



# Management

*The monthly update on Emergency Department Management*

Vol. 12, No. 3

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March 2000

## Study offers solutions for bottlenecks: Treat and move patients in record time

*Benchmark study of 100 EDs addresses your ED's worst problems*

**W**ould you like to cut more than two hours from the time it takes to get a patient out of the ED and admitted upstairs? A national benchmarking study has discovered innovative ways to do just that, identifying best practices at more than 100 EDs.

The Clockwork ED Series on Eliminating Bottlenecks and Delays was developed by the Washington, DC-based Clinical Initiatives Center, a membership-based health care organization that performs strategic research for more than 1,500 hospitals. Three segments of a patient visit were identified: time to physician, time to ancillary services, and expediting admission. Best practices were identified for each. (See **tips focusing on physician delays, p. 29.**)

"This project is without a doubt the most exhaustive and insightful review of ED practice as a single body of work," according to **Joseph Guarisco, MD, FACEP**, chairman of the department of emergency medicine at Alton Ochsner Medical Foundation in New Orleans, which participated in the project.

### Executive Summary

The Clockwork ED Series on Eliminating Bottlenecks and Delays, developed by the Clinical Initiatives Center in Washington, DC, identified best practices for expediting admission and reducing wait times to see a physician and receive ancillary services.

- With bed control bypass, ED nurses fax or tube reports to inpatient nurses and send patients directly to inpatient beds.
- By giving ED physicians the authority to start the admission process, turnaround time for admits in Alton Ochsner Medical Foundation's ED in New Orleans was reduced from 5.5 hours to 2.8 hours.
- Implementing a "zero tolerance" policy for empty ED beds increases satisfaction and reduces wait times.
- Your ED should have a place for patients other than the waiting room, such as an observation unit.

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Getting patients out of the ED is the single biggest bottleneck that ED managers face, says **Gabor Kelen**, MD, chair of the department of emergency medicine at The Johns Hopkins Hospital and professor at The Johns Hopkins University School of Medicine, both in Baltimore. "All the data shows you can spend all the time you want on the front end, but if you don't fix the back end, it's almost meaningless," he says. "All that will happen is you'll delay by an hour or so when your ED becomes clogged."

The biggest obstacle to reducing delays in getting patients upstairs is the cultural divide between the ED and other hospital departments, Kelen says. "The vast majority of services are used to controlling their volume and workload. They see patients one at a time in serial mode and want to do the best they can for one patient before going on to the next."

The ED's operations are very different, he emphasizes. "We have to work in parallel, caring for multiple patients simultaneously in different stages of work-up. We consider the total patient volume as one big organism and must provide the best possible care for that large organic system, and not necessarily for its individual parts."

Still, there are ways to get around that obstacle and bypass delays in the admitting process, urges Kelen. (See **flowchart that identifies ED bottlenecks, enclosed in this issue.**)

Here are some of the best practices identified by EDs that participated in the Clockwork ED Series (see **tips on cutting delays for admitted patients, p. 27**):

- **Bed control bypass.**

ED nurses fax or tube reports to inpatient nurses and send patients directly to inpatient beds. "This reduces the chance that the nurse will come up with an excuse not to take the patient," says **Kyle Weston**, a consultant for the Clinical Initiatives Center who worked with ED managers who participated in the project.

Common excuses given by floor nurses include shift changes, lunch breaks, or unmade beds. "Some of these excuses are definitely legitimate and they are not always stall tactics, but they still delay getting the patient upstairs," says Weston.

- **Instant bed-status alert.**

The floor nurse is removed from the communication process regarding bed status.

"Instead, housekeepers or transporters will flag the ED when the bed is ready to be cleaned and will automatically page staff so the next step is completed," says Weston. "As a result, the ED has more intelligence into what the status of the bed is, and the appropriate people are alerted when the bed is ready to receive the patient."

This eliminates communication delays by removing floor nurses from the process, so no data entry is needed, he says.

- **Emergency physician admission authority.**

This practice has reduced turnaround time for admissions in the ED at Alton Ochsner from 5.5 hours to 2.8 hours, reports Guarisco. "The emergency physician requests a bed as soon as the need for admission becomes evident. Not only is the bed requested, but also the patient admission process is initiated."

While the patient is being evaluated, the bed procurement and admission processes are taking place simultaneously, Guarisco says. "The consultants are notified once all of the critical information necessary to make management decisions is obtained. Consultants are involved in the management of the patient early, once sufficient information is obtained which allows the consultant to initiate orders for inpatient management."

