

# ED NURSING™

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## Overhauled asthma guidelines: The way you care for patients will be revamped

*Revised classifications of severity, new treatment options are spelled out*

A teen-ager with mild intermittent asthma used a quick relief inhaler only one day a week or less, but still developed a viral upper respiratory infection, recalls **Karen Huss**, RN, DNSc, CANP, FAAN, associate professor at the Johns Hopkins University School of Nursing in Baltimore, and member of the National Asthma Education Program Nurses' Committee, part of the Bethesda, MD-based National Heart, Lung, and Blood Institute.

"She went to a family outing for the day, which included horseback riding and being around other furred animals to which she was allergic," Huss says. "Later that evening, she had a severe attack which was not helped by her quick relief medication. She required hospitalization, including intubation for a severe attack."

Recognizing that even a patient with mild intermittent asthma can have a severe exacerbation is one of the many dramatic changes to asthma guidelines from the institute, titled *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*. (See excerpt, p. 63. See ordering information, p. 65.)

The guidelines can help you develop a cutting-edge strategy to manage asthma,

## ED Nursing covers new asthma guidelines

This special issue of *ED Nursing* updates readers on the newly revised asthma guidelines from the National Heart, Lung, and Blood Institute, which will dramatically impact ED care of asthmatics.

Read our cover story for a complete overview of key changes, including revised definitions and treatment options. Sidebars report on a unique program to educate pediatric asthmatics, new asthma medications, and admission criteria. In related stories, we debunk common misconceptions about asthma and list key questions to ask asthma patients. Special features for this issue include an excerpt from the guidelines, innovative forms to track patients and improve care, an asthma IQ test and calendar handout for children, and forms to share with your local school district.

## EXECUTIVE SUMMARY

Revised asthma guidelines have been published by the National Heart, Lung, and Blood Institute to address both acute exacerbations and chronic management.

- Definitions of mild, moderate, and severe have changed to mild intermittent, mild persistent, moderate persistent, and severe persistent.
- Patients at any level of severity can have mild, moderate, or severe exacerbations of asthma.
- New treatment options include anticholinergics for patients with moderate and severe exacerbation and higher dose beta agonists.

emphasizes **Richard Nowak**, MD, FACEP, vice chairman of the emergency medicine department at Henry Ford Health System in Detroit.

“We need to have some scientific basis for our overall approach to asthma,” Nowak says. “The guidelines represent a comprehensive, multidisciplinary overview of both chronic and acute exacerbation management.”

“The idea of the guidelines is to provide quick, efficient care of the asthmatic with exacerbation and have it driven by objective guides such as pulmonary function instead of just a gestalt,” says **Rita Cydulka**, MD, emergency medicine department residency director at Case Western Reserve University in Cleveland. “The guidelines are very clear-cut and easy to institute. Following them will allow for quick, efficient care of the asthmatic patient.”

The guidelines are lengthy, which makes it difficult for busy practitioners to read them in their entirety, notes Huss. “There is a *Practical Guide for the Diagnosis and Management of Asthma*, which is based on the full report,” she explains. “It concentrates on improving asthma care by health care providers within the time constraints of their practices.”

Here are some key points in the revised guidelines:

- **Know changed definitions of severity.**

Asthma severity classifications have been changed from mild, moderate, and severe to the following: mild intermittent, mild persistent, moderate persistent, and severe persistent. “These categories better reflect the clinical manifestations of the disease,” says Huss.

- **Use a stepwise approach.**

In a stepwise approach to therapy, the dose and number of medications and frequency of administration are increased or decreased whenever possible. The changed categories for severity make it possible to use a stepwise approach to treat asthma, says Huss. The stepwise approach also emphasizes initiating higher level therapy at the onset to establish prompt control, then stepping down, she explains.

- **Be familiar with the new peak flow parameters.**

“It used to be that a severe exacerbation had a peak flow of less than 40% predicted; now it’s less than 50% predicted,” Cydulka says. “Moderate is now from 50% to 80%, and mild is above 80%.”

- **Understand the two categories of medications.**

The guidelines now categorize medications into two general classes: long-term control medications for control of persistent asthma and quick relief medications to treat acute symptoms and exacerbations. Patients with persistent asthma require both classes of medication, notes Huss.

“The most effective medications for long-term therapy are those having anti-inflammatory effects,” she says. Inhaled steroids are the most effective anti-inflammatory medications, according to the guidelines.

- **Start therapy at triage.**

“The guidelines address the recognition of acute exacerbations, objective measurements of that, and initiation of appropriate therapy by nursing staff,” notes Nowak. “Nurses should establish the level of severity and initiate albuterol inhalation. If patient can’t be seen immediately, you should continue to give beta agonists until they are seen.”

Understand how to assess severity during presentation and the patient’s therapy, says Nowak. “In our ED, nurses administer albuterol, not the respiratory department. There is definitely a role for nurses not only to assess, but to treat,” he adds.

- **Know correct dosages.**

“The guidelines give you a framework for dosage of the beta agonists. If you’re severe, it’s 5 mg. If you’re not, it’s 2.5 mg, with three treatments in the first hour,” says Nowak. “That’s an approach to start with. Then you can follow them closely in terms of

(Continued on page 65)

## COMING IN FUTURE MONTHS

■ New approaches for seizures

■ HIV reporting controversy

■ Manage difficult physicians

■ Create a trauma flow sheet

■ Start a sexual assault nurse examiner program

## Emergency Department and Hospital Management of Asthma Exacerbations (Excerpt)

Severe exacerbations of asthma are potentially life-threatening. Care must be prompt. Effective initial therapies (i.e., a short-acting  $\beta_2$  agonist and the means of giving it by aerosol and a source of supplemental oxygen) should be available in a physician's office. However, severe exacerbations require close observation for deterioration, frequent treatment, and repetitive measurement of lung function. Therefore, most severe exacerbations of asthma require prompt transfer to an emergency department for a complete course of therapy. An overview of the treatment strategies in emergency departments and hospitals is detailed below.

### Assessment

An expert panel of the National Institutes of Health, National Heart, Lung, and Blood Institute in Bethesda, MD, recommends all clinicians treating asthma exacerbations be familiar with the characteristics of patients at risk for life-threatening deterioration. In the emergency department, treatment should be started as soon as an asthma exacerbation is recognized and assessment of lung function is made.

