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New tool aims to standardize hand-offs in the ED, boosting safety and preventing communication failures

Shift changes are a point of risk in hospital settings because as outgoing clinicians hand off patients to incoming staff, it is easy for important information to be missed or misunderstood. And this risk is heightened in the emergency setting, where providers are working under a constant state of urgency.

"It is a fast and furious process in most EDs. No one really wants to admit that, but it is the truth," observes **Drew Fuller, MD, MPH, FACEP**, the director of safety innovation at Emergency Medicine Associates, (EMA), a Germantown, MD-based provider of medical services in the Mid-Atlantic region. "Most of what is done is what is called a hopeful handoff. You say what you have to say to the other clinician, and you hope that he or she got it all."

EXECUTIVE SUMMARY

To address identified patient safety risks in the handoff process, a group of emergency providers developed Safer Sign Out, a paper-based template that prompts clinicians to jointly review issues of concern on patients who are being passed from one clinician to another at the end of a shift. Already in practice at 12 hospitals in the Mid-Atlantic region, the approach is now being disseminated nationwide with the help of the non-profit Emergency Medicine Patient Safety Foundation.

- Advocates of the new tool say very few EDs have a clear, agreed-upon process for how to conduct handoffs.
- Safer Sign Out seeks to prevent communications failures by putting structure into the handoff process.
- In addition to prompting incoming and outgoing physicians to discuss each patient being handed off, the approach involves having both physicians round at the bedside of these patients so that patients fully understand when their care is being transitioned to a new provider.

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While there has been considerable discussion about how to better focus the conversation during handoffs, Fuller explains that there is no generally accepted process or standard for handoffs in the ED. "Very few EDs actually have an agreed-upon, clear process in place for physician sign out," he says. "Emergency departments are probably the highest-risk areas of the health care system and,

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because of that, sign out can be a process that is fraught with risk and vulnerability."

Intent on coming up with a way to put some common-sense structure into the handoff process, Fuller and colleagues at EMA developed a new protocol specifically designed with emergency physicians in mind. The process, called Safer Sign Out, includes a template that prompts physicians to jointly cover the key issues of concern when one clinician is passing a patient off to another clinician. (See *Safer Sign Out form*, p. 87.)

Thus far, the approach has been implemented in 12 hospitals served by EMA in Maryland, Virginia, West Virginia, and Washington, DC. And now the group has teamed up with the non-profit Emergency Medicine Patient Safety Foundation (EMPSF) to make the process available to other EDs around the country. (Also see "Anticipate pushback, identify champions for successful launch of sign out process," p. 89.)

Rely on evidence

Work completed by the American College of Emergency Physicians (ACEP) Section on Quality Improvement and Safety (QIPS) formed the basis for the Safer Sign Out template, explains Fuller. A paper published by the group in 2010 made several recommendations on how to improve handoffs and decrease the risk associated with the process, he says.¹

Picking up on these recommendations, Safer Sign Out seeks to shore up areas of vulnerability during the handoff process. Among these is the risk there will be a communication failure. "Studies have shown that if you use a template conversation piece, or a template tool with details already populated, and then it is discussed jointly with both physicians focused on that tool, you are less likely to have information and data loss," explains Fuller.

Consequently, the Safer Sign Out process utilizes a paper-based form that prompts discussion regarding the key issues pertaining to patients that are transitioning from one provider to another. "If I am taking a sign out from another physician, and he or she wants to sit down with me and tell me what the issues are while I still have to continue working on my other patients, it is so much more practical and easy for me to pull out that piece of paper and look at it as I am roaming through the department and checking on things," explains Fuller.

