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Crash injuries may be missed in the elderly — know the complexities

Triage, assessment adjustments required for this population

A review of the literature has revealed that injuries in the elderly resulting from motor vehicle crashes has been underdetected, and resulted in patients being inappropriately treated or assigned to nontrauma centers. The article was published in the January 2010 issue of the *Journal of Emergency Nursing*.[1]

"As this population is rising and becoming more independent [i.e., more likely to continue traveling], there will be increased demand for them to be assessed, and we must look at certain things that make them present differently," says lead author **Jenelle M. Weber**, MS, RN, who began her paper while at The Pennsylvania State University. Weber submitted her paper after assuming her current position as a nurse with the Johns Hopkins Health System in Baltimore. "It is important that ED nurses understand the physiologic changes that occur with aging, comorbid conditions, and making sure they're not missing anything in their treatment," she says.

This issue must be brought to the "front page" of ED care, asserts **Scott Magley**, MD, FACEP, an emergency physician with Conemaugh Health Systems in Johnstown, PA, who previously directed a trauma center and an ED. "Taking care of geriatric patient is a unique type of care, and we are

EXECUTIVE SUMMARY

A new study reveals that elderly victims of car crashes often are undertriaged and/or underassessed.

- Take care to identify all comorbidities, because they lead to greater risk of mortality from trauma.
- Review all medications, especially anticoagulants and beta-blockers, which mask the patient's true condition and can lead to late complications and life-threatening conditions.
- Talk with your EMS leaders about the possibility of using a tightened injury severity score.

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just now starting to get comfortable with geriatric medicine and the comorbidities these patients have," Magley says.

There is increased complexity involved in taking care of these patients, he says. "They present not only with diabetes, hypertension, or heart disease, but they may be taking aspirin, clopidogrel bisulfate, and warfarin, which can cause them to become unstable or for them to appear to be stable, and then later you find something has to be addressed," Magley says. (**Patients on warfarin should receive coagulation testing. See clinical tip on p. 39.**)

In other words, Magley says, you must go beyond the assessment of perfusion, such as blood pressure and pulse rate, performed on younger trauma patients and consider whether the patient is taking any medications that might cause them to bleed, or if they are taking a beta-blocker. "Normally, when people start to bleed [internally], the body responds with an increased heart rate, but when they're on beta-blockers, they do not mount a tachycardia. They stay in a very slow rate," he says. Normal heart rate does not mean the patient isn't bleeding.

Similarly, blood thinners can lead to delayed presentation of bleeding into the brain or spinal cord. "There can be a delayed neurological deficit, and there could be a mass lesion," Weber says.

"It's important for these factors to be part of the assessment; you need to know if these patients are diabetic or if they have COPD, for example, and what meds they're on. It's important to include them in the assessment in part because they can have increased mortality if they have these comorbidities and experience a traumatic injury."

This altered assessment should extend to prehospital triage, the authors noted. EMS personnel should be educated to consider trauma center transportation for senior patients with any significant mechanism of trauma. "Certain studies indicate a tighter injury severity score [ISS] is more appropriate for older adults," says Weber.

Treatment must be customized

Elderly victims of automobile crashes should receive a completely different type of care in the ED than younger adults, says Magley.

"When we do pediatric trauma, we use specific meds and equipment for the size and age of that

SOURCES

For more information about assessing and treating elderly victims of automobile crashes, contact:

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CLINICAL TIP

Older trauma patients need coagulation testing

If you're treating a car crash victim who is on warfarin, the key for an ED nurse or doctor is to follow through with a baseline prothrombin time (pro-time) (or the International Normalized Ratio [INR]) coagulation test, says **Scott Magley**, MD, FACEP, an emergency physician with Conemaugh Health Systems in Johnstown, PA, who previously directed a trauma center and an ED. In some select circumstances, anticoagulation would be reversed. ■

child," he says. "What we're suggesting is that in geriatric trauma, there has to be a modification." Some facilities bring in pediatricians when there is pediatric trauma, Magley says. "I can see having the primary care doctor or geriatrician more involved down the line," he says. "Trauma patients should not only be screened for vitals, but if they're above age 55, I think you should screen them for comorbid conditions as well."

For these patients, the ED should do the same assessment, reassessments, and paperwork every time, Magley says. "The manager needs to build into the protocol what's required to be documented on the computer screen or on the medical record," he says. "When the patient is 55 or older, it should set off a 'bright light' in the mind of the provider that signals this is a different type of patient."

When reassessing these patients, "you should look back at the chart and see if they have comorbidities, or if they are on something where you could have a hidden injury that is just now becoming manifest," he says. In other words, "you set up a system so you do not have any adverse cases or problems," Magley says.

REFERENCE

1. Weber J, Jablonski RA, Penrod J. Missed opportunities: Under-detection of trauma in elderly adults involved in motor vehicle crashes. *J Emerg Nurs* 2010; 36:6-9. ■

HHS unveils strategy for disaster response

All responders will be on the same page

With the release of the National Health Security Strategy (www.hhs.gov/disasters) and interim implementation guide for protecting public health in a large-scale emergency, the Department of Health and Human Services (HHS) has taken the first step toward the realization of a vision long held by emergency response individuals and organizations: a cohesive plan to be followed by everyone in the nation who is involved in disaster response.

