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Anticoagulant errors could kill your next ED patient: Make changes now

Dosage errors, inappropriate use are common nursing mistakes

A patient came to an ED with unstable angina and chest pain and was given aspirin, Plavix (clopidogrel bisulfate), and Fragmin (dalteparin). An hour later the patient received Retavase (reteplase), and a heparin infusion was started based on a protocol for treatment of acute myocardial infarction, but the patient's previous dose of Fragmin was overlooked. The patient hemorrhaged and later died.

This is an actual report received by the Institute for Safe Medication Practices. "In order to prevent these types of oversights, ED staff need to review the medications already given to the patient before administering additional anticoagulants," says **Matthew P. Fricker Jr., MS, RPh**, program director. (**See related story on actual errors made involving anticoagulants in the ED, p. 135.**)

In other tragic cases, patients have been given enoxaparin in the ED and, after admission, a heparin infusion was started too soon after the enoxaparin, which resulted in cerebral bleeding and death. The problem is the interval between the two drugs, he explains. The inpatient pharmacist often is not aware of the drugs that were administered in the ED prior to admission, he says. "We have had a number of reports of this happening with deaths," says Fricker. "The

EXECUTIVE SUMMARY

When administering anticoagulant therapy, if you overdose, underdose, or fail to recognize signs and symptoms of bleeding, your patient can be seriously harmed or killed. Reducing the likelihood of patient harm involving anticoagulant therapy is one of the new National Patient Safety Goals for 2008. To reduce risks:

- Use only standardized premixed anticoagulants.
- Have at least two nurses independently calculate dosages before administration.
- Reassess the patient frequently.
- Give exact dosages for specific weights and diagnoses in ED protocols.

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sad part is, the patient received good care in the ED and after being admitted, but the timing was too close together."

You will need to take a close look at your ED's practices involving anticoagulants, since reducing the likelihood of patient harm associated with these medications is a new 2008 National Patient Safety Goal from The Joint Commission.

Bleeding is a major risk, says **Marjorie Van Riper**, BSN, RN, CEN, NREMT-P, clinical educator for the ED at The Nebraska Medical Center in Omaha. "Individuals vary widely in their response to heparin," she says. You must be able to recognize signs and symptoms related to these medications, Van Riper says. (**See list of signs and symptoms, p. 136.**) "Not all of these signs and symptoms are obvious — especially if the patient is a poor historian or if they arrive from an institution where their history is not as detailed as we

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Editorial Questions

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would desire," adds Van Riper.

If a trauma patient is bleeding, you need to determine whether the cause is the injury or the patient's anticoagulant medications, says Van Riper. For example, a patient might come to the ED bleeding, presumably from a fall injury, but the patient has been missing his or her doses and then trying to "make up" for the missed doses by taking more than his or her prescribed amount, she explains. "Concomitant use of glycoprotein IIb/IIIa inhibitors, thrombolytics, Coumadin [warfarin], and nonsteroidal anti-inflammatory drugs will increase the risk of bleeding," adds Van Riper.

To reduce risks of anticoagulants, do the following:

- **Have separate protocols for cardiac and neurological conditions.**

At Nebraska Medical Center, different heparin protocols are used for coronary thrombosis syndromes and venous or arterial thromboembolism, says Van Riper. Extensive training on anticoagulants was given to ED nurses, with an online teaching module developed by the hospital's pharmacy department, she says. "Failure to be familiar with your ED's policies and procedures may have detrimental effects on the patient," Van Riper warns.

If your ED uses one anticoagulant for stroke patients and another one for myocardial infarction patients, these drugs need to be segregated, says Fricker. "You can easily pull out the wrong one for the disease state you are treating," he explains.

- **Do independent double-checks.**

"If you are going to hang an infusion, there is always a chance for mix-ups between the rate and the dose.

SOURCES

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People will transpose one for the other," says Fricker. For example, the patient's dose may be 1,000 units per hour, which may require an administration rate of 10 mL per hour, but the nurse programs 1,000 mL per hour into the pump instead of 10 mL per hour, resulting in a massive overdose, he says.

Look-alike drugs or containers may be confused, such as prefilled syringes of heparin flush, heparin 5,000 units, or saline flush; all of these have green caps, says Fricker. "There have been reports of these getting mixed up, with somebody giving heparin for saline or vice versa," he says.

