ED NURSING™

A MONTHLY CLINICAL UPDATE ON EMERGENCY NURSING

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IN THIS ISSUE

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Is your next stroke patient outside treatment window? Don't be so sure

Study calls for extending time frames right away

A patient reports stroke symptoms that began four hours ago — outside the window for treatment with intravenous tissue plasminogen activator (IV tPA).

Does this frustrating scenario sound familiar? This patient would now be treated in many EDs, due to compelling new evidence that the time frame can safely be extended to 4½ hours. Of 321 patients given IV tPA or a placebo at three to 4½ hours after symptom onset, more had favorable outcomes who received treatment (52.4% vs. 45.2%), and death rates did not differ between the two groups.[1]

"The study demonstrates enhanced quality of life for a larger number of patients, virtually without any increased risk," says **Joyce McIntyre**, RN, MSN, clinical nurse specialist for the ED at Massachusetts General Hospital (MGH) in Boston. "This is a high-quality study that supports extending the time frame to administer tPA, for patients who meet the criteria."

MGH's ED is evaluating giving tPA beyond the three-hour window. In the past five years, a total of 133 patients came to the ED between three and 4½ hours after the onset of stroke and did not receive tPA. "These patients would now meet the requirement," says McIntyre.

The study's findings are "exciting and very compelling," according to **Lee H. Schwamm**, MD, FAHA, vice chairman of the Department of Neurology

EXECUTIVE SUMMARY

Your stroke protocols will need to change to extend the time frame for treatment with intravenous tissue plasminogen activator from three hours to 4½ hours, as a result of new research showing that this is safe and effective.

- By extending the window to 4½ hours, more patients can be treated.
- For patients who present between three and 4½ hours, evaluate CT perfusion.
- The sooner treatment is given, the better the outcome.

and director of TeleStroke and Acute Stroke Services at MGH.

"This is an important advance in the field of acute stroke care and demonstrates that well-designed studies of reperfusion therapy can extend the benefits beyond the three-hour window," says Schwamm.

When should you change your ED's protocols to include patients who arrive up to 4½ hours after onset of symptoms? "Immediately," according to **J. Stephen Bohan**, MD, MS, FACP, FACEP, executive vice chairman of the Department of Emergency Medicine at Brigham and Women's Hospital in Boston. A well-constructed randomized study is "about the best proof that you can get," says Bohan. "It took patients who could be treated between three and 4½ hours and randomized them to no treatment and treatment, and treatment was beneficial," he says. "It showed fairly distinct benefits."

University of California, San Diego Medical Center's ED sees "many patients that arrived marginally after the three-hour window and did not receive the therapy because they were 15 minutes late," reports **Tia Moore**, RN, CEN, clinical nurse educator. Patients in this "grey area" now will be treated, she says. "We currently err on the side of good patient care and will administer the thrombolytic."

Currently, very few ED patients are able to be treated with tPA, says **Lauren Brandt**, RN, MSN, CNRN, clinical director of the Neurosciences, Brain & Spine Center at Brackenridge Hospital in Austin, TX. "Opening this window to 4½ hours would immediately increase utilization," Brandt says.

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EDs will adopt the new time frame "probably starting right away," she says. "I really think this will change practice — if nothing else, for those people who get here who we miss by minutes. That will probably be the first step toward adoption. Then they'll start expanding the window more and more," says Brandt.

Recently, a 52-year-old man treated at Brackenridge's ED had an initial National Institutes of Health Stroke Score (NIHSS) of four, but within 30 minutes it progressed to a 10. The man was given a normal noncontrast CT scan, a CT perfusion study with a clear deficit and a normal CT angiogram. At four hours after onset of symptoms, the patient was given IV tPA after discussion with him and his family.

"In addition, informed consent was obtained since it was clearly outside of the time window," says Brandt. "The patient responded well to the tPA, and his NIHSS decreased back to a 5." **(See related stories on handoffs of stroke patients, below; saving valuable minutes, right; and preparing to administer tPA, p. 28.)**

Reference

1. Hacke W, Kaste M, Bluhmki E, et al. Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke. *N Engl J Med* 2008; 359:1,317-1,329. ■

Clinical Tips

Do neuro assessment with oncoming nurse

If you're the off-going nurse "handing off" a stroke patient, take the oncoming nurse to the bedside for a brief neurological exam, advises **Tia Moore**, RN, CEN, clinical nurse educator for the ED at University of California — San Diego Medical Center.

"People have many interpretations over what a 'firm hand grasp' feels like. It is important that the patient gives me a firm hand grasp, then gives you the same firm hand grasp," she says.