The former process in which the ED physician saw the patient, ordered the test, waited for the results, called the consultant, and then initiated the admit process was too time-consuming and cumbersome, he emphasizes.

- **Zero tolerance for empty ED beds.**

At Johns Hopkins, patients are always brought back when there is an empty ED bed, with empty beds hand-counted at four-hour intervals. "There used to be resistance from nurses to bring patients from the waiting room or from triage to an empty room, since they might not be able to get to them right away," notes Kelen.

It's better to put patients in rooms even if you can't treat them immediately, he says. "If they are in the waiting room, there is further delay. Also, if a patient crashes, they are better off in a treatment room than a waiting room."

Nurses were extremely resistant to this idea, so a new nurse manager was hired to help implement the

## COMING IN FUTURE MONTHS

- Reduce medication errors in the emergency department

- Care for VIPs

- Give nursing staff incentives

- Reduce the level of noise in your ED

program, he notes. “Eventually, they understand that this change has to occur, and it has reduced delays significantly.”

Staff members are resistant to change as a rule, Kelen says. “People get into a certain mode, and it’s very difficult for them to adapt. So you literally have to make it somebody’s job and build in incentives to their job structure.” The ED is working with hospital administration to find ways to reward nurses for reducing delays, he adds.

Data are collected on room availability and the number of patients waiting, and the data are shared with the charge nurses, he says.

• **An admission facilitator.**

This individual handles all the administrative work in admitting a patient, which includes dealing with the floor nurses; previously, those administrative aspects were completely in the hands of house staff, says Kelen. “So a house officer would phone another person upstairs and notify the medical shift coordinator and let central admitting know. Admitting would then notify the ED that the bed has been assigned. The whole process was extremely time-consuming.”

Admission facilitators are extensions of the admitting office. “They don’t work directly for the ED; they work for central admitting,” Kelen explains. “This is similar to the way you would put a satellite lab in the ED, which is run by the lab, but under our control.”

The facilitator fills out a form that begins the tracking of the admissions process. **(See copy of form, p. 28.)** “They record some basic information, including the patient’s name and who the admitting attending is going to be,” says Kelen. “At that point, the time starts ticking.”

The following times are documented:

- the time the decision to admit was made;
- the time the facilitator was notified;
- when the medical shift coordinator was notified;
- when the patient arrived.

The facilitators also make sure all insurance information is verified and next of kin is recorded. “We can’t get a patient up to the floor until all that information is completed,” Kelen notes.

A checklist is filled out with the steps the ED needs to complete, such as sending chest X-rays or labs, before the patient is sent upstairs. Then the facilitator makes sure the staff upstairs are notified in a timely manner, he says.

The time the bed is ready is recorded. “At that point, we only give them about 40 minutes before we send the patient up,” says Kelen. Approximately three hours were saved since the facilitator was hired. **(See chart, p. 29.)**

## Reducing ED stays for admitted patients

The Clockwork ED Series on Eliminating Bottlenecks and Delays from the Washington, DC-based Clinical Initiatives Center had the following key findings:

- Given continuity of care concerns, most hospitals mandate the attending physician, or a physician from the admitting service, to write admitting orders for patients. Delays here are common and stem from physician time to get to the ED, length of subsequent exam, and, in some cases, additional test ordering. To avoid delays in physician arrival to the ED, some community hospitals are extending responsibility of hospitalists to include writing admitting orders.

- For academic medical centers, strong disincentives for residents to assume new patients often result in unnecessary handoffs between services and lengthy work-ups. That leads to granting ultimate admission authority to ED physicians.

- The result of successful reduction in admission decision process is earlier initiation of the bed placement process. Rather than confront political and operational challenges of speeding admission decision, some hospitals are achieving the same end by starting the decision and bed placement processes simultaneously.

- At many hospitals, admitting patients from the ED is cumbersome, requiring nine steps, at least five communications, and often taking 90 minutes. Some hospitals are trying to streamline the process by reducing necessary communications and removing bed control as the go-between for the ED nurse and the inpatient nurse.

- The biggest problem is inpatient nurse disincentives to assume new patients. All information needed for the admission process to move forward — namely, bed occupancy, bed availability, and the floor’s readiness to accept the patient — rely on inpatient nurse reporting and responsiveness.

