



Management

Best Practices – Patient Flow – Federal Regulations – Accreditation



EDs not taking chances with H1N1, protocols updated, supplies checked

Departments taking a 'better-safe-than-sorry' approach

IN THIS ISSUE

- EDs take proactive approach to H1N1 cover
- Reverse triage: A surge capacity cure-all? 64
- Save more than \$200K a year — without cutting staff 66
- Staff attends free FEMA courses on emergency response 67
- Multifaceted initiative boosts revenues by \$20M 68
- ED leader, hospitalist team up for throughput plan 70
- **Enclosed in this issue:**
— Anatomy of swine flu outbreak

Financial Disclosure:

Author Steve Lewis, Senior Managing Editor Joy Dickinson, Associate Publisher Coles McKagen, and Nurse Planner Diana S. Contino report no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies having ties to this field of study. Executive Editor James J. Augustine discloses he is a consultant for The Abaris Group and conducts research for Ferno Washington. Carol Edelberg, guest columnist, discloses that she is a retained consultant for TeamHealth and that she is a stockholder in Edelberg Compliance Associates.

Even with the outbreak of H1N1 influenza in its relative infancy, and no one knowing for certain how dire the situation might become, ED managers and their staffs are taking the situation very seriously. If we are fortunate, and this particular chapter ends with a whimper, then their actions still will be a good test of how well prepared they are for a pandemic.

Precisely because this is an entirely new strain, experts can't predict with certainty what will happen. Even if this current outbreak ends with the heat of summer, there are no guarantees the virus will not return when the flu season begins next fall.

"The big concern is that this is a new and unknown virus that no one has been exposed to before, and it seems to have spread rather quickly," says **Charles Pattavina**, MD, FACEP, chief of emergency medicine at St. Joseph Hospital in Bangor, ME.

David Ross, DO, FACEP, an emergency physician at Penrose Hospital in Colorado Springs, CO, and a spokesman for the American College of Emergency Physicians (ACEP), says, "The severity of these cases in the U.S. so far has been very mild, so the quick answer is it's not very serious. But the potential for spread is much more serious and more concerning and, in the fall, this virus may mutate and become substantially more severe."

Katherine West, BSN, MSED, CIC, infection control consultant at Infection Control/Emerging Concepts in Manassas, VA, says, "We just don't know how serious

Executive Summary

The ultimate severity of the current H1N1 outbreak is far from certain, but ED managers and other infection control experts are taking a proactive approach to ensure they are prepared for the worst. Here are some steps they're taking:

- Patients are being asked additional questions in triage to determine risk levels.
- Staff members are double-checking the fit on their N95 masks.
- Arriving EMS patients with suspected respiratory infections are remaining in the ambulance until ED determines where they should be taken.

JUNE 2009

VOL. 21, NO. 6 • (pages 61-72)

NOW AVAILABLE ONLINE! www.ahcmedia.com/online.html
For more information, call toll-free (800) 688-2421.

a threat this is, but so far it seems to be acting as a normal flu would. We have to keep this in perspective.” That “perspective” includes the fact that about 36,000 people in the United States die from influenza every year, she says. “Yes, there are going to be deaths, but the media is inciting fear in the way they cover this,” West complains. As *ED Management* goes to press, the total number of confirmed cases in the United States is nearly 900,

ED Management[®] (ISSN 1044-9167) is published monthly by AHC Media LLC, 3525 Piedmont Road, N.E., Six Piedmont Center, Suite 400, Atlanta, GA 30305. Telephone: (404) 262-7436. Periodicals Postage Paid at Atlanta, GA 30304 and at additional mailing offices.

POSTMASTER: Send address changes to *ED Management*[®], P.O. Box 740059, Atlanta, GA 30374-9815.

AHC Media LLC is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity has been approved for 12.5 nursing contact hours using a 60-minute contact hour.

Provider approved by the California Board of Registered Nursing, Provider #14749, for 12.5 Contact Hours.

AHC Media LLC is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AHC Media LLC designates this educational activity for a maximum of 15 *AMA PRA Category 1 Credits*[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Approved by the American College of Emergency Physicians for 18 hours of ACEP Category 1 credit.

This activity is intended for emergency physicians, ED nurses, and other clinicians. It is in effect for 24 months from the date of the publication.

Subscriber Information

Customer Service: (800) 688-2421 or fax (800) 284-3291 (customerservice@ahcmedia.com). **Hours of operation:** 8:30 a.m.-6 p.m. Monday-Thursday; 8:30 a.m.-4:30 p.m. Friday, EST. Subscription rates: U.S.A., one year (12 issues), \$489. Add \$17.95 for shipping & handling. Outside U.S., add \$30 per year, total prepaid in U.S. funds. Discounts are available for group subscriptions, multiple copies, site-licenses or electronic distribution. For pricing information, call Tria Kreutzer at 404-262-5482. Missing issues will be fulfilled by customer service free of charge when contacted within 1 month of the missing issue date. Back issues, when available, are \$82 each. (GST registration number R128870672.)

Photocopying: No part of this newsletter may be reproduced in any form or incorporated into any information retrieval system without the written permission of the copyright owner. For reprint permission, please contact AHC Media, LLC. Address: P.O. Box 740056, Atlanta, GA 30374. Telephone: (800) 688-2421, ext. 5491. Fax: (800) 284-3291. World Wide Web: <http://www.ahcmedia.com>.

Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. Clinical, legal, tax, and other comments are offered for general guidance only; professional counsel should be sought for specific situations.

Editor: Steve Lewis (steve@wordmaninc.com).

Associate Publisher: Coles McKagen

(404) 262-5420 (coles.mckagen@ahcmedia.com).

Senior Managing Editor: Joy Daugherty Dickinson

(229) 551-9195 (joy.dickinson@ahcmedia.com).

Director of Marketing: Schandale Kornegay.

Senior Production Editor: Nancy McCreary.

Copyright © 2009 by AHC Media LLC. **ED Management**[®] is a registered trademark of AHC Media LLC. The trademark **ED Management**[®] is used herein under license. All rights reserved.



including two deaths.

Nonetheless, ED managers, including Pattavina, are taking no chances. “We’ve made sure that we’re up to date on fitting for [N95] masks, and we’ve reviewed the usual procedures for precautions with respiratory illnesses,” he says. At the state’s request, his department has changed the swab it uses for flu testing so that the same swab also can be used to test for H1N1, Pattavina says. “They’ve asked us the call them if we want to test for swine flu, to make sure the case meets their criteria, such as travel history, exposure to someone who has or is suspicious for the disease, and if they have gastro symptoms, which do not typically accompany the flu,” he says.

Finally, Pattavina adds, his department has cut back on “liberal” flu testing so as not to run out of supplies.

At Penrose hospital, Ross has a built-in advantage. “We have a physician on our emergency medicine staff that has an MPH, and he’s very interested in pandemics and influenza, so in addition to all the outside sources we get information from, like the [Centers for Disease Control and Prevention] and the Department of Public Health, he’s been giving us advice as well,” he says.

So, for example, this doctor has recommended that additional questions be asked during triage to determine if the patients are at risk for H1N1, such as whether they have fever, cough, congestion, vomiting, and diarrhea. “If they answer ‘yes,’ we ask if they have been in Mexico or any of the border states,” Ross says. “If they answer ‘yes’ again, we put them in a surgical mask and in a room with a door instead of a bay.” Then, he says, the doctors or other staff members treating them wear N95 masks. “After the physician asks some more in-depth questions, the decision is made whether to keep the masks on or remove them,” Ross adds.