While utilizing a paper-based tool may seem a

Figure 1: Patient Sign Out Form

Safer Sign Out Form (v17)					
<input type="checkbox"/> Check if No Patients Signed Out		Off-Going Clinician: _____	Receiving Clinician: _____	Date Shift Started _____	
Patient Name & Age	Problem List & Key Issues		Pending Items	Disposition	Receiving Clinician's Notes
Room	Diagnosis/CC: Key Issues: Potential Safety Issues or Precautions?			Home _____ Admit _____ Transfer _____ NH _____ TBD _____	<input type="checkbox"/> Rounded on Patient <input type="checkbox"/> Included/Informed Nurse
Room	Diagnosis/CC: Key Issues: Potential Safety Issues or Precautions?			Home _____ Admit _____ Transfer _____ NH _____ TBD _____	<input type="checkbox"/> Rounded on Patient <input type="checkbox"/> Included/Informed Nurse
Room	Diagnosis/CC: Key Issues: Potential Safety Issues or Precautions?			Home _____ Admit _____ Transfer _____ NH _____ TBD _____	<input type="checkbox"/> Rounded on Patient <input type="checkbox"/> Included/Informed Nurse
Room	Diagnosis/CC: Key Issues: Potential Safety Issues or Precautions?			Home _____ Admit _____ Transfer _____ NH _____ TBD _____	<input type="checkbox"/> Rounded on Patient <input type="checkbox"/> Included/Informed Nurse

Figure used with permission from Emergency Medicine Patient Safety Foundation, Folsom, CA

bit old fashioned or even primitive in the age of digital communications, it is the most reliable way to do it, emphasizes Fuller. “Electronic Medical Records (EMR) have not lived up to their promise yet,” he says. “Some EMR [companies] are trying to build these types of tools, but we aren’t aware of any that have successfully done it. They may claim they have done it, but we aren’t aware of any clinicians out there saying that they are finding these tools usable, so we have stuck with the tried and true.”

Jointly round on patients

A second area of risk that Safer Sign Out attempts to address is the potential that a patient’s clinical status may change in the midst of a transition and the new provider may not know about it. To reduce the risk of this happening, the new process calls for both physicians to go to the patient’s

bedside and round on the patient together. This happens after they have had a conversation about the patient and understand what the issues are.

“You go to the bedside, you see the patient, and you see the monitor, and you quickly get a good idea of what is happening with the patient,” says Fuller. “It also gives the patient the feeling that their care is being transitioned in an appropriate way.”

Informing the patient that a new provider is taking over his or her care may seem like a standard task, but Fuller suggests that it is not unusual for patients to be left out of the loop. “We have had complaints about that,” he says. “We find that Safer Sign Out is a good way of showing patients that they are now part of the process.”

While Safer Sign Out is a physician tool, it also recognizes that nurses are a part of the care team. Next to each patient’s information on the template, there is a box that the physician checks indi-

cating that the nurse has been brought up to speed. “One of the physicians has to connect with the nurse and make sure that the nurse understands that a transition has taken place, and what the key issues are,” explains Fuller. “This also gives the nurse the opportunity to communicate information that the physicians may not be aware of.”

Consider patient impact

Michael Kerr, MD, the chair and medical director of the ED at MedStar Montgomery Medical Center in Olney, MD, acknowledges that his first reaction to the Safer Sign Out process was annoyance that ED providers were being asked to fill out yet another piece of paper, but his view changed when he personally experienced the kind of mental lapse that can take place without more structure in the handoff process.

“I literally did the typical ED drive-by sign out to one of my partners. I told him about an active patient or two that I had in the department, and then I headed out to go home,” explains Kerr. “On the way home, I was listening to a public service announcement on the radio about depression, and I suddenly recalled a psych patient that I had in the back that I totally forgot about who had been there for ages.”

At that point, Kerr realized he was as guilty as the next person, and he decided to mandate that all the emergency physicians in the department adopt the Safer Sign Out process. “Everybody kind of groaned, but then they did it. Then literally within a matter of weeks I saw several changes,” he says.

Not only had the process become routine, but the physicians also didn’t seem to mind doing it anymore. To the contrary, many physicians indicated that completing the process made them feel better about the care they were providing to patients when they leave the department at the end of a shift, notes Kerr.

“Our rule is that every single patient that is on [a physician’s] board gets written down on [the Safer Sign Out] form and gets discussed, including those patients who are admitted that have not yet left the ED, patients in our long-term drug/alcohol side of the department, and active patients,” explains Kerr. “For all active medical patients who have a test or an issue outstanding, the physician actually goes to the bedside and has a verbal discussion with the patient and family as to what is going on and who the new physician is who is coming on and taking over the case.”

Kerr explains that implementation of the Safer Sign Out process has put an end to what used to be recurrent complaints from patients that their physicians had disappeared and that nobody told them what was going on. “The patient knows they are being passed off from one physician to another,” he says. “Now there is a bedside sign out and there is a good transition.”

