and facilities.

A lot of these reports that are required under the standard need to be reported through either the quality or safety committee so there's a more global review. The intent of the standard is that they're doing specific testing and that it's getting reported up through the committee.

Q: Is there any new documentation required for this to show that you're in compliance?

Howlett: I would anticipate, because every facility is a little bit different, some people might already be doing something. But during a survey, they're going to have to provide a specific risk assessment that doesn't just include the water supply, but also fixtures in areas in the hospital that they have identified that they have to pay attention to.

Previously it would have been something where maybe they just provided the water report and that would have sufficed, especially for small facilities. Now they have to risk-assess their own facilities and items inside them that present a hazard. After that, they should have a policy that states how often they should be testing. And [surveyors] will need those test reports to see that they're doing that testing. These are some

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Legionella overview

The legionella bacterium is responsible for legionellosis: a respiratory disease that can cause a type of pneumonia called Legionnaires' disease, which kills about a quarter of the people who contract it. Legionellosis is especially dangerous for patients older than 50, who smoke, or have chronic lung or immunosuppression conditions.

The bacterium breeds naturally in warm water and can usually be found in the parts of hospital systems that are continually wet. Poorly maintained water systems have been linked to the 286% increase in legionellosis between 2000 and 2014. The CDC says there were 5,000 reported cases of it in 2014 alone, with about 19% of outbreaks in long-term care facilities and 15% in hospitals.

things that maybe they weren't doing before but they need to step up and do now.

Obviously, once you have an initial test report and you're not getting anything for a while, we're not expecting them to test every month or a more frequent interval. But the risk assessment is really the key point that we're looking at.

Q: Why the focus on legionella specifically, as opposed to other waterborne ailments?

Howlett: Part of it is on CMS. We focus on what CMS tells us to focus on.

In CMS' memo S&C 17-30, which was revised June 2017, they have some great background information on recent outbreaks—particularly for hospitals and long-term nursing facilities because those patient populations are going to be much more subject to fatalities or illness based on legionella.

It came about because [CMS was] looking at data from 2000–2014 and about 9% of those reported cases were fatal. CMS has identified that as a major issue for patient care areas where you're expected to have an environment that won't harm patients.

Beem: It has reached national attention, and we have to respond. As an example, here in the great state of Illinois, there's been a lot of publicity about legionella found in a Veterans Administration facility. And it came to public attention because of several deaths in a short period of time.

Q: Anything else you'd like to add?

Beem: This is a combined effort between the infection control coordinator and the facilities manager. Neither of them can do it in isolation; it's a team effort.

Howlett: Facilities believe that being in compliance with their local plumbing code is enough to grant them protection, but that's probably not true. So this might be a surprise to facilities, or they would be looking to their plumbing code for protection, and they really need to go above and beyond that for the risk assessment. That's why CMS has gone so far to look for additional requirements.

RESOURCES

- ANSI/ASHRAE Standard 188-2015 "Legionellosis: Risk management for building water system"
- ASHE monograph. "Water Management in Health Care Facilities: Complying with ASHRAE Standard 188"
- CDC FAQ on ASHRAE 188-2015
- CDC water management toolkit on Legionella
- CDC's webpage of information on controlling Legionella and Legionnaire's disease
- Federal Register public comments on CDC's request for information about Legionella best practices

And don't forget to look at your previous editions of BOAQ for more education about legionella and CMS' expectations:

- Hospitals need to test for Legionella
- CMS tells surveyors to double check for Legionella contamination

Questions Comments & Ideas

Contact me at *bward@hcpro.com* or 781-639-1872, Ext. 3430.

– Brian Ward, Associate Editor

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Medication management

Case study: How DeKalb Medical cut its overridden medication safety alerts after fatal accident

One month after a fatal error, patient leaders were able to reduce overridden safety alerts by 60%

DeKalb Medical is a nonprofit health system based out of Decatur, Georgia, with 627 beds across its three campuses. The facility was the first in Georgia to receive an international "Baby-Friendly" hospital designation, an impressive feat as America's maternal mortality rates shoot up. And 83 out of the 800 physicians working for DeKalb were named "Top Doctors" by *Atlanta Magazine* in 2017.

But last October, the hospital was placed under immediate jeopardy following the death of a patient with dementia. After being admitted from a nursing home, the patient was given 10 times the maximum daily dose of a calcium channel blocker, causing a fatal overdose.

