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Beware the Rear Seat of Compact Extended-Cab Pickups

ABSTRACT & COMMENTARY

Source: Winston FK, et al. Risk of injury to child passengers in compact extended-cab pickup trucks. *JAMA* 2002;287:1147-1152.

THE COMPACT EXTENDED-CAB PICKUP TRUCK WITH A REAR occupant compartment has grown in popularity during the past decade. Yet, little is known regarding the safety of children seated in this rear compartment as compared to rear row seating in other vehicles such as standard passenger cars, vans, sport utility vehicles (SUVs), and full-sized extended-cab pickup trucks.

In this cross-sectional study, researchers compared injury rates and risk for injuries in children age 15 years or younger who were passengers in compact extended-cab pickup trucks vs. other types of vehicles involved in motor vehicle crashes (MVCs). Data were obtained from a large-scale, child-specific, crash surveillance system involving insurance claims data identifying MVC incidents in 15 states.

A stratified cluster sampling of these incidents then was investigated further by means of a telephone survey of the vehicle occupants and an on-site crash investigation. Compact extended-cab pickup trucks were defined as pickup trucks with a second row of seats and a gross vehicle weight rating of fewer than 6000 lbs.

Overall, complete data were obtained on 7192 MVCs involving vehicles with two or more seating rows. There were 11,335 children at risk for injury in these MVCs. Children in compact extended-cab pickup trucks comprised 1.1% of the population. Injuries occurred in 7.5% of children in the compact extended-cab pickup truck, compared with 1.6% in other vehicles.

Adjusting for age, restraint use, point of impact, vehicle weight, and crash severity, children in compact extended-cab pickup trucks were at three times greater risk of injury than in other vehicles (odds ratio [OR] = 2.96). Moreover, seating position (rear vs front) had a significant interaction, as rear-seated children were more than four times as likely to be injured as those in rear seats of other vehicles (OR = 4.75). In comparison, there was only a trend toward

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increased risk of injury to children seated in the front row of compact extended-cab pickup trucks compared to other vehicles. In addition, when comparing compact vs. full-sized pickup trucks, children in the rear seat of a compact vehicle were at twice the risk of injury.

Based on their findings, the authors conclude that children seated in compact extended-cab pickup trucks are not as safe as children seated in other vehicles. The authors suggest that parents who have a choice should not transport their children in these vehicles.

COMMENTARY BY THEODORE C. CHAN, MD, FACEP

Rear-row seating of children in motor vehicles has long been encouraged to reduce the risk of crash injuries in this population. This study suggests, however, that such advice may not be appropriate for the popular compact extended-cab pickup truck.

These vehicles have small rear occupant compartments, often with side-facing, fold-down, or jump seats. The seats are considered auxiliary and are not subject to the same testing requirements for interior impact as other vehicles.[1] In many instances, this rear compartment often has only two-point restraints and limited protective interior padding. In fact, researchers in this study found that contact with the vehicle interior contributed to the increased risk of injury to children in these vehicles.

The findings of this study are important to emergency physicians (EPs) for two reasons. First, EPs should be aware that children in such vehicles, particularly those seated in the rear, are at greater risk of significant injury requiring medical attention. Second, parents should be advised of the potential dangers of transporting children in the rear seat of these vehicles. In this study, 46% of children transported in compact extended-cab pickup trucks were in the rear seat. Parents and others should be advised that, unlike in other vehicles, the rear seat position may not be safer than the front seat in the compact extended-cab pickup truck. ❖

Reference

1. U.S. Federal Motor Vehicle Safety Standard (FMVSS) 201, Occupant Protection in Interior Impact (49 CFR 571.201).

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Commotio Cordis: Clinical Spectrum

ABSTRACT & COMMENTARY

Source: Maron BJ, et al. Clinical profile and spectrum of commotio cordis. *JAMA* 2002;287:1142-1146.

COMMOTIO CORDIS (CC) IS SUDDEN CARDIAC DEATH caused by a blunt, non-penetrating blow to the chest wall. Recent CC events have received increasing attention in the media, as early reports of CC in professional sports have been joined by reports of CC in youth sports and in seemingly benign activities. This paper examined a registry of 128 confirmed cases of CC in an attempt to describe the spectrum of causes and outcomes of CC events.

Each case met the following inclusion criteria: 1) witnessed blunt blow to the chest wall immediately preceding cardiovascular collapse; 2) detailed documentation of the circumstances from available sources; 3) lack of structural damage to the sternum, ribs, and heart; and 4) absence of underlying cardiovascular abnormalities. These cases were added to the registry through direct

submission by involved or interested parties, U.S. Consumer Product Safety Commission reports, and news media and Internet accounts.

