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Vol. 33, No. 7; p. 73-84

→ INSIDE

Principles of cognitive psychology key to addressing diagnostic errors. 76

HHS amends training requirement to obtain an X-waiver 77

Treating patients with comorbid substance use disorders 79

Take these steps to boost smart infusion pump safety. 82

Charting a Better Way Forward in Addressing Diagnostic Errors

Several years ago, clinicians at Children’s Hospital Colorado (CHC) in Aurora were grappling with what led to the death of a patient who presented several times to the health system’s ED and urgent care centers with what was initially diagnosed as a migraine.

“Unfortunately, [the patient] ended up dying from a brain abscess, and that was the actual correct diagnosis,” explains **Joe Grubenhoff**, MD, who is now the medical director of the diagnostic safety program at CHC. “There was a root cause analysis done to show that this was primarily a diagnostic error. Nobody took into account the patient’s fever and considered that perhaps something else was going on.”

The tragic event ultimately led the health system to delve deeply into how diagnostic errors occur and what can be done to ensure that mistakes are not repeated. That process is ongoing, but CHC has made significant progress toward dealing with the multiple barriers that can stymie efforts to improve diagnostic performance. For instance, Grubenhoff notes one important early hurdle for any health

system engaged in this work involves finding a way to ensure everyone knows when diagnostic errors occur.

Employ Active Surveillance

“Most hospitals have ways that you can report adverse events or at least safety concerns, but, traditionally, physicians are not good reporters. They report far fewer incidents than nursing staff. They may not even be aware that a diagnostic error occurred, especially in the ED,” Grubenhoff shares. “If you have discharged the patient, and then he comes back after your shift or after your week of service ... you might not even know the patient is back in the hospital and that he has a different diagnosis than the one you sent him home with.”

Further, clinicians who see the patient upon his return to the hospital also may not report the incident. Those clinicians might not want to tell on their colleagues, or they may not recognize the care provided during the patient’s initial visit as something that could have been handled better. Grubenhoff calls this “passive surveillance,” which can cause problems to fall through the



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cracks. Grubenhoff and colleagues at CHC are moving from passive to active surveillance to detect diagnostic errors. This involves leveraging an electronic algorithm to pick up cases from the electronic medical record that meet specific criteria.

Recently, investigators studied pediatric patients who had visited an ED/urgent care system, and then were subsequently admitted to the hospital with a different diagnosis within 10 days of the original encounter.

For each case pulled, the electronic algorithm identified the diagnosis from the initial care encounter and the hospital discharge summary from the subsequent admission. Investigators analyzed the cases to see if clinicians missed an opportunity to identify a condition earlier based on the available information. If yes, then the case was categorized as a probable diagnostic error.

“Our hospital admits from the ED about 12,000 kids a year. Of that 12,000, about 1,000 end up being kids who were seen previously in the system,” Grubenhoff explains. “Over the first two years of data collection, [we found] about 5% of all admissions had a potential diagnostic error if they were seen [in the healthcare system] in the prior few weeks.”

Following a structured review of these cases,¹ investigators concluded that in the two-year review period, there were 92 cases for which there was sufficient information available to the clinician during a prior encounter to pursue further workup of the patient. However, that follow-up did not occur. Grubenhoff says only six of the cases identified through active surveillance were detected by any of the hospital’s passive systems in place for reporting errors or safety concerns.

While some of the diagnostic errors were relatively minor and did

EXECUTIVE SUMMARY

Preventing diagnostic errors has proven difficult. Many of these errors are captured through passive reporting, and systems are not in place to help clinicians learn from such errors.

- Children’s Hospital Colorado in Aurora has implemented active surveillance to identify potential diagnostic errors. The approach involves leveraging an electronic algorithm to identify cases that meet specific criteria.
- Once potential errors are identified, they are reviewed to find what learning opportunities can be passed on to clinicians and what steps may be needed to prevent such errors from happening again.
- A nonpunitive approach is needed when sharing diagnostic errors with clinicians. Researchers piloted a system of feedback that can be used to discuss diagnostic errors with physicians in emergency medicine, primary care, and hospital medicine.
- The pilot was well-received, and it is expanding. The model can be duplicated at other health systems interested in employing similar approaches to improve diagnostic performance. Notably, the program can be challenging in terms of time and resources.

not result in any lasting harm, some patients experienced serious adverse events. “One patient that stands out in particular was a girl similar to [the young patient who died from a brain abscess in 2015],” Grubenhoff explains. “She had been seen for what sounded like migraine headaches, but she kept having fevers, and she ended up also having a brain abscess.”