DeKalb Medical officers self-reported the incident to CMS and released a statement saying they "want to make sure it never happens again." The case has spurred a series of patient safety reforms, many of which seek to reduce overreliance on technology.

"Our staff, physicians, pharmacists, nurses, other healthcare team members—and I don't think this is unique to our hospital system—have become very task-oriented in their actions as it relates to working with an electronic medical record," says **Sharon Mawby, MSN, RN, NEA-BC,** vice president of patient care services and chief nursing officer for DeKalb.

"Many hospitals, in an effort to decrease keystrokes for a practitioner, have developed order sets and systems which allow our practitioners to simply check boxes or choose from drop-down screens," she says.

That efficiency, without proper safeguards, can make it easier for healthcare workers to carry out unsafe orders methodically, without a second thought, Mawby says.

"Why aren't we asking questions?" she adds. "Why aren't we stopping to listen to our gut when something doesn't feel right?"

What went wrong

The doctor who ordered 100 mg of amlodipine besylate tablets failed to second-guess an existing error made by another physician in the patient's file. A pharmacist tasked with reviewing the order missed the error as well, even though DeKalb's medication management system alerted the pharmacist to the unsafe dosage.

Pharmacists may mistakenly override a medication safety alert because they are inundated with false alarms, DeKalb's pharmacy director told inspectors after the fatal incident, according to an inspection report CMS released to *HealthLeaders Media* in response to a public records request.

The rate of adverse drug events originating during an inpatient stay at U.S. hospitals declined 23.8% from 2010 to 2014, falling most dramatically among patients ages 65 and older, according to a study released in January by the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project.

But the quality concerns over "alert fatigue," which can make it more difficult to catch medication errors before they harm patients, continue to plague hospitals and health systems nationwide.

Research conducted by **Adrian Wong, PharmD, MPH, BCPS, BCCCP,** an outcomes research and pharmacy informatics fellow at Brigham and Women's Hospital in Boston, found that nearly three-quarters of medication safety alerts were overridden over a three-year period at a large teaching institution he studied. About 40% of the overrides were deemed inappropriate.

Despite the numbing effects of alert fatigue, a second DeKalb pharmacist caught the doctor's error last October, notified the first pharmacist of the problem, and kept the unsafe order from being processed, according to the CMS documents.

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But the pharmacists failed to contact the doctor to modify the mistaken order.

When the patient was transferred from the Express Admission Unit to a medical wing, a registered nurse followed the unmodified order. The nurse scanned the patient's wristband and the medication packaging to verify the proper dose, then helped the patient take all 10 amlodipine tablets.

The patient's blood pressure dropped sharply, and she was transferred to the ICU, where she was placed on a ventilator until her death two days later.

Mawby says individual workers were held responsible for the actions they took with "reckless disregard" for safe medication administration procedures. She declined to say whether anyone was fired.

Seeking systemic solutions

When serious medication mistakes occur, it may be tempting to place blame squarely on the shoulders of the doctors, pharmacists, and nurses who erred. But beyond holding individuals responsible for their actions, DeKalb's leadership team also identified several systemic problems it could solve.

Below are five key steps DeKalb took to shore up patient safety at its organization:

1. Medication safety team restructured

The three-hospital system already had a standing team tasked with addressing medication safety concerns. But the fatal error last October prompted DeKalb to restructure, revamp, and revitalize the initiative, Mawby says.

"The problem with the previous team was that it was not robustly overseen, so even though they reported directly to the pharmacy and therapeutics committee, there was no link to the board for information," she says. "There was really no direct link to me for patient care to help them solve issues."

The restructured team—which rewrote its charter—now reports to the board quality committee, linking it directly to C-suite leadership for more consistent communication.

2. Data points identified, tracked

To quantify DeKalb's problems and progress, the medication safety team identified key data points it will track in an effort to trend all medication safety errors and adverse drug events that rise above a defined level of severity.

The team will keep an especially close eye on one metric, Mawby says: the number of overridden medication safety alerts.

After months of planning and technical EMR adjustments, the team began formally tracking these overridden alerts in February. At the beginning of the month, there were 433 alerts overridden in a single day. By the end of the month, DeKalb slashed that number by 60% to 175 alerts overridden in a single day.

"It's a definite improvement, but the fix is going to take a long time," Mawby says.

For starters, the EMR and related systems require that every medication be mapped individually to identify its safe dosage parameters. If the parameters are too strict, then healthcare workers will be bogged down with unneeded alerts; if they're too lax, then those who prescribe and administer medication will be driving without guardrails.