Of the 128 cases of CC, 95% were in males and the mean age was 13.6 years, with a range of 3 months to 45 years. Only 22% of cases occurred in victims age 18 years or older. At the time of the event, 79 cases (62%) were participants engaged in 11 different organized sports, with baseball, softball, and ice hockey accounting for 74% of cases. Many of these athletes were struck with projectiles, most commonly baseballs. Two of these balls were commercially marketed as softer-than-normal "training" balls designed to reduce injury. With the exception of one case caused by a soccer ball, each of the projectiles causing CC had a solid core.

Of the competitive athletes, 22 (28%) were wearing standard, commercially available chest protectors. These included 12 hockey players (including two goalkeepers), five football players, three lacrosse goalkeepers, and two baseball catchers. Further analysis of these events describes mechanisms in which many of the CC-inducing blows may have struck the chest wall directly despite the presence of padding. This may have been due to relatively small chest protectors used in hockey and football that may have been displaced during motions such as raising the arms. However, seven of the events (in two baseball catchers, three lacrosse goalies, and two hockey goalies) most likely occurred despite blows that struck the chest protector directly, rather than the chest wall itself.

The other 49 (38%) CC events occurred during a wide variety of activities. These included non-organized sports, backyard recreational activities, and seemingly mild bodily contact during non-sports activities. These events ranged from snowball fights to sledding injuries to a fall from "monkey bars" at a playground. Several of these events happened during parent-to-child discipline and during playful "shadow" boxing. One small child sustained CC by being struck in the chest by the head of her pet dog as it ran to greet her.

Of the 128 cases of CC, 107 (84%) resulted in death. Of the 21 survivors, 19 had resuscitative measures instituted at the scene, including two cases terminated by an automated external defibrillator. The other two survivors responded spontaneously without resuscitation. Among 68 cases in which resuscitation was instituted within three minutes, 25% resulted in survival. In the cases in which resuscitation was not initiated within three minutes (often due to the failure of bystanders to appreciate the nature of the collapse), there was only one (3%) survivor. Data from the initial electrocardiogram conducted after collapse (if available) revealed ventricular fibrillation/ventricular tachycardia in 36 cases, asystole (unlikely the initial rhythm after impact as per the authors) in 40 cases, bradyarrhythmia in three cases, idioventricular rhythm in two cases, and complete heart block in one case.

COMMENTARY BY JACOB W. UFBERG, MD

This report underscores the need for improved protective sports equipment, and not only for professional athletes. A 90 mph fastball or professional slapshot is not required to cause CC. It can occur in seemingly benign situations, and we must emphasize to the public the danger of blows to the chest under any conditions.

This article also re-emphasizes the urgency of timely resuscitative efforts. While the mortality of CC was high regardless of the time to resuscitation, the survival rates were improved greatly when that time was less than three minutes. Increased public awareness of CC and increased access to automated external defibrillators potentially could improve survival after CC events. ❖

Macrolide-Resistant Strep Throat Infections Appear Common

ABSTRACT & COMMENTARY

Source: Martin JM, et al. Erythromycin-resistant group A Streptococci in schoolchildren in Pittsburgh. *N Engl J Med* 2002;346:1200-1206.

The authors of this investigation have been performing a long-term epidemiologic study of schoolchildren in a single, private elementary school in Pittsburgh. Approximately 100 children age 5-13 years have been followed for the past three years. During the school year, throat swabs were obtained routinely every two weeks and each time a child had a respiratory tract infection. The swabs were cultured and isolates tested for antibiotic susceptibility. The authors noted whether the child was symptomatic of a respiratory illness at the time the culture was obtained.

During the first two years of the study, 2200 swabs were obtained and 322 (15%) were positive for group A streptococci. All isolates were sensitive to erythromycin. During the third year of the study (October 2000 to May 2001), 1794 swabs were obtained and 318 (18%) grew group A streptococci. Of these 318 isolates, 153 (48%) were resistant to erythromycin. All were sensitive to clindamycin. Children with erythromycin-

resistant infections were indistinguishable clinically from those with erythromycin-sensitive infections.

To determine if this drug-resistant infection was restricted to the single school, the authors evaluated 100 random pharyngeal group A streptococci isolates from the laboratory of a local children's hospital. Thirty-eight percent of these isolates were erythromycin-resistant. The authors conclude that macrolide antibiotics should not be used routinely for streptococcal pharyngitis.