The patient was required to undergo a craniectomy. During that procedure, surgeons also removed an infected bone flap and installed a titanium plate. “Had we caught that a week earlier when we saw her for the first time, she might not have had that complication,” Grubenhoff says. “We are detecting things that are worrisome that otherwise go unrecognized.”

Find the Repeats

Now engaged in their fourth year of active surveillance data collection, CHC investigators are finding groups of kids on similar trajectories. They arrive with the same complaints, the same errors occur, and clinicians miss the same diagnoses.

“I found 12 kids who had a story where they were diagnosed initially with a migraine headache and ended up having some sort of intracranial process like an abscess, tumor, or a bleed,” he says. “We also found several kids who came in with fever

and a limp; they came back with a bone infection or a joint infection that was missed [during the initial encounter].”

With this evidence, investigators can aggregate the cases and look for the reason why these diagnoses are missed repeatedly. The information can be included in a quality improvement effort that underscores these are not one-off cases.

“Human beings reason the same way all the time, and we keep making the same mistakes over and over again,” Grubenhoff says. “What can we do or what can we put in place to keep those repetitive mistakes from causing patient harm?”

Electronic prompts could remind clinicians to consider certain diagnoses and/or workups when specific criteria are met. Still, it also is important for clinicians to know when they have made a diagnostic error. It turns out a significant obstacle to this task is finding an acceptable way to broach the topic with clinicians so the information is well-received.

“When you are talking about diagnostic errors, you are talking about the fundamental role of what a physician or a nurse practitioner does,” Grubenhoff observes. “The first step in doing any patient care is making the diagnosis. If you don’t get that right, then you are potentially treating the wrong problem and causing harm.”

In his own research, Grubenhoff has found conversations about diagnostic errors make clinicians uncomfortable, particularly when such discussions take place in open forums, such as in morbidity and mortality conferences.² However, Grubenhoff also has found clinicians want to know when they have made an error and how they can avoid making similar errors in the future.

So what is the best way to deliver this feedback to clinicians? CHC surveyed providers about their preferences regarding this type of feedback.

“[The providers indicated] that they wanted something that is actionable, a clinical learning pearl,” Grubenhoff reports. “They wanted it delivered by somebody with either the same or more experience. They preferred to have it delivered primarily through a conversation, such as during a phone call, rather than in an email or something like that.”

Grubenhoff explains more data collection around this topic is ongoing, but the information already provides some clear guidance on how to fashion a process around error identification, case review, and feedback.

“Having a conversation with a colleague after a group has had a chance to review [the case] and come up with some discrete opportunities ... has made some people seem to

10

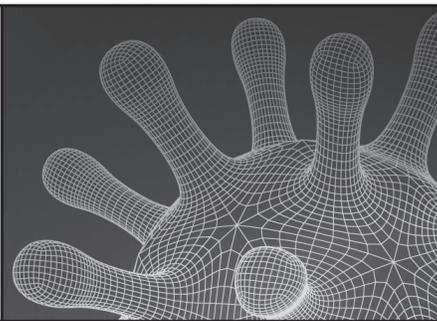
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feel a bit more comfortable with the feedback they are getting,” he says.

Secure Leadership Support

Geisinger Health, a large, integrated health system based in Pennsylvania, has been focused on diagnostic improvement in recent years, too. Its Committee to Improve Clinical Diagnosis (CICD) has partnered with a multidisciplinary research team to form the Safer Dx Learning Lab, a group focused on a range of activities aimed at boosting diagnostic safety and measurement.

As part of this effort, the group developed processes to identify what it calls missed opportunities in diagnosis (MOD). The CICD partnered with the departments of emergency medicine, hospital medicine, and primary care to pilot an approach for providing feedback to the clinicians involved with these identified MODs.³

Key to their approach was delivering the feedback in a non-punitive manner, and presenting the errors as learning opportunities. A clinical psychologist accustomed to working with clinicians trained

department leaders on how to deliver this feedback to other providers based on a guidebook outlining the approach.