Jennifer Abele, MD, FACEP, chair and medical director of the ED at Johns Hopkins Sibley Memorial Hospital in Washington, DC, agrees that the Safer Sign Out process is a clear plus as far as patient satisfaction is concerned. “Many patients have expressed gratitude for the bedside sign out,” she says. “They want to know who their doctor is, and are relieved to know that the oncoming person has all of the information needed to make good decisions.”

Further, while it took time to get emergency providers to consistently use the Safer Sign Out forms, Abele stresses that she did not have to make a strong case for the new process. “The providers knew that handoff risks could be reduced, so it really didn’t take any convincing to show them that this was the right thing to do for the patient,” she says. “Sign out is a risky time for the patient. There is a lot of information that needs to be passed between providers, so standardizing the process helps reduce errors and gives the process structure.”

Operationalize the process

Do the tasks outlined in Safer Sign Out conflict with efforts to move patients through the ED quickly and efficiently? Developers are still waiting on data from the 12 sites that have implemented the tool, but Fuller hypothesizes that at worst, the process probably has no impact on wait times.

“When people hear about this, there is a perception that it is going to take too long, but once you operationalize it and it becomes part of your system, we are finding that it doesn’t take very long at all, and people don’t mind doing it,” says Fuller.

Kerr agrees, noting that most emergency physicians try to complete the care required for all of their patients before the end of a shift, so they don’t usually have very many active patients that they need to pass off to another physician. This minimizes the amount of time it takes to complete the Safer Sign Out process, he says. “It is actually a very good transition; it enhances patient care and patient safety,” adds Kerr. “Things don’t get missed anymore.”

Fuller estimates that completing the Safer Sign Out process at the end of one of his eight- or nine-hour shifts typically takes about five minutes. But Fuller also stresses that speed should not be prioritized over safety. "Not every initiative or undertaking that comes under the heading of quality or throughput helps safety. In fact, if we are not careful, quality measures could jeopardize safety," he says. "If we are trying to rush patients through the system to decrease length of stay or decrease waiting times, we could be doing it for good intentions, but it could have bad outcomes." ■

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Anticipate pushback, identify champions for successful launch of sign out process

Administrators interested in implementing the Safer Sign Out process should first reach out to physicians and nurses to discuss problems related to handoffs and get their feedback, advises Fuller. "If you show them what the issue is up front, then they will be more prepared for it," he says.

However, Fuller also emphasizes that it is important to anticipate some pushback because

physicians and nurses are trained to do what he calls logical negative thinking. "We are trained to look for what is wrong in our patients ... and that sometimes translates to a process," he says. "You are always going to have your laggards because they are just being logical negative thinkers. If you think that they are not going to exist, you are setting yourself up for failure."

Recognize that laggards are a natural part of the team, says Fuller. Hear them and embrace them, but also help to educate them, he advises.

To help with the education piece, the non-profit Emergency Medicine Patient Safety Foundation (EMPSF) is acting as a national distribution site for the Safer Sign Out process, explains Diane Vass, executive director of EMPSF. "We have a forum for people to learn about Safer Sign Out through a regular bi-monthly webinar that Fuller will be doing," she says. "The foundation is also offering onsite coaching and training for those who would like to work with us more closely to insure a more successful launch of the process."

A critical step for organizations interested in implementing the process is to identify department champions early on, advises Vass. "They can take the lead in bringing the rest of the team together," she says. "It is not that complicated in the sense that all physicians and nurses intuitively understand what the risks are in handoffs." ■

Editor's note: Access the Safer Sign Out form, and the EMPSF's resources on Safer Sign Out at: www.empsf.org/safersignout.html.

Rapid-response process reduces mortality, facilitates speedy treatment for patients with sepsis

Approach brings added resources to bear on suspected sepsis cases

Sepsis is a leading cause of mortality in hospitals, but it is challenging to address because while studies suggest that speedy treatment can improve outcomes, all the tests and evaluations that are required to pin down the diagnosis take time to complete.

Given these tricky circumstances, it is no wonder that hospitals struggle to stay on top of this condition, particularly in the hectic environment

of the ED where staff-to-patient ratios can make it even more challenging to identify sepsis at an early stage.