"You can't just turn the button on and say, 'OK, we've got these dose quantity alerts on for everything,' " Mawby says. "It just doesn't work that way."

The goal should not be to reach zero overridden alerts, Mawby notes. The goal should be to track and verify that the alerts are being overridden for the right reasons.

Alarm fatigue

With alarms and alerts constantly going off in the hospital, it's common for providers to grow numb to them. The ECRI Institute made alarm fatigue the fourth biggest healthcare tech hazard for 2018. You can read more about the problem (and some solutions) in our May article "Ransomware and reprocessing lead the ECRI list of top tech hazards."

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3. Changes to EMR systems implemented

As the medication safety team has begun to track overridden alerts more closely, the DeKalb team has pinpointed which medications and providers need the attention of a fine-toothed comb.

"We've been able to go in and readjust order sets so they're not alerting inappropriately," Mawby says. "We've been able to go in and teach physicians and pharmacists and show them what they're doing wrong."

Arguably the most significant systemic problem that contributed to last October's incident was rooted in DeKalb's EMR setup. Although the pharmacists tasked with reviewing and filling the unsafe medication order received an automated safety alert from the system, the physician did not.

That setup has since been changed. DeKalb turned on medication safety alerts for prescribing physicians as well, offering immediate feedback when an order appears to contradict safe practices.

"The only way that a physician, or person ordering the medication, can get past the alert now is by choosing the appropriate override comment as to why the order is given outside of the normal parameters," Mawby says.

"When the medication order gets to the pharmacist, they will be able to see why the medication was overridden. They will be the second line of defense to make sure that that's an appropriate reason as well to override an alert."

4. Policies and training updated

In addition to targeted training for physicians, pharmacists, and others involved in medication administration, DeKalb implemented more general safety training and information-sharing initiatives on a regular basis. These initiatives include daily safety briefings.

"Those are led by our senior leaders, which is somebody from the C-suite," Mawby says. "And at these daily safety briefings, we report out on safety events that may have occurred in the past 24 hours or issues that we are concerned might be an event in the next 24 hours."

Attendees include hospital leaders from across the DeKalb system, including representatives from facilities services, sanitation, and other teams not directly involved in patient care.

5. Transparency practiced

In the immediate aftermath of the medication safety error, DeKalb hosted town halls that were mandatory for all patient care services staff and optional for the rest of the system's employees.

"One of the best things that we did as an organization was be completely transparent about the event that occurred," Mawby says, noting that nearly 800 people attended.

Leaders stood in front of DeKalb staff, outlined what went wrong, and identified eight missed opportunities that could have stopped the error from harming the patient.

"It brought a lot of caregivers to tears," Mawby says.

This transparency in the wake of a tragedy that stemmed from individual and systemic blunders alike is necessary to foster a culture of safety.

"You've got to have a culture of safety in the hospital that is supportive of asking questions and bringing concerns forward," Mawby says.

"This horrible event actually has changed us in so many ways that we've expanded our focus beyond medication administration to include other items around patient safety," she adds. "It has to become an overriding theme for us."

Written by SteVen Porter, editor at HealthLeaders Media

Medication management

Here are some links to our previous medication management articles.

- Opioids: What do healthcare professionals want and need to know?
- Q&A: What you need to know about compounding medicine
- The Joint Commission pain management deadline is approaching fast
- USP <800> deadline on hazardous drug handling postponed until 2019

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Infection control

Case study: Automating sepsis alerts at Harborview Medical Center

Using a simple EMR alert, the hospital reduced sepsis fatalities by 41%

Sepsis is the body's extreme response to an infection. The condition is life-threatening, common, and on the rise. In 2014 alone, there were 1.7 million sepsis hospitalizations and 270,000 sepsis deaths in the U.S. And in 2017, it was reported that even though sepsis is only present in 6% of hospitalizations, it accounts for 15% of in-hospital deaths.

Sepsis mortality rates increase quickly when the condition is left untreated, even for just a few hours. However, there isn't a simple test for sepsis. Instead, providers have to watch for patterns and symptoms that could indicate sepsis. As a result, it's common to have misdiagnoses or delays in diagnosis.

Sepsis is also the most fatal complication for burn victims, accounting for 50%–60% of burn injury deaths. That last issue is a particular concern for places like Harborview Medical Center in Seattle. The 413-bed facility is the only designated Level I trauma and burn center in Washington state and is the regional trauma and burn referral center for Alaska, Montana, and Idaho. It has around 17,000 admissions, 259,000 clinic visits, and 59,000 emergency department visits annually.