Doing this task together sets the baseline exam for the oncoming nurse, and any deviation of strength can be used as a change in the patient's status. "It is much easier to establish the baseline with the person that has been caring for the patient," says Moore. ■

Cut delays by taking these actions for stroke

Even with the possibility of a 4½-hour window for treatment of stroke patients, you should always act with a sense of urgency, stresses **Stacey Claus**, RN, BSN, CNRN, clinical instructor for the Department of Nursing at Cleveland Clinic.

"Time is brain, and efforts to treat stroke quickly should continue to be our standard of care," Claus says. To cut delays, take these actions:

• Before the patient arrives, prepare the room and stretcher.

A travel monitor, intravenous (IV) equipment, blood tubes, lab slips, and paperwork should await the patient, says **Joyce McIntyre**, RN, MSN, clinical nurse specialist for the ED at Massachusetts General Hospital in Boston.

"An oxygen tank and large-volume pump can be placed on the stretcher just in case oxygen is needed or tPA [tissue plasminogen activator] is to be administered," she adds.

• If oxygen is needed, hook the nasal cannula directly to the portable tank and not to the gasses on the head wall.

"Oxygen is needed if a patient's room air oxygen saturation level is less than 92%," says McIntyre.

• Place alteplase in the room, and bring it to the CT scanner.

"This reduces valuable time once the decision has been made to administer tPA," says McIntyre. "Every second counts. With every second, brain cells become damaged and die."

• Expedite transport to the CT scanner.

Lauren Brandt, RN, MSN, CNRN, clinical director of the Neurosciences, Brain & Spine Center at Brackenridge Hospital in Austin, TX, says, "Acting as a patient advocate and getting them to the CT scanner timely is very important. Without that vital piece of information, treatment can be delayed."

• Place an 18-gauge IV in the patient's right antecubital vein, regardless of which side the patient has symptoms.

McIntyre says, "Placing an IV in the right arm promotes IV dye to travel to the brain; whereas, if the IV is placed in the left arm, the heart takes up the dye first. Thus, less dye gets to the brain."

• While one nurse is placing an IV in the right arm, have a second nurse on the patient's left side obtaining a finger stick to check the patient's glucose level.

"Hypoglycemia can mimic a stroke, while hyperglycemia may be a contraindication for administering tPA," says McIntyre. Labs should be sent immediately,

she says. "A known creatinine value is helpful in determining whether or not to go ahead with a CT angiography," McIntyre says.

• Do not give patients with stroke symptoms anything by mouth until a swallowing screen is performed and passed.

All medications should be given IV or rectally; ask physicians to rewrite any order that is to be given orally, says McIntyre.

• If possible, give the electrocardiogram (ECG) after the patient has had the CT scan and tPA has been administered.

"It is not absolutely necessary to get an ECG prior to the CT *unless* a patient is having acute coronary syndrome symptoms that should be immediately assessed," says McIntyre. "If a patient is complaining of chest pain, jaw pain, left arm pain, or shortness of breath, the ECG should be done before the patient goes to CT. If the patient does not have cardiac symptoms, CT should not be delayed to obtain an ECG."

• If a patient arrives with symptoms of a stroke and has a fever, administer an antipyretic.

"Each degree of Celsius elevation doubles the risk of poor outcome," says McIntyre.[1]

Reference

1. Badjatia N. Therapeutic temperature modulation in neurocritical care. *Curr Neurology Neuroscience Rep* 2006; 6:509-517. ■

Do this to prepare if your patient might get tPA

If your patient is a possible candidate for tissue plasminogen activator (tPA), past medical/surgical history, allergies, and medications need to be reviewed, says **Joyce McIntyre**, RN, MSN, clinical nurse specialist for the ED at Massachusetts General Hospital in Boston.

"Nurses should document the time of the last dose of warfarin or aspirin and communicate that information to the physician," says McIntyre.

Document the patient's weight; mental status; neurological exam; interventions as they are provided; communications with the medical team, patient, family, and witnesses; time of symptom onset; and the time tPA is initiated, says **Stacey Claus**, RN, BSN, CNRN, clinical instructor for the Department of Nursing at Cleveland Clinic. "If the patient does not receive tPA and PO orders are written, then the nurse would need to perform and document a swallowing screen prior to giving anything PO," she says.

Your documentation should include frequent vital signs and neurological checks, as well as interventions such as decreased tactile stimulation, head of bed elevation, and seizure precautions, says **Tia Moore**, RN, CEN, clinical nurse educator for the ED at University of California — San Diego Medical Center.