At Indian River Medical Center in Vero Beach, FL, only standardized premixed anticoagulants are used to prevent any mixture errors, says **Cindy Vanek**, RN, MS, director of emergency services. "We require at least two competent staff members to calculate the appropriate dosage for the patient prior to administration," she says. "Two nurses calculate the dose to ensure that it is correct. An over- or underdose can have devastating effects."

- **Question unclear or inappropriate orders.**

An example of an unclear order is "administer heparin 60 units/kg and start an infusion per protocol," says Van Riper.

"You will need to clarify which protocol is to be used — either coronary thrombosis syndromes or treatment of venous or arterial embolism," says Van Riper. "The nurse will also have to know the patient's admission weight and lab values such as PTT [partial thromboplastin time]."

- **Follow protocols to the letter.**

"The most dangerous thing an ED nurse can do is to not follow the established protocol," says Vanek. "Any error in this process could seriously jeopardize a patient." **[Editor's note: A copy of the ED's weight-based heparin protocol is available with the online version of ED Nursing. If you're accessing your online account for the first time, go to www.ahcpub.com. Click on the "Activate Your Subscription" tab in the left-hand column. Then follow the easy steps under "Account Activation." If you already have an online subscription, go to www.ahcpub.com. Select the tab labeled "Subscriber Direct Connect to Online Newsletters. Please select an archive." Choose "ED Nursing," and then click "Sign on" from the left-hand column to log in. Once you're signed in, select "2007" and then select the October 2007 issue. For assistance, call Customer Service at (800) 688-2421.]**

Dangerous errors include failing to calculate the correct dosage according to weight, failing to double-check the dosage, or failing to reassess the patient frequently, says Vanek.

Your protocol should spell out exact dosages for

specific weights and diagnoses, such as acute myocardial infarction or coronary artery disease, and also address the various anticoagulants used in your ED, says Vanek. "It must address the reassessment times for PTT/INR [international normalized ratio], and guidelines for adjustment according to the results," she says. "Each nurse competencies in the administration of anticoagulants must be secure in his or her knowledge of the medication and the protocol."

- **Reconcile the patient's medications.**

At Indian River's ED, every patient has a medication reconciliation done by a physician prior to an order for anticoagulation being given, says Vanek. If the patient already is taking anticoagulants, blood tests and doses are adjusted accordingly to make sure the treatment is safe as well as effective, she explains. "Also, other drugs can interact with heparin, as can certain vitamins, especially vitamin K," says Vanek. "So the information gathered must include prescribed medications, over-the-counter medications, vitamins, and herbs." ■

Learn from actual ED anticoagulant mistakes

There were 2,070 errors involving use of anticoagulants in EDs from August 1998 through 2006 reported to the United States Pharmacopeia's database. Of these, 88 harmed patients. Here are some of the actual mistakes that were made by ED nurses:

- **Use of incorrect protocol.**

Instead of a neurological protocol, ED nurses used the cardiovascular protocol, which resulted in the patient being given an incorrect dosage. In this case, the patient had a stroke and was permanently harmed,

EXECUTIVE SUMMARY

Mistakes involving anticoagulants in the ED include incorrect protocols used, tenfold overdoses due to programming errors, wrongly assuming medication from an automated dispensing machine is correct, and incorrect timing of lab values. To avoid these errors:

- Have two nurses sign the infusion record.
- Require nurses to record the patient's international normalized ratio before administering anticoagulants.
- Clearly document when the next lab draw is due.

Signs/Symptoms of Overanticoagulation

- Allergic reaction
- Bleeding from the gums or nose
- Bruising easily
- Coughing up blood
- Decrease in urine output
- Difficulty breathing or swallowing
- Dizziness or lightheadedness
- Fever
- Chills
- Sore throat
- Cough
- Bleeding from cuts or wounds that does not stop
- Purple discoloration of toes or the soles of the feet
- Red or dark-brown urine
- Red or black stools
- Swelling in hands, ankles, or feet
- Vomiting of blood or material that looks like coffee grounds.

Source: Marjorie Van Riper, BSN, RN, CEN, NREMT-P, ED Clinical Educator, The Nebraska Medical Center, Omaha.

says **Rodney Hicks**, PhD, ARNP, manager of patient safety research at U.S. Pharmacopeia.

• Tenfold overdoses.

In one case, a patient was supposed to be given 1,000 units per hour, but the ED nurse programmed the device to give 10,000 units per hour, which caused extensive bleeding. To prevent these errors, have two nurses sign the infusion record, recommends Hicks. "When two nurses have their names on it, they tend to take it a little more seriously," he says. "Make sure your form contains enough space for the signatures of the nurses who verified the doses and who verified the pumps."