Rosemary Grant, BSN, RN, CPHQ, is the sepsis coordinator at Harborview. She says her facility chose to focus on sepsis detection because the condition is "prevalent, expensive, and deadly."

"When we looked at data from our hospital and others, we saw that patients who develop sepsis in the hospital have a much higher mortality than patients who arrive in the emergency department with sepsis," Grant says. "So we knew we needed to focus on faster identification of sepsis in our inpatient population."

In 2011, the Harborview team decided to fight sepsis by changing the way they detected it. Working in-house, they developed an automated flagging system for their electronic health record (EHR).

When a patient is admitted to Harborview, the patient's vitals are plugged into the EHR several times each day. The system searches for patterns, trends, and symptoms that might indicate sepsis. If found, a red box appears around the patient's name, and the nurse is assigned a task in the EHR to screen the patient for infection.

The nurse then assesses the patient for non-sepsis causes for the readings. If the nurse decides the readings could indicate sepsis, then the physician is alerted. The system is designed so it won't sound more than every 12 hours, she says, meaning nurses won't get more than one alert per patient per shift.

Get Ahead of Sepsis

Earlier this year The Centers for Disease Control and Prevention (CDC) launched an anti-sepsis campaign to bring attention to the condition. Called "Get Ahead of Sepsis," the program was launched last August as an educational initiative to protect Americans from the devastating effects of sepsis, including emphasizing the importance of early recognition and rapid treatment, as well as the importance of preventing infections that could lead to sepsis.

The program calls on healthcare professionals to educate patients, prevent infections, suspect and identify sepsis early, and start sepsis treatment fast. In addition, this work urges patients and their families to prevent infections, be alert to the symptoms of sepsis, and seek immediate medical care if sepsis is suspected or if an infection is not improving or is getting worse.

"Detecting sepsis early and starting immediate treatment is often the difference between life and death. It starts with preventing the infections that lead to sepsis," said CDC Director Brenda Fitzgerald, MD, in a CDC statement. "We created Get Ahead of Sepsis to give people the resources they need to help stop this medical emergency in its tracks."

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"I think the most important component of our system is that it incorporates the bedside nurses' clinical judgment," says Grant. "The alert is just a computer algorithm, and if it paged the provider every time, they would become tired of it very quickly. Instead, it asks the nurse who is spending his/her shift with a patient whether infection is suspected based on abnormal vitals and the patient's overall clinical picture. It's only if and when the nurse suspects infection that the provider is notified."

> **"We saw that patients who develop sepsis in the hospital have a much higher mortality than patients who arrive in the emergency department with sepsis. So we knew we needed to focus on faster identification of sepsis in our inpatient population."**
>
> – Rosemary Grant, BSN, RN,CPHQ

Since the system's inception, Harborview has seen remarkable results. Sepsis mortality has gone down 41% from 2011 to 2017, and over 95% of alerts are addressed by a nurse within two hours. There's also been an increased awareness of the condition and its risks, Grant adds.

Sepsis patterns

Currently, Harborview's system uses systemic inflammatory response syndrome (SIRS) criteria to determine if a patient has sepsis. SIRS is defined as a combination of the following symptoms:

- Temperature less than 36°C (96.8°F) or greater than 38°C (100.4°F)
- Heart rate greater than 90 beats per minute
- Respiratory rate of more than 20 breaths per minute or an arterial carbon dioxide tension (PaCO2) of less than 32 mmHg
- Abnormal white blood cell count (either greater than 12,000/µL or less than 4,000/µL, or greater than 10% immature band forms)

Harborview's system also looks for:

- Systolic blood pressure less than 90 mmHg
- Lactate level greater than or equal to 2 mmol/L

Grant does note that there are slightly different criteria for burn patients, pediatric patients, and burned pediatric patients.

While sepsis and SIRS are closely linked, sepsis isn't the only possible cause for SIRS or SIRS symptoms. A patient could register on the SIRS scale if he or she has been more active, is in pain, has a bad cold, etc. That's why a nurse has to make the final call.

"If a patient has two or more of these criteria, the bedside nurse is asked if he/she is concerned for infection," she says. "If the nurse says yes, the provider is automatically paged to come to the bedside. If the nurse says no, he/she is asked to explain why the patient has abnormal vitals if it's not infection."