EMS chief beefs up monitoring

Don’t take any chances with H1N1. Just ask **Mike McEvoy**, PhD, REMT-P, RN, CCRN, EMS coordinator, Saratoga County, NY, EMS director, New York State Association of Fire Chiefs, and clinical associate professor, critical care medicine, at Albany (NY) Medical College.

“We’ve beefed up monitoring; at our dispatch center, we’ve activated a protocol called Severe Respiratory Illness, which adds extra questions onto the information collected from callers,” says McEvoy, who works in the critical care unit at Albany Medical Center. For example, he says, callers are asked if they’ve been to Mexico or been around somebody who has been there in the last seven days, if they have a fever over 101°,

Sources

For more information on H1N1 preparation and response, contact:

- **Mike McEvoy**, PhD, REMT-P, RN, CCRN, EMS Coordinator, Saratoga County, NY. Phone: (518) 383-8608, Fax: (518) 383-4915. E-mail: mcevoymike@aol.com.
- **Charles Pattavina**, MD, FACEP, Chief of Emergency Medicine, St. Joseph Hospital, Bangor, ME. Phone: (207) 907-3450.
- **David Ross**, DO, FACEP, Penrose Hospital, Colorado Springs, CO. Phone: (719) 494-7810.
- **Katherine West**, BSN, MSED, CIC, Infection Control Consultant, Infection Control/Emerging Concepts, Manassas, VA. Phone: (703) 365-8388. E-mail: info@ic-ec.com.

and if they have a cough or any symptom of respiratory illness. “The protocol requires that dispatch conveys that information to the fire department and EMS people who respond,” McEvoy explains.

In addition, he has contacted all chief officers on fire departments and at EMS sites and told them to review plans for pandemic flu and “make sure they’re ready to go in case of a huge outbreak.”

When to put on an N95 mask

McEvoy also has issued very specific guidance to patient care providers. “They should be asking for information from the dispatcher about respiratory illness, if it has not been given, and they should not walk within 6 feet of a patient who potentially has a respiratory illness without asking if they have a fever,” he says. “If the patient can’t answer, or if they say yes, they should put on an N95 mask.”

He also has asked providers to limit any actions that could cause patients with respiratory illnesses to spread droplets or respiratory secretions. “For example, if people have trouble breathing, they often give them nebulizer treatment and sometimes suction out secretions,” says McEvoy. “We recommend they not do that unless it’s absolutely necessary.”

He also suggests that if ambulance patients are thought to be infectious, the EMS should not simply bring them in, but call ahead and then leave them in the ambulance until hospital personnel tell them where to go “so they do not spread germs all over the ED,” McEvoy says.

He’s taking these actions “not because we suspect we will have a wild and crazy outbreak, but because there are just so many unknowns.” ■

Will pandemic keep staff home?

Whenever the possibility of a pandemic arises, ED managers and other health care professionals wonder whether they will have adequate staff to treat patients or whether many staff members will stay home for personal reasons. As the current outbreak of H1N1 shows, there are no easy answers.

“We’ve had about 25% more call-outs than usual this week, but I’m not sure that’s why,” says **Charles Pattavina**, MD, FACEP, chief of emergency medicine at St. Joseph Hospital in Bangor, ME.

But **David Ross**, DO FACEP, an emergency physician at Penrose Hospital in Colorado Springs, CO, and a spokesman for the American College of Emergency Physicians (ACEP), says, “We have not seen any absenteeism in our hospital; it’s been business as usual. The staff has looked at which precautions we should take in what circumstances, and everyone has shown up ready to work.”

Nonetheless, absenteeism could be a serious issue, warns **Katherine West**, BSN, MSED, CIC, infection control consultant, Infection Control/Emerging Concepts in Manassas, VA. “I saw a survey of nurses in the San Francisco area where more than 50% said

Resources

The Centers for Disease Control and Prevention (CDC) is an excellent source for the latest information on H1N1. At www.cdc.gov/swineflu, you will find consumer and provider fact sheets, current information, and steps you can take to protect yourself against infection. You will also be able to download a widget that you can post to your own web site to help your patients get the most current and accurate information. At www.cdc.gov/swineflu/guidelines_infection_control.htm, you will find the latest available guidelines.

The World Health Organization (WHO) is posting information at www.who.int/csr/don/en.

The Association for Professionals in Infection Control and Epidemiology (APIC) also provides valuable information about H1N1. Check out their web site www.apic.org. At the top of the page, select “Emergency Preparedness” and then “Swine Flu Information.”

Executive Summary

Providing adequate surge capacity during a disaster is one of the greatest challenges of emergency response. Now, researchers have proposed a new process called “reverse triage” to help create surge capacity that otherwise would not exist.

- Patients who have only a slight chance of experiencing an adverse event within four days of leaving the hospital may be discharged to free bed space.
- ED staff can provide a daily initial reverse triage score for patients being admitted, even if a disaster is not imminent.
- While general guidelines can have great value, take the interests of the patient and their family into account when making discharge decisions.

they would not come in, so this is where we have to begin preparation,” West cautions.¹ “We have to assess our own workplaces hardcore and see who would come to work.” **(For more information, see “If pandemic strikes, how much staff will you have?” *ED Management*, April 2007, p. 44.)**

To do this, she says, it’s important to ask your staff in ways that will not identify them. “You have to somehow get an honest assessment,” West says. “You can get all the plans in the world, but if you do not have adequate staff, it is problematic.”

In addition, she says, it’s important to survey staff readiness at home. Have they planned for child care, elder care, or pet care? “You need to make sure people have been doing that preparation,” West asserts. **(Because staffing can be problematic during a disaster, a group of researchers has devised a “reverse triage” process to help address surge capacity. See the article, below.)**

Reference

1. Anderson K, Dahl C, DeBaun B. Are all disasters created equal? A survey of nurse’s ability and willingness to work during a health care crisis. Abstract 3-37. Presented at the Association for Professionals in Infection Control and Epidemiology. San Jose, CA; June 24-28, 2007. ■

‘Reverse triage’ adds to surge capacity

Process more reliable than added staff, resources

A new study published online ahead of print in *Disaster Medicine and Public Health Preparedness* indicates that a process called “reverse triage” contributed to 50%, 55%, and 59% of the creation of surge capacity respectively in three hospitals in a single health system in Maryland.¹ The researchers canvassed inpatient units for 19 weeks at the three facilities. Any patients who did not require any critical intervention — used as a proxy for a consequential medical event — within four days of the hypothetical disaster were deemed suitable for early discharge.

The concept is not entirely new, explains **Gary Green, MD, MPH, MBA**, vice chair of emergency medicine and director of simulation services for the NYU Langone Medical Center in New York City and one of the authors of the paper. Green was with the Johns Hopkins system when the research was initiated. “The military used it initially in considering how they could get people back to the battlefield, and others have suggested that the poor minorities in New

Orleans were the victims of reverse triage,” he notes, “but we use it in a very different capacity; it’s triaging at the exit rather than at the entrance.”

There are several options for increasing surge capacity, Green notes. You can increase resources, decrease demand, or change the way you distribute resources to meet demand. “Traditionally, we have focused on increasing resources, but that’s problematic because in most disasters the ability to increase them just won’t be there,” he says. Green says following the lessons of Katrina, The Joint Commission and other national organizations recommend that hospitals expect and plan to surge in place for up to four days.