"I think most ED managers and other hospital-level emergency preparedness coordinators have all felt pretty isolated since [9/11 in] 2001," says **Eric Toner**, MD, an emergency physician who is a senior associate at the Center for Biosecurity at the University of Pittsburgh (PA) Medical Center. Toner also has worked with the Office of the Assistant Secretary for Preparedness Response on the Hospital Preparedness Program. (**These initial publications are written by design at a high level. See the story on p. 41.**)

"In my hospital I worked on my response plans, but I did not know what others were doing, what the state or the federal government was doing," Toner says. "We need more local collaboration — collaboration that's really transparent — with other hospitals, and then close planning and exercise work with our state, neighboring states, and the federal government."

The country has made significant progress

EXECUTIVE SUMMARY

While ED managers are intimately involved in the emergency planning processes of their hospitals, they are often unaware of how other EDs and facilities are planning for events that will affect them all. The recently announced National Health Security Strategy seeks to address that problem.

- Pay special attention to the objectives that address work force availability, communication, drugs and vaccines, and surveillance activities.
- Re-examine your connections with public health agencies and community organizations.
- Review the strategy and guide online, see how it applies to you, and contact national organizations to make a contribution to further its development.

Key Objectives of the National Health Security Strategy

- Foster informed, empowered individuals and communities.
- Develop and maintain the work force needed for national health security.
- Ensure that situational awareness so responders are aware of changes in an emergency situation.
- Foster integrated, health care delivery systems that can respond to a disaster of any size.
- Ensure timely and effective communications.
- Promote an effective countermeasures enterprise, which is a process to develop, buy, and distribute medical countermeasures.
- Ensure prevention or mitigation of environmental and other emerging threats to health.
- Incorporate post-incident health recovery into planning and response.
- Work with cross-border and global partners to enhance national, continental, and global health security.
- Ensure that all systems that support national health security are based upon the best available science, evaluation, and quality improvement methods.

Source: Department of Health and Human Services, Washington, DC.

in preparing hospitals for what are referred to as common disasters, such as tornados and bus crashes, says Toner. "But we are not at all well prepared for catastrophic disasters, the kinds of things that really keep us up at night like a major terrorist attack, a large earthquake such as the one that hit Haiti, or a nuclear attack," he says. What is needed are a strategy and road map for how to become prepared, and that is what the new publication starts to provide, Toner says.

The National Health Security Strategy (NHSS) was required by the Pandemic and All Hazards Preparedness Act of 2006. It sets priorities for government and nongovernment activities over the next four years, while an interim guide sets forth initial implementation activities. (**For a list of the key objectives of the strategy, see the box, above.**)

The interim implementation guide, to be used until September 2010, focuses on accomplishing the following eight initial activities, which provide a foundation for further implementation of the NHSS:

• Identify and prioritize a list of investments to enhance the capabilities required to achieve national health security.

• Conduct a work force gap analysis and develop work force competencies for all sectors involved in national health security.

• Coordinate HHS's efforts to improve national health security with those of Department of Homeland Security and all federal agencies involved in national health security.

• Begin to identify and develop methods for risk analysis appropriate to the broad range of risks to public health.

• Develop an evaluation framework, including plans for performance monitoring and evaluating the impact of investments.

• Promote and implement quality improvement (QI) methods for health security on a broader scale.

• Propose an agenda for research to enhance national health security.

• Conduct an assessment of the countermeasures enterprise with the aim of identifying how to develop, manufacture, and ensure availability and delivery of countermeasures faster and more efficiently. *(Editor's note: The guide can be found at www.hhs.gov/aspr/opsp/nhss/implementationguide.html.)*

Among the initial actions for the federal government are conducting a review to improve the system for developing and delivering medications, vaccines, supplies, and equipment for health emergencies; identifying the and prioritizing capabilities of local and state governments; determining the investment needed to ensure national health security; and evaluating the impact of those investments. Plans call for the document to be updated every four years.

Gregg Pane, MD, FACEP, director of National Health Care Preparedness Programs, Department of Health and Human Services, says, "Some of the objectives of particular interest to EDs involve work force elements, communication, countermeasures, and situational awareness. These involve a trained-and-ready work force available for surge

SOURCES

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and scalable systems. This includes pre-hospital and hospital, drugs and vaccines, and surveillance activities, including reporting situations to the state public health officials." ED managers and their staffs "would be key partners," Pane says.

To Pane, the significance of the strategy is that "in my judgment it raises the profile [of disaster response] and puts it under one roof. It's the first effort to put everything strategic in one document." ■

Strategy begins at 'a high level'

The good news is that with its National Health Security Strategy and interim implementation guide, the Department of Health and Human Services is, for the first time, outlining a cohesive plan for nationwide response to a major disaster. The "bad" news, if you can call it that, is that it is not yet in actionable form.

"Part of the problem is the strategy as written so far is really high-level," says **Eric Toner**, MD, an emergency physician who is a senior associate at the Center for Biosecurity at the University of Pittsburgh (PA) Medical Center. Toner also has worked with the Office of the Assistant Secretary for Preparedness Response on the Hospital Preparedness Program. "You cannot yet really drill down into the concrete specifics an ED manager needs to know," says Toner, noting that the interim implementation guide will be followed by an interim plan in September 2010. "Hopefully, that will have concrete guidance and strategies ED managers will find useful in their own planning; meanwhile they should continue improving their own strategies," he says.