Between January 2019 and June 2020, the trained facilitators held feedback sessions about the potential MODs with clinicians. The sessions were scheduled at a convenient time for the providers, and investigators reported that most of these sessions lasted for 20 to 30 minutes.

In follow-up surveys, most facilitators reported they believed recipients were open to the feedback and the sessions would improve patient safety. Likewise, most recipients reported the feedback was delivered in a nonpunitive way, providing them with opportunities to improve their diagnostic process.

Nevertheless, there were some hurdles. **Hardeep Singh**, MD, MPH, one of the authors of this research, notes finding the time and resources to do this work was challenging.

“Also, [you] need very strong leadership support to create these programs. Most institutions do not currently have such programs, so it will take some time and additional evaluation before this can get into routine practice,” Singh explains. “We feel everyone can start, even in a pilot

form, based on the resources and ideas we [have] provided. In addition, you need some data sources, such as safety reports and cases, that can facilitate the discussions.”

Geisinger is expanding the feedback process to other departments, and Singh is hopeful the approach can be implemented in other health systems. In the meantime, he acknowledges more research is needed to assess whether such interventions actually improve diagnostic performance. “We are envisioning this in our future work,” Singh adds. ■

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Include Cognitive Psychology in the Discussion of Diagnostic Errors

To effectively address diagnostic improvement, clinicians should understand some concepts around how people reason and the common pitfalls that can lead to errors, explains **Joe Grubenhoff**, MD, medical director of the diagnostic safety program at Children’s Hospital Colorado in Aurora. For example, one commonly observed

cognitive bias is triage queuing. This happens when early during a clinical encounter, a patient receives a diagnosis that firmly establishes his or her care trajectory, shutting off any consideration of alternative diagnoses as the patient advances through the specified workup.

Grubenhoff recalls a case in which a young girl presented to the ED

with what seemed like psychotic features. “There was a vague history of her recently using marijuana for the first time. She basically got put in a pathway of being worked up for a psychiatric concern,” he explains.

Specifically, the provider’s diagnosis was cannabis-induced psychosis. Once that label was applied to this patient that was

the focus throughout the clinical encounter. But this diagnosis was incorrect. The patient was eventually diagnosed with anti-NMDA receptor encephalitis, a rare autoimmune inflammation that occurred in response to a benign ovarian teratoma.

How might case reviewers address such an error with the provider? “They might say that [he or she] should have known better, that the patient still needed a broad differential and maybe a workup before just assuming that the patient had psychosis from marijuana,” Grubenhoff offers.

However, he suggests a more effective approach would be to help the provider understand how triage queuing may explain what was going on in his or her mind when managing this case. This is where

cognitive psychology enters the conversation.

“This doesn’t happen to just one person; it could have happened to any provider in that same scenario because of the way the human mind works ... the provider [develops] an understanding of where his thinking might have gone wrong,” Grubenhoff says.

The issue becomes less about the individual provider and more about the systems of reasoning that humans employ. It gives the provider something he or she can address going forward. Specifically, the next time a patient comes in with what looks like psychiatric symptoms, the provider should keep his or her differential diagnosis broad.

“Avoiding diagnostic errors is a challenge. Most of the time, we actually do a reasonably good

job, and a lot of the errors that we make, we make subconsciously,” Grubenhoff shares. “We don’t even realize that we are making them.”

Research suggests the largest body of adverse events in emergency medicine is caused by a combination of cognitive errors and systems errors.¹ “These things don’t happen in isolation. We have to be cautious that when we are talking about the human part of this, the decision-making and the diagnosis, that we don’t ignore the systems part of it. Those two things [affect] one another,” Grubenhoff says. ■

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Feds Ease X-Waiver Training Requirements, Emergency Providers Advocate Further Action

In the continuing tussle over whether providers should have to obtain an X-waiver to prescribe buprenorphine, the Biden administration has staked out some middle ground, at least for now.

The Department of Health and Human Services (HHS) has issued updated buprenorphine practice guidelines that significantly loosen

some of the requirements needed to obtain the X-waiver, although waiver requirement remains.¹

What does this all mean for emergency providers, many of whom encounter patients with opioid use disorders (OUD) regularly? **Lewis Nelson**, MD, FACEP, says under the new guidelines, many providers will no longer be required to complete the

eight-hour training course that was part of obtaining the X-waiver. But there are some stipulations.