“In terms of increased staffing, you may not have that ability during a major event. Staff may not show up because they’re concerned about their family, they’re injured, or they’re cut off from the hospital,” Green says. “You won’t be able to surge in place; that’s where reverse triage comes in.”

In an ideal situation, says Green, hospital staff would have an evidence-based computer model or some other predictive instrument to determine the risk of subsequent adverse events for patients they are considering discharging early. “It does not yet exist. Our team is working on developing that instrument,” he says. In the absence of such a model, the researchers developed a “proxy” in an earlier study where they used an expert panel of clinicians and hospital leadership to create consensus guidelines and recommendations. “They came up with a ‘magic number’ of 12% risk of an adverse event in the next four days as acceptable to release to the community or transfer to home,” Green shares.

Andrew Milsten, MD, MS, FACEP, disaster medicine fellowship director at the University of

Sources

For more information on reverse triage, contact:

- **Gary Green**, MD, MPH, MBA, Vice Chair of Emergency Medicine, NYU Langone Medical Center, New York City. Phone: (646) 861-0796.
- **Andrew Milsten**, MD, MS, FACEP, Disaster Medicine Fellowship Director, University of Massachusetts, Worcester Campus. Phone: (410) 707-8738.

Massachusetts, Worcester campus, says, “This is a good approach. It’s a good start to showing how to get people out quickly, but it’s not a cure-all.” For example, he points out, if you have empty beds but insufficient staff to treat the future patients who would fill them, you still have a problem. **(Another ED expert also supports this general approach, but notes that each patient should be treated as an individual case. See the story, below right.)**

Reference

1. Kelen GD, McCarthy ML, Kraus CK, et al. Creation of surge capacity by early discharge of hospitalized patients at low risk for untoward events. *Dis Med Pub Health Prepared* 2009. Doi:10.1097/DMP.0b013e3181a5e7cd. ■

Implications seen for ED staffs

When hospitals adopt a reverse triage policy as part of their disaster response plan, it has direct implications for ED leadership, says **Gary Green**, MD, MPH, MBA, vice chair of emergency medicine and director of simulation services for the NYU Langone Medical Center in New York City and one of the authors of a paper in *Disaster Medicine and Public Health Preparedness* describing the process.¹

“One way this process could be applied is on admission on a daily basis, where admitted patients are assigned a reverse triage score, and that would presumably be done by the ED attending,” says Green. “Then, it would be updated on a continuous basis on daily rounds or via a computerized system,” he says at Bellevue Hospital, one of the New York City facilities he supervises, the routine admission paperwork includes a space for the reverse triage score.

“The ED’s role would also be to manage patients coming in and sending home rapidly anyone who does

not need to be there,” adds **Andrew Milsten**, MD, MS, FACEP, disaster medicine fellowship director at the University of Massachusetts, Worcester campus. “In terms of who is to be admitted, if someone comes in that’s in a ‘gray’ zone, a ‘soft admit,’ where you might be more inclined to send them home, there might be more transfers out of the ED to other hospitals.”

Green agrees. “Reverse triage can be applied to a department, as well as to a hospital or a system,” he says. “But you do not want to discharge someone unless the incoming patients have a higher risk, and you need to be able to stratify that risk.”

Finally, says Green, since ED nurses, physicians, and managers are the “natural experts” in critical event preparedness and often the leaders in overall hospital response, “they should be aware of this work and be proposing at their hospitals and medical centers that they consider whether this type of frame would work for them.” He adds that they should have discussions with hospital staff and other departments and encourage them to consider it, “since this identifies that the greatest capacity you can potentially gain is by reverse triage than by other means that have traditionally been identified.” [Editor’s note: Have you instituted effective surge capacity strategies in your facility? Let us know about it. Contact: Steve Lewis, Editor, *ED Management*, at (678) 740-8630. E-mail: steve@wordmaninc.com.]

Reference

1. Kelen GD, McCarthy ML, Kraus CK, et al. Creation of surge capacity by early discharge of hospitalized patients at low risk for untoward events. *Dis Med Pub Health Prepared* 2009. Doi:10.1097/DMP.0b013e3181a5e7cd. ■

Don’t forget the individual patient

The reverse triage approach described in an online article in *Disaster Medicine and Public Health Preparedness*¹ makes sense — to a point, says **James J. Augustine**, MD, FACEP, director of clinical operations at Emergency Medicine Physicians, an emergency physician partnership group in Canton, OH.

“If you have to address a community emergency, you first look to internal capacity within the institution, and that would have to include the possibility of moving patients out,” he notes.

However, Augustine adds, “It has to be situation-specific and up to the individual physician, patient, and family, and the facility that may or may not accept

Source

For more information on patient/family considerations in reverse triage, contact:

- **James J. Augustine, MD, FACEP**, Director of Clinical Operations, Emergency Medicine Physicians, Canton, OH. Phone: (404) 456-6211. E-mail: JAugustine@emp.com.

the [transferring] patient,” because there can be so many different types of situations. For example, he says, a patient might be brought into the hospital for elective surgery. An emergency occurs, other patients become infected, and the patient himself decides he doesn’t really want to be there. “Or a patient may be nearing discharge anyway, and the physician knows they can safely be discharged out of the hospital and have a place to go,” Augustine suggests.

Families also are an important consideration. “The family may want to evacuate out ahead of the disaster,” he offers. “On the other hand, there may have been a wildfire. You would normally discharge a given patient to make room for more seriously ill patients, but the home has been affected and the family has nowhere to go themselves.”

Reference

1. Kelen GD, McCarthy ML, Kraus CK, et al. Creation of surge capacity by early discharge of hospitalized patients at low risk for untoward events. *Dis Med Pub Health Prepared* 2009. Doi:10.1097/DMP.0b013e3181a5e7cd. ■

Staffing changes save ED more than \$200K a year

Atypical shifts, flexible internal pool key strategies

In three years, the ED at Dameron Hospital in Stockton, CA, has achieved total savings of \$650,000 through a combination of staffing optimization, creation of atypical shifts and a flexible internal pool, and providing staff the option to take open shifts, all while still meeting the challenging nursing ratios required by the state. These changes were made in concert with The Optime Group, a consulting firm based in Evanston, IL.

For some patients, such as Code 3 trauma, the ratio is 1-to-1, explains **Janine Hawkins**, RN, MBA, the hospital’s chief nursing officer. “It’s 1-to-2 for cardiac patients receiving tPA [tissue plasminogen activator],

and for lesser acuity patients, it can be 1-to-4,” she says. “The challenge was to learn how to have the manpower when we needed it, but to not be over-staffed at other times.”

When **Jordan Geiman**, MBA, staffing manager for nursing, joined the staff in 2006, her title was director of nursing finance. Six months into the year, the nursing department was \$1.8 million over budget, she recalls. “They wanted to add a person just to focus on the execution of the plan that Optime Group had come up with, which was not really embraced by the former leadership,” Geiman said.

Geiman concedes that many of the recommendations were “tough concepts to follow,” but adds that “there is a science to all this — matching staffing to demand, which is very much a culture change.” By the end of the year, she says, “We were under budget.”