Gregg Pane, MD, FACEP, director of the National Health Care Preparedness Programs, Office of the Secretary, Department of Health and Human Services, agrees that "this is high-level guidance and policy," Pane says. However, there is much ED managers can be doing right now, he says. The two big goals of the strategy, Pane explains, are building community resiliency and strengthening and sustaining health and emergency response systems.

"We have to be able to intervene if we have a major health event. That's where EDs and hospitals really come into play," notes Pane. He also recommends that ED managers look at the strategy and guide online, determine where they might fit in, and then make a contribution to its further development. *(Editor's note: The Department of Health and Human Services will sponsor meetings and seminars on the strategy and encourages participation by ED representatives. We will make the schedule available to our readers when it is published.)*

"I would take a look at what you're doing right now in terms of preparedness, and examine your connections with public health agencies and community organizations," Pane adds. Then, by looking at the document, "you can get an idea of where we're headed, and see where to better focus your energy," he says. ■

ED cuts LWBS from 5% to 0.5%

Input required from several departments

Recognizing that ED wait times and throughput are affected by the entire hospital, the leaders at King's Daughters Medical Center in Ashland, KY, engaged all the departments that interface with the ED and slashed the rate at which ED patients leave before treatment from 5% to 0.5%. This accomplishment is all the more remarkable because the ED sees 76,000 patients a year and volume has not declined during the implementation period.

During that same time period, turnaround time for admitted patients decreased by 22%, from 312 minutes to 242 minutes, and turnaround time for patients discharged from the ED fell by 9%, from 183 minutes to 166 minutes. "We still have a long

EXECUTIVE SUMMARY

The leaders at King's Daughters Medical Center in Ashland, KY, firmly believe that solving ED throughput problems must be the responsibility of the entire hospital. They must be on the right track. A recent initiative has slashed the rate of patients who left without being seen from 5% to 0.5%.

- When beds are available in the ED, presenting patients are moved there immediately and then triaged by the bed nurse.
- Throughput assessments are conducted hourly so that problems can be addressed immediately.
- When the ED is in danger of becoming overwhelmed, all department leaders are paged and direct their units to take appropriate action.

way to go," says **Mona Thompson**, MBA, RN, CPHQ, CENP, vice president of patient services and chief nursing officer.

Brandi Boggs, RN, MSN, director of emergency services, says, "Throughput is a high priority for us for lots of reasons: patient satisfaction, quality of care, overall decline in length of stay."

Senior leaders outlined the goals and methods to achieve them. "We had a goal of reaching best practice in terms of left without being seen as defined by The Advisory Board — which is 0.55%," says Boggs. *(Editor's note: The Advisory Board, based in Washington, DC, is a provider of performance improvement services to the health care and education sectors.)*

Thompson says, "Brandi and her team came up with this plan. She involved radiology, bed placement, doctors and nurses, housekeeping, the pharmacy, the customer satisfaction team, the laboratory, case management, social workers, and IT — all the stakeholders." These stakeholders worked on actions specific to their discipline needed to achieve the 0.55% goal, she says. "That's really important," says Thompson. "Teamwork is important to us, and the team members who do the work know how to make things better." So, for example, ED charge nurses and triage nurses accept responsibility for patient-left-without-being-seen rates and actively interact with patients to explain the benefits of receiving a medical screening exam, she says.

After several months of meetings, the plan was implemented in February 2009. Boggs says that in the ED itself, "one of the things we do differently now is triage patients directly to the back when there is an open bed. Triage is a function, not a location. If there is an open bed, and you bring the patient straight back, it increases quality of care and customer satisfaction."

This step eliminates the "funnel," Thompson says. "Most ED teams will tell you that patients arrive at triage in clusters, not in a steady stream, so if you funnel all of them through one or two triage nurses, it makes it slower for the last person in the cluster," she says. Now if there is a bed open, the patient can be triaged by the bedside nurse, Boggs says.

"We also do hourly throughput assessments in the ED," she says. "We developed a worksheet where we can look at things that define throughput — patients in the lobby, current wait time, boarders" who are waiting more than two hours for a bed. Based on the worksheet, the charge nurse will assign a color (green, yellow, orange, or red) to indicate throughput status. [**A copy of the worksheet is available with the online issue of *ED Management*. For assistance, contact customer service at (800) 688-2421 or customerservice@ahcmedia.com.**] If there is a problem, all of the departments will swing into action. (**For more details, see the story, below.**)

This team approach has led to steady progress, says Thompson, who notes that the 0.5% figure was first achieved in January 2010. "In the last two fiscal years [which end in October], we averaged 4.55% and 3.49%, respectively," she reports. "Year to date, we are at 1.33%." ■

Other units can 'rescue' the ED

The decrease in the rate of ED patients leaving before treatment at King's Daughters Medical Center in Ashland, KY, from 5% to 0.5% was not achieved by the ED alone. It took a concerted effort on the part of all of the major departments that interface with the ED.

Hourly throughput assessments in the ED result in the charge nurse assigning a color (green, yellow, orange, or red) indicating the current throughput status. "Based on that level, different actions are taken to elevate the urgency of getting resources to the ED to get it moving," explains **Mona Thompson**, MBA, RN, CPHQ, CENP, vice president of patient services and chief nursing officer.