COMMENTARY BY DAVID J. KARRAS, MD, FAAEM, FACEP

Both penicillin and macrolide antibiotics have been regarded as acceptable therapies for group A streptococcal pharyngitis for decades. Because of its convenient dosing, azithromycin has become the most commonly used alternative to penicillin in treating this common illness. Resistance to azithromycin in the United States has remained negligible over the years. Macrolide resistance has been noted, however, in Europe and the Far East during the past decade, and it was inevitable that it eventually would be noted in this country.

The fact that half of all isolates in this study were resistant to erythromycin (and presumably to azithromycin) is both surprising and disturbing. As the authors point out, throat cultures largely have been supplanted by rapid antigen testing in diagnosing pharyngitis, and this resistance pattern might have gone unnoticed for years. Empiric strep treatment with macrolides frequently would have been inadequate, and the risk of suppurative and non-suppurative complications (such as rheumatic fever) probably would have increased dramatically. Unless these authors' findings are negated by larger surveillance studies, macrolide therapy probably should not be used empirically to treat strep throat. Despite its inconvenient dosing, penicillin should be used; clindamycin is the best alternative if penicillin is contraindicated. ❖

Special Feature

Pediatric Asthma 2002: Concerns, Controversies, and Creative Options

By Michael W. Felz, MD

Asthma is childhood's most common chronic disease, affecting 5 million patients younger than age 18. Admissions for reactive airway disease have increased sharply for children younger than age 4, especially among African-Americans, and asthma deaths have doubled in recent decades. Asthma is a major cause of school absenteeism. Despite novel new therapeutic agents for asthma, and extensive insights into pathologic and immunologic aspects of the disease, cases are mounting and emergency department (ED) visits by children represent up to 10% of total census.[1] Why these troubling trends? Where is current research leading?

Concerns

Asthma is a challenging diagnosis to confirm, with features that may vary between symptomatic episodes.[2] Characteristics include reversible inflammatory airway obstruction manifesting as dyspnea, wheeze, cough, abnormal pulmonary function tests (PFTs), and tendency to recurrence. Common triggers are viral infection, allergen exposure, atopy, passive smoking, and exercise. Physical evaluation may be difficult due to young age, limited air movement, inability to perform PFTs adequately, and inconsistent physician (and parental) perception of severity of airflow compromise.[3] A recent survey of 571 Massachusetts pediatricians illustrates considerable disagreement (60% consensus) over combinations of factors for diagnosing asthma, and only 10% identified PFTs as necessary.[4] Even with the availability of National Institutes of Health (NIH) practice guidelines updated in 1997, physicians and parents often are deficient in compliance, with large gaps in assessment tools and medication usage.[5] Inertia of previous practice, and lack of recent training, have been prominent in failure of adherence to guidelines.[6] Fewer than than two-thirds of surveyed pediatric ED physicians employ peak expiratory flow rate (PEFR) in evaluating children, and only 50% suggested home PEFR monitoring after discharge.[7] The advent of leukotriene (LT) inhibitors has met with mixed acceptance, despite evidence that these agents are moderately effective as first-line therapy for "young, wheezy preschoolers."[8]

Controversies

While β_2-agonists and systemic steroids are of proven value in acute asthma attacks, the data on maintenance medications—such as inhaled corticosteroids (ICS), cromolyn, nedocromil, long-acting β_2-agonists (LABA), and LT modifiers—are sorely limited in small children. Only theophylline has a labeled indication for children younger than age 2, whereas cromolyn and one LT modifier, montelukast, are indicated at age 2, and ICS and salmeterol (LABA) at ages 4-6.[9] Clinicians must weigh desired benefits on airway dynamics against a myriad of side effects from agents with diverse

mechanisms of action, and medication choices are far from standardized.[10] There even is controversy over whether use of a metered dose inhaler with spacer is as efficacious as nebulizer therapy in the pediatric ED, although equal benefit has been demonstrated previously.[11,12] Even in regions of high β_2-agonist usage by physicians, ICS prescribing in children falls far short of national guidelines.[13] Some experts boldly claim that allergists, not pediatricians, provide better care for asthmatic children and are more cost effective.[14] In 1528 severely asthmatic children requiring intensive care unit (ICU) admission, usage of mechanical ventilation and invasive monitoring varied widely by institution and level of hypercarbia, emphasizing lack of uniformity even among academic centers.[15] The bottom line is that, for both out- and in-patients with asthma, significant heterogeneity exists among primary care and specialist physicians making key therapeutic decisions.