One of the keys was the atypical shifts, Hawkins says. The team reviewed hour-by-hour workloads with Optime. “Instead of having seven nurses at 7 a.m., for example, we now have five, and then add two at 11 a.m. and another at 3 p.m.,” she says. Hawkins adds that the results were “magical.” “Our rate of left without treatment was in the teens; now it’s 2%,” she shares.

In addition, Hawkins says, nurses throughout the division were categorized by skill level and then assigned to shifts in a way that guaranteed a balanced skill level for every shift.

Flexible use of registry nurses also contributed to the success of the initiative. “All registry nurses utilized in the ED have to be available to the ICU and CCU as well, but if they’re needed in the ED to fulfill a ratio, they can do that,” notes Geiman.

Hawkins says, “I’ve not seen a work force like that, and I’ve been in several hospitals. The nurses are hired to the critical care/ED pod; hour to hour, you can pull

Executive Summary

The ED at Dameron Hospital in Stockton, CA, estimates it has saved more than \$200,000 a year simply by adjusting the way its staff is allocated. In addition, its rate of left without treatment was in the teens and is now 2%. Here are a few of their winning strategies:

- “Atypical” shifts were created to match the change in patient load at different times of the day and night.
- Every nurse was rated according to skill level, so that each shift now has the same balance of skill on its team.
- A computer portal was created to allow nurses to learn of shift openings.

Sources

For more information on realigning ED nursing staff, contact:

- **Jordan Geiman**, MBA, Staffing Manager for Nursing, Dameron Hospital, Stockton, CA. Phone: (209) 944-5550.
- **Janine Hawkins**, RN, MBA, Chief Nursing Officer, Dameron Hospital, Stockton. Phone: (209) 944-5457. E-mail: J.Hawkins@Dameronhospital.org.

them from the ICU down to the ED to give a hand with resuscitation, for example.” In fact, she adds, this applies to all nurses. “On the hiring agreement, it explains that this is how we work here, and registry nurses follow the same program,” she explains.

Finally, says Hawkins, all RNs have access to a computer portal, which posts any open shifts. When they log in, any nurse in the ED or capable of working in ED can sign up for that shift.

Initially, says Geiman, the changes weren't

implemented easily. “People were angry at first,” he says. “They complained that, for example, they were now working on Fridays and they had always had Fridays off, or that they had been working with the same group of nurses ‘forever,’ and they didn't want the group broken up.”

How did he deal with the complaints? “We explained why we were doing this — that it was all about patient care and having the right number of nurses and the right skill mix,” Geiman notes.

The administrators also shared the data with them, recalls Hawkins. “After the changes were made and they saw the cost savings come along, *they* began to come along,” she says. “They realized if we continued to be over budget, that something else would have to give.”

“We held monthly staffing forums to put the data in front of them and let them know there was a science behind what we were doing — and things *did* get better,” she adds. Hawkins supplemented the forums with a monthly newsletter. Persistence paid off.

“Once they tried it, they loved it, and they'll never go back,” Hawkins says. “They loved the fact that they had enough staff when they needed it, as well as not being overstaffed during slow periods of the day.” ■

ED staff attend courses on disaster prep, response

Government pays for travel, meals, instruction

Five employees from Redlands (CA) Community Hospital recently obtained training in fundamentals of emergency management at the Center for Domestic Preparedness based in Anniston, AL, operated by the Department of Homeland Security's Federal Emergency Management Agency (FEMA). ED leaders say this valuable training has made them much better prepared for any disasters they might face.

“They prepare us to survive for 72 hours without any assistance,” says **Steve Demming**, RN, the ED manager. “Based on the lessons learned from [Hurricane] Katrina, they realized we have to be self-sufficient for three days before they show up.”

While this was Demming's first trip to the center, it was the third for **Robert M. Tyson**, RN, a nurse liaison in the ED. He took his first class in January 2008. “I was first made aware of it through a local junior college, which was sending paramedics,” he recalls. “I tagged along.”

He soon realized that the center offered all kinds of classes and that his hospital should take advantage of it. “This was the first time we opened it up to people within

the department and the hospital,” says Demming.

Best of all, notes Tyson, the entire experience is free of charge. FEMA pays for air fare to Atlanta, and then buses the students to the center. “They put you up in dorm-style rooms, and there's a cafeteria right on site,” says Tyson, who took a course in pandemic influenza planning and preparedness during his second trip. “All you have to do is get the time off from the hospital.”

This latest course, which lasted a week, covered planning, mitigation, finances, and recovery, and it included tabletop drills during which the students could practice what they had learned. They also showed participants how to conduct a hazard vulnerability analysis, says

Executive Summary

Redlands (CA) Community Hospital has found an easy, cost-effective way to update its staff's emergency response training: courses offered by the Federal Emergency Management Agency (FEMA). Here's why you should consider these courses for your staff:

- FEMA covers all travel, lodging, and meal expenses, and the courses are offered free of charge.
- ED staff members from different hospitals attend at the same time and share lessons learned.
- Course leaders teach how to prepare for risks that are specific to your community.

Demming. “They helped us put together a plan for vulnerabilities we find here, like earthquakes, fire, flood, train crashes, and chemical exposure,” he says. For example, he notes, Redlands is located near a busy rail line. “This training enhanced how we can prepare for situations at home,” he says.

Tyson says the courses have taught him some valuable lessons. “I think we want to make our preparedness more hospitalwide,” he says. “Everyone has to participate.”

Demming agrees. “We’re going to train more people in our department to be incident-command certified,” he says. “This will strengthen the ED.”

One of the benefits of the Center for Domestic Preparedness is that you interact and learn from representatives of other EDs, says Demming.

“For example, we are fortunate that in this area we have not had to deal with major disasters like they have in the Midwest and on the East coast,” he notes, “but we talked to people from the EDs of a Cedar Rapids hospital that had to be evacuated during a flood, and one in North Carolina that had to ‘shelter in place’ when hurricanes hit.”

Demming says one ED went as long as five weeks without electricity and *really* had to learn how to run a department in the wake of a disaster. “Listening to them gave us ideas for better preparing ourselves,” he says.

The “tough” instructors, Demming continues, also helped the students adjust their mindsets. “They never said ‘if’ a disaster strikes, they always said ‘when,’” he explains. “This underscored the message that when we came back to our facilities we *really* had to get prepared.”

(Demming believes more ED personnel should take this course. See the story, below.) ■

More EDs should attend FEMA classes

Steve Demming, RN, the ED manager at Redlands (CA) Community Hospital, is surprised more EDs aren’t taking advantage of the courses offered at the Center for Domestic Preparedness in Anniston, AL, operated by the Federal Emergency Management Agency (FEMA). He recently received training in fundamentals of emergency management.

“The reality is that a disaster *can* happen,” he says. “While we need to take a really hard look at what we’re doing to prepare, unfortunately not many facilities in our area are taking advantage of these programs.”

Preparedness is important for more than just ensuring an effective response to disaster, he says. “It also might be a marketing necessity,” he says. When a disaster occurs, “the community will look to us, and this could be ‘make or break’ in terms of how they perceive us,” Demming says.

If a facility rises to the occasion, it will continue as a respected institution, he says. “If it crumbles and falls, it will take a long time to get that respect back,” he says. ■

ED initiative adds \$20M in revenues

Lower LWBS rate, volume bring benefits

A process improvement project addressing the entire emergency service line at The Medical Center of Central Georgia in Macon is expected to increase hospital revenues by \$20 million — \$24 million this year, according to **DeLanor Doyle**, MD, FACEP, the medical director of the emergency center.