- A few leading hospitals are attacking the problem in two ways. The first: Give ED nurses authority to send patients to a ready bed, regardless of floor nurse responsiveness. The second: Limit floor nurses’ role in providing bed readiness information. Hospitals use housekeeping to flag “patient-ready” and “ready to be cleaned” beds and use technology to inform necessary staff. ■

(Continued on page 29)



# Department of Emergency Medicine Admission Process Form

Pat Com Number \_\_\_\_\_

Addressograph Plate \_\_\_\_\_

(Information above the broken line is to be filled in entirely by resident)

**Date:** \_\_\_/\_\_\_/\_\_\_ **Patient Location:** \_\_\_\_\_

**Admitting Diagnosis:** \_\_\_\_\_ **Treatment:** \_\_\_\_\_

**Admitting Service/Firm:** \_\_\_\_\_ **House Officer:** \_\_\_\_\_ **Pager:** \_\_\_\_\_

**MD Information:** *(please fill out or put None if applicable. A discharge summary will be sent to all listed including Emergency Medicine physicians)*

**ED Attending** \_\_\_\_\_ **ED Resident** \_\_\_\_\_

**Admitting Attending** \_\_\_\_\_ **Primary MD** \_\_\_\_\_

**Referring Attending (if applicable)** \_\_\_\_\_  **Notified (time)** \_\_\_\_\_ **am/pm**  **N/A**

<p><b>Decision to Admit (time)</b> _____ <b>am/pm</b></p> <p><b>Admission Facilitator Notified:</b> _____ <b>am/pm</b></p> <p><b>Time House Officer Paged:</b> _____ <b>am/pm</b></p> <p><b>Time House Officer Returned Call:</b> _____ <b>am/pm</b></p>	<p><b>Needs:</b></p> <p><input type="checkbox"/> Monitoring</p> <p><input type="checkbox"/> Isolation</p> <p><input type="checkbox"/> Sitter</p> <p><input type="checkbox"/> Tridil Drip</p> <p><input type="checkbox"/> Dopamine</p> <p><input type="checkbox"/> Endocarditis Study</p> <p><input type="checkbox"/> CCU Consult (requested): _____ <b>am/pm</b></p> <p><input type="checkbox"/> N/A</p>	<p><b>Precautions</b></p> <p><input type="checkbox"/> VRE</p> <p><input type="checkbox"/> MRSA</p> <p><input type="checkbox"/> Prisoner</p> <p><input type="checkbox"/> TB <small>(requires ID approval)</small></p> <p><input type="checkbox"/> N/A</p>
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**If HO Not Notified at Time of Admission (explain)** \_\_\_\_\_

**ED Physician (name)** \_\_\_\_\_

**HMO:** \_\_\_\_\_ **Contacted:**  Yes  No  N/A **Precert #:** \_\_\_\_\_ **Phone #:** \_\_\_\_\_ **Form Faxed:**  Yes  No

<p><b>Triage Time:</b> _____ <b>am/pm</b></p> <p><b>Rm. Time:</b> _____ <b>am/pm</b></p> <p><b>Coordinator Paged:</b> _____ <b>am/pm</b></p> <p><b>Coordinator Returned Page:</b> _____ <b>am/pm</b></p>	<p><b>Bed Posted to</b> _____ <b>at</b> _____ <b>am/pm</b></p> <p><b>Time Bed Ready:</b> _____ <b>am/pm</b></p> <p><b>Time Patient Transported to Floor:</b> _____ <b>am/pm</b></p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**If Bed Not Ready (reason):** \_\_\_\_\_

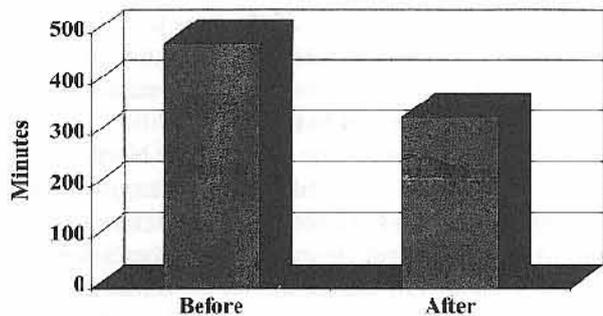
**Admission Facilitator:** \_\_\_\_\_ **NCIII:** \_\_\_\_\_

**Comments:** \_\_\_\_\_

*Source: The Johns Hopkins Hospital, Baltimore.*

## Emergency Department Admission Facilitator Process Time Change

### Admit Throughput Improvement



Source: The Johns Hopkins Hospital, Baltimore.

■ Admit Time

#### • A place for patients.

EDs need to have their own “back-end safety valve,” a place for patients other than the waiting room, he suggests. “This is a place completely under the ED’s control, such as an observation unit. This is the only solution in institutions where priorities of other services are not aligned with the ED.”