Learn onset time

Most often, patients are not treated because the time of symptom onset is unknown, says **Dawn K. Beland**, RN, MSN, CCRN, CS, CNRN, stroke center coordinator at The Stroke Center at Hartford Hospital (CT).

"The patient may have woken with symptoms or been found with changes without a known time they were last seen well," she says.

Statements such as "the symptoms started about an hour ago" are less helpful than "the symptoms started at 10 a.m.," says Beland.

"Eliciting this information from EMS or the family can be difficult for the triage nurse, and the story can change as new people are contacted," says Beland. "Once the timeline is clear, we know whether or not the patient will be eligible for treatment."

If the timeline is solid, and the patient is presenting within three hours, the most frequent reason patients are not treated usually is related to hypertension, says Beland. "Uncontrolled hypertension puts the patient at risk for intracerebral hemorrhage or hemorrhagic transformation after tPA is given," says Beland.

If the patient's blood pressure cannot be controlled with labetalol or intravenous nicardipine hydrochloride, the patient should not be given IV tPA, warns Beland. "We use a very concise checklist that covers all of the inclusion/exclusion criteria, including the CT exclusions, that the nurse can pull and start checking off, even before the CT scan is done," says **Lauren Brandt**, RN, MSN, CNRN, clinical director of the Neurosciences, Brain & Spine Center at Brackenridge Hospital in Austin, TX. **(See the ED's checklist with standing orders for thrombolytics on p. 29.)**

Take these steps before giving tPA, says McIntyre:

• Repeat vital signs to be sure the systolic blood pressure is less than 185 and the diastolic blood pressure is less than 110.

• Check lab values for these contraindications: Platelets less than 100,000, partial thromboplastin time greater than 40 seconds after heparin use, prothrombin time greater than 15, or international normalized ratio greater than 1.7.

• Assess the patency of the IV, and closely monitor the IV site while tPA is infusing.

• Do not perform any invasive procedure for 24

Continued on page 30

Stroke Standing Orders: Checklist for TPA (Alteplase) for Acute Ischemic Stroke

INCLUSION CRITERIA	YES	NO	RN or MD INITIALS	COMMENTS
Age 18 or older				
Clinical diagnosis of ischemic stroke causing a measurable neurological deficit.				
Time of onset of symptoms well established to be less than 180 minutes before treatment would begin.				

EXCLUSION CRITERIA				
Major symptoms that are rapidly improving by the time of treatment.				
Evidence of intracranial hemorrhage on CT scan.				
Hypodensity or mass effect suggestive of evolving infarction on CT scan.				
Seizure at onset of stroke unless determined by physician to be separate event				
Clinical presentation of Subarachnoid Hemorrhage, even if initial CT is negative.				
On repeated measurement, SBP is greater than 185, or DBP is greater than 110 at the time treatment is to begin.				
Requires overly aggressive treatment to reduce BP.				
Blood glucose is less than (<) 50 or greater than (>) 400.				
Platelet count of less than (<) 100,000.				
Patient is currently taking oral anticoagulants and PT is greater than (>) 15, INR greater than (>) 1.5				
Patient has received heparin within 48 hours and has an elevated PTT.				
Serious head trauma in the previous three months.				
Major surgery or serious trauma in the previous 14 days.				
History of stroke in the previous three months.				
History of an intracranial hemorrhage.				
Patient is known or suspected to be pregnant.				
CAUTIOUS USE				
Patient is currently taking oral anti-platelet drugs.				
History of GI/GU hemorrhage in previous 21 days.				
Recent arterial puncture at a non-compressible site.				
Lumbar puncture in the previous 7 days.				
Clinical presentation consistent with acute myocardial infarction.				
Clinical presentation consistent with post-myocardial pericarditis.				

Source: Brackenridge Hospital, Austin, TX.

hours once tPA is given.

• Do not place urinary catheters, nasogastric tubes, or IVs unless absolutely necessary.

"If there is any lag time at all, such as waiting for a CT scanner to open or waiting for CT results, a second IV or Foley catheter could be placed after checking with the physician," says McIntyre. ■

ED's protocol covers all heparin recommendations

Smaller ED is very proactive

Anticoagulant safety is in the spotlight. A recent *Sentinel Event Alert* issued by The Joint Commission says that 59,316 medication errors involving blood thinners were reported between 2001 and 2006 to a database run by U.S. Pharmacopoeia, a nonprofit public health organization that supports research and development of patient safety initiatives. Of those, about 1,700 resulted in patient harm or death.