For example, clinicians can choose to bypass the customary training and certification process; perhaps more importantly, these clinicians who choose that route would not be allowed to treat more than 30 patients with buprenorphine at the

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same time. Those wishing to exceed the 30-patient threshold would take the traditional training and certification route.² Also, Nelson notes all buprenorphine prescriptions (and prescribing providers) still will be tracked by the DEA.

Theoretically, an emergency provider could prescribe buprenorphine to more than 30 people in a week. Nelson believes that is unlikely to happen.

“If you are an emergency physician like I am, you would not typically give someone more than a week or two of the medication,” says Nelson, professor and chair of the department of emergency medicine and director of the division of medical toxicology at Rutgers New Jersey Medical School and University Hospital in Newark, NJ.

Nelson explains the typical goal in the ED is to start patients on buprenorphine, and then transition them to a long-term medication-assisted treatment (MAT) provider. However, the goals might be entirely different for some primary care providers.

“If you have a cadre of more than 30 people that you want to prescribe buprenorphine for on a regular basis, then you need to get the waiver training,” Nelson says.

Combat Stigma

While Nelson sees the revised guidelines as a positive, he is skeptical that merely dropping the training requirement to prescribe buprenorphine will result in any significant increase in the number of emergency provider-issued prescriptions.

“I think there will be a marginal benefit. I don’t think it will be the silver bullet that some people want to believe it is,” he explains.

Nelson acknowledges the eight-hour training requirement was a barrier to treatment, but he observes the training was available at no or low cost.

“I think the real problem is [buprenorphine] is a medication that has been explained or touted as being very difficult to use,” he offers. “The medicine has always been given a certain mystical quality because it is a little different than all of the other opioids. It is a partial agonist, not a full agonist ... like morphine or oxycodone.”

Further, there remains a certain stigma associated with patients who require OUD treatment, and some clinicians prefer not to be involved.

“[OUD] is often viewed as a weakness or a vice, not a medical disease. Many clinicians are hesitant to treat this patient population, particularly with a drug that isn’t something that is very clearly easy to use,” Nelson explains.

Provide Incentives

In fact, Nelson stresses that because of its pharmacological properties, buprenorphine is a relatively safe drug that is not often diverted or abused. However, while medical students receive considerable instruction on how to use traditional opioids, they generally do not learn how to use buprenorphine.

“That is why there has always been this extra training requirement [for buprenorphine],” Nelson says.

Nelson sees a need to replace the eight-hour training that was required for the X-waiver so clinicians can develop a comfort level with prescribing the drug.

“One of the things I am working on ... is making sure that we develop a training program that is an hour long to replace the waiver training. I am

still concerned that many clinicians will not know how to use this drug,” he says.

When not used properly, buprenorphine can result in short-term consequences, such as precipitated withdrawal.

“While not life-threatening, this is pretty uncomfortable [for the patient],” notes Nelson, adding this is the primary reason why some clinicians are reluctant to use buprenorphine. “I spend a lot of time trying to explain to physicians how to do this. Even among those of us who practice in toxicology and addiction, there is not a unified answer. There are multiple different dosing regimens and multiple different time schemes that people use.”

Nonetheless, Nelson says emergency clinicians could receive appropriate guidance on buprenorphine in multiple ways, including via real-time approaches. For instance, he notes providers can call the New Jersey Poison Control Center, and staff will walk them through how to initiate a patient on buprenorphine.

In addition to making such training easily accessible, Nelson believes incentives are needed to encourage emergency providers to initiate appropriate patients on MAT.

“Right now, we are disincentivizing the treatment of this population,” he says. “Many of these patients are uninsured or underinsured, they take a lot of time in the ED, and there are often complicated issues [involved].”

Some states, such as Pennsylvania, have provided financial incentives to hospitals that initiate patients on MAT in their EDs.³ Nelson believes the providers should be incentivized.

“If you want to make a wholesale change, you are going to need to incentivize people to do it,” he says. “This is just a complicated drug and a

very marginalized patient population. It is a double-whammy.”

Push for More

In a statement, the American College of Emergency Physicians (ACEP) welcomed the guideline changes, but argued the updates do not address other remaining barriers.