While treatment is given, obtain a brief, focused history and physical examination pertinent to the exacerbation. Take a more detailed history and complete physical examination and perform laboratory studies only after initial therapy has been completed.

#### Objectives of functional assessment are to:

- Obtain objective information on the severity of airflow obstruction and the patient's response to treatment.
- In the emergency department, obtain forced expiratory volume in one second ( $FEV_1$ ) or peak expiratory flow (PEF) on presentation, after initial treatment, and at frequent intervals thereafter, depending on the patient's response to therapy. Rarely, a patient's airflow obstruction may be so severe as to prevent performance of a maximal expiratory maneuver.
- In the hospital, measure  $FEV_1$  or PEF before and 15-20 minutes after bronchodilator therapy during the acute phase of the exacerbation.

Thereafter, measure  $FEV_1$  or PEF at least daily after discharge. Values  $<30\%$  of predicted that improve by  $<10\%$  after bronchodilator therapy or that fluctuate widely over 24 hours indicate a heightened risk of life-threatening deterioration.

In patients with severe distress or with  $FEV_1$  or PEF  $<50\%$  of predicted, assess the adequacy of arterial oxygen saturation by pulse oximetry.

#### Objectives of the brief history are to determine:

- time of onset and cause of current exacerbation;
- severity of symptoms, especially compared with previous exacerbations;
- all current medications and time of last dose;
- prior hospitalizations and emergency department visits for asthma, particularly within the last year;
- prior episodes of respiratory insufficiency due to asthma (loss of consciousness or intubation and mechanical ventilation);
- other potentially complicating illness, especially other pulmonary or cardiac disease or diseases that may be aggravated by systemic corticosteroid therapy such as diabetes, peptic ulcer, hypertension, and psychosis.

#### Objectives of the physical examination are to:

- assess the severity of the exacerbation as indicated by the findings;
- assess overall patient status, including level of alertness, fluid status, and presence of cyanosis, respiratory distress, and wheezing. Wheezing can be an unreliable indicator of obstruction; in rare cases, extremely severe obstruction may be accompanied by a "silent chest";
- identify complications (e.g., pneumonia, pneumothorax, or pneumomediastinum);
- identify other diseases that may affect asthma (e.g., allergic rhinitis or sinusitis);
- rule out upper-airway obstruction. Both intrathoracic and extrathoracic central airway obstruction can cause severe dyspnea and may be diagnosed as asthma. Causes include

epiglottitis, organic diseases of the larynx, vocal cord dysfunction, and extrinsic and intrinsic tracheal narrowing. Clues as to their presence include dysphonia, inspiratory stridor, monophonic wheezing loudest over the central airway, normal values for  $PO_2$ , and unexpectedly complete resolution of airway obstruction with intubation. When upper airway obstruction is suspected, obtain further evaluation by flow-volume curves and referral for laryngoscopy.

The most important objective of laboratory studies is detection of actual or impending respiratory failure; other objectives include detection of theophylline toxicity and conditions that complicate the treatment of asthma exacerbations. Do not permit these studies to delay initiation of treatment. For example:

Consider arterial blood gas (ABG) measurement for evaluating arterial carbon dioxide tension ( $PCO_2$ ) in patients with suspected hypoventilation, with severe distress, or with  $FEV_1$  or PEF 30% of predicted after initial treatment. (Note: Respiratory drive is typically increased in asthma exacerbations, so a "normal"  $PCO_2$  of 40 mm indicates severe airflow obstruction and a heightened risk of respiratory failure.)

Complete blood count (CBC) may be appropriate in patients with fever or purulent sputum; keep in mind modest leukocytosis is common in asthma exacerbations and corticosteroid treatment causes a further outpouring of polymorphonuclear leukocytes within one to two hours of administration.

Measure serum theophylline concentration in patients taking theophylline prior to presentation.

It may be prudent to measure serum electrolytes in patients who have been taking diuretics regularly and patients with coexistent cardiovascular disease, because frequent  $\beta_2$  agonist administration can cause transient decreases in serum potassium, magnesium, and phosphate.

Chest radiography is not recommended for routine assessment but should be obtained in patients suspected of a complicating cardiopulmonary process, such as pneumothorax, pneumomediastinum, pneumonia, lobar atelectasis, or congestive heart failure.

Electrocardiograms need not be routinely

obtained, but a baseline electrocardiogram and continual monitoring of cardiac rhythm are appropriate in patients older than 50 years of age and those with coexistent heart disease or chronic obstructive pulmonary disease. The electrocardiogram may show a pattern of right ventricular strain that reverses promptly with treatment of airflow obstruction.

#### **Assessment considerations unique to children and infants are as follows:**

It is often difficult for physicians and parents to determine the severity of the airway obstruction in infants and small children with asthma. However, using a combination of the subjective and objective parameters permits a fairly accurate assessment to guide initial therapy. Many of these parameters have not been systemically studied, so they serve only as general guides.

The differences in the anatomy and physiology of the lungs of infants place them at greater risk for respiratory failure. These differences include greater peripheral airway resistance, fewer collateral channels of ventilation, further extension of airway smooth muscle into the peripheral airways, less elastic recoil, and mechanical disadvantage of the diaphragm. Viral infections, particularly respiratory syncytial virus, are the most common cause of acute wheezing illness in infants. The edematous inflammatory response in the airways leads to air trapping and hyperinflation, atelectasis, increased respiratory rate, and wheezing. This sequence of changes can rapidly progress to respiratory failure. Close monitoring is crucial.

It is particularly important to monitor  $O_2$  saturation by pulse oximetry in infants because their ventilation/perfusion characteristics lead them to become hypoxemic more readily than adults.  $SaO_2$  should be normal for altitude (>95% at sea level). Decreased oxygen saturation is often an early sign of severe airway obstruction, and an  $SaO_2$  <91% on room air is a good predictor of the need for hospitalization in small infants.

Capillary or ABG measurements should be performed in infants suspected of respiratory failure.  $PCO_2$  is the best measurement of ventilation in infants, as it is in adults. Children with a normal  $PCO_2$ , but in obvious respiratory distress are at high risk for respiratory failure.

*Source:* Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma, National Institutes of Health, National Heart, Lung, and Blood Institute, Bethesda, MD.

repetitive pulmonary function testing.”