"We have addressed many of The Joint Commission's points with our standardized heparin infusion protocol," says **Christine Snow**, RN, BSN, director of emergency services at Lodi Community Hospital in Akron, OH. Snow's ED's protocol includes:

• an order to discontinue enoxaparin and not to administer it while the patient is on heparin;

• instructions to wait an additional six hours for routine laboratory tests after any changes to the infusion rate. "Saline, not heparin, is used to flush the intermittent infusion devices," says Snow;

• use of a standardized concentration throughout the hospital. Nurses do not mix heparin;

• a requirement for two nurses to sign off on the order, be at the bedside to identify the patient, and program the intravenous pump;

• a "notify physician" section listing specific adverse effects from heparin;

• an order sheet with separate sections for "acute MI + thrombolytics" and "other thromboembolic syndromes." "This is of particular interest to the nursing and physician staff. It has proven to be very readable, and easy to interpret the orders," says Snow;

• a heparin infusion nomogram at the bottom of the order sheet. "This aids everyone in understanding quickly and clearly what the weight-based dosage should be and when the next lab test should be completed," she says.

ED nurses were educated in two parts: a general inservice on anticoagulants covering all The Joint Commission recommendations, and a separate inservice on the ED's new heparin order sheet. **(See related story on three ways to avoid errors involving anticoagulants, p. 31.)**

Snow says her small community ED was very proactive in responding to the alert's recommendations. "It is much easier for the smaller hospitals to bring the parties together, do the evidence-based research, educate the clinicians, and make the changes that impact patient lives," she adds. ■

EXECUTIVE SUMMARY

Prevent heparin errors by having two nurses identify the patient and program the intravenous pump, using standardized concentrations, and waiting six hours for routine laboratory tests after changes to the infusion rate. Your protocol should include:

- A list of adverse effects to notify the ED physician about.
- Separate sections for acute myocardial infarction and other thromboembolic syndromes.
- A heparin infusion nomogram to clarify weight-based dosages.

SOURCES/RESOURCE

For more information on prevention of anticoagulant drug errors, contact:

- **Wendi Deleon**, RN, MS, Assistant Chief Nursing Officer, Northeast Baptist Hospital, San Antonio. E-mail: wxdeleon@baptisthealthsystem.com.
- **Betsy Lee**, RN, MSPH, Director, Indiana Patient Safety Center, Indianapolis. Phone: (317) 423-7795. E-mail: blee@ihaconnect.org.
- **Christine Snow**, RN, BSN, Director of Emergency Services, Lodi Hospital. Phone: (330) 948-3643. Fax: (330) 948-0053. E-mail: csnow@lodihospital.com.

A free, self-assessment tool called *Reducing Anticoagulant Toolkit: Reducing Adverse Drug Events and Potential Adverse Drug Events with Unfractionated Heparin, Low Molecular Weight Heparins and Warfarin* is available at www.indianapatientsafety.org. Select "Links & Resources." On the right side of the page, select "Anticoagulant toolkit PDF."

3 ways to avoid anticoagulant errors

At Northeast Baptist Hospital in San Antonio, ED nurses are given training to prevent anticoagulant errors during orientation and during advanced certification training, says **Wendi Deleon**, RN, MS, assistant chief nursing officer and former director of the ED. Here are three ways to avoid problems:

• **Do a double-check.**

"In the ED, we primarily give heparin [intravenously] IV," Deleon says. "Prior to administration, it must be double-checked by two nurses to ensure the correct dose, correct medication, and correct patient."

When heparin is taken out of the medication dispensing machine, a red alert sign pops on to the screen that states "double-check dose" to flag the above process, she reports.

• **Monitor patients closely.**

When it comes to anticoagulants, the biggest risk for ED nurses is "fear of the unknown," says Deleon. "Just like with every ED patient and every medication, you never know when a patient will act unfavorably post administration," she says. "We take every precaution to prevent this from occurring, but sometimes patients bleed from anticoagulants. Unfortunately, even though they aren't identified as having any risks, it can still occur."

• **Get a good medication history.**

One potential risk in the ED involves medication reconciliation, says **Betsy Lee**, RN, MSPH, director of the Indiana Patient Safety Center in Indianapolis. "For example, if the patient is taking warfarin and no one obtains a good medication history, the patient may be at risk for bleeding complications if heparin or other anticoagulants are given without appropriate history or lab tests." ■

Study finds unacceptable delays in ED pain meds

If you would like to use standing orders for pain management in your ED, a new study's findings give you powerful evidence to share.