#### • Transformation of the ED into an inpatient-style unit.

The most innovative approach is the creation of an ED-managed inpatient-style unit that transcends observation all the way to full admission, says Kelen. “The ED physician takes the role of the inpatient attending,” he explains. “Thus, the ED is not held hostage to the vagaries and practice styles of physicians and services elsewhere in the hospital.” The Johns Hopkins ED will be implementing that unit in July 2000, he reports. ■

## Sources

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## How to cut delays on the front end

A benchmarking project that is part of The Clockwork ED Series conducted by the Clinical Initiatives Center in Washington, DC, identified best practices that reduce front-end delays — for example, the time that patients wait before seeing a physician. Here are five best practices implemented by progressive EDs:

### 1. Profile physicians.

Peer-to-peer comparisons are the best way to change physician behavior, says **Kyle Weston**, who worked with ED managers participating in the project as a consultant for the Clinical Initiatives Center, a health care organization that performs research for hospitals. “If you hear something from your peers, you take it differently than from someone above,” he explains.

The ED at Alton Ochsner Medical Foundation in New Orleans tracks ancillary utilization, consult information, and admission and discharge information, which is used to profile ED physicians, says **Joseph Guarisco**, MD, FACEP, chairman of the department of emergency medicine. “This information is distributed in a nonblinded fashion to all ED physicians,” he says. “Knowledge of each physician’s practice style immediately identifies inefficiencies in his/her practice.”

By addressing individual issues about efficiency and productivity, ED managers also uncover issues relating to ancillary usage, time management, admit/discharge decisions, and other behaviors, says Guarisco. “It give incentives to physicians to become involved with the events that occur during each patient’s stay and better understand processes that affect patient care, and to become involved in resolving any issues that delay this process.”

As a result of profiling, physicians are aligned with ED goals and objectives, he says. “That is a tremendous plus for a business that runs 24 hours a day.”

### 2. Register patients at the bedside.

All EDs should register patients at the bedside, advises Weston. “There is no reason why any ED should be registering patients differently based on severity. EDs have been traditionally so good with acute patients, so why not non-acute patients? This is a no-brainer.”

Laptop computers are most efficient because there is no redundant documentation, but paper bedside registration is another option, notes Weston.

### 3. Hire consultants chosen by the ED.

The ED group should hire or contract with consultants of their choice for internal medicine and other services, recommends **Gabor Kelen**, MD, chair of the department of emergency medicine at The Johns Hopkins Hospital and professor at The Johns Hopkins University School of Medicine, both in Baltimore.

“Since this group of consultants works for the ED, the free market should drive competition to some extent,” he explains. “Nonresponders and poor performers can be replaced.”

### 4. Implement rapid triage.

Previously, patients were locked into a long tedious process of arrival, waiting, triage, waiting, registration, waiting, and then finally seeing a physician, Guarisco says. “With rapid triage, patients are truly impressed when they are moved from triage to a room.”

However, one obstacle is resistance from nurses, who don’t want to do full nursing assessments during triage, Guarisco notes. “This remains a problem since new nurses are coming from traditional training centers that are generally practicing old style emergency medicine. It’s a ongoing battle to convince nursing staff that patient care is improved by doing less triage.”

Another spin-off benefit of rapid triage is that patients are available to see the physician immediately, even before registration. “This parallel processing and time-shifting of activities greatly reduces patient length of stay,” says Guarisco, noting that the ED has reduced patient length of stay by 27 minutes through rapid triage and bedside registration.

### 5. Hire a dedicated nurse to improve patient flow.

At Ochsner’s ED, a charge nurse is removed from any clinical activity for each shift to expedite patient throughput. “That nurse’s only responsibility is to manage information and processes and to alert the physician and other personnel, such as radiology supervisors, when things are not going as planned,” says Guarisco.

Before this dedicated position, no one pushed the processes to their maximum efficiency, he stresses. “Many times, those delays went unnoticed far too long. Any ED with 15,000 patients or more needs a dedicated nurse manager without clinical responsibilities to ensure efficient and productive patient throughput.”

This concept creates a team dedicated to improving the patient’s experience in the ED. Because your ED management team cannot be in the ED 24 hours a day, you need a surrogate management team of charge nurses on each shift whose goals are aligned with department objectives, says Guarisco. ■

## Managers: Use color-coded forms in the ED

You already may use the Broselow/Luten Rainbow tape to calculate correct dosages for pediatric patients. Now there are discharge instructions and treatment sheets available to help ensure accurate dosing. (See sample, inserted in this issue.)