“During the pandemic, the opioid epidemic has accelerated across the country and the number of overdose deaths has increased,” ACEP President **Mark Rosenberg**, DO, MBA, FACEP, said. “Expanding patient access to [MAT] in the emergency department is one of the most effective methods for addressing [OUD] or overdose.”⁴ Acknowledging the Biden administration may not have the legal

authority to outright eliminate the X-waiver requirement, ACEP urged Congress to pass the Mainstreaming Addiction Treatment (MAT) Act or similar legislation that would fully repeal the X-waiver.⁵ That would make it easier for patients to access the life-saving treatment, according to Rosenberg.

ACEP believes the HHS guidelines are a step forward, but the organization said the existence of the X-waiver leads to misperceptions about MAT and nurtures the stigma that makes some clinicians reluctant to treat OUD patients.⁴ ■

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Treat Comorbid Substance Use with Motivational Interviewing, Navigational Assistance

Investigators have concluded a personalized intervention that pairs motivational interviewing with hands-on navigation assistance can benefit hospitalized patients with comorbid substance use problems.

The approach, called Navigation Services to Avoid Rehospitalization (NavSTAR), was put to the test in a randomized, controlled trial at the University of Maryland (UMD)

Medical Center in Baltimore. Researchers observed strong evidence indicating the intervention produces valuable returns on a range of metrics when deployed in the inpatient setting.¹

NavSTAR was implemented at a site that had already made significant strides toward identifying and addressing patients with substance use problems who present to the

ED. Now, investigators are thinking about how aspects of the NavSTAR approach could be added to the mix in the ED to enhance the screening and linkage-to-care processes clinicians there already use.

Address Barriers

“The idea for NavSTAR came from the fact that we saw patients

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with comorbid substance use disorders being hospitalized over and over again, with addiction relapse often a contributing factor,” explains **Jan Gryczynski**, PhD, lead author and senior research scientist at the Friends Research Institute in Baltimore. “We needed something that could strengthen engagement and service linkage after patients left the hospital.”

The approach builds on previous work by James Sorensen, PhD, a professor at the University of California, San Francisco who has worked on opioid linkage, Harold Freeman, MD, who developed the first patient navigation program for patients with cancer at Harlem Hospital Center in New York City, and others. “It focuses on helping patients to access services and support for substance use disorders, medical recovery, self-care, and basic needs, recognizing that these aspects are inherently interconnected,” Gryczynski says.

To examine the effect of the intervention, Gryczynski and

colleagues studied 400 adult patients who were hospitalized with comorbid substance disorders involving opioids, cocaine, or alcohol. Half the patients received usual care, and the other half received NavSTAR. In this highly personalized intervention, a social worker would meet with each patient at the bedside during his or her hospitalization. This engagement would continue weekly for four weeks after discharge, then biweekly for the following two months.

“NavSTAR works by addressing the patient’s internal barriers, like motivation and ambivalence about treatment, in tandem with practical external barriers like transportation or access to basic resources,” Gryczynski explains. “NavSTAR combines motivational interviewing principles with a very proactive model of case management to resolve these various barriers to service engagement.”

For example, navigators will help patients traverse the healthcare/ service landscape by using supportive coaching, advocating on patients’ behalf, providing help with required

paperwork, and more. “Proactivity and persistence are guiding principles,” Gryczynski says.

Bolster Resources

During the 12-week observation period, patients in the NavSTAR group recorded 26% fewer inpatient admissions than patients in the usual care group. Investigators also reported the intervention reduced the risk for ED visits by 44% when compared to usual care for the year following the intervention.

Gryczynski and colleagues noted patients receiving NavSTAR were roughly half as likely as the usual care participants to require a subsequent hospital admission within 30 days of discharge. Also, NavSTAR patients were more likely to enter treatment for their substance use within three months of discharge from the original inpatient admission. About half the NavSTAR group entered substance use treatment vs. just over one-third of the usual care group.

Results from the NavSTAR study were promising, but Gryczynski says feedback from both patients and navigators suggests the intervention may have been too short.

“This is because some patients were difficult to find and engage in the community,” Gryczynski explains. “Others had a more complicated post-discharge trajectory involving skilled nursing facilities, emergency shelters, and readmissions. Many experienced an array of deep needs that take a long time to address.”