However, with appropriate buy-in from staff and commitment from higher-ups, administrators at Wake Forest Baptist Medical Center in Winston-Salem, NC, have shown that it is possible to improve both outcomes and performance related to sepsis care. By employing a rapid-response protocol and an institution-wide education effort related to sepsis, the hospital has been able to reduce its risk-adjusted mortality index from 1.8 to less than 1.25 in just one year.

Further, in the ED specifically, where a modified version of the protocol has only been in place since April 1 of this year, time-to-treatment for sepsis patients has drastically improved. "Prior to implementing the protocol, about 20% to 25% of patients who turned out to have sepsis got antibiotics within the first hour," explains Howard Blumstein, MD, director of the ED, which sees about 110,000 patients per year. "After we implemented the protocol, 85% received antibiotics within the first hour. And that is just for the ED in the month of April." (*Also see: "Mandatory education module, department champions facilitate adoption of new process for sepsis care," p. 92*)

EXECUTIVE SUMMARY

To reduce mortality and improve the care of patients with sepsis, Wake Forest Baptist Medical Center in Winston-Salem, NC, created a new rapid-response protocol aimed at facilitating earlier diagnosis and treatment. In this approach, clinicians who suspect a patient may have sepsis can call a Code Sepsis, which will fast-track the series of tests and evaluations that are needed to confirm the diagnosis and get appropriate patients on IV antibiotics quickly. Administrators say the approach fits in with the culture of the ED, and it has quickly slashed time-to-treatment in this environment.

- In just one year, the hospital has been able to reduce its risk-adjusted mortality index from 1.8 to less than 1.25.
- In the ED, where a modified version of the approach has been in place since April 1 of this year, the percentage of patients with sepsis receiving antibiotics within one hour of diagnosis has increased from 25% to 85%.
- Key to the success of the approach are specially trained rapid-response nurses who are called in on a case whenever a diagnosis of sepsis is suspected and a series of policy changes designed to facilitate needed diagnostic tests to confirm a diagnosis.
- A mandated online education module helped to bring all clinicians and staff up to speed on the new process quickly.

Get stakeholders involved

Catherine Messick Jones, MD, MS, associate chief medical officer, medical services, at the level 1 trauma facility, explains that hospital leaders decided to focus on sepsis as part of an organizational goal to reduce mortality by 15%. "That was set at a high level, so if you think about the things that people die of within a hospital, sepsis is pretty high on that list," she says. "Also, sepsis was something where it seemed as though there was in the literature a set of evidence-based guidelines that would allow us to really make a difference."

Jones acknowledges that it took some time for hospital leaders to find the right path toward improvement. "In the beginning, we did the traditional things that hospitals and health care systems do. We had meetings, we talked about it, and we made policies," she says. "We showed people their data and we implored them to do better."

However, it became pretty clear that just providing people with knowledge would not be enough to move the needle on improvement, so administrators organized what is known in the lean literature as a Kaizen event, where they brought a very large and diverse group of stakeholders within the organization together to share their perspectives and identify what steps they could take to improve sepsis care.

The group included everyone from nursing assistants and emergency physicians to medical directors and pharmacists, explains Jones. And from the outset, the goal was to figure out how to recognize patients with sepsis quickly and administer antibiotics to them within one hour.

"Setting the time goal helped to influence our thinking," notes Jones. "For example, we made a decision to deviate from evidence-based practices because we knew that in our organization, lactic acids are read by our lab on the main chemistry line. That means that certainly if you order a serum lactic acid in a routine fashion, you will not get it back in the hour, let alone have time to administer your antibiotics."

Administrators knew that up on the floors in the hospital they could quickly conduct whole blood lactate tests in their blood gas lab, so they decided to use whole blood lactates instead of serum lactic acids when assessing patients for sepsis. And when the ED implemented the approach, administrators there opted for point-of-care tests in order to get results quickly in that environment.

Establish early indicators

Also, instead of taking steps to teach every nurse in the hospital how to screen for sepsis using the SIRS (Systemic Inflammatory Response Syndrome) criteria when taking vital signs, the group opted to train about 15 rapid-response nurses. This enabled the hospital to get a rapid-response system up and running quickly rather than waiting weeks or months for all the nurses to get trained, explains Jones.