Creative Options

What evidence-based interventions for asthma are wise in the pediatric ED? One group showed that oral dexamethasone (0.6 mg/kg/d x 2 doses) was superior to prednisone (2 mg/kg STAT, then 1 mg/kg/d x 4 more days), with better compliance, less vomiting, and reduced school absence.[16] This provides a shorter, more tolerable, two-dose regimen for asthmatic children in the office or ED, and may keep them in school more. Mixing medication with pudding, chocolate syrup, or applesauce seemed to improve children's cooperation. For children with troublesome side effects from nebulized β_2-agonists, it is noteworthy that, compared to racemic albuterol 2.5 mg, the R-isomer levalbuterol (Xopenex) 0.16-1.25 mg was shown equally effective in increasing forced expiratory volume in one second (FEV1) in 43 children ages 3-11, but tremor and tachycardia were less frequent.[17] Levalbuterol may, therefore, prove attractive if side effects limit compliance to traditional nebulizer therapy. In 182 Dutch infants and children ages 0-3 years who required nebulizer therapy, the novel "Babyhaler" device demonstrated 93% ease-of-handling scores among both parents and practitioners.[18] This mask-valve-chamber tool resembles spacer devices widely employed in American EDs for administration of bronchodilators or maintenance medications to very young children.

In what ways can physicians keep children out of the ED? In a persuasive study of 11,195 asthmatic children ages 3-15 years in three urban areas, those prescribed daily controller medication (ICS, cromolyn, or nedocromil) had a relative risk of needing an ED visit of 0.4 (95% confidence interval [CI]: 0.3-0.5) and of hospitalization of 0.4 (95% CI: 0.3-0.6) over a one-year follow-up period.[19] This information should prove useful at time of discharge for "frequent flyers" in the ED or inpatient ward. Within the ED, addition of a nebulized anticholinergic, ipratropium (250 mcg), to a common regimen of nebulized albuterol (2.5 mg) and oral prednisone (2 mg/kg) in 427 asthmatic children resulted in a 28-minute (13%) reduction in treatment time and required fewer albuterol doses (3 vs 4) compared to placebo.[20] This lends credence to the "triple therapy" approach, which is becoming more standard, and rightfully so, in some centers. The impact of magnesium therapy recently was analyzed from five adult and two pediatric randomized trials involving 668 patients, concluding that this promising therapy demonstrated nonsignificant benefits in most patients. Only in severe exacerbations were admissions reduced (OR = 0.10) and PEFR improved (52 L/min).[21] This data must be evaluated in light of a recent trial in 30 children ages 6-18 years with asthma refractory to β_2-agonists and intravenous steroids. In this small cohort, intravenous magnesium 40 mg/kg resulted in significantly improved asthma scores vs. placebo. Of note, eight of 16 treated patients (50%) were discharged home, while all 14 placebo recipients required admission.[22] Perhaps single dose magnesium could play a beneficial role as a rapid, safe, and effective adjunct to traditional asthma therapy in the ED.

Not to be overlooked is reduction in home tobacco exposure, which has been shown to lower recurrent ED visits (OR = 0.32) among minority children of smoking parents.[23] Likewise, clinicians must be reminded that gastroesophageal reflux disease (GERD) is common among asthmatic children and can trigger pulmonary symptoms that respond to anti-reflux therapy.[24] Such patients often have been misdiagnosed as having "steroid-resistant" asthma.[25] And, last but not least, an old standby, theophylline, of dubious benefit in mild asthma, recently has been demonstrated to hasten recovery from severe status asthmaticus among 47 children in a St. Louis pediatric intensive care unit (PICU), with more pronounced effects among intubated patients.[26]

Conclusion

Pediatric asthma remains an unsolved challenge today, with frustration, confusion, and heartbreak galore for families and physicians. Despite a panorama of proven therapies, preventive strategies, and novel new interventions, symptomatic children, school absenteeism, ED visits, hospital and PICU admissions, and death are far too frequent. As one researcher observed, we seem to be in the midst of "an epidemic in the

absence of infection."[27] ED staff need frequent updates on late-breaking research into this baffling syndrome—one which seems able to defy the aggregate efforts of monumental medical experts.[28] I am convinced from my own practice, and from this review, that the wheezy child may not be the easy child in the ED. ❖

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Physician CME Questions

1. **With regard to rear-seated children in compact extended-cab pickup trucks involved in a motor vehicle collision:**
   a. They are at four times greater risk of injury compared with rear-seated children in other vehicles.

b. They are at twice the risk of injury compared with rear-seated children in full-size pickup trucks.
c. Both a and b are correct
d. They are safer in a compact extended-cab pickup than in the rear seat of a full-size pickup truck.