Nonetheless, it is notable that NavSTAR produced positive outcomes in a clinically challenging population. Gryczynski hopes other hospitals will adopt the approach.

“They stand to improve patient outcomes and also help ... avoid costly readmissions — a win/win for

EXECUTIVE SUMMARY

Research has shown a highly personalized intervention designed for hospitalized patients with comorbid substance use problems can significantly reduce subsequent readmissions and ED visits. After testing, investigators are exploring whether Navigation Services to Avoid Rehospitalization (NavSTAR) might prove beneficial in the ED.

- NavSTAR pairs motivational interviewing and hands-on navigational assistance, beginning while patients are hospitalized, but extending for three months after discharge.
- During a 12-week observation period, patients in the NavSTAR group recorded 26% fewer inpatient admissions than patients in the usual care group. Investigators also reported the intervention reduced the risk for ED visits by 44% vs. usual care for the year following the intervention.
- Aspects of the NavSTAR approach could bolster some existing efforts, although there are differences in medical severity and workflow between inpatient and ED settings.

everyone,” Gryczynski says. “We are looking into several avenues of future research on this approach, including a larger study to see how [NavSTAR] works in different hospitals and communities.”

Gryczynski acknowledges hospitals interested in the approach may need to strengthen their addiction medicine infrastructures to realize the full potential of NavSTAR. Ideally, this would include creating the capacity to start appropriate patients (i.e., those who are willing and clinically suitable) on medications for opioid use disorder. For instance, the services offered in the study by Gryczynski and colleagues were built on an experienced addiction consultation service in place at UMD Medical Center.

“We were fortunate to hire very dedicated and mission-driven patient navigators, as some elements of the work can be unglamorous and discouraging, such as when patients miss appointments, leave treatment, or experience an avoidable readmission,” Gryczynski shares. “In orienting the patient navigators, it’s important for them to get a good handle on the service system in the community, including medical services like skilled nursing facilities, substance use disorder treatment providers, and things like housing.”

Gryczynski adds the patient navigators involved with the study played a defined role in NavSTAR without contending with competing obligations. “They maintained a relatively low rolling patient caseload. We also made sure they had access to regular clinical supervision and support from the broader team,” he says.

Consider ED Options

If intervening with hospitalized patients with comorbid substance

use issues works well, would an intervention employed in the ED offer similar, if possibly even greater, potential? Gryczynski agrees the ED offers a critical opportunity to help patients with substance use disorders, but notes there are some differences from the inpatient setting in terms of the patients’ medical severity and workflow.

For example, inpatient hospitalization offers more time for navigators to develop an initial rapport with patients at the bedside and to develop initial plans. Gryczynski notes there also are several points of compatibility between the inpatient and emergency settings. Investigators hope to explore this area in the future.

In fact, many EDs throughout Maryland, including UMD Medical Center, are already initiating appropriate patients on medication-assisted treatment (MAT) and using recovery coaches to rapidly link people to treatment.

“Those sorts of interventions are very promising,” Gryczynski says. “We are currently thinking about how elements of the NavSTAR approach could be used in EDs to enhance the great work being done in these settings.”

Much of this ED work was pioneered at hospitals in Baltimore in collaboration with Mosaic Group, a small consulting firm that responded to the opioid crisis by working with hospitals to develop a “reverse the cycle” comprehensive ED response program.

As with the NavSTAR program, the “reverse the cycle” approach works in partnership with the addiction consultation service at UMD Medical Center. “The peer [recovery coaches] actually report to a supervisor with the consult service, and there are protocols that were developed as part of the planning process work that

we do,” says **Marla Oros**, RN, MS, founder and president of Mosaic Group. “A lot of the hospitals don’t have that consult service, so [the program] looks a little bit different at UMD Medical Center because of the terrific resource that they have.”

Begin with Screening

The “reverse the cycle” approach may be different from an operational standpoint, depending on a hospital’s resources, but the basic components are similar. First, Oros explains there is a universal screening model aimed at identifying any patient with a substance use disorder regardless of why he or she presented to the ED. “[We] put in place validated screening instruments as part of the EMR [electronic medical record], and we put in place a protocol for nursing to be able to do that screening,” she says.