A page is sent to the hospital's leadership council twice a day indicating the overall status of the organization and specifically the ED. This page goes to every individual with the title of manager, director, or above.

"When the ED gets to orange or red [indicating that throughput is becoming seriously impaired], we do individual hourly pages until that is resolved," says Thompson. This page includes leaders who are at home, adds Thompson, noting that the previous night, a Code Orange was called at 1 a.m. "The expectation is that the entire leadership team will either come in or call to ensure their department is appropriately responding to meet the needs of the ED," she explains.

Brandi Boggs, RN, MSN, director of emergency services, says, for example, "if we are at orange, on the inpatient side, they will look at their units to see if any patients are ready to go home and discharge them in a timely manner to free up a bed.

Housekeeping is notified so they can get the beds cleaned."

Thompson adds, "The lab may put an extra phlebotomist in the ED, or the radiologist may call out another tech, depending on what the needs of the particular patient population are at that time. Pages may even be sent to the laundry to make sure there are adequate linens or to have them bring an extra linen cart." ■

ED makes lemonade out of lemons

Inadequate intake system vastly improved

An adverse event in the ED at University Medical Center (UMC) in Las Vegas might have drawn negative media coverage and state and federal investigations, but it also led to process changes that the ED managers say have made a world of difference in patient satisfaction and quality.

"The problem was an incident that began at one of our outlying clinics, which we call Quick Cares," says **Dale Carrison**, DO, MS, FACEP, FACEOP, chairman of emergency services at UMC. He adds that ongoing legal action prevents him from going into too much detail. "They called the ED and advised us that a patient — a female with abdominal pain — was coming in her own vehicle. She had chosen not to come by ambulance."

There are varying versions on what happened once she arrived in the ED, says Carrison, "but she waited for a significant period of time — for too long," he notes. (**Communications with the Quick Cares have since been improved. See the story on p. 44.**)

An aggravating factor was that the woman was pregnant. However, the outlying clinic had not detected the pregnancy, and in fact, according to Carrison, the woman herself did not know she was pregnant. There was a delay in seeing the triage nurse, and the patient left on her own. According to local press reports, she tried another hospital but was told the wait there would be a long one, was given pain medication, and went home, where she delivered a premature baby girl. Paramedics failed to revive the baby, say the reports. The patient and her fiancé subsequently filed a complaint alleging that she was ignored in the ED so long that she and her fiancé returned home.

Following the investigations, including one by the Centers for Medicare & Medicaid Services, and the request for corrective actions, Carrison put together a team and conducted a root-cause analysis on all that had happened. "We looked at every portion of the system to determine the best odds of preventing this from happening again," he says.

One of the changes already had been under way, but the team decided to further modify it. "In the real old days, a patient took a number and sat down. We realized that was not good, and [we] went on to have a CNA get an initial chief complaint, put the patient's name in the computer, take vitals, and then forward the information to a triage nurse," says Carrison.

More recently, however, the department had implemented a rapid medical assessment (RMA) process, with a doctor in triage from 9 a.m. to 6 p.m. When this event occurred after 6 p.m., the team decided to extend the RMA hours until 3 a.m.

During those hours, the patients are now seen by a nurse "meeter/greeter," says **Evelyn Lundell**, RN, MSN, the clinical manager of the ED. In addition to performing the "mini-medical" initial assessment, "they can offer an extra eye that is trained to pick up a patient that might be deteriorating and cause an unfortunate death, such has been seen EDs across the country," she notes. The nurse enters the patient information into the computer and obtains a pain level and chief complaint. A rapid registration is performed. The patient is seen by the RMA doctor, who orders treatments and tests. (**For more on pain levels, see clinical tip, p. 44.**)

"He may be able to discharge the patient or expedite them to the back, during which time the nurses initiate the testing, get labs drawn, and finish the triage from the nurse's perspective," says Lundell.

Carrison says he is collecting data to evaluate

EXECUTIVE SUMMARY

Having a well-publicized adverse event involving your ED can be embarrassing and costly, but the University Medical Center (UMC) in Las Vegas has shown it also can lead to improved processes that benefit patients and your facility. Some changes implemented at UMC following state and federal investigations of an adverse event were:

- A root-cause analysis was performed to identify opportunities for process improvement.
- Hours were extended for the rapid medical assessment, which is performed by a physician in the front of the ED.
- Patients being transferred from hospital-owned Quick Care facilities are registered by computer before arriving at the ED.

Clinical Tip

If patient feels pain, it's real

It's important for ED nurses to acknowledge that a patient's pain is real to them, even if they have their own doubts about its legitimacy, says **Evelyn Lundell**, RN, MSN, the clinical manager of the ED at University Medical Center (UMC) in Las Vegas.

"It is not our job to determine if the pain is real or not. It is real to them, and we need to acknowledge that," she says. "If they say it's a nine, then we need to assume that it's true, even if they're smiling and do not seem to be in pain."

A nurse can document that the pain assessment is not consistent with the patient's behavior if they wish, Lundell adds. Pain issues have even led to process changes in the ED, she says. "We give PO meds in the waiting room now because of pain complaints," she says. ■

those changes, which have been in place only a few months. However, he says, "Anecdotally, I can tell you that adding RMA hours has absolutely made a difference in this 53-bed ED." UMC, he adds, has completed its corrective actions. ■

ED and outside clinics expand communications

To prevent a repeat of an adverse event that resulted in state and federal investigations, the ED at University Medical Center (UMC) in Las Vegas has improved communications with the facility's outlying Quick Care clinics, as recommend by a team that conducted a root-cause analysis of the event.