Never assume that just because you took medication from an automated dispensing machine that the drug and dosage are correct, says Hicks. "Even though it says, 'Open Door 2 and take out Bin No. 4,' you cannot trust that it was filled correctly," he says. "You still have to read the label."

In the ED at Mary Immaculate Hospital in Newport News, VA, all drug-dispensing machines have a question prior to dispensing warfarin that requests an input of the patient's international normalized ratio (INR), says **Valerie Sommer**, RN, BSN, nurse manager of the ED. "By making the nurse input the INR, it reminds them that they need to know what it is prior to giving the [warfarin]," she says. "This keeps nurses from blindly giving [warfarin] just because the physician ordered it." For example, the ED nurse may realize that the patient's INR

is already 3.7, which is too high, says Sommer. "She then questions the physician regarding the order, saving the patient from receiving more warfarin, which could cause them to bleed even more easily," she says.

• Concurrent therapy.

One ED physician ordered heparin and another ordered enoxaparin, and the nurse didn't catch that the patient already was on one or the other, says Hicks. "You can't give enoxaparin and heparin at the same time, because of the clotting cascade," says Hicks. "This disrupts clotting factors which are your safety net so you don't bleed out."

• Wrong administration technique.

Heparin and enoxaparin should be given subcutaneously, but in a couple of reported cases, ED nurses gave the drugs intramuscularly, causing the patients to develop hematomas at the injection site, says Hicks.

• Incorrect timing of lab values.

"Once you start the infusion, there is a schedule when you are supposed to draw your next lab value," says Hicks. "Nurses are not getting those timed correctly."

Often, this is because there is not clear documentation for when the next lab draw is due, says Hicks. "In the ED, we are used to starting the medicine and letting somebody else deal with it. But when we are holding patients for a long time, we have to follow those through," he says.

Use a comprehensive anticoagulation flow sheet instead of "freelance charting" which is usually done by ED nurses, says Hicks. "Your form should show the indication, weight, and everything else, so you can take one look and all your information is right there in a 'cookbook' format: Here is your next scheduled lab draw, here are the changes you make based on the results," he says.

• Failing to draw appropriate labs before starting the infusion.

SOURCES

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- **Valerie Sommer**, RN, BSN, Nurse Manager, Emergency Department, Mary Immaculate Hospital, Two Bernardine Drive, Newport News, VA 23602. E-mail: Valerie_Sommer@bshsi.com.

"If you take the medicine and then get the anticoagulant profile, it won't give a valid result," says Hicks. "It must be drawn *before* you get the infusion."

- **Lack of documentation.**

One handoff error involved a nurse who gave the bolus with the loading dose of heparin and went to lunch without documenting it. "The covering nurse didn't think it had been given, so she repeated it and the patient got two doses," says Hicks.

- **Basing dosage on incorrect weights.**

Nurses have made errors in converting the patient's weight in pounds to kilograms, says Hicks. "Use the actual patient weight in kilograms," he says. "The stated weight varies way too much from actual weight."

- **Abbreviation and calculation errors.**

"We are still seeing these errors over and over," says Hicks. When documenting, write out "units," so that the letter "U" does not get confused for an "O," he says.

If time allows, have the pharmacist do an independent double-check, in addition to the independent double check done by a second nurse, recommends Hicks. "The nurse can do the double-check for the right dose and right drug. But the pharmacist is going to look at other things and will take it to a higher level, looking at lab results and drug interactions," he says.

Giving anticoagulants incorrectly — to the wrong patient, the incorrect dose, or not observing for side effects — are all very dangerous, warns Sommer. "Vigilance is paramount," she says. "Do not take shortcuts." ■

Niacin overdoses on the rise: Be on the lookout

Patients attempting to fool drug tests

You probably would not suspect that a patient complaining of skin irritation or dizziness had overdosed on a vitamin, but this is something you may soon see in your ED. ED nurses are caring for patients who have ingested large amounts of niacin, in a misguided attempt to "fool" urine drug tests, says a new study.¹

"Because niacin is known to affect metabolic processes, there is a completely unfounded notion that it can rapidly clear the body of drugs such as cannabis and cocaine," says **Manoj K. Mittal**, MD, one of the study's authors and an emergency physician at The Children's Hospital of Philadelphia.

Many Internet sites promote the misconception that niacin can be used to pass urine drug screening tests, says Mittal. However, not only is niacin ineffective for this purpose, it also is dangerous when taken in large

EXECUTIVE SUMMARY

ED nurses are caring for patients who have overdosed on the vitamin niacin because this is purported to "fool" urine drug tests. Niacin overdoses can be life-threatening.