Then, Mosaic works with hospitals to install teams of peer recovery coaches who staff the ED seven days a week. “We build in triggers in the EMR for a positive screen to notify the peer coach [indicating] that there is a positive patient in the ED,” Oros notes. “We train the peers for this role, and they engage with the patient.”

If a peer coach determines a patient is motivated and desires treatment, the coach will make an appointment with a treatment provider and take steps to address any barriers. “If a patient does not want treatment, we still do telephonic follow-up and harm-reduction education,” Oros says.

Another aspect of the program involves working with hospitals to institute an order set so appropriate opiate-using patients who desire treatment can receive an initial dose of Suboxone in the ED. “The patients are screened by nursing ... they are

identified as opiate-using, the peers engage with them, and if the patients are motivated, they are evaluated by the clinical team,” Oros explains. “Clinicians go through the order set. [If appropriate], they will give [the patient] a single dose ... of Suboxone.”

Mosaic works with hospitals to develop a network of fast-track treatment providers.

“These are MAT providers who work with us to develop protocols to accept patients the same day or the next day,” Oros says. “That might even happen in the middle of the night. We have a mechanism to send them.”

The final piece of the “reverse the cycle” program is for overdose survivors. “These patients typically can’t be screened; they are not vocal when they first present,” Oros observes. “They have been given Narcan, and there is an alert sent to the peer recovery coach who will go in and talk to the patient [as soon as possible]. We know we don’t usually have a lot of time. These patients

usually want to leave the ED very quickly.”

The peer recovery coach will contact a community-based peer who will follow up with the patient for three to four months. The goal is to keep the patient alive, prevent subsequent overdoses, and engage the patient into treatment as quickly as possible.

Gain High-Level Support

Oros reports the “reverse the cycle” program that began in Maryland has spread to 53 hospitals across the country, with much of the work paid for through city, state, or federal funds. For emergency personnel interested in implementing a similar approach in their own settings, Oros recommends they bring top leaders on board.

“It is to really assure that there is a commitment to do this,” Oros says. “That can be a stumbling block to achieving what you want.” Next, identify champions who can

spearhead the work. These should be individuals with influence, according to Oros. Then, clarify goals, the steps required to reach those goals, and the range of methods the organization will use to address the issues involved.

“Those are the natural planning steps that we often take for granted. [These steps] are really important if you are going to try to really have a culture change around how you as an organization are going to address patients with substance use issues,” Oros stresses. “I think people often underestimate what it takes to put these programs in place if they are going to be lasting programs that truly are aimed at shifting the way hospitals respond.” ■

REFERENCE

1. Gryczynski J, Nordeck CD, Welsh C, et al. Preventing hospital readmission for patients with comorbid substance use disorder: A randomized trial. *Ann Intern Med* 2021; Apr 6. doi: 10.7326/M20-5475. [Online ahead of print].

TJC Offers Tips to Boost Smart Infusion Pump Safety

On the market for years now, so-called smart infusion pumps are nearly ubiquitous in acute care settings across the country today, representing a big step forward in infusion safety. However, errors still can occur. The Joint Commission (TJC) notes errors usually are attributable to a combination of human and technical risk factors.

In a recent *Sentinel Event Alert*, TJC stressed that an important way to optimize safety when using these pumps is by using smart pumps along with built-in dose-error reduction software (DERS).¹

What is DERS, and how does it work to boost safety? **Michelle Mandrack**, MSN, RN, director of consulting services at the Institute for Safe Medication Practices (ISMP), says by using DERS, staff can preload high and low limits around the different parameters of infusion orders. “The parameters could pertain to the dose itself, the rate, the concentration, or how long [it should take] for infusion to take place,” she explains.

Generally, these parameters are set in a drug library that works with a hospital’s fleet of smart infusion

pumps. If a clinician accidentally enters an amount or concentration of a medication outside the limits set in the drug library, the smart pump will communicate a hard stop to the clinician, indicating the infusion cannot go forward as entered. Alternately, the instructions in the library may dictate a soft stop in which the limits can be overridden in that circumstance, but the clinician is alerted to double-check the order. In either case, most dosing or data entry errors are prevented.

Considering the importance of the information in the drug library,

TJC advises hospitals to designate a multidisciplinary team or department to oversee the library and the infusion pump interoperability. The ISMP agrees with this recommendation.² “This key committee would [include] pharmacists who are very familiar with building drug libraries. It would [include] some nurse representation, maybe a biomedical engineer, as well as some ad hoc prescribers,” Mandrack says.