The products are being used in four North Carolina EDs: Northern Hospital of Surrey County, Womack Army Hospital at Fort Bragg, Bowman Gray School of Medicine-Baptist Hospital in Winston-Salem, and Duke University Medical Center in Durham.

At Duke’s ED, 25 physicians and 50 nurses were surveyed, and focus groups were conducted. “Their overall response was that the products were helpful to deliver age-appropriate information to kids and their families,” reports **Karen Frush**, MD, FAAP, director of pediatric emergency medicine at Duke. “I think the system is such a great idea, and it has improved my practice. It helps me give better care to kids, and I am pediatric trained.”

The color-coded materials will raise the general level of pediatric emergency care, according to **James Broselow**, MD, FACEP, who developed the products. “They will increase the efficiency of pediatric resuscitation while decreasing the general level of anxiety,” he explains. “Hopefully, the discharge sheets will also help us better communicate information about pediatric dosing and injury prevention to the lay public.”

Here are some of the benefits of the new color-coded products:

- **Discharge instructions.**

The discharge instructions may be more useful in small community EDs that treat a small number of pediatric patients, notes Frush. “We looked at it in an academic center with pediatric services, but the clinicians

### Executive Summary

New color-coded products, including treatment sheets and discharge instructions, have been tested at four North Carolina EDs.

- Color-coded treatment sheets give dosages and equipment sizes to use for acute pediatric patients.
- Color-coded discharge instruction sheets help parents determine medication dosages and injury prevention for their children.
- Over-the-counter products are being created to help parents calculate correct medication doses for children.

with the strongest positive reactions were the ones who spent less of their time working with children. It seems to be a very useful tool for people without pediatric experience.”

Parents like the fact that the discharge instructions are age-specific, she says. “There are some things that have very specific differences for different ages. When you give parents a piece of paper that is color-coded, it’s more individualized care. They feel that ‘this is my child you’re talking about, not just any patient.’”

• **Acute treatment booklets.**

Color-coded treatment booklets list the resuscitative doses and equipment seen most commonly in the ED. Using the treatment booklet requires a change in outlook, notes Frush. “This is not how we are trained. We base everything on weight and use formulas to calculate doses and determine equipment sizes.”

Look at the doses suggested by the system and critically evaluate them, she advises. “Then you can use it with confidence and allow yourself to free up that part of your mind.”

The treatment sheets helped providers to feel more confident in giving the correct dosages and equipment sizes, says Frush. “Having the equipment size already determined helped them to concentrate on resuscitating the child. It provides an organizational approach, so you can go through the protocols and don’t have to remember a number.”

It’s best to use the printed dosage information with the Rainbow tape, she advises. There is dosage information on the tape, she says, “but once you lay it down to measure the child, the printing is very small and in different colors, so it’s hard to read.” The information on the sheet is a clearer presentation of the material and easier to read. “That allows you to lay down the tape just to get the color.”

Medication dosages are listed according to the child’s medical condition, such as seizure. “So you don’t have to look up a long list of alphabetized medications. Instead, you can go by the problem you’re dealing with,” she says.

• **Over-the-counter products.**

Color-coded products for over-the-counter use also are being tested. Studies have shown that parents give incorrect dosages more than 50% of the time, but with color-coded syringes, parents gave correct dosages 95% of the time, Frush reports.

In the study, 75 parents who brought a child to the ED were given a sheet of paper that had a weight range, which indicated the color for the child based on weight. They were handed a syringe and asked to draw up a dose for the child. “The doses were incredibly

## Sources

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consistent and accurate with what the indicated amount should be,” says Frush.

Even non-English-speaking caregivers gave correct dosages, she notes. “When one Hispanic woman was given the acetaminophen and a syringe and told to draw up the dose, she commented that she liked color more than numbers or English.” ■



Todd KH, Deaton C, D’Adamo AP, et al. **Ethnicity and analgesic practice.** *Ann Emerg Med* 2000; 35: 11-16.

**B**lack patients with isolated long-bone fractures were less likely than white patients to receive analgesics in the ED, according to this study from Emory University in Atlanta.

All ED patients who presented with new isolated long-bone fractures were included in the 40-month study. Ethnic identifiers were removed from the medical records, and analgesic administration was recorded. Participants in the study included 127 black and 90 white patients. White patients were significantly more likely to receive ED analgesics, despite similar records of pain complaints in the medical record.

“We cannot be certain that some aspect of ethnicity, or an unmeasured confounder such as the presence of friends or family, might influence black patients’ expression of pain to physicians and nurses,” said the researchers.