- Symptoms include skin irritation, liver toxicity, hypoglycemia, nausea, vomiting, and dizziness.
- There is no definite antidote for niacin overdose.
- Patients may need intravenous fluids, anti-emetics, sodium bicarbonate, dextrose infusion, and monitoring of abnormal laboratory levels.

amounts, he warns.

The study reports on two adults and two adolescents who came to Children's ED with serious side effects from taking large amounts of niacin. Both adult patients suffered skin irritation, while both adolescents had potentially life-threatening reactions, including liver toxicity and hypoglycemia, nausea, vomiting, and dizziness. One of the teens also experienced heart palpitations. All four patients recovered after treatment for the adverse effects.

More overdoses likely

With the proliferation of urine drug testing by prospective employers and various government agencies, more patients with niacin toxicity may present to EDs, says Mittal. "Niacin in high doses is also being promoted by some groups for cleansing of the body. Some of these users may also get toxic reactions," he says.

Always be alert to the possibility of substance abuse, whether this means cocaine, cannabis, over-the counter supplements, or prescribed drugs such as narcotic pain relievers or central nervous system stimulants, says Mittal. "Remember that any drug, even a vitamin, taken in overdose can be harmful," he says.

There is no definite antidote for niacin overdose, and most patients with this condition will get better with supportive treatment, says Mittal.

The patient may need intravenous fluids to correct dehydration, antiemetics, sodium bicarbonate for severe metabolic acidosis, dextrose infusion for hypoglycemia, and monitoring of any abnormal lab parameters, such as complete blood count and liver function tests, to ensure their normalization over a few hours to days, says Mittal.

As an ED nurse, always be prepared for the unpredictable effects for *any* ingestion, says **Lucinda Williams**, RN, emergency nurse at The Children's

SOURCES

For more information on niacin overdoses in the ED, contact:

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Hospital of Philadelphia, where several niacin overdoses were treated. "Recognize the ingestion and contact poison control for plan of care while placing the patient on cardio respiratory monitoring," she says.

At triage, ask every patient not only what prescription or over-the-counter medications they take, but also if they take any other supplements or herbal remedies, advises **Jackie Noll**, RN, CEN, BSN, a clinical Level 4 nurse in the ED at Children's.

"If a patient exhibits any of the particular symptoms of niacin toxicity, the triage nurse should specifically inquire about niacin use," she adds. If you suspect a niacin overdose, look for the following symptoms, says Noll:

- feeling of warmth in the upper body and face;
- visible erythema and/or itching;
- gastrointestinal disturbances including nausea and vomiting;
- signs of dehydration (tachycardia, decreased urine output);
- tachycardia, hypothermia, tachypnea, or hypotension;
- mental status changes related to hypoglycemia or hyperglycemia.

Many of the symptoms can be fairly vague and similar to other illnesses, not just poisoning, says **Stefan Maar**, RN, CEN, MSN, a clinical Level 3 nurse at Children's ED. "Also, the nature of the use might make the patient more reluctant to disclose that they ingested this product," Maar says.

Reference

1. Mittal MK, FlorinT, Perrone J. Toxicity from the use of niacin to beat urine drug screening. *Ann Emerg Med* 2007 Apr 4; [Epub ahead of print]. doi:10.1016/j.annemergmed.2007.01.014. ■

Don't give wrong meds when alcohol is on board

Prevent adverse outcomes by screening all patients

If you're unaware that a patient has alcohol in their system, you could give a medication that could seriously harm that patient, warns **Paula Beaulieu**, RN, BSN, director of emergency services at South Shore Hospital in South Weymouth, MA. South Shore's ED screens every patient for alcohol use as part of its Screening, Brief Intervention, Referral and Treatment (SBIRT) program. **For more information on SBIRT, see resource box on p. 140.**

About 30% of Americans report having some form of alcohol use disorder at some point in their lifetimes, according to a just-published study.¹ If you fail to screen patients for alcohol abuse, this is a potentially dangerous omission in that patient's history, says **Sandra Ouellette**, RN, ED nurse at St. Anne's Hospital in Falls River, MA, also participating in the SBIRT program.

Many medications can interact with alcohol, which leads to increased risk of illness, injury, or death, says **Patricia Mitchell**, RN, assistant research director at the Department of Emergency Medicine at Boston University Medical Center. "It is estimated that alcohol-medication interactions may be a factor in at least 25% of ED admissions," she says.