For patients 8 years or older who presented to the ED with moderate to severe pain, researchers compared four triage systems to see how quickly analgesics were given. They found that all of them, including the Emergency Severity Index (ESI), demonstrated unacceptably long times to administration of pain medications. Also, many patients received no analgesic at all during their ED stay.[1]

"We recommend exploration of nurse-initiated, standing analgesic orders to help improve the proportion of patients that get analgesics and the time to initial analgesics," says **Paula Tanabe**, PhD, RN, MPH, one of the study's authors and research assistant professor in the Department of Emergency Medicine at Northwestern University in Chicago. **(See clinical tip for administering pain medication, below.)**

There are no data on the number of EDs that use nurse-initiated standing analgesic orders, says Tanabe. "But the number is very small, and I would not say it is growing. In fact, it may be shrinking due to some places removing standing orders due to the medication safety concerns. If there are standing orders, most are for acetaminophen and ibuprofen."

Reference

1. Ducharme J, Tanabe P, Homel P, et al. The influence of triage systems and triage scores on timeliness of ED analgesic administration. *Am J Emerg Med* 2008; 26:867-873. ■

Clinical Tips

Don't put patient in sudden withdrawal

An ED physician prescribes nalbuphine or butorphanol for pain, thinking that the patient might have less severe drowsiness than from other pain medications, but doesn't check to see if the patient is chronically on a narcotic for pain control. This scenario is dangerous, according to **Joan Somes**, PhD, MSN, RN, CEN, FAEN, ED educator at St. Joseph's Hospital in St. Paul, MN.

"It is easy to put a patient into sudden withdrawal with these agonist/antagonist medications, as we reverse their 'normal' pain control," says Somes.

Somes has seen geriatric patients put into sudden severe and acute withdrawal when an ED nurse gave full dose of naloxone, thinking the patient was sleepy from a previously administered narcotic. "In fact, that nurse just added to the narcotic that the patient takes on a routine basis," says Somes. "Even though the

patient is sleepy, the dose of the naloxone needed to be titrated to effect. I have seen a patient become so tachycardic and hypertensive from a nurse-caused withdrawal that the patient was unable to meet his oxygenation needs and required intubation to maintain adequate ventilations."

At St. Joseph's, ED nurses mix 0.4 mg naloxone in 9 cc saline and administer 1 cc at a time until the patient wakes up, notes Somes. She adds that many older ED patients are taking acetaminophen and oxycodone, propoxyphene napsylate and acetaminophen, oxycodone, morphine sulfate, and fentanyl patches for pain. "We really need to be aware of what they are taking so as not to reverse, or add to, the sedation." ■

CMS says yes, ED nurses can use standing orders

Patients could have been harmed

Were you concerned that your ability to use standing orders at triage was in jeopardy? A February 2008 interpretive guideline from the Centers for Medicare & Medicaid Services (CMS) alarmed emergency nurses by requiring patient-specific practitioner approval for standing orders prior to treatment.

However, an October 2008 clarification says that standing orders can be signed later by a physician. The memo states: "The use of standing orders must be documented as an order in the patient's medical record and signed by the practitioner responsible for the care of the patient, but the timing of such documentation should not be a barrier to effective emergency response, timely and necessary care, or other patient safety advances." *(Editor's note: To see the complete letter, go to www.cms.hhs.gov/SurveyCertificationGenInfo/downloads/SCLetter09-10.pdf.)*

"We are excited that CMS has changed their stance on this issue," says **Donna Mason**, RN, MS, CEN, immediate past president of the Emergency Nurses Association (ENA) and senior nurse consultant with Orlando, FL-based Blue Jay Consulting, specializing in ED processes. Mason is former nurse manager of adult emergency services at Vanderbilt University Medical Center in Nashville, TN.

Many ED nurses were worried that they would have to stop using standing orders for pain medications, acetaminophen for children with fever, or aspirin for myocardial infarction patients, says Mason. "Early intervention is evidence-based. Aspirin is in the core measures for acute MI," she says. "Emergency nurses are in constant contact with physician colleagues, which is different from other areas in the hospital setting. We have those resources readily available to us."

Without the use of standing orders, there would be "needless pain and suffering" by patients, says Mason. "We want patients cared for in an efficient and timely manner with the best outcomes," she says. "We do not want to delay any treatment which could result in patients having further damage or suffering. Regulatory bodies sometimes forget patients come first."

ENA president **Denise King**, RN, MSN, CEN, says that before this clarification, ED nurses were "put in a difficult position. Without the ability to utilize standing orders, patients would be subject to delays in treatment," she says. **(See story on how patients benefit from standing orders used by ED nurses, below.)**

The CMS clarification came at a time when many EDs are struggling with overcrowding, notes **Gayle Walker-Cillo**, RN, MSN/Ed, CEN, an ED clinician at Morristown (NJ) Memorial Hospital. "The confusion over the regulations could have put nurses or patients at risk," she says. "Emergency nurses should not be in the situation of being concerned about initiating care without a physician order in a critical situation or have their hands tied when they assess a patient is in trouble." ■

EXECUTIVE SUMMARY

Standing orders used by emergency nurses are allowed, according to a memo from the Centers for Medicare & Medicaid Services that clarified a previous interpretation that put this practice into question.