However, the medical records contained detailed notation of pain complaints in nearly identical proportions in black and white patients, they noted. “Our findings suggest that it is not the failure of physicians to assess pain, but the failure to administer analgesics,” the researchers said. ▼

Moody-Williams JD, Linzer J, Stern A, et al. **Twenty-four hour access to emergency care for children in managed care.** *Ann Emerg Med* 1999; 34:761-767.

This article assessed approaches used by managed care organizations (MCOs) to control the flow of patients to the ED. The article is part of the white paper series published by the Emergency Medical Services for Children (EMSC) Managed Care Task Force, formed by the Washington DC-based EMSC National Resource Center.

Telephone triage personnel at MCOs may lack expertise in pediatric emergencies and thus be unable to correctly assess a child's condition and need for emergency care, the researchers said. Educating plan members about the proper use of emergency services can be confusing, and MCOs lay too great a burden of responsibility on the parents to distinguish life-threatening symptoms from those that only require prompt attention by a primary care physician, they added. The panel made several recommendations to address issues of access to the ED, as follows:

- Make 911 universally accessible to everyone facing a true emergency.
- Ensure that children are permitted access to facilities that are best equipped to provide pediatric care.
- Ensure provision of pediatric specialty/subspecialty care, without prior approval, for patients in EDs.
- Ensure that any definitions of conditions requiring emergency care address parents/caregivers' concerns.
- Promote pediatric emergency preparedness at alternative care sites such as freestanding urgent care facilities.
- Develop methods to accommodate language barriers during triage and in member information. ▼

Hollander JE, McCracken G, Johnson S, et al. **Emergency department observation of poisoned patients: How long is necessary?** *Acad Emerg Med* 1999; 6:887-894.

A significant percentage of overdose patients who are medically cleared after six hours of observation can be identified within two to four hours of presentation, reports this study from the University of Pennsylvania in Philadelphia. The study looked at 260 patients with potentially toxic oral ingestions that occurred less than six hours before the patients presented to the ED. Data were collected at presentation and two, four, and six hours later, including signs and symptoms, laboratory determinations, and suicide risk.

At two or four hours, physicians were asked whether they thought the patient was safe for medical

clearance. No patient who was believed to be safe for medical clearance at two or four hours had a complication within the six-hour period. That finding suggests asymptomatic patients with selected acute ingestions can be released from observation in less than six hours. However, the results of the present study should not be applied to patients who have ingested long-acting medications or poisons who present with delayed clinical symptoms, noted the researchers. ■

## Joint Commission

### When to report sentinel events during transfers

In the past 3½ years, the Oakbrook Terrace, IL-based Joint Commission on Accreditation of Healthcare Organizations has reviewed 20 sentinel events affecting patients in emergency departments, according to **Donna Larkin**, media relations specialist for the Joint Commission. Twelve were associated with significant and avoidable delays in assessment or treatment of the patients.

A sentinel event is any unexpected occurrence involving death or serious physical or psychological injury. One type of sentinel event that is particularly relevant to ED managers involves the transfer of a patient from one hospital to another following the occurrence of an "error," notes Larkin.

For example, a patient comes to Hospital A and a medical error happens, such as a life-threatening medication error. If the patient is transferred to Hospital B

### Prevent sentinel events

*Sentinel Event Alert* is a publication that is distributed periodically to all accredited organizations and is published as needed with information about sentinel event prevention. Back issues are available on the Joint Commission's Web site: [www.jcaho.org](http://www.jcaho.org).

For more information on sentinel events, contact the Joint Commission, One Renaissance Blvd. Oakbrook Terrace, IL 60181. Sentinel event hotline: (630) 792-3700. Fax: (630) 792-5942. E-mail: [standards@jcaho.org](mailto:standards@jcaho.org). ■

and subsequently dies while being treated in the receiving hospital, this case would be a “reviewable” sentinel event under the Joint Commission’s policy, Larkin explains.

Who is accountable for conducting the root-cause analysis for that sentinel event? “In this situation, where the patient died is not a factor in this determination,” she says. “The objective is to understand why the event occurred and how to prevent it. This event is related to a medication error, so the sending hospital would be responsible for performing the root cause analysis.”