Patients with alcohol in their systems can experience increased effects of certain medications such as analgesics and anxiolytics that work on the central nervous system, says Ouellette. The antibiotic metronidazole can cause a disulfiram-like reaction resulting in severe vomiting if the patient has ingested alcohol within the last 24 hours, and sedatives and narcotics can cause somnolence and compromise the patient's airway, says Beaulieu. The list of medications that

EXECUTIVE SUMMARY

If a patient has alcohol in their system, many medications should not be given due to the risk of side effects that can seriously harm them. To reduce risks, screen every patient for alcohol abuse.

- Elderly patients are at high risk for adverse outcome from mixing drugs and alcohol.
- Sedatives and narcotics can compromise the patient's airway if mixed with alcohol.
- Alcohol can mask the pain of trauma injuries.

Triage Assessment for Alcohol Use

Social History

Do you have any concerns for your personal safety? YES NO COMMENT

Alcohol Use YES NO

**Alcohol Amount/
Frequency** Comment
**Females considered at risk if > 4 drinks per event or more than 7 drinks in a week
**Males considered at risk if > 4 drinks per event or more than 14 drinks in a week

**Hx Recreational
Drugs** YES NO COMMENT

**Recreational Drug
Use Amount/Frequency** COMMENT

**Have you used any tobacco
products within the last 12 months** COMMENT

Indicate type and amount of tobacco products used

Source: South Shore Hospital, South Weymouth, MA.

interact with alcohol is long and includes anesthetics, certain antibiotics, anticoagulants, antidiabetic agents, antihistamines, antipsychotics, antiseizure medications, sedatives and hypnotics, says Beaulieu.

Chronic alcohol ingestion may activate drug-metabolizing enzymes, decrease the drug's availability, and diminish its effects, says Mitchell. "Certain enzymes activated by chronic alcohol consumption transform some drugs into toxic chemicals that can damage the liver or other organs," she says. For example, a patient who presents complaining of increased anxiety may be given an anti-anxiety drug, says Mitchell. "The combination of alcohol and lorazepam may result in depressed heart and breathing functions," she says.

Elderly, trauma patients at risk

The elderly may be especially likely to mix drugs and alcohol and are at particular risk for the adverse consequences, Mitchell says. "They are more likely to suffer medication side effects compared with younger persons," she explains. "These effects tend to be more severe with advancing age."

Alcohol may mask the pain of a trauma patient's injury, says **Nancy O'Rourke**, MSN, ACNP, ANP, RnC, director of the ED and acute care services at Heywood Hospital in Gardner, MA. For example, a person who presents after a motor vehicle crash may not

complain of neck pain, she says. "Nurses need to know that intoxicated patients may not complain of pain, but that does not mean there is no injury," she says.

If a trauma patient with a fracture or abdominal pain comes to the ED with alcohol in his or her system, this will intensify the effects of narcotic analgesics and interfere with actions of other medications such as antibiotics, O'Rourke notes. Also, patients taking blood thinners such as aspirin or warfarin are more prone to falls and bleeding when they are intoxicated, says O'Rourke. "Be careful about monitoring the level of consciousness after medicating these patients," she advises.

Screen all patients

Without universal screening, ED nurses would miss more than 20% of patients who are abusing alcohol, says Mitchell. "These patients are at risk for illness and injury," she says.

Many ED patients do not realize the guidelines for alcohol consumption, nor do they see a possible correlation between their drinking or drug use and their visit to the ED on that day, says Ouellette.

As of 2006, the American College of Surgeons (ACS) now requires accredited Level 1 and Level 2 trauma centers to have a mechanism to identify patients who are problem drinkers, and Level 1 centers must have the capability to provide an intervention for

patients identified as problem drinkers.²

At Heywood Hospital's ED, the triage nurse asks all women whether they have more than three drinks at

SOURCES/RESOURCES

For more information on alcohol screening and medications, contact:

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The Bethesda, MD-based National Institute on Alcohol Abuse and Alcoholism offers a variety of free resources for emergency department nurses available at its web site, www.niaaa.nih.gov. To access a publication titled *Alcohol Problems Among Emergency Department Patients: Proceedings of a Research Conference on Identification and Intervention*, click on "Professional Education Materials" under the "Publications" heading, then scroll down to *Alcohol Problems Among Emergency Department Patients — 2001*. For a publication titled *Screening and Brief Intervention in the Emergency Department*, click on "Alcohol Research & Health" under "Publications," then "Screening and Brief Intervention, Part II — A Focus on Specific Settings," and scroll down to the publication's title.