These multidisciplinary panels will be comprised differently, depending on the organization involved. Regardless, Mandrack says some physician representation is essential. Not only is their input helpful in building the drug library, but they could help the organization standardize prescribing styles.

For example, Mandrack says the way an ED physician orders an infusion might differ from the way the same infusion is ordered on a med-surg floor or in the ICU. Different providers may be accustomed to using different nomenclatures, weights, and unit measures, but facilities would want these standardized and clarified in the library.

Also, depending on the part of the library that is under construction or revision, leaders should include prescribers involved in that area. “If you are building the oncology drug library, then of course you would have an oncology prescriber involved,” Mandrack offers. “Then, if you have changes to that oncology drug library, depending on what they are, you would want to get input from the prescriber perspective as well.”

Connect with EMR

In addition to assembling a multidisciplinary team to oversee smart infusion pumps, TJC

recommends hospitals define a process for creating, testing, and maintaining the drug library. The accrediting agency suggests hospitals train and assess the competency of all clinical staff to use smart infusion pumps and make the use of DERS an expected practice.

Further, the agency asks hospitals to take steps to connect their smart pump fleets with their electronic medical record (EMR) systems. This is a relatively new capability, but one that takes safety to another level.

“Then, a physician order for an infusion can be reviewed by a pharmacist, and then automatically go to the pump through bar coding, [where it] populates the screen so the nurse doesn’t have to manually enter all of the components of the order,” Mandrack says. “The pump can then send that information, when it is pumping, back to the EMR automatically.”

Such interoperability can reduce any data entry errors, but Mandrack notes it does take time for nurses to acclimate. “This [process] may not seem intuitive for the nurses because they’ve got to take a scan of the patient’s barcode. They then have to scan their own [hospital]

badge. They then have to scan the medication container, usually an infusion label. Finally, they’ve got to scan the pump,” she explains. “Nurses tell us that it probably takes a little bit longer, but they incorporate it into their workflow. It becomes like a new pattern, and there is that safety value for sure.”

TJC adds hospitals should put mechanisms in place to monitor pump alerts, overrides, equipment or software recalls, and reports of adverse events or close calls. Further, when programming errors occur, TJC states those events need to be analyzed to determine what human and environmental factors may have contributed. Finally, the accrediting agency notes hospitals need to keep their smart pump fleets safe from security threats when they are not in use. ■

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1. The Joint Commission. Optimizing smart infusion pump safety with DERS. *Sentinel Event Alert*. April 14, 2021. <https://bit.ly/3fqTslI>
2. Institute for Safe Medication Practices. Guidelines for optimizing safe implementation and use of smart infusion pumps. Feb. 10, 2020. <https://bit.ly/3fMIs7C>

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.

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CME/CE QUESTIONS

- 1. When investigators at Children's Hospital Colorado surveyed providers to find out how they prefer to receive information about diagnostic errors, respondents indicated they want to learn this information from:**
 - a. somebody with either the same or more experience.
 - b. someone from a different department or division.
 - c. the hospital's chief medical officer.
 - d. a supervisor from risk management.
- 2. Triage queuing happens when:**
 - a. patients with similar diagnoses are grouped together in the ED.
 - b. clinicians repeat the same diagnostic errors when a patient presents with similar symptoms.
 - c. a patient receives a diagnosis early in an encounter, shutting off any consideration of alternative diagnoses in the provider's mind.
 - d. clinicians are hesitant to make a diagnosis, causing wait times to pile up in the ED.
- 3. The Department of Health and Human Services has issued new buprenorphine practice guidelines that remove the requirement that providers fulfill eight hours of training to obtain an X-waiver, but such providers still must:**
 - a. undergo regular competency reviews.
 - b. report to a supervisor who has undergone the eight hours of training.
 - c. spend a day working at a substance use treatment facility.
 - d. not prescribe buprenorphine to more than 30 patients at the same time.
- 4. When errors occur during the use of smart infusion pumps, they are usually attributed to:**
 - a. equipment malfunctions.
 - b. incorrect prescription orders by the provider.
 - c. a combination of human and technical risk factors.
 - d. data entry mistakes.