- Orders can be signed by the ED physician later.
- Standing orders ensure that care is not delayed.
- Nurses can give medications such as aspirin to myocardial infarction patients.

ED nurses say care is quicker and safer

Orders at triage standardize care

Standing orders used by emergency nurses not only speeds patient care; it also "adds a measure of safety in that they are standardized," says **Gayle Walker-Cillo**, RN, MSN/Ed, CEN, an ED clinician at Morristown (NJ) Memorial Hospital.

Morristown Memorial's emergency nurses use

standing orders that are complaint-specific, developed by ED physicians. "We took the top patient complaints presenting to our ED and identified the first level of interventions," says Walker-Cillo.

These are: patients over 21 years old with asthma, patients over 21 years old with abdominal pain, chest pain patients over 40 years old, patients with fever over 65 years old, patients with syncope over 40 years old, flank pain, stroke, pediatric diabetic ketoacidosis, children with cyclic vomiting, and children with fever.

For example, if a patient reports to the triage nurse that they are having chest pain, these steps occur:

• A 12-lead electrocardiogram (EKG) is done at triage to rapidly identify patients who are having an ST-segment elevation myocardial infarction.

• The EKG is reviewed by the attending physician.

• While the physician is reviewing the EKG, the nurse independently places an intravenous line and initiates lab work, continuous cardiac monitoring, and oxygen.

"These initial interventions prepare the patient for rapid medication administration and facilitation to the cath lab," says Walker-Cillo. "The process allows the patients to receive complex and comprehensive care, vs. a linear and more time-consuming process. This is imperative when time is muscle."

At Wake Forest University Baptist Medical Center in Winston-Salem, NC, ED nurses use standing orders for extremity X-rays with isolated injuries, and urinalysis and urine pregnancy tests for females with abdominal pain.

"The volume of ED patients continues to rise. Expeditiously moving them through our department is essential," says **Michelle Collins**, BSN, RN, unit manager of the ED.

Performing diagnostic tests at triage decreases length of stay when no bed is available for a patient with a foot injury or abdominal pain, she says. "Many times once a treatment space is opened for one of these patients, the physician already has the X-ray or initial lab report. This expedites the patient's diagnosis, treatment and disposition," says Collins.

At University of California — Irvine, ED nurses are trained to initiate clinical pathways beginning at triage for chief complaints of chest pain, stroke, abdominal pain, shortness of breath, and vaginal bleeding. "They can also initiate blood work and radiological exams which are protocol-driven," says **Sarah Landrum**, RN, a clinical nurse II. "These actions not only expedite the care of the patient; they also reduce the length of time in the emergency department." ■

New noninvasive test can ID internal bleeding in ED

If your patient is bleeding internally, you can know this in seconds instead of waiting for blood test results to come back by using a new noninvasive test for hemoglobin, developed by Irvine, CA-based Masimo.

Several ED nurses at the University of California San Francisco Medical Center were given "super-user" training on this new needle-free hemoglobin test, SpHb, and then trained the rest of the ED nurses.

"I also developed several posters to educate nurses on the new devices," says **Andrew Maruoka**, RN, MS, assistant manager of the ED. "There are a few minor differences in the operation of the equipment, but it really is as simple as a traditional pulse oximetry monitor. This technology simply requires slipping a sensor on a patient's finger and reading the result."

ED nurses already are using Masimo's Radical-57 Pulse CO-Oximeters, and they will begin using the noninvasive hemoglobin function shortly. "In the ED, noninvasive hemoglobin is a welcome addition that I anticipate will play a great role in our assessment and triage efforts," says Maruoka.

Having immediate, continuous access to hemoglobin levels will allow nurses to detect and treat internal bleeding faster, says Maruoka. Until now, ED nurses have never had the ability to monitor hemoglobin levels in real time. "We can continuously trend a physiologic parameter we normally only assess by spot checks," Maruoka says. "With the ability to see a patient becoming more anemic in real time, we can better anticipate resuscitative measures such as blood transfusions."