A new guide from the Substance Abuse and Mental Health Services Administration (SAMHSA) helps health care professionals incorporate substance abuse treatment into trauma care. *Alcohol Screening and Brief Intervention (SBI) for Trauma Patients: Committee on Trauma Quick Guide* includes screening methods and intervention scenarios that can be incorporated by emergency departments. The guide is available free on the web at ncadistore.samhsa.gov/catalog/productDetails.aspx?ProductID=17652. Single copies may be obtained free of charge by calling SAMHSA's Health Information Network at (877) 726-4727. Request inventory number SMA 07-4266.

one sitting or more than seven drinks a week, all men whether they have four drinks at one sitting or more than 14 drinks a week, and all elderly patients whether they have one drink at one sitting or more than seven drinks a week. Those numbers are based on the definition of high-risk drinking from the National Institute on Alcohol Abuse and Alcoholism, says O'Rourke.

"If patients are in the ED with an injury, a complaint of gastritis, or blood pressure that is poorly controlled and they are drinking at or above these rates, the possibility that alcohol is contributing to their problem or medical condition exists," says O'Rourke. "Our job is to start the conversation and raise the question about the health effects of alcohol." (See the script used by ED nurses on p. 139. For more information on this topic, see "EDs not screening for substance abuse," *ED Nursing*, May 2005, p. 82.)

A young woman recently came to the ED with a sore throat and was asked about alcohol use, says O'Rourke. "We found out that this woman had been in recovery for two years, had recently begun drinking again and was indeed ready to seek help," says O'Rourke. "The patient was placed in a detox program. This would not have happened in our ED a year ago."

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Prevent needless pain during lumbar punctures

Simple practices reduce difficulties

If lumbar punctures are not successful, there can be needless discomfort, antibiotic use, and hospitalization for your patient, says **Lise E. Nigrovic**, MD, MPH, and attending ED physician at Children's Hospital Boston.

Researchers looked at 1,459 lumbar punctures done in the ED at Children's Hospital in Boston and of these, 513 (35%) were traumatic or unsuccessful on the first attempt. Lack of local anesthetic use was one of the factors associated with the difficult cases.¹

Both eutectic mixture of local anesthetic (EMLA) cream and injected lidocaine can be used for children undergoing lumbar punctures, says Nigrovic. "While lidocaine is usually injected at the time of the procedure,

EXECUTIVE SUMMARY

For successful lumbar punctures, give appropriate local anesthetics, position the patient properly, and address concerns of patients.

- Apply eutectic mixture of local anesthetic (EMLA) cream to the backs of children likely to undergo lumbar punctures.
- Use injected lidocaine at the time of the procedure.
- Give adequate analgesia or anti-anxiety medications for adults as needed.

EMLA can be placed by nursing staff on the backs of children who are likely to undergo lumbar punctures,” she notes. The youngest patients are at the highest risk for traumatic lumbar punctures, Nigrovic says.

At Children’s Healthcare of Atlanta, ED nurses apply liposomal 4% lidocaine cream (LMX), a topical anesthetic product similar to EMLA, to the lumbar puncture site before physician puncture attempts, as part of the ED’s standard protocol for septic work-up, says **Marianne Hatfield**, RN, BSN, system director of emergency services. [The ED’s septic work-up for febrile infants is available with the online issue of *ED Nursing*. If you’re accessing your online account for the first time, go to www.ahcmedia.com. Click on the “Activate Your Subscription” tab in the left-hand column. Then follow the easy steps under “Account Activation.” If you already have an online subscription, go to www.ahcmedia.com. Select the tab labeled “Subscriber Direct Connect to Online Newsletters. Please select an archive.” Choose “*ED Nursing*,” and then click “Sign On” from the left-hand column. Once you’re signed in, select “2007” and then select the October 2007 issue. For assistance, call Customer Service at (800) 688-2421.] “Our nurses are trained in the proper placement of the topical anesthetic on the lower spine during orientation. It is also reviewed annually during required competency training,” she says. Here is what ED nurses do:

- Identify patients that might require a work-up at triage.
- Apply a topical anesthetic to potential peripheral intravenous access sites.
- Apply topical anesthetic to the lumbar puncture site after the patient is in the treatment room.
- Complete other procedures that are part of a septic work-up: first, catheterization for a urine culture, then peripheral intravenous line placement and blood specimen collection.
- Notify the physician that the patient is ready for

lumbar puncture. “This allows the topical anesthetic to have taken effect,” says Hatfield. “The physician then injects lidocaine and completes the lumbar puncture.”