"We've changed how transfers come from Quick Care," says **Dale Carrison**, DO, MS, FACEP, FACEOP, chairman of emergency services at UMC. The hospital has an area named the Patient Placement Center that handles outside transfers. "Quick Care now calls that center, and the patient is already in our system," he says.

This change saves time by avoiding dual registration, he says. In addition, "if this patient has already been seen by a physician, they should not go to the back of the list when they get here, but to the front," Carrison says.

Evelyn Lundell, RN, MSN, the clinical manager of the ED, says, "They've already waited two or three hours at Quick Care." However, the more serious patients obviously receive priority in the ED, she says.

Carrison says, "If you take dual registration out of the process, that saves probably 10 minutes per patient — a minimum of five. And there's less chance of a patient falling through the cracks when they come via ambulance."

In the adverse incident, the patient insisted on driving herself to the hospital, he says. "Now we ask the patient to sign a form saying they've refused transport by ambulance," says Carrison. ■

ED documentation aids certification

Timing of processes is a key for Joint Commission

A change in documentation procedures in the ED played a significant role in making it possible for Porter Adventist Hospital in Denver to receive certification as an advanced primary stroke center by The Joint Commission.

"I'm not sure the entire process of treating stroke patients changed, but the documentation and a lot of the logistics or flow patterns did," says **Adam Wolff**, MD, the stroke medical director. "We took good care of stroke patients previously, but once we decided to try to become a certified stroke center, we had to take even greater care in a timely manner and be able to prove it." (**Education also was an important part of the process. See the story, p. 45.**)

In the Porter Adventist ED, he explains, a stroke alert can be activated via EMS in the field or in the ED via a walk-in patient. "But when it is activated, the nurse in charge and the clerk in the ED have a flow sheet specific to that patient that contains a lot of data points." [**A sample copy of the form is available with the online issue of *ED Management*. For assistance, contact customer service at** (800) **688-2421 or customerservice@ahcmedia.com.**]

Summer Cooper, RN, CCRN, the stroke coordinator, explains the data points. "There are some specific time frames to be seen in the ED recommended by the National Institute of Neurologic Disorders to meet the 'golden hour' for care,"

EXECUTIVE SUMMARY

When Porter Adventist Hospital in Denver set out to earn certification by The Joint Commission as an advanced primary stroke center, the ED played a major role in the ultimate success of the process. Here are some of the ways in which the ED contributed:

- Documenting the time it takes to perform key steps in the treatment of stroke patients;
- Developing multidisciplinary and multidepartment coordination of timely services, such as brain imaging.
- Coordinating with EMS, and responding appropriately to "stroke alert" calls.

Cooper notes. "For example, from door to initial evaluation is 10 minutes, [a total of] 25 minutes until the CT scan is initiated, 45 minutes until it is interpreted, and an additional 15 minutes for the tissue plasminogen activator [tPA] decision." In addition, she notes, The Joint Commission has outlined eight standardized measures with which each stroke patient should be treated. *(Editor's note: To see a copy of the measures, go to www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/STK+Core+Measures.htm. At the bottom of the page, select "Specification Manual for National Hospital Quality Measures."* **Avoiding low blood pressure is an important clinical consideration. See clinical tip on p. 46.**)

Wolff says, "Our ultimate goal is to treat every stroke patient within one hour of hitting the ED. When we meet in committee to review all cases, if a case 'fell out,' we identify why it did. Perhaps they did not receive the CT scan fast enough or the lab was tardy."

The Joint Commission wants to see that you have a plan in place and quality improvement processes to recognize problem areas within the plan and improve them, he says. "So, for example, we were having problems getting reads from radiologists on time," Wolff recalls. "We came up with a solution by ordering not just a CT, but instead a 'CT stroke alert brain,' which requires the radiologist to call with a 'wet read' immediately."

"Immediately" means within minutes, Wolff says. However, he does not want to require the ED to make sure that happens. "They deal with emergent patients all the time, and the more of an onus you put on them, the more likely they are to fall out," Wolff says. When a stroke alert is called, he adds, several services such as radiology, lab, the ED, pharmacy, and neurology are notified, "and that should get everybody moving in a coordinated way."

On the ED level, the nurse is responsible for two IV access lines, Wolff says, "and they do a really good job." The ED physician is responsible for doing a National Institutes of Health Stroke Scale screening. "We do fall out a lot on documentation because the docs are too busy, but we have a program in place to contact the doctors and remind them to do that," says Wolff. ■

Education key part of certification

Education was an important part of Porter Adventist Hospital in Denver earning certification as an advanced primary stroke center from The Joint Commission, says **Summer Cooper**, RN, CCRN, the stroke coordinator.

"We worked a lot with EMS to educate them. They know that they can call ahead with a stroke alert, so we prepared them and got everyone else to be ready to hit the time frames," Cooper says. (**For a list of the time frames, see the story on p. 44.**) "If they call an alert, we can prepare and have the doctor waiting. The radiology department knows a stroke patient is coming, so they clear a table, and the on-call neurologist is paged to be present or available to talk with the ED physician on the phone."