Currently, revenues are \$2 million to the positive side per month. This amount represents a 40-to-1 return on the fees paid to Compirion Healthcare Solutions of Elm Grove, WI, the firm that worked with the ED to design and implement the project, which was paid fees of about \$500,000.

The accomplishments of the project, initiated in June 2008, include:

- The hospital has consistently grown its billable patient volume through the ED by 15% in month-to-

Sources/Resource

For more information on sending your staff to Federal Emergency Management Agency (FEMA) courses, contact:

- **Steve Demming**, RN, ED Manager, Robert M. Tyson, RN, ED Nurse Liaison, Redlands (CA) Community Hospital. Phone: (909) 335-5500.

For more information on the courses offered at the Center for Domestic Preparedness in Anniston, AL, go to cdp.dhs.gov. For registration information, contact:

- **Central Region:** Grant Bissey. Phone: (866) 213-9547. E-mail: bisseyg@cdpemail.dhs.gov.
- **Eastern Region:** Tom Tidwell. Phone: (866) 213-9546. E-mail: tidwellt@cdpemail.dhs.gov.
- **Western Region:** Chris Caputo. Phone: (866) 213-9548. E-mail: caputoc@cdpemail.dhs.gov.

Executive Summary

There's more than one way to boost ED revenues. Here are just a few of the strategies the ED at The Medical Center of Central Georgia in Macon used to increase revenues by at least \$20 million:

- The triage area was changed into a "triage and treatment" area, utilizing unused space in the department.
- A special "code" was instituted to speed availability of inpatient beds.
- The chest pain center, which had been on another floor, was moved to ED's fast track area so chest pain specialists could supplement ED staff.

month comparisons with last year.

- The percentage of ED patients leaving before treatment has been slashed from 14% to 2.72%.
- By the end of Compirion's engagement in January 2009, the elapsed time from patient registration to inpatient units had dropped by 50%. The goal for door-to-treatment time for outpatients had been set at 4.5 hours; in January, the hours dropped from 6.65 to about four hours, well below the hospital's target.
- As a result of improved throughput, billable patient volume grew from 132 to 155-165 patients per day.

One of the most significant changes was to change the triage area in the front of the department into a "triage and treatment" area, says **Barb Stickel**, MSN, RN, senior vice president and chief nursing officer. "We utilized unused areas as treatment areas," she explains.

Doyle adds, "We had a little quick care area next to triage that we started using, and triage rooms themselves were used as treatment areas, and we just triaged in a smaller area."

In addition, nurse practitioners and physician assistants were brought to the front and, when needed, doctors, says Doyle. "So, instead of them just being triaged and waiting up to 15 hours, we can see them and have them out much more quickly," he says.

To handle the increased volume in the ED, more beds on the floors needed to be available during peak hours. To address that issue, another new process that was implemented has been named "Code Census." "When we realize we're getting backed up, we will call an alert to the staff on a housewide page," explains Stickel. "If we do not see the nurses are refocused on getting discharges moving within a reasonable period of time, we send another message: We play a few bars of the 'William Tell Overture.'"

This unorthodox approach has proved to be quite effective, she says. "It's amazing, but within 30-45

minutes, the beds have freed up," Stickel shares.

Another recommendation involved moving the chest pain center, which originally was located on another floor, into the fast track area closer to the ED. Fast-track patients are now being seen via the new triage and treatment process. This way, the chest pain specialists, who are also emergency physicians, can assist in the ED.

"Overnight, the two physicians cover the chest pain center as well as the ED," notes Doyle. "The physicians in the ED now see more patients per hour than ever before." **(Team meetings were one of the keys to such quick success. See the story, below.) ■**

Team meetings spur quick results

Generating projected revenue increases of \$20 million to \$24 million is impressive enough, but accomplishing the task in less than a year is really remarkable. How did The Medical Center of Central Georgia in Macon do it? By laying a solid foundation with the help of Elm Grove, WI-based Compirion Healthcare Solutions.

"Starting in June 2008, we sat down with them and our nursing group, our medical director, and our administration, and at the very beginning we developed what metrics we wanted to improve and determined our baselines," recalls **Barb Stickel**, MSN, RN, senior vice president and chief nursing officer. "We wanted to increase volume, improve quality of care within our core measures, and look at patient satisfaction — because any time you make changes, you do not want to adversely impact patient satisfaction."

The implementation phase was completed in December 2008, and it clearly has succeeded. In addition to boosting revenue and reducing the percentage of patients who leave before treatment, Stickel reports that core measures "are just about running at 100%." These include giving aspirin and beta-blockers to heart attack patients

Sources

For more information on strategies to increase revenues, contact:

- **DeLanor Doyle**, MD, FACEP, Medical Director, Emergency Center, The Medical Center of Central Georgia, Macon. Phone: (478) 633-1153.
- **Barb Stickel**, MSN, RN, Senior Vice President and Chief Nursing Officer, The Medical Center of Central Georgia. Phone: (478) 633-1412.

within 90 minutes, and blood cultures and antibiotics for pneumonia patients within four hours.

As wait times dropped, patient satisfaction scores climbed from the ninth percentile to higher than a 90th percentile ranking. “Our task force selected five questions for every patient to be asked,” says Stickel, noting they included topics such as wait time, overall experience, and confidence and trust in their doctor.

The staff is able to keep track of their performance thanks to a dashboard developed with Compiron. “We have a weekly dashboard of our metrics, which shows us what the baselines were and what our targets are,” Stickel explains. “We still look at them. We don’t want to get complacent.” ■

ED/hospitalist plan improves throughput

Collaboration also reduces diversions

A new plan for admitting patients from the ED at Johns Hopkins Bayview Medical Center in Baltimore jointly developed by an ED physician and a hospitalist, decreased ED throughput for admitted patients 98 minutes (from 458 minutes to 360 minutes) from the same period a year earlier, despite an 8.8% increase in the ED census. The proportion of hours that the ED was on ambulance diversion because of ED crowding decreased 6 percentage points, or 182 fewer hours. The proportion of hours that the ED was on red alert (ambulance diversion due to lack of ICU beds in the

Executive Summary

An ED leader and the head hospitalist at Johns Hopkins Bayview Medical Center, Baltimore, MD, jointly developed a new plan for admitting patients from the ED that has decreased ED throughput for admitted patients 98 minutes (from 458 minutes to 360 minutes) from the same period a year earlier, despite an 8.8% increase in the ED census. Here are some of the keys:

- A hospitalist, with the treating ED physician, makes the final decisions for admitting ED patients to the cardiac ICU; the medical ICU; and the cardiology, pulmonary, and general medicine units.
- The rotating position, covered 24/7, also has responsibility for bed management.
- Objections of specialists in other departments were overcome by giving them input.

Sources

For more information on using hospitalists to help admit patients from the ED, contact:

- **Edward Bessman, MD, FAAEM, FACEP**, Chairman of Emergency Medicine, and **Eric E. Howell, MD, FHM**, Director of Hospital Care, Department of Medicine, Johns Hopkins Bayview Medical Center, Baltimore. Phone: (410) 550-0350.

hospital) decreased 27 percentage points, or 786 fewer hours.