In addition, the improvement team decided to take full advantage of the modified early warning score — or the aggregated weighted vital signs scoring system, which was already embedded in the hospital's electronic medical record (EMR). This score, which can be automatically tabulated by the EMR with the push of a button, can provide a first indication that a patient might have sepsis, so the group elected to use this process as an initial step in its rapid-response system.

"We have a policy that stipulates in the first 24 hours we check vital signs and do the early warning score every four hours. That is our routine vital signs policy [for inpatients]," says Jones.

In the ED, the vital signs and early warning score are tabulated at triage when the nurse is first evaluating a patient. After that point, it is up to the nursing staff to recognize any deterioration in vital signs, explains Blumstein. "All of these patients are on monitors, and the nurses are responsible for checking those vital signs and seeing if they are becoming unstable," he says.

The early warning score is also tabulated on any ED patients who are being admitted to the hospital. "That is a second chance to assess whether the patient is getting better or worse, and to check on whether the plan of care we have worked out for the patient is appropriate," says Jones. "Sometimes, we catch something at this point, so getting that second early warning score determination before a patient actually gets into a bed helps us to make sure that we have done all we need to do in the ED, and the patient is going to the right location of care."

Facilitate rapid diagnoses

When a bedside nurse sees a high early warning score, she is directed to call a rapid-response nurse, whether she thinks the patient has an infection or not, notes Jones. "We know high early warning scores are associated with bad outcomes from any clinical condition," she says. "So the nurse will put

in a call to our emergency communications center, which will activate a page to the rapid-response nurses who will come and evaluate the patient. They will screen and document SIRS criteria and evaluate the patient for a possible infection."

In cases in which the rapid-response nurses believe a patient may have sepsis, they will call the hospital's communications center to issue a Code Sepsis page, a prompt that will go to a variety of key departments in the hospital that provide support services for sepsis patients, explains Jones. For example, the blood gas lab will receive word that it can expect orders for a whole blood lactate level on a patient that will need to be prioritized and processed before their routine samples, and the pharmacy will receive word that they should be anticipating orders for antibiotics.

"The pharmacists who get these pages are typically in the central pharmacy, and they know the clock is ticking," observes Jones. "So, if a Code Sepsis is paged and they don't receive an antibiotic order, they will call the rapid-response nurse to find out what is going on, or whether there is anything the pharmacist can do to help."

To eliminate delays, the hospital has put policies in place so that if a physician has identified the source of sepsis on a particular patient, pharmacists can actually enter the orders for antibiotics themselves, using recommendations from the hospital's antibiotic stewardship group, adds Jones.

Respiratory therapy will also receive a page because therapists from this group may need to assist in drawing blood gasses or in providing mechanical ventilation in cases in which potential sepsis patients have pneumonia. In addition, the intensive care unit will receive a heads up that a sepsis patient may soon require an ICU bed.

Consider culture

In the ED, creation of the Code Sepsis fit right in with the culture, explains Blumstein, noting that there are already codes for stroke and heart attack. "Nurses have a set of criteria in which they can call a Code Sepsis — even without consulting a physician, and physicians have the freedom to call a Code Sepsis whenever they believe a patient may have sepsis, and they are encouraged to do so broadly," he says. "There is no penalty and no downside to calling a Code Sepsis, even if a patient turns out not to have sepsis."

To the contrary, Blumstein points out that a Code Sepsis brings added resources to bear on a suspected sepsis case, and it enables testing and

treatment to occur much more quickly than in the past. "We get a second nurse, so the patient's bedside nurse and the second nurse can bang out all the nursing tasks that need to be done fairly quickly," he says. "It also brings us X-ray techs to shoot a portable chest X-ray; it gets us a quick bedside urinalysis; the pharmacist comes out to help us with antibiotic choice and administration; and it gets us a respiratory therapist who comes right to the bedside to get a point-of-care testing lactate."

Getting sepsis identified at an early stage, and then having a process for completing all the tests necessary to confirm the diagnosis quickly are the key reasons why the ED has been able to chart swift improvements in sepsis care, explains Blumstein. Such changes are hardly insignificant when you consider that the ED sees about 50 patients per month who have sepsis, he adds.