In addition, nurses give infants a pacifier dipped in “Sweetease”—a sucrose solution that infants love to suck on, says Hatfield. “It helps to distract them from the uncomfortable position they must be placed in for optimal puncture success,” she says.

In another study of 148 lumbar punctures, researchers found that the procedure was difficult in 47 patients (32%) and traumatic in 23 patients (16%). The percentage of patients that did not have a visible spine was significantly higher in the difficult and traumatic groups.²

The study shows that it may be possible to predict which patients will have difficult or traumatic lumbar punctures before performing the procedure, says **Jonathan A. Edlow**, MD, one of the study’s authors and associate chief of the Department of Emergency Medicine at Beth Israel Deaconess Medical Center in Boston. Doing a simple bedside assessment of spine visibility and palpability may assist in planning your approach to a lumbar puncture, says Edlow.

To ensure that the patient is adequately prepared for the procedure, do the following:

- **Give adequate analgesia or anti-anxiety medications if necessary.** “Ask the patient if their pain or anxiety is a problem. If the answer is yes, then suggest medications to the physician,” says Edlow.
- **Ask the patient if they have any questions about the procedure, and either answer those or**

SOURCES

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refer them to the physician. “Though this is really a pretty benign procedure, be sure to give the patient adequate psychological support,” says Edlow.

• **Position the patient correctly.** “Holding the patient as asked by the physician is very important to increase the likelihood of a successful tap,” says Edlow.

References

1. Nigrovic LE, Kuppermann N, Neuman MI. Risk factors for traumatic or unsuccessful lumbar punctures in children. *Ann Emerg Med* 2007; 49:762-771.
2. Shah KH, McGillicuddy D, Spear J, et al. Predicting difficult and traumatic lumbar punctures. *Am J Emerg Med* 2007; 25:608-611. ■

Pediatric CORNER



Some ‘psychiatric’ patients have underlying conditions

Don’t make assumptions about unusual behavior

An 8-year-old boy came into the ED Northwest Community Hospital in Arlington Heights, IL, swinging his arms at objects that were apparent only to him and saying nonsensical things. At first, nurses suspected a psychiatric disorder, but after determining that the patient had an elevated temperature, a further work-up revealed a diagnosis of encephalitis, says

EXECUTIVE SUMMARY

Many life-threatening medical conditions can appear as psychiatric disorders in pediatric patients, including ingestions, encephalitis, hypoxia, head injury, and diabetic ketoacidosis. To rule out underlying conditions:

- Ask about sudden changes in behavior.
- Check bedside glucose levels to rule out new onset diabetes.
- For stomachache complaints, ask about bowel movements and vomiting to rule out gastrointestinal pathology.

Barbara Weintraub, RN, MSN, MPH, APN, CEN, FAEN, manager of pediatric emergency services.

Without a complete evaluation, it would have been easy to conclude that the boy had a psychiatric disturbance, as his behavior was markedly different than baseline and he had no specific findings on physical examination, says Weintraub. “The finding of an elevated temperature is unlikely in the setting of psychiatric illness and led these care providers to seek a medical cause for his bizarre behavior,” she says.

Various ingestions or overdoses, encephalitis, hypoxia, head injury, and diabetic ketoacidosis are all potentially life-threatening conditions which can masquerade as psychiatric conditions in children, says **Carol A. Ziolo, RN, LCPC**, a clinical educator for Northwest’s mental health network. “It is so important to rule out medical conditions before you automatically go to a psychiatric diagnosis,” she says.

To avoid missing life-threatening conditions, consider the following:

- **Ask if there has been a sudden change in behavior.**

For instance, a teenager may be disinterested in their usual activities, sleeping more, complaining of headaches, and behaving in a different manner than the parent recognizes as “normal” for their child, says **Shawn Kelly, RN**, program director of the ED at Columbus (OH) Children’s Hospital.

“In this type of scenario, it is important to consider the possibility of depression versus brain pathology such as a tumor,” she says. Even if you suspect depression, probe further to determine if there are other physical signs such as an unsteady gait, weakness in extremities, or an abnormal Glasgow Coma Scale score, says Kelly.

- **Consider new-onset diabetes.**

Hyperglycemia and hypoglycemia can have different presentations in children and in adults, and they could be confused with psychiatric conditions, says Weintraub. All children who are ill or injured, including those presenting with unusual behavior, should have a bedside glucose level checked, she recommends.