“Before, this plan, admissions were largely handled from house staff to house staff, which we called ‘service ping pong,’” recalls **Edward Bessman, MD, FAAEM, FACEP**, who was then an ED physician and is now chairman of emergency medicine. “There was a lot of back and forth, where physicians agreed the patients needed to be admitted, but not necessarily to their service.”

That problem has been eliminated, because now a hospitalist, in consultation with the treating ED physician, makes the final decisions for admitting ED patients to the cardiac ICU; the medical ICU; and the cardiology, pulmonary and general medicine units. **(This change did not go over well at first with hospital specialists. See the story on p. 71.)** That same position, filled on a rotating basis by all hospitalists, is responsible for 24/7 bed management. ICU admissions are transferred no longer than 90 minutes after the assignment decision is made, while patients admitted to a non-ICU unit are transferred out of the ED as soon as a bed is available.

To implement the plan, Bessman and **Eric E. Howell, MD, FHM**, director of hospital care for the department of medicine, had to convince administration to take on an additional 2.4 hospitalist FTEs. “It took a while to convince various administration types that in fact if we could solve our admissions problem, we’d solve a large part the ED overcrowding problem,” says Bessman. “But we showed them that two-thirds of our admissions come from the ED, and that when it’s full, admissions fall off and ambulance diversions increase.” In fact, he says, the two actually walked administrators through the ED to show them how full the ED was.

Pointing out the “lost” admissions was critical, Bessman emphasizes. “You can talk about patient safety and satisfaction all you want, but if you really want something to happen, you have to frame it in terms of dollars,” he says.

Howell says, “When I talked to the administration, there were internal studies we had done that showed for every two hours of diversion, you lost half an admission. We also found evidence in the literature to support the fact that diversions cost a minimum of \$1,000 an hour.”

The investment seems to have paid off, Bessman says. “On the expense side we added about \$1 million, but we’re in the middle of return on investment calculations, and it looks like our return will be about two to one based on incremental volume and admissions,” he says. ■

Specialists are skeptical at first

It was a challenge to convince administration officials to invest about half a million dollars a year for 2.4 additional hospitalist FTEs required for a new plan for admitting patients from the ED at Johns Hopkins Bayview Medical Center in Baltimore. However, it was just as hard to convince some specialists to cede the responsibility for admitting patients to their units to a hospitalist, as the new plan required.

“In some institutions, coming up with the money might not be the difficult part,” says **Eric E. Howell**, MD, FHM, director of hospital care for the Department of Medicine. “For us, it was equally difficult to gain acceptance of the decision to allow the active bed manager [hospitalist] to, in fact, triage for all divisions.”

How were the objections overcome? “It was not an overnight process,” he concedes. “Probably the main selling point was giving them input into our process.” A medicine oversight admissions committee was created, Howell explains. Through monthly meetings, the primary

departments continue to have input into the process, he adds.

“With that collaboration, they signed off on it, and ironically, now they love it,” says Howell. “The cardiac intensive care unit, for example, which was one of most reluctant, has seen an increase in primary coronary infusions, and door-to-balloon times have gone down.”

Edward Bessman, MD, FAAEM, FACEP, chairman of emergency medicine, says, “We made other changes at the same time, but we are now doing angio within 120 minutes 91% of the time, vs. 40% before we began. Our goal is to have 75% under 90; currently it’s almost 60%.” ■

CNE/CME objectives

1. **Apply** new information about various approaches to ED management.
2. **Discuss** how developments in the regulatory arena apply to the ED setting.
3. **Implement** managerial procedures suggested by your peers in the publication. ■

CNE/CME questions

13. According to Mike McEvoy, PhD, REMT-P, RN, CCRN, how close can providers get to a patient who potentially has a respiratory illness without asking if they have a fever?
 - A. No closer than 3 feet.
 - B. No closer than 4 feet.
 - C. No closer than 5 feet.
 - D. No closer than 6 feet.
14. According to Gary Green, MD, MPH, MBA, in the reverse triage process, it is deemed acceptable to discharge a patient early if the risk of a subsequent adverse event within four days of discharge is:
 - A. 12% or lower.
 - B. 10% or lower.
 - C. 8% or lower.
 - D. 6% or lower.
15. According to Janine Hawkins, RN, MBA, which of these staffing strategies were part of a new approach that helped save more than \$200,000 a year?
 - A. The creation of atypical shifts.

CNE/CME instructions

Physicians and nurses participate in this CNE/CME program by reading the issue, using the references for research, and studying the questions. Participants should select what they believe to be the correct answers, then refer to the answer key to test their knowledge. To clarify confusion on any questions answered incorrectly, consult the source material. After completing the semester’s activity with the **September** issue, you must complete the evaluation form provided and return it in the reply envelope to receive a certificate of completion. When your evaluation is received, a certificate will be mailed to you. ■

COMING IN FUTURE MONTHS

■ Hospital shuts down, but ED keeps right on ticking

■ Nurses revolt over boarding patients in hallways

■ Improving your collection prospects on the front end

■ ED uses split-flow system to help manage patient flow

■ H1N1: Progress report, ED response success stories

- B. Ensuring an even distribution of nursing talent on all shifts.
- C. Creating a portal so that nurses could see and volunteer for open shifts.
- D. All of the above
16. According to Steve Demming, RN, the free emergency preparedness course he took at the Center for Domestic Preparedness taught ED leaders the skills necessary to enable them to sustain operations for a period of time that has been established in many federal plans. That interval of self-sustainment is:
- A. 24 hours.
- B. 48 hours.
- C. 72 hours.
- D. 90 hours.
17. According to Barb Stickel, MSN, RN, the ED used which of the following strategies to boost hospital ED revenues?
- A. Moving the pain center into the ED.
- B. Instituting a code census to improve bed availability.
- C. Changing the triage area into a triage and treatment area.
- D. All of the above
18. According to Eric E. Howell, MD, FHM, the literature shows that diversions cost a minimum of:
- A. \$500 an hour.
- B. \$1,000 an hour.
- C. \$1,500 an hour.
- D. \$2,000 an hour.

EDITORIAL ADVISORY BOARD

Executive Editor: James J. Augustine, MD, FACEP

Director of Clinical Operations, Emergency Medicine Physicians
Canton, OH

Clinical Assistant Professor, Department of Emergency Medicine,
Wright State University, Dayton, OH.

Medical Director, Atlanta Fire Rescue Department and
Hartsfield-Jackson Atlanta International Airport

Nancy Auer, MD, FACEP
Vice President for Medical
Affairs
Swedish Health Services
Seattle

Kay Ball, RN, PhD, CNOR, FAAN
Perioperative
Consultant/Educator
K & D Medical
Lewis Center, OH

Larry Bedard, MD, FACEP
Senior Partner
California Emergency
Physicians
President, Bedard and
Associates
Sausalito, CA

Robert A. Bitterman
MD, JD, FACEP
President
Bitterman Health Law
Consulting Group
Harbor Springs, MI

Richard Bukata, MD
Medical Director, ED, San
Gabriel (CA) Valley Medical
Center; Clinical Professor of
Emergency Medicine, Keck
School of Medicine,
University of Southern
California
Los Angeles

Diana S. Contino
RN, MBA, FAEN
Senior Manager, Healthcare
Deloitte Consulting LLP
Los Angeles

Caral Edelberg
CPC, CCS-P, CHC
President
Edelberg Compliance
Associates
Baton Rouge, LA
President Emeritus
Medical Management
Resources of TeamHealth
Jacksonville, FL