2. Which of the following is true regarding compact extended-cab pickup trucks?
a. The rear occupancy compartment is subject to the same federal testing standards as other vehicles.
b. Injury risk is greater than in passenger cars for children seated in the rear.
c. Passengers are safest when seated in the cargo area.
d. Injury risk is less than in sports utility vehicles for children seated in the rear.

3. Commotio cordis is:
a. seen more commonly in adults than children.
b. inevitably fatal.
c. associated with blunt trauma to the chest by a variety of mechanisms.
d. seen only in contact sports such as football and boxing.

4. In light of recent antibiotic susceptability data, the best alternative agent for the treatment of streptococcal pharyngitis in penicillin-allergic children is:
a. erythromycin.
b. ciprofloxacin.
c. nitrofurantoin.
d. clindamycin.

5. Contributors to pediatric asthma exacerbation include all of the following *except:*
a. scoliosis.
b. gastroesophageal reflux disease.
c. tobacco exposure.
d. suboptimal medical management.

6. For children with acute asthma attacks not fully responsive to β_2 agonist and steroid therapy, additional emergency department adjuncts include:
a. ipratropium, magnesium, and theophylline.
b. ribavirin, interferon, and acyclovir.
c. amoxicillin, azithromycin, and trimethoprim-sulfamethoxazole (TMP/SMX).
d. guiafenesin, dextromethorphan, and pseudoephedrine.

CME Objectives

To help physicians:
- Summarize the most recent significant emergency medicine-related studies;
- Discuss up-to-date information on all aspects of emergency medicine, including new drugs, techniques, equipment, trials, studies, books, teaching aids, and other information pertinent to emergency department care; and
- Evaluate the credibility of published data and recommendations.

Complete AV Block—Or Not?

By Ken Grauer, MD

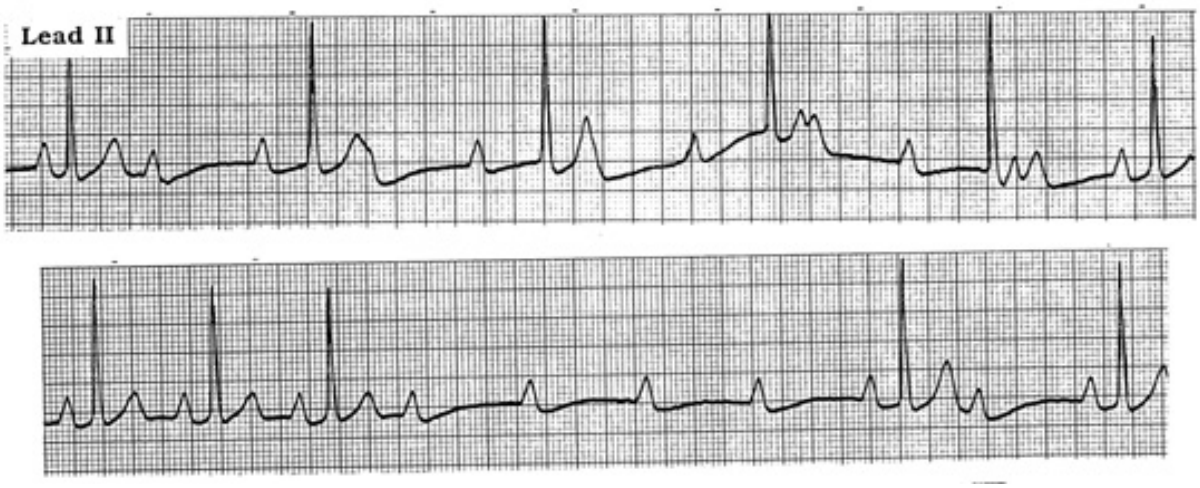

Figure. Noncontinuous rhythm strips obtained from an elderly man with syncope.

Clinical Scenario: The noncontinuous tracings shown in the Figure were obtained from an elderly man with syncope. What is the rhythm? Is complete atrioventricular (AV) block present in the top tracing?

Interpretation: The underlying rhythm in the Figure is sinus, as suggested by the initial three beats in the lower tracing. There is a 1° AV block (the PR interval of these first three beats clearly exceeds 0.20 second). Significant bradycardia and AV block are present on the remainder of these rhythm strips. The QRS complex is narrow. P wave morphology is consistent throughout, and demonstrates a fairly regular atrial rate of 80 beats per minute (bpm) in the top tracing (some P waves being hidden by or deforming several of the T waves). Despite the presence of AV dissociation in the top tracing, the top rhythm strip does *not* represent complete (3°) AV block. The key clue to this conclusion is that the last beat in the top tracing occurs early. Most of the time, the ventricular rhythm will be *regular* when the degree of AV block is complete (due to the regular rate of the escape pacemaker). The occurrence of an early beat in the top tracing suggests that at least some sinus impulses are being conducted. Further support that this last beat is, in fact, being conducted is forthcoming from the observation that the PR interval preceding it is identical to the PR interval of the three sinus conducted beats.