- **Look at the big picture.**

“We are managing a disease, and acute asthma is a small part of that,” says Nowak. “We need to be sure patients are appropriate with medicines and have some sort of plan, including peak flow monitoring. It’s important that they understand not only the acute management, but also the chronic strategies to keep them out of the hospital.” (See **questions to ask asthma patients, p. 67.**)

- **Make sure patients are well-oxygenated.**

“The guidelines say that inhaled  $\beta_2$  agonists are the first line treatment, and systemic corticosteroids should be considered for all exacerbations in the moderate to severe range,” says Cydulka. “The guidelines also say to consider oxygen to relieve hypoxemia for moderate to severe exacerbations.

“Response to therapy should be monitored with a serial measurement of lung function,” she adds. “The goal of treatment is to correct hypoxemia to rapidly restore airway function and reduce relapses.”

- **Consider anticholinergics for patients with moderate and severe exacerbation.**

“Even though the research is mixed, the guidelines say anticholinergics should be considered,” notes Cydulka.

- **Consider higher dose beta agonists.**

“Consideration of higher dose beta agonists for everyone except the mildest of exacerbations is new in this set of guidelines,” says Cydulka. “The current thinking is that .5 mg instead of .25 mg seems to be more effective.”

- **Be familiar with ventilation issues.**

“The new treatment addressed in these guidelines is permissive hypocapnea. This is a ventilator strategy that minimizes airway pressures and hopefully minimizes barotrauma,” says Cydulka. “Whereas in the past we’d try and make sure that the  $\text{CO}_2$  level was normal, now we’ll allow hypocapnea and just treat the respiratory acidosis with bicarbonate.”

- **Know recommended treatments.**

“The mainstay of therapy is short-acting inhaled  $\beta_2$  agonists every two to three minutes for three treatments for all patients,” says Huss. “Subsequent therapy and disposition depends on response.” (See **story on new and controversial asthma treatments, p. 66.**)

Corticosteroids are given to most patients, usually orally, Huss says. “Onset of action is four hours or longer,” she explains. “Often, a three- to 10-day course of moderate to high dose steroids is given [in adults, usually 400 to 600 mg daily]. When given in a short course, tapering is not necessary.” (See **related story on asthma myths, p. 66.**) ■

## Which asthma patients should be admitted?

“After the patient is worked up, a decision needs to be made: Do they go home, to a clinical decision or observation unit, or get admitted to the hospital?” asks **Richard Nowak**, MD, FACEP, vice chairman of the department of emergency medicine at Henry Ford Health System in Detroit. Here are some things to consider when evaluating a patient’s need for admission:

- **Monitor patients carefully.**

“Nursing monitoring with repetitive monitoring of peak flow and clinical evaluation is an important part of making the decision about admission,” says Nowak.

- **Consider placing patient in observation unit.**

Many asthma patients can be managed in an observation unit in the ED, notes Nowak.

“A lot of asthmatics don’t need three- or four-day admissions,” he says. “Before, we had only two options: Does the patient go home, or are they are hospital admission? The guidelines don’t make that stipulation; they just identify which patients need more care. Now we have more avenues than before to manage these patients.”

- **Beware of risks of moderate exacerbations that don’t respond to treatment.**

The decision is the most difficult with patients with a moderate exacerbation who don’t respond well in the ED, notes **Rita Cydulka**, MD, residency director for the department of emergency medicine at Case Western Reserve University in Cleveland.

“It’s unclear whether the right answer is hospitalizing

## Resources

The *National Heart, Lung, and Blood Institute’s Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma* (NIH Publication 97-4051) is \$7 for single copies. An abbreviated version of the guidelines, *Practical Guide for the Diagnosis and Management of Asthma* (NIH Publication 97-4053), is \$5 for single copies, with no shipping and handling charge for orders under \$6. To order, contact:

- **National Heart, Lung, and Blood Institute Information Center**, P.O. Box 30105, Bethesda, MD 20824. Telephone: (301) 251-1222. Web site: [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov).

them or sending home with an intensive treatment plan,” she says. “The reality is, it’s frequently a judgment call. You need to consider background information, including past history with asthma, history of hospitalizations, and whether they have access to care quickly.”

- **Consider patient history.**

The decision needs to be based on pulmonary function testing and other criteria, notes Nowak.

“The guidelines give you peak flow criteria, but also a whole set of clinical scenarios that you need to consider when deciding who to admit,” says Nowak. “If a patient has multiple previous admissions, is homeless, or has no access to medical care, you are more likely to admit them.”

- **Monitor patient’s initial response.**

The response to the initial treatment in the ED is a better predictor of the need for hospitalization than the severity of the attack on presentation, notes **Karen Huss**, RN, DNSc, CANP, FAAN, associate professor at the Johns Hopkins University School of Nursing in Baltimore, and member of the National Asthma Education Program Nurses’ Committee. ■

## Are you up-to-date on new asthma treatments?

New medications are available for treatment of asthma. Here are several that emergency department nurses need to be aware of:

- **Controversial therapies.**

Controversial therapies include use of anticholinergics, magnesium, and heliox, says **Rita Cydulka**, MD, residency director for the department of emergency medicine at Case Western Reserve University in Cleveland.

“The use of noninvasive positive pressure ventilation in the treatment of severe asthmatics is also controversial,” says Cydulka. “Inhaled corticosteroids in ED treatment is controversial, as is the usefulness of inhaled corticosteroids at discharge, although the use for maintenance is very clear-cut.”

“The effectiveness of these treatments hasn’t been determined,” she says. “Some of the literature has showed that magnesium sulfate is effective for severe exacerbation, but not very effective for mild or moderate exacerbation,” she says.

Likewise, heliox appears to be effective with severe exacerbation, but so far no role has been found for moderate or mild exacerbation, Cydulka says.

“There have been a few studies on inhaled corticosteroids, but there is not enough literature out on that

yet,” she adds. “Leukotriene modifiers are in the process of being addressed, but their role in an exacerbation has not been delineated yet at all.”

- **Methylxanthines.**

Sustained-release theophylline is a mild-to-moderate bronchodilator used principally as adjuvant to inhaled corticosteroids for prevention of nocturnal asthma symptoms, says Cydulka. “However, the guidelines do not recommend use of methylxanthines,” she notes.

- **Antibiotics.**

“Antibiotics are also still not recommended unless there is an infection noted. And aggressive hydration is not recommended unless indicated,” Cydulka adds.