Building the system

The original build for the alert system took 12 months of work, says Grant. That included designing it, getting feedback and buy-in, building it in the EHR, and implementation. Then, in September 2016, Harborview held a weeklong rapid process improvement workshop (RPIW) to further refine the system based on provider feedback.

Approximately 15 team members were in attendance for the RPIW: attending physicians, resident physicians, bedside nurses, APRNs/PAs, a data analyst, a quality improvement specialist, and IT support. Afterward, the system was updated, with a continuing back and forth between the RPIW team on what changes to keep or drop.

"Since the implementation of those changes in February 2017, we have seen further decreases in mortality for hospital-acquired sepsis as well as increased three-hour [sepsis] bundle compliance," she says.

We're seeking experts

Contact me at *bward@hcpro.com* or 781-639-1872, Ext. 3430 and let me know your areas of expertise and interests in publishing or training.

– Brian Ward, Associate Editor

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How states are fighting sepsis

Here are some examples of what states are doing to battle sepsis:

Gabby's Law – Illinois Senate Bill 2403 (SB 2403)

This law was named in honor of a 5-year-old girl who developed an infection from an undetected tick bite that led to sepsis. It requires hospitals to:

- Implement an evidence-based process for quickly recognizing and treating adults and children with sepsis
- Train staff to identify and treat patients with possible sepsis
- Collect sepsis data to improve the quality of care and provide it to the state (e.g., the Centers for Medicare & Medicaid Services (CMS) Hospital Inpatient Quality Reporting Program)

(New York) Rory's Regulations – NYCRR Title 10 Sections 405.2, 405.4, and 405.7

This law was named in honor of a 12-year-old boy who died when he developed an infection that led to sepsis after falling and cutting himself in a school gym. It requires hospitals to:

- Implement an evidence-based process, which should include suitable training, resources, and equipment for healthcare providers, for quickly recognizing and treating sepsis in adults and children.
- Collect sepsis data to improve the quality of care and provide this data to the state annually.
- Implement a Parents' Bill of Rights to ensure that parents and primary care providers receive vital information about children's care. Some components include:
  - Allowing parents or guardians to stay with pediatric patients at all times
  - Reviewing medical tests with the patient or the patient's parent or guardian before discharging a child patient

Reducing Sepsis Mortality in Ohio – Ohio Hospital Association's Sepsis Initiative

This two-year sepsis prevention and early recognition program, funded from CMS' Leading Edge Advanced Practice Topics (LEAPT), focuses on reducing sepsis mortality in Ohio by 30%. The program encourages hospitals to:

- Conduct a survey to identify gaps in sepsis knowledge and treatment
- Identify, track, and report sepsis data
- Provide healthcare provider training for sepsis prevention and early recognition

"Think Katie First" – Wisconsin Hospital Association's Partners for Patients Initiative

This initiative was named in honor of Katie McQuestion, a 26-year-old healthcare worker who died from sepsis after being hospitalized with flu-like symptoms. It brings Wisconsin hospitals together to:

- Reduce sepsis mortality through early detection and rapid treatment of sepsis
- Share sepsis prevention and early recognition best practices

Collaboration efforts have led to a 16% decrease in mortality-associated sepsis since 2013.

Source: CDC.

If your facility is considering setting up its own automated sepsis flagging program (and it should), Grant says that holding an RPIW or similar event with stakeholders is the way to go.

"So much was accomplished having the right people in the room, especially the bedside nurses who will use the system every day," she says. "They were also able to go back to their units and talk to their colleagues about suggested changes before they were made, and we were able to further refine and improve the system based on that feedback."

Buy-in

One of the benefits of gathering stakeholders together was convincing them of the system's merit. Grant says at the start, there was some pushback from providers who thought their patients were "somehow different than other patients in the hospital."

"We worked using a 'pilot' model where we asked if [the stakeholder] could just try [the system] for three months and see," she says. "It usually worked out that they realized the benefit of the system."