ED nurses will be able to make an immediate diagnosis of chronic anemia and more quickly identify patients with active bleeding from gastrointestinal bleeding, aneurysm, or trauma, as well as those who present with

RESOURCE

Masimo's noninvasive and continuous total hemoglobin monitoring (SpHb) can help clinicians quickly detect chronic or acute anemia, identify occult bleeding earlier, and more effectively manage blood transfusions. The test will be commercially available in the first half of 2009. The single device list price ranges from $5,000 to $10,000, based on features and quantity. For more information, contact:

- **Masimo Corp.**, Irvine, CA. Telephone: (800) 257-3810 or (949) 297-7000. E-mail: info@masimo.com. Web: www.masimo.com.

anemia secondary to cancer. "These patients will benefit from immediate real-time detection, intervention and treatment, potentially leading to better outcomes and recoveries," Maruoka says. **(See story on four types of patients who can benefit from this test, below.)**

There also is increased safety for ED nurses, since the hemoglobin test is noninvasive, says **John Viljoen**, MD, clinical professor of anesthesiology at Loma Linda (CA) University School of Medicine. "I expect that ED nurses will be hearing and seeing much more about this in the near future," he says. "Given its potential to create clinical efficiencies, decrease patient wait times, and increase patient throughput in the ED, it represents a valuable and compelling alternative to waiting for lab results." ■

These patients can benefit from ED hemoglobin test

Here are three scenarios in which noninvasive hemoglobin measurements could affect an ED patient's care:

• Acute trauma situations, such as motor vehicle accidents, gunshot wounds, and knife wounds.

When internal bleeding isn't obvious, having an immediate noninvasive hemoglobin measurement available can be life-saving, according to **John Viljoen**, MD, clinical professor of anesthesiology at Loma Linda (CA) University School of Medicine. "Drawing a blood sample, sending it off to the lab, and receiving the result takes time, which is precious in these situations," he says.

Also, on-the-spot hemoglobin levels can help you determine whether a blood transfusion is needed. "If the level is not critically low, all that may be needed is an infusion of crystalloids/colloids. This can eliminate the need to transfuse blood, which is costly and always carries a risk," Viljoen says.

Also, the ED nurse can track the patient's response to the treatment without the need for repeated drawing of blood samples, he adds.

• When a patient presents with a previous history of chronic bleeding that is not apparent, due to a peptic ulcer, or a genitourinary or colon problem.

"Having an immediate measurement saves the time and expense associated with lab testing to confirm the diagnosis," Viljoen says.

• When anemia has to be ruled out.

Because the signs and symptoms of anemia can mimic other conditions such as the flu or the common cold, hemoglobin levels can be measured quickly and easily to readily rule out anemia, he says.

• When you need to determine if a chemotherapy patient has developed anemia.

When cancer patients present to the ED, hemoglobin levels can be measured within seconds to rapidly determine their anemic status without drawing blood, Viljoen says.

Learning a patient's hemoglobin level in the ED can lead to discovering a potentially life-threatening condition that would otherwise go undiscovered. He says his own esophageal cancer was caught early as a result of a random hemoglobin measurement. At the time, he exhibited none of the signs or symptoms of cancer and had no outward appearance of anemia.

"Nonetheless, I received a low measurement of 10.6 g/dl, which was confirmed by lab blood testing. This signaled anemia and prompted additional medical testing, which revealed esophageal cancer as the cause," says Viljoen. "It has been 18 months since I underwent surgery to remove the cancer, and I've had no evidence of recurrence." ■

ED makes big changes to med reconciliation process

At Beth Israel Deaconess Medical Center in Boston, ED nurses "made some huge changes" to their medication reconciliation process, reports **Shelley Calder**, RN, CEN, MSN, clinical nurse specialist for the ED.

"Before, we really were not successful with this. We were in the 50th percentile at the time, and we are 98% complaint now," she says.

The ED's former process was done on paper, but an electronic form is now used, which ED nurses complete for each patient. **(For more information on the medication reconciliation module, developed by Beth Israel and Waltham, MA-based Forerun, see resource box, p. 35.)**

"It pulls information from the patient's previous visits, so the nurse doesn't have to recreate the list every time," says Calder.

Nurses can pull up the patient's medication list, but they still go through the list with the patient to check it for accuracy. "If it's a new patient, we have to gather the entire list. But the system has a library of medications. If you type in first few letters of the drug's name, it will pop up and give the doses," she explains.

The ED physician also reviews the list with the patient, and there is an electronic page for them to enter "continue," "stop," or "add" for each medication.

"Previously, ED nurses were doing everything," says Calder. "They were collecting the list, and then based

RESOURCE

A medication reconciliation module is available as an integral part of Forerun ED, a comprehensive clinical workflow management system. The system is available commercially on a "pay-as-you-go" basis with no upfront licensing fee. For more information, contact:

- **Jeff Scott, Forerun**, Waltham, MA. Phone: (781) 250-0693. E-mail: jscott@forerunsystems.com.

on the physician's discharge instructions, they were writing on our paper record 'continue,' 'change,' or 'stop.' They were also responsible for adding any new medications to the list and giving that to the patient."