The receiving hospital was treating a patient with a life-threatening condition (resulting from the medication error), but it was not involved in the error, she says. Therefore this would not be considered a reviewable sentinel event for the receiving hospital unless some other error occurred there that worsened the prognosis of the patient, Larkin explains. ■

## TECH WATCH

### SPECT imaging boosts flow: Here’s how to use it

According to a published study, new technology can identify myocardial infarction in chest pain patients in just minutes, says **Stephen Stowers**, MD of SouthPoint Cardiology in Jacksonville, FL. Single photon emission computed tomography (SPECT) imaging, combined with early exercise stress testing, might lead to reduced in-hospital costs and decreased lengths of stay, he adds.<sup>1</sup>

SPECT imaging is a diagnostic test used for patients not initially classified at high risk, in addition to echocardiography, exercise stress testing, and cardiac markers. It is similar to a computerized axial tomography scan of the heart, says Stowers. The patient is injected intravenously in the ED with an isotope that goes right into the heart muscle.

“This ‘freezes’ whatever is happening at the time of the injection, even though the patient may be imaged 15 or 30 minutes later,” he explains. After the patient is injected, a gamma camera takes X-rays to determine the blood flow in the heart.

The study found that SPECT imaging, combined with early exercise stress testing for assessing intermediate risk patients with chest pain and no electrocardiographic evidence of acute ischemia, leads to earlier

discharges, says **Eric Eisenstein**, DBA, assistant research professor in the department of medicine at Duke Clinical Research Institute, Duke University Medical Center in Durham, NC. “It resolves the physician’s diagnostic dilemma and leads to more discriminate use of coronary angiography,” he says.

Currently, the unit dose cost for the injection to perform a SPECT scan is about \$60, Stowers says. There is an overall reduction in average costs of care with no adverse clinical outcomes, he maintains. Because length of stay was reduced, median in-hospital costs for patients in the conventional diagnostic strategy were \$3,747, compared with \$1,254 in the SPECT imaging, he reports.

The costs of implementing the technology depend on whether your facility currently has nuclear imaging, Eisenstein explains. “If so, the additional costs associated with implementing an acute imaging strategy would involve the availability of the imaging agent, training ED physicians, and providing nuclear imaging and exercise stress testing during off hours.”

Currently, there is a dependence on cardiac enzymes for determining the presence of myocardial infarction in chest pain patients, says Stowers, principal investigator of a study that showed the benefits of SPECT imaging.

These biochemical markers take up to 10 to 12 hours from onset of symptoms before they become positive, he notes. “It takes time for them to be elevated in the blood. So you have people sitting around waiting for biochemical markers to become positive, which clogs up your ED.”

That delays treatment, which can be life-threatening, says Stowers. “People who are having an acute MI will be sitting there with an occluded artery. Their enzymes will come back positive from six to eight

#### Executive Summary

Use of single photon emission computed tomography (SPECT) imaging and early exercise stress testing can assess chest pain patients and lead to earlier discharges from the ED, according to researchers.

- SPECT imaging and early exercise stress testing are used with intermediate-risk chest pain patients with no electrocardiographic evidence of acute ischemia.
- In a published study, SPECT imaging reduced median in-hospital costs for patients to \$1,254, compared with \$3,747 with conventional diagnostics.
- Biochemical markers take up to 12 hours from onset of symptoms before they become positive, while SPECT imaging can determine the presence of myocardial infarction in chest pain patients in minutes.

hours after they present. By that time, it's usually too late to get any effective relief of their MI."

With a perfusion scan, you can look at what's actually going on in the patient's heart, he says. "This is not an indirect marker of damage that we draw from the blood, and it's not an electrical wave form."

Instead, you are actually looking at the myocardial blood flow at the time you are imaging the patient, Stowers explains. "If there is interruption of the blood flow, you are going to see it."

This technology is a tremendous advance in the diagnosis of acute coronary syndromes because it allows you to pick up the problem immediately, he emphasizes. "The scan is much more sensitive than an electrocardiogram. Because you are getting a direct look at the heart and blood flow at the time you are doing the scan, that allows us to be able to be confident that it's safe to do an exercise test on that patient immediately and not have to wait."

If the test is positive, then it's clear that intervention is needed to improve the disrupted blood flow or open up the arteries, he explains. "The scan will allow MI patients to be treated faster. In our study, we only had nine MI patients, but a larger study might be able to demonstrate that early intervention can save lives."

With the SPECT imaging, chest pain patients with a negative scan are discharged from the ED much more quickly, says Stowers, who refers to that as the "4S" approach: see, scan, stress, and street.

The technology will have a significant impact on ED patient flow, he says. "It will free up overcrowding caused by having five or six people waiting around for cardiac enzymes. Those people would be gone."

"If the initial scan is negative, patients would go directly to the treadmill and then home, which could be done in a couple of hours, Stowers says. "If the ED is jammed, this would remove the logjam, by not having these people clog up the ED and also not having to admit all these chest pain patients. You quickly identify the 10% to 15% who would be admitted."