- **Long-acting inhaled  $\beta_2$  agonists.**

Long-acting inhaled  $\beta_2$ -agonists is adjunctive therapy to inhaled corticosteroids, especially for night-time symptoms, says **Karen Huss**, RN, DNSc, CANP, FAAN, associate professor at the Johns Hopkins University School of Nursing in Baltimore, and member of the National Asthma Education Program Nurses’ Committee, part of the Bethesda, MD-based National Heart, Lung, and Blood Institute.

Duration of action is 12 hours, Huss says. “It is not to be used for acute symptoms or acute exacerbations, because it takes at least 30 minutes to work,” she explains.

- **Leukotriene modifiers.**

Leukotriene receptor antagonist for age 12 and older, is used BID, says Huss.

“Leukotriene modifiers may be useful as daily long-term control medications for patients with mild persistent asthma,” she says. “Their role in helping asthma in more severe cases is not yet established.”

- **Zileuton lipoygenase inhibitor.**

Zileuton lipoygenase inhibitor is used QID for ages 12 and older, says Huss.

- **Montelukast leukotriene receptor agonist.**

Montelukast leukotriene receptor agonist are used for ages 6 and older with once-a-day dosage, Huss says. ■

## Eight asthma myths you need to recognize

When treating asthmatics, keep in mind these eight myths:

- **Myth 1: If patients have already used beta agonists at home, there is no reason to give beta agonist therapy.** “Failure of beta agonist therapy at home does not translate to failure of beta agonist in the ED,” says **Rita Cydulka**, MD, residency director for the department of emergency medicine at Case Western Reserve

## EXECUTIVE SUMMARY

A number of myths exist about the treatment of asthma that could lead nurses to withhold needed treatment from patients. Here are the right responses:

- If beta agonist therapy failed at home, patients should still be given beta agonists in the emergency department.
- A silent chest of an asthmatic is a warning sign of possible ventilatory failure.
- Asthmatics with rapid respiratory rate should have diminished PCO<sub>2</sub>.
- Steroids should not be withheld from pregnant asthmatics.
- Used properly, meter dose inhalers are just as effective for treating exacerbations as aerosolized β<sub>2</sub> agonists.

University in Cleveland.

• **Myth 2: A silent chest is not an ominous sign.**

“Those people are probably near moribund,” Cydulka says. “When you listen to the chest of asthmatics, you usually hear wheezing. But sometimes you hear nothing, which means they’re so obstructed they aren’t able to generate a sound. You need to be very worried about these patients.”

• **Myth 3: A normal PCO<sub>2</sub> in an asthmatic that is breathing rapidly is not cause for concern.** “Actually, you should be concerned. One would expect that an asthmatic with a rapid respiratory rate would have diminished PCO<sub>2</sub>,” says Cydulka. “You would see a PCO<sub>2</sub> of 40 to 42 in an otherwise healthy person without asthma.”

But in an asthmatic with an increased respiratory rate, that is considered a CO<sub>2</sub> retention, because they should have a PCO<sub>2</sub> in the 25 to 30 range, Cydulka explains. “If the level is normal, it means they are failing to blow it off and having signs of ventilatory failure,” she says.

• **Myth 4: You shouldn’t treat pregnant asthmatics with steroids.** “Actually, the opposite is true,” advises Cydulka. “You need to be very vigilant in caring for pregnant asthmatics and give them steroids very readily. Asthmatics who do poorly have lots of maternal and fetal complications. They tend to be eclamptic and wind up with abruptions and babies small for gestational age babies. So you need to be extra careful rather than withholding treatment from them.”

• **Myth 5: Clinical judgment and physician exam are just as good an indicator of the state of the airways as pulmonary functions.** “We have done

studies where physicians were asked to guess the pulmonary functions of patients, and the results were not good,” Cydulka says. “You really need pulmonary functions to assess the level of obstruction. There have been multiple studies showing that vital signs and breath sounds normalize long before pulmonary function does.”

• **Myth 6: Metered-dose inhalers (MDIs) don’t work as well as nebulized aerosols during exacerbation.** “If patients are properly educated in the correct use of MDIs or given a spacer device to use, MDIs are just as effective for treating exacerbation as aerosolized beta agonists,” says Cydulka.

• **Myth 7: Most asthma patients will not be able to live a normal life.** That is a common misconception, says **Richard Nowak, MD, FACEP**, vice chairman of the department of emergency medicine at Henry Ford Health System in Detroit. “The guidelines clearly show that when asthmatics are appropriately managed, they can live a totally normal life,” Nowak says. “That includes not waking up at night, being able to exercise, and not being impaired in lifestyle. That is a realistic goal with appropriate strategies and avoidance of triggers.”

• **Myth 8: Asthmatics don’t belong in the ED.**

“It’s not that every asthmatic is incorrigible. Some can’t get to see their doctors; others are mismanaged or just don’t take their meds,” says Nowak. “If we can’t educate people to take inhaled corticosteroids steroids, maybe it’s our problem and we’re not doing it right. It’s a real challenge, but the more you know about the disease, the better you can educate the patient. You don’t want people to stay at home and die of an acute exacerbation of the disease.”

Asthmatics with very severe exacerbations should never hesitate to come to the ED, stresses Cydulka.

“When you have an asthmatic with acute ventilatory failure and respiratory failure, you may need to intubate and ventilate to maintain their oxygenation. However, that is not a cure, and it’s fraught with many complications,” she says. “Those are very frightening patients.” ■

## Seven questions to ask your patients about asthma

Many patients don’t know enough about management of asthma, warns **Rita Cydulka, MD**, residency director for the department of emergency medicine at Case Western Reserve University in Cleveland.

## SOURCES

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- **Richard Nowak**, MD, FACEP, Emergency Department, Henry Ford Health System, 2799 W. Grand Blvd., Detroit, MI 48202. Telephone: (313) 916-1909. E-mail: rnowak@home.com.

“The goal is to make asthmatics responsible for their care at home; recognize when they are able to adequately treat themselves at home; and seek emergency care before it’s too late,” she recommends. “We need to make the general population realize that although asthma is very common and we frequently think of it as a mild disease, about 4,000 people die from it each year.”

Take the time to ask asthmatics the following questions:

### 1. Do you understand what asthma is?

Explain to patients that asthma is a chronic inflammatory disorder of the airways, recommends **Karen Huss**, RN, DNSc, CANP, FAAN, associate professor at the Johns Hopkins University School of Nursing in Baltimore, and member of the National Asthma Education Program Nurses’ Committee, part of the Bethesda, MD-based National Heart, Lung, and Blood Institute. “This has implications for the diagnosis, management, and prevention of the disease,” she says.