Now, the ED nurse collects the list at triage, and the ED physician takes over from there. Later, the nurse prints the medication reconciliation sheet with the patient's discharge instructions. "This [electronic system] has made us compliant with 'do not use' abbreviations as well," she reports. ■

What ED nurses can expect from Obama

Although it's impossible to know what an Obama administration means for emergency nurses, there is reason to be encouraged, according to **Denise King**, RN, MSN, CEN, president of the Emergency Nurses Association (ENA).

"There appears to be a strong commitment by the Obama campaign to address the fundamental issues facing health care delivery in the U.S.," King says.

ENA would like steps taken to provide all individuals with equitable access to comprehensive health care services, including mental disorders, alcohol and substance abuse, and addictions, she says.

"Everyone in the nation should have access to a health home for basic care, health promotion, and nonurgent medical needs. Proposals for health care reform should remove those factors that impede individuals from attaining the necessary quality care to which all persons are entitled," says King, noting that emergency services and trauma care have reached a crisis mainly due to overcrowding and boarding, lack of health care providers, and the burden of uncompensated care.

"But until the Obama administration is up and running, it is difficult to determine whether or not these issues can and will be addressed," she says.

King hopes that ED nurses will see electronic medical records implemented more rapidly in their institutions. "Standardized electronic medical information not only will improve quality, but will make the delivery of emergency services more efficient," she says.

King says another hope is that President-elect Obama will recognize and address the growing need for nurses, by pushing for the following:

- increased funding for the Nursing Workforce Development Programs under Title VIII of the Public Health Services Act, at a level to meet current and future health care needs.
- increased nurse faculty scholarship funding, to develop the next generation of educators and midlevel practitioners, and increased scholarship funding for entry into practice;
- maximized education funding for health care professionals who commit to practice in underserved areas;
- funding for health care worker education to deliver "culturally proficient" care. ■

CNE instructions

Nurses participate in this continuing education program by reading the issue, using the provided references for further research, and studying the questions at the end of the issue.

Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material.

After completing this semester's activity with the **June** issue, you must complete the evaluation form provided in that issue and return it in the reply envelope provided in order to receive a certificate of completion. When your evaluation is received, a certificate will be mailed to you. ■

COMING IN FUTURE MONTHS

- ■ Foolproof ways to keep elderly safe during long waits
- ■ Prevent catastrophes with admitted patients being held
- ■ Proven method to ID abnormal vital signs more quickly
- ■ Dramatically cut delays at triage for your sickest patients

CNE *objectives/questions*

Participants who complete this activity will be able to:

- **identify** clinical, regulatory, or social issues relating to ED nursing;
- **describe** how those issues affect nursing service delivery;
- **integrate** practical solutions to problems and information into the ED nurse's daily practices, according to advice from nationally recognized experts.

1. What does a *New England Journal of Medicine* study say regarding treatment of stroke patients treated with thrombolytics at three to 4½ hours after symptom onset?

A. These patients had higher death rates than a group given a placebo.
B. More patients treated had favorable outcomes.
C. Fewer patients treated with had favorable outcomes.
D. The vast majority of patients treated had adverse outcomes.

2. Which is recommended for stroke patients, in light of the above study's findings?

A. An evaluation of CT perfusion for patients presenting between the three- and 4½-hour time window.
B. Taking a "wait-and-see" approach to widen the treatment window, even for a few minutes beyond the three-hour time frame.
C. Acting with less urgency in getting patients to CT scan.
D. Giving fewer stroke patients thrombolytics to avoid adverse outcomes.

3. Which is part of the protocol for administration of heparin at Lodi Community Hospital?

A. Instructions for administering enoxaparin while the patient is on heparin.
B. Directions to give routine laboratory tests immediately after changes to the infusion rate.
C. Instructions for emergency nurses to mix heparin.
D. A process with two nurses at the bedside to identify the patient and program the intravenous pump.

4. Which is recommended for administration of pain medications to avoid sudden withdrawal?

A. Giving nalbuphine without checking to see if the patient is chronically on a narcotic for pain control.
B. Giving a full dose of naloxone to a patient who appears drowsy.
C. Always titrating the dose of naloxone to effect.
D. Giving butorphanol to prevent drowsiness even if the patient already is taking a narcotic.

Answers: 1. B; 2. A; 3. D; 4. C.

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