Significant block definitely is present in the lower tracing, with nonconduction of four consecutive atrial impulses. However, further support against a diagnosis of complete AV block is forthcoming from the presence of three sinus conducted beats at the beginning of this lower tracing, and 2:1 AV conduction (constant PR interval) at the end of the tracing. Slight slowing of the atrial rate (to 75/min) at the beginning of the lower strip may be the reason that 1:1 conduction was able to occur transiently (the atrial rate had been 80 bpm in the top tracing). Nevertheless, high-grade (albeit *not* complete) AV block clearly is present, and permanent pacing was required for treatment of this elderly man with syncope. ❖

In Future Issues: **Popliteal Cysts**

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BIOTERRORISM WATCH
Preparing for and responding to biological, chemical and nuclear disasters

They don't call it bio*terror* for nothing: Fear is the foe when anthrax spores are found within hospital walls

'We feel we were able to ward off a panic . . .'

Clinicians nationwide were beset with hoax powder scares last year at the height of the anthrax attacks, but at one hospital, the threat turned out to be real. Positive cultures for *Bacillus anthracis* were found within hospital walls, setting off a wave of anxiety that threatened to descend into panic.

"There was a mounting level of anxiety among our health care workers," said **Maureen Schultz**, RN, infection control coordinator at Veterans Affairs (VA) Medical Center in Washington, DC. "It had to be dealt with before we could work out any other aspect of the situation."

The events began to unfold last October, when it was discovered that the anthrax letter sent to Sen. Tom Daschle (D-SD) might have contaminated other federal buildings through cross-contamination of mail processed at the Brentwood postal building in Washington, DC.

"It was several days before the contamination was discovered, and by that time, several downstream facilities, including our VA hospital, were contaminated," she said recently in Salt Lake City at the annual meeting of the Society for Healthcare Epidemiology of America (SHEA).[1] In light of the situation, it was recommended that mailrooms in federal buildings be cultured for anthrax.

"One of the things we found frustrating was that we were not given any guidance as to how we should screen the mail," Schultz said. "So we [took] cotton swabs and ran each swab over an approximately 10 to 50 square inch area."

Four of 34 environmental swabs taken in the hospital mailroom grew *B. anthracis*, with colony counts varying from one to 11. The anthrax was found on a canvas mail tote, a cardboard box that had been mailed, on the top of a mailroom speaker, and on a canvas mail cart.

The fear factor

"Even before the contamination was discovered, [we] decided to take some action because of the growing concern among our employees," she said. "So [we] convened a group from the emergency response team, infection control, safety, and public affairs."

The focus of the response was to determine risk level, provide prophylaxis as needed, decontaminate the environment, and get accurate information to all 1,700 health care workers, patients, and visitors, Schultz said. In order to reduce the high level of anxiety, a series of educational sessions were held, information was posted on the hospital web page, press releases were distributed, and printed materials were given to staff, patients, and families. In addition, a series of "town-hall" meetings was held to fully air the concerns of employees.

"These were informal sessions that we had in our auditorium where many health care workers could come and interact on an informal basis," Schultz said.

The risk to hospital workers was determined to

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be low, and only eight staff members were started on prophylactic antibiotics. Those included five mailroom employees who were encouraged to take full 60-day regimens. Another three workers, considered at lower risk, were given 10-day regimens due to possible contact with contaminated mail. The mailroom and surrounding area were decontaminated by an outside contractor.

Overall, some 500 health care workers attended the education sessions, and each town-hall meeting drew more than 200 staff members. With the colony counts low and the contamination limited, the decision was made to limit prophylaxis to only the eight aforementioned employees. That approach was not well received by other health care workers who feared they could have been unknowingly exposed.

"We refused treatment to all other employees, and initially, this created a lot of anxiety among the health care workers, particularly in these large town-hall meetings," Schultz said. "They were demanding ciprofloxacin or doxycycline in case they had come in contact with something contaminated. But we did hold firm on this, and we did not provide prophylaxis to any other employees."

Still, at the SHEA meeting, the Centers for Disease Control and Prevention (CDC) conceded that many of its initial assumptions about anthrax turned out to be false, including the perception that mail handlers were not at risk for inhalational anthrax. Given that acknowledgment, *Bioterrorism Watch* asked Schultz if she would now reconsider the decision to limit antibiotic prophylaxis to a few workers. "Based on the information we have now, no. I don't think we would change that decision." There really was no evidence that any widespread contamination had occurred, she added.