Asthma includes the following immunohistopathologic features, she says:

- denudation of airway epithelium;
- collagen deposition beneath basement membrane;
- edema;
- mast cell activation;
- inflammatory cell infiltration;
- airway inflammation contributes to airway hyperresponsiveness to a wide variety of stimuli;
- airway inflammation contributes to airflow limitation including acute bronchoconstriction, airway edema, mucus plug formation, and airway wall remodeling. These lead to bronchial obstruction; and atopy, the

genetic predisposition for the development of mediated response to common aeroallergens, is the strongest identifiable predisposing risk factor for developing asthma.

Before discharge, patients must know how to take their medications through written and verbal information, (usually) be provided with a peak flow meter, trained on inhaler technique, and referred for medical follow-up, says Huss. “Also, they should know when to return to the ED if symptoms return or peak flows drop,” she advises.

### 2. Do you know what triggers your asthma?

Studies demonstrated that patients presenting to EDs for asthma have a high rate of sensitization to indoor allergens, says Huss.

“About 80% of young children and 50% of more of adults will have an allergic component to their disease,” she notes.

Asthmatics may be allergic to indoor allergens such as house dust mites, cat hair, dog dander, and cockroaches, says Huss. “Once I determine what the patient is allergic to by allergy skin testing, I emphasize allergen specific environmental control measures to reduce chronic inflammation in the airways.”

### 3. Do you know when to come to the ED?

Revised asthma guidelines from the National Heart, Lung, and Blood Institute include a home management protocol that gives a sample strategy for using the inhaler with two or three puffs every 20 minutes for an hour.

“But it’s guided by pulmonary function testing, and if it’s not improving, then patients need to go to the ED,” says **Richard Nowak**, MD, FACEP, vice chairman of the department of emergency medicine at Henry Ford Health System in Detroit.

Patients may be managed by primary care practitioners who aren’t following the guidelines, notes Nowak. “You may need to look at what the chronic care physician is doing. They might not meet the [institute’s] recommendations. If a patient comes in who isn’t being managed as well as they should be, we should write them a prescription for analcoteroid steroids if they need them.”

The goal is to reduce visits to the ED, says Nowak. “In addition to treating acute exacerbation, it would be nice if we can add therapies so the patient can better control the disease.”

### 4. Do you understand the difference between your medications?

“Review with patients which are the long-term medications that prevent symptoms and reduce inflammation, and which are the quick-relief meds like bronchodilators to take if you feel obstructed to help relax the muscles around their airways,” says Cydulka.

A common problem occurs when a patient uses long-term control medications when they have an

exacerbation, she says. "So they'll furiously take puffs on steroid inhaler and expect quick relief when that's not the way those medications work," Cydulka explains.

### 5. Will you seek follow-up care?

"The ED nurse should emphasize the importance of follow up with primary care provider or an asthma doctor so they can develop action plans," says Cydulka.

### 6. Do you know how to use your inhaler?

"I find that many patients in the ED just don't know how to use their inhalers," says Cydulka. "Have the patient show you how they use it, then review with them step by step. There are picture guides in the guidelines which you can use."

### 7. Do you monitor symptoms at home?

"Talk to them about monitoring their symptoms and peak flows at home, so they can recognize early on that their asthma is worsening," suggests Cydulka. "It's rare that we see patients early on in the asthma attack. We usually see them as time goes on." ■

## Emergency department targets pediatric asthma

At Hemet Valley Medical Center's ED in Hemet, CA, a task force that targets pediatric asthma with a focus on education began after one child had nine ED visits in one month and was at risk for death.

"She came in cyanotic with acute conditions many times," says **Jessica Lopez**, RCP, CRTT, RTT, respiratory therapy educator for the ED.

The child wasn't able to get her inhalers refilled because she would use all of her doses in two weeks, Lopez recalls.

"She had many middle of the night trips to the ED, and her family had no car or phone, which increased our concern," she says. "It was clear she was going to be a frequent flier constantly if we didn't correct this."

A task force was formed to address the problem, including monthly tracking of pediatric asthma patients. A tracking form is used to review charts of all asthma patients ages 0 to 18, then the data is compiled into quarterly data. (See **QA/I Retrieval Form for Pediatric Asthma Patients**, inserted in this issue.) A Variance Tracking Sheet is used to track problems of managing asthma patients in a timely manner and documents delays in available beds, information, and supplies or ancillary services. (See **form inserted in this issue**.)

An educational packet was created, and is handed out to every asthma patient. "It's written at the third-grade reading level and includes things to do at home

## SOURCE

For more information on the Huff and Puff pediatric asthma program, contact:

- **Jessica Lopez**, RCP, CRTT, RTT, Hemet Valley Medical Center, 1117 E. Devonshire Ave., Hemet, CA 92543. Telephone: (909) 652-2811 ext. 5941.

to keep asthma from flaring up, such as reminders to do peak flow monitoring," says Lopez.

The packet includes a coloring book, asthma calendar, and asthma IQ quiz. (See **Asthma Explorers calendar and "Check your asthma IQ" form**, inserted in this issue.)

All children aged 5 to 18 are trained in peak flows before they leave the ED. Patients are educated about environmental triggers, such as smoking cessation, removing or cleaning carpet, and covering mattresses and pillows with plastic, notes Lopez. (See **chart on environmental preventions for asthma**, p. 72.)

A pediatric asthma chart for children less than 18 includes nursing diagnosis, response to interventions after 20 minutes, one hour, and three hours, and referrals. (See **form**, inserted in this issue.)

"The form includes making sure all children patient receives asthma education before they leave the ED, and get a referral to our Huff and Puff classes, which are held each month at one of three hospitals," says Lopez.

Outreach education is done at schools with local pediatricians. "Our ED asthma committee is currently meeting with our two school districts to provide further education for teachers and students," Lopez reports.

A form is given to schools for asthmatic children, including emergency contact information, daily asthma management plan, daily medication plan, and steps to take during asthma episodes. (See **Asthma Student Action Information form**, p. 70.)