Gregory L. Henry, MD, FACEP
Clinical Professor
Department of Emergency
Medicine
University of Michigan Medical
School

Risk Management Consultant
Emergency Physicians Medical
Group
Chief Executive Officer
Medical Practice Risk
Assessment Inc.
Ann Arbor, MI

Tony Joseph, MD, FACEP
President & CEO
AMC Registry Inc.
Columbus, OH

Marty Karpziel
MPA, FACHE, FHFMA
Emergency Services
Consultant
Karpziel Consulting Group Inc.
Long Beach, CA

Thom A. Mayer, MD, FACEP
Chairman
Department of Emergency
Medicine
Fairfax Hospital
Falls Church, VA

Larry B. Mellick, MD, MS, FAAP, FACEP
Professor of Emergency
Medicine
Professor of Pediatrics
Department of Emergency
Medicine
Medical College of Georgia
Augusta

Robert B. Takla, MD, FACEP
Medical Director and Chair
Department of Emergency
Medicine
St John Hospital and Medical
Center
Detroit

Michael J. Williams, MPA, HSA
President
The Abaris Group
Walnut Creek, CA

To reproduce any part of this newsletter for promotional purposes, please contact:

Stephen Vance

Phone: (800) 688-2421, ext. 5511

Fax: (800) 284-3291

Email: stephen.vance@ahcmedia.com

To obtain information and pricing on group discounts, multiple copies, site-licenses, or electronic distribution please contact:

Tria Kreutzer

Phone: (800) 688-2421, ext. 5482

Fax: (800)-284-3291

Email: tria.kreutzer@ahcmedia.com

Address: AHC Media LLC
3525 Piedmont Road, Bldg. 6, Ste. 400
Atlanta, GA 30305 USA

To reproduce any part of AHC newsletters for educational purposes, please contact:

The Copyright Clearance Center for permission

Email: info@copyright.com

Website: www.copyright.com

Phone: (978) 750-8400

Fax: (978) 646-8600

Address: Copyright Clearance Center
222 Rosewood Drive
Danvers, MA 01923 USA

CNE/CME answers

13. D; 14. A; 15. D; 16. C; 17. D; 18. B.

Author: James A. Wilde MD, FAAP, Associate Professor of Emergency Medicine and Pediatrics, Medical College of Georgia, Augusta; member, State of Georgia Pandemic Flu Planning Committee and the Altered Standards of Care Sub-committee. Dr. Wilde assisted in the preparation of the Medical College of Georgia Pandemic Flu Plan, and is an influenza sentinel provider for the CDC.

As this article goes to print in the first week of May, we are ending the second full week of the 2009 H1N1 swine flu outbreak. It appears the World Health Organization (WHO) may raise its Pandemic Alert level to Phase 6, indicating a full-scale pandemic with sustained human-to-human infection. Despite this, there are signs that this outbreak will turn out to be relatively mild and may even fade altogether.

Why, then, the high level of concern from both WHO and the Centers for Disease Control and Prevention (CDC)? What is the significance of this outbreak? Are there any further actions we as individual clinicians should take? These questions and others will be examined in this article.

Background

A frequent question from the audience in flu pandemic presentations is “How much time will we have to prepare once a pandemic starts?” The 2009 swine flu outbreak provides an excellent example to illustrate just how little time we will have. This is of critical importance in planning for a pandemic at the national, state, and local level.

To understand the events of the past two weeks, it is helpful first to understand how flu activity is monitored at the state and national level.

More than 1,000 clinicians from around the United States voluntarily collect data on patients in their practice setting who present with influenza-like illness (ILI) and relay that information to the CDC on a weekly basis. ILI is defined by the CDC as temperature of $\geq 100^{\circ}$ F PLUS either cough or sore throat in the absence of an alternative diagnosis such as pharyngitis due to group A *streptococcus*.¹ The CDC has found that ILI correlates well with influenza activity and is an excellent way to monitor the progress of a typical flu season. These “sentinel providers” also are asked to send occasional throat or nasopharyngeal swabs to the CDC for influenza culture so that the circulating strains can be monitored.

A graph of ILI found on the CDC web site shows that the season was winding down by week 14, the week ending April 11, 2009.² The number of people seen in clinics and emergency departments with ILI was actually below the baseline of approximately 2%, indicating that the rate of ILI was no higher than the background rate for the year.

As of week 14, CDC reported that the majority of the isolates tested during the influenza season that started October 1, 2008, were influenza A/H1N1. About one-third of the isolates tested were influenza B, and there was a small number of A/H3N2 isolates.¹ Subtypes H1N1 and H3N2 have accounted for all the human influenza A strains that have circulated in the world since 1977.³ Overall flu activity that week was down substantially on the national level, and only 15 states were still reporting regional or widespread activity.

Swine Flu Appears, then Events Unfold Rapidly

On April 22, 2009, CDC announced that it had detected two unusual cases of influenza in children in California.⁴ The isolates were type A influenza, subtype H1N1, but they were clearly distinct from the A/H1N1 human influenza virus that had circulated earlier in the winter. They appeared to be of swine origin. The earliest of the two cases was a

child with onset of symptoms on March 28, and both patients had already recovered at the time of the report.

That report was met with interest by some in the infectious diseases world but hardly raised an eyebrow elsewhere. In general, influenza viruses do not cross the species barrier, although isolated cases of swine or avian flu have been reported in humans before and are not necessarily cause for alarm.^{5,6} The largest recent outbreak was caused by avian influenza type A, subtype H5N1, also known as “bird flu.” This virus was first reported in 1997 in Hong Kong and has since infected more than 300 people, with a mortality rate over 60%.⁷

A/H5N1 is still circulating in the Eastern Hemisphere but has not yet been found in the Western Hemisphere. It has shown limited person-to-person spread. It has caused public health authorities throughout the world to advise their nations to prepare for a new pandemic, possibly coming from a mutated strain of A/H5N1 or from a currently unknown source. The last influenza pandemic to strike the world was Hong Kong flu in 1968, a type A, subtype H3N2 that caused the deaths of 1 million to 2 million people worldwide. At least 50 million people worldwide perished from the 1918 “Spanish Flu.”

Everything changed on Thursday, April 23, when CDC reported human cases of swine influenza A/H1N1 in seven patients in California and Texas, with evidence of human-to-human spread. Anne Schuchat, Interim Deputy Director for Science at the CDC, indicated in a news conference that day that the virus has components from swine, human, and possibly avian sources. According to Dr. Schuchat, “That particular genetic combination of swine influenza virus segments has not been recognized before in the U.S. or elsewhere.”⁸ This news was particularly relevant because of the fact that swine can serve as intermediate hosts for both avian and human viruses. This allows for genetic reassortment and the production of novel viruses with human and avian components that can theoretically produce pandemic influenza.⁵

Suddenly there was cause for concern, and the CDC decided to send a team of seven epidemiologists to California to aid in the investigation. Part of the reason for the increased urgency was that three ingredients are required for a new flu pandemic: the emergence of a novel virus; a population with no existing immunity against the subtype; and rapid transmission from person to person. It appeared that the first two criteria had already been met. It was not yet clear if the third criterion had been.