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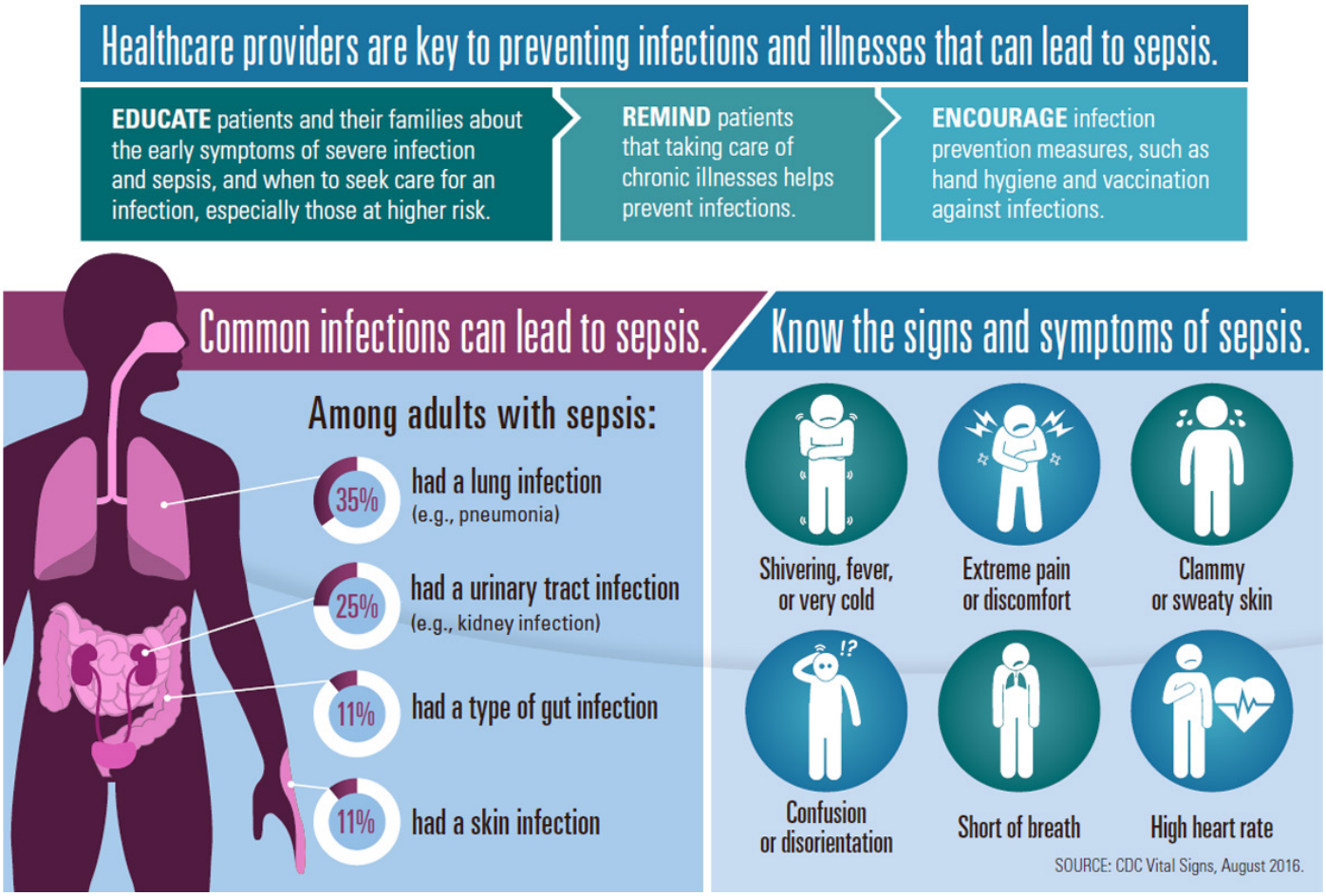

The pilot model also allowed Harborview to gather patient safety data as well as metrics that also impact administrators, such as length of stay (LOS). By demonstrating shorter LOS for patients diagnosed with sepsis more quickly and treated efficiently, they were able to get the needed leadership support for the program.

Improvement

There is still room for the system to improve; for instance, vital signs currently have to be typed in manually. Time is a major factor in treating sepsis, with each hour of delay in administering antibiotics resulting in a 7.6% decrease in survival on average. Having vital signs automatically updated in the EHR would make it easier and faster for caregivers to notice worrisome changes in a patient's condition.

"I think it would be great to not have to manually enter the vital signs, and there are some groups working on that, although we haven't explored much at Harborview—yet!" says Grant. "I think this would be helpful for a lot of reasons. But the system is still very successful even with the sometimes delayed entry of vitals."