### *Huff and Puff program a success*

A three-session Huff and Puff asthma program is available for children ages 2 through 13. Only parents attend the first session, which includes how asthma affects the lungs, how to monitor a child's signals, asthma triggers, medications, prevention of signals, and asthma control plan. Both parents and children attend the following two sessions.

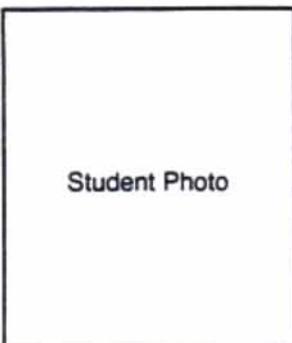
"We focus a lot on emergency patients who we see

(Continued on page 72)



# Asthma Student Action Information

## GENERAL INFORMATION



Name \_\_\_\_\_ Age \_\_\_\_\_

Teacher \_\_\_\_\_ Room \_\_\_\_\_ Grade \_\_\_\_\_

Parent/Guardian Name \_\_\_\_\_ Home Phone \_\_\_\_\_

Address \_\_\_\_\_ Work Phone \_\_\_\_\_

Parent/Guardian Name \_\_\_\_\_ Home Phone \_\_\_\_\_

Address \_\_\_\_\_ Work Phone \_\_\_\_\_

## EMERGENCY AND PHYSICIAN CONTACTS

Emergency Contact #1 \_\_\_\_\_  
Name \_\_\_\_\_ Relationship \_\_\_\_\_ Phone \_\_\_\_\_

Emergency Contact #2 \_\_\_\_\_  
Name \_\_\_\_\_ Relationship \_\_\_\_\_ Phone \_\_\_\_\_

Emergency Contact #3 \_\_\_\_\_  
Name \_\_\_\_\_ Relationship \_\_\_\_\_ Phone \_\_\_\_\_

Physician for Asthma Treatment \_\_\_\_\_  
Name \_\_\_\_\_ Phone \_\_\_\_\_

Other Physician \_\_\_\_\_  
Name \_\_\_\_\_ Phone \_\_\_\_\_

## DAILY ASTHMA MANAGEMENT PLAN

Identify things that start asthma episode (check all that applies to student)

- |   |  |   |   |
|---|--|---|---|
| <input type="checkbox"/> Exercise               | <input type="checkbox"/> Strong odors or fumes | <input type="checkbox"/> Molds            | <input type="checkbox"/> Foods #1 _____ |
| <input type="checkbox"/> Respiratory infections | <input type="checkbox"/> Chalk dust            | <input type="checkbox"/> Windy conditions | <input type="checkbox"/> Foods #2 _____ |
| <input type="checkbox"/> Change in temperature  | <input type="checkbox"/> Carpets               | <input type="checkbox"/> Air pollution    | <input type="checkbox"/> Other #1 _____ |
| <input type="checkbox"/> Animals                | <input type="checkbox"/> Pollens               |   | <input type="checkbox"/> Other #2 _____ |

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

Control measures for school environment (list pre-medications, dietary restrictions, and environmental control to prevent asthma episode). \_\_\_\_\_

Peak Flow Monitoring Peak flow number \_\_\_\_\_ Monitoring times \_\_\_\_\_

## DAILY MEDICATION PLAN

	Name	Amount	Time to use
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

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## Environmental Preventions for Asthma

One bottle boric acid solution (8 ounces) added to water (2-3 gallons) only in steam cleaner. Clean 9-by-15 room. If carpets need to be cleaned, clean carpets, then rinse carpet thoroughly once with water only, then use boric acid solution. Allow carpet to dry thoroughly. Use solution every three months.

Cover pillows and mattress with zippered plastic covers.

Change pads in swamp coolers every month during use.

In central heat and air system, change disposable filters every month if possible or every three months without fail. Washable filters should be cleaned monthly and allowed to dry completely before returning. When washable filters no longer fluff up, replace them. (3M has a filter now that even picks up .4 mc particles such as viruses).

Cleaning and disinfecting household surfaces can be done using one part white vinegar and one part tap water. Wipe down surfaces in kitchen, bathroom, play areas, and any washable surface. Allow to dry thoroughly.

Weekly, remove bedspread comforter, pillows, and stuffed animals from room. Hang on clothesline for two hours or place in dryer on "air fluff" for 20 minutes to remove dust and dander from these items.

Change bedding weekly. Wash bedding in hot water and dry thoroughly. Vacuum mattress if not covered with plastic. If there is a cover on the mattress, wipe down with vinegar solution.

Source: Hemet Valley Medical Center, Hemet, CA.

frequently. If a child has no transportation, someone will pick them up and bring them to class," says Lopez.

Insurance companies provided incentives for ED patients if they complete the hospital's asthma programs, such as gift certificates to local supermarkets.

Asthmatic children who visit the ED frequently are at risk of death, stresses Lopez.

"A lot of times they don't follow through with their primary care provider, so they are at great risk," she says. "Asthma visits have been increasing every year, especially among young children. Our goal is to keep them from having a debilitating illness or permanent brain injury from their asthma." (See p. 75 for more on avoiding asthma fatalities.) ■

## Be the first to know about drug testing device

A newly approved drug testing device, OnTrak Test Cup ER, can reduce delays in waiting for test results from hours to minutes.

"This is a very efficient way of obtaining urine toxicology screening," reports **Howard Freed, MD**, chairman of the department of emergency medicine at District of Columbia General Hospital, in Washington, DC, and principal investigator for a clinical testing protocol for the device.

"In the ED, it's not unusual to have to wait a week for results," Freed says. "Now we can get them back within minutes. As a result, our patterns of care could change."

OnTrak TestCup ER from Roche Diagnostics in Somerville, NJ, is a self-contained, integrated collection and testing device that screens for drugs commonly linked to ED admissions. The device can simultaneously detect cocaine, morphine, amphetamines, barbiturates, and benzodiazepines and provide positive or negative results in five minutes, Freed notes. (See **information on how to use the test, p. 73. See ordering information, p. 74.**)

The device is similar to the original OnTrak Test Cup used for workplace and criminal justice drug testing, which was approved several years ago. Test Cup tests for five substances: marijuana, cocaine, amphetamines, opiates, and PCP.

"The difference with the Test Cup ER is that the marijuana and PCP have been replaced with tests for barbiturates and benzodiazepines," says **Stuart Bogema, PhD**, a clinical toxicologist at Forensic Testing, a Clifton, VA-based research consulting firm that evaluated OnTrak Test Cup ER. "These drugs are more common with overdose situations."