Blumstein clarifies that the Code Sepsis protocol is designed to be implemented in cases of severe sepsis or septic shock, not the milder form of sepsis. Patients suspected of having less severe sepsis will still likely be treated with antibiotics, but time-to-treatment is not as critical a factor as in the more severe cases, he says.

One of the things that prompted hospital administrators to reach out to the ED to implement the Code Sepsis protocol was the discovery that some patients who had been admitted to the hospital through the ED ended up triggering a Code Sepsis once they were on the inpatient floors. "They had been started on antibiotics, but not in the time frame that we try to administer them on the floors," explains Jones. "That gave us the idea that if we started this process when patients arrive in the ED, then we would be ahead of the game."

Jones acknowledges that the ED faces unique challenges because there are typically no laboratory data to rely on at this stage, but she observes that the upper floors sometimes struggle with having so much data that clinicians have trouble picking out sepsis from all the other things that could be going on.

In fact, now administrators are looking at starting the early warning process in the clinics that feed into the hospital because many patients with sepsis initially arrive in a clinic setting. "We have the tools, so we could potentially recognize this when a patient arrives at a clinic and has their vital signs checked," says Jones. "This is a never-ending job because the more you work on this, the more you see what you can do, but I think we have made a good start." ■

SOURCES

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Mandatory education module, department champions facilitate adoption of new process for sepsis care

Getting the entire clinical staff on board with a new process for assessing and treating sepsis was a daunting task when administrators at Wake Forest Baptist Medical Center in Winston-Salem, NC, began the effort in April of 2012. However, by eliciting the assistance of department champions, and by mandating that everyone complete an online module that explains the new process, the transition to the new process was smooth. "We had a very strong expectation and we followed through," explains Catherine Messick Jones, MD, MS, associate chief medical officer, medical services.

There was some pushback, to be sure, particularly from specialists who insisted that they didn't need the online training because of their expertise in sepsis care. "I told them that I was sure that they did know all about sepsis, but that they still needed to take the training because they needed to understand the system we put in place to help manage sepsis better," notes Jones.

The ED didn't begin implementing a modified version of the protocol until April 2013, but adoption of the approach went smoothly in this environment as well. Howard Blumstein, MD, the director of the ED, attributes the success of the implementation to a robust education effort on the front end.

"If the nurses had had expectations about what the physicians would do that were unfulfilled or the physicians had had expectations of what the nurses would do that were unfulfilled, the whole

thing would have fallen apart, so we did a lot of work trying to make sure everyone was on the same page," notes Blumstein.

Also instrumental to success was the way the new process was presented to physicians. "We sold it to the physicians on the basis that it would make things better for them," observes Blumstein, explaining that the Code Sepsis process really expedites their ability to care for the patient as opposed to the protracted, drawn out type of evaluation that a suspicion of sepsis typically requires. "That got a lot of people saying that yeah, this will be helpful to us." ■

San Diego ED leverages telemedicine in a bid to ease crowding, long wait times

Investigators report patients, providers give remote visits high marks

Telemedicine has been used to connect patients in rural areas with providers, and to obtain quick access to a neurologist when patients present with symptoms of stroke. However, now a group of emergency providers at the University of

EXECUTIVE SUMMARY

In a study dubbed Emergency Department Telemedicine Initiative to Rapidly Accommodate in Times of Emergency (EDTITRATE), investigators at the University of California San Diego Health System are gauging whether remote physicians can be quickly and cost-effectively mobilized to evaluate patients when the ED is busy. While there have been administrative hurdles involved with implementing the approach, investigators say the strategy could offer big savings in terms of time and efficiency.

- Onsite nurses facilitate telemedicine encounters, utilizing technology that enables remote physicians to evaluate patients.
- While both patients and providers give the telemedicine encounters high marks, managing the workflow is challenging.
- Investigators say the approach could produce significant gains in efficiency, including the possibility that a single on-call physician could remotely treat patients from multiple ED sites.

California San Diego Health System (UCSD) are testing whether telemedicine may also provide a cost-effective solution to crowding in the ED.