However, for the system to work, your staff need to

be committed, he notes. Every hospital has a gamma cam that can perform these scans, but the problem has been a lack of committed staff to come in and read them, he says. "You need staff who are willing to read these scans in the middle of the night and off hours. If you just do this from 9 to 5, it's not going to be effective. You need to have the service available for as many hours as possible."

A tech, nurse practitioner, or physician's assistant can be cross-trained to perform the treadmill test under the supervision of the ED physician, says Stowers. "Then based on a treadmill score, decide whether patient is admitted or not."

## Reference

1. Stowers SA, Eisenstein EL, Wackers FJ, et al. An economic analysis of an aggressive diagnostic strategy with single photon emission computed tomography myocardial perfusion imaging and early exercise stress testing in emergency department patients who present with chest pain but nondiagnostic electrocardiograms: Results from a randomized trial. *Ann Emerg Med* 2000; 35:17-25. ■



## Pediatrics ED medicine is focus of this listserv

*(This is the first of a regular feature on Web sites and listservs pertaining to emergency medicine. We encourage you to send in your own favorite Web sites or listservs for inclusion. Please see the form enclosed in this issue.)*

A listserv devoted to discussion of pediatric emergency medicine is a valuable resource for many ED managers. The topics of the postings on this listserv were studied, and an abstract was presented.<sup>1</sup> Here are the key findings:

- When categorized by content, 72% of the mail related to the clinical management of patients. Of that group, 21% appeared to be prompted by a specific case.

- 14% related directly to pediatric ED administrative issues, and 15% concerned educational, political, or legislative concerns and other miscellaneous announcements.

### Sources

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• 31 attending jobs were advertised during the study period.

The listserv provides an informal, relatively immediate forum for discussion, says **Dale Steele, MD**, the list owner and assistant professor of pediatrics at Rhode Island Hospital in Providence. "Posts often focus on clinical problems common to all, particularly those in which there is practice variation, controversy, or new information," he says.

For example, a recent discussion on the listserv focused on the indications, route, and method of delivery of dexamethasone for croup, says Steele. "The thread includes anecdotal and pragmatic details such as 'we crush the pills and mix with chocolate syrup,'" he explains. "However, there was frequent reference to recent evidence in the literature, including several posts from the Australian author of studies which support a lower dose of oral dexamethasone. In addition, there was mail from an individual who had recently completed a clinical trial."

This type of discussion can facilitate making practice changes based on the best current evidence, notes Steele.

*[For additional information about the listserv, contact: Dale Steele, MD, Pediatric Emergency Medicine, Potter 212, Rhode Island Hospital, 593 Eddy St., Providence, RI 02903. Telephone: (401) 444-6236. Fax: (401) 444-4569. E-mail: Dale\_Steele@brown.edu.]*

## Reference

1. Steele DW. Ped-EM-L: An internet discussion list for pediatric emergency medicine. Presented at the Medical Informatics Joint Pediatric Academic Societies Platform Session. New Orleans; May 5, 1998. ■

## Vital signs

- ✓ **When listserv was started:** September 1994
- ✓ **Number of subscribers:** 1,400 subscribers from 51 countries
- ✓ **List address:** PED-EM-L@listserv.brown.edu
- ✓ **Server address:** LISTSERV@listserv.brown.EDU
- ✓ **To subscribe:** Go to the following home page: [www.brown.edu/Administration/Emergency\\_Medicine/ped-em-l.html](http://www.brown.edu/Administration/Emergency_Medicine/ped-em-l.html). Click on "subscribe."

## CE objectives

After reading this issue of *ED Management*, the continuing education participant should be able to:

1. Discuss and apply new information about various approaches to ED management. (See in this issue *Journal Reviews; Study offers solutions for bottlenecks: Treat and move patients in record time; How to cut delays on the front end; and SPECT imaging boosts flow: Here's how to use it.*)
2. Explain developments in the regulatory arena and how they apply to the ED setting. (See *When to report sentinel events during transfer.*)
3. Share acquired knowledge of these developments and advances with employees.
4. Implement managerial procedures suggested by your peers in the publication.

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*Your reader survey will make a difference*

Enclosed in this issue of *ED Management*, you'll find two special surveys. The first one is our reader survey, designed to find out how well the newsletter is meeting your needs and to ask you for information about successful programs, strategies, or technology you've used in your own emergency department. The second one is a Web site/listserv form you can use to send us any sites you have found useful. Your comments will help make the newsletter more helpful to you and your peers in emergency medicine. ■

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