Physician education was handled by the ED medical director, adds **Adam Wolff**, MD, the stroke medical director. "Basically it was a primer on the use of tPA. One of the main points of the program is appropriately treating people who are candidates with tPA," he says.

Topics include a description of the drug, its indications and contraindications, side effects, the National Institutes of Health Stroke Scale, and documentation.

"A couple of Colorado facilities in our system are certified, so we worked with their coordinators to help build the program," Cooper says. Then, in preparation for the deciding site visit by The Joint Commission, they performed a mock survey in May 2009. The mock survey was conducted by two stroke coordinators and a neurosciences director from sister Centura hospitals that already were certified primary stroke centers. "They essentially re-enacted an actual TJC on-site review," she says.

Following the mock survey, a number of changes were made, including revision of the ED and in-house stroke patient process flows, so that they were more streamlined. Also, a computerized slide presentation was created with an overview of the processes to create a clearer portrait of the

Clinical Tip

Beware of low BP in stroke patients

One of the pitfalls to avoid in treating acute stroke patients is lowering the patient's blood pressure (BP), warns **Adam Wolff**, MD, the stroke medical director at Porter Adventist Hospital in Denver.

"That can be dangerous for the patient," he says. "You often want their BP to be elevated."

Another error to avoid is failing to give the patient a swallow screen, he says. "A lot of stroke patients have trouble swallowing and end up with aspiration pneumonia because oral medications have been given inappropriately," he says. "They should always be screened before give anything PO." ■

program for the surveyor.

"The mock survey was an essential first step to certification," says Cooper. ■

Expanded MEWS is more predictive

Updates seen as more appropriate for ED

Many facilities and EDs use the tool called the modified early warning score (MEWS), which includes questions about the patient's health state, to determine if patients are getting sicker and if they require transfer to the intensive care unit (ICU). However, researchers led by **Chadwick Miller**, MD, MS, assistant professor and director of clinical research in the Wake Forest University Department of Emergency Medicine in Winston-Salem, NC, believed that MEWS was not completely appropriate for the ED setting. They set out to prove it.

They reviewed records from 280 patients being admitted to the Wake Forest Baptist Hospital from the ED. Using MEWS, 82% of the patients fell into the category of "intermediate risk," a gray area where it can be unclear whether a higher or a lower level of care is needed. MEWS predicted that

EXECUTIVE SUMMARY

Researchers studying the modified early warning score (MEWS) found several areas of weakness that led them to modify the tool, which is used to assess risk levels in ED patients. Their recommended modifications took into account a number of variables they thought would provide a more accurate prediction, and their research seems to confirm their approach. Those variables include:

- whether the patient was brought to the ED via ambulance;
- patients who received intravenous antibiotics in the ED or who had infectious illness;
- the patient's length of stay.

18% of those patients required intensive care, but a look back at patients' records told the team that, in fact, 27% of the patients ultimately needed a higher level of care.

The team decided to make some additions to MEWS and then see if its predictive ability was improved. In its original form, MEWS looks at the following factors: systolic blood pressure, heart rate, respiratory rate, temperature, and the Glasgow Coma scale. Each value is given a score, and a total score of 5 indicates likelihood of death and transfer to the ICU. The researchers added the following variables: whether the patient arrived at the ED via ambulance, received intravenous antibiotics in the ED, the patient's length of stay in the ED, and gender.

"We thought patients who were brought to the ED by ambulance were probably more ill, and that this could predict patients who would need a higher level of care," Miller explains. "Patients who received intravenous antibiotics in the ED, or who had infectious illness, would probably be more likely to decompensate." The patient's length of stay likely would indicate those who were more ill, he adds, and gender also "proved to have some predictive ability."

When they reviewed the same charts again using what they call MEWS Plus, the researchers found that about 22% more patients were placed in an

COMING IN FUTURE MONTHS

- MRI provides faster, more accurate MI diagnosis
- AHRQ Innovations Exchange shares best practices
- Diverting nonurgent cases cuts wait times
- New database outlines nationwide costs and utilization

appropriate risk category than had been using the original MEWS model. (**Despite these findings, the researchers warn against immediate implementation of this new model. See the story, below.**)

Corey R. Heitz, MD, assistant professor in the Department of Emergency Medicine, Boonshoft School of Medicine, Wright State University, Kettering, OH, says the weakness of MEWS is that it does not have sufficient low-risk criteria, resulting in a "huge middle ground."

"Initial studies on MEWS looked at the time of ED presentation. Unfortunately, people stay in the ED for a period of time, and things can happen there," Heitz notes. "What happens is at some point in time problems may have been corrected, and the patient may not need the ICU anymore." Conversely, he notes, the original score might say the patients does not need the ICU, but he or she could end up getting worse. ■

Don't be in rush to use MEWS Plus

While the researchers who developed an expanded version of the modified early warning score (MEWS), or MEWS Plus, for use in the ED showed that it had greater predictive ability than the original MEWS, they caution ED managers about using the newer version immediately.

They note that the 280 patient charts on whom they performed reviews represented too small a sample to justify wide adoption of MEWS Plus.

"At this point, I do not think any of the information is ready to be put to use, but they can understand this research is going on and that in the future there may be a better way of making those distinctions," says **Corey R. Heitz**, MD, assistant professor in the Department of Emergency Medicine, Boonshoft School of Medicine, at Wright State University, Kettering, OH.