"What we realized is that in the current environment, we are seeing a trend of increased visits to the ED. This is not just true in academic medical centers. Community hospitals all across the country are operating at capacity and dealing with overcrowding," explains Vaishal Tolia, MD, MPH, FACEP, an emergency medicine physician at UCSD, and a co-investigator on the project.

With more demand than capacity, hospitals have come up with a number of different strategies to alleviate long wait times, but Tolia observes that many of these are far from ideal. "One solution is just putting a physician in triage, so if someone comes in, they get seen by a physician quickly," he says. "This helps to reduce the number of patients who leave without being seen (LWBS), but the problem with just having a fixed time for the physician to be there to deal with a potential surge is that emergency medicine is very unpredictable. You never know when you are going to have that surge, so it is a potentially costly resource."

By applying telemedicine to the problem, Tolia and colleagues theorize that EDs can easily activate an on-call physician precisely when they need the extra help, and they can just as quickly deactivate the physician when he or she is no longer needed. There are technical and administrative hurdles, but armed with a \$50,000 University of California Health Quality Improvement grant, the UCSD team is in the process of implementing the approach, and investigators say that early results are promising.

Patients feel more involved

As part of the study, dubbed Emergency Department Telemedicine Initiative to Rapidly Accommodate in Times of Emergency (EDTITRATE), telemedicine is first being deployed at UCSD's Hillcrest Medical Center, a level 1 trauma facility that sees about 60,000 patients per year in the ED. "The logistics of it right now are that we have one full telemedicine module in a patient care room ... and we have a cadre of physicians within our group that have gone through the training, and have agreed to participate in this study," explains Tolia. "Since this is still a pilot project, we are making the telemedicine available Monday through Friday, from about noon until 8 p.m."

The onsite telemedicine module is equipped with a video screen, a camera that can be controlled by the remote physician, and tools that enable the physician to evaluate a patient much as he or she would during an in-person encounter. A dedicated onsite nurse handles the peripherals and facilitates the telemedicine encounter. “The nurse’s hands are what we are using remotely to assist us in examining patients,” says Tolia. “We ask them to press in different parts of the abdomen, and we have shown them where to put the stethoscope so we can listen to heart and lung sounds.”

The remote physician requires a laptop or desktop computer that is equipped with a camera, as well as the software that enables a secure connection with the telemedicine module. Most physicians already have the basic hardware required to manage a telemedicine encounter, observes Tolia. Further, while the equipment has not been used in this manner before, it has been used in other medical settings, he says.

The technology has not presented any problems, observes Tolia. To the contrary, patients who have been treated via the telemedicine unit thus far have provided positive feedback on the approach. “They really feel more involved in the care process themselves because when we are evaluating them and looking at their throat because they have pharyngitis or strep throat, for example, they can actually see what we are looking at,” explains Tolia. “That is usually not the case in a typical provider-patient encounter, whether it is in a clinic or the ED.”

At the conclusion of each telemedicine encounter, an onsite physician will reassess the patient to confirm the findings of the remote provider.

Managing workflow is challenging

While there have been no issues with the technology, there have been administrative hurdles to work through. For instance, as the telemedicine unit requires a dedicated nurse and physician, the UCSD team has had to figure out how to manage these requirements with existing staff. Currently, the ED has assigned the nurse charged with making follow-up phone calls to patients to also manage the telemedicine visits, and the physician on-call is handling the remote encounters, explains **Benjamin Guss, RN**, the nurse champion on the telemedicine project.

Since the telemedicine unit is only set up in one room, another challenge is trying to keep up with the need to constantly clean the room for the next

telemedicine patient. “This takes up a lot of the nurse’s time, and you end up not seeing as many patients,” says Guss. “One [potential solution] is to use a room that is big enough to accommodate four patients, so the module can be moved from patient to patient.”

In that case, there would be curtains between each patient to provide some privacy. “That is something we might do in the future,” says Guss. “Right now, since this is a research project, we have to consent each patient, so that takes us extra time as well.”

Managing the workflow is still a struggle, acknowledges Guss, but he observes that the team is working out the kinks. “We are improving the process each and every time we do a telemedicine encounter,” he says.