A total of 34 workers reported to the occupational health service for clinical evaluation, but there were no reports of staff refusing to work, and patient care was not interrupted. The initial level of fear and anxiety among many of the workers eased off under the continuous education and communication effort.

"We feel we were able to ward off a panic situation by the actions that we took," she said.

NYC hospital faces similar situation

A similar contamination incident was feared at Memorial Sloan Kettering Institute, a 431-bed cancer center in New York City. Some 1,200 health care workers at Sloan Kettering work in the same building as Gov. George Pataki's Manhattan office, which was reported to be the target of anthrax mailing. On Oct. 17, possible anthrax (positive by polymerase chain reaction test) was discovered in the governor's office. Pataki and staff vacated their part of the building, and infection control staff and hospital administration at Sloan Kettering developed a response plan to protect their workers.

The hospital employees worked on 10 floors of the 40-story building, including three floors that shared an air-ventilation system with the governor's offices. The response was honed to focus on mailroom staff and some 250 employees who worked on the three floors with shared air. With incomplete information on the scope of potential contamination of Pataki's offices, hospital clinicians decided to perform nasal cultures on the employees on the three floors, **Janet Eagan**, RN, an infection control professional at Sloan Kettering reported at the SHEA conference.[2] All of the 245 cultures taken were negative.

"I think the nasal swabs were more to allay fear," she said. "We wanted to do something that was proactive."

Public health investigators first used the nasal swab approach after the first anthrax case in Florida, but the CDC would later advise against routine use of the practice. The reliability of the swabs came into question, in part, because even those exposed may test negative as the nose clears of spores. At a Nov. 1, 2002, press briefing, the CDC advised against using nasal swabs "as a nonspecific probe to determine whether anthrax has ever been present in an environment."

Of course, clinicians at Sloan Kettering were dealing with a situation before that clarification was issued, but even then there were doubts about the wisdom of swabbing the workers.

"By the time we agreed to do the nasal swabs, I was kicking myself, thinking what on earth are we going to do with this information," **Ken Sepkowitz**, MD, epidemiologist at the hospital told SHEA attendees. "The nasal swabs was a screw-up, but with the information we had . . ."

With all the swabs negative, no antibiotics were administered. Additional efforts were needed to reassure the "worried well" that they were not at risk. Personnel from infection control, safety, security, and social work all met with the staff. Building management conducted an independent environmental survey of the building.

"E-mails went to all staff that all 245 employees tested had negative results," Eagan said.

"Communication is key. We believe that by having a hands-on approach — actually being there meeting with staff — prevented panic in employees that were very vulnerable."

Then word came that the original specimen from the governor's office had been found culture negative on retesting. The hospital had been through an intense false alarm drill, but overall had met the challenge, Eagan said.

"Decisions were made using incomplete information at a time-sensitive pace," she said. "Staff responded in a positive manner to the high visibility of administrative leadership, infectious disease, and infection control in numerous educational sessions and e-mail alerts."

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APIC: Smallpox plan uses outdated infection control

Designating patient facilities a mistake

The Centers for Disease Control and Prevention (CDC) has based its smallpox bioterrorism response plan on "outdated concepts," and entire sections need to be revised to reflect current epidemiologic strategies, the nation's leading group of infection control experts warned.

The Association for Professionals in Infection Control and Epidemiology (APIC) commented on the *CDC Interim Smallpox Response Plan and Guidelines*, which has been released as something of a work in progress.

"In general, we are concerned that the draft guidelines appear to be based on outdated strategies used to control this disease decades ago and do not appropriately integrate those infection control strategies and environmental controls utilized in our hospitals today," the APIC letter stated.

The CDC response plan calls for investigators to rapidly immunize a "ring" around the first cases. The ring concept uses isolation of confirmed and suspected smallpox cases followed by contact tracing, vaccination, and close surveillance of contacts. The ring approach was used to successfully eradicate smallpox from the world in 1980. But the ring concept was effective when the demographics of smallpox were very different, when few were infected, and the vast majority of people already were immune.

As part of the ring response, vaccine would be administered to people involved in the direct medical care, public health evaluation, or transportation of confirmed or suspected smallpox patients.

"Vaccination, like any preventive strategy, is more effective if given prior to exposure," APIC argued. "If health care workers are not immunized prior to case identification, these individuals [especially emergency department staff, direct caregivers, and laundry personnel] should be vaccinated immediately upon documentation of a case in their community. It is crucial that we not wait for a case to present in the facility before taking preventative action."