After April 23, events unfolded with breathtaking speed best illustrated with a timeline. (See Table.)^{9,10}

Discussion

As of May 5, it is still unclear if we are heading for a full-scale influenza pandemic with the impact of the pandemics we encountered in 1918, 1957, or 1968. The very high death rate initially reported from Mexico has been revised downward with each passing day. At this point the mortality rate in Mexico is about 4%, but the mortality rate in the United States and the rest of the world combined is not appreciably different from the mortality rate from routine seasonal flu. It is possible that

Table. H1N1 Timeline

- Friday April 24:** Mexico's Minister of Health confirms seven cases of swine flu in Mexico. There are 854 cases of pneumonia reported from Mexico City, with 59 deaths; further investigations are in progress. Data provided by the Mexican government to the WHO indicate an upturn in ILI cases in Mexico starting March 18. CDC confirms that the Mexican strains match those found in the U.S. The CDC begins to refer people to its web site for information on preparation for a pandemic. There are now 18 confirmed cases of H1N1 in the United States.
- Saturday April 25:** CDC sends a team to Mexico.
- Sunday, April 26:** There are now 20 cases confirmed in five U.S. states. A cluster of students is identified in New York; most have traveled recently to Mexico. The Department of Health and Human Services declares a public health emergency in the United States. Homeland Security Secretary Janet Napolitano announces the release of 25% of the 50 million treatment courses of Oseltamivir (Tamiflu) in the Strategic National Stockpile.
- Monday April 27:** There are 40 confirmed cases in five U.S. states. The median age of infected patients is 16 years, with a range of 7 to 54 years. All have recovered uneventfully. The new strain is susceptible to Oseltamivir and Zanamivir (Relenza). It is resistant to the older adamantane class of antiviral medications (Amantadine, Rimantidine). CDC reports that there is no cross-reacting antibody from the seasonal vaccine H1N1 against the H1N1 swine virus. This means that the new virus is so completely different from the human H1N1 subtype that there is no protection to be offered against the new strain by the influenza vaccine that was in use this season. CDC now confirms 26 cases in Mexico and advises that "non-essential" travel to Mexico should be avoided but does not recommend that the border to Mexico be closed.
- Tuesday April 28:** Sixty-four cases are confirmed in five U.S. states. WHO reports seven countries with confirmed swine flu H1N1 infection in humans: New Zealand, Canada, United Kingdom, Israel, and Spain. The WHO raises the worldwide pandemic alert level from Phase 3 on its 6-point scale, where it has been since the emergence of H5N1 avian flu, to Phase 4. This indicates confirmed person-to-person spread. The CDC directs clinicians to its Web site for guidance on detection and treatment of swine flu. President Obama requests \$1.5 billion in emergency supplemental funding for swine flu.
- Wednesday, April 29:** There are now 91 confirmed cases in 10 U.S. states. CDC issues guidance on antiviral recommendations for patients with confirmed, probable, or suspected H1N1. Definitions of those terms in persons with acute febrile respiratory illness are as follows:¹¹
- Confirmed: by RT-PCR or culture (available only at CDC but soon to be available in all state laboratories).
 - Probable: positive for flu A, negative for human H1 and H3. Further testing at CDC required.
 - Suspected: contact with confirmed patient within seven days of symptom onset or travel within seven days to an area with known swine flu activity or in a community with confirmed H1N1.
- There is no recommendation to treat patients with ILI who are not in those categories. CDC and the Food and Drug Administration (FDA) issued recommendations in favor of using Oseltamivir in children younger than 1 year of age, a group for which the drug has not yet been approved.¹² The WHO raises its Pandemic Alert Level to Phase 5, indicating significant person-to-person transmission.
- Thursday April 30:** 109 cases are confirmed in 12 U.S. states. One death is reported in Texas, a 23-month-old child from Mexico City who had crossed into Texas shortly before her death. WHO reports 257 confirmed cases in 11 countries other than the United States and Mexico, with no deaths.
- Sunday May 3:** CDC completes the deployment of 25% of the supplies in the Strategic National Stockpile to all states in the continental United States.
- Monday May 4:** There are now 286 confirmed cases in 36 U.S. states with one confirmed death. WHO reports that 21 countries have a total of 1,085 confirmed cases of swine flu, with 25 deaths in Mexico (590 laboratory confirmed cases) and no deaths outside the United States and Mexico (209 laboratory confirmed cases).¹³

Mexico has undercounted the number of infected persons, driving the mortality numbers artificially high. More data are urgently needed to better understand the widely divergent mortality figures between Mexico and the rest of the world.

While the spread of the disease around the world has been quite rapid, the total number of infected patients has been relatively modest in the 4–6 weeks since the first case was identified. Even in Mexico, approximately two thirds of the patients who had ILI and were in a known endemic region tested negative for swine flu. It is not clear yet how easily the virus is spread, or how many additional cases result from each infected individual. If that number is small, as it was with the SARS virus, then this outbreak may fade.

We will probably know by the middle of May how severe this outbreak will be. Until we have more information, we should maintain our vigilance and continue to make preparations for a possible pandemic. It is also important to be aware that an aborted outbreak now may reappear next flu season as a more widespread pandemic.

(On May 1, the Medical College of Georgia Department of Emergency Medicine and the MCG Center for Operational Medicine broadcast a one-hour lecture on pandemic flu and H1N1. A videotape of that lecture can be viewed by going to www.mcg.edu/about/h1n1 and clicking on "Pandemic Influenza: What We Should Know" in the corner box.)

References

1. Centers for Disease Control and Prevention. Flu Activity and Surveillance. <http://www.cdc.gov/flu/weekly/fluactivity.htm>.
2. Centers for Disease Control and Prevention. Flu View: 2008-2009 Influenza Season Week 14 ending April 11, 2009. <http://www.cdc.gov/flu/weekly/weeklyarchives2008-2009/weekly14.htm>.
3. MMWR Centers for Disease Control and Prevention. Prevention and Control of Influenza. *MMWR* 2008;57(No. RR-7):4.
4. Centers for Disease Control and Prevention. Swine Influenza A(H1N1) Infection in Two Children: Southern California, March-April 2009. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0421a1.htm>
5. Mandel, Betts RF. Influenza Virus. In: *Principles and Practice of Infectious Diseases*, 4th ed, Mandel GL, Bennet JE, Dolin R, editors. Churchill Livingstone: Philadelphia;1995:1550.
6. Myers KP, Olsen CW, Gray GC. Cases of swine influenza in humans: a review of the literature. *Clin Infect Dis* 2007;44:1084-1088.
7. Gambotto A, Barratt-Boyes SM, de Jong MD, et al. Human infection with highly pathogenic H5N1 influenza virus. *Lancet* 2008;371:1464-1475.
8. Centers for Disease Control and Prevention. Press Briefing Transcripts: CDC Briefing on Public Health Investigation of Human Cases of Swine Influenza. <http://www.cdc.gov/media/transcripts/2009/t090423.htm>.
9. Centers for Disease Control and Prevention. H1N1 Flu (Swine Flu). www.cdc.gov/h1n1flu.
10. World Health Organization. Influenza A(H1N1): Special Highlights. www.who.int/en.
11. http://www.cdc.gov/h1n1flu/casedef_swineflu.htm.
12. Centers for Disease Control and Prevention. Interim Guidance for Clinicians on the Prevention and Treatment of Swine-Origin Influenza Virus Infection in Young Children. <http://www.cdc.gov/h1n1flu/children-treatment.htm>.
13. World Health Organization. Influenza A(h1N1): Update 14 http://www.who.int/csr/don/2009_05_04a/en/index.html.