### EXECUTIVE SUMMARY

An on-site integration drug testing device called OnTrak Test Cup ER, has received approval from the Food and Drug Administration.

- The device can simultaneously detect cocaine, morphine, amphetamines, barbiturates, and benzodiazepines and provide positive or negative results in five minutes.
- The device enables quick screening for cocaine in potential cardiac cases.

## How to use OnTrak Test Cup ER

**O**nTrak Test Cup ER, an on-site integration drug testing device from Roche Diagnostics in Somerville, NJ, is very simple to use, so staff inservicing is minimal, notes **Howard Freed**, MD, chairman of the department of emergency medicine at District of Columbia General Hospital, in Washington, DC.

“The test is performed in the same plastic cup that the urinalysis is obtained in. A toxicology test is built into the cup, so no transfer of urine is necessary,” he says. “It has controls for each test built right into the urine cup.”

The Test Cup is simple to use. “There is no pipetting and no dipping of the card. After the specimen is collected, the cup is tilted for 10 seconds. In a couple minutes, you have the result and can read it on the side of the cup,” says **Stuart Bogema**, PhD, a clinical toxicologist at Forensic Testing, a Clifton, VA-based research consulting firm that evaluated OnTrak Test Cup ER.

Once the urine sample is collected, the lid is secured and the sample is tilted forward for five to 10 seconds, allowing it to flow through a membrane to a sample reservoir in the cup. After the cup is righted and left undisturbed for a brief period, a distinct blue line in each drug’s “Test Valid” window indicates the results are ready. At that point, staff peel off the cover label to view the five results. Positive results are indicated by a white “plus” sign and negative results by a blue “minus” sign. ■

The Clinical Laboratory Improvement Act (CLIA) requires clinical labs to be licensed. Currently, there are no on-site drug testing devices available that have waived-test status for CLIA, which means most EDs can’t currently use the test. Waived-test status is expected later this year.

Here are some benefits of OnTrak TestCup:

- **Rapid results may save lives.**

Nearly 500,000 annual ED visits are directly linked to illicit drug abuse, according to the Department of Health and Human Services. Treatment of these patients can be positively impacted, says Freed.

“It would be most helpful in cases where we need to rule out drugs as a cause of a patient’s behavior,” he says. “Cocaine in particular is associated with MIs and

arrhythmias, and this would give us a heads up on whether cocaine is involved.”

The device enables quick screening for cocaine in those potential cardiac cases, says Freed. “If we have a young patient with suggestive symptoms of myocardial ischemia, I think we’ll be more likely to take it seriously as a potential hospitalization if we know that cocaine is involved,” he explains.

Rapid results can potentially save patients’ lives, says Bogema. “With drug tests performed in the laboratory, the result arrives back at the ED after the patient has been treated and released, so the information is not available to make treatment decisions,” Bogema notes.

Getting results within minutes could also smooth the interface between the ED and acute psychiatric intervention. “If we are doing a screening evaluation for a detox center, they may not want to take a patient if there is still morphine in their system,” says Freed.

- **Accuracy of results.**

“In my experience, it’s the most accurate of the on-site drug testing devices,” says Bogema. It has very low false positive and false negative rates, he notes.

With all the devices, you have a positive or negative based on the presence of a colored line, set above and below a threshold concentration, Bogema says. “This device is very accurate in determining whether a drug is positive, which is the most difficult thing for a manufacturer to do properly,” he says.

- **Cost-effective testing.**

Each device is disposable and can only be used once. “This would be less expensive than performing the test in the laboratory. If performed in the lab, the reagent cost would be comparable to the disposable device,” notes Bogema.

- **Reduction of delays.**

Little drug testing currently takes place directly in the ED, notes Bogema.

“Currently, all drug tests have to be sent to the laboratory in the hospital or clinic,” he says. “Just the process of collecting it, sending it, and waiting for results takes at least an hour or two hours.”

If you need to wait hours or days for results, delays are increased throughout the ED.

“You are possibly extending the stay of the patient for several hours in the ED, which is analogous to somebody staying an extra day in the hospital bed,” notes Bogema. “You save a significant amount of money over the course of a year by making make that space available for other patients.”

OnTrak Test Cup ER reflects a growing trend toward point of care testing in the ED, predicts Freed. “We can get results without the delays of specimen transport, handling of urine samples, timing, pipetting,

## SOURCES

OnTrak Test Cup ER can be ordered through:

- **Roche Diagnostics**, 1080 U.S. Highway 202, Somerville, NJ 08876-3771. Telephone: (317) 576-4755. Web site: [www.roche.com](http://www.roche.com).

For more information about OnTrak Test Cup ER, contact:

- **Stuart Bogema**, PhD, Forensic Testing, P.O. Box 196, Clifton, VA 20124. Telephone: (703) 968-7002. E-mail: [scbog@yahoo.com](mailto:scbog@yahoo.com)
- **Howard Freed**, MD, Emergency Care Center, District of Columbia General Hospital, 1900 Mass Ave. S.E., Washington, DC 20016. Telephone: (202) 675-5098. Fax: (202) 675-8053. E-mail: [chipfreed@aol.com](mailto:chipfreed@aol.com).

mixing, instrument calibration, and maintenance,” he says. “Any time we can perform a test much faster than we otherwise would, it has a very beneficial effect on reducing delays overall.” ■

## GUEST COLUMN



# When a partner is at risk from HIV-positive patient

By **Sue Dill Calloway**, RN, MSN, JD  
Director of Risk Management  
Ohio Hospital Association  
Columbus

What can a health care provider legally do if a patient is HIV-positive or tests positive for an STD and wants to warn the patient's spouse or partner?

This question is not addressed by federal law. Therefore, the states may enact legislation in this area. Most states have passed laws on this issue. For example, Ohio — like many other states — has a specific law that allows a physician to disclose that information to a spouse, sexual partner, or a needle-sharing partner without the patient's permission. Usually, we advise the emergency department physician to tell the patient they will inform the spouse and it would be better

coming from the patient.

All states have a reportable disease reporting law. Most states require the health care providers to report all sexually transmittable diseases to their state health department. The state health department conducts follow-up and attempts to locate any sexual contacts who might have been infected.