RESOURCES

Below is a non-comprehensive list of our previous BOAQ articles and blog posts on the dangers of sepsis as well as treatment solutions:

- www.hcpro.com/QPS-328519-234/As-the-threat-of-sepsis-intensifies-experts-push-for-a-faster-response.html
- www.hcpro.com/QPS-327095-16/Implementing-the-CMS-sepsis-bundle.html
- www.hcpro.com/QPS-326755-16/Deciphering-CMS-sepsis-bundle.html
- http://blogs.hcpro.com/acc/2016/03/quick-look-at-new-sepsis-definition/

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Infection control

Cold weather and drug resistance; tracking seasonal changes in antibiotic misuse

Outpatient antibiotic overuse peaks and valleys throughout the year

This March, a team of experts working with the Centers for Disease Control and Prevention (CDC) published a study on antibiotic prescription habits in outpatient facilities. The study, published in the *Infection Control & Hospital Epidemiology* journal, showed that there are seasonal trends in prescriptions, with most antibiotics prescribed during winter months.

The study also found that antibiotic misuse continues to be a problem, writing that "the lack of any apparent change in utilization over the course of this study may support the findings of other studies suggesting that professional guidelines may not be the most effective form of influencing provider actions."

The study authors say their findings suggest that "current initiatives to improve the use of antibiotics in outpatient settings may not be enough to change clinicians' prescribing practices." And they feel clinicians must be better equipped "with the tools and knowledge to know when antibiotics are needed."

"It is one of the most important steps towards reducing antibiotic-resistant bacteria, as well as adverse events associated with these powerful drugs," the study's lead author, **Michael Durkin, MD, MPH,** assistant professor of medicine at Washington University School of Medicine, said in a statement released by SHEA. "There has been progress in reducing antibiotic prescriptions in hospitals, but there needs to be more research and attention on how to address this issue in the outpatient setting."

Unchanged rates

Durkin and the team of researchers conducted a retrospective analysis of 98 million outpatient antibiotic prescriptions found in administrative claims data from 2013 to 2015, using a sample from Express Scripts Holding Company's database of insured members.

They tracked monthly prescription rates for all antibiotics, in addition to the five most commonly prescribed antibiotics:

- Azithromycin
- Amoxicillin
- Amoxicillin/clavulanate
- Ciprofloxacin
- Cephalexin

Despite new professional guidelines, the study authors wrote there wasn't any apparent change in the annual prescription rates. They added that according to their most conservative estimate, 30% of those medications were inappropriately prescribed.

"If quality improvement guidelines were sufficient to improve antibiotic prescribing practices, then we would have expected to see an overall decrease in antibiotic prescribing rates over time. However, stand-alone

Seven core elements of an ASP

The CDC and Joint Commission standards say that an effective antimicrobial stewardship program (ASP) has seven core elements:

- **Leadership commitment:** dedication of human, financial, and information technology resources
- **Reporting:** regularly conveying prescribing and resistance patterns to staff
- **Educating:** teaching antibiotic resistance and improving prescribing
- **Tracking:** monitoring patterns
- **Action:** performing at least one prescribing improvement action
- **Drug expertise:** having at least one pharmacist responsible for improving antibiotic use
- **Accountability:** having someone in leadership responsible for improving outcomes

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educational materials are rarely successful for changing clinician behavior," Durkin wrote. "A more rigorous framework and greater investment of resources is needed to substantially improve outpatient antibiotic prescribing rates, helping to combat antibiotic resistance and improve patient safety."

He recommends healthcare organizations (HCO) use the CDC's Core Elements of Outpatient Antibiotic Stewardship, which recommends:

- Continued education on antibiotic stewardship
- Accountability for optimizing antibiotic prescribing
- HCO implementation of at least one policy or practice to improve antibiotic prescribing
- Tracking and reporting antibiotic utilization to providers
- Investing in easy, low-cost interventions—such as posters and brochures in waiting rooms

It remains to be seen if regulations and programs implemented after 2015 will move the needle on stewardship. For example, since January 2017, The Joint Commission has required all hospitals, critical access hospitals, and nursing care centers to have an antibiotic stewardship program that meets CDC guidelines (see breakout box).

Money on the mind

Durkin's study found that at least 30% of outpatient antibiotic prescriptions are unnecessary. The CDC says that number could be higher, once you factor in inappropriate antibiotic selection, dosing, and duration. But what does that 30% mean in terms of finances? For the facilities studied, the combined cost of antibiotics was between $840 million and $1 billion annually. Assuming they were misusing 30% of their antibiotics, that's between $252 to $300 million wasted each year. That's a lot of money that could be used for better patient care, improving facilities, or giving staff a well-deserved bonus or raise.