ED physicians do a lot of "clinical gestalt," so it's nice when they can be backed up by numbers, "and in the future, we may have numbers we can attach to that gestalt," Heitz says.

Chadwick Miller, MD, MS, assistant professor and director of clinical research in the Wake Forest University Department of Emergency Medicine in Winston-Salem, NC, also was cautious. "Yes, the revised model needs to be further validated," Miller says. Several items need to go into the decision of whether to send an ED patient to the ICU, and a lot of those items are not captured in the MEWS, so perhaps the questions they added may be considered, he says.

Miller adds, however, that there are other factors to consider as well. "In your mind, you summarize the entire ED course and try to predict how the patient will do in a day or two," he says. "There are a lot of intangibles involved." ■

CNE/CME INSTRUCTIONS

Physicians and nurses participate in this CNE/CME program by reading the issue, using the references for research, and studying the questions. Participants should select what they believe to be the correct answers, then refer to the answer key to test their knowledge. To clarify confusion on any questions answered incorrectly, consult the source material. After completing the semester's activity with the **September** issue, you must complete the evaluation form provided and return it in the reply envelope to receive a certificate of completion. When your evaluation is received, a certificate will be mailed to you. ■

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 Gregg Pane, MD, FACEP, Director, National Health Care Preparedness Programs, Office of the Secretary, Department of Health and Human Services, which objective outlined in the National Health Security Strategy should be of particular concern to ED managers?

A. Work force availability
B. Countermeasures
C. Surveillance activities
D. All of the above

2. According to Brandi Boggs, RN, MSN, director of emergency services at King's Daughters Medical Center, how often does her ED check throughput data?

A. Every hour
B. Every 90 minutes
C. Every two hours
D. Every three hours

3. According to Scott Magley, MD, FACEP, an emergency physician with Conemaugh Health Systems in Johnstown,

PA, how old must a patient be to be considered geriatric?

A. 50
B. 55
C. 60
D. 65

4. According to Dale Carrison, DO, MS, FACEP, FACEOP, chairman of emergency services at University Medical Center, how much time did the elimination of dual registration for transferred Quick Care patients save his ED?

A. At least three minutes per patient.
B. At least four minutes per patient.
C. At least five minutes per patient.
D. At least 10 minutes per patient.

5. According to the "golden hour" standards set out by the National Institute of Neurologic Disorders, what is the maximum amount of time that should pass from door to initial evaluation?

A. 12 minutes
B. 10 minutes
C. Eight minutes
D. Five minutes

6. According to Chadwick Miller, MD, MS, assistant professor and director of clinical research in the Wake Forest University Department of Emergency Medicine, the modified early warning score (MEWS) should take into account additional variables, including:

A. Whether the patient arrived at the ED via ambulance.
B. Whether the patient received intravenous antibiotics in the ED.
C. The patient's length of stay in the ED.
D. All of the above

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CNE/CME ANSWERS

1. D; 2. A; 3. B; 4. C; 5. B; 6. D.

Total Current Census (Hospital):

ED Charge Nurse Throughput Worksheet--HOURLY ASSESSMENT

Date: **TIME:** **ALERT LEVEL:**

Green		Yellow		Orange		Red	
#lobby <5		#lobby 6-15		#lobby 16-20		#lobby >20	
Lobby Wait Time <30 mins		Lobby Wait Time 30mins-60 mins		Lobby Wait Time 60mins-1.5hrs		Lobby Wait Time >1.5hrs	
#LWBS <2 (per 24 hr 12m-12m)		#LWBS 2-6 (per 24 hr 12m-12m)		#LWBS 7-12 (per 24 hr 12m-12m)		#LWBS >12 (per 24 hr 12m-12m)	
#Holds >2hrs awaiting bed <2		#Holds >2hrs awaiting bed 3-6		#Holds >2 hrs awaiting bed 7-12		#Holds >2 hrs awaiting bed >12	
ED Staffing		Notify House Supervisor?		Notify House Supervisor? (assure page placed)		Notify House Supervisor? (assure page placed)	
RNs (CHECK HOURLY TO ASSURE ASSIGNED TO PATIENTS)		Notify ED Leadership?		Notify ED Leadership? (ED Leadership to notify ED Director and Nurse Administrator On-Call discuss all NM notification, notify administrator on call)		Notify ED Leadership? (ED Leadership to notify ED Director, Nurse Administrator, and Hospital Administrator On-Call, discuss all NM notification)	
CMTs		Alternate Area Opened? Y or N (if N respond below)		Alternate Area Opened? Y or N (if N respond below)		Alternate Area Opened? Y or N (if N respond below)	
Scribes		If not, why?		If not, why?		If not, why?	
ED Volume							
#Side 1							
#Side 2							
#Side 3		Reason YELLOW/support needed?		Reason ORANGE/support needed?		Reason RED/support needed?	
#Side 4		ED volume issue?		ED volume issue?		ED volume issue?	
#Alternate Area		Admit/boarders issue?		Admit/boarders issue?		Admit/boarders issue?	
#Waiting room		Staffing issue?		Staffing issue?		Staffing issue?	
#Waiting for bed/admission		Support needed?		Support needed?		Support needed?	