The issue of HIV-positive patients is a more difficult one, and this led many states to pass a specific state law that would address the issue. Therefore, every nurse and health care provider should be familiar with their state's specific statute. Nurses who are unfamiliar with their state's law should contact the facility's risk manager or in-house counsel for information on their state's law.

### *Some states prosecute as a felony*

Many states have a criminal law in place that makes it a felony offense for anyone who knows they have AIDS to have sexual intercourse with anyone else without disclosing this fact. Ohio has a state law, ORC 3701.243, titled *Confidentiality of Information about HIV tests*, which states that the results of an HIV test, or the identity of an individual on whom a test is performed, or who is diagnosed as having AIDS or an AIDS-related condition, may be disclosed to his spouse or any sexual partner.

This issue arose recently in the emergency department where I work. The patient had only been married for two weeks and he had not told his wife he was HIV positive. The patient informed the physician he did not want his wife to know. The physician sat down with the patient and explained that under the Ohio law, he was legally permitted to disclose this information to the patient's spouse. The physician explained that if the patient did not tell his wife, the physician would. The physician suggested to the patient that it might be better if the wife heard it from him. The patient concurred

## EXECUTIVE SUMMARY

In many states, health care providers can legally disclose a patient's HIV positive status to a spouse, sexual partner, or a needle-sharing partner without the patient's permission.

- Contact your facility's risk manager or in-house counsel for information on your state's law.
- In many states, it is a felony offense for anyone who knows they have AIDS to have sexual intercourse with anyone else without disclosing this fact.

## SOURCES

For more information about liability issues of HIV disclosure, contact the following:

- **Sue Dill Calloway**, RN, MSN, JD, Ohio Hospital Association, 155 E. Broad St., Suite 15, Columbus, OH 43215. Telephone: (614) 221-7614. E-mail: sued@ohanet.org

The Association of Women's Health Obstetric and Neonatal Nursing has a position statement titled *HIV/AIDS Testing and Disclosure*. Single copies are free for members with a \$4 shipping and handling charge, and \$15 for non members plus a \$4 shipping and handling charge. To obtain a copy, contact: A1 Distribution, 2000 L St. N.W., Suite 740, Washington, DC 20036. Telephone: (800) 354-2268 or (202) 261-2400. E-mail: tracyab@a1.org.

The American Nurses Association (ANA) has a position statement on guidelines for disclosure to a known third party about possible HIV infection. To obtain a copy, contact the ANA, 600 Maryland Ave. S.W., Suite 100 W., Washington, DC 20024. Telephone: (800) 274-4ANA or (202) 651-7027. E-mail: orders@ana.org. Web site: www.nursing-world.org.

and told his wife he was HIV positive.

Ohio law also provides immunity to any person who acts in good faith with this section of the law. The physician or health care provider is not liable for civil damages if a lawsuit is brought. Ohio law also states that a health care provider will not be liable for failure to disclose the information in this situation. ■



## Calculate ET tube size

**P**ediatric Advanced Life Support (PALS) teaches a formula to calculate the size of endotracheal (ET) tube you need for orotracheal intubation in children, says **Carolynn Zonia**, DO, FACEP, ED education director at St. Francis Hospital in Evanston, IL.

“Take the age in years divided by 4, plus 4,” Zonia explains. (Or, to arrive at the same number, take the age in years plus 16, divided by 4.)

Double that number to determine the Foley catheter tube size and orogastric tube size, she says. Double that number to determine the average size of chest tube to insert, she says. (You can arrive at that same number by multiplying the first number by 4, she explains.) ■

## Pediatric asthma fatalities put caregivers on Red Alert

**A**fter a child died of asthma symptoms in Gainesville, FL, in 1988, **Cindy L. Capen**, MSN, RN, began to develop the Red Alert Program at The University of Florida, in order to decrease asthma mortality among children.

The child's death was attributed to a combination of factors that programs like Red Alert can prevent, says the pediatric pulmonary division nursing specialist at the University of Florida in Gainesville. These factors include:

- family members uneducated about asthma;

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### Editorial Questions

**For questions or comments, call Joy Daughtery Dickinson at (912) 377-8044.**

- delays seeking medical attention;
- communication errors in emergency departments causing delays in treatment.

Capen says Red Alert helps at-risk children get rapid access to a network of health care professionals who are trained to swiftly respond to their needs. The program also provides individually tailored education and prevention techniques to parents and caregivers, as well as to others who interact with the child, such as school officials, teachers, EMS technicians, and primary care physicians.

“This is an aggressive safety net program,” she says. “There’s a lot of education and a lot of people involved.”

The approach is proactive. On three occasions, medical teams sought medical foster home placement when parents of young asthmatic children “failed to appropriately intervene in life-threatening episodes,” Capen says.

Patients are recommended for the program after showing difficulty controlling their disease. They may have had an asthma-related emergency, needed hospitalization three or more times, lack family support, or have other difficulty with asthma symptoms.

Here’s what is included in the Red Alert Program’s multidisciplinary intake assessments:

- the child’s asthma history;
- the child and the family’s knowledge of asthma and asthma management;
- family health beliefs;
- the child’s environmental and socio-economic factors.

A key to the Red Alert program is a rapid response network composed of family caregivers, the local emergency department, local ambulance service, child’s primary care physician, school or day care center, tertiary caregivers and the hospital’s pediatric pulmonary team.

Details of the child’s medical history, medications and instructions about appropriate responses to an acute episode are given to all those who were part of each child’s support network with the parents’ permission.

Local EMS crews in the child’s area get information about the patient, directions to the child’s residence, and instructions for emergency treatment specific to the equipment available to them.

Emergencies that take place during office hours are given immediate attention, and handled by a nurse specialist. At other times, a call to the hospital operator sets off a chain of emergency events:

- first, a STAT page to a pulmonologist;
- if the page is not answered within two minutes, a second pulmonologist is paged;
- if that page is not answered with two minutes, the senior pediatric resident is to be paged (Capen says this third step has never been necessary in the

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University of Florida’s experience).

“I think the idea is a really, really exciting one,” says **Diane McLean, PhD, MPH**, director of the Childhood Asthma Initiative for the Children’s Health Fund at Montefiore Medical Center Schering-Plough in New York City. “They recognized all the factors predictive of mortality and addressed them.” ■

## CE Objectives

After reading this issue of *ED Nursing*, the CE participant should be able to:

1. Identify clinical, regulatory, or social issues relating to ED nursing
2. Describe how those issues affect nursing service delivery.