If you work at an outpatient facility, here's a simple exercise you can do. Find out how much you spend on antibiotics annually and subtract 30%. Bring that number to the attention of leadership as another reason why a solid antibiotic stewardship program makes good business sense.

Recap of antibiotic resistance

Every time an antibiotic is used, there is a risk the infection it's fighting will develop a resistance to it. However, that hasn't stopped antibiotic misuse and overprescription. Often these medications are given for viral infections, which they do not work on (especially viral respiratory infections like the common cold). And the first disease resistant to the antibiotic colistin has widely been blamed on farmers in China giving the medicine to farm animals.

Currently, 2 million Americans are infected annually by antimicrobial-resistant infections, with 23,000 people dying as a direct result of their infections. It is estimated that the multidrug-resistant Clostridium difficile infection alone causes 2.5 million infections, 14,000 deaths, and $1 billion in excess medical costs annually.

In 2016, an American woman contracted a strain of E. coli that was resistant to the last "fallback" antibiotic, only used when bacteria are resistant to all other forms of antibiotics. This discovery means that we could face infections that are invulnerable to all antibiotic treatments. According to one estimate, by 2050 antibiotic resistance could cause 10 million worldwide deaths annually, and some have said we've entered the "post-antibiotic era."

"I do not like knowing that … [this] is now circulating here in the U.S.," said **Beth Bell, MD**, director of the National Center for Emerging and Zoonotic Infectious Diseases, in an interview with Stat News. "It is a very unfortunate example of what we've been saying about how dangerous this antibiotic resistance phenomenon really is."

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There are also two bills that were introduced in Congress this March, H.R. 1587 and S. 629. Both of them intend to prevent the misuse of antibiotics by requiring the FDA to refuse a new animal drug application if the drug is a medically important antimicrobial used to treat humans. The use of antibiotics to promote livestock growth has spurred the rise and transmission of antibiotic-resistant diseases to humans.

However, it should be noted that similar antibiotic stewardship bills have been introduced to Congress every year since 2001, and none have been passed.

Seasonal changes

While the study didn't find much of a change on a year-by-year basis, it did find that prescription rates had massive swings based on the season. In fact, if you went into a hospital in February (the highest prescribing month), you'd be 42% more likely to get an antibiotic than if you went in September (the lowest).

Previous studies have suggested that spikes in antibiotic prescriptions in winter months could be due to inappropriate treatment for viral conditions, which tend to occur more frequently in the winter. But Durkin's team says that the seasonal changes make sense.

They point out, for example, that azithromycin, amoxicillin, and amoxicillin/clavulanate are most often prescribed during February, when pneumonia is more common.

Ciprofloxacin and cephalexin, meanwhile, are both used for skin and soft-tissue infections. So it's unsurprising that they're most often prescribed in the summer months, when such infections are more common.

Patient safety

Update: Human Trafficking

This June, The Joint Commission released Quick Safety Issue 42 on identifying human trafficking victims. The Health and Human Services Department estimates that 88% of trafficking victims visit a healthcare provider at least once during their captivity and aren't recognized as victims. Misconceptions and a lack of awareness have caused many providers to inadvertently send victims back to their captors.

"Human trafficking is modern-day slavery and a public health issue that impacts individuals, families and communities," The Joint Commission wrote in a news release. "The alert provides health care professionals with tips to recognize the signs of human trafficking, including a patient's poor mental and physical health, abnormal behavior, and inability to speak for himself/herself due to a third party insisting on being present and/or interpreting."

Human trafficking is the fastest growing criminal enterprise in America, worth $32 billion a year (for comparison, Starbucks' annual revenue is $19 billion.)

It's difficult to gauge how many victims there are in the U.S. However, in the past 10 years there's been over 40,000 human trafficking cases reported to the National Human Trafficking Hotline.

There are many challenges to identifying trafficking victims. Injuries and ailments are attributed to other causes; drug addiction, accidents, sexual promiscuity, etc. The victims themselves are often afraid to speak up because they or a family member is being threatened.

There are many entities working to create standardized human trafficking tools for providers, similar to suicide screening tools, to identify potential victims. The National Association of Pediatric Nurse Practitioners launched a national human trafficking initiative last fall and has come out with a new training module, Human Trafficking 101, which is available online for $15.

We'll have more in-depth coverage of this topic in upcoming editions of BOAQ.

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