Approach offers intriguing advantages

Since the ED first began the telemedicine visits in November 2012, most of the patients examined in this manner have been on the lower acuity side. “We are not remotely evaluating the most critically ill patients,” says Tolia. “That is not the purpose of this. The purpose is to initiate care on patients who would otherwise be sitting in the waiting room.”

However, Tolia notes that some patients evaluated via the remote visits have required hospital admission. “There is no particular criteria for telemedicine other than that the person would otherwise be deemed safe after being triaged to be waiting in the waiting room when the ED was full,” he says. “Then that person, in general, would qualify for a telemedicine consultation.”

For this early phase of the study, investigators are primarily gathering data and analyzing parameters regarding safety, outcomes, and satisfaction. Early trends are positive, according to Tolia. “We survey each patient, nurse, onsite physician, and

COMING IN FUTURE MONTHS

- Point-of-care testing in the ED
- Leveraging talent of case managers in the ED
- Picking up on pelvic disease signs in emergency settings
- Power of ED-based peer referral in reaching HIV patients

remote physician for each of our cases just to judge how they felt the encounter was," he says. "Patients have rated us extremely high, close to 5 (the highest possible ranking) almost unanimously. And we have had almost no pushback from the physicians."

Tolia acknowledges that there has been some constructive criticism, but he says both the nurses onsite and the remote physicians have all provided ratings that are well above 4.5. "In terms of provider and patient satisfaction, we are very pleased," he says.

Later this year, investigators plan to move to the next phase of the study, in which they will hone in on whether using this approach makes a difference in alleviating crowding when the ED is busy. If the telemedicine visits work as intended in a cost-effective way, they could then be implemented at another UCSD ED in La Jolla, CA, as well as other hospitals in the UC system.

"One way this could be deployed is that a single physician could potentially remotely see patients at different sites simultaneously," offers Tolia. "It is not something we have tried yet, but it is definitely something that is done in non-emergency applications of telemedicine." ■

SOURCES

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CNE/CME INSTRUCTIONS

HERE ARE THE STEPS YOU NEED TO TAKE TO EARN CREDIT FOR THIS ACTIVITY:

1. Read and study the activity, using the provided references for further research.
2. Log on to www.cmecity.com to take a post-test; tests can be taken after each issue or collectively at the end of the semester. *First-time users will have to register on the site using the 8-digit subscriber number printed on their mailing label, invoice, or renewal notice.*
3. Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.
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CNE/CME OBJECTIVES

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. ■

CNE/CME QUESTIONS

1. According to **Drew Fuller**, MD, MPH, FACEP, studies have shown that when you use a template tool to guide discussion during handoffs, you are less likely to:

- A. make eye contact with the other clinician
- B. include the patient in the discussion
- C. have information and data loss
- D. inform the nurse about key details

2. Fuller also states that some pushback is to be expected when implementing a new process because physicians and nurses are trained to:

- A. stick to the tried and true
- B. resist new ideas
- C. never deviate from the norm
- D. be logical negative thinkers

3. According to **Catherine Messick Jones**, MD, MS, when Wake Forest Baptist Medical Center in Winston-Salem, NC, decided to launch a hospital-wide effort to improve the care of sepsis patients, the initial goal was to figure out how to identify sepsis quickly and to:

- A. deploy a rapid-response protocol
- B. rush patients to the intensive care unit
- C. administer antibiotics within one hour
- D. make clinicians aware of their data

4. Jones also states that under the hospital's new approach to sepsis care, when a nurse sees a high early warning score, she is directed to call a rapid-response nurse:

- A. if she is unsure how to proceed
- B. whether she suspects the patient has an infection or not
- C. when she suspects that the patient has an infection
- D. after first consulting with a physician

5. According to **Vaishal Tolia**, MD, MPH, FACEP, patients who are treated via a telemedicine module that is being deployed in the ED at Hillcrest Medical Center say they feel more involved in their care because:

- A. they can actually see what the physician is looking at
- B. there is more interaction with the remote physician
- C. the remote physician seems more attentive to their concerns
- D. all of the above

6. Tolia states that the purpose of the telemedicine initiative at UCSD's Hillcrest Medical Center is not to care for the most critically ill patients, but rather to:

- A. treat patients with non-emergency needs
- B. initiate care on patients who would otherwise be in the waiting room
- C. see how patients react to telemedicine encounters
- D. maximize resources

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