Hyperglycemia frequently presents in children with complaints of abdominal pain and not feeling well, whereas adults more often complain of frequent urination and excess thirst, she says. While hypoglycemia in adults is characterized by altered mental status and diaphoresis, children are rarely diaphoretic and may just seem quieter than usual, says Weintraub.

“I recall more than a few teenagers being brought to the ED by a parent to rule out drug abuse, only to learn the child had diabetes,” says Kelly. If you suspect new-onset diabetes, ask whether the child has been drinking more, is unusually thirsty, or has an increased appetite

along with weight loss, she advises.

- **Take psychiatric symptoms seriously.**

The possibility of a brain tumor or diabetes is a significant consideration when a child exhibits behavioral changes, but it is equally important to consider the possibility of suicidal ideation, says Kelly. "This is a growing epidemic that cannot be taken any less seriously than a medical condition that is life-threatening," she emphasizes.

Ask, "Does your child have a history of any behavioral or psychiatric disorders?" and "Has he/she talked about killing himself, and does he/she have a plan?" says Kelly.

- **Closely assess complaints of abdominal pain.**

Many times, anxiety is the cause of a complaint of stomachache, but you need to be sure there is no gastrointestinal pathology, says Kelly. "Ask questions regarding other physical complaints for this, such as bowel movements, vomiting, level of pain, and location," she says.

- **Perform a thorough history and physical.**

This is your "best tool" in differentiating between medical and psychiatric conditions, says Weintraub. Since children often present with nonspecific signs and symptoms, carefully assess for nasal flaring, unusual odors, neurologic status, and hidden bruising, says Weintraub.

Ask these questions, recommends Weintraub: How long has the unusual behavior been going on? What was the child doing immediately prior to noticing this? Who was with the child during that time? Is there a family history of similar behavior or incidents? Is anyone else similarly affected? "Assess whether the signs and symptoms that you are seeing match both the caretaker's story as well as the child's developmental level," advises Weintraub.

When caring for adolescents, recreational drugs may be causing psychotic symptoms, says Ziolo. "Always do a complete history and physical, along with medical tests such as a complete blood count, comprehensive metabolic, urinalysis, urine drug screen, and CT scans, if needed," she says.

- **Document a complete assessment, both physical and psychological.**

Your documentation should show that medical causes of a psychiatric outburst were considered and ruled out, says **Gail Schoolden**, RN, MS, nurse

clinician in the pediatric ED at Johns Hopkins Hospital in Baltimore. "Include their current affect, mood, and whether or not they are cooperating with the exam and

SOURCES

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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 **December** 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

■ Avoid triage mistakes
overlooking heart attacks

■ Stop dangerous
acetaminophen overdoses

■ Don't miss a crucial life-saving intervention for asthma

■ Dramatically improve care
of pediatric trauma patients

care," she says. "Will they look you in the eyes or not?"

Document answers to questions such as, "Do you want to hurt yourself or anyone else right now?" says Schoolden. "If they say yes, ask about the details and document that information," she says. "It is also vital to document all treatment, medications, and response to any interventions done for the patient." ■

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.
13. To avoid anticoagulation errors in the ED, which is recommended, according to Cindy Vanek, RN, MS?
- A. Assume that a trauma patient's bleeding is caused by their injury, not anticoagulants.
 - B. Use single protocols for cardiac and neurological conditions.
 - C. Store anticoagulants for stroke and myocardial infarction together.
 - D. Use only standardized premixed anticoagulants.
14. Which is recommended to prevent calculation errors in anticoagulant dosages, according to Valerie Sommer, RN?
- A. Require nurses to input the patient's international normalized ratio (INR) before anticoagulants are given.
 - B. Avoid requiring of signatures on the infusion record.
 - C. Assume that dosages are correct from automated medication dispensers.
 - D. Abbreviate "U" for units.
15. Which is true regarding niacin overdoses in the ED, according to Manoj K. Mittal, MD?
- A. Niacin is an effective way to "fool" urine drug screening tests.
 - B. Niacin is dangerous when taken in large amounts.
 - C. Side effects are limited to skin irritation and nausea.
 - D. There is a definitive antidote for niacin overdoses.
16. Which is a possible sign of new-onset diabetes in a pediatric patient?
- A. Unsteady gait.
 - B. Increased appetite with weight loss.
 - C. Weakness in extremities.
 - D. An abnormal Glasgow Coma Scale score.

Answers: 13. D; 14. A; 15. B; 16. B.

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