In addition, it may not be possible to distinguish between febrile response to vaccine or actual exposure in health care workers, APIC warned.

"Approximately 20% of vaccinated employees will develop fever and not be able to work if vaccine is given in response to a suspect or confirmed case," the association stated. "We need to develop strategies for dealing with staffing shortages whether they are due to febrile reaction to vaccination, true infection / disease, or refusal to care for patients in a smallpox emergency."

'Misuse of resources'

APIC also questioned the CDC concept of a "Type C isolation facility" for smallpox patients. As proposed, the sites would be facilities that are at least 100 yards from any other occupied building, or those that have nonshared air-ventilation systems with filtered exhaust.

"We believe it would be a misuse of resources to design, build / retrofit, and maintain a designated facility that is not integrated with the existing health care system," APIC stated. "Using alternative structures rather than enhancing the current infrastructure is not a wise use of our limited resources."

Instead, existing facilities could substantially

benefit from dedicating resources to ensuring appropriate air handling and ventilation systems for existing clinics, emergency departments, and isolation rooms. "This would provide the added benefit of controlling more likely exposures to infectious droplet nuclei [tuberculosis, disseminated zoster, chicken pox, measles, etc.] in addition to minimizing or eliminating the likelihood of intrafacility transmission of smallpox," APIC stated.

The association expressed concern that health care delivery might be compromised in separate Type C facilities, particularly if they are not designed to provide services such as intensive care, ventilator support, dialysis, and laboratory resources. Rather then designate facilities for smallpox patients, each hospital should be prepared in advance to activate its program when the first case is identified, APIC argued.

"There needs to be a predetermined area [building or wing, etc.] that meets the 'Type C' facility requirements for isolation," APIC noted. "Part of a facility's planning would include a determination regarding the number of patients that could be housed in the designated area."

Some of the cleaning and disinfection recommendations in the document are out of date with current sterilization principles and practices. That includes "fogging" rooms to disinfect environmental surfaces, the association charged.

"CDC has not recommended the fogging of rooms for many years," APIC stated. "We strongly suggest the deletion of any archaic references to fogging." ■

Stanford sets the standard for bioterrorism planning

A separate piece: Stand-alone plan advised

It's not enough merely to update the bioterrorism component of your current disaster preparedness plan, experts say; you must create a detailed bioterrorism response plan that stands on its own.

That's precisely the philosophy behind the Stanford (CA) Hospital and Clinics (SHC) & Lucile Packard Children's Hospital (LPCH) Bioterrorism Response Preparedness Plan, which is gaining widespread recognition as a model for such plans. In fact, several Kaiser Permanente facilities in California already have adopted the plan.

"You need a separate [bioterrorism] plan," asserts **Eric A. Weiss**, MD, assistant professor of emergency medicine at Stanford, associate director of trauma at Stanford Hospital, and chairman of the disaster committee and bioterrorism task force. "During most disasters, for instance, you don't rely on the microbiology lab to identify pathogens. Also, infectious disease and infection control staff take on a major, heightened role."

In disasters such as an earthquake, Weiss notes, you generally don't have to worry about the quarantine of patients or the spread of infectious agents. Similarly, you may not have to put on protective clothing or worry about cross-contamination of existing patients who may be immunosuppressed.

A bioterrorism plan had been in place prior to 2001, Weiss says, "but it was really just a skeleton plan — not very comprehensive. It was part of a larger disaster preparedness plan, but a plan to deal with mass casualties from bioterrorism is very different."

When you have a major disaster such as the collapse of the World Trade Center, Weiss notes, local health care providers are likely to come to the hospital and offer to chip in and help wherever they can.

"But what happens when the word goes out that patients are walking around with smallpox?" he asks. "Are providers going to want to stream down to the hospital and potentially infect themselves and their families? You need a response plan to address the safety of health care providers, so they will feel comfortable and want to show up for work."

To create such a plan, the Bioterrorism Planning Task Force was formed, incorporating personnel from 30 or more different departments at both facilities. Those departments include infectious diseases, infection control, emergency medicine, pediatrics, critical care, intensive care units, nursing and hospital administration, dermatology, psychology, social services, and environmental health and safety.

"We began putting the plan together when we identified the fact that the current plan was not adequate," notes Weiss. "We accelerated our activities after Sept. 11. After Sept. 11, *everybody* wanted to be part of it."

[Editor's note: The bioterrorism plan is available on the Stanford web site at www.stanfordhospital.com.] ■