Charge Nurse Signature:_____

Assess ongoing, complete form hourly, turn in completed forms to Emergency Department Nurse Manager after each shift

Admission Beds Needed			Admission Beds Needed		
Patient Name/ED Bed Number	Total Time Waiting Bed	Type Bed Needed	Patient Name/ED Bed Number	Total Time Waiting Bed	Type Bed Needed

Assess ongoing; complete form hourly

Charge Nurse Signature: _____

****Turn in completed forms to Emergency Department Nurse Manager after each shif**

**Admits: Report within 15 mins of bed assignment, Transport within 15 mins of report called, if unable team member to notify charge nurse to call report, call house transporter to help transport when needed, if floor won't accept report, call House Supervisor to facilitate.

Alternate Area Criteria

*Consider for Yellow or greater ED
*Consider opening side 4 for non-express care patients
*If alternate area needed for non-express care patient and side 4 unavailable consider endoscopy d/t cardiac monitoring capability
*Call below contact for alternate area and call House Supervisor to notify opening alternate area and location
*Call for supplies, assure area ready to receive patients
*Shuttle for Outpatient Surgery
*Clean up

Contacts	Location	Manager/Supervisor	Department Number
IV Therapy	**Sheri Burton**	**6785**	**7076**
Endoscopy	**Sandy Hicks**	**4410**	**4852**
Outpatient Surgery Center	**Adria Lucas**	**5441**	**5250**
Radiology	**Supervisor**	**6860**	**4193**
Supplies	**Cart on Express Care/Side 4, bring IV and suture cart with you, portable otoscope (IV shelf next to Randy's desk) (call materials mgt if problem locating cart)**		
Shuttle	**Security**	**n/a**	**4487**
Badge Access to alternate areas	**Security**	**n/a**	**4487**
Pharmacy--Pyxis access	**RNs assigned to alternate area to pharmacy, show badge to have access granted to pyxis in alternate area**		

ED Management	Pager
Brandi Boggs	**606-327-9246**
Laura French	**606-327-9283**
Heather Sellars	**606-327-0279**
House Supervisor	**4490**

revised 3/25/09, 7/09, 9/

Source: King's Daughters Medical Center, Ashland, KY.

Porter Adventist Hospital

Stroke Alert/Rapid Response Record

READ FIRST

- **Initiate form in ED or at Rapid Response location**
- **Please complete for all Stroke Patients regardless of time of day**
- **When complete, please return to Stroke Coordinator**

Critical Times for Stroke Alert	Time (24 hr clock)
Bio Phone Stroke Alert call received	:
Time Stroke Alert/Rapid Response Called	:
Triage Time/Time of onset of symptoms	:
Patient presents to ED	:
ED/Attending/Intensivist Physician in to see pt.	:
Neurologist paged (Name: _____)	:
Neurologist call back time	:
Neurologist decision time	:
CT called	:
Patient to CT (Goal 25 minutes from Door)	:
Results from CT called to physician(Goal 45 min)	:
Admin. Coordinator paged	:
Admin. Coordinator response to page	:
Labs ordered	:
Labs drawn	:
Lab results received (Goal 45 min. from order)	:
Thrombolytic started	:
Patient admitted / Transferred (Total ED Time)	:
	:

Barriers to Thrombolytic Therapy

Complete if Time to Thrombolytic > 3 Hours

- ❑ **Unknown time of onset of Symptoms**
- ❑ **Symptoms of Stroke not recognized**
- ❑ **Delay in Patient seeking Medical Treatment**
- ❑ **Delay in Neurologist Call Back**
- ❑ **Prolonged Decision Time**
- ❑ **Equipment Failure**
- ❑ **CT in Use**
- ❑ **CT Stroke Protocol not utilized**
- ❑ **Other – Explain:**

_____

_____

_____

EMS Agency	From Field	From PAH
❑ Action Care Ambulance	❑	❑
❑ Columbine Ambulance Service	❑	❑
❑ Cunningham Fire Department	❑	❑
❑ Denver Health Paramedics	❑	❑
❑ Elk Creek Fire Department	❑	❑
❑ Englewood Fire/Rescue	❑	❑
❑ Flight for Life	❑	❑
❑ Littleton Fire Department	❑	❑
❑ Parker Fire Department	❑	❑
❑ Sheridan Fire Department	❑	❑
❑ South Metro Fire Rescue	❑	❑
❑ West Metro Fire Department	❑	❑
❑ Other:_____	❑	❑

Patient Disposition

Admitted to the floor Room #_____
Admitted/Transferred to ICU Room #_____
Transferred to another Facility, Facility Name:_____

CT Stroke Protocol	**Yes**	**No**
CT without contrast	**Yes**	**No**
CT with contrast	**Yes**	**No**
MRI	**Yes**	**No**
CTA Brain and Neck	**Yes**	**No**
Carotid NIVEA	**Yes**	**No**
Expired	**Yes**	**No**

Emerg. Dept. MD: _____

Neurologist: _____

Admitting MD: _____

Dx: _____

To Be Completed by Pre-Hospital		
EMS follow-up completed by:		
Date/Time:		
Report to:		
Stroke Alert – Critique		
EMS "Stroke Alert"?	**Yes**	**No**
Did patient fit Stroke Alert criteria?	**Yes**	**No**
Was EMS Stroke Alert accurate?	**Yes**	**No**

Place Zebra Label Here

CONFIDENTIAL
Not Part of the Patient's Medical Record
Version 2

Source: Porter Adventist